

Pollution Status of Indian River and Water Quality Parameters

Dr. Sanjay Shahi

Associate Professor, Department of Geography, J S Hindu P.G. College, Amroha, INDIA

Corresponding Author: shahibisen@gmail.com

ABSTRACT

A solution to the country's water dilemma is urgently required in the modern day. It is imperative that the country find a way to increase the amount of water that can be used for drinking. A steady supply of high-quality drinkable water is essential to achieving any kind of progress in the economy or in the political arena. As a result, it's obvious that river revitalization efforts should be spread out across the country. Furthermore, we will need to collect rainwater wherever it falls in order to ensure local water security and recharge each well. The present study looks at India's water resources from two angles: pollution in river basins and the necessity for river rejuvenation projects to be carried out in India. The results are mixed. For example, river rejuvenation and water resources in India have been harmed by pollution from numerous sources and types in river basins, so this is the basis for this proposal.

Keywords-- Water Quality, Environmental, Indian River, Pollution

I. INTRODUCTION

There is a dynamic equilibrium between the biotic (such as the flora and fauna) and abiotic (such as the hydrology and geomorphology) components in the river ecosystem, making it a complex mosaic. As the river's flow changes, so does the river's ecological role. What is the greatest amount of water that can be extracted from a river in order to retain its ecological integrity?

The goal of river rejuvenation is to restore the health of rivers that have been degraded due to overuse and pollution. An awareness of the root causes of ill health and measures to restore it must be taken into account from the source to the sink (ICFR, 2014). The goal of river rejuvenation is to create a new, sustainable, healthy river habitat depending on the extent of deterioration. The river's health can also be restored to a previously accepted historical level. The health of the river can be improved by preventing the direct introduction of sewage and industrial effluents into the water. A river's flow is its defining characteristic and the most important variable in a river system. A river's self-cleaning and healing abilities are two of its many purposes. As a result, the river rejuvenation aims to ensure that the river system receives an adequate amount of fresh water throughout the year. The greatest

way to restore a river's natural flow is to maintain it. The evaluation of river recovery potential and course, as well as threshold requirements for long-term management of the Ganga River basin's river systems, should also be emphasised further.

Objectives

Studying the need for river revitalization in India is the primary focus of this project.

- Do we need an investigation into river rejuvenation in India?
- Pollution, pollution sources in river basins and adjacent river systems.
- The Indian government has proposed water conservation measures and river regeneration legislation.

II. RESEARCH METHODOLOGY

An analysis of secondary sources such as books, periodicals, research institutions, non-profit organisations (NGOs), and a variety of websites and journal articles is used in the current study. India's water resources information system serves as the data source for the water index (Table-1). Water availability estimates for 2010 are based on data from the Central Water Commission for river basins per capita (Table-2). From the years 1900–2012, the Indian government has seen a reduction in water supply in key Indian rivers. Per capita fresh water availability in India and future water scarcity and stress data from the Ministry of Water have been obtained. The Ministry of Water Resources and the Central Ground Water Board in India have significant information on rainwater collection for ground water recharge. Tables are used as a means of converting data into a usable form.

III. DISCUSSION

There is a need for river rejuvenation in India based on secondary data for the current study. There are numerous polluted rivers in India as of the year 2018. As can be seen in Table 2, water availability in the major Indian River basins in 2010 is shown per capita annually. Between 1900 and 2012, the major Indian rivers' water availability decreased by a percentage. It shows the need

for rain harvesting for groundwater recharging in India's future water scarcity and water stress.

Factors Affecting River Regeneration

Environmental and anthropogenic factors were discovered during the research process. In the following section, you'll find a more in-depth explanation of the study that led to it.

(A) Environmental Considerations

Long-term trends in a river's profile tend to be smooth and uniform. This is the best profile for a river in terms of water and sediment movement. It symbolises harmony with the environment. A total of 2500 water bodies are being monitored by the central and state population control boards (SPCB). Several of India's most polluted river basins Drought, a failing river system, and climate change (changes in rainfall, time dynamics, and carbon emissions) are all key factors.

(B) Pollution Caused by Humans

More than a million litres of raw sewage, untreated millions of litres of waste water, and thousands of tonnes of non-biodegradable solid waste are deposited into the river each year. The pulp and paper sector is the largest contributor by volume. In the Indian River, one of the biggest causes of pollution is sewage. More than 62,000 ml/d (million litres per day) of sewage is thrown into India's contaminated rivers by 650 cities located near them (source: S.O.E. in 2016).

