

## CIRCULAR ECONOMY IN FLOWER MANAGEMENT

### **ABSTRACT**

India is a country with lots of different religions where worshipping is the way of living and people offer various offerings to the deities, out of which floral offerings are found in huge quantities. Therefore, temple waste has an exceptional share of flower waste in the total waste. After gratifying their purpose, flowers along with other waste, find their way into the garbage or are discarded into rivers, sea or oceans causing various environmental problems. The majorly offered flowers in temples are marigold, rose, jasmine, chrysanthemum, hyacinth, hibiscus, etc. This floral waste can be properly managed and utilized in various value-added forms. Techniques like vermicomposting, composting, dyes extraction, extraction of essential oils, making of Holi colors and bio-gas generation can be used. As most of the flower contains secondary metabolites which can be further used in essential oil extraction and food additives.

The project focuses on the important application of floral wastes in the making of dhoops which are used in temples and houses for worshipping the deity.

### **INTRODUCTION**

In India, specifically at religious places large amounts of solid waste is generated in functions, worships, ceremonies and festivals. These wastes are thrown on the roadsides or on to the rivers. Degradation of floral waste is a very slow process as compared to kitchen waste degradation.

The circular economy is a concept that aims to create a sustainable and regenerative economic system by minimizing waste, maximizing resource efficiency, and promoting the reuse, recycling, and repurposing of materials. While the circular economy concept is often associated with industries like manufacturing and consumer goods, its principles can be applied to various sectors, including flower management. Here's how the circular economy can be incorporated into flower management practices.

### **METHODOLOGY**

The flowers are collected from temples. The flowers are dried in sunlight for 3-4 days. It is separately petal by petal. It is crushed in a mixer and made into fine powder. It is sieved 4.25 $\mu$ m sieve. The powder is weighed. It is then mixed with essential oil, ghee, benzoin resin and sandalwood powder. All are mixed as in the proportion given below to form a thick paste. It is represented in Fig.1 The paste is moulded in different shapes and sun dried for 4-5 days.

In one case, charcoal is added to the paste.

