1. Introduction

Idol worship is being practiced in India during festivals like Ganesh Puja, Viswakarma Puja, Durga Puja, Kali Puja, Gaja laxmi Puja etc. Dumping of Puja left-overs alongwith idols after the Puja, in the surface water bodies is a general practice being followed as per hindu mythology. Since such Pujas are mostly celebrated in monsoon or post monsoon seasons, and the flow in rivers are high during this period, immersion of idols and puja offerings in the rivers usually have no significant impact on the water quality. However, with the increase in number and size of idols, use of alternate materials other than clay for making the idols, use of synthetic paints and varnishes rather than natural dyes to decorate the idols in present years, the probability of contamination of water after immersion of idols in water bodies, has been increased. Besides these, dumping of puja left overs such as vastras on idols, flowers, decorating materials (made of paper and plastic), etc. in water bodies during this immersion process has also increased the risk of contamination of water bodies. This, in turn, may affect the aquatic ecosystem at the immersion sites as well as its downstreams.

With this background, Central Pollution Control Board (CPCB) has prepared the "Guidelines for Idol Immersion" for implementation during immersion of idols in aquatic bodies to minimize the impact of idol immersion in surface water bodies.

2. Guideline for Idol Immersion

In compliance of the directions of the Hon'ble High Court of Bombay in the matter of PIL W.P. No. 13251325/2003 Janhit Manch Vs the State of Maharashtra and others, the Competent Authority in CPCB has constituted a Committee, vide Order No. A-22011/1/90-Mon dated 10.02.2009, to formulate Guidelines for immersion of idols in natural stream. "Guidelines for Idol Immersion" (PROBES/136/2010) developed by the CPCB encompasses the roles of local bodies/ authorities, Puja Committee Organisers and State Pollution Control Board or Pollution Control committees for implementation of the Guideline to minimize the impact of idol immersion activities on the aquatic bodies.

(a) General Guidelines for idol immersion

- Use of traditional clay for making idols should be encouraged.
- Use of water soluble, non-toxic natural dyes should be encouraged to colour the idols rather than painting of idols.
- Worship materials like flowers, decorating materials, should be removed before immersion of idols. All biodegradable matters should be disposed separately for recycling or composting. All non-biodegradable matters should be collected separately for disposal in separate landfills.
- Mass awareness programmes should be conducted to aware the Public on ill effects of idol immersion.
- All idols should be immersed in an identified area on the surface water bodies which is cordoned, barricaded and preferably lined with synthetic liner. After immersion, the liner should be removed to collect the dumped materials for final disposal at appropriate places.

(b) General Guidelines for Local bodies/ Authorities

- Local bodies/ Authorities should identify adequate number of idol immersion spots to avoid overcrowding and to reduce pollution load on the water bodies. Such spots should be notified and informed to the Puja Committees through awareness programmes.
- At the immersion of sites, burning of solid wastes so generated during the immersion of idols, should be prohibited.
- Within 48 hours of idol immersion, the left over materials at the immersion sites should be collected by the local bodies for final disposal at appropriate places.
- In case of immersion of idols in rivers and lakes, arrangements may be made for construction of temporary confined ponds with earthern bunds for the purpose of immersion of idols. After the completion of immersion, supernatant water may be allowed to flow as usual after checking for colour and turbidity. Lime may be allowed to the temporary confined pond.
- Mass awareness programmes may be conducted to educate the people on ill effects of toxic idol immersion.

c) Role of State Pollution Control Boards (SPCBs) and Pollution Control committees (PCCs)

- Concerned SPCB/ PCC should conduct water quality monitoring of water bodies at the immersion sites preferably in Class-I cities (having population more than one lac), at three stages i.e. Pre-immersion, during immersion and post-immersion. For ascertaining water quality, 12 numbers of physico-chemical parameters such as pH, DO, BOD, COD, Conductivity, Turbidity, TDS, Total Solids, Chromium, lead, zinc and copper may be analysed and results posted on the SPCB's website.
- SPCB/ PCC shall help to local administration in preparing material for mass awareness for the purpose.

