

Study on the Environmental Impact of Tourism Activities of Maha Kumbh, Prayagraj, 2025

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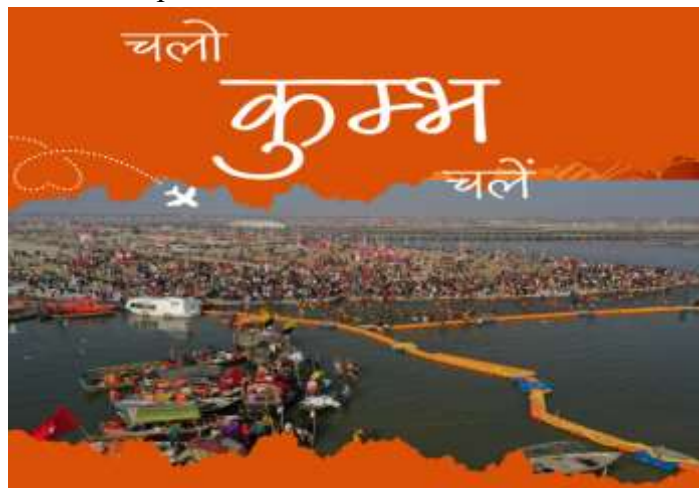
ABSTRACT

The KUMBH MELA is considered as the most pious and spiritual festival of Hindu's. This has served as the backbone of Hindu culture for ages. The festival takes place at four major cities of India, as it caters to and hosts a lot of devotees, and there are a lot of detrimental effects of it too. This is one of the highest-grossing tourism activities, which receives tourists from all across the world. Now, where there is tourism, there is environmental degradation. Tourism, anyhow, causes some damage to nature and its surroundings. This is a study about the contamination of the water, the amount of waste generation, health risks associated to the following of rituals, and the infrastructural strain.

INTRODUCTION

The KUMBH MELA is a sacred festival of the hindu's of India. It is organized in the 4 cosmopolitan cities, Prayagraj, Nashik, Ujjain, and Haridwar. This festival is not only a pride to India but it is also an Intangible Cultural site of UNESCO since 2017, entitled to the "World's Biggest festival". This festival is attended by devotees from across the globe, to reach the level of moksha to achieve virtue and vice. It is an event that occurs in every four years and each place gets its turn after 12 whole years. This much information is solely evident to understand the wait of devotees.

This year in 2025, the KUMBH MELA took place at Prayagraj, Uttar Pradesh. This place holds a lot of cultural significance. This particular city is situated on the bank of river Ganga, particularly on a confluence of the Ganga, Yamuna, and Saraswati(THE SANGAM). The timing of the fest is decided by astrological positions. This year was really special in different terms it happened after 144 years all the planets were aligned to form this auspicious date and time.



This festival is a great example to study the repercussions on the environment due to tourism on such a large scale. Although the fest this year was named as “Green Kumbh” for sustainability, but the reality is totally different from what is supposed to be eco-friendly.

Let's segregate each into a category of ideal, expected, and actual. These will be determined on the basis of tourists' arrival, Infrastructural devoid, Waste management, Water contamination, pollution, biodiversity loss and resource depletion. The government took a big initiative to make the practices sustainable and called this MAHA KUMBH a “ Green Kumbh”.This is not the whole truth, studies still suggest that a lot of adverse effects have been seen in the habitat of Prayagraj. The Kumbh Mela generates a staggering amount of solid waste. Food packaging, plastic bottles, disposable utensils, and floral offerings accumulate rapidly, overwhelming existing waste management systems. (1)Devotees float thousands of lighted earthen lamps (Diyas) on the flowing waters of the Triveni Sangam as an offering of gratitude. Third one is Prayagraj Panchkoshi Parikrama.(2) The NGT reprimanded the Uttar Pradesh Pollution Control Board (UPPCB) for allowing mass bathing in contaminated waters(3).

A lot of such instances are available through literature, where the observations have been made that the Green Kumbh was not totally green but all blue. Beginning from the basics

DATES AND DAYS	January 13 – February 26	Lasts for about 45 days	
	IDEAL	EXPECTED	ACTUAL
TOURISTS ARRIVAL	40 CRORE	45 CRORE	66 CRORE
		COLLECTED	PRODUCED
DAILY WASTE FIGURES		14,000 TONNES	20,000 + METRIC TONNES
WATER QUALITY INDICATORS	BIOCHEMICAL OXYGEN DEMAND	FAECAL BACTERIA	ORGANIC POLLUTION LEVELS
	Exceeding the levels	Higher	Exceeding the safety limits
BIODIVERSITY LOSS	AQUATIC BIODIVERSITY	BIRDS AND WILDLIFE	DESTRUCTION OF SOIL
	Reduced dissolved oxygen levels	Habitat Displacement	Degradation of river bank ecosystem
INFRASTRUCTURAL DAMAGE	TRANSPORTATION	WATER AND SEWAGE	POST EVENT RESTORATION BURDEN
	Overloading, overcrowding and damaging	Increased risk of flooding and contamination	Repairing caused a significant public expenditure

