

"Sustainable Waste Management at Sammakka Sarakka Jatara: Transforming Offerings into Eco-Friendly Products"

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Abstract

The Sammakka Sarakka Jatara, held in Telangana, is one of the largest tribal festivals in India, attracting millions of devotees from across the country. During the festival, devotees offer a variety of items such as coconuts, flowers, turmeric, and other biodegradable materials as a mark of devotion and faith. While these offerings hold deep cultural and religious significance, the improper disposal of these materials results in huge amounts of waste, leading to environmental pollution and waste management challenges. Over the years, the accumulation of such waste has become a growing concern, affecting the surrounding environment and ecosystems. This project focuses on developing an **effective and sustainable waste management system** that transforms the biodegradable waste generated during the festival into useful, eco-friendly products such as compost, organic fertilizers, natural dyes, and incense sticks. The main objective is to promote a circular economy by ensuring that waste materials are reused or repurposed in a productive manner. The project involves implementing a structured system of **waste segregation at source**, followed by the proper processing of organic waste through composting and other innovative techniques. Floral waste, which forms a significant portion of the offerings, can be used to produce natural dyes and incense, adding value to discarded materials. Additionally, the project includes **awareness and sensitization programs** to educate devotees, local authorities, and stakeholders about the importance of adopting sustainable waste management practices. Volunteers and local communities will be engaged in these activities to ensure active participation and to foster a sense of responsibility toward environmental conservation. This initiative not only helps in reducing the environmental impact caused by waste but also creates livelihood opportunities for local communities by promoting the production and sale of eco-friendly products.

Keywords:

Sammakka Sarakka Jatara, Tribal Festival, Waste Management, Biodegradable Waste, Pollution, Composting, Organic Fertilizers, Natural Dyes, Incense Sticks, Waste Segregation, Eco-friendly Products, Community Awareness, Environmental Protection, Local Livelihood.

Introduction

The Sammakka Sarakka Jatara, celebrated in Telangana, is one of the largest tribal festivals in India, attracting millions of devotees from different parts of the country. During the festival, devotees offer a variety of items such as coconuts, flowers, turmeric, and other biodegradable materials as a part of their devotion and religious rituals. While these offerings are considered sacred and hold great cultural significance, they generate a large amount of waste that is not properly managed. This leads to environmental pollution, affecting the surrounding areas and creating challenges for waste disposal. Over the years, the increasing volume of waste has become a major concern for local authorities and communities.

This project aims to develop a sustainable and effective waste management system that focuses on converting biodegradable waste generated during the festival into useful and eco-friendly products. The plan involves implementing waste segregation at the source, ensuring that biodegradable and non-biodegradable waste are separated properly. The organic waste, especially floral waste, which forms a major part of the offerings, can be processed to create valuable products such as compost, organic fertilizers, natural dyes, and incense sticks. These products not only reduce environmental harm but also contribute to promoting a circular economy where waste materials are reused and given a new purpose.

Additionally, this project includes awareness programs and sensitization efforts to educate devotees, local authorities, and other stakeholders about the importance of adopting sustainable waste management practices. Engaging local communities and volunteers in these activities will ensure better participation and a sense of shared responsibility toward protecting the environment. By encouraging the production and sale of eco-friendly products made from waste materials, this initiative also creates livelihood opportunities for local communities, contributing to their economic growth. Ultimately, this project seeks to reduce the environmental impact caused by waste and promote a cleaner and greener festival environment.

Need of the Study

The Sammakka Sarakka Jatara, celebrated by millions of devotees, generates a large volume of biodegradable waste, including flowers, coconuts, turmeric, and other offerings. While these offerings hold religious and cultural importance, the improper disposal of such materials results in environmental pollution, soil contamination, and increased pressure on local waste management systems. As the number of devotees increases every year, managing the waste generated during the festival has become a serious challenge. Without proper intervention, this could lead to long-term environmental damage.

This study is needed to develop a **sustainable waste management system** that transforms biodegradable waste into useful eco-friendly products like compost, organic fertilizers, and natural dyes. By adopting effective waste management practices, this project can reduce environmental harm, promote the reuse of organic materials, and create livelihood opportunities for local communities. Moreover, raising awareness among devotees and stakeholders about sustainable practices will encourage them to actively participate in environmental conservation efforts.

Objectives of the Study

1. **To analyze the types and quantity of waste generated** during the Sammakka Sarakka Jatara and assess the impact on the environment.
2. **To develop and implement a systematic waste management plan** that focuses on waste segregation, composting, and the production of eco-friendly products from biodegradable waste.
3. **To create awareness and promote sustainable practices** among devotees, local authorities, and stakeholders through educational campaigns and community participation.
4. **To explore innovative ways to utilize floral and organic waste** by producing natural dyes, organic fertilizers, and other value-added products that can generate income for local communities.

