

## **Waste management in major events: Case study on Lalbagh flower show**

### **1. Abstract:**

The generation of solid waste is a major environmental problem faced by most of the world. The management, proper disposal and reuse, in the most appropriate and planned manner are the daily challenges faced by Indian cities. While typically households and bulk generators are seen as the primary source of municipal waste, major events, which produce a huge amount of waste in a short time have emerged as a challenge in urban spaces.

Located in the southern region of Garden city Bengaluru, Lalbagh is one of the largest botanical gardens of South Asia. Every year in Lalbagh Botanical Garden the Directorate of Horticulture, Karnataka organizes the Biennial Flower show in January and August on the occasion of Republic Day and Independence Day respectively. The flower show held in the Glass house is known to have the largest collection of tropical plants in India. The Lalbagh Garden has hosted two hundred and ten flower shows in the past 105 years of the park.

This article aims to evaluate the efficiency of the methodology adopted by Saahas in the Lalbagh Flower Show August 2019, seeking to define the most appropriate way to manage waste in events without affecting the dynamics of cities and, in addition, promote social inclusion and valuation of waste.

**Keywords:** solid waste, events, management

### **2. Objective:**

This research aims at providing a process for handling waste in events based on the Lalbagh Flower Show (Aug 2019) case study. From the results it is possible to analyse the possibility of converting an event to a zero waste event and the implementation of this control as a permanent policy for events.

### **3. Background:**

Lalbagh Botanical Gardens or Lalbagh is an old botanical garden in Bengaluru, India which was planned and laid out during the rule of Hyder Ali. Till the year 1856 Lalbagh garden was known as Mango Tope and the Cypress Garden. Later the Garden was named Lalbagh because of a collection of red roses that remain blooming all through the year in this garden. It has 1,000 species of plants with many trees that are more than a hundred years old. It also served a social function as a park and recreational space, with a central glass house dating from 1890 which was used for flower shows.

In modern times it hosts two flower shows coinciding with the week of Republic Day (26 January) and Independence Day (15 August). As an urban green space along with Cubbon Park, it is also home to numerous wild species of birds and other wildlife. The garden also has

a lake adjoining a large rock on which a watchtower had been constructed during the reign of Kempegowda II. It is managed by the Department of Horticulture.

**Biannual Flower Show:**

Every year in Lalbagh Botanical Garden the Directorate of Horticulture, Karnataka organizes the Bi-annual Flower show in January and August on the occasion of Republic Day and Independence Day respectively. The extensive flower show held in the Glass house biannually is known to have the largest collection of tropical plants in India. The Flower show displays a large number of different species and varieties of plants and shrubs including vegetables and fruits for the visitors. The Lalbagh Botanical Park has hosted over two hundred and ten flower shows in the past 105 years of the park. Climate in Bengaluru helps a lot in nurturing the plants as it remains pleasant all throughout the year. Every year over three hundred varieties of flowers are put on display at the exhibition(Flower Show) that includes Roses, Marigolds, celosia, Geranium, orchids and many more. A lot of effort is involved in seed sowing and raising plants in pots to display their blossom twice a year. The Flower show being the centre of attraction is also very creative and enthrals all the visitors. Over the last 105 years, flower shows have been conducted attracting lakhs of tourists and dignitaries from across the globe. Along with various exhibits, about 100-200 vendors sell horticulture products and eatables including soft drinks, packaged food etc. As a result, tonnes of waste is generated during these shows.

**Solid Waste Management Rules:**

The Ministry of environment, forest and climate change has published Solid Waste Management Rules, 2016 which states duties of waste generators. According to the rule, “waste generator” means and includes every person or group of persons, residential premises and non-residential establishments including Indian Railways, defence establishments, which generates solid waste and the duties of waste generators section mentions that, no person shall organise an event or gathering of more than one hundred persons at any unlicensed place without intimating the local body, at least three working days in advance and such person or the organiser of such an event shall ensure segregation of waste at source and handing over of segregated waste to waste collector or agency as specified by local body. It also states that, every street vendor shall keep suitable containers for storage of waste generated during the course of his activity such as food waste, disposable plates, cups, cans, wrappers, coconut shells, left over food, vegetables, fruits, etc. and shall deposit such waste at waste storage depot or container or vehicle as notified by local body. The circular issued by Forest, Ecology and Environment secretariat on plastic ban in 2016 imposes ban on plastic plates, plastic spoons and plastic cups.