IV. NDIA'S RIVERS NEED REVIVED

To rejuvenate a river means bringing it back to its former state in order to create something entirely new. Temperature rises, little rainfall, and depleted water supplies provide a bleak picture when it comes to bridging the gap between demand and supply. In addition to rivers and groundwater, the rate of water contamination is increasing the fear. Recent research on the condition of the country's waterways provided an index of what is truly going wrong. An increase from 121 polluted rivers in 2003 to an alarming 445 rivers in 2009 prompted the government to take action. However, as of this writing (2018), only 275 of the 445 rivers being monitored are polluted at all. In 2018, 302 river lengths were polluted, compared to 150 in 2009. The water index is depicted in Table-1 for India. As part of environmental conservation, rivers and other water sources must be prioritised. Success in saving other regions depends on the availability of portable water. Since water is a life-sustaining, critical commodity, efforts and plans should be larger than the obstacle. The gulf between supply and demand has been expanding steadily. This means that both sources are in danger right now. When rivers are protected and water resources are used to their full potential, the answer is clear:

Table 1: The water index in India

In India, the water index	Parameters
The availability of clean, potable drinking water	Per capita, 1545 cubic metres of waste per day
All the fresh water produced in the world	4% of the total.
Indicator for fresh water quality.	Only 122 out of 122 countries
Accessibility to clean drinking water	133 countries out of 180
Access to pure and safe drinking water	Small towns are home to 18% of the population
Villages make up 18% of the total population.	Nearly 833 million people
Diseases caused by exposure to contaminated water are reported by the WHO	The population of 38 million

Source: India's water resources information system, 2018

Lifeline in the Indian River

The rivers were the most ancient water sources, existing long before the emergence of the human race. Throughout history, civilizations have relied on river networks for their water supply. Table 2 shows the population of people who reside in river basins for drinking water, agriculture, livestock farming, etc. The

amount of water available in the Indian River basins in the Northwest Agriculture, fisheries, power generation, transport & tourism, navigation, pottery, sand-mining, art and craft, poultry and livestock farming, several small- and medium-sized industries (apiculture, sericulture, jute, etc.), and large-scale industries (such as leather) are all based on the rivers and tributaries for their livelihood.

Table 2: Indian river basins' yearly water supply per capita

River Basin	Annual water supply availability per capita (m ³)	Estimated population (million)	River Basin	Annual water supply availability per capita (m ³)	Estimated population (million)
Ganga	1062	494	Brahmani	2113	13
Mahanadi	1826	37	Pennar	472	13
Sabarmati	263	14	Brarak	5667	9
Krishna	933	84	Indus	1271	58
Brahmaputra	13407	40	Tapi	731	20
Subernarekha	958	13	Narmada	2253	20
Cauvery	530	40	Mahi	761	14
Godavari	1486	74			

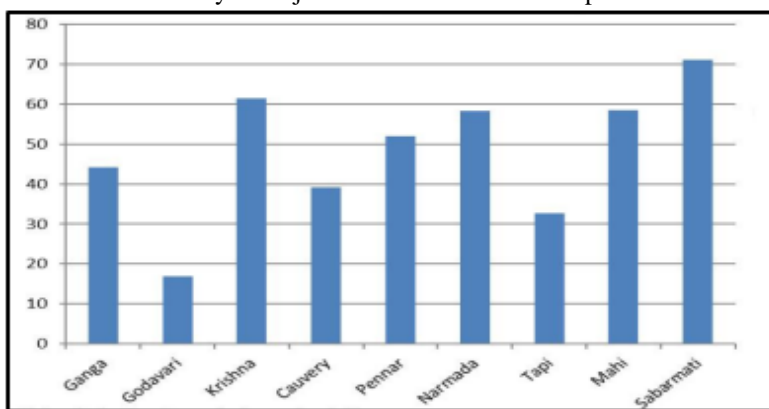
Source: Central Water Commission, 2010

Indian Rivers: The State of the Environment

River water is essential for human health and agriculture, but it also plays a role in transportation, energy, habitat, civilization, and industry. There has been a drop in water availability percentage in key Indian rivers between 1900 and 2012, according to a study from the Government of India, Ministry of Water Resources. This year, the Central Pollution Control Board (CPCB) found

302 polluted rivers, compared to 121 polluted rivers in 2009, a significant increase. Most organic contaminants in rivers can be traced back to sewage that has been partially or untreated and industrial wastes. The 61948 million litres of municipal wastewater generated each day is compared to the 23277 million litres of sewage treatment capacity installed each day.

Figure 1: Water availability in major Indian rivers decreased period from 1900 to 2012.



Source: Government of India, water resources, 2013

Some Obstacles to River Rejuvenation

According to the study, there are three key obstacles to river rejuvenation in India:

A. Lack of Enforcement

The law mandates that enterprises build up common wastewater treatment plants and install new technologies to achieve zero liquid discharge into rivers, but enforcement has been lax.

B. Lack of Infrastructure

These states can only treat 45 percent of the sewage produced by states with more than 50 percent of the population. Considering that many cities, such as

Kanpur and Allahabad, are not even connected to a sewage network, this figure is significantly more serious.

C. Neglecting to Maintain the Equipment

In spite of the fact that the government built sewage treatment plants, slack state governments and local corporations have rendered these facilities ineffective. Many of these facilities are still in the process of being put into operation.

