

Study of Idol Immersion in Water Bodies

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Abstract

Water bodies are the biological wealth to mankind so its duty of all humans to maintain its quality. Various festivals religious rituals that are foremost in India have much importance of rivers. In accordance to this there is decrease in water quality and the water bodies are loaded with toxic materials and chemicals due to idol immersions. This paper gives clear idea about the various materials that are used in forming of Idols and the negative impact caused due to these materials on the human and aquatic life. The major parameter that are affected severely due to idol immersion are also listed. Sustainable management must be carried out by the cooperation of Government Authority as well as citizens.

Keyword- Adverse effect, Idol Immersion, Materials, Parameters

I. INTRODUCTION

India is a country in which different festivals of different cultures and religions are celebrating their festivals at glance. Some of the major festivals in India are Durga Puja, Ganesh Puja, Tazia, Laxmi Puja etc. Worshipping of God/Goddess in form of Idols, Idols is an image. Duration of these kinds of festivals one day, three days, five, seven and ten days. After these duration period of worshipped idols, idols are immersed in Lentic and Lotic body. Lentic is a static water body like, ponds, lakes, marshes etc while Lotic is a dynamic water body like rivers, streams, brooks etc. Both Lentic and Lotic are fresh water body which depends on weather and climatic condition.

The size of idols varies from one and half feet, 20 feet, up to 40 feet heights are immersed in above said water body with different time and locations. In India, major Lotic ecosystems are Yamuna river, Ganga river, Narmada river, Gomti, Bhrahmaputra, Krishna, Kaveri, Mahi, Tapi (Suryaputri), Vishavamitri, Sabarmati, Indus rivers etc. while the Lentic ecosystems consists of Hussainsagar lake, Chhatri, Masunda, upper and lower lakes of Bhopal etc. All these Lakes/Ponds and Rivers are used for immersion of Idols in form of worshipped from Indian Mythology view. The immersion practices of idols were first started by Lokmanya Tilak, purpose of these would be the unity creating between the divided populations of India. At that time, Idols were made up of Clay for immersion activities create less pollution to above water bodies. But now day's idols were made up of Plaster of Paris, Paper Mache and Clay is a base material and coloring of Idols with Natural and Synthetic Paints causes water pollution which is not favorable for drinking purpose without any treatment.

Decorative materials are extremely used for Idols. Water pollution became a major global problem in this era. Water is essential for all i.e. (microorganisms to man), almost all fresh water bodies over a globe are polluted and under Stress due to improper location locations of STP, domestic waste, industrial, agricultural, and religious activities (idol immersion). Environment and Ecosystem were disturbed now days in terms of rapid unplanned urbanization and industrialization. Alteration in water quality due to above factors leads to serious threat to aquatic life, humans etc. Population increasing day by day also plays an important role to the environment. According to World Health Organization, about 80% of all diseases in human beings are caused by water. Physico-chemical characteristics and heavy metals are accumulated in water leads stress on water bodies due to these ill practices of idol immersion. Rhythm of Nature, Dynamic seasonal changes and the cycle of life are three factors found religious and spiritual re-enforcement through a number of Indian festivals tradition. Resurgence and Rejuvenation, many of them involve immersion of idols into water bodies as a symbol of returning the elements, which give life, back to the earth for a cycle to begin.

Every year in India Idols immersion plays a crucial role for polluting the water bodies. Material are POP is cheaper and lighter contains chemical causes phosphorus, gypsum, sulphur etc. and used in making the Idol, thermocol and plastic is non-bio-degradable leads toxicity and synthetic paints causes heavy metals like, lead, zinc, mercury, cadmium etc.



Ganesh Chaturthi



Durga Puja



Moharam(Tazia)

Fig. 1, 2 & 3: Images of Ganesh Chaturthi, Durga Puja and Moharam (Tazia) Celebrations in India

Degradable metals and organic pollutants are tending to accumulate in fish vital organs and through food chain humans getting health hazards.

Impacts and Effects of Idol immersion is a significance cause of environment, ecosystem and water pollution. For this study on the self-purification of the river is becoming more and more important. Self-purification means, the physical and chemical action such as flowing, dilution, deposition and adsorption. An anthropogenic activity leads to decrease in the self-purification capacity of river and posing serious threat to aquatic eco-system and environment. River systems of India are adversely affected by pollution and nutrient loads that are increased after idol immersion. Input of biodegradable and non-biodegradable substances deteriorates river water quality, enhances the silt load in water, and also adversely affects the human, flora and fauna around it.