#### 4. Challenges:

The below table shows the details on the number of visitors, quantity of waste generated, number of bins and the number of people employed for waste management in the year 2017 and 2018.

Year	Number of visitors	Quantity of waste generated	Number of bins	Number of people employed for waste management
Jan 2017	4.5 lakh	Approx. 8 Tonnes	237	70
Aug 2017	5 lakh	Approx. 8.5 Tonnes	237	70
Jan 2018	4.7 lakh	Approx. 8 Tonnes	237	60
Aug 2018	5 lakh	Approx. 8.5Tonnes	237	60

As seen in the above table, the quantity of waste generated during each flower show was approximately 8 Tonnes and all of this waste ended up in landfills. It was also noticed that the number of bins installed were very less. Other than this because of poor planning on emptying the bins, littering and dumpsites were a common site during flower show in Lalbagh [\[1\]](#) [\[2\]](#) [\[3\]](#). Improper waste management and dumping of waste by vendors caused further menace. Since the authorities also had multiple responsibilities during the flower shows, waste management would always take a step back.

#### 5. Strategy

Saahas in association with Bosch took an initiative to take up waste management in Lalbagh from October 2018. After initial assessment, following were the strategies taken into consideration to improve waste management in Lalbagh:

- Installation of 100 sets of bins for wet and dry waste with stickers on the items that categorise under wet and dry waste
- Removing the broken bins
- Designating old bins for either wet or dry waste by painting appropriate messaging on the same
- Setting up waste management shed in Lalbagh
- Providing the regular vendors with bins to separately store wet and dry waste
- Ensuring that wet waste goes for composting and dry waste goes for recycling
- Educating the vendors, Lalbagh staff and visitors on anti-littering and waste segregation
- Working with Lalbagh staff to improve their waste collection process
- Tying up with nearest dry waste collection centre to ensure that the sorted dry waste is sent to recycling centre

There were also a few specific strategies to manage waste during flower shows. They were as follows:

- a. Installing extra bins in the prime locations
- b. Making it mandatory for both temporary and permanent vendors to segregate their waste and hand it over to the collection staff
- c. Making it mandatory for both temporary and permanent vendors to use reusable or compostable cutlery
- d. Training vendors and Lalbagh staffs on waste segregation
- e. Collaborating with other organisations for spreading continuous awareness on anti-littering and waste segregation for the visitors and the vendors
- f. Imposing fines to visitors who are found to litter the waste and to the vendors who are found to dump their waste

## 6. Implementation

### a. Pre event activities:

#### i. Meetings with Lalbagh authorities:

We had multiple meetings with Lalbagh authorities along with the beautiful Bengaluru team to discuss various strategies on managing waste in a better way. Following were the key points discussed:

- Arranging for a meeting with police authorities
- Awareness session for the extra staff arranged for flower show
- Discussion on vendor's agreement, with the vendors
- Dry waste art installation
- Permission for free entry of volunteers
- Arranging for a meeting with regular vendors
- Projecting awareness videos on LED screens
- Use of steel cutleries at food joints meant for police and Lalbagh officials

#### ii. Infrastructure set up

- Placing extra bins wherever required:

During the flower show, about 200-300 stalls were put up and among these about 100 were food stalls and hence Saahas with support from Lalbagh officials had installed 30 sets of extra blue and green bins and vendors were given the responsibility to be accountable for the same.

- Getting extra vehicle for collections:

During last flower show, we were not provided the vehicle by Lalbagh authorities on a regular basis and hence we arranged for one of our spare electric vehicles as a backup for collection



- Jumbo bags for collection: Lalbagh authorities sponsored about 100 jumbo bags for collection of waste
- Cleared sorted dry waste from shed and procured extra white bags, safety gears and got the weighing machine and fire extinguisher checked
- Made sure that Lalbagh authorities make it mandatory for the regular vendors to wear the uniform during flower show

iii. Gathering volunteers

Call for volunteers was sent out through social media as well as by reaching out to all the schools, colleges and other organisation. Following were the roles of volunteers:

- Creating awareness on source segregation of waste
- Explaining the Purpose of two colour bins and guiding the visitors to use the right bin
- Requesting the visitors not to litter

**b. Activities during flower show**

i. Installation of awareness boards:

To spread the message on segregation and not littering, Saahas had installed awareness boards in the stalls with support from the vendors and police officers.



ii. Training collection staffs and extra sorting staff:

In order to improve the collection, Saahas team trained the collection staff and in order to handle sorting of huge amounts of waste generated during flower show, we trained extra staff for sorting too. We also provided them with protective equipment like gloves, masks and jackets.