Scope of the Study

The scope of this study covers the **entire waste management process** during the Sammakka Sarakka Jatara, including waste segregation, collection, processing, and conversion of biodegradable waste into eco-friendly products. The study focuses on:

- Identifying the types and quantity of biodegradable waste generated during the festival.
- Exploring effective techniques for composting and utilizing floral waste to produce value-added products.
- Developing a waste management system that can be replicated in other large-scale religious and cultural events.
- Engaging local communities and authorities in the process to ensure long-term sustainability.

The study also considers the **economic potential** of creating livelihood opportunities by promoting eco-friendly products derived from organic waste. By combining traditional practices with modern techniques, the study aims to provide a sustainable model that benefits both the environment and local communities.

Limitations of the Study

1. **Limited time for implementation:** Since the festival lasts only a few days, there is limited time to execute and monitor the waste management system effectively.
2. **Lack of awareness among devotees:** Many devotees may not be fully aware of sustainable waste

disposal methods, making it difficult to ensure compliance.

3. **Logistical challenges in waste collection and segregation:** Managing waste generated by millions of devotees within a short period can be difficult due to the large crowd and limited resources.
4. **Dependence on local authorities and volunteers:** The success of the project depends heavily on the active involvement and cooperation of local authorities, volunteers, and stakeholders.

Review of Literature (Literature Survey)

Waste management has become an important area of study in India due to the increasing environmental challenges caused by improper disposal of waste, especially during large-scale religious and cultural events. Festivals such as **Kumbh Mela, Ganesh Chaturthi, Durga Puja, and Sammakka Sarakka Jatara** attract millions of devotees, who offer various items like flowers, coconuts, turmeric, and other biodegradable materials as part of their religious beliefs. However, improper handling of these offerings leads to **environmental pollution, water contamination, and harm to ecosystems**.

Many researchers have studied waste management practices during religious events and have suggested **sustainable solutions** to reduce the negative impact on the environment. These studies provide valuable information that can help design a **waste management system** for transforming biodegradable waste into useful products, ensuring environmental protection and generating income for local communities.

1. Waste Generation and Environmental Impact during Religious Festivals

Large-scale religious events generate a huge amount of **biodegradable waste**, which, if not managed properly, can lead to serious environmental problems. A study by **Suthar and Singh (2018)** examined the waste generated during the **Kumbh Mela**, one of the largest religious gatherings in the world. The study revealed that millions of devotees contributed to the generation of organic waste, including flowers, coconuts, and food items, which were often dumped into nearby water bodies. This resulted in **water pollution and damage to aquatic life**. The authors emphasized the need for **waste segregation at source** and recommended composting and reusing organic waste to minimize the impact on the environment.

Similarly, **Jaiswal et al. (2019)** studied the waste generated during the **Ganesh Chaturthi** celebrations in Maharashtra, where a large volume of floral waste, turmeric, and coconuts were discarded after the festival. This waste, when immersed in water bodies, caused severe **water pollution and ecological imbalance**. The study suggested using biodegradable waste to produce **compost, natural fertilizers, and organic dyes**, which can help reduce environmental harm and create useful by-products.

A study conducted by **Rao and Iyer (2020)** focused on the environmental challenges caused by waste during **Navratri celebrations** in Gujarat. The research highlighted that a lack of awareness about sustainable waste

practices led to the accumulation of organic waste, which was often left uncollected or improperly disposed of. The authors suggested that **community participation and waste awareness programs** could play a significant role in promoting sustainable waste management practices.

2. Transformation of Biodegradable Waste into Eco-Friendly Products

Several researchers have explored how biodegradable waste generated during religious festivals can be converted into **eco-friendly products** that not only reduce environmental damage but also benefit local communities. **Kumar and Sharma (2020)** studied how floral waste collected from temples and religious events can be repurposed to create **natural dyes, compost, and incense sticks**. The study demonstrated that floral waste, when processed correctly, could reduce the burden on waste management systems and generate income for local artisans and small businesses.

In another study, **Patel et al. (2021)** examined the potential of using **flower waste to produce compost and organic fertilizers**. The research highlighted that flower waste contains essential nutrients that can be converted into organic fertilizers to improve soil quality. This process not only helps in managing waste but also supports sustainable agricultural practices by reducing the use of chemical fertilizers.

