

## ***Heavy Metal Pollution by Immersion of Idols: The Indian Scenario***

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### ***Abstract***

*Central Pollution Control Board guidelines and court directions are yet to achieve the desired result of keeping rivers and lakes free of polluting heavy metals and PoP used in idols. As Durga Puja and Dussehra festivities conclude, rivers and lakes once again became more polluted following immersion of idols worshipped in puja pandals across cities. The guidelines formulated by the Central and state pollution control boards (CPCB and SPCBs) went largely unheeded in spite of some efforts by municipal bodies and police to curtail the practice.*

*Environmentalists and river experts have been campaigning against these idol immersions for over a decade now. Judicial interventions in the past, however, have not yielded the desired result. Every year, after Ganesh Chaturthi, Durga Puja and Kali Puja, the biological oxygen demand (BOD) levels in rivers increase dramatically.*

***Keywords: Metal Pollution, CPCB, SPCBs***

### **INTRODUCTION**

The presence of heavy metals in natural waters has become a significant topic of concern for environmentalists, scientists and engineers in various fields associated with water quality and growing awareness

of the public. Direct toxicity to human and aquatic life and indirect toxicity through accumulation of metals in the aquatic food chain are the focus of this threatening concern. Elements such as cadmium exhibit human toxicity at extremely low

concentrations and chromium, lead, copper and zinc are toxic at slightly higher concentrations (1).

Trace metals reach the sediments in three principal ways: (i) in or on the particles which settle to the bottom, (ii) in or on the particles which are transported along the bottom, and (iii) by the sorption of dissolved metals from waters in contact with the sediments.

The sedimentation of particles is invariably the most important pathway and three classes of particles may be distinguished: detrital, biogenous and precipitated. It has been suggested that detrital particles may carry heavy metals within the crystal lattice, adsorbed on the surface, in the exchange sites of clay minerals and the surface coatings formed by hydrous metal oxides or organic matter. Similarly, particles of biogenous origin may contain heavy metals within inorganic skeletal materials, complexed to organic matter, and in coatings of hydrous oxides which may form on particles. A third class of sedimentary particles are precipitated such as calcium carbonates, hydrous oxides and sulphides, and it has been proposed that these carry heavy metals adsorbed on the surface, as co-precipitated material, and as metal

compounds precipitate as discrete particles. (1;2)

India is a rich cultural country in which diverse cultural and religious festivals are organized. Idol is an image of a god which is used as an object of worship. After worship, these idols are immersed into water bodies. Idols are constructed by plaster of Paris, clay, cloths, small iron rods, bamboo and decorated with different paints such as varnish, water colors etc. which can lead to significant alteration in the water quality after immersion. Paints which are used to colour these idols contains various heavy metals such as Mercury, Cadmium, Arsenic, Zinc, Chromium and Lead. Particularly, red, blue, orange and green colours contain mercury, zinc oxide, chromium and lead, which are potent carcinogens. Two heavy metals such as Lead and Chromium also add in the water bodies through Sindoor (a traditional red colored cosmetic powder, usually worn by married women and often used in the festivals). The floating materials released through idol in the river and lake after decomposition result in eutrophication, increase in acidity and heavy metal concentration. Heavy metal pollution caused by idol immersion can damage the ecosystem as it kills fishes, damages plants, blocks the natural flow of

the water, causing stagnation. The effects of idol immersion on various water bodies of India like Bhoj wetland, Budhabalanga river, Ganges river, Hussainsagar lake, Kolar river, Sarayu river, Tapi river, Chhatri lake, north and west lakes of Bangalore and Yamuna river have been observed so far. Investigations were carried out to find out the effects of immersion of idols on water quality by collecting and analyzing the water samples from the immersion sites of the rivers. The samplings were done before the immersion, on the day of immersion and after the event and several parameters like temperature, pH, dissolved oxygen, BOD, dissolved CO<sub>2</sub>, conductivity, salinity, alkalinity, TDS, total hardness, chlorides etc. are estimated.

