

Sustainable Material in Set Design

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Abstract—The growing need to protect the environment has pushed industries to rethink their methods, including set design. Set design often uses materials that harm the environment due to their short lifecycle and non-recyclable nature. This paper explores the use of sustainable materials in set design and shows how they can reduce environmental harm without compromising creativity or quality. Case studies and literature reviews help highlight practical examples and benefits.

Index Terms—Sustainable materials, set design, eco-friendly alternatives, recycling, creative industry.

I. INTRODUCTION

Sustainable materials are those that will be replenished naturally and have a minimal impact on the environment. For set design, sustainable materials can mean recycled materials, locally sourced materials, and materials that can be reused or repurposed. Using sustainable materials for set design will reduce waste, conserve natural resources, and minimize the harm to the environment.



Figure 1: The National Theatre's "War Horse" set design
Source: <https://puppetswithguts.com/shows/war-horse/>

II. LITERATURE STUDY

A. Sustainable Materials in Set Design

The number of studies on sustainable materials in set design is increasingly on the rise. Other research has been made regarding the use of recycled materials in set construction, including reclaimed wood and recycled plastics. There is also research done

regarding the potential of using sustainable materials, such as bamboo and sustainable fabrics, in set design. The studies revealed the advantages of using sustainable materials in set design, which include waste reduction, decreased carbon emissions, and cost savings.

B. Current practices in set design

Traditional set design practices are mainly based on unsustainable materials like wood, steel, and plastics. These materials are used primarily because they are readily available, inexpensive, and convenient to work with. However, their use results in severe environmental damage, such as deforestation, pollution, and waste. Many set designers and production companies are now looking for alternative materials and practices that could help them minimize their environmental damage.



Figure 2: Sustainable materials used for Set Design
Source: <https://interiorstylehunter.com/sustainable-materials-every-interior-designer-needs-to-know/>

C. Problems with traditional material

Environmental Impact

Traditional materials such as wood, steel, and plastic contribute a lot to environmental effects. Extraction, processing, and disposal lead to forest clearing, pollution, and waste. Steel, for instance, takes up massive amounts of energy in the production process and also contributes heavily to greenhouse gas emissions.

Waste Generation

These conventional materials used for building in the set designs eventually give much waste generation. They often build the set only for one production run, which then leaves such sets discarded, producing quite a large amount of it to landfills that generate more pollution and cause many bad impacts on the environment.

Resource Depletion

It may also increase the depletion of resources while using traditional materials for design in a set. Such is the use of wood for construction that contributes towards the depletion of wood leading to deforestation.

Cost Implications

The use of traditional materials during set design is also financially expensive. Costs associated with purchasing and getting rid of traditional materials can be high. The more the sets involve traditional material, the cost of their repair and maintenance is highly charged.



Figure 3: Sustainable materials used for Set Design
Source: <https://www.theatredesign.org.uk/a-guide-to-sustainable-materials-for-theatre-design/>

D. Sustainable Practices in Design

It focuses on the adoption of circular economy principles in set design with the emphasis on reuse, recycling, and biodegradable materials. For instance, according to (Rosenthal, 2021), integrating renewable materials such as bamboo, cork, and FSC-certified wood reduces carbon emissions by a significant percentage. Lightweight materials, like biodegradable plastics, provide practical advantages for transportation and assembly.

E. Challenges in Implementation

Despite their benefits, sustainable materials often experience challenges such as higher initial costs and limited availability. According to (Green, 2020), there is a need for industry-wide collaboration in establishing sustainable supply chains. Furthermore, ignorance and resistance to change from stakeholders also prevent large-scale adoption.

F. Renewable Materials

Bamboo

Bamboo grows quickly and is a renewable resource.

Uses: Bamboo can be used for framing instead of wood due to its strength and flexibility.

Recycled Cardboard

It's lightweight, easy to work with, and recyclable.

Uses: Recycled cardboard panels can replace plywood for temporary flats or backdrops.

Hemp-based Fiberboard

Hemp grows rapidly and doesn't require as many resources to cultivate.

Uses: It can be used as an alternative to Plywood for hard flats.

Recycled Plastic Panels

Recycled plastic reduces waste and offers a durable, waterproof alternative to wood.

Uses: These can be used for outdoor sets or hard flats, providing longevity and easy maintenance.

Aluminum or Steel Frames

Although metals require significant energy to produce, they are highly durable and recyclable.