II. IDOL COMPOSITION & ITS ADVERSE EFFECT

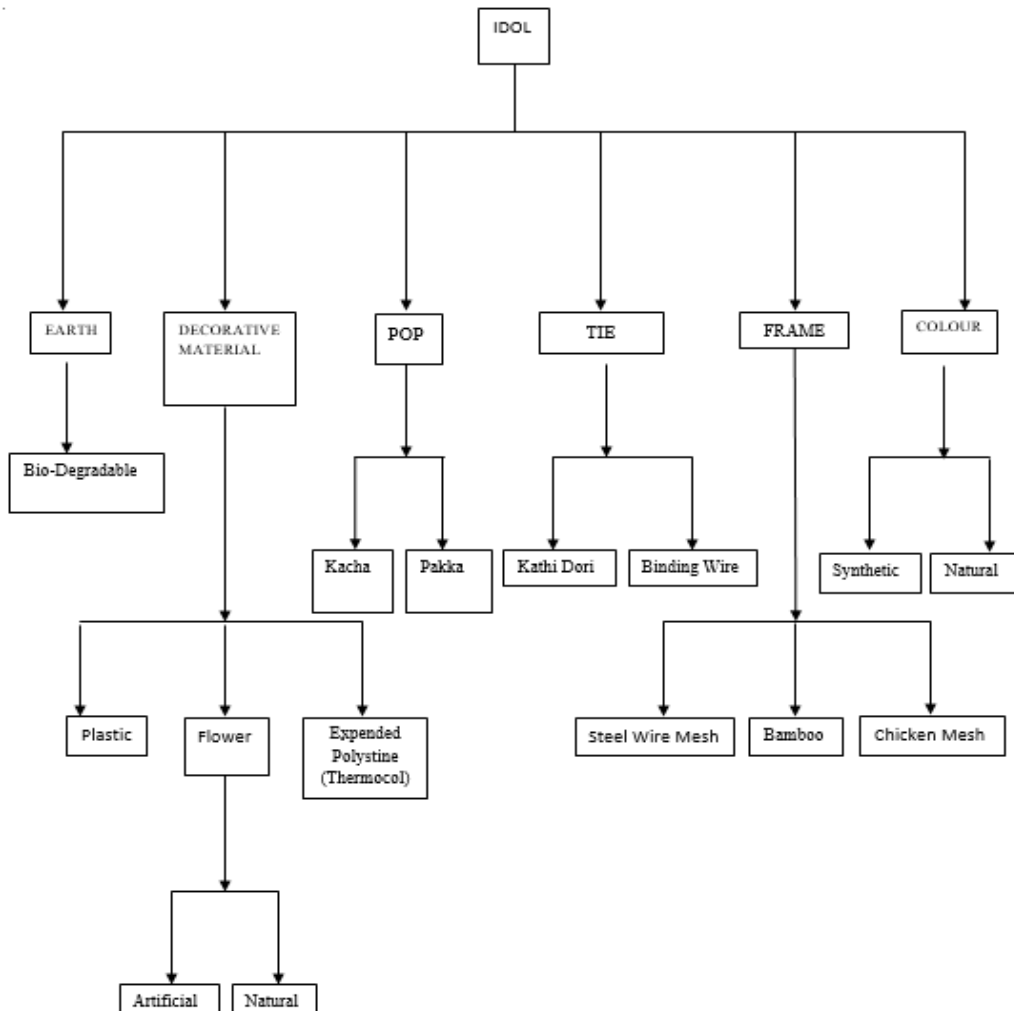


Fig. 4: Different Idol Composition Materials

Idols are prepared by plaster of Paris, clay, cloths, small iron rods, bamboo and ornamented with different paints such as glaze, watercolors etc.

Plaster of Paris (POP), which is inexpensive and lighter, has turned into the preferable material to make these idols. POP contains chemicals such as phosphorus, gypsum, sulphur, and magnesium. Plaster of Paris is extracted from Gypsum rock and is comprised of Calcium and Sulphate. When gypsum is heated at about 150 degrees Celsius it loses water and produces powder PoP. i.e. Calcium sulphate dehydrate is fired at relatively low temperature and then reduced to powdered form is Pop. When PoP is mixed with water, it sets within few minutes due to expansion and its surface becomes smooth.

Due to this property, it is used in molds. Pop is not easily soluble in water but gradually goes in water bed over a long time period. Large amount of PoP when comes directly in contact with skin, causes serious burns because of heat produced. Material used for making Pop idols contains the Pop (Gypsum) 80% and above and paper (cellulose) up to 10% and other material within 1-2% like starch, Boric Acid, Potassium sulfate, Vermiculite, Glass fiber, Paraffin wax and Crystalline Silica.

Colors used are mostly chemical and contain metals such as Copper, Chromium, Cadmium, Nickel, Lead, Mercury etc. POP makes water alkaline if deposited excessively. Calcium and magnesium concentration in water increases significantly leading to an increase in the hardness of water. Clay (Shadu) Traditionally, Ganesh Idols are made up of clay from bank of river. Natural clay was widely used for preparation of Idol but making idol from clay is a very skillful job. These clay idols are fragile, and hence limit transportation over longer distance. Due to this property, it is used in molds.



