



INTERNATIONAL RESEARCH JOURNAL OF HUMANITIES AND INTERDISCIPLINARY STUDIES

(Peer-reviewed, Refereed, Indexed & Open Access Journal)

DOI : 03.2021-11278686

ISSN : 2582-8568

IMPACT FACTOR : 8.031 (SJIF 2025)

Environmental Racism and Justice-River Water

Ms. Ruma Agwekar

(B.Sc, ADSM, MBA (Finance), Dip. EXIM)

DOI No. **03.2021-11278686**

DOI Link :: <https://doi-ds.org/doi/10.2025-89343933/IRJHIS2510030>

Abstract:

A striking growth in the population index and an equally alarming lack of awareness among the urban, rural and rural-urban population has resulted in a menace of piling up plastic garbage at the banks of river. The seeping STPs, the flow of industrial effluents, and wastes into some of the prime rivers as Indrayani River (Maharashtra), Yamuna River (Uttar Pradesh), Ganges River (Uttar Pradesh) etc., is tarnishing the sanctity of the river, canals and nallahs in the city. An example of sheer negligence and lack of sanity among most of the Indians.

Water an important aspect of Indian religion is an element of life. It is a source of creation and sustenance, a faith of God in the form Brahma, Vishnu and Maheshwara. Water is used as holy water to sprinkle on deities and is used for 'Abhishek', an Indian ritual for purity and blessings.

It is a mockery, where on one side we promote deification of water, fire, earth and air, we are polluting the elements with plastic, house waste, open defaecation, vehicle pollution etc. It is disgusting where we offer prayers in wellness and emancipation of the water as of River Ganges, River Brahmaputra, or River Indrayani, we are unable to adopt them as their protectors.

The river water system in spite of new provisions and installation of efficient systems is inadequate to offer its eco-system, life-long sustenance and sustainability.

Keywords: River, Water, Racism, Justice

A. INTRODUCTION:

Human body consists of 60% water. Indian Earth has 71% of its constitution as water. Freshwater sources, including rivers, lakes, wetlands, and groundwater, account for about 3.5 % of the earth's water. About 30% of freshwater is found underground, with aquifers serving as vital sources of drinking water. Water is a Life support -is essential for all known forms of life a source of life and rejuvenation. Water supports ecosystems, including aquatic life, flora and fauna. It is important for various activities agriculture, industry and human consumption. The major source of water are rivers and its tributaries, ponds, lakes (natural and artificial lakes). India as a rich source of water is blessed with big rivers as Ganga, Krishna, Godavari, Brahmaputra, Kaveri etc.

India accounts for 18% of the world's population but has access to only about 4% of the world's water resources. Over the years the per capita water availability has been declining, from

5200 cubic meters per person in 1951 to 1,588 cubic meters per person in 2010.

The reason of water scarcity has always been over extraction of groundwater - leading to water scarcity in states like Delhi, Punjab and Haryana. Irregular climate, irregular monsoon patterns and increased frequency of natural disasters strain India's water resources. The growing population and increasing unawareness of the source of water has caused a lot of concern amongst the patrons and individuals and state corporations. Increasing amounts of wasteful matters and open defaecation is the cause of lack of water resources. The statistics shows that 70% of surface water resources in India are polluted.

The sources of river water have been misused, the onslaught of the industries, rising construction, increasing wellness of the inhabitants, continuous deforestation by the banks of the river, increasing religious community culture by the banks of the river as "Mahakumbh", religious rituals as funerals "Manikarnika Ghat", "Holy Dip" culture at the river Ganga for purity are few of the instances which have tired the hearts of the river. Few other rivers which are facing the calamity of the cult are River Indrayani (Maharashtra), which is polluted by the industrial flow directly into the river. The SOS raised by NGOs and by the temple community has been on deaf years. The river Mula-Mutha river faces the similar devastation in many areas of the Pune City and is recognised as nullahs in various part of the city. The conduct towards rivers is bad and very untowardly. The banks of the rivers stink, and are source of different infectious diseases, like dengue, malaria, chikangunea etc.

River and its systems in Pune have been polluted deliberately without showing much concern for the debris and waste management system. Our city Pune has over 240 natural nullahs covering approximately 380 km, but many are blocked by encroachments and dumped waste, leading to urban flooding and severe river pollution from untreated sewage and industrial effluents. The city faces recurring issues with pre-monsoon nullah cleaning, with efforts often hampered by poor quality work and ongoing illegal dumping of garbage and debris, which impedes natural water flow and exacerbates flooding during the monsoon season.