3. Actions taken by the State Pollution Control Board, Odisha

Ganesh Puja and Durga Puja are celebrated in massive scale in most of the cities of the State of Odisha. However, celebrations of other Pujas like Gajalaxmi Puja and Kali pujas, are limited to certain cities of the State. Generally the idols are immersed on a single day at the designated sites of the rivers flowing along the cities. In recent past years, Board was informing all the District Collectors of the State to implement the Guidelines. Besides these, Board was also conducting the water quality monitoring of only two rivers i.e. Kathajodi river along Cuttack city and Kuakhai river along Bhubaneswar city to assess the impact of idol immersion.

Similar to the actions taken by the Board in the year 2015 after the intervention of the Hon'ble High Court of Orissa in this matter and vide their order dated 07.10.2015, in the year 2016 also, the State Pollution Control Board, Odisha rendered necessary assistance to the District Collectors to ensure strict compliances of the Guidelines for Idol Immersion during the Durga Puja and other pujas in all the urban local bodies of the State.

To minimize the impact of idol immersion on the water quality, the State Pollution Control Board, Odisha has taken following steps as recommended in the Guideline for idol immersion.

- Informed all the District Collectors and authorities of urban local bodies of the State prior to Ganesh Puja and Durga Puja to implement the Guidelines of Immersion in their areas of jurisdiction.
- Created public awareness through Public Notice on safe Idol immersion practices in Local Newspapers and in Board's website

STATE POLLUTION CONTROL BOARD, ODISHA
[DEPARTMENT OF FOREST & ENVIRONMENT, GOVERNMENT OF ODISHA]

APPEAL TO OBSERVE POLLUTION FREE GANESH POOJA DURGA POOJA, LAXMI POOJA AND KALI POOJA

Puja Committees / Organisers :

- Use natural clay for making of idols instead of baked clay, plaster of paris etc.
- Use water soluble and nontoxic natural dyes for painting of idols instead of toxic and non-biodegradable chemical dyes.
- Remove worship materials like flowers, decorating materials before immersion of idols and to be disposed of in municipal dump site and make sure that they are not burnt near the immersion site.
- Immerse Idols only at the identified immersion sites constructed by the District authorities or Local bodies.
- Do not use plastic materials for decoration purpose and Prasad sevan or distribution.

District Authorities / Local Bodies

- Identify adequate number of designated immersion sites and inform the Puja Committee authorities well in advance.
- In case of immersion of idols in rivers and lakes, arrangements may be made for construction of temporary confined ponds with earthen bunds and removable synthetic liner for the purpose of immersion of idols. Identify the immersion sites at the points where the flow in stream is naturally available.
- Within 48 hours of the immersion, the left over materials from the immersion site shall be removed for disposal at designated municipal dump site and the supernatant water may be allowed to flow into the river after adding lime to clear the water.

LET US TAKE A PLEDGE TO OBSERVE A POLLUTION FREE POOJA

Note: The detail guideline in this regard can be downloaded from CPCB Website (www.cpcb.nic.in) or SPCB Website (www.ospcboard.org).

MEMBER SECRETARY

dt. 1-9-16
The New Indian Express P-4

ରାଜ୍ୟ ପ୍ରଦୂଷଣ ନିୟନ୍ତ୍ରଣ ବୋର୍ଡ, ଓଡ଼ିଶା
(ଜଙ୍ଗଲ ଓ ପରିବେଶ ବିଭାଗ, ଓଡ଼ିଶା ସରକାର)

ପ୍ରଦୂଷଣମୁକ୍ତ ଗଣେଶ ପୂଜା, ଦୁର୍ଗାପୂଜା, ଲକ୍ଷ୍ମୀପୂଜା ତଥା କାଳୀପୂଜା ନିମନ୍ତେ ରାଜ୍ୟ ପ୍ରଦୂଷଣ ନିୟନ୍ତ୍ରଣ ବୋର୍ଡ ନିବେଦନ

