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Assessment of Pollution Load from worship remains disposal (Nirmalya Visarjan) in River Narmada and Need for Eco-friendly Pujan Ghats

Dr N P Shukla Chairman, M P Pollution Control Board, Bhopal

Dr Munna Lal Patel Superintending Engineer, M P Pollution Control Board, Bhopal,

ABSTRACT

Water is the basis of life and probably the most essential requirement of economic growth and social development (Takashi et. al., 2009). Narmada is considered as life line for the State of Madhya Pradesh. Assessments of river water quality have been done by various agencies and it is found that being the purest river of India is facing threat to its water quality. The list of pollutants is endless which includes domestic waste. Festivals are very important and heartiest to every person of India (Rai Basant, 2013) and organic pollutants and chemicals are being discharged into the river during religious activities. An attempt has been made to assess the biomass load in the river due to sewage and worship remains disposal in Mandla and Jabalpur Districts. It is pertinent to note that, the pollution load due to worship remains (Nirmalya) disposal is significant and to be addressed to prevent the river pollution. Specific pujan ghats are required to be constructed in every city/town for the environmental management of the Nirmalya.

KEYWORDS : Life line, waste, pollutants, worship remains (Nirmalya), Idol immersion (Murti Visarjan), pollution load, bio mass, eco-friendly worship places (Pujan Ghats)

Introduction:

Narmada, the life line for the State of Madhya Pradesh Originates from Asmarkantak, travells around 1,312 km before draining through the Gulf of Khambhat in Gujrat. There are 41 major tributaries, out of which 19 join her on the southern end and 22 on the northern end. The longest portion of Naramada travels in Madhya Pradesh. People have used water, mainly rivers, lakes and lagoons, as a convenient sink into which to dump wastes from either point or nonpoint sources originating mainly from domestic and industrial sectors, and from agricultural runoff. The list of pollutants is endless, and varies from organic pollutants to synthetic and highly toxic chemicals (Takashi et. al., 2009). Festivals are very important and heartiest to every person of India (Rai Basant, 2013). Assessments of river water quality have been done by various workers in India (Sangu and Sharma, 1985; Das and Sinha, 1993; Baruah and Baruah, 2003; Rajaram et al., 2005; Kulshrestha and Sharma, 2006). The study for the pollution load on Narmada has been conducted in Mandla and Jabalpur District. As an outcome of the study the major sources of Pollution in Narmada are as follows:

- The sewage from the city of Mandla through Dhobi Ghat Nalla meeting at Rangrej Ghat and 16 other small nallas.
- The Sewage generated from City of Jabalpur and joining to the River Narmada through Shah Nallla, Khandari Nalla, and Daroga Ghat Nalla.
- The Sewage generated from Bheraghat and joins at Panchwati Ghat.
- Daily worship remains disposal (Nirmalya visarjan).
- Worship remains disposal (Nirmalya visarjan) during Ganesh, Durga Utsav and Narmada Jayanti.
- Idol immersion (Murti Visarjan).

Methodology adopted:

The study has been done on the basis of the survey conducted for the collection of data from the respective agencies. The basic sources of the data are as follows:

- This study is based on the information collected through survey and inventorying the activities related to the different pollution sources in Narmada at Mandla, Jabalpur and Bheraghat.
- The sewage and Municipal Solid waste quantity has been assessed on the basis of the population covered and water supply data in the area.
- Information regarding worship remains disposal (Nirmalya visarjan) estimated on the basis of the discussion with the local Pandits/pujaries.
- Information regarding Idols (Murtis) collected from the Murtikars.
- Waste Water quality data are taken from the analysis reports from Regional Office of Madhya Pradesh Pollution Control Board, Jabalpur.

Assessment of Sewage Load from the Municipal Local Bodies on the Bank of River in Mandla and Jabalpur District;

In many countries the major pollution problem in river is associated with the discharge of untreated municipal wastewaters (Laishram Kosygin et.al, 2007). Mandla, Jabalpur, and Bheraghat are important local Bodies on the Bank of River Narmada. The sewage and Municipal Solid waste quantity has been assessed on the basis of the population covered and water supply data in the area. Sewage from Jabalpur city flows through 05 major nallas out of which 03 nallas carry about 60% 0f city sewage through river pariyat which joins to Hiran River and ultimately the River Narmada where as two nallas join to Narmada directly. Sewage from Mandla is being discharged through 17 Nallas out of which 16 small nallas carriy about 30% of the city sewage joins to River Narmada and a major nalla carrying about 70% sewage joins Narmada at about 10 Kms but it is generally dried after travel of about 3 km and the sewage is not reaching to River Narmada. About 95% sewage from Bheraghat joins Narmada through a nalla joining at Panchwatighat.

Table, 1 : Quantification of Bio-mass in the River through sewage

No	Name of the Local Body	Population (2011 Census)	Estimated Sewage (MLD)	Estimated MSW (MT/D)	Sewage discharge to Narmada (MLD)	Ave. BOD (mg/l)	Annual BOD (kg)
1	Mandla	49471	4.7	15	1.7	60	37230
2	Jabalpur	1080865	92.4	462	27	40	394200
3	Bheraghat	8658	0.13	3.0	0.13	60	2847

Inventorying of the Pollution Load from the Worship (Pujan) activities:

The cities and towns situated on the bank of Narmada are very much spiritual and extensive pujan activities are performed. Most of the Pujan activities are performed on the Gahts situated on the banks of the River. There are six major River Fronts (Ghats) at Mandla:

1 Rapta Ghat, 2. Chhotikheri Ghat, 3. Nanaghat, 4. Rangrej Ghat, 5. Mata Mhakali Ghat and 6. Sai Dharmshala Ghat.

There are seven major River Fronts (Ghats) at Jabalpur:

1 Zilahari Ghat, 2. Uma Ghat, 3. Gwari Ghat, 4. Daroga Ghat, 5. Tilwara Ghat, 6. Khari Ghat and 7. Siddh Ghat.

There are four major River Fronts (Ghats) at Bheraghat:

1 Panchwati Ghat, 2. Sarshwati Ghat, 3. Lamheta Ghat and 4. Dalpur Ghat

A survey has been conducted for the assessment of the Pollution Load discharged in the River for the worship (Pujan) activites. The assessment has been done on the sample survey basis. The outcome of the survey is as follows:

4.1 Daily worship remains disposal (Nirmalya Visarjan) for 365 days @400 to 600 gm /pujan

The data regarding daily worship performed at different ghats in Mandla, Jabalpur and Bheraghat is given in Table, 2

Table, 2: Daily worship performed at different ghats

Place	No of Ghats used for daily worship (Pujan)	No of Pujan per day
Mandla	06	150 to 200
Jabalpur	07	1000 to 1200
Bheraghat	04	80 to 100

4.2 Worship remains disposal (Nirmalya Visarjan) during Idol Sthapna @200 to 400 gm /pujan

The detail of Idlo sthapna at Ganesh Utsav, Durga Utsav and Narmada Jayanty Utsav in Mandla, Jabalpur and Bheraghat is given in Table, 3

Table, 3: Idlo sthapna at Ganesh Utsav, Durga Utsav and Narmada Jayanty Utsav

Place	No of worship days	No of Idols	No of Idols with average Weight (Kg)		
			40	20	2.5
Ganesh Utsav					
Mandla	10	100 to 150	10	40	100
Jabalpur	10	900 to 1100	150	200	850
Bheraghat	10	10 to 15	5	7	13
Durga Utsav					
Mandla	09	140 to 150	10	40	100
Jabalpur	09	1000 to 1200	150	200	850
Bheraghat	09	20 to 25	5	7	13
Narmada Jayanti					
Mandla	03	10 to 15	02	05	08
Jabalpur	03	45 to 50	05	14	31
Bheraghat	03	5 to 8	--	02	06

Data Interpretation:

The data as received from the survey have been interpreted for assessment of the pollution load which is being disposed in River Narmada. The average quantity of Nirmalya Kg/year is given in Table-4.

Table, 4: Average quantity of Nirmalya from Daily Pujan Kg/year

S. No.	Places	Average worship (Pujan) / day	Nirmalya kg/day	Nirmalya kg/year
1	Mandla 6 ghats	150-200	120	43800
2	Jabalpur 7 ghats	1000-1200	720	262800
3	Bheraghat 4 ghats	80-100	60	21900
	Total			328500

Worship remains disposal (Nirmalya Visarjan) during Idol sthapna keeping generation as @ 200-400 gm/pujan given in Table, 5.

Table, 5: Worship remains disposal (Nirmalya Visarjan) during Idol sthapna

S. No.	Place	No of Idols	Nirmalya Kg/day	Nirmalya kg/year
Ganesh Idol sthapna (@ 200-400 gm/pujan for 10 Days)				
1	Mandla	80-100	40	400
2	Jabalpur	800-1100	440	4400
3	Bheraghat	12-15	6	60
	Total			4860
Durga sthapna (@ 200-400 gm/pujan for 9 Days)				
1	Mandla	145-150	60	540
2	Jabalpur	1000-1200	480	4320
3	Bheraghat	20-25	6	90
	Total			4950
Narmada Jayanti sthapna (@ 200-400 gm/pujan for 3 Days)				
1	Mandla	12-15	6	18
2	Jabalpur	45-50	20	60
3	Bheraghat	5-8	3	9
	Total			87

5.1 Biomass Assessment:

The assessment of the Biomass disposal during the daily pujan, Murti-sthapna and Murti visarjan, in the Narmada River has been done andtedail is summerised in Table, 6.

Table, 6: Assessment of the Biomass disposal during the daily pujan, Murti-sthapna and Murti visarjan, in the Narmada River

S. No.	Type of Disposal	Total Weight (Kg/Year)	% of Biomass	Biomass Visarjan (Kg/Year)
1	Nirmalya Daily Pujan	328500	90	295650
2	Murtipujan	9897	90	8900
3	Murti Visarjan	26804	60	16080
	Total			320630

Discussion & conclusion:

It is evident from the above data analysis that;

- The biomass discharge in the river from sewage disposal different nallahs from Jabalpur, Mandla and Bheraghat is around 434 MT/Year.
- The biomass discharge from the above towns from daily pujan & murtivisarjan is around 320 MT/year.
- Generally the Nirmalya visarjan is being done at important Ghats.

Considering the facts as an outcome of the survey, prevention of untreated sewage disposal in the river is not sufficient to prevent the pollution of the river. The contribution of pollution load from the religious activities is significant hence, construction of eco-friendly pujanghats is necessary to reduce the regular biomass disposal in the river.

Concept of Eco-friendly Pujan Ghats:

The concept of an eco-friendly pujan ghat is to create separate ponds on the bank of river by simulating the river flow in the pond. The ar-

rangements are to be made to scrap the worship remains after disposal in scientific manner. The Eco-friendly Pujan Ghats will require:

- Pujan Kund of sufficient capacity as per requirement.
- The pumping arrangements from the River to maintain regular flow.
- The Pujan kunds will be provided with coarse bar screens with collection arrangements.
- The storage arrangements for the collected Nirmalya with compost pits for composting the biomass.
- Collection pits for non biodegradable materials in the Nirmalya.
- Filtration units with fine screens with inlet in the upstream and outlet in the downstream
- It may be provided at the existing Ghats or nearby to them.

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