AGRI MAGAZINE
(International E-Magazine for Agricultural Articles)
Volume: 03, Issue: 07 (July, 2026)
Available online at http://www.agrimagazine.in
©Agri Magazine, ISSN: 3048-8656

Blooms to Bucks: Flower Waste, Reimagined

*Dr. Adhi Sri Latha
Teaching Associate, Dept. of Resource Management and Consumer Sciences, CCSc., PJTAU, Hyderabad, Telangana, India
*Corresponding Author's email: adisrilatha20@gmail.com

Every morning, across more than a lakh temple, mosques, gurudwaras, churches and dargahs in India, devotees offer fresh flowers to their gods — marigolds, roses, jasmine, tuberoses, lotus, hibiscus. By evening, most of these flowers are already wilted. Because they are considered sacred, they cannot simply be thrown into a municipal garbage bin. So, they are gathered up and, more often than not, tipped straight into the nearest river, pond or open dumping ground. It is one of India's largest, least-discussed waste streams and increasingly, one of its most promising opportunities for green enterprise, women's employment and rural income generation.

The Scale of the Problem

The numbers involved are staggering. Various government and research estimates put the volume of floral waste generated in India annually anywhere between 800 million tonnes at the offering stage across temples, mosques and gurudwaras nationwide, and roughly 8 million metric tonnes of that ending up dumped directly into rivers such as the Ganga every year. A widely cited figure from research on temple waste puts India's daily floral discard at close to 2 million tonnes after religious ceremonies alone.

To put this in more tangible, city-level terms:

- The Mahakaleshwar Temple in Ujjain, visited by 75,000–100,000 devotees a day, generates an estimated 5–6 tonnes of floral waste daily.
- Tirumala Tirupati Devasthanams, one of the world's richest and busiest pilgrimage sites, has recorded over 86,000 metric tonnes of untreated waste in recent years, with the Tirupati Municipal Corporation alone handling over 6 tonnes of floral waste every single day.
- Mumbai's Siddhivinayak Temple, with up to a lakh devotee on peak days, generates 120–200 kg of floral offerings daily.
- During the 2025 Ganesh festival, the Nagpur Municipal Corporation collected and recycled over 200 tonnes of floral immersion waste (Nirmalya) in a matter of days, while Pune Municipal Corporation processed over 7 lakh kilograms of Nirmalya into compost in a single festival season.
- The Ganga alone is estimated to absorb over 8 million metric tonnes of flower waste annually, according to a UN Climate Change report.

The environmental cost of this is significant. Because most cultivated flowers are grown using pesticides and chemical fertilisers, the petals that end up in rivers carry residues of arsenic, lead, cadmium and other toxins as they decompose — worsening water pollution and posing risks to the roughly 400–420 million people who depend on the Ganga basin for drinking water.

From Waste to Wealth: What "Value Addition" Actually Looks Like

The good news is that floral waste is, biochemically, an unusually rich resource. Petals are loaded with pigments, essential oils and lignocellulosic material — meaning almost every

part of a discarded flower can be repurposed. Enterprises across India, many of them women-led social enterprises, have built an entire micro-industry around what is now popularly called "flower cycling." The main value-addition routes include:

1. Organic compost and vermicompost — the single largest and simplest use, converting flower waste (rich in nitrogen) into nutrient-dense manure for gardens, parks and farms.
2. Incense sticks, cones and dhoop — charcoal-free, hand-rolled using dried, pulverised petals mixed with natural binders, replacing the coal- and chemical-based incense that dominates the conventional market.
3. Natural dyes — marigold and rose petals, rich in carotenoids and flavonoids, are used to dye cotton, wool and silk, offering a chemical-free alternative to synthetic textile dyes.
4. Biogas and biofuel — research shows flower waste actually produces significantly more biogas per kilogram than typical vegetable waste, and digests faster, making it an efficient feedstock for decentralised energy plants.
5. Handmade paper and packaging — fibrous flower waste is pulped into seed-paper and biodegradable packaging material as an alternative to plastic and thermocol.
6. Cosmetics and personal care — even rotten petals are converted into herbal soaps, essential oils, and skincare bases.
7. Bio-leather — perhaps the most striking innovation, where microbial growth on flower biomass is used to create "Fleather," a leather-like, chitin-rich material positioned as a vegan alternative to animal leather.
8. Holi colours — natural, non-toxic gulaal made from dried flower pigments, replacing synthetic colours known to cause skin and eye irritation.

The Enterprises Leading the Shift

Phool.co, a Kanpur-based startup founded in 2017, is the best-known name in this space and is often described as India's first "biomaterial" enterprise built around temple waste. It now collects roughly 21 metric tonnes of floral waste every week — about 3 tonnes a day — from five major pilgrimage towns: Kanpur, Varanasi, Ayodhya, Bodh Gaya, and Badrinath. Cumulatively, it has flower cycled well over 42,000 tonnes of temple waste to date, in the process preventing thousands of kilograms of pesticide residue from entering rivers. The company employs over 300 women, many of them former manual scavengers from marginalised communities, offering them salaries, provident fund contributions, healthcare and transport benefits — turning what was once a stigmatised, invisible task into dignified, skilled work. On the business side, Phool has raised roughly $12–13 million in funding from investors including Sixth Sense Ventures and actors and reported revenues of around ₹50 crore in FY2024, growing at 75–130% year-on-year — evidence that this is not merely a charitable experiment but a commercially scalable model.

