"Impact Of Festivities On Biochemical Oxygen Demand (BOD) In The Yamuna River"

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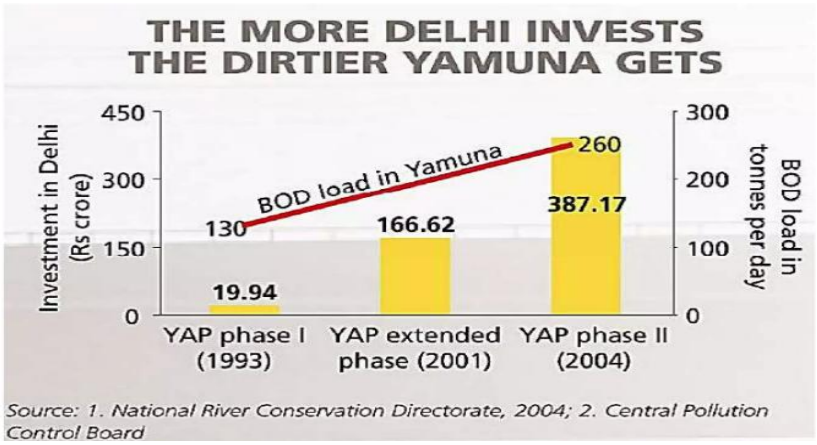
Abstract:
The Yamuna River, often called the lifeline of North India, suffers from severe pollution, significantly impacting its ecological and human health. One of the primary indicators of pollution in the Yamuna is the Biochemical Oxygen Demand (BOD), a measure of organic matter in the water.The Yamuna Action Plan (YAP) is a bilateral project between India and Japan to improve the quality of water in Yamuna River.The YAP has been implemented in multiple phases i.e., YAP-I, YAP-II, and YAP-III.



Despite significant financial investments in the phases of Yamuna Action Plan (YAP-I, YAP-II, and YAP-III) by the Delhi government and other stakeholders, the water quality of the Yamuna River remains critically poor.
This paper examines the causes and implications of elevated BOD levels in the Yamuna and proposes a comprehensive action plan to reduce these levels. The study focuses on scientific, policy-driven, and community-oriented strategies for sustainable river rejuvenation.

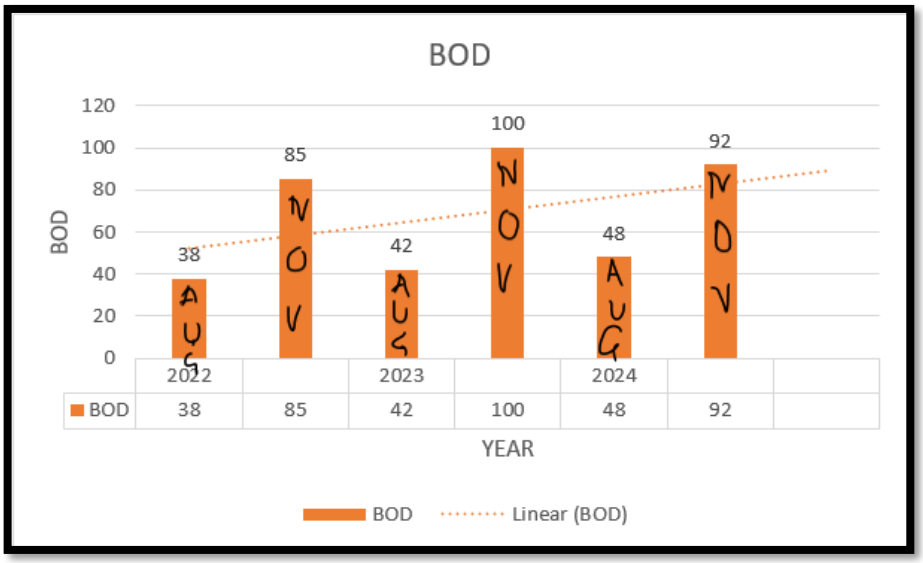
The studyincludes:
➢ Objective: Assessing the impact of Chhath Puja/Ganesh Chaturthi/Durga Puja on BOD levels in the Yamuna River and to evaluate the environmental impact of the festivities.
➢ Methods: Sampling and comparison of BOD levels before and after the festival.

Introduction:
Definition of BOD:
➢ BOD measures the oxygen demand of biodegradable organic pollutants in water.
➢ High BOD levels correlate with low dissolved oxygen, which is essential for aquatic life.
Current Status of BOD in the Yamuna:
➢ The Yamuna has critical BOD hotspots, particularly between Delhi and Agra.
➢ BOD levels often exceed 30 mg/L in these regions, while the permissible limit for bathing water is 3 mg/L.
Sources of High BOD:
➢ Domestic Sewage: Untreated or partially treated wastewater from households contributes over 70% of pollution.
➢ Industrial Effluents: Chemicals and organic waste from industries increase organic load.
➢ Agricultural Runoff: Fertilizers and pesticides elevate nutrient levels, promoting algal blooms and organic matter decomposition.
➢ High pollution during festivals and rituals performed during idol immersion.
Impact of High BOD:
➢ Oxygen depletion harms aquatic organisms, leading to fish kills and biodiversity loss.
➢ Elevated pollution levels impair the river's usability for drinking, bathing, and irrigation.
➢ Indirect effects include public health crises and economic losses in affected regions.

Materials and Methods
Study Area:
➢ Location: Specific points along the Yamuna River where Chhath Puja rituals are performed.
Sampling Strategy:
➢ Timeframe: Collect water samples during rainy season and thenimmediately after Chhath Puja.
➢ Locations: Multiple locations to ensure representative data.
Parameters Measured:
➢ BOD levels (mg/L), pH, turbidity, TDS etc.
Laboratory Analysis:
➢ Standard methods for measuring BOD.

Observation:

➢ There is a marked spike in BOD levels, indicating a significant increase in organic and inorganic pollutants.The trend suggests a **cumulative increase** in post-festival BOD levels over the three years, likely due to the growing scale of celebrations andinadequate waste management.



Action Plan to Reduce BOD:

Community Engagement and Awareness:

➢ Conduct awareness campaigns by school children highlighting the importance of river health. For eg. Street plays and skits, Poster & Banner Campaigns, Educational Talks, Art and Essay Competitions**,** Music and Songs.

➢ Involve local communities in monitoring and cleaning activities.

➢ Encourage public initiatives to track water quality.

➢ Organize training programs for artisans to promote the craftsmanship of clay idol-making, ensuring quality and availability.

➢ Encourage societies and organizations to collectively adopt clay idols for community celebrations.

➢ Enforce guidelines for eco-friendly festivals, ensuring only biodegradable materials are used.

➢ By promoting clay idols, festivals can retain their cultural essence while contributing to a cleaner and healthier environment. This approach fosters a balance between devotion and sustainability.