The key indicators of the damage caused at Prayagraj due to the happenings of the rituals in MAHA KUMBH 2025 are in detailed given below:

1. THE POLLUTANTS THAT ARE MAKING THE GANGA IMPURE

To begin with the most prominent loss was observed to the river Ganga , the most significant part of the traditions that take place in Kumbh mela is taking the sacred bath in the most pious river ganga for Shuddhi(purification).

On January 14, around 3.50 crore people bathed in the Sangam. the government, over 92 lakh devotees had taken a dip till 6 pm on Friday alone, pushing the overall footfall at Maha Kumbh past 50 crore (till February 14). This data is record breaking announced by the government itself, taking the holy dip. It is quite evident how much destruction it has caused to the river Ganga.

Days and dates	No of pilgrims took bath
11-16 January	7+ crores (over 3.5 crore alone on makar sankranti)
Later January	Cumulative total of 13.21 crores
1 February	2 crores
12 February	73 lakh
14 – 15 February	Were more than 50 crore

Nobody notices the aftermath of such a large gathering, the assessment of water quality for pH, conductivity, turbidity, dissolved oxygen, biochemical oxygen demand (BOD), chemical oxygen demand and Fecal coliform parameters (4)pH values observed during the 2025 Maha Kumbh Mela at different locations revealed that the water was predominantly alkaline , The low level of dissolved oxygen in water indicates contamination and is an important factor in determining water quality, pollution control, and treatment processes. The level of dissolved oxygen (DO) is affected by a variety of physical, chemical, and biochemical factors that occur in water, both in natural waters and in wastewater. (4)Not only this one ritual that all the pilgrims follow is of deep daan , devotees . Thousands of lamps are floated on the river, creating a celestial glow that symbolizes devotion and divine blessings.(5)Veeni Daan (offering hair to the Ganges) symbolize surrender and purification(5).



All this clearly indicates how disruptive the whole gathering was, now to mitigate this government has taken some steps, the rivers were cleaned with Cleantec trash skimmers were used to remove a total 600 tons of floating waste from rivers, treated 16 million litres per day of faecal sludge and 240 million litres of grey water per day. The National Green Tribunal (NGT), indicates that the river water is unsuitable for bathing, posing potential health risks to millions of pilgrims participating in the festival(6)

2. THE NUMBER OF PILGRIMS THAT WERE HOSTED

The city itself is not capable of accommodating such a large population, and that was the reason to build an entirely new city on the banks. A temporary settlement was constructed on the banks of the river. These tents could have only accommodated a total of 400 million (9). Over 4,600 religious, social, and spiritual organisation being allotted the land in all 25 sectors of mela campus(10). All of this caused over-tourism in the city of Prayagraj, which is another big contributor of environmental damage, leading to the exploitation of natural resources and jamming of the whole transportation system.

Area	4000 HECTARES
No of tents	160000 TENTS
Akharas and Pandals	14 AKHARAS and 4,600 PANDALS
Sectors	25
Holding Capacity	40 – 45 crores
Population of Prayagraj	59,54,390.(11)
Actual tourists arrival	60 – 66 crores

A stampede was caused due to the influx of such a huge mass on 30 th January, within a few days of the commencement of the fest. The government death toll is of 30 but others find it difficult and determines more. BBC report claims more than 82 killings.(12) One of the raising concerns is that the calculation was done on the basis of transportation , which means the residing populations' visits are probably ignored. This reflects the data accountability is pretty low.