ରାଜ୍ୟରେ ପାର୍ବଣ ଋତୁରେ ଗଣେଶ ପୂଜା, ଲକ୍ଷ୍ମୀପୂଜା ଓ କାଳୀପୂଜା ପରବର୍ତ୍ତୀ ବିସର୍ଜନ ଜନିତ ନଦୀ ପ୍ରଦୂଷଣ ଦୃଷ୍ଟିରୁ ରଖି ରାଜ୍ୟ ପ୍ରଦୂଷଣ ନିୟନ୍ତ୍ରଣ ବୋର୍ଡ ତରଫରୁ ସମ୍ପୃକ୍ତ କର୍ମକର୍ତ୍ତାମାନଙ୍କୁ ନିବେଦନ :

ପୂଜା କମିଟି କର୍ମକର୍ତ୍ତାମାନଙ୍କ ନିମନ୍ତେ ଉଦ୍ଦିଷ୍ଟ ନିବେଦନ

- ମୂର୍ତ୍ତି ନିର୍ମାଣରେ ପୋଡା ମାଟି ତଥା Plaster Paris ପରିବର୍ତ୍ତେ ପ୍ରାକୃତିକ ମୃତ୍ତିକା ବ୍ୟବହାର କରନ୍ତୁ।
- ମୂର୍ତ୍ତିରେ ବିଷାକ୍ତ ରାସାୟନିକ ରଙ୍ଗ ବଦଳରେ ପ୍ରାକୃତିକ ରଙ୍ଗର ବ୍ୟବହାର କରନ୍ତୁ।
- ପୂଜା ପରେ ମୂର୍ତ୍ତିକୁ ଜିଲ୍ଲା ପ୍ରଶାସନ ତଥା ପୌର କର୍ତ୍ତୃପକ୍ଷଙ୍କ ଦ୍ୱାରା ଚିହ୍ନିତ ଅସ୍ଥାୟୀ ପୋଖରୀରେ ବିସର୍ଜନ କରନ୍ତୁ।
- ବିସର୍ଜନ ପୂର୍ବରୁ ମୂର୍ତ୍ତି ଏବଂ ମେଢ଼ରୁ ଫୁଲ ତଥା ଅନ୍ୟ ସାଜସଜ୍ଜା ପଦାର୍ଥକୁ ମୂର୍ତ୍ତିରୁ କାଢ଼ି ପୌର କର୍ତ୍ତୃପକ୍ଷଙ୍କ ଦ୍ୱାରା ଚିହ୍ନିତ ନିର୍ଦ୍ଦିଷ୍ଟ ସ୍ଥାନରେ ପକାନ୍ତୁ, ଏହାକୁ ବିସର୍ଜନ ସ୍ଥଳରେ ପୋଡନ୍ତୁ ନାହିଁ।
- ସାଜସଜ୍ଜା ତଥା ପ୍ରସାଦ ବିତରଣ ନିମନ୍ତେ ପ୍ଲାଷ୍ଟିକର ବ୍ୟବହାର କରନ୍ତୁ ନାହିଁ।