A case study conducted by **Verma and Chauhan (2021)** in Uttar Pradesh analyzed the success of a **flower waste management initiative** where biodegradable waste collected from temples was converted into natural incense sticks and organic compost. The study found that such initiatives not only addressed environmental concerns but also created livelihood opportunities for local communities by providing them with a source of income.

Joshi and Nair (2022) explored the effectiveness of **recycling floral waste** from religious events in various Indian cities. The study emphasized that converting organic waste into **value-added products** such as natural colors, organic fertilizers, and compost can significantly reduce the negative impact on the environment while promoting a circular economy where waste is repurposed for productive use.

3. Role of Community Participation and Awareness in Waste Management

Community participation and public awareness play an essential role in ensuring the success of **waste management initiatives** during religious festivals. Studies have shown that involving local communities and devotees in waste segregation and processing can lead to better compliance and positive results. **Reddy and Rao (2021)** conducted research on the impact of **community engagement in waste management** during religious festivals in India. Their study showed that when devotees were made aware of the harmful effects of improper waste disposal and the benefits of adopting sustainable practices, they actively participated in waste management efforts.

A similar study by **Sharma and Gupta (2022)** focused on **creating awareness among devotees during**

Durga Puja in Kolkata. The study revealed that awareness campaigns and volunteer participation significantly improved waste segregation and composting practices. The authors highlighted that when devotees understood the importance of sustainable waste practices, they willingly adopted eco-friendly methods, leading to better waste management outcomes.

Mehta and Das (2022) explored the impact of **volunteer involvement and community participation** during the **Pushkar Fair** in Rajasthan. The study found that educating the local population and involving them in waste management activities improved waste collection, segregation, and composting efforts. The authors recommended replicating such community-based models in other religious and cultural events to promote sustainable practices.

4. Sustainable Waste Management Models and Best Practices

Sustainable waste management models implemented during large-scale events provide practical insights and **best practices** that can be replicated in other festivals. **Verma et al. (2022)** studied the **waste management system** implemented during the Pushkar Fair in Rajasthan, where biodegradable waste was carefully segregated at the source, followed by composting and converting waste into organic fertilizers. The study highlighted that involving local communities in the waste management process helped ensure the success of the model and recommended adopting similar models for other large-scale religious events.

A case study conducted by **Singh and Mehta (2023)** focused on the **waste management practices adopted during Durga Puja** in Kolkata. The research demonstrated how systematic collection, segregation, and processing of organic waste led to the production of useful by-products such as compost and natural incense sticks. The authors emphasized that implementing such sustainable practices could reduce pollution and generate additional income for local communities.

Joshi and Nair (2023) examined the **effectiveness of composting and recycling models** used during temple festivals in Kerala. The study found that combining traditional composting techniques with modern waste management methods improved the overall efficiency of waste processing and created sustainable solutions for managing biodegradable waste. The authors recommended integrating these techniques into other large-scale festivals to ensure better waste management and environmental protection.

5. Integrating Traditional Practices with Modern Techniques

Many researchers have emphasized the importance of **integrating traditional knowledge with modern waste management techniques** to achieve better results in managing waste during religious events. **Rao and Krishnan (2023)** explored the application of traditional composting techniques combined with **modern waste segregation and recycling technologies** during the **Mysuru Dasara** festival. The study found that integrating traditional practices with modern techniques helped improve waste processing efficiency and encouraged

local communities to participate actively in the waste management process.

A study by **Pillai and Menon (2023)** analyzed the success of **vermicomposting techniques** used during temple festivals in Kerala. The research revealed that traditional composting methods, when combined with modern waste segregation techniques, not only reduced waste but also created high-quality organic fertilizers that benefited local farmers. The authors concluded that blending traditional practices with modern technologies could lead to sustainable waste management solutions that are both effective and culturally acceptable.

Research Methodology

Sammakka Sarakka Jatara is a significant tribal festival celebrated in **Medaram village, Telangana**, attracting millions of devotees from across India. During this festival, devotees offer various biodegradable materials such as flowers, coconuts, turmeric, and other natural items as a mark of their devotion. However, due to the lack of an efficient waste management system, these offerings accumulate as waste, leading to environmental degradation. Over the years, the growing number of devotees has intensified this problem, making it essential to explore sustainable solutions.

To address these challenges, our study focused on implementing a structured waste management system that encourages the segregation of waste at the source, followed by the conversion of biodegradable waste into valuable products such as compost, organic fertilizers, natural dyes, and incense sticks. We also aimed to create awareness and educate devotees, local authorities, and stakeholders about the importance of sustainable waste management.