Fig. 5: Crowd at Time of Ganesh Utsav



Fig. 6: Decorative Pandals

Clay is from natural source and is easily soluble in water. Material used for making clay idols contains the clay popularly called "Shadu" now a day's mostly sourced from Gujath. Other material like starch etc. and colors used are mostly natural / eco-friendly, except for the Golden color. Due to disintegration of Hindu undivided families and urbanization demand of house hold idols is increased. This has increased demand of 'Shadu Clay', which is not easily available resulting into increased cost of Ganesh Idols made from Shadu Clay. Since, these idols get rapidly dissolved in water turbidity of water tends to increase immediately. "Eco-Ganesh" idols are made up of Shadu Clay and Paper pulp, Natural gum, eco-friendly colors and natural coir from palm / coconut tree. These idols have advantage of light weight, close to traditional belief and having lesser metal contents. The idols have benefit of easy disintegration in water.

Idols are ornamented with plastic and thermocols. Out of all materials used in making the idol, thermocol and plastic are non-bio-degradable, so they are toxic. Paints which are used to color the idols contain various heavy metals such as Mercury, Cadmium, Arsenic, Zinc, Chromium and lead. {Red, blue, orange and green colors contain mercury, zinc oxide, chromium and lead, which are potent carcinogens} Sindoor (a traditional red or orange-red colored cosmetic powder from India, usually worn by married women along the parting of their hair, often used in the festivals, especially in Durga Puja) results into two heavy metals

such as Lead and Chromium which are very toxic even in very small quantity for human being through the process known as Bioaccumulation and Bio magnifications.

Heavy metals can enter into the living systems through the food chain process they may directly incorporate through the digestive tract due to the consumption of contaminated water or food, or through indirect routes across penetrable membranes such as gills. Immersion of these idols poisons the water so lakes, rivers and these by increasing acidity and the content of heavy metals. 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. It damages health of human beings also by polluting drinking water sources, causing breathing problems, and blood and skin diseases.

III effect of the celebrations practice causes river pollution. It disturbs the ecological balance by polluting the water from microorganism to man.



Fig. 7: Condition of Water Body After Immersion Activity

III. IMPACT DUE TO IDOL IMMERSION ON AQUATIC LIFE

The idols are painted with oil paints of various colors which contain heavy metals which are non-biodegradable and bio-accumulate and bio-magnify along the food chain and are brutally neuro and nephrotoxic and some even carcinogenic. It is apparent that the heavy metals viz., Copper, Ferrous, Calcium, Magnesium, Manganese, Molybdenum, Silicon, Arsenic, Iron, Lead, chromium, nickel, cadmium, zinc and Mercury are used to prepare synthetic paints of different colors. The concentration of these metals (mg/l) rises in multiple folds after the immersion of idols. These metals are absorbed in the bodies of aquatic flora and fauna and get accumulate in the food chain. When the levels of these metals exceed the tolerable limits it results in fish kill as well as other aquatic animals like snails, frogs etc. which is a common scene for some post-immersion days. [8]

S. No.	Materials contributed by immersion	Impact on the aquatic body
1.	Plaster of Paris	Increases dissolved solids, contribute metals and sludge.
2.	Decoration material viz. clothes, polish, paint, ornaments, cosmetic items etc.	Contributes suspended matters, trace metals (Zinc, lead, iron, chromium, arsenic, mercury etc.) metalloids and various organic and inorganic matter, oil & grease etc.
3.	Flowers, Garlands, oily substance	Increase floating suspended matter organic contamination, oil & grease and various organic and inorganic matter.

4.	Bamboo sticks, Beauty articles	Big pieces got collected and recycled while small pieces remain floating in water or settled at the river bottom inhabiting river flow.
5.	Polythene bags/plastic items	Contribute suspended, settle able matter and hazardous material to water and chokes the aquatic life.
6.	Eatables, food items etc.	Contributes oil & grease, organics to water bodies.

Table 1: Foreign Materials and its Impact on Aquatic Life

Source: Toxics Link

IV. PARAMETERS AFFECTED DUE TO IDOL IMMERSION

During the idol immersion period, lentic and lotic bodies water quality are affected. The physio-chemical parameters are altered and along with that heavy metals are generated due to synthetic paints. This mainly consist of below listed parameters, as these parameters are playing major role for the existence of living beings within it and also life settled at its bank.

Physio-chemical parameters	Heavy metals
pH	Lead (Pb)
Dissolved oxygen	Zinc (Zn)
Temperature	Total Chromium
Conductivity	Cadmium (Cd)
Chemical oxygen demand	Mercury (Hg) etc.
Biological oxygen demand	
Turbidity	
Total dissolved solids	
Total suspended solids	
Chloride	
oil & grease etc.	

Table 2: List of affected Parameters.

V. CONCLUSION

- Idol immersion have negative impact on water quality as well as on the aquatic life.
- Eco-friendly, clay idols should be used instead of Plaster of Paris idols that would have negligible amount of impact on water bodies.
- Rules and regulations that are made for idol immersion should be implemented strictly in accordance with governmental powers.
- Sustainable management must be carried out by the cooperation of Government Authority as well as citizens.

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