3. THE WRECKAGE OF INFRASTRUCTURE

Whether it is a transportation system, water and sewage, or rewamping the city back to basics. The mela has caused significant long-term damage to the vicinity of Prayagraj. The restoration work is still going on as the harm to the land and biodiversity is irreparable .The mela was set to host 400 million people for whom the transportation system was upgraded, 98 special trains were introduced.(13) This spiked the rates of airways as well as railways , the next best alternative was roadways which created a massive long jam. Reportedly, a 10-hour-long jam was there due the rush for 200 to 300 kms. The emission of air pollutants can be understood by this mere data.(14) On February 9, around 330 trains transported 12.5 lakh pilgrims, with 130 more departing by 3 PM on February 10(1)The tent city that was erected for the guests took days to restore. The authorities’ next big task is dismantling the mega temporary city set up on the banks of the Sangam to accommodate the staggering footfall of over 66 crore within a 15-day deadline. (15)Due to this, land and soil degradation took place at the banks of the river Ganga. PWD has to remove 500 km of checkered plates and 30 pontoon bridges (15)



Renovation of 92 roads and beautification of 17 major roads. Over 2,69,000 checkered plates had been laid for pathways. Mobile toilets and robust waste management systems ensured hygiene. (5)The airport witnessed 30,172 passengers and operated 226 flights within a week. For the first time, over 5,000 passengers traveled through the airport in a single day. Night flights were introduced, providing 24/7 connectivity—a historic first in the airport’s 106-year history. (5)

Health and Sanitation that was tried to maintain, took a lot of management by the government. Over 150000 temporary toilets and hospitals were established.(13)Nigam has to remove 1,306 km of underground drinking water pipelines, 70,000 tap connections, and 85 tubewells(15). All of this requires a lot of workforce and government expenditure; restoration and clean-up is the biggest task. The place will face a lot of consequences in the future.

4. LOSS OF BIODIVERSITY, EXPLOITATION AND DEPLETION OF RESOURCES, AND DAMAGE TO NATURAL HABITAT

The state of Uttar Pradesh has a wide variety of biodiversity, the city of Prayagraj is also a hotspot as the confluence of three rivers allows migratory birds to nest. Especially, the MAHA KUMBH began with the International Bird Festival. This festival blended science, nature, and culture, inspiring conservation efforts and sustainable development(5)

	Census before the MELA	Census during the MELA
Date and Venue	December, 2024	January - March 2025
Wet land species	45	56
Forest associated	40	23
Winter migrants	27	

Residential species	58	
TOTAL ARRIVALS	85	79

Noise, lighting, and human crowding caused, disturbance to nesting and roosting sites, reducing breeding success in some ground-nesting birds. Not only was the soil erosion and flooding system sabotaged, but the temporary tent city was also built alongside the river banks, which were later demolished. The area near the river also supported a large habitat of small shrubs. The temporary structures removed the natural vegetation. Although the government did afforestation, on a real large scale but gaining somewhere losing somewhere, equalizes the effect.

The later aspect of which is the overusage and depletion of resources. Reportedly , in 2025, serious concerns arose over the safety of the water at MAHA KUMBH . A .millions of pilgrims leave behind vast amounts of waste in the Ganga, believing it to be a sacred offering. While flowers and biodegradable materials once formed the majority of these contributions, modern waste now includes synthetic clothing, plastic packets, and chemical-laden items that do not break down naturally. This surge in cases of skin infections, rashes, and stomach-related illnesses is a significant concern. Pilgrims complained of burning sensations on their skin(18) Marine life was also doomed as the dissolving oxygen level was at risk.

Air pollution was really high amid the fest, the jamming, honking emission of carbon pollutants from the vehicles. Not only this , the rituals that took place of burning diyas and offering 1000s to the river caused pollution to both air and water.

AQI OF PRAYAGRAJ	198 UNHEALTHY
BEFORE KUMBH	93 MODERATE
AFTER KUMBH	120 – 180 MODERATE TO UNHEALTHY

5. THE DUBIOUS MANAGEMENT OF WASTE

The Kumbh Mela generates a staggering amount of solid waste. Food packaging, plastic bottles, disposable utensils, and floral offerings accumulate rapidly, overwhelming existing waste management systems. Inefficient collection and improper disposal can lead to overflowing landfills, littering the ghats and surrounding areas. This not only creates an unsightly environment but also pollutes the rivers themselves.(2)During the Prayag Raj Kumbh Mela, used water from bathing, washing, and cleaning activities was treated using advanced filtration techniques to ensure minimal environmental impact. This fact is rejected by the NGT report still calling it unhealthy.

Tons of waste were produced every day, and clean ups was also maintained, with 1.5 lakhs of temporary toilets(13), processing, treatment and recycling. Nevertheless, Environmental impacts like water contamination and biodiversity stress were short-term, not “waste left behind”. Micropollutants and ecological disturbances cannot be equated with visible waste.



As far as the part of the government is concerned, they started a lot of initiatives and schemes to mitigate the risks associated with this mass gathering, like a huge number of sanitation workers were hired and paid on a daily basis, bio-toilets, Sewage water treatment plants, removal of trash to the nearest dumping zone etc. This might be sufficing on a temporary basis, but the hazardous permanent effects will be seen in the future.