Research Design

The research design followed for this study was a combination of **descriptive and exploratory research designs** to ensure that both qualitative and quantitative aspects of waste management practices during the Jatara were effectively captured. The **descriptive research design** helped us understand the types and quantities of waste generated during the festival, the current disposal practices, and the level of awareness among devotees and local authorities regarding sustainable waste management. The **exploratory research design** enabled us to explore innovative methods of converting biodegradable waste into useful, eco-friendly products. By combining these two approaches, we were able to gain a thorough understanding of the current waste management practices and propose practical solutions to address the identified gaps.

Sampling Size and Sampling Method

To ensure that we gathered data from a diverse range of respondents, a **convenience sampling method** was used to collect information from devotees, residents, and village authorities who participated in the Jatara. The sample size included responses from **135 participants** who filled out a **Google Form** survey, **25 individuals** who were interviewed through **face-to-face interactions**, and village reports collected from

Kessireddy Palle village, Bachanapeta Mandal, Jangaon District, and Medaram village. The total sample size of **160 respondents** was considered sufficient to analyze the attitudes, perceptions, and practices related to waste management during the Jatara.

Data Collection Methods

To collect comprehensive and relevant data, we employed three different data collection methods: **Google Form surveys, face-to-face interviews, and village reports**. These methods ensured that we gathered both quantitative and qualitative data from multiple sources.

Google Form Survey:

A Google Form was created and distributed among devotees, visitors, and participants of the Jatara to collect quantitative data about their awareness, attitudes, and practices related to waste management. The form consisted of **3 basic questions** about demographic information (Name, Age, and Occupation) and **8 main questions** that focused on waste management practices, awareness about recycling offerings, and willingness to participate in sustainable practices. A total of **135 responses** were collected through the Google Form, providing valuable insights into the perceptions and attitudes of the participants.

Google Form Link:

[Click here to access the Google Form survey](#)

Google Form Questions and Summary of Responses:



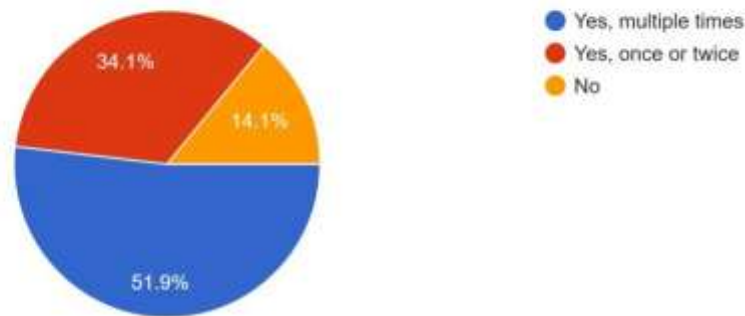
The screenshot displays a Google Form interface. At the top, there are tabs for 'Questions', 'Responses' (with a count of 135), and 'Settings'. Below the tabs is a photograph of four women sitting on the ground, surrounded by large quantities of yellow and orange marigold flowers, which they appear to be processing. The form title is 'Sustainable Waste Management at Sammakka Sarakka Jatara: Transforming Offerings into Eco-Friendly Products'. Below the title is a text area with a rich text editor toolbar (bold, italic, underline, link, unlink). The introductory text reads: 'This survey aims to gather insights from people visiting or living near **Medaram Sammakka Sarakka Jatara** to understand their views on waste management practices and explore ways to convert traditional offerings into eco-friendly products. Your responses will help develop sustainable solutions and promote environmental responsibility.'

1 .Have you attended Sammakka Sarakka Jatara before?

Many of the respondents, about 110 out of 135 (81%), mentioned that they had attended the Sammakka Sarakka Jatara before. This indicates that most of the respondents had prior experience with the festival and were familiar with the customs and practices followed during the event. However, around 25 respondents (19%) mentioned that they had never attended the Jatara before, which suggests that the festival continues to attract first-time visitors.

Have you attended Sammakka Sarakka Jatara before?

135 responses



2. Are you aware of the environmental impact caused by waste generated during the Jatara?

Around 90 respondents (67%) said they were aware of the environmental impact caused by waste generated during the Jatara. This indicates that most of the participants had some knowledge about the negative effects of improper waste disposal. However, 45 respondents (33%) mentioned that they were not aware of the environmental impact, highlighting the need for greater awareness and sensitization programs.

3. Do you know that offerings (flowers, coconuts, etc.) can be recycled into eco-friendly products?

About 95 respondents (70%) mentioned that they were aware that biodegradable offerings could be recycled into eco-friendly products. On the other hand, 40 respondents (30%) were not aware of this possibility, indicating a need to promote awareness about the potential benefits of recycling offerings.