Studies have shown that the Indrayani River's water quality parameters, such as pH, DO, BOD, COD, Chlor, Nitrate, Sulphate, calcium, Magnesium and Hardness, are at alarming levels. The river has visible signs of contamination, including foaming and discoloration, particularly near Alandi. Ramnadi's degradation is closely tied to unchecked urbanisation in surrounding areas like bhugaon, bhukkum, bavdhan, baner, aundh and pashan. The river has narrowed by 15%, and 106 of its 416 feeder streams have vanished. Once sustaining the biodiversity of pashan lake and supporting heritage temples as Jarseshwar and Someshwar, the river now acts as an unofficial sewage canal. According to civic officials, during the seasonal chemical testing in the Pavana, Mula and Indrayani rivers, Pavana was identified as the most polluted. Since it flows through the heart of the city, it

receives direct inflow from several contaminated drains. Indrayani, which flows through industrial belts, is the second most polluted.

The ESR 2024-2025 states that 60 nullahs flow into the Pawana River, 12 into the Indrayani River, and nine into the Mula River. These nullahs are natural channels which are meant only for rainwater, however, during inspection, these were found carrying a dangerous mix of household waste, sewage, and industrial effluents, especially from slum and industrial areas. This untreated wastewater enters rivers, severely degrading the water quality.

Almost all the nullahs in the Pimpri Chinchwad area which flow into rivers are highly polluted, according to the latest ESR released by the PCMC. The drains continue to discharge water even during the summer season, indicating a constant flow of domestic sewage and chemical-laced wastewater, causing significant pollution in the rivers.

B. RESEARCH METHODOLOGY:

The priority of water although very well maintained as to drinking water is neglected in forms water flowing in the drains, water in the nullahs, Industrial waste flowing into the river water, the chemical waste coming from various industries, the polluted water at the river banks- pollution caused by women washing clothes, washing utensils, bathing by the river side, dhobi ghat at the river side or disposal of human excreta. The flow of unwanted matter is not been acknowledged and is a cause of concern in many parts of the city, the open drains or nullahs are a cause of severe pollution, diseases and not to be interpreted as to provision of covered drains. The author has attended discussions on river water, cause and concern by Jeevit Nadi, attended talk show on Ram Nadi at Indradhanush hall, environment day week and has attended open forums on STPs and pollution of rivers by plastic waste. Attended plastic collection drive at River front Mula -Mutha River, arranged by NGO Vartul. The author has been a silent observer to various habitats as bund garden bridge, Mula-Mutha river and river flowing under the Narhe bridge. A viewpoint of openly spoiling the purity of the river, disturbing the sanity of the habitat has been generated.

Labtests for water, toilet water, rain water, corporation water and tank water were taken to check the consistency of water in year 2020-21. All the tests were **normal**, with pH range 6.5 to 8.5. The research is primarily on secondary database. For the research data has been gathered for SDG6, Water Quality Index, ISO for Water and NITI Water Index from various websites, META, organisations, to provide conclusions and recommendations.

(a) India in comparison to SDG 6 Goal Water -clean water and sanitation:

SDG 6, "Clean Water and Sanitation," is a global goal to ensure water and sanitation for all by 2030, focusing on universal and equitable access to safe drinking water and sanitation, improved water quality by reducing pollution, increased water-use efficiency, and the implementation of integrated water management and the protection of water-related ecosystems. Despite progress,

billions still lack access, and the goal is crucial for health, economic development, education, and gender equality, as inadequate WASH facilities contribute to disease, malnutrition, and poverty.

(i) SDG6.1 SAFE AND AFFORDABLE DRINKING WATER:

Goal-By 2030, achieve universal and equitable access to safe and affordable drinking water for all.

To provide safe and affordable drinking water through **Jal Jeevan Mission (JJM)**, residents in rural and peri-urban will be benefited by the scheme.

Water treatment and infrastructure: The operation of wastewater treatment plant, like the PMC's Naidu plant (90 MLD) and PCMC's Thergaon plant (100 MLD), are critical for improving water quality in the Mula-Mutha River. They are run by Pune's municipal bodies, the PMC and the Pimpri-Chinchwad Municipal Corporation (PCMC)

(ii) SDG6.2 END OPEN DEFECATION AND PROVIDE ACCESS TO SANITATION AND HYGIENE:

By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.

High rankings in national cleanliness surveys: Pune has consistently performed well in the national Swachh Survekshan rankings, indicating improvements in cleanliness and sanitation. In 2024, the city earned the "Water+" and a 5-star "Garbage Free City" (GFC) certification.