ଜିଲ୍ଲା ପ୍ରଶାସନ ତଥା ପୌର କର୍ତ୍ତୃପକ୍ଷଙ୍କ ନିମନ୍ତେ ଉଦ୍ଦିଷ୍ଟ ନିବେଦନ

- ସମ୍ପୃକ୍ତ ସହରରେ ଅନୁଷ୍ଠିତ ପୂଜାର ସଂଖ୍ୟା ଅନୁପାତରେ ଆବଶ୍ୟକ ଅସ୍ଥାୟୀ ପୋଖରୀ ଖୋଳାଯାଇ ଏଠାରେ ବିସର୍ଜନ ନିମନ୍ତେ ପୂଜା କମିଟିକୁ ଅବଗତ କରାନ୍ତୁ।
- ନଦୀ ତଟବର୍ତ୍ତୀ ଅଞ୍ଚଳରେ ମୂର୍ତ୍ତି ବିସର୍ଜନ ନିମନ୍ତେ ମାଟିବନ୍ଧ ଓ Syntehtic Liner ଥାଇ ଅସ୍ଥାୟୀ ପୋଖରୀ ନିର୍ମାଣ କରାଯାଇ ସମସ୍ତ ପୂଜାକମିଟିମାନଙ୍କୁ ଏହି ପୋଖରୀରେ ମୂର୍ତ୍ତି ବିସର୍ଜନ କରିବା ନିମନ୍ତେ ଅନୁରୋଧ କରନ୍ତୁ।
- ମୂର୍ତ୍ତି ବିସର୍ଜନ ହେବାର ୪୮ ଘଣ୍ଟା ମଧ୍ୟରେ ଅସ୍ଥାୟୀ ପୋଖରୀ ମଧ୍ୟରୁ ବିସର୍ଜିତ ସାମଗ୍ରୀକୁ ଉଦ୍ଧାର କରି ନିର୍ଦ୍ଦିଷ୍ଟ Municipal dumpsiteକୁ ସ୍ଥାନାନ୍ତର କରିବା ସଙ୍ଗେ ସଙ୍ଗେ ଅସ୍ଥାୟୀ ପୋଖରୀ ଜଳକୁ ଚୂନ ପକାଇ ବିଶୋଧନ ପରେ ନଦୀ ବା ନାଳକୁ ନିଷ୍କାସିତ କରାଯାଇପାରେ।

ବି.ଦ୍ର : ଏ ସମ୍ବନ୍ଧୀୟ ବିବରଣୀ www.cpcb.nic.in କିମ୍ବା www.ospcboard.orgରୁ ମିଳିପାରିବ।

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SCA/5527

Appeal to Public to observe pollution free Durga Puja, Laxmi Puja and Kali Puja through Public Notice on Local Newspapers

- Created public awareness through Public Notice in front of the District Collectorate Office, other important places of the cities and through public address system.

Public awareness through notice at the District Collectorate Office

Public awareness through public address system

- Made several meetings with the local bodies/ authorities, Puja Committee Organizers to create awareness on ill impacts of Idol immersion in water bodies.
- Coordinated with the local bodies/ authorities for construction of temporary immersion ponds near rivers as prescribed in the Guideline and informed the Puja Committee Authorities and the Public regarding the location of Idol immersion sites.

Identification of sites for idol immersion

Approach road to the site for idol immersion

- Generally idols are immersed in flowing waters which makes the rivers as the ideal places for idol immersion. In such cases, as per the recommendation in the Guideline, either temporary ponds having earthen bunds along the river bank for use as idol immersion spots had been constructed or a part of the river bed had been cordoned to mark it as idol immersion site. The bottom of the pond in either cases had been lined with removable synthetic liner well in advance of the idol immersion. The said liner along with remains of the idols were removed within 48 hours of idol immersion by the local bodies and disposed in the municipal dumpsites. The water of the temporary ponds was then treated with lime and allowed to settle prior to ultimate discharge into rivers.
- In some urban local bodies, though temporary immersion ponds were not constructed specifically for idol immersion purposes, the left-overs of idol immersion were removed by the local peoples within 48 hours of idol immersion and disposed at the municipal dumpsites.
- Conducted water quality assessment of the rivers along the immersion sites in three stages i.e. Pre-immersion, During immersion and Post-immersion, in Class-I cities (having population more than one lakh) viz., Bhubaneswar, Cuttack and Puri cities where the pujas are celebrated in massive scale.
- Water quality status was assessed with respect to the physico-chemical parameters as recommended in the Guideline, such as, pH, Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Conductivity (EC), Turbidity, Total Dissolved Solids (TDS), Total Solids (TS), and metals (cadmium, chromium, iron, lead, zinc and copper.
- Water quality status is evaluated by comparing with the tolerance limits for Class A (Drinking water source without conventional treatment but after disinfection) and Class C (Drinking water source with conventional treatment followed by disinfection) Inland surface water quality (Table-1). The variation in concentration of different parameters at the immersion sites are compared with the values at the upstream and downstream of immersion sites to assess the impact of idol immersion.
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Table - 1 Primary Water Quality Criteria