Water Conservation Initiatives of the Government of India

Increasing populations have resulted in a variety of environmental issues for Indian residents. Indian environmental legislation dates back to the days before the

country gained its independence. Prior to independence, legislation governing public health and water, air, and other public resources was not solely focused on environmental protection. A well-developed framework was established after the Stockholm Conference on the Human Environment in 1972. In India, various environmental statutes and laws are in effect. According to the sequence in which they were enacted in India, the following statutes govern water pollution:

The Water Pollution Prevention and Control Act of 1974

1. Water pollution prevention and control act of the Environmental Protection Agency (EPA) (1978).
2. The 1986 Environment (Protection) Law
3. Hazardous waste (handling and management) regulations, 1989
4. The National Environmental Tribunal Act, 1995
5. Environmental protection appellate authority legislation of 1997
6. The Green Tribunal Act of 2010
7. The National Water Framework Act of 2016 (the "Proposed Act").

- A. The right to water for life
- B. Water is a commonwealth resource that we all share.
- C. Regrowth of the river
- D. Water recycling
- E. Water quality
- F. Management of floodplains and mitigation of their effects
- G. Involving the public in water management

Proposals for River Restoration

1. Core issues and concerns connected to river health have been identified and documented.
2. Creating a treatment plan with several stages (first, second, etc.)
3. Assessment of the bio-physical characteristics of the watershed and valley areas
4. Consider a ridge-to-valley strategy (microstructure importance).
5. A comprehensive approach that includes steps for restoring water flow from upstream to downstream, and planting trees and halting illegal logging in forested areas, will be implemented, as will treatment along the entire ridge and into the valley.
6. Road map formulation and core team composition, including management, technical, and communication expertise. Consultation
7. The development of a comprehensive project report based on the findings of the river site surveys and measurements (technical and financial)

8. Measurement and implementation should be given top priority.
9. The implementation and documentation are being monitored.
10. Process of reflection and discussion.

V. CONCLUSION

Following the findings of the study, India, the world's second-largest country by population, now places a high value on river conservation and rejuvenation. Natural water resources, such as springs, rivers, and groundwater, need to be developed in an environmentally appropriate manner. Water resources may be sustainably exploited with a process-based understanding of the river basin ecology. In order to determine the sustainable boundaries of river water resource development, we use the environmental flow concept. When it comes to restoring rivers, localised river rejuvenation is a cost-effective option, but more importantly, community participation is required to manage water in a sustainable way. The national government has issued a multi-point guideline for the entire country to prohibit the immersion of idols in rivers or their tributaries during festivals such as Dussehra, Diwali, Chhath, and Saraswati Pooja. This includes cordoning off ghats and imposing a fine of Rs 50,000. Planning and policy makers must incorporate the notion of environmental flow into water resource development plans. The administration has also come to understand the importance of having access to high-quality water in any effort to improve public health. As a result, the renewal strategy has been implemented to help conserve and rejuvenate rivers.

REFERENCES

- [1] Evaluation of operation and maintenance of sewage treatment plants in India- 2007, (http://www.cpcb.nic.in/upload/NewItems/NewItem_99_NewItem_99_5.pdf).
- [2] Das, Subhajyoti (2014): River Ganga needs informed debate. *Journal of geological society of India*, Vol. 84, pp.121-124.
- [3] ICFR. (2014): India charter for rivers adopted by delegates at India rivers week, 24-27 November 2014, New Delhi.
- [4] Jain, S.K. and Kumar, P. (2014): Environmental flows in India: towards sustainable water management. *Hydrological sciences journal*, Vol. 59 (3-40), pp. 751-769.
- [5] Shahid Ahmed and Saba Ismail (2018) 'Water Pollution and its Sources, Effects & Management: A Case Study of Delhi', *International Journal of Current Advanced Research*, 07(2), pp. 10436-10442.

- [6] Wastewater production, treatment and use in India (http://www.ais.unwater.org/ais/pluginfile.php/356/mod_page/content/111/CountryReport_India.pdf) UN Water (publisher)."Water Quality Database of Indian rivers, MoEF" (http://cpcbenvi.nic.in/water_quality_data.html#). Retrieved 15 September 2016
- [7] <https://www.indiawaterportal.org/articles/groundwater-maps-india>.
- [8] <https://waterresources.assam.gov.in/portlet-innerpage/rejuvenation-of-river>.
- [9] Pawari, M. J, Gawande S. (2015), Ground water pollution its consequence, *International journal of engineering research and general science*, 3(4):773-76.
- [10] Alrumman, S.A., El-kott, A.F and Kehsk, M.A.(2016), Water pollution: Source and treatment, *American journal of Environmental Engineering*, 6(3):88-98.
- [11] Bansal N 2017 *Industry and environment: The case of Gujarat* (Ahmedabad: Dissertation CEPT University)
- [12] Villar, P.C., Ribeiro, W.C. and Sant'Anna, F.M. (2018). Transboundary governance in the La Plata
- [13] River basin: status and prospects. *Water Int*, 43: 978-995. <https://doi.org/10.1080/02508060>.
- [14] Villar, P.C., Ribeiro, W.C. and Sant'Anna, F.M. (2018). Transboundary governance in the La Plata River basin: status and prospects. *Water Int*, 43: 978-995.
- [15] Shah, T. and Rajan, A. (2018). Cleaning the Ganga. *Econ Polit Wkly* 39: 57-66.
- [16] Downtoearth. (2018). Aquifer mapping programme critical to raise groundwater levels. 1-25.