Elimination of open defecation: By achieving the Open Defecation Free (ODF) and ODF++ status, Pune has largely eradicated open defecation within its city limits.

Improved waste management: The PMC has implemented comprehensive solid waste management programs, including:100% door-to-door garbage collection, Source-level waste segregation, Operation of multiple waste processing centers using modern technologies like composting and biogas.Promotion of decentralized composting within communities, projects as Pro-Earth being implemented in various societies.

(iii) SDG 6.3IMPROVE WATER QUALITY, WASTEWATER TREATMENT AND SAFE REUSE:

By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.

PMC has installed large scale project as JICA and projects on small scale for the waste water treatment and improving the water quality.

One project installed an eco-filtration bank to treat polluted stream water and reuse it for a garden and flushing toilets at the Indradhanush Centre in Pune.

(iv) SDG 6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.

Water-use efficiency (Indicator 6.4.1): While a study conducted in Pimpri-Chinchwad showed a drop in per capita water usage in a pilot area, it remained significantly higher than the WHO benchmark. Non-revenue water—caused by physical leaks from aging infrastructure and commercial losses—remains a major operational inefficiency for municipal water systems.

Water stress (Indicator 6.4.2): Large parts of Pune are in a rain shadow zone, and several eastern talukas are classified as drought-prone. This, combined with high water consumption that exceeds the city's allocated quota, has led to increased water stress. In April 2025, the water reserves in the Pune region were reported to be at a critically low 36.31%.

High demand and unsustainable consumption: Pune's annual water consumption of 20.49 TMC exceeds its allocated quota of 14.61 TMC. Many areas still use excessive amounts of water, exceeding the 135liters per capita per daybenchmark recommended by the WHO.

(v) SDG 6.5IMPLEMENT INTEGRATED WATER RESOURCES MANAGEMENT:

By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.

PMC has implemented several measures to manage water resources:PMC has implemented meter system -43% of water connections are metered.A comprehensive sewage network covers 98% of the Pune city. Sewage treatment plant treats 75% of daily sewage, and 60% of this treated water is reused for irrigation, construction, and gardening.

Across Maharashtra, efforts by organizations like WOTR have promoted sustainable development through organic production, composting, and community-led water conservation.

(vi) SDG6.6PROTECT AND RESTORE WATER-RELATED ECOSYSTEMS:

By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.

Mula-Mutha River Rejuvenation Project: This ambitious project, led by the PMC and the PMRDA, aims to clean and rejuvenate a 44-kilometer stretch of the Mula-Mutha river network. It is being implemented in two parts:

(a) Pollution Abatement: A component funded by the JICA focuses on building STPs and managing municipal sewage to reduce pollution. As of 2023, more than 20% of wastewater in the city remained untreated, highlighting the urgency of this infrastructure overhaul.

(b) Riverfront Development: This aspect, valued at over ₹4,700 crore, involves constructing concrete embankments, walkways, and other public spaces along the riverbanks.

There have been several citizen and NGO-driven initiatives -

-Adopt a River Stretch: Through this program, local citizens, institutions like Symbiosis Institute of International Business, and volunteers monitor and restore specific parts of the river.

-Wetland Development Project: Jeevitnadi has also engaged in creating wetlands in areas like Vitthalwadi to aid in natural water purification and conservation.

-Earth5R's BlueCities Model: Earth5R, an environmental organization, has customized its scalable framework for Pune to address the Mula-Mutha's restoration. This model integrates citizen-led clean-up groups, decentralized recycling hubs, and the use of green technologies like floating wetlands and bio-filtration parks. It also features an IoT-based system for real-time water quality monitoring, aiming to engage citizens in "Water Guardianship" challenges.

-Construction houses as Dream Reality – Indulgent into forming Sparrow Gardens

-Eco-Factory – Sashwat Setu

Kirloskar Vasundhara-A yearly show of Indian Flora Fauna, Conservation programmes through media

(vii) SDG6.7EXPAND WATER AND SANITATION SUPPORT TO DEVELOPING COUNTRIES:

By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.

Expansion of STPs: In 2023, the PMC announced its plan to significantly increase its sewage treatment capacity. This involves new STPs funded by organizations like the JICA and potentially the International Finance Corporation. These efforts aim to treat wastewater before it flows into natural water bodies like the Mula-Mutha river.

The CWPRS, with collaboration from the Water Resources Department of Maharashtra and the PMC, is leading a project to rejuvenate the Mula-Mutha river. In conjunction with the riverfront development project, this is aimed at cleaning and beautifying the river, though it has faced some public criticism.