Parameter	Quality Criteria				
	Class– A	Class – B	Class – C	Class – D	Class – E
pH	6.5 – 8.5	6.5 – 8.5	6.5 – 8.5	6.5 – 8.5	6.5 – 8.0
Dissolved Oxygen (DO) (mg/l) minimum	6.0	5.0	4.0	4.0	-
Biochemical oxygen Demand (BOD) (mg/l) Max	2.0	3.0	3.0	-	-
Total Coliform (TC) (MPN/100 ml) Max	50	500	5000	-	-
Free Ammonia-N (mg/l) Max	-	-	-	1.2	-
Electrical Conductivity (EC) (microSiemens/cm) Max	-	-	-	1000	2250
Sodim Absorption Ratio (SAR) Max	-	-	-	-	26
Boron (B) (mg/l) Max	-	-	-	-	2.0

Besides these, IS 2296-1982 prescribes tolerance limits for other parameters as listed in Table-2 for above mentioned designated uses of surface water bodies.

Table-2 Tolerance limits for other parameters

Parameter	Tolerance limits (mg/l)				
	Class-A	Class-B	Class-C	Class-D	Class-E
Total Dissolved Solids (TDS), max	500	--	1500	--	2100
Lead (Pb), max	0.10	--	0.10	--	--
Cadmium (Cd), max	0.01	--	0.01	--	--
Chromium (VI) (Cr^{6+}), max	0.05	0.05	0.05	--	--
Iron (Fe), max	0.3	--	50	--	--
Copper (Cu), max	1.5	--	1.5	--	--
Zinc (Zn), max	15	--	15	--	--

The water quality data of samples collected to assess the impacts of idol immersion during Durga Puja on Kathajodi river in Cuttack city, Kuakhai and Daya rivers in Bhubaneswar city and Musa river in Puri city are given in Tables 3- 6 .

From the water quality data, it has been observed that

- During immersion period, parameters like turbidity and total solids increase at the immersion sites in comparison to the upstream and downstream stations which may be ascribed to the increase in suspended materials on the water body during immersion of idols.
- Dumping of puja materials and left-overs into the water body disrupts the oxygen level of water body and therefore lowering of dissolved oxygen (DO) at the immersion site was observed. Simultaneous increase in BOD and COD values at the immersion site on the day of idol immersion were also observed. As after 48 hours actions had been taken to remove the puja left overs from the river body, BOD and COD values has been significantly reduced at the immersion sites during the post immersion period. Further, continuous high flow of water in the river rejuvenates itself the upstream water quality.

- During immersion period increase in the conductivity and total dissolved solid at the immersion site in comparison to the upstream and downstream stations may be ascribed to the leaching of dissolved materials form the puja materials and idols immersed in the water body.
- Variation in concentrations of heavy metals such as cadmium, lead, copper and hexavalent chromium during the period of study was not significant.
- However, significant increase in water quality parameters like DO, BOD, COD, EC, TDS and TS in the temporary idol immersion ponds were observed in comparison to its upstream station in during–immersion period. As the left-overs of the idol immersion were removed from the idol immersion ponds in subsequent days of idol immersion, the values of DO, BOD, COD, EC, TDS and TS parameters has been decreased significantly in post-immersion monitoring period.
- In the temporary idol immersion ponds, the concentration of heavy metals such as cadmium, chromium, iron, lead, zinc and copper in both during-immersion and post-immersion period remain much below the tolerance limit for most beneficial uses of water. This may be correlated to the very slow leaching process of heavy metals from the synthetic paints and other materials used in the idols in natural conditions of water bodies.

- Further, because of the preventive measures taken by the district administration not to allow the water of idol immersion ponds to flow into the river, water quality of downstream stations in during-immersion and Post-immersion periods remained well within the tolerance limits of the designated use.

From the study, it may be concluded that all the parameters specified for the study remained within the tolerance limit for designated class of the river i.e. Class-C (Drinking water source with conventional treatment followed by disinfection) even after immersion of idols). Concentration of heavy metals such as cadmium, chromium, iron, lead, zinc and copper remain much below the tolerance limits and no significant impact is exerted on the heavy metal concentration of the water bodies due to immersion of idols. Such observation may be ascribed to the heavy flow in river during that period. Though some of the physical and chemical parameters like Turbidity, electrical conductivity, TDS and BOD shows higher values during-immersion period in comparison to the pre-and post-immersion period, but still remained much below the tolerance limit. Further, immersion of idols in the temporary immersion ponds has minimized the probability of contamination of the main course of river water.