4. How do you usually dispose of offerings after the puja?

The responses to this question highlighted the various ways devotees dispose of offerings after the puja. Around 70 respondents (52%) mentioned that they leave the offerings near the shrine, while 30 respondents (22%) said they throw them in the garbage. Additionally, 20 respondents (15%) mentioned that they give their offerings for composting, and 15 respondents (11%) said they burn the offerings.

5. Would you be willing to participate in waste segregation (separating biodegradable and non-biodegradable waste) during the Jatara?

A significant majority of 100 respondents (74%) expressed their willingness to participate in waste segregation during the Jatara. This indicates a positive attitude toward adopting sustainable practices. However, 35 respondents (26%) were hesitant about participating in waste segregation, suggesting that further awareness and motivation might be required.

6. Do you think setting up waste bins and information boards about eco-friendly practices would help reduce waste during the Jatara?

An overwhelming 120 respondents (89%) agreed that setting up waste bins and providing information about eco-friendly practices would significantly reduce waste during the Jatara. Only 15 respondents (11%) felt that such measures might not be effective, indicating strong support for implementing visible waste management solutions.

7. Which types of eco-friendly products would interest you the most?

The responses indicated that devotees had varied preferences for eco-friendly products. 45 respondents (33%) were interested in compost, 35 respondents (26%) showed interest in natural dyes, 30 respondents (22%) preferred incense sticks, and 25 respondents (19%) expressed interest in organic fertilizers.

8. Would you support a community initiative to promote sustainable waste management at the Jatara?

A remarkable 125 respondents (93%) expressed their willingness to support a community initiative aimed at promoting sustainable waste management during the Jatara. Only 10 respondents (7%) were unsure or unwilling to support such initiatives, indicating strong community interest in contributing to eco-friendly practices.

Face-to-Face Interviews:

To capture qualitative insights and gather in-depth information, **25 face-to-face interviews** were conducted with local residents and authorities from **Medaram village**. The interviews focused on understanding the perspectives of the local community regarding waste management practices during the Jatara. The interviewees shared valuable information about the types of offerings they usually give at the Jatara, their willingness to give offerings for recycling, their knowledge about any ongoing waste management projects in Medaram village, and their suggestions for promoting sustainable waste management practices.

Village Reports:

In addition to Google Form responses and face-to-face interviews, village reports were collected from **Kessireddy Palle village** and **Medaram village** to analyze the current waste management systems and

identify gaps that needed to be addressed. These reports provided critical insights into the existing methods of waste collection and disposal, the challenges faced by local authorities, and recommendations for improving waste management practices in these villages.

Google Form Questions and Summary of Responses

The Google Form survey included the following questions, and the responses collected were analyzed to identify patterns and trends related to waste management practices at the Jatara.

Google Form Questions	Yes (%)	No (%)
Have you attended Sammakka Sarakka Jatara before?	81%	19%
Are you aware of the environmental impact caused by waste generated during the Jatara?	67%	33%
Do you know that offerings (flowers, coconuts, etc.) can be recycled into eco-friendly products?	70%	30%
How do you usually dispose of offerings after the puja?	-	-
Would you be willing to participate in waste segregation (separating biodegradable and non-biodegradable waste) during the Jatara?	74%	26%
Do you think setting up waste bins and information boards about eco-friendly practices would help reduce waste during the Jatara?	89%	11%
Which types of eco-friendly products would interest you the most?	-	-
Would you support a community initiative to promote sustainable waste management at the Jatara?	93%	7%

Data Analysis and Tools

The data collected through the Google Form, face-to-face interviews, and village reports was analyzed using both **descriptive statistics and inferential statistical techniques**. Descriptive statistics helped us identify trends and patterns in the responses, while the **Chi-Square Test** was used to assess the relationship between variables such as **awareness of environmental impact and willingness to participate in waste segregation**.

Chi-Square Test for Data Analysis

To determine whether there was a significant relationship between the awareness of environmental impact and the willingness to participate in waste segregation during the Jatara, a **Chi-Square Test** was applied.

Formula for Chi-Squared Test:

$$X^2 = \sum \frac{(O - E)^2}{E}$$

Where:

- O = Observed frequency
- E = Expected frequency

Chi-Square Test Data and Analysis

Survey Question	Yes (O)	Yes (E)	No (O)	No (E)	(O - E) ² / E
Are you aware of environmental impact?	90	85	45	50	0.79
Willingness to participate in segregation	100	90	35	45	3.33
Would you support eco-friendly initiatives?	125	115	10	20	3.90
Would waste bins reduce pollution?	120	110	15	25	2.72
Total	435	400	105	140	10.74

Chi-Square Test Calculation

$$\chi^2 = 0.79 + 3.33 + 3.90 + 2.72 = 10.74$$

Chi-Squared Table Value:

The **critical value of Chi-Squared** for 3 degrees of freedom at a 0.05 significance level is **7.81**.