CONCLUSION

Tourism itself is not eco-friendly, it damages nature most. Environment that is so sacred to us and protected at all costs, tourists exploits it the most. When an attraction with such a low holding capacity accommodates thousand even lakhs of overpopulation, it is when the effects of tourism become inevitable. The precarious holding of the natural resources by the people who are not native and leaving the residual for the residents is a harm to locality. Even the consequences of tourism cannot be fully mitigated, then how come something that's on such a big level can thrive? The MAHA KUMBH was denoted and green kumbh because it tried to mitigate the risks and certainly created a benchmark. However, the scale of the kumbh mela will never cope up with the safety measures that were taken, the effects will be lasting long. There are permanent damages also to the natural property, the contaminated water will not be purified in a day. The dissolved oxygen for the aquatic habitat will not be good enough sooner. The emission of different php pollutants in the air will not fizz away. Last but not the least the most time-consuming natural process of soil formation, that was interrupted and ruined by the temporary tents and restoration, will make the floodplains useless.

REFERENCES

1. <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2101679®=3&lang=2>
2. <https://www.ijert.org/impact-of-kumbh-mela-on-environment>
3. <https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/feb/doc2025226509201.pdf>
4. <https://cwc.gov.in/sites/default/files/water-quality-report-kumbh-mela-2025.pdf>
5. <https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/feb/doc2025226509201.pdf>
6. <https://www.greaterkashmir.com/national/alarming-water-contamination-in-maha-kumbh-ganga-water-ngt-raises-concerns-over-unsafe-bathing->

- [conditions/#:~:text=While%20the%20CPCB%20complied%2C%20the,emphasizing%20the%20event's%20global%20significance.](#)
7. <https://www.jagranjosh.com/general-knowledge/mahakumbh-2025-facts-and-stats-about-prayagraj-kumbh-mela-1736858494-1>
 8. <https://www.bbc.com/news/articles/cvg7gzx3gno>
 9. https://invest.up.gov.in/wp-content/uploads/2024/04/worlds-largest_090424.pdf
 10. <https://timesofindia.indiatimes.com/city/allahabad/maha-kumbh-2025-preparations-in-full-swing-as-over-4600-organisationssetupcamps/articleshow/116762119.cms#:~:text=Maha%20Kumbh%202025:%20Over%204%2C600,Prayagraj%20News%20%2D%20Times%20of%20India>
 11. <https://prayagraj.nic.in/demography/>
 12. <https://www.thehindu.com/news/national/bbc-report-claims-at-least-82-killed-in-maha-kumbh-stampedes/article69680239.ece>
 13. <https://theconversation.com/the-worlds-largest-gathering-how-india-plans-to-keep-400-million-pilgrims-safe-at-the-maha-kumbh-mela-festival-247210>
 14. <https://timesofindia.indiatimes.com/life-style/travel/news/maha-kumbh-rush-triggers-one-of-indias-biggest-traffic-jams-pilgrims-stranded-in-300-km-traffic-jam/articleshow/118110216.cms#:~:text=With%20over%2040%20crore%20visitors,workers%20to%20assist%20stranded%20pilgrims.>
 15. https://www.newindianexpress.com/thesundaystandard/2025/Mar/02/after-maha-kumbh-sangam-cleanup-next-big-task?utm_source=chatgpt.com
 16. https://gyanganga.ai/admin/fileupload/Six_Month_Report_July_to_Dec_2024.pdf?utm_source=chatgpt.com
 17. https://www.freepressjournal.in/mahakumbh/maha-kumbh-2025-yogi-govt-develops-dense-forests-in-prayagraj-to-ensure-clean-air-for-devotees?utm_source=chatgpt.com
 18. https://reflections.live/articles/6076/beyond-the-holy-dip-the-unheard-voices-of-maha-kumbh-mela-2025-article-by-varshini-s-20704-m82mfdli.html?utm_source=chatgpt.com
 19. <https://cgispburg.gov.in/pdf/english%20final-14-01-2025.pdf>
 20. <https://www.downtoearth.org.in/water/you-made-500-million-people-bathe-in-polluted-sewage-water-ngts-stern-remarks-on-uppcb-raises-safety-concerns>
 21. <https://academic.oup.com/inthealth/advance-article/doi/10.1093/inthealth/ihaf081/8236280>
 22. <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2101679®=3&lang=2>
 23. https://www.newindianexpress.com/nation/2025/Jan/16/mahakumbh-2025-over-7-crore-pilgrims-bathed-at-sangam-from-jan-11-to-16?utm_source=chatgpt.com