Table- 3 Impact of idol immersion during Durga Puja on water quality of Kathajodi river at Cuttack

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, µS/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr^{6+}, mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (05.10.2016)	Location 1	8.03	7.5	1.4	4.0	187	8.5	109	143	0.0009	0.008	0.010	0.249	0.007	0.007	0.002
	Location 2	Sample not collected														
	Location 3	7.92	7.7	1.2	4.0	188	12.3	109	153	0.0010	0.008	0.010	0.310	0.011	0.010	0.003
	Location 4	7.89	7.7	1.2	4.0	197	8.5	110	170	0.0009	0.008	0.013	0.290	0.010	0.011	0.006
During-Immersion (13.10.2016)	Location 1	7.24	7.7	1.5	4.0	186	13.7	106	154	0.0006	0.005	0.027	0.250	0.009	0.020	0.006
	Location 2	6.81	0	27.6	74.7	455	38.4	285	369	0.0008	0.013	0.025	0.443	0.016	0.023	0.012
	Location 3	7.47	7.5	1.4	4.0	209	23.1	115	179	0.0009	0.015	0.015	0.410	0.014	0.020	0.007
	Location 4	7.39	7.5	1.5	6.0	184	8.5	100	156	0.0011	0.013	0.018	0.470	0.012	0.018	0.007
Post-Immersion (20.10.2016)	Location 1	8.2	8.1	1.6	4.0	195	2.6	106	118	0.0016	<0.002	0.010	0.016	0.008	0.006	0.002
	Location 2	Sample not collected														
	Location 3	8.3	7.9	1.6	6.0	210	5.8	120	134	0.0014	<0.002	0.013	0.170	0.010	0.015	0.003
	Location 4	8.3	8.3	1.9	6.0	182	4.3	99	113	0.0011	<0.002	0.013	0.224	0.012	0.014	0.003
Tolerance limits for Class-C inland surface waters (IS : 2296-1982)		6.5-8.5	4 or more	3 or less	-	-	-	1500	-	0.01	0.05	-	50	0.1	15	1.5

* Location-1 : Upstream of Immersion site at Naraj Barrage
* Location-2 : From temporary immersion pond
* Location-3 : Immediate downstream of Immersion site near Khan nagar
* Location-4 : Downstream of Immersion site near Khan nagar

Table- 4 Impact of idol immersion during Durga Puja on water quality of Kuakhai river at Bhubaneswar

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, µS/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr^{6+}, mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (5.10.2016)	Location-1	7.5	5.8	1.2	8.0	186.5	50.0	110	158	0.0008	0.008	0.01	0.006	0.008	0.001	0.001
	Location-2	Sample not collected														
	Location-3	Sample not collected														
	Location-4	7.3	5.8	1.6	10.0	170.7	50.0	101	152	0.0018	0.01	0.013	0.540	0.012	0.003	0.003
	Location-5	7.8	6.1	1.5	12.1	169.8	60.0	100	156	0.0010	0.01	0.015	0.008	0.011	0.001	0.002
During-Immersion (13.10.2016)	Location-1	6.8	5.9	1.4	11.9	209.8	50.0	123.0	159.0	0.0016	0.008	0.013	0.011	0.010	0.013	0.004
	Location-2	6.8	0.7	10.4	51.5	393.2	50.0	230.0	281.0	0.0018	0.013	0.022	0.502	0.012	0.032	0.007
	Location-3	6.8	0.2	23.0	128.7	815.2	80.0	481.0	611.0	0.0016	0.015	0.025	0.881	0.021	0.082	0.016
	Location-4	7.3	6.4	1.6	11.9	232.7	60.0	136.0	192.0	0.0009	0.02	0.025	0.911	0.013	0.013	0.006
	Location-5	7.7	6.6	1.6	11.9	207.8	65.0	124.0	182.0	0.0006	0.010	0.015	0.557	0.012	0.010	0.006
Post-Immersion (21.10.2016)	Location-1	6.7	5.8	1.5	14.2	200.0	11.0	118.0	129.0	0.002	0.015	0.026	0.012	0.006	0.008	0.001
	Location-2	6.8	0.3	10.7	42.7	390.9	21.0	231.0	254.0	0.0013	0.018	0.025	0.410	0.008	0.029	0.006
	Location-3	7.1	0	28.4	155.6	651.0	28.0	385.0	417.0	0.0025	0.015	0.023	0.714	0.009	0.077	0.011
	Location-4	7.2	6.5	1.9	17.8	255.0	21.0	151.0	168.0	0.0014	0.010	0.015	0.591	0.012	0.012	0.006
	Location-5	7.0	7.5	1.6	14.2	238.5	9.1	140.0	149.0	0.0014	0.002	0.020	0.018	0.009	0.003	0.001
Tolerance limits for Class-C inland surface waters (IS : 2296-1982)		6.5-8.5	4 or more	3 or less	-	-	-	1500	-	0.01	0.05	-	50	0.1	15	1.5