TERI, private companies as Hinduja group of companies suggested rainwater harvesting. The project was implemented in various parts of Daund, Pune districtwastewater recycling, securing millions of liters of freshwater annually and recharging groundwater. The Persistent Foundation has also improved water access and conservation in rural areas of the Pune district.

Borewell revival: A corporate social responsibility project by the RSB Group, inaugurated by Maharashtra's Deputy CM, focused on reviving borewells in Pune to conserve water and facilitate second-crop cultivation.

(viii) SDG6.8SUPPORT LOCAL ENGAGEMENT IN WATER AND SANITATION MANAGEMENT:

Support and strengthen the participation of local communities in improving water and sanitation management. For, achieving the SDG 6.8 shows implementation of integrated water resources management system. The SDG has been inventive. The initiatives have been taken by various local bodies, green societies, entities as Rotary District 3131 and educational institutes to improve the water stress and awareness of water.

(b) NITI Aayog Index:

To bring up the index of water and to offer the Water an International Standard NITI Aayog has set up NITI Aayog Index. Maharashtra with help of the scheme has implemented various schemes and systems for preventing the waste of water. NITI Aayog has implemented various schemes such as Jal Jeevan mission for water management. **Atal Bhujal Yojana (ATAL JAL)** - A World Bank-funded central scheme focusing on community-led, demand-side management of groundwater. Through Jal Yukt Shivar Abhiyan, NITI Aayog encourages the adoption of rainwater harvesting, wastewater reuse, and integrated watershed management to augment water supplies. **Swachh Bharat Mission (SBM)**: NITI Aayog tracks Maharashtra's progress in eliminating open defecation and improving waste management under this mission. Through, **Jal Hi Amrit (under AMRUT 2.0)**: This scheme, supported by NITI Aayog, incentivizes ULBs in Maharashtra to reuse treated wastewater for non-potable purposes, thereby reducing fresh water demand.

SDG India Index and Dashboard: By tracking Maharashtra's performance on SDG 6, NITI Aayog provides a benchmark for progress. The state significantly improved its SDG 6 score from 63 in 2018 to 89 in 2023–24, based on targets like ODF status and access to improved drinking water. The NITI Aayog has developed a CWMI to evaluate and improve water resource management across Indian states and union territories by using 28 different indicators across 9 themes, including groundwater, surface water, irrigation, and water supply.

The index CWMI 1.0 - Released in June 2018, using data from FY 2015-16 as the base year.

The index CWMI 2.0 - Released in August 2019 for the reference year 2017-18, building upon the initial version. The index highlights the water stress, promotes best practices for water and also aids policy making.

(c) Water Quality Index:

Water Quality Parameters:

There is no single comprehensive "Global Water Quality Index" for 2024; however, reports highlight water quality disparities and trends. India fairs very low on Water Quality Index. All the parameters for Water quality fail to match the international standards. India is ranked 120, which is the lowest for the water standards.

(d) Water Quality System – International Standard for Water:

International standard enables a safe and sustainable management of water resources,

safeguarding public health and ecosystems. They provide businesses with tools for measuring and optimizing water use and wastewater treatment. The practical solutions and best practices outlined in these standards facilitate equitable sharing of this precious resource, even across national borders. The standards authenticate the water at source, water in an eco-system, fresh water, pure water, industrial water or river water.

e.g ISO 16094-2- Water quality — Analysis of microplastic in water, ISO 11133, to name a few

(C) CONCLUSION:

1. There is no evidence that the PMC water supply has a comprehensive ISO certification for its water quality standards, especially given the recent reports of contamination. However, the PMC's Quality Assurance Laboratory did receive a specific ISO accreditation in 2013.
2. Recent reports show that PMC's water quality has been inconsistent, indicating it does not hold a universal ISO certification for its tap water.
3. Contamination findings (2025): In March 2025, the PMC's own testing found 102 water samples unfit for consumption, particularly from private tankers and RO plants.
4. "Muddy water" alert (2024): In July 2024, the PMC issued an advisory telling residents to boil their water due to contamination from heavy rainfall and water released from dams.
5. Ongoing river pollution (2023–2024): The PMC's Environmental Status Report for 2023-24 indicated that most stretches of the Mula and Mutha rivers had pollutants above prescribed levels.
6. Pune faces a massive problem of rapid urbanisation, which prevents a leverage between the PMC and the residents in various parts of Pune.
7. The Groundwater is depleting due to changing climatic conditions, irregular drought and flood conditions of Pune. In Pune various regions face irregular or scanty rains, becoz of which water provision is irregular and has to be provided by tankers.
8. The waste management is irregular and not 100%, the waste, most of it plastic or faecal matter finds way to nullahs to river. This water thus is highly contaminated, deprived of purification, finds way to irrigation water to fields, to village tap water.
9. Industrial water is highly polluted with harsh chemicals and wastes, which flow to river and cause hazardous diseases as skin diseases, infection or cancer.
10. Ecological Concerns: Environmental experts and citizen groups, including the SANDRP, argue that the riverfront development plans are unscientific and prioritize aesthetics over ecological health. Critics, say the projects rely on heavily concretized embankments that destroy natural floodplains, riparian zones, and riverbed habitats.
11. Insufficient Ecological Restoration: Many believe the initiatives fail to address the core issues of sewage and solid waste pollution adequately, with restoration efforts often being cosmetic rather than ecological.