Uses: These can replace wooden frames for longer-lasting, reusable flats.

Biodegradable Plastics (PLA)

Made from renewable resources like cornstarch, PLA is compostable.

Uses: It can be used to make lightweight, eco-friendly flats

III. CASE STUDY

A. Broadway's "The Lion King"

Introduction

The Broadway production of "The Lion King" is a landmark musical, entertaining audiences since 1997. The show's elaborate set and costumes have been well-praised, and its commitment to sustainability has earned the show several awards and recognition.

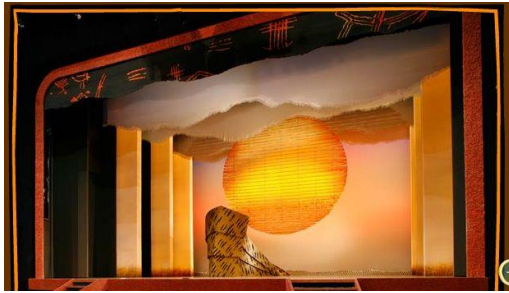


Figure 4: "The Lion King" Set

Source:

<https://in.pinterest.com/pin/1829656087591797/>

Sustainable Set Design

Designed by (Hudson, 2013), the set of "The Lion King" incorporates sustainable materials and practices into the design. The set includes many of the film's most memorable elements: the Pride Lands, the Elephant Graveyard, and the stampede scene, to name a few. Those were crafted both traditionally and with the help of technology.



Figure 5: The Lion King Set Design

Source: <https://in.pinterest.com/pin/422423640021309970/>

Sustainable Materials

The set of "The Lion King" features a number of sustainable materials, including: -

Reclaimed wood: The set's framework is made from reclaimed wood, which was sourced from local suppliers. -

•Recycled metal: The metal parts in the set, like the giraffe sculptures, were created from recycled metal.

•Low-VOC paints: The set was painted with low-VOC paints, which decreases indoor air pollution.

Energy Efficiency: The crew of "The Lion King" also used a lot of energy-efficient techniques. Among them are:

•LED lighting: Replaced the show's lighting system with LED lighting that consumes a lot less energy in comparison to traditional lighting.

•Energy-efficient motors: The mechanical systems found in the show, mainly elevators and turntables, were replaced with the use of energy-efficient motors.

B. The Royal Shakespeare Company's "Waste"

Introduction

"Waste" is one of the major productions by the Royal Shakespeare Company that addresses environmental degradation and social responsibility. The set and costume design for production will be sustainable, and the play has been widely recognized for reducing its environmental impact.



Figure 6: The Royal Shakespeare Company's Set

Source: <https://www.theardenhotelstratford.com/rsc-theatre-package/>

Sustainable Set Design

"Waste" is one of the major productions by the Royal Shakespeare Company that focuses on environmental degradation and social responsibility. The set and costume design for production will be sustainable, and the play has been widely recognized for reducing its environmental impact.

Sustainable Materials

The set of "Waste" has the following sustainable materials:

•Recycled plastic: The plastic parts of the set, such as the platforms and staircases, were made from recycled plastic.

•Sustainably sourced wood: The wooden parts of the set, such as the stage and platforms, were made from sustainably sourced wood.

•Low-VOC paints: The set was painted using low-VOC paints, which reduces indoor air pollution.

Energy Efficiency: The production team for "Waste" also took steps to green the show by putting in:

- Energy-efficient lighting: The overall lighting system was upgraded on the show from the energy-guzzling lighting technology to LED lights.
- Energy-efficient motor: The mechanical aspects of the show, such as the lifts and turntables, used energy-efficient motors.

IV. CONCLUSION

The integration of sustainable materials into set design is not only environmentally crucial but also creatively enriching. It can promote a future in which more sustainable entertainment industries flourish with the implementation of eco-friendly materials and creative practices. It then requires solving the barriers facing these practices: cost, access, by working through partnerships and government policies.

V. ACKNOWLEDGMENT

I extend my heartfelt gratitude to my research guide, Ar. Khushboo Sahu, for their invaluable guidance and support throughout this research. My sincere thanks to the faculty and staff of Amity University Chhattisgarh for their assistance and resources. Appreciation goes to my colleagues and peers for their encouragement and constructive feedback. Special thanks to the professionals and experts who shared their knowledge and insights. Lastly, I owe my deepest thanks to my family and friends for their unwavering support and patience throughout this journey. This accomplishment is a testament to their belief in me.

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