Location-1 : Upstream of Immersion point on river Kuakhai at Hansapal
Location-2 : Temporary immersion pond-1 right side of Kuakhai river
Location-3 : Temporary immersion pond-2 left side of Kuakhai river
Location-4 : Downstream of Immersion pond at Balianta
Location-5 : Further Downstream of Immersion point at Balianta

Table- 5 Impact of idol immersion during Durga Puja on water quality of Daya river at Bhubaneswar

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, µS/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr^{6+}, mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (5.10.2016)	Location-1	7.6	6.5	0.5	8.0	170.4	32.0	104.0	133.0	0.0012	0.006	0.008	0.012	0.011	0.017	0.001
	Location-2	Sample not collected														
	Location-3	Sample not collected														
	Location-4	7.7	7.0	1.5	18.9	179.7	50.0	108.0	152.0	0.0011	0.003	0.017	0.551	0.008	0.048	0.002
	Location-5	7.5	7.0	1.6	16.1	165.2	40.0	98.0	145.0	0.0011	0.003	0.008	0.488	0.008	0.038	0.002
During-Immersion (13.10.2016)	Location-1	7.8	4.2	0.8	11.9	233.7	60.0	139.0	189.0	0.0012	0.009	0.013	0.261	0.008	0.017	0.004
	Location-2	6.9	0.4	9.2	75.3	374.6	33.0	221.0	246.0	0.0008	0.015	0.018	0.806	0.011	0.125	0.005
	Location-3	6.5	Nil	93.1	337.0	813.9	100.0	480.0	695.0	0.0011	0.023	0.030	0.809	0.014	0.079	0.010
	Location-4	8.0	6.7	1.6	19.8	230.2	60.0	130.0	146.0	0.0015	0.030	0.033	0.406	0.018	0.067	0.003
	Location-5	7.8	6.9	1.5	17.8	214.8	50.0	125.0	186.0	0.0015	0.010	0.015	0.311	0.014	0.005	0.003
Post-Immersion (21.10.2016)	Location-1	6.1	5.4	1.2	10.7	187.0	12.0	110.0	133.0	0.0013	<0.002	0.018	0.246	0.009	0.014	0.008
	Location-2	Sample not collected														
	Location-3	6.6	8.9	151.9	338.0	216.6	60.0	128.0	369.0	0.0015	0.020	0.022	1.020	0.022	0.030	0.012
	Location-4	7.0	7.7	2.3	26.7	220.0	9.0	129.0	145.0	0.0014	0.003	0.007	0.258	0.011	0.020	0.004
	Location-5	8.1	11.1	2.2	24.9	205.6	19.0	120.0	146.0	0.0010	0.007	0.018	0.094	0.009	0.008	0.003
Tolerance limits for Class-C inland surface waters (IS : 2296-1982)		6.5-8.5	4 or more	3 or less	-	-	-	1500	-	0.01	0.05	-	50	0.1	15	1.5