12. Delayed and Aggressive Implementation: The Mula-Mutha project has been subject to delays, legal challenges, and public protests. The state's use of a "War Room" to expedite clearances has been criticized for fast-tracking environmental approvals.

13. JICA Projects- Projects such as JICA have not been implemented as there has been various controversies and both the government and PMC body has not been able to come to an accord for a long time. Recent news room has rehighlighted on the project and its effective implementation.

14. Although PMC has been awarded on state and national level for various initiatives for water and meeting the SDG Goals, it has still not achieved the Global Water Quality Index or Global standards for Water.

(D) RECOMMENDATIONS:

1. **Wastewater reuse:** In line with Maharashtra's State Water Policy (2019), Pune is increasing the reuse of treated wastewater for non-potable purposes. Treated water is being directed toward industrial cooling, gardening, and construction, aiming to reduce the city's reliance on fresh water.

2. **Developing Groundwater through rainwater harvesting or building artificial aquifers for water resources.**

3. **It is important that the city as Pune which is growing at a very rapid pace should be more coherent on DEI model.**

4. **The civic bodies should be more tech savvy and opt for decentralised model (Smart water management)** - Companies like Planet Smart City have used IoT devices and sensors in some Pune housing societies to monitor water usage and detect leaks. This has resulted in significant water savings.

5. **Retrieving old wells:**

6. Workshops, and Open forums should be arranged for discussing Water Problems.

7. Urban local bodies or educational institutes should be included for talks and innovative initiatives. E.g Vishwakarma University's "Unnat Bharat Abhiyan" involved engineering students interacting with villagers to address local issues related to water, sanitation, and hygiene.

8. Enhancing usability of Hard water for industry and washing.

9. Improving the Waste water treatment system, implementing water purification system at nullahs, small and bigger drains.

10. The rivers should be given to bigger corporates on BOT basis. The river banks can be converted to large Eco-Systems, BIO-diversity parks or Water Sports Zone.

(E) ACKNOWLEDGEMENTS:

1. State wise Tested Source

2. https://ejalshakti.gov.in › rpt_WQM_GPwiseTesting_S

3. [WQuality_River-Data-2023.pdf](#)

4. Water Quality for the year 2006-2007 under GEMS MINARS Project | Maharashtra Pollution Control Board
5. Water Body Pollution for Pune | Open Government Data (OGD) Platform India
6. <https://cgwb.gov.in/sites/default/files/2022-11/pune.pdf>
7. <https://www.cgwb.gov.in/cgwbpm/public/uploads/documents/1707983103489626080file.pdf>
8. https://mpcb.gov.in/sites/default/files/Establishment%20of%20MPCB/Seniority%20list/2014/Final_WQR_22_23.pdf
9. State-Water-Policy-2019.pdf
10. 1810/DBR/2009

(F) ABBREVIATIONS:

- a.STP: Sewage Treatment Plant
- b.PMC: Pune Municipal Corporations
- c.Japan International Cooperation Agency (JICA)
- d.The Central Water and Power Research Station (CWPRS)
- e.The Energy and Resources Institute (TERI)
- f.Sustainable Development Goal (SDG)
- g.Composite Water Management Index (CWMI)
- h.urban local bodies (ULBs)
- i.Pune Metropolitan Region Development Authority (PMRDA),
- j. Pimpri-Chinchwad Municipal Corporation (PCMC)
- k. Environmental Status Report (ESR)
- l. World Health Organization (WHO)
- m. Integrated Water Resource Management (IWRM)
- n. Watershed Organisation Trust (WOTR)
- o. Internet of Things (IoT)
- p. South Asia Network on Dams, Rivers and People (SANDRP)
- q. Thousand Million Cubic Feet (TMC)
- r. LPCD (liters per capita per day)
- s. Build-Operate-Transfer (BOT)
- t. National Institution of Transforming India (NITI Aayog)