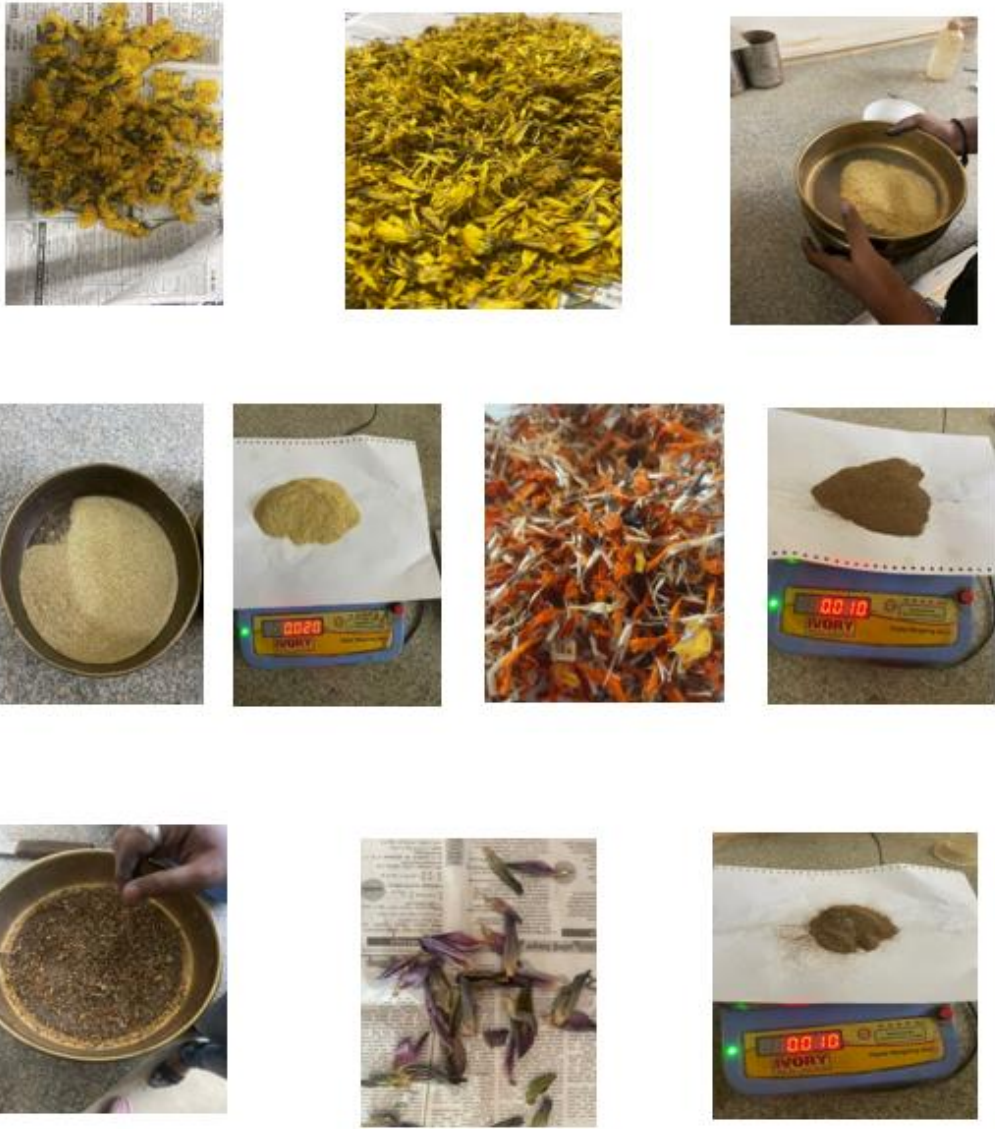


Fig.1 – Process of incense cone preparation

**MIX DESIGN PROPORTION**

➤ **LOTUS INCENSE CONES**

- DRIED LOTUS POWDER – 10 g
- SANDALWOOD POWDER- 10g
- GHEE – 15ml
- BENZOIN RESIN - 4g
- ROSEMARY ESSENTIAL OIL – 1ml
- CHARCOAL POWDER- 10g

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### CHRYSANTHEMUM INCENSE CONES WITH CHARCOAL

- DRIED CHRYSANTHEMUM POWDER -10g
- SANDALWOOD POWDER- 5g
- GHEE – 15ml
- BENZOIN RESIN - 2g
- ROSMARY ESSENTIAL OIL – 1ml
- CHARCOAL POWDER - 10g



### ➤ CHRYSANTHEMUM INCENSE CONES WITHOUT CHARCOAL

- DRIED CHRYSANTHEMUM POWDER -10g
- SANDALWOOD POWDER- 5g
- GHEE – 15ml
- BENZOIN RESIN - 2g
- ROSEMARY ESSENTIAL OIL



### ➤ MARIGOLD INCENSE CONES

- DRIED MARIGOLD POWDER- 10g
- SANDALWOOD POWDER- 5g
- GHEE – 15ml
- BENZOIN RESIN- 2g
- ROSEMARY ESSENTIAL OIL – 1ml



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### RESULTS

The time duration of burning was tested for all cases. The results are tabulated in Table.1. The chrysanthemum flower waste failed in burning due to development of fungus formation. The lotus flower incense cone burned for the max time of 50 mins. Fig. 2 and Fig. 3 show the burnt version of chrysanthemum and marigold flower waste.

FLOWER TYPE	TIME DURATION OF BURNING
LOTUS	50 MINS
CHRYSANTHEMUM (WITH CHARCOAL)	FAILED
CHRYSANTHEMUM (WITHOUT CHARCOAL)	FAILED
MARIGOLD	7 MINS

Table. 1 – Time duration of burning of incense cone



Fig. 2 - chrysthemum incense cone



Fig. 3 - marigold incense cone

### CONCLUSION

- From the project work we conclude that lotus incense cone has given the proper output where, the burning duration time was 50 mins.
- Marigold incense cones were lightened up and burned only for 7mins which shows that it's doesn't provide the better outcome as expected.
- The chrysanthemum incense cone's that was mixed with charcoal powder and without charcoal powder that turned into fungus formation and where it was lightened up but didn't get burned as expected.