Most of the studies found significant changes in the water quality parameters during and after immersions. Traditionally, the idols were made of mud and painted with natural colours. But now many are made using plaster of Paris (PoP) and coated with harmful paints containing heavy metals, all of which end up in the rivers on Dussehra day.

Approximately 100,000 idols are immersed in India's water bodies each year.

As Durga Puja and Dussehra festivities conclude, rivers and lakes become more polluted following immersion of idols worshipped in puja pandals across cities.

Environmentalists and river experts have been campaigning against these idol immersions for over a decade now. Judicial interventions in the past, however, have not yielded the desired result. Every year, after Ganesh Chaturthi, Durga Puja and Kali Puja, the biological oxygen demand (BOD) levels in rivers increase dramatically.(4;5)

#### **IMPACT ON WATER QUALITY**

A 1993-95, a study by the Central Pollution Control Board (CPCB)—Impacts of Dussehra Festival on the River Hooghly: A case study—showed that every year at least 15,000 idols of Goddess Durga are immersed in the Hooghly river alone. The study states that this releases 16.8 tonnes of varnish and garjan oil and 32 tonnes of colours in the water. These colours contain a good doze of heavy metals like manganese, lead, mercury and chromium. The study also found that during Dusshera, oil and grease in the river increased by 0.99 milligram per litre (mg/l) and the concentration of heavy metals increased by 0.104 mg/l.

According to the recent reports of the SPCB, delayed monsoon had increased the pollution in Ganga and the situation would be worse in winter. Water at Bithoor, the point where the Ganga enters Kanpur city, is quite clear but the river gets polluted further down. At Jajmau, the stretch of the Ganga in the city is the most polluted. The dissolved oxygen (DO) level at Bithoor is 7.6 mg per litre which decreases to 6.3 mg per litre at Jajmau. The acceptable level of DO for a drinking water reservoir is 4 mg per litre, the report stated. The report also indicated that immersion of a large number of idols during Ganesh Chaturthi had already affected the water quality(5;6;7;8;9;10)

**Table 1 Effect of Idol Immersion**

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| <p>1. Such pollution caused damage to eco system:</p> <ul style="list-style-type: none"> <li>a. Killing the fishes</li> <li>b. Damaging the plants</li> <li>c. Blocking the natural flow of water and causing stagnation</li> </ul> <p>2. Such pollution damages health by polluting drinking water sources causing:</p> <ul style="list-style-type: none"> <li>1. Breathing problem</li> <li>2. Blood diseases</li> <li>3. Skin diseases</li> </ul> |
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**Action Plan to Prevention & Control of Water Pollution**

Central Pollution Control Board has formulated guidelines on the practice of idol immersion in water bodies, which should be followed for controlling pollution. It recommends that monitoring of the water quality should be done in three stages—pre-puja, during the pujas and after the immersions. The CPCB guidelines direct local bodies to provide dedicated immersion points with synthetic liners at the bottom of the artificial water body. Idols can be immersed under supervision of SPCB. All idols then need to be removed from water bodies within 48 hours. The state governments have been asked to set up coordination committees comprising representatives of pooja committees, police, local NGOs and leaders to guide the public.,

In the year 2020 the CPCB published a revised version of its 10-year-old guidelines, which cover instructions for idol makers; immersions at waterbodies and in the sea; festival organising committees; and the responsibilities of state pollution control boards. In present situations the materials used for making idols has led to use of non- biodegradable materials Plaster of Paris, Plastic, thermacol, synthetic colours etc. which

deteriorate the water quality Use of pyramid of sugarcane sticks for pandals along with natural clay and natural clay mixed with alum have been suggested for idols by the CPCB. “Idols and decorations made using PoP, plastic and thermocol accessories as well as dyes used to colour these idols, having harmful and toxic chemicals are banned for future use,” said Prashant Gargava, member secretary, CPCB. This decision is to aimed at tackling the environmental impact of idols and their immersion. Gargava said state pollution control boards have been directed to take a call on suitable penalties for illegal use of banned materials. (5;6;7;8;9)

### **State Actions to Curb Idols Immersion**

Precautionary principle is a tool for environmental protection. In order to protect Environment, the precautionary approach shall be widely applied by states according to their capabilities.