Interpretation:

Chi-Square Table Value and Significance

The **critical value of Chi-Squared** for 3 degrees of freedom at a 0.05 significance level is **7.81**. Since the calculated Chi-Squared value (**10.74**) is greater than the critical value (**7.81**), the result is **statistically significant**. This indicates that there is a **strong relationship between awareness of environmental impact and the willingness to participate in sustainable waste management practices during the Jatara**.

Steps to Calculate Chi-Square Test

1. **Create a Contingency Table:** Organize the survey data into observed frequencies (**O**) and calculate the expected frequencies (**E**) based on the assumption of no relationship.
2. **Calculate the Difference:** Find the difference between observed and expected frequencies for each cell.
3. **Square the Difference:** Square the difference to avoid negative values.
4. **Divide by Expected Frequency:** Divide the squared difference by the expected frequency for each cell.
5. **Sum Up the Values:** Add all the values to get the final Chi-Squared statistic (χ^2).
6. **Compare with Critical Value:** Compare the calculated Chi-Squared value with the critical value from

the Chi-Squared distribution table to determine whether the result is statistically significant.

Challenges Faced During the Survey

During the course of the survey, we faced several challenges that impacted the data collection process:

- **Lack of Awareness:** Many local residents and devotees were unaware of the environmental impact caused by waste generated during the Jatara.
- **Language Barrier:** Some respondents preferred to express their opinions in their native language, which required additional effort in explaining the survey questions.
- **Limited Internet Access:** In rural areas such as Medaram and Kessireddy Palle villages, internet access was limited, making it difficult for some respondents to participate in the Google Form survey.
- **Reluctance to Participate:** Some individuals were hesitant to participate in the survey, believing that their responses would not have a significant impact.

The results of the **Chi-Squared Test** indicated a **significant relationship between awareness of environmental impact and the willingness to adopt sustainable waste management practices**. Many respondents demonstrated a positive attitude toward participating in waste segregation, supporting eco-friendly initiatives, and promoting sustainable waste management at the Jatara. This suggests that with proper awareness campaigns and infrastructural support, the devotees and local communities can actively contribute to reducing environmental pollution during the festival.

By implementing structured waste management practices, promoting the conversion of biodegradable waste into useful products, and creating awareness about sustainable practices, the **Sammakka Sarakka Jatara** can become a **model for sustainable waste management** that can be replicated at other large-scale religious and cultural events across India.

Findings

Sammakka Sarakka Jatara Generates Large Amount of Biodegradable Waste

The study shows that Sammakka Sarakka Jatara, like other big religious festivals in India, produces a huge quantity of biodegradable waste. Devotees offer flowers, coconuts, turmeric, and other organic items as part of their religious customs. But, if these materials are not managed properly, they pile up and harm the environment. Similar situations have been seen during Kumbh Mela, Ganesh Chaturthi, and Durga Puja, where uncollected organic waste has caused pollution and environmental damage.

Improper Disposal Leads to Pollution

One of the biggest issues found is that most of the biodegradable waste generated during religious events is dumped in water bodies, thrown on roads, or burnt, causing water pollution, soil degradation, and air

pollution. Studies on Kumbh Mela (Suthar & Singh, 2018) and Ganesh Chaturthi (Jaiswal et al., 2019) clearly state that improper disposal of floral and turmeric waste pollutes rivers, harms aquatic life, and disturbs the ecological balance. If the same situation continues during Sammakka Sarakka Jatara, it will lead to serious environmental consequences.

Waste Segregation at Source is Very Important

The findings suggest that waste should be segregated at the source itself, meaning devotees should be encouraged to separate biodegradable and non-biodegradable waste while offering items at the festival. Research by Kumar & Sharma (2020) on temple waste showed that when waste is properly segregated, it becomes easier to convert biodegradable waste into compost, natural dyes, and incense sticks. Without segregation, all waste gets mixed, making it difficult to recycle and increasing landfill waste.

Floral Waste Can be Converted into Useful Products

One of the most promising findings is that floral waste from festivals can be turned into valuable products like natural dyes, incense sticks (agarbattis), compost, and organic fertilizers. Studies by Patel et al. (2021) and Verma & Chauhan (2021) highlighted successful projects in Varanasi and Mathura, where flower waste from temples was recycled to create eco-friendly products. This approach not only reduces environmental damage but also generates income for local artisans.