We had 4 extra staff from Saahas and about 9 extra staff from Lalbagh.



iii. Monitoring all crowded zones:

We had identified most visited zones of Lalbagh and there were 5 such zones. Throughout the day we had 6 staff members from Saahas and 18-20 volunteers to monitor the bins in these zones to ensure segregation of waste at source and zero littering.



We engaged about 180 volunteers in the span of 10 days

iv. Art installation using dry waste:

In order to spread awareness on segregation, Saahas with Pushkar films installed an art piece using dry waste collected in Lalbagh.



v. Using LED screens for awareness:

In order to spread awareness on segregation and anti-littering, we had projected video on the LED screens installed in Lalbagh during flower show. [\[4\]](#)

**Waste Segregation**

Green For **WET** (Food Waste)

Blue For **DRY** (Packages)

**Zero waste style**

First steps towards Zero Waste

- When you step out, always remember to carry your water bottle and a cloth shopping bag.
- Instead of tissues, wet wipes - use handkerchief. Can be washed and reused.
- Carry your own containers while ordering takeaway food.
- Rent reusable steel plates/cups for parties instead of using disposable cups and plates.
- Replace kitchen sponges, sponge wipes with old/used cotton cloth.

**Waste in 10 days**

Waste Type	Quantity
Dry Waste Managed	3 Tonnes
Wet Waste Managed	500 KG
Recyclable Waste Managed	500 KG

Together with your support we managed 4 Tonnes of waste in Republic Day Flower Show 2019

vi. Steel cutleries for police and Lalbagh staff:

In order to maintain law and order during Lalbagh flower show about 150 police officers are appointed throughout the event and three meals for these officers and Lalbagh staff is arranged inside the premises. Till last flower show, they were using single use non-recyclable cutlery for this activity and that itself used to account for 1T of waste.



In order to reduce the amount of waste generated, Saahas and beautiful Bengaluru - another organisation working on waste management suggested Lalbagh authorities and police staff to rent out steel cutlery for their meals and we ensured that the leftover food and paper cups are segregated.

vii. Strategy to empty bins:

- During such big events, the bin gets full very often and hence emptying of bins from time to time is very critical
- Before the show itself we had identified the crowd flow in Lalbagh based on inputs from Lalbagh officials
- We had divided Lalbagh into 8 zones out of which 5 were most visited by visitors
- We had a total of 15 staff to handle collection alone ie 9 staff from Lalbagh, 4 field staff from Saahas and 2 supervisors from Saahas
- We had divided 8 Lalbagh staff into 4 teams, every team had 1 field staff from Saahas and each of our supervisors were leading 2 teams
- These teams were assigned 2 zones, their primary responsibility being to empty the bins and tie the waste from the emptied bins in white bags and stack the bags in the identified points. We had identified 15 such points.
- We had one dedicated vehicle and 2 staff to collect these white bags from designated points.

viii. Maintaining the sorting shed & Sorting of dry waste generated during flower show:

- Everyday about 200kgs of dry waste on non-peak days and 500kgs of dry waste on peak days was collected
- We had 4 extra staff for sorting to semi sort the waste and stack the waste in a proper way

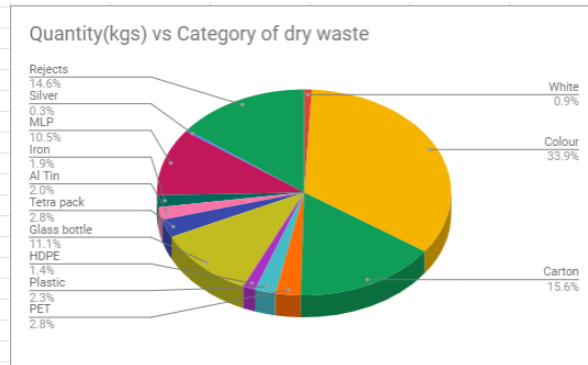
**c. Waste statistics for Aug 2019 flower show**

i. Sorting dry waste and sending it to the dry waste collection centre:

About 2 Tons of dry waste was collected during flower show and the sorting of the same into 14 categories was completed in 15 days and this was sent to the nearest dry waste collection centre.