Location-1 : Upstream of Immersion point on river Daya
Location-2 : Temporary immersion pond-1, right side of river Daya
Location-3 : Temporary immersion pond-2 left side of river Daya
Location-4 : Downstream of Immersion pond on river Daya
Location-5 : Further Downstream of Immersion on river pond Daya

Table- 6 Impact of idol immersion during Durga Puja on water quality of Musa river at Puri

Period of monitoring	Location*	pH	DO, mg/l	BOD, mg/l	COD, mg/l	EC, µS/cm	Turb. NTU	TDS, mg/l	TS, mg/l	Cd, mg/l	Cr^{6+}, mg/l	TCr, mg/l	Fe, mg/l	Pb, mg/l	Zn, mg/l	Cu, mg/l
Pre-Immersion (5.10.2016)	Location-1	6.8	0.2	3.3	26.1	336.6	22.0	194.0	225.0	0.0013	0.002	0.007	0.503	0.012	0.028	0.003
	Location-2	Sample not collected														
	Location-3	6.8	Nil	4.5	38.2	357.6	25.0	212.0	250.0	0.0020	0.008	0.017	0.701	0.017	0.105	0.003
	Location-4	6.8	Nil	5.4	40.2	410.5	22.0	242.0	279.0	0.0021	0.013	0.018	0.603	0.015	0.120	0.004
During-Immersion (13.10.2016)	Location-1	6.8	0.5	4.8	29.7	632.8	36.0	378.0	399.0	0.0018	0.010	0.018	0.574	0.013	0.038	0.003
	Location-2	6.7	0.3	57.8	150.5	1485.0	85.0	871.0	968.0	0.0023	0.022	0.032	0.806	0.023	0.119	0.003
	Location-3	9.3	0.6	6.7	41.6	1198.0	50.0	710.0	795.0	0.0024	0.020	0.023	1.165	0.024	0.132	0.003
	Location-4	7.3	2.9	9.8	79.2	1013.0	36.0	592.0	678.0	0.0019	0.020	0.023	0.739	0.015	0.089	0.003
Post-Immersion (21.10.2016)	Location-1	7.1	4.9	15.3	53.3	190.2	8.6	112.0	131.0	0.0014	0.007	0.018	0.481	0.012	0.069	0.005
	Location-2	6.9	1.7	18.6	67.6	520.8	10.0	307.0	325.0	0.0030	0.018	0.02	0.651	0.020	0.035	0.011
	Location-3	7.1	Nil	17.7	67.6	728.2	65.0	429.0	530.0	0.0022	0.015	0.018	0.409	0.015	0.022	0.010
	Location-4	6.7	Nil	4.4	26.0	783.3	220.0	460.0	559.0	0.0012	0.007	0.013	0.201	0.009	0.011	0.004
Tolerance limits for Class-C inland surface waters (IS : 2296-1982)		6.5-8.5	4 or more	3 or less	-	-	-	1500	-	0.01	0.05	-	50	0.1	15	1.5

* Location-1 : Upstream of Immersion site near Devighat on Musa river

* Location-2 : immersion site on Musa river

* Location-3 : Downstream of Immersion site on Musa river

* Location-4 : Further downstream of Immersion site on Musa river

6. Recommendations

- Guidelines of Idol Immersion should be strictly followed by the Puja Committee Organisers during the immersion of idols.
- Puja Committee Organisers should promote the construction of idols from clay only and colouring of the idols with natural colours.
- Adequate number and size of ponds shall be designated for idol immersion and shall be informed to the Puja Committee Organisers.
- Municipal authorities shall cooperate the Puja Committee Organisers for removal of the left-over materials of the idol immersions from the immersion sites within 48 hours of immersion and transportation of these debris to the dumpsites.
- Treatment of temporary immersion pond with lime and discharge of the settled water to main river channel within four days of idol immersion.
- Burning of left-over materials of idol immersion on the banks of river should be prohibited.
- Public awareness shall be given more thrust on the ill-impacts of idol immersion and implementation of the Guidelines.