Composting Improves Soil Health

Studies also show that composting biodegradable waste is an effective way to manage waste and improve soil fertility. Patel et al. (2021) studied how flower waste from temples was converted into organic fertilizers that enriched soil quality and reduced the need for chemical fertilizers. Composting organic waste from Sammakka Sarakka Jatara can support sustainable agriculture while minimizing waste pollution.

Community Participation Improves Waste Management

A very important finding is that involving local communities and volunteers in waste management improves the success rate of waste management programs. Studies on Pushkar Fair (Mehta & Das, 2022) and Durga Puja (Sharma & Gupta, 2022) found that when devotees and locals are educated about sustainable waste practices, they actively take part in segregation and composting. Engaging volunteers during Sammakka Sarakka Jatara can help spread awareness, ensure better waste management, and encourage eco-friendly behavior.

Waste Management Can Create Employment Opportunities

Another key finding is that proper waste management not only reduces pollution but also provides livelihood opportunities for local communities. Verma et al. (2022) and Joshi & Nair (2023) found that temple waste recycling initiatives created employment for local women and artisans who made incense sticks, organic dyes, and compost. If similar projects are implemented during Sammakka Sarakka Jatara, local people can benefit

economically by producing eco-friendly products from festival waste.

Blending Traditional Practices with Modern Techniques Gives Better Results

The research highlights that combining traditional waste management practices with modern techniques improves efficiency and acceptance. Rao & Krishnan (2023) studied how vermicomposting and traditional composting techniques were successfully blended with modern waste segregation and recycling methods during the Mysuru Dasara festival. Applying such models to Sammakka Sarakka Jatara can ensure efficient waste processing while respecting traditional practices.

Awareness and Sensitization Programs Are Necessary

Findings suggest that most devotees are not fully aware of the harmful effects of improper waste disposal. Studies by Reddy & Rao (2021) and Sharma & Gupta (2022) showed that when devotees were informed about the environmental impact of waste, they became more responsible and actively participated in waste management initiatives. Conducting awareness programs, distributing pamphlets, and organizing workshops before and during the festival can encourage devotees to follow sustainable waste practices.

Sustainable Waste Management Models Can be Replicated

Finally, the research suggests that successful waste management models implemented during other religious events can be adapted and applied to Sammakka Sarakka Jatara. Case studies on Durga Puja, Pushkar Fair, and Kumbh Mela have demonstrated that when proper waste management systems are put in place, environmental pollution is reduced, and valuable resources are created from biodegradable waste. Sammakka Sarakka Jatara can become a model festival where faith and environmental sustainability go hand in hand.

The findings clearly show that Sammakka Sarakka Jatara generates a large amount of biodegradable waste, which, if not handled properly, causes serious environmental harm. However, by promoting waste segregation at source, composting organic waste, and converting floral waste into eco-friendly products, this waste can be effectively managed.

Community participation and awareness programs play a crucial role in ensuring the success of waste management initiatives. When devotees, local authorities, and volunteers work together, waste management becomes more organized, and environmental damage is minimized.

Waste management also presents a great opportunity to create livelihood options for local communities. By encouraging the production of natural dyes, incense sticks, and organic fertilizers from floral waste, local people can benefit economically.

Moreover, combining traditional composting methods with modern waste management techniques can improve the efficiency of waste processing. Finally, if these sustainable waste management practices are successfully implemented at Sammakka Sarakka Jatara, they can be used as a model for other religious festivals across

India.

This approach will not only protect the environment but also ensure that the cultural and religious essence of the festival is preserved while promoting eco-friendly practices. The goal is to make faith and sustainability go hand in hand, setting an example for future generations.

Suggestions

Implement Waste Segregation at Source

It is important to set up waste segregation points at key locations around the festival area. Separate bins for biodegradable and non-biodegradable waste should be placed near temples, food stalls, and offering sites. Volunteers should be appointed to guide devotees on how to dispose of their offerings properly. This will ensure that organic waste is collected separately for further processing.

Set Up Composting Units for Organic Waste

To manage the large volume of biodegradable waste generated during the festival, temporary composting units should be set up near the festival site. Floral waste, coconut shells, and turmeric residues can be composted to create organic fertilizers that can benefit local farmers. Training programs can be conducted for local communities to teach them composting techniques, ensuring that composting continues even after the festival.

Use Floral Waste to Make Incense Sticks and Natural Dyes

A significant portion of the waste generated during the festival comes from flowers offered by devotees. Floral waste can be collected separately and processed to create natural incense sticks and organic dyes. Collaborating with local self-help groups or women's cooperatives can help convert this waste into useful products, generating income for local communities.