- Number of staff involved for sorting this waste: 8

Category	Quantity
White	14.6
Colour	578.5
Carton	267.1
PET	47.5
Plastic	39.1
HDPE	23.4
Glass bottle	189.7
Tetra pack	48.5
Al Tin	34
Iron	31.8
MLP	180.1
Silver	5
LDPE	0
Paper cup	0
Rejects	249.4
Total	1708.7



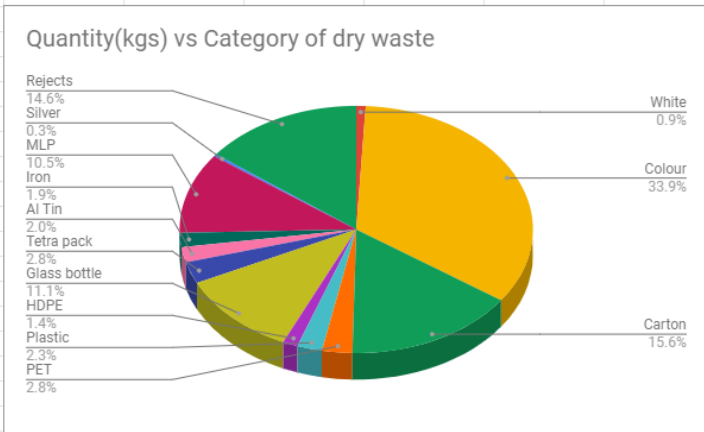
- ii. Sending wet waste for composting  
About 2T of wet waste was collected during the flower show and this was sent to the in house composting facility of Lalbagh.

**d. Waste statistics for Jan 2020 flower show**

We followed similar activities for the next flower show as well and below are the waste statistics for the same:

- i. About 2 Tons of dry waste was collected during the flower show and the sorting of the same into 14 categories was completed in 15 days and this was sent to the nearest dry waste collection centre.

Category	Quantity
White	43.1
Colour	609.9
Carton	202.2
PET	58.6
Plastic	33.7
HDPE	52.6
Glass bottle	306.7
Tetra pack	37.3
Al Tin	29.1
Iron	24.8
MLP	290.9
Silver	4.7
LDPE	8.2
Paper cup	223.2
Rejects	305.5
Total	2230.5



- ii. About 1.4 T of wet waste was collected during the flower show and this was sent to the in house composting facility of Lalbagh.

**7. Acknowledgement**

The efforts of following members of Lalbagh, Bosch, Saahas, DWCC, SWMRT, beautiful Bengaluru, Lets be the change, Youth for Seva and innumerable volunteers are acknowledged for their support and contribution for this project.



Name	Designation	Organisation
Dr Jagadeesh	Joint Director	Lalbagh
Mr Chandrasekhar	Deputy Director	Lalbagh
Mr Ramakant	Founder	SWMRT
Odette	Founder	Beautiful Bengaluru
Sonia	Member	Beautiful Bengaluru
Aniruddh	Founder	Let's be the change
Nandini	Partner NGO relations-Co-ordinator	Youth for Seva

## 8. Feedback

### Media Coverage:

1. Deccan chronicle 12th Aug,2019: <https://www.deccanchronicle.com/nation/current-affairs/120819/bengaluru-lalbagh-goes-litter-free-thanks-to-saahas.html>
2. Hindu 12th Aug,2019: <https://www.thehindu.com/news/cities/bangalore/a-peek-into-the-flower-show-at-lalbagh-botanical-gardens/article29014264.ece>
3. Deccan chronicle 21st Aug 2019: <https://www.deccanchronicle.com/nation/current-affairs/120819/bengaluru-lalbagh-goes-litter-free-thanks-to-saahas.html>
4. The new Indian express 19th Aug 2019: <http://www.newindianexpress.com/cities/bengaluru/2019/aug/19/lalbagh-botanical-garden-independence-day-flower-show-ends-on-a-clean-note-in-bengaluru-2020890.html>
5. Deccan herald 20th Aug 2019: <https://www.deccanherald.com/city/life-in-bengaluru/lalbagh-pulls-off-a-neat-feat-after-10-day-flower-show-755569.html>
6. The news minute on 28th Jan 2019 <https://www.thenewsminute.com/article/how-sustained-3-year-campaign-has-helped-reduce-waste-bengaluru-s-lalbagh-95762>
7. The Hindu on 20th Jan 2019 <https://www.thehindu.com/news/cities/bangalore/plastic-finds-its-way-into-lalbagh-flower-show/article26043911.ece>

### Feedback from Lalbagh officials:



<https://drive.google.com/open?id=1-KOA29i8rtvM9pUbF0adRuFQN0ycoRNK>

<https://drive.google.com/open?id=1-xeQ9KwIOoVY7NHInDeye4AkWuC9K0P0>

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