Other enterprises are replicating and adapting the model across the country. Holy Waste, a Hyderabad-based startup, runs a process called "Florjuvination," collecting over 1,000 kg of floral waste weekly from 40 temples and market areas to make soaps, incense and fertiliser. In Mumbai, the sustainable design house Adiv Pure Nature collects 1,000–1,500 kg of temple flower waste a week from Siddhivinayak Temple to produce natural textile dyes. In Ujjain, the Shiv Arpan Self-Help Group of women has crafted over 30 million incense sticks from Mahakaleshwar Temple's daily floral waste using dedicated "Pushpanjali Econirmit" collection vehicles and a 3-tonne-per-day processing unit. Municipal bodies have joined in too — Nagpur, Pune, Rajkot and others now run dedicated Nirmalya collection drives during major festivals, feeding city composting units instead of rivers.

The Scope: Why This Is Bigger Than It Looks

Three trends suggest this sector is only beginning to realise its potential.

First, the raw material supply is effectively limitless and permanent. Religious offerings are not seasonal or cyclical in the way agricultural waste is — temples generate floral waste every single day of the year, with predictable spikes during festivals. This gives flower-

recycling enterprises a stable, recurring feedstock that most waste-to-value businesses would envy.

Second, the broader floriculture economy is expanding rapidly, which will only increase the volume of waste available for value addition. The global floriculture market, valued at roughly $73 billion in 2026, is projected to grow at a compound annual rate of nearly 8% through 2033. In India specifically, flower consumption is rising by an estimated 7–8% annually, driven by festivals, weddings and hotel decor. More flowers consumed today means more floral waste generated tomorrow — and a growing addressable market for anyone able to process it.

Third, the model directly serves at least three of India's biggest policy priorities at once— river cleaning (dovetailing with missions like Namami Gange), women's livelihood generation in both self-employment and formal-sector roles and the shift toward a circular, waste-to-wealth economy under the Swachh Bharat Mission 2.0. This alignment has already brought floral-waste recycling into government-backed programmes, municipal partnerships and CSR initiatives from companies such as Coal India and Indian Oil Corporation, which has partnered with the Tirumala Tirupati Devasthanam to build a biogas plant from temple waste.

Yet the sector remains vastly under-tapped. Even Phool, the largest and most recognised player, processes only a few thousand tonnes a year against a national floral waste stream estimated in the millions of tonnes. Most of India's 100,000-plus temples still have no organised collection or processing system at all, and the bulk of daily floral offerings continues to go straight into landfills or waterways. For entrepreneurs, self-help groups, municipal bodies and policymakers, that gap between "waste generated" and "waste value-added" is precisely the opportunity: a resource that is renewable, religiously significant, environmentally urgent to solve, and — as the last decade has shown — genuinely profitable to work with.

Conclusion

What was once seen simply as unavoidable religious refuse is increasingly being understood for what it is: an underused raw material capable of generating compost, fragrance, colour, energy and even leather — while creating dignified livelihoods for thousands of women along the way. As India's flower consumption keeps climbing and its rivers keep bearing the cost of untreated floral waste, the enterprises "flower cycling" today are not just cleaning up an old problem — they are quietly building a new, sustainable industry out of what everyone else was happy to throw away.

References

1. ScienceDirect. "Temple floral waste for various bio-products in India." Book chapter, 2023. sciencedirect.com
2. UNFCCC (United Nations Framework Convention on Climate Change). "Phool | India" — Momentum for Change: Women for Results. unfccc.int
3. The Conversationalist. "The Sacred Cycle." May 2025. conversationalist.org
4. Press Information Bureau (PIB), Government of India. "Flower Power: India's Temple Waste Transformation." pib.gov.in
5. Down To Earth. "In these temples, offerings do not go waste." April 2024. downtoearth.org.in
6. Press Information Bureau (PIB), Government of India. "Floral Waste is boosting circularity in economy." pib.gov.in
7. Agricultural Journals. "Review on floral waste utilization: A sustainable and eco-friendly approach." 2025. agriculturaljournals.com
8. Mongabay India. "Giving floral waste a second life." June 2025. india.mongabay.com
9. HinduPost. "Sacred Sustainability: Transforming Temple Waste into Environmental Wealth in Bharat." November 2025. hindupost.in
10. CleanIndiaTech Blog. "Temple Waste Management Archives." cleanindiatech.com

11. PitchBook. "Phool 2026 Company Profile: Valuation, Funding & Investors." pitchbook.com
12. Tracxn. "Phool - 2026 Company Profile, Team, Funding, Competitors & Financials." tracxn.com
13. The Finthusiastic. "Phool.co: Complete Business Model Analysis." November 2025. thefinthusiastic.com
14. Coherent Market Insights. "Floriculture Market Size, Share & Opportunities, 2026–2033." coherentmarketinsights.com
15. Your Story. "Phool: How Flower cycling Is Revolutionising Waste and Livelihoods." July 2025. yourstory.com
16. Forbes India. "Exclusive – India's first biomaterial startup Phool.co raises $8 million in Series A funding." April 2022. forbesindia.com
17. Startup Talky. "Phool Startup Story: Transforming Temple Waste into Sustainable Products." March 2025. startuptalky.com
18. The India Playbook (Substack). "How can Phool — a flower recycling startup — become a Unicorn." April 2023. theindiaplaybook.substack.com