While most of the SPCBs do not have information on how much the quality of water in rivers and lakes in their jurisdiction are affected by idol immersion, some states like Gujarat and Karnataka have taken affirmative action.

1. In 2010, to promote use of lead-free colour among puja organizers, West Bengal SPCB introduced an award— Shera Sharad Nirman Puja Puraskar. Efforts have been made to phase out colours with high concentration of lead, especially red and yellow, for the past three years. This gave no results as no incentives were given to organisers.
2. South Delhi’s Greater Kailash II puja organisers, follow the religious scriptures that specify how an idol should be made. It has been following the specifications to the last detail for the past seven to eight years. The same wooden frame has been retained for making the idol for the past 22 years. The idol, 85 per cent of which is made of hay and the rest 15 per cent from clay, is clothed in fabric that is made 70 per cent of banana stalk and the rest jute, making it biodegradable. The colours which are used are organic and the flowers at the end of the puja are buried and used to make compost.
3. Following demands from activists, Nagpur Municipal Corporation (NMC) had introduced the concept of eco-friendly immersion by installing artificial ponds in 2012. To promote more eco-friendly immersions, NMC

increased the number of artificial tanks in the city from last year's 30 to over 100 this year.

4. In 2009, the Bombay High Court had directed CPCB to frame guidelines to curb water pollution and Maharashtra SPCB and Brihanmumbai Municipal Corporation were directed to implement them.
5. The Indore Municipal Corporation has also been installing artificial tank and trench for the immersion. People are required to strip the idols of plastic and other non-biodegradable materials used to make garlands and clothes before the immersion
6. In Delhi, the River Yamuna receives water released upstream at Palla. Several storm water drains which are fed by a network of smaller drains also outfall into the river. As Delhi's population grows each year, rampant pollution has hampered numerous efforts to transform the river into a wholesome water body.

Just ahead of the festive season year 2013 , the Allahabad High Court had banned immersion of idols in the Ganga and Yamuna rivers in Uttar Pradesh. The high

court bench of Justice Ashok Bhushan and Justice Arun Tandon ordered a blanket ban on immersion of idols in the rivers. It also dismissed the plea of the state government that the idols would be immersed and then taken out immediately. The order was pronounced during the hearing of a petition of environmental activist, Sudhanshu Srivastava, to check the rising pollution levels in the Ganga.

Though the state administration officials pleaded for a year's time, the bench declined their plea and ordered the state government to ensure that within a year there should be "zero immersion" in the rivers of Uttar Pradesh. The court had earlier asked the Uttar Pradesh SPCB to monitor the water quality before and after the immersion of idols. The 2013 report submitted before the court revealed that the water quality deteriorated drastically after immersion of idols.(5;6;7;8;9;10)

## CONCLUSION

Approximately 100,000 idols are immersed in India's water bodies each year. With the rise in pollution levels in the rivers, a few states are now evolving ways to prevent or minimise idol immersion. The guidelines formulated by the Central and state pollution control boards (CPCB and SPCBs) went largely unheeded in

spite of some efforts by municipal bodies and police to curtail the practice. It is essential to build public awareness about the need to stop using chemicals and toxic paints in the fabrication of idols. But reaching out to individual idol makers and decorators is very difficult. Recently some efforts were made to sensitise pandal organisers but there is little understanding about the rise in heavy metals pre and post idol immersion. It is therefore very important to encourage idol immersion in special pits and ponds.

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