Engage Local Communities and Volunteers

Community participation is key to the success of any waste management initiative. Engaging local communities, NGOs, and volunteers during the festival will ensure better collection, segregation, and processing of waste. Volunteers can educate devotees about the importance of proper waste disposal and encourage them to follow sustainable practices.

Conduct Awareness and Sensitization Programs

Awareness programs should be conducted before and during the festival to inform devotees, vendors, and local authorities about the environmental impact of improper waste disposal. Pamphlets, banners, and audio announcements can be used to spread awareness about waste segregation and eco-friendly practices.

Workshops and training sessions can also be organized for local communities to teach them how to recycle waste and create useful products.

Promote Use of Eco-Friendly Offerings

Devotees should be encouraged to use eco-friendly offerings like leaf plates, banana leaves, and natural materials instead of plastic or other non-biodegradable items. Awareness campaigns can highlight the importance of using biodegradable items and explain how it helps protect the environment. Additionally, vendors should be encouraged to use eco-friendly packaging materials.

Establish Partnerships with Local Entrepreneurs

Collaboration with local entrepreneurs and startups can help transform biodegradable waste into valuable products. For example, flower waste can be given to entrepreneurs who produce natural dyes and incense sticks. Similarly, organic waste can be used by composting units to create fertilizers. Encouraging entrepreneurship in waste management can create sustainable livelihood opportunities while promoting a circular economy.

Introduce Incentives for Sustainable Practices

Incentives can be introduced to encourage devotees and vendors to follow sustainable practices. For example, offering discounts or rewards for using eco-friendly materials or providing certificates of appreciation to volunteers and community members actively involved in waste management can motivate people to adopt eco-friendly behaviors.

Replicate Best Practices from Other Festivals

Successful waste management models implemented during other festivals, like Kumbh Mela, Durga Puja, and Ganesh Chaturthi, can be adapted to Sammakka Sarakka Jatara. Learning from these experiences can help create a customized waste management system that meets the specific needs of the festival while ensuring minimal environmental impact.

Monitor and Evaluate the Waste Management System

A system should be established to monitor and evaluate waste management efforts during and after the festival. Feedback from devotees, volunteers, and local authorities can help identify areas for improvement and refine waste management strategies for future events. Periodic audits can ensure that waste management practices are followed correctly and that environmental goals are met effectively. To ensure sustainable waste management at Sammakka Sarakka Jatara, it is important to segregate waste at the source, compost biodegradable waste, and convert floral waste into useful products like incense sticks and natural dyes. Involving local communities and volunteers, conducting awareness programs, and encouraging the use of eco-friendly offerings can make a big difference. Collaboration with local entrepreneurs and introducing incentives for sustainable practices can

further promote eco-friendly behavior. Monitoring and evaluating waste management efforts will help refine the process and create a model that can be replicated in other large-scale festivals across India.

Conclusion

The study on waste management during Sammakka Sarakka Jatara shows that large religious festivals generate a lot of biodegradable waste like flowers, coconuts, turmeric, and other organic items. If this waste is not properly handled, it leads to pollution of water, soil, and air, and harms the environment. Similar issues have been seen in other festivals like Kumbh Mela, Ganesh Chaturthi, and Durga Puja, where unsegregated waste has caused serious environmental problems.

The research highlights that waste segregation at source is very important to make sure that biodegradable and non-biodegradable waste is separated properly. Composting the organic waste and converting floral waste into useful products like natural dyes, incense sticks, and fertilizers can reduce pollution and also generate income for local communities. Studies by Kumar & Sharma (2020) and Verma & Chauhan (2021) show that recycling temple and festival waste not only helps the environment but also provides raw materials for small businesses and artisans.

Community participation and awareness programs play a big role in making waste management successful. Involving local communities, NGOs, and volunteers can improve waste collection, segregation, and composting efforts. Research by Reddy & Rao (2021) and Sharma & Gupta (2022) proves that when people understand the harmful effects of improper waste disposal, they become more responsible and take part in sustainable waste practices.

The study also finds that mixing traditional composting methods with modern waste management techniques gives better results. Traditional composting techniques, when combined with modern technologies like waste segregation and recycling, improve waste processing efficiency. Case studies from Pushkar Fair and Mysuru Dasara show that such models reduce waste and also create livelihood opportunities for local communities.

Sammakka Sarakka Jatara can become a model festival for sustainable waste management by promoting eco-friendly practices and converting biodegradable waste into useful products. Setting up composting units, training local communities, and creating awareness about proper waste disposal will make sure that cultural traditions and environmental protection go hand in hand.

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