PRIMUS PARTNERS®
Solutions for Tomorrow

PRIMUS RESEARCH

BEYOND THE FROTH

22 Kilometres of Crisis, Over 20 Million Reasons to Revive Yamuna

JUNE 2025

Foreword

Shri Parvesh Sahib Singh

Hon'ble Cabinet Minister of PWD, Legislative Affairs,
Irrigation & Flood Control,
Water & Gurudwara Elections,
Govt of NCT Delhi

The Yamuna River holds a deep and enduring significance for the entire country and especially our capital - Delhi. The revered river has shaped our history, nurtured our civilization and represented our culture ethos. Apart from being an intrinsic part of the historical city of Indraprastha that is today's Delhi, the river Yamuna finds significant presence in our national epics and cultural literature.

Thus, it is our strong endeavour today to restore the river to its former glory, by not only combining good governance and strong policy actions but also involving each citizen of Delhi in this significant and critical task. Strong and active people-participation remains the foundation of all policy actions under the leadership, guidance and vision of Hon'ble Prime Minister Sh. Narendra Modi, who has given the mantra of "Vikas bhi, Virasat bhi". Cleaning and reviving river Yamuna shall be a shining example of this mantra.

I convey my happiness that this topic is the central theme of this report. An objective, active and scientific discussion in public sphere is always encouraging and helpful. It is my sincere hope that each reader of this report plays an even stronger role in shaping the discourse on this important project of reviving the revered river. Let us move forward with a sense of shared responsibility and a vision for a cleaner, healthier Yamuna.

Foreword

Nilaya Varma

Group CEO & Co-Founder,
Primus Partners

At Primus Partners, we believe that true progress is built on a foundation of purpose and sustainability. As an Indian management consulting firm guided by our values of Passion, Respect, Integrity, Mastery, Us, and Stewardship, we are committed to shaping India's future through innovative solutions and collaborative action.

Primus Research, our dedicated knowledge practice, reflects this commitment. By harnessing the power of primary research and global insights, we bring forward-looking perspectives that inform policy, support public institutions, and enable communities to thrive. Our work consistently demonstrates that complex challenges demand both data-driven rigor and empathy for those affected.

This dual approach is at the heart of our Earth and Sustainability practice, a core area of focus for Primus. We understand that environmental stewardship is not optional, it is essential. From climate action to river rejuvenation, we work alongside governments, businesses, and civil society to design sustainable solutions that respect the delicate balance between development and ecology.

The Yamuna River, a lifeline to millions and a symbol of cultural and spiritual heritage, is a cause that resonates deeply with us. Its current state reflects the urgent need for collective resolve to reverse decades of neglect. We see this not just as an environmental imperative, but as a social and moral one. The health of the Yamuna is inextricably linked to the health of Delhi and its people.

This report, Beyond the Froth: 22 Kilometers of Crisis, 30 Million Reasons for Revival, emerges from that conviction. It goes beyond data to bring forth the lived realities of those who depend on the river - farmers, fisherfolk, and communities whose voices often go unheard. It draws lessons from global best practices and proposes a clear path forward for a cleaner, healthier river.

It is our hope that this report catalyzes action, fostering partnerships and policies that honor the Yamuna's past and secure its future.

Acknowledgement

We extend our heartfelt thanks to the community members along the Yamuna who engaged with us openly and shared their lived experiences and aspirations for a cleaner river. Your insights brought depth and authenticity to this research.

We thank Shri Parvesh Singh Saheb, Hon'ble Cabinet Minister of PWD, Legislative Affairs, Irrigation and Flood Control, Water and Gurudwara Elections, Govt of NCT Delhi and his office for their gracious support throughout this project.

A special note of appreciation to Ms. Susmita Sengupta from the Centre for Science and Environment, Prof. T.R. Shreekrishnan from IIT Delhi and Dr. Raj Shankar Ghosh for their invaluable guidance and insights.

Executive **Summary**

The Yamuna River, once a thriving lifeline of northern India, is now in a state of ecological collapse along its 22-kilometre stretch through Delhi. **Although this segment constitutes less than two percent of the river's total length, it accounts for over 76% of its pollution load.** The river's transformation from a sacred and life-sustaining waterbody into a stagnant drain has been the result of decades of neglect, unregulated urban expansion, and a steady disconnection between people and the river.

This report places people at the heart of Yamuna's rejuvenation. **While technical solutions are essential, it is the lived experiences of riverine communities that give urgency and direction to the river's recovery.** Drawing on first-hand accounts from fishermen, farmers, priests, boatmen, and residents of informal settlements, the report captures how **Yamuna's pollution has eroded livelihoods, disrupted cultural practices, and severed emotional ties to a once-sacred river.** These voices reveal that the crisis is not just ecological, but deeply social and economic. Many community members shared how pollution has disrupted their daily lives, contaminating water sources and affecting livelihoods. **Traditional occupations like fishing, boating and small-scale farming have become increasingly difficult, with some families forced to seek alternative or informal work.** Others described how pollution has eroded the cultural and religious significance of the river, making festivals and ceremonies more challenging to observe. These riverine communities showed strong emotional connection with Yamuna despite the pollution and expressed sadness about Yamuna's condition. These perspectives underline that the river's pollution is not just an environmental concern but has serious social and economic consequences for those who depend on it. From community clean-up drives to citizen science and public storytelling, the recommendations emphasize restoring not only the river but also the people's connection to it. In doing so, this report reframes Yamuna's revival as a collective civic mission grounded in empathy, equity, and shared responsibility.

The **pollution in the river is primarily caused by untreated and partially treated sewage being discharged from 22 major drains. Delhi treat approximately 618 MGD i.e. about 80% of the total sewage generated, and nearly 30% of the treated water still fails to meet the prescribed discharge standards.** This coupled with the **lack of environmental flow** during the lean season industrial effluents and solid waste, have rendered the river hydrologically and biologically dead through much of the year. The problem is compounded by over-reliance on centralised sewage treatment infrastructure, underutilised or dysfunctional STPs and CETPs, and patchy sewerage coverage across unauthorised colonies and informal settlements.

Yamuna's revival will require a two-pronged strategy. The first step is to address the structural and systemic issues. This includes **institutional reforms**, such as the establishment of an **Interstate Yamuna Rejuvenation Compact** to ensure cross-state accountability and collaborative targets for pollution control, as well as the formation of a **Yamuna Cleaning Board** to streamline fragmented governance and align the responsibilities of different agencies. Additionally, there is a need for governance and enforcement enhancements, including the introduction of a **treated wastewater reuse policy** to promote water circularity, the implementation of a **central land pooling mechanism**, and the enforcement of **stricter zero liquid discharge (ZLD) and near-ZLD norms for industries.**

Given that drains and sewage remain the primary sources of pollution, drain and sewerage management is also important. This would involve developing an **integrated sewerage master plan**, which encompasses comprehensive mapping of sewerage networks and infrastructure, incentivise sewer connections, and prioritise the **clean-up of major drains such as the Najafgarh and Shahdara drains.** To strengthen the monitoring and surveillance systems, implementing a **SCADA-based monitoring dashboard** to facilitate project management and ensure data transparency can be useful. Furthermore, **independent third-party audits** can play a crucial role in verifying the health of the river and the performance of treatment plants.

Equally crucial is **reviving the people-river relationship**. Real improvements in water quality, combined with more public information and updates, will be essential to building trust and driving action. A **Yamuna Citizen Connect Campaign** that includes cultural programming, public art installations, and school-based river education will aid to build civic pride and ecological stewardship. Local communities particularly those with historical ties to the river, such as fishermen and priests should be involved through community-managed ghats, citizen science initiatives, and participatory planning. Insights from the field show that seeing measurable results, community clean-up drives, and public art or storytelling events offer the most engagement potential. Additionally, targeted micro-grants and skill-building efforts can help revive cultural practices and traditional livelihoods linked to the river, ensuring that restoration efforts are socially rooted and inclusive.

Reviving the Yamuna demands more than infrastructure upgrades, it requires reimagining governance, rethinking public participation, and rebuilding trust between people and the river. This report proposes an integrated roadmap that balances systemic reforms with community-led action. By centering the voices of those who live with the river every day, it offers a vision of rejuvenation that is inclusive, resilient, and grounded in reality. If implemented with sustained political will, institutional coordination, and citizen engagement, this can be the beginning of a new chapter, where the Yamuna is no longer seen as a drain, but as a living, shared heritage for generations to come.

Table of **Contents**

Table of **Contents**

01 Introduction: Contextualizing the Yamuna

1.1 Geography of the Yamuna

The Yamuna River originates from the Yamunotri Glacier in Uttarakhand and flows southwards for about 1,376 kilometers through the states of Himachal Pradesh, Haryana, Delhi, and Uttar Pradesh before merging with the Ganga at Prayagraj. It is the largest tributary of the Ganga and an integral part of the northern Indian river system. Along its course, the river is fed by important tributaries such as the Tons, Chambal, Hindon, Betwa, and Ken rivers, significantly augmenting its flow. Despite being a perennial river, extensive damming, diversion, and seasonal fluctuations often reduce its flow to a mere trickle in critical stretches, especially downstream of urban centres like Delhi.

1.2 Ecological Significance

Ecologically, the Yamuna serves as a vital life-supporting system. Its floodplains recharge groundwater, regulate microclimates, and provide seasonal habitat for migratory birds, including species such as bar-headed geese, painted storks, and black-winged stilts. The river supports aquatic species like Indian carp, catfish, and freshwater turtles, while its riparian zones host native vegetation such as acacia, jamun, and grassland species that stabilize soils and absorb runoff. Historically, the Yamuna's flow carried nutrient-rich sediments essential for downstream agriculture, and its floodplains acted as natural buffers against urban flooding.

1.3 Cultural and Religious Importance

The Yamuna holds deep spiritual and symbolic significance in Indian culture. Revered in Hindu mythology as a divine goddess, she is believed to purify and liberate the soul. The river features prominently in religious texts and folklore and remains a site of pilgrimage, especially in cities like Mathura, Vrindavan, and Delhi. Ritual bathing, idol immersion, and water offerings continue along the riverbanks, particularly during festivals like Yamuna Jayanti and Chhath Puja. For millions, the Yamuna is not just a river, but a sacred presence woven into everyday life.

1.4 Socio-Economic Significance of Yamuna

The Yamuna is central to the socio-economic fabric of the regions it flows through. Nearly 57 million people depend on the Yamuna's water. The floodplains in Delhi and neighbouring parts of Haryana and UP also serve as agricultural zones, informal settlements, and ecological buffers. Any changes in the river's health directly affect livelihoods, water security, and public health outcomes across these regions. Moreover, inter-state dependencies on water-sharing and waste management make it a shared concern across administrative boundaries.

1.5 Yamuna in Delhi

Within the National Capital Territory of Delhi, the Yamuna flows for 52 kilometers[1] , of which a critical 22-kilometer segment—from Wazirabad to Okhla—has become the focal point of multiple planning and policy efforts. Although this stretch constitutes less than 2% of the river's total length, it carries a disproportionate share of its pollution and institutional burden since it is responsible for 76% of Yamuna's total pollution.[2]

In recent years, the conversation around the Yamuna has seen renewed engagement across policy, civil society, and scientific domains. State governments have announced substantial plans—including Delhi's ₹1,500 crore budgetary allocation[3] for river cleaning, sewage infrastructure and rejuvenation projects, and there is growing alignment between river rejuvenation and broader development goals. At the same time, implementation challenges persist, ranging from coordination gaps to capacity constraints. These issues are discussed in subsequent chapters.

Flow Path of River Yamuna and Major Drains & STPs in Delhi

Source: Yamuna: The Agenda for Cleaning the River by CSE, published May 2025

[1]https://dda.gov.in/land-/Journey-Of-Yamuna
[2]Final Report of the Yamuna Monitoring Committee dated June 29, 2020
[3]https://www.ptinews.com/story/business/delhi-govt-unveils-rs-1-500-cr-plan-for-yamuna-cleaning-sewage-management/2404008

02 Current Status of Yamuna: A Diagnostic View

2.1. Benchmarking Yamuna's Pollution Level

2.1.1. Water Quality Norms

The Central Pollution Control Board (CPCB) applies the "Designated Best Use" classification, categorizing water bodies based on intended use—drinking, bathing, irrigation, etc. —and defining quality criteria for each. Each use case has its own requirements, for instance drinking water should be pure, wholesome, and potable; while for irrigation the level of dissolved solids and toxicants are important; and for outdoor bathing the level of pathogens are important.

The CPCB specifies thresholds for key parameters:

- Dissolved Oxygen (DO) – DO is the amount of oxygen available in dissolved form. Fishes can survive at or above DO of 4mg/l. Higher DO is better.

- Biochemical Oxygen Demand (BOD) – BOD is the amount of dissolved oxygen required by aerobic microorganisms to decompose organic material present in a water body. Less BOD is good.

- pH – Reflects the acid-base balance.

- Faecal Coliform (FC) – FCs are a group of bacteria present in faeces of humans/homeotherms, indicating discharge of untreated sewage in a water body.

While the Designated Best Use framework has five classifications and the highest classification is Class A "Drinking Water", the Supreme Court in the case of In Re: News Item Published in Hindustan Times Titled "And Quiet Flows the Maily Yamuna"[4] has given the mandate to Delhi government to ensure that the water quality is at least Category C. However, at present, the water quality in Delhi still does not meet Category C.

[4](2012) 13 SCC 736

Designated Best Use Water Quality Criteria

Designated Best Use	Class of Water	Criteria
Drinking water source without conventional treatment but after disinfection	A	• Total Coliforms Organism MPN/100 ml • Dissolved oxygen 6 mg/l or more • Biochemical Oxygen Demand 5 days 20C 2mg/l or less
Outdoor bathing	B	• Total Coliforms Organism MPN/100 ml shall be 500 or less • pH between 6.5 and 8.5 • Dissolved oxygen 5 mg/l or more • Biochemical Oxygen Demand 5 days 20C 3mg/l or less
Drinking water source after conventional treatment and disinfection	C	• Total Coliforms Organism MPN/100 ml shall be 5000 or less • pH between 6 and 9 • Dissolved oxygen 4 mg/l or more • Biochemical Oxygen Demand 5 days 20C 3mg/l or less
Propagation of wild life & fisheries	D	• pH between 6.5 and 8.5 • Dissolved oxygen 4 mg/l or more • Free Ammonia (as N) 1.2mg/l or less
Irrigation, industrial cooling, controlled waste disposal	E	• pH between 6.0 and 8.5 • Electrical Conductivity at 25C micro mhos/cm Max. 2250 • Sodium absorption Ration Max. 26 • Boron Max. 2mg/l

Source: CPCB Website, Environment (Protection) Rules, 1986

2.1.2. Water Quality in Yamuna

CPCB established a National Water Quality Monitoring Programme (NWMP) in 1978, which currently comprises of more than 4480 stations to test nutrient levels, organic matter, major ions, microbiological, other inorganic matter and other qualities of water bodies as required.

In Yamuna alone, there are 33 stations which monitor its quality at a yearly, quarterly and monthly interval. On the basis of the water quality levels, Yamuna river can be categorised into[5]:

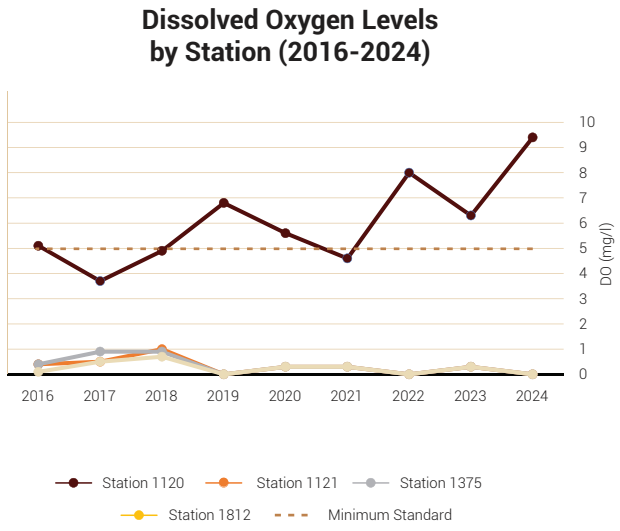
1. Yamunotri to Hathnikund – Pristine, unpolluted Himalayan segment.
2. Hathnikund to Palla – Moderately polluted.
3. Delhi Stretch (Palla to Okhla) – Critically polluted
4. Delhi to confluence of Chambal – Very polluted.
5. Downstream of Chambal to Prayagraj – Polluted, with improvement because of Chambal's water

[5]https://dda.gov.in/sites/default/files/Landescape/A_Case_study_Yamuna_River.pdf

2.1.3. Water Quality in Delhi Stretch of Yamuna

A longitudinal analysis of three key water quality parameters—Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), and Faecal Coliform (FC)—across four monitoring stations along the Yamuna River in Delhi from 2016 to 2024 reveals a deeply concerning pattern of severe and persistent degradation along its downstream stretches within Delhi. While Station 1120 (Palla) — where the river enters the city — shows encouraging improvement in Dissolved Oxygen (DO) levels and compliance with Biochemical Oxygen Demand (BOD) and Faecal Coliform (FC) standards in recent years, these gains are quickly nullified further downstream. Downstream stations continue to record critically low DO levels, alarmingly high BOD values, and Faecal Coliform concentrations that remain several orders of magnitude above acceptable thresholds. These findings highlight that the Yamuna's condition within Delhi remains overwhelmingly compromised.

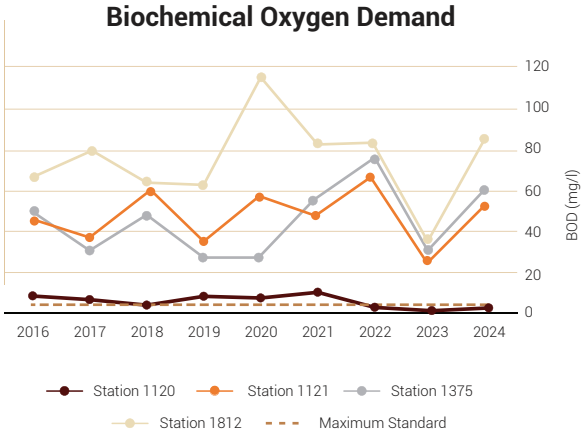
2.1.3.1 Dissolved Oxygen (DO)



Palla shows a clear upward trajectory, with DO rising from around 5.1 mg/l in 2016 to 9.4 mg/l in 2024, consistently staying above the minimum requirement since 2019. In contrast, other stations in Delhi remain well below the threshold throughout the period, with most values hovering close to zero, indicating severe oxygen depletion and poor water quality in these segments.

2.1.3.2. Biochemical Oxygen Demand (BOD)

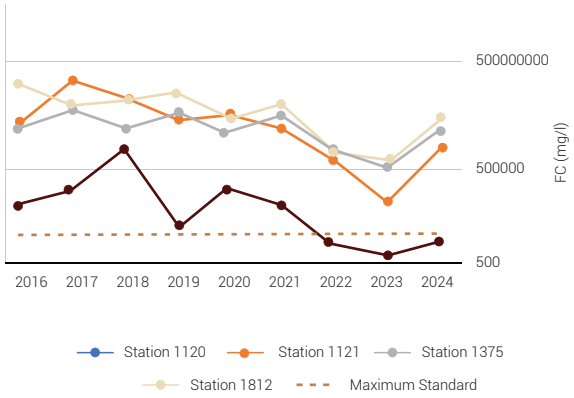
The station at Palla consistently records BOD values below or close to the threshold, with notable improvement since 2021. In contrast, the other stations show alarmingly high BOD levels throughout, peaking above 80 mg/l in several years—especially after Shahadra drain meets Yamuna (station 1812), which reached a staggering 114 mg/l in 2020. While all three polluted stations saw a temporary dip in 2023, BOD levels rebounded sharply in 2024, indicating that any improvement was short-lived or inconsistent. These elevated BOD values signal intense organic pollution, likely due to the continuous inflow of untreated sewage and industrial waste, posing significant ecological and public health risks.



2.1.3.3. Faecal Coliform (FC)

The data and graph for FC levels from 2016 to 2024 indicate a marginally encouraging trend, with all stations showing a notable decline in contamination levels since 2022. However, FC concentrations at most locations—particularly downstream of major drains like Shahdara (1812)—still remain alarmingly above the CPCB's permissible limit of 2,500 MPN/100 ml. While the station at Palla (1120) now records values within the acceptable range by 2024, the remaining three stations continue to reflect severe microbial pollution, with FC counts still running into hundreds of thousands. The recent dip points to possible improvements in sewage treatment, drain interception and reduction in open defecation under the Swach Bharat Mission, yet the persistently high levels highlight the need for more rigorous and sustained interventions. To ensure meaningful progress, consistent monitoring and accelerated infrastructure upgrades must remain a priority.

Faecal Coliform by station (2016-2024)



2.2. Causes of Pollution in Yamuna

Pollution in rivers is commonly categorized as point source or non-point source pollution. Point source pollution refers to contaminants entering a water body from a single, identifiable source, such as an industrial outlet or a sewage pipe. In contrast, non-point source pollution arises from diffuse sources spread over a large area—such as surface runoff from urban settlements, agricultural fields, and unconnected sewage systems—making it harder to trace and manage.

In Delhi's stretch of Yamuna, the major contributors is the inflow of untreated wastewater through numerous sub-drains and stormwater drains that ultimately discharge into the river. A total of 22 drains empty into the Yamuna, primarily between Wazirabad and Okhla, with the Najafgarh drain being the most significant in terms of both volume and pollutant load. These drains contribute to an estimated 80% of Yamuna's pollution load in Delhi.[6] Therefore, since these drains represent discrete, identifiable conveyance channels directly releasing pollutants into the river, they are classified as point sources of pollution.

2.2.1. Gap in Sewage Generation and Treatment Capacity in Delhi

As of April 2025, the city generated approximately 792 million gallons per day (MGD) of sewage. While the installed treatment capacity stood at 764 MGD (96.5% of the total sewage generated), only 618 MGD (approximately 80.9%) was actually treated.[7] This disparity is attributed to several systemic challenges, including growing population, uneven flow of sewage to pumping stations, incomplete connectivity of trunk and peripheral sewer lines to STPs, delays in rehabilitation of silted and settled trunk sewers, land constraints for new infrastructure, and intermixing of sewage and stormwater networks.

As a consequence, a substantial volume of untreated sewage continues to be discharged directly into the Yamuna River. This has resulted in alarmingly high levels of Biochemical Oxygen Demand (BOD) and faecal coliform, rendering the river unfit even for bathing.

[6]Parliamentary Committee Report

[7]Progress in Rejuvenation of River Yamuna: Against Action Plan and Timelines, DPCC dt. April 2025

2.2.2. Untreated Sewage Discharge from Unauthorised Colonies and JJ Clusters

A significant portion of Delhi's population resides in unauthorized colonies and JJ (Jhuggi Jhopri) clusters, many of which are not connected to the formal sewage network. There have been multiple instances of septage from these colonies reaching Yamuna without any treatment, leading to increase in pollution levels especially FC levels. While the Delhi Jal Board (DJB) has installed decentralized sewage treatment plants in a few areas, the coverage remains insufficient. The Delhi Economic Survey 2023-24 identified colonies/categories without sewerage network, as mentioned in the below mentioned table. Therefore, today 31.9% unauthorised colonies and 47.74% villages are not connected to sewerage system.

Colonies /Categories	Total No. of Colonies	Colonies With Sewerage System	Colonies Without Sewerage System
Unauthorised Regularised Colonies	567	557	10
Urban Village	135	130	5
Rural Village	219	55	164
Unauthorised Colonies	1,799	1,224	575
Resettlement Colonies	44	44	0

Source: Delhi Economic Survey 2023-24
+DPCC Progress Report dt. April 2025

2.2.3. Industrial Pollution and Wastewater Discharge

Industrial pollution is another critical issue for Yamuna. As per the CPCB, Delhi has 51 Grossly Polluting Industries (GPIs) spread across 28 industrial areas and located along the Yamuna and its drains. Out of these 28 industrial areas, 17 approved industrial areas are connected with 13 CETPs having a capacity of 212.3 MLD[8] . However, their utilization capacity is just 65.161 MLD i.e. merely 30.7% [9] These industries, mainly involved in dyeing, chemical processing, and electroplating, often release untreated or partially treated effluents into the river. Effluent samples from these areas revealed dangerously high levels of heavy metals such as chromium (Cr), lead (Pb), and zinc (Zn), particularly during the pre-monsoon season. The foaming phenomenon frequently observed at the Okhla Barrage is directly linked to surfactants and detergents used by both households and industries.

[8]Parliamentary Committee Report

[9]Progress in Rejuvenation of River Yamuna: Against Action Plan and Timelines, DPCC dt. April 2025

2.2.4. STPs Failing to Meet Quality Norms

One of the critical measures to prevent untreated sewage from polluting the Yamuna is to ensure that all sewage is directed to and effectively treated by STPs. However, evidence from multiple studies and inspections shows that a substantial number of Delhi's STPs fail to meet the pollution control norms set by the DPCC)and the CPCB. The norms include the treated water to have a pH between 6.5-9.0, BOD below 10 mg/l, COD below 50 mg/l, N-total below 10 mg/l, Fecal Coliform below 230 MPN/100 ml and PO4-P below 2 mg/l.[10]

According to the April 2025 DPCC progress report, only 21 out of 37 STPs (56.75%) which treats 531/764 MGD (69.5%) of sewage are compliant with prescribed discharge standards. These underperforming STPs release treated wastewater that does not meet the minimum biochemical oxygen demand (BOD) and fecal coliform thresholds, leading to continued degradation of the Yamuna's water quality.

This failure is not merely technical—it has large-scale ecological and economic implications. Currently, only about 89 MGD (million gallons per day) of treated wastewater is reused—for non-potable purposes like horticulture, industrial operations, construction, and cleaning of public transportation infrastructure such as railways and buses. The remainder, despite being labelled as "treated," is discharged back into the Yamuna. Given that much of this "treated" water still fails to meet basic environmental standards, this discharge significantly contributes to the river's pollution load.

Notably, ammonia levels and BOD concentrations in several STP outflows exceed limits suitable for even non-potable reuse, let alone safe discharge into a river system.[11] This undermines not only the ecological balance but also public trust and planned reuse strategies.

The Parliamentary Standing Committee and independent monitoring bodies have attributed the poor STP performance to several systemic issues:

- Aging infrastructure designed for outdated norms (some
- for BOD of 30 mg/L vs the current 10 mg/L requirement).
- Underutilization of capacity.
- Ineffective operations and maintenance.
  Inadequate segregation of industrial and municipal sewage.

Until STPs are upgraded to reliably produce effluents meeting CPCB's Class C standards (BOD < 3 mg/L, FC < 500 MPN/100 ml), they will continue to serve as indirect polluters rather than pollution mitigators. Moreover, without improvements in treated water reuse (currently a fraction of its potential), the city continues to miss an opportunity to reduce its freshwater dependency and promote circular water use.

2.2.5. Non-Availability of Required Environmental Flow

The absence of sufficient environmental flow (e-flow) in the Yamuna, especially in the Delhi stretch, severely compromises its self-purifying ability. Although the minimum flow recommended by the National Institute of Hydrology is 23 cumecs, only 10 cumecs are released downstream of Hathnikund Barrage—most of which evaporates or is consumed before reaching Wazirabad. As a result, the 22 km stretch of the Yamuna through Delhi remains stagnant and highly polluted for most of the year. The problem intensifies in the lean season, when there is virtually no fresh water in the river beyond Wazirabad, turning it into a virtual drain.

2.2.6. Discharge of Waste Water from Neighbouring States

Another significant contributor to the pollution of the Yamuna is the discharge of untreated or partially treated sewage and industrial effluents from neighbouring states—Haryana and Uttar Pradesh—through multiple drains that eventually enter the river within the Delhi stretch.
From Haryana, effluents originating from Gurugram, Sonipat, and Bahadurgarh flow into the Najafgarh Drain via specific channels such as L-III (Badshahpur Drain), L-II (from Dharampur), L-I (from Bajghera-Palam Vihar), Drain No. 6 (from Sonipat), and the Mungeshpur and Bhupania Drains. The Najafgarh Drain, in turn, empties this pollutant load into the Yamuna.[12]

Similarly, wastewater from Uttar Pradesh, carried by the Shahibabad, Indirapuri, and Banthala Drains, flows into the Shahdara Outfall Drain, which also discharges directly into the Yamuna in Delhi. Additionally, untreated or inadequately treated effluent is released through the Hindon Cut Canal, entering the river upstream of the Okhla Barrage. This transboundary inflow of pollutants severely compounds the efforts to rejuvenate the river within Delhi's jurisdiction.[13]

[10]Standards for Treated Effluent of Sewage Treatment Plants, available at <https://www.dpcc.delhigovt.nic.in/uploads/page/STPStandardspdf-9769efcaacc11566786ae2b364c14c56.pdf> last accessed May 21, 2025
[11]Final Report by Yamuna Monitoring Committee
[12]Parliamentary Committee Report
[13]Ibid

2.2.7. Solid Waste Pollution

Delhi's untreated solid waste is a silent yet significant contributor to Yamuna pollution. The city generates 11,376 tonnes per day (TPD) of MSW, but only 7,529 TPD is actually processed, leaving a shortfall of over 3,800 TPD.[14] This unprocessed waste is often dumped into open drains, eventually reaching the river. Items like plastics, organic waste, packaging materials, and hazardous substances not only degrade water quality but also create long-lasting impacts such as microplastic pollution and leachate contamination. The lack of segregation at source and insufficient processing capacity further worsens the problem.

2.2.8. Floodplain Degradation : Sand Mining, Dumping of Debris, Encroachment

Flood plains play an important role in maintaining the flow of the river, help recharge ground water and provide a habitat for aquatic biodiversity-the most significant sign of a river's health. Human interventions such as sand mining, dumping of debris and encroachment of flood plains lead disturbs these natural processes thereby adding to Yamuna's pollution.

2.2.8.1. Sand Mining

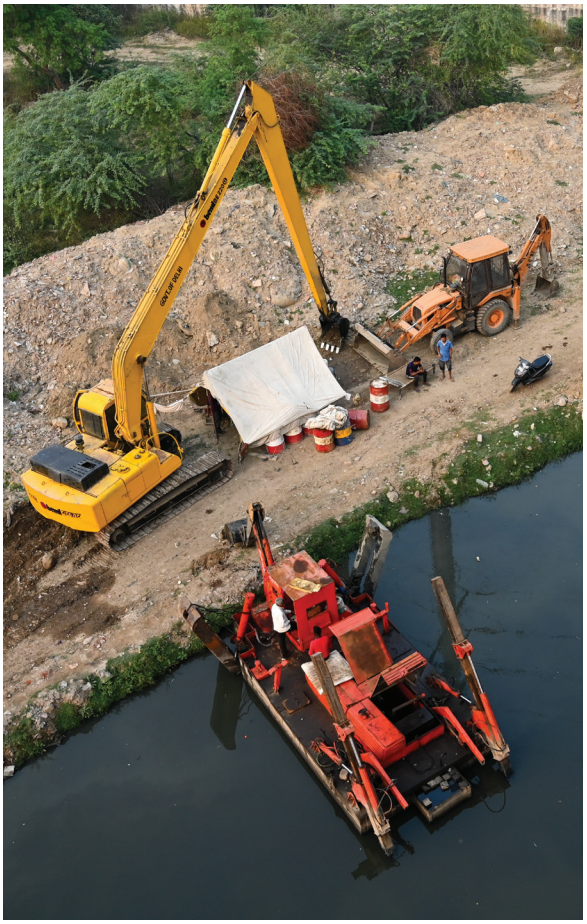
Illegal and unregulated sand mining from the Yamuna's riverbed and floodplains continues to be a major threat, especially in Uttar Pradesh and Haryana. Although Uttar Pradesh has designated lease areas for legal mining, the Parliamentary Committee Report highlights that illegal operations still occur. In Haryana, 3,792 cases of illegal sand mining were recorded between 2018 and 2023, resulting in penalties worth ₹33.64 crore. However, illegal extraction still persists, often beyond the reach of law enforcement. Sand mining disturbs aquatic habitats, accelerates erosion, alters river morphology, and reduces the river's capacity to sustain its natural flow, further compounding pollution problems.

2.2.8.2. Dumping of Debris

Construction debris and even biomedical waste are routinely dumped along the Yamuna's floodplain, especially in the Delhi stretch between Wazirabad and Okhla Barrage. The Delhi Development Authority (DDA) has reported frequent instances of unauthorized dumping, prompting them to deploy 134 security guards, install 93 CCTV cameras at 27 locations, and issue 929 challans between 2018 and 2021.[15] Dumping alters river hydraulics, clogs natural drainage channels, and introduces hazardous materials into the aquatic ecosystem.

2.2.8.3. Encroachment

The Yamuna's floodplain and wetland zones have been heavily encroached upon, particularly in Delhi. According to the Master Plan of Delhi 2021, about 9,700 hectares are designated as floodplains (Zone O), but only 1,675 hectares are available for rejuvenation. Approximately 162 hectares are officially recorded as encroached.[16] These encroachments, including unauthorized constructions and JJ clusters, block natural flow paths, reduce groundwater recharge zones, and contribute to habitat loss for aquatic and riparian species. Legal complications and public resistance make removal of such encroachments a slow and contentious process.



[14]Parliamentary Committee Report

[15]Ibid

[16]Fifth Report of the Standing Committee on Water Resources (18th Lok Sabha) on Action taken by the Governmnet on the observations/recommendations contained in the Twenty Seventh Report (Seventeenth Lok Sabha) of the Standing Committee on Water Resources on "Review of Upper Yamuna River Cleaning Project upto Delhi and River Bed Management in Delhi" pertaining to the Ministry of Jal Shakti - Department of Water Resources, River Development and Ganga Rejuvenation dt 11th March 2025

03 Government Initiatives and Key Challenges

The Yamuna River, has long been the focus of national environmental and urban planning agendas. Recognizing its strategic and ecological significance, the Government of India has launched multiple initiatives since the early 1990s to address the river's pollution and restore its ecological health.

3.1 Central Government Initiatives

3.1.1. Yamuna Action Plan (YAP)

The Yamuna Action Plan (YAP) represents one of the most significant bilateral initiatives for river rejuvenation in India, launched as a collaborative effort between the Government of India and the Japan International Cooperation Agency (JICA). Initiated in 1993 under the aegis of the Ministry of Environment, Forest and Climate Change (MoEF&CC), the core objective of YAP has been to improve the water quality of the Yamuna River by addressing issues related to sewage treatment, waste management, and public awareness. The project, executed in multiple phases—YAP-I, YAP-II, and YAP-III—has been implemented primarily in Delhi, Uttar Pradesh, and Haryana. The guiding principle behind the plan is to intercept, divert, and treat domestic wastewater before it enters the Yamuna, thereby reducing the pollutant load.

Yamuna Action Plan Phase I (YAP I)	
Implementation Period	1993–2002 (extended to 2003)
Executing Agency(ies)	Uttar Pradesh Jal Nigam, Public Health Engineering Department, Delhi Jal Board, Municipal Corporation of Delhi
Coverage	21 urban centres
Budget	Sanctioned ₹705.51 crore; actual expenditure ₹682 crore
Key Interventions	• Sewerage Infrastructure: Construction of 29 sewage treatment plants (STPs), 58 pumping stations, and 179 km of sewer lines. Additionally, 5 mini-STPs and 10 micro-STPs were set up to pilot decentralized wastewater treatment, generating a cumulative capacity of 750 million litres per day (MLD). • Non-Sewerage Measures: Developed 1,282 public toilet complexes, 96 crematoria, and undertook plantation and ghat/riverfront improvement. • Supportive Initiatives: Conducted river pollution studies across 33 towns and ran public awareness campaigns through NGOs.

Yamuna Action Plan Phase II (YAP II)	
Implementation Period	2004–2008 (extended to 2013)
Executing Agency(ies)	Uttar Pradesh Jal Nigam, Public Health Engineering Department, Delhi Jal Board, Municipal Corporation of Delhi
Coverage	Over 100 towns along the Yamuna
Budget	Sanctioned ₹624 crore; actual expenditure ₹832 crore (excess borne by state governments)
Key Interventions	• Sewerage Infrastructure: Expansion of capacity through the construction of a 135 MLD STP at Okhla and rehabilitation of STPs at Keshopur (324 MLD), Ring Road, Bela Road, and Wazirabad. Overall, an additional 189 MLD of treatment capacity was built covering Delhi, six towns in Haryana, and 98 in Uttar Pradesh. • Outreach: Pilot demonstrations and enhanced public engagement.

Yamuna Action Plan Phase III (YAP III)	
Implementation Period	2012 – ongoing
Executing Agency(ies)	Delhi Jal Board in Delhi
Coverage	Primarily Delhi but with projects in Sonepat, Panipat, Mathura & Vrindavan
Budget	1,656 crore (85% funded by JICA, 15% by GNCTD)
Key Interventions	• Development of eight major sewerage infrastructure projects, adding and upgrading over 950 MLD of STP capacity in Okhla, Kondli, and Rithala zones. • Rehabilitation of approximately 35 km of trunk sewers and rising mains. • Ongoing implementation across ten packages; foundation laid for nine decentralized STPs (2.25 crore LPD) and waterbody rejuvenation at Chattarpur (₹65.24 crore).

The projects achieved high facility utilization and reached many beneficiaries. It was particularly effective in enhancing access to hygiene facilities for vulnerable groups like rickshaw drivers and day labourers. However, despite these local gains, it maybe noted that the broader river water quality had not improved significantly due to continued population growth and increasing pollution loads. This pointed to the need for sustained awareness campaigns and enhanced local governance to maintain momentum and impact.

3.1.2 Namami Gange Programme (NGP)

The Central Government launched the Namami Gange Programme in 2014-15 for the rejuvenation of the Ganga and its tributaries, including the Yamuna. Initially planned for five years until March 2021, the program has been extended to March 2026. Projects sanctioned under NGP include creation of new STPs, rehabilitation of the existing STPs, rehabilitation of trunk sewers, and interception and diversion works.

The details of projects sanctioned under NGP for rejuvenation or river Yamuna:

State & No. of Projects	Treatment Capacity (MLD)	
Uttar Pradesh | 22	827.09	4226.88
Delhi | 9	1268	1951.04
Himachal Pradesh | 1	3.16	11.57
Haryana | 2	145	217.87
Total | 34	**2243.25**	

Source: Lok Sabha Unstarred Question No. 4514, answered on 27.03.2025 by MoS for Jal Shakti.

3.2 Government of Delhi Initiatives

In addition to contributing to centrally sponsored schemes, the Government of NCT Delhi also undertakes independent initiatives to augment sewage treatment and river rejuvenation. Within Delhi, various government department play their own pivotal role in cleaning Yamuna, viz.,

(a) Delhi Jal Board: It is the nodal agency for all YAP projects. It is responsible for capturing entire sewage
(b) and conveying it to STPs
Municipal Corporation of Delhi: Responsible for preventing dumping of garbage in the drains and river, desilting/fencing of drains, closing unauthorised industries, slaughtering & dhobi ghats in residential areas
(c) Delhi Development Authority: Removal of squatters from J.J. Clusters and from the banks of Yamuna; and river front development
(d) DSIIDC: Ensuring all industrial effluent is treated through CETPs before discharge.
(e) Flood and Irrigation Department: Desilting of drains and sub-drains; and building bunds for flood prevention.

Given the involvement of multiple authorities in the rejuvenation of the Yamuna, the National Green Tribunal observed a need for greater coordination, clarity in responsibility, and streamlined oversight and directed the formation of a High-Level Committee (HLC) to monitor and guide efforts for the cleaning and rejuvenation of the Yamuna River within Delhi.[17] The HLC comprises of top officials from the Delhi government, Delhi Jal Board, DDA, Union Ministries of Agriculture, Jal Shakti, Environment, Central Pollution Control Board, and National Mission for Clean Ganga, among others.

In line with the NGT directive, the HLC developed a department-wise action plan to guide implementation. It holds regular review meetings and reports progress to the NGT, with some of these updates also made publicly available online.
The Delhi government in its latest budget has announced a sleuth of measures to clean Yamuna, which are as follows:

(a) Constructing 40 Decentralised STPs
Estimated at the cost of Rs 3726 crores, this project includes building 40 DSTPs in 416 unauthorised colonies and 115 villages in Najafgarh, Chattarpur, Matiala, Bijwasan, Mundka, Narela, and Bawana. A total of 35 lakh people will benefit from this project where sewer lines will be laid down in colonies which will be connected with house sewer connections.

(b) Augmenting the sewage treatment capacity by 118 MGD
This project includes new scheme for upgradation and augmentation of existing STPs at Yamuna Vihar Phase I and II, Vasant Kunj, Ghitorni, Mehrauli and Okhla Phase V. Further, budgetary provisions have been made for existing schemes for augmentation of STPs at Nilothi Phase I, Pappankalan Phase II, Keshopur Phase II & III, Rohini, Narela and Najafgarh. These STPs are proposed to be upgraded by December 2026 and will cost a total of Rs. 750 crores.

(c) Installation of Sludge Management System in STPs
DJB intends to install this at various STPs at the cost of Rs 228 crores for sludge treatment and its safe disposal in an environment friendly manner.

(d) Third party audit of STPs
The Government of Delhi has ordered a third-party audit of all 37 STPs in Delhi. These audits will provide more clarity on the installed treatment capacity and the actual treatment carried out by the STPs, which would enable the authorities to take corrective actions in improving and expanding the sewerage treatment network.

(e) Installing sensors for real time water quality data
DPCC is in the process of installing 32 water quality monitoring stations at the Yamuna and some of the drains. These monitoring sensors will give real time data on water quality, as opposed to the present system where samples are manually collected and tested in a lab once a month.

(f) Projects to revive Yamuna floodplains
Delhi government and Delhi Development Authority have intensified efforts to clean and rejuvenate the Yamuna, with 11 restoration projects spanning 1,600 hectares across its floodplain.

[17]Ashwini Yadav vs. Government of NCT of Delhi

3.3 Challenges in Implementation

Despite sustained policy focus and considerable financial outlays, the Government's efforts to clean the Yamuna River—especially within the 22-km Delhi stretch—have faced persistent structural and operational challenges. These hurdles have limited the effectiveness of flagship schemes like the Yamuna Action Plan (YAP) phases I–III and the Namami Gange Programme, and continue to delay measurable outcomes.

3.3.1 Land Acquisition Delays and Encroachments

Timely land availability remains critical for accelerating the rollout of Decentralized Sewage Treatment Plants (DSTPs) and associated infrastructure. A number of identified sites currently await formal allotments or remain under legal review. Additionally, existing encroachments on floodplain areas and earmarked project sites further stall execution timelines, delaying environmental gains.

3.3.2 Institutional Fragmentation and Coordination Failures

Project delivery often encounters inefficiencies due to the overlapping jurisdiction and parallel mandates of agencies such as DJB, MCD, DDA, IFCD, and others. Administrative lead times—particularly in land identification, inter-agency concurrence, and environmental/statutory clearances—continue to delay ground-level commencement.

3.3.3 Monitoring and Compliance Gaps

While STPs are largely built as per design norms, compliance with BOD, TSS, and faecal coliform standards remains uneven. Strengthening telemetry-based dashboards and automating compliance flagging could enable timely interventions. A combined approach of regulatory enforcement and capacity-building for O&M contractors may improve sustained performance.

3.3.4 Floodplain Restoration

Ongoing wetland and biodiversity park efforts demonstrