

# A comparative study on the pollution status of the Narmada river

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**Key Words :**

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It is now generally recognized that quality of water is just as important as the quantity of the water. In specifying the quality characteristic of the water chemical, physical and biological analysis are normally required. A complete analysis of water sample includes determination of the organic and inorganic constituents present in water body by natural and man made activities. Narmada river is getting polluted day by day and the major source of the pollution are the organic waste by religious activity and effluent discharge at different ghats.

These sources of pollution include the following :

Sewerage system, sanitation system, water supply, water shed/catchment treatment, municipal solid waste and industrial waste, bio-medical waste, agriculture waste and dairy waste, crematoria, river front development, bathing ghats, dhobi ghats, eco-tourism development activities, Funding, privatization, regulatory liaison, Human Resource Development, institutional framework, public awareness and public participation, environmental assessment and mitigations measures.

Our main focus to study the pollution level of Narmada river by DO analysis The major water quality factors that are important in freshwater aquaculture systems. Some water quality factors are more likely to be involved with fish losses such as dissolved oxygen, temperature, and ammonia. Others, such as pH, alkalinity, hardness and clarity affect fish, but usually are not directly toxic. Each

water quality factor interacts with and influences other parameters, sometimes in complex ways.

**Dissolved oxygen :**

The minimum dissolved oxygen (DO) level that fish can safely tolerate depends upon temperature and to a certain extent the species. Volubility of oxygen increases as temperature decreases. Typically, oxygen levels are lowest just before dawn and highest in the late afternoon.

**Factors affecting dissolved oxygen :**

Volume and velocity of water flowing in the water body, climate/Season, the type and number of organisms in the water body, altitude, dissolved or suspended solids, amount of nutrients in the water, organic wastes, riparian vegetation and groundwater inflow.

**EXPERIMENTAL METHODOLOGY**

**Purpose of study :**

River Narmada is getting polluted day by day due to social and religious activities its pollution level getting increased specially at the ghaat area. So we had selected different ghaat of the Narmada river to check its pollution level by measuring DO. From Narmada river water were analyzed from 25<sup>th</sup> april to 5<sup>th</sup> May 2013, with total 108 samples.

Main objectives of the study :

- To know the water quality of the river Narmada.

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- To know about the pollution level by the organic matter of the river Narmada.
- To know that weather water is getting purified naturally or not by moving from one place to another of the river Narmada.
- To know pollution difference of the upper surface of the water and under surface of the water of the river Narmada.
- To know pollution difference of the river from one side to another side of the river Narmada.
- To know pollution difference of different ghaat of the river Narmada.
- Comparative assessment of the pollution level of the ghaat of Narmada River, before and after one year.
- Assessment of the clean Narmada green Jabalpur project by DO analysis.

**Experimental work :**

For the present study we had selected 3 different ghaats and from each ghaat 3 different point 150 M away from each other, for upper surface and for under water surface and same sampling done in opposite side of the river also.

Table A : List of samples			
Front side		Opposite side	
Sample	Type	Sample	Type
A-1	Surface water	C-1	Surface water
A-2	Surface water	C-1	Surface water
A-3	Surface water	C-1	Surface water
B-1	Under water	D-1	Under water
B-2	Under water	D-1	Under water
B-3	Under water	D-1	Under water

**Selected ghat :**

- Jamtara ghat
- Gwari ghat
- Bheda ghat

Selected time period : 25<sup>th</sup> April to 5<sup>th</sup> May 2013.

Temperature range (during experimental work) : 40 °C to 41 °C.

Selected method for sampling : Grab method.

Selected method for do analysis : Azide-Winkler titration method.

**EXPERIMENTAL FINDINGS AND DISCUSSION**

By the above method of analysis, we analyzed all the 36 samples of the same year and compare it with the 36 reading of last year and results are tabulated here.

The DO should be 6.5 during 41<sup>o</sup> C as according to standards of drinking water. 72 samples of water have analyzed DO within desirable limit and water can be used for drinking purpose by using small purification practices.

By the above results and discussion we can conclude that for the jamtara ghaat surface water is more polluted than under water because DO of the under water is higher than surface water in all the samples of front site. And for the opposite site results are same but DO is less than front site.

**Table 1 : The comparative status of DO and % value of the pollution**

Site	Sampling site	DO value of 2012	DO value of 2013	% of pollution level
Jamtara ghat				
Front side	A-1	4.6	5	Decrease 7 %
	A-2	4.2	5.5	Decrease 20%
	A-3	4.3	4.8	Decrease 8%
	B-1	5.6	5.2	Increase 6%
	B-2	4.5	5.2	Decrease 10%
	B-3	5.6	4.4	Decrease 18%
Opposite side	C-1	3.9	4.5	Decrease 10%
	C-2	4.2	4.9	Decrease 10%
	C-3	4.5	4.5	SAME
	D-1	4.4	4.2	Increase 3%
	D-2	4.2	4.7	Decrease 4%
	D-3	4	4.4	Decrease 6%
Gwari ghat				
Front side	A-1	4	5.2	Decrease 18%
	A-2	3.9	4.8	Decrease 14%
	A-3	3.6	4.5	Decrease 14%
	B-1	3.8	5.1	Decrease 20%
	B-2	3.8	4.6	Decrease 12%
	B-3	3.6	4.3	Decrease 10%
Opposite side	C-1	3.8	5.6	Decrease 27%
	C-2	4	5.2	Decrease 18%
	C-3	3.6	5.1	Decrease 23%
	D-1	3.8	6	Decrease 34%
	D-2	3.8	5.6	Decrease 27%
	D-3	4	5	Decrease 16%
Bheda ghat				
Front side	A-1	5.2	7.4	Decrease 34%
	A-2	5.8	7.2	Decrease 22%
	A-3	5.4	7	Decrease 25%
	B-1	5.1	6.8	Decrease 26%
	B-2	5.3	7	Decrease 26%
	B-3	5.5	7.2	Decrease 26%
Opposite side	C-1	5.4	7.7	Decrease 36%
	C-2	5.1	7.2	Decrease 32%
	C-3	5.9	7.9	Decrease 31%
	D-1	5.8	7.5	Decrease 27%
	D-2	5.1	7.3	Decrease 34%
	D-3	4.9	7.2	Decrease 36%

So we can say that at jamtara ghat under water of the front site is less polluted than in comparison with surface water of front and opposite and under water of opposite site. Surface water of the opposite site is highly polluted.

For the Gwari ghat surface water is less polluted than under water of the front side because DO of the surface water is higher than under water but for the third sampling site pollution status of the surface water and under water are the same because value of the DO is same. for the opposite site of the river sampling one of the surface water and under water DO value were the same so pollution status would be same. for the second sampling surface water is less polluted than under water and at the third sampling surface water if more polluted as compare to under water.

For the Bheda ghat surface water of the front site is less polluted than under water and for the opposite site samples of the first station and second water is almost all equally polluted but for the third sampling surface water is less polluted than

under water because there is a vast difference in values of the DO.

So by the above concession we can say that water of the Bheda ghat is less polluted than in comparison with other ghats. And if we will compare water quality of 2012 and 2013, we can say that pollution level get decreased due to clean Narmada green Jabalpur project and water is healthy due to the presence of healthy aquatic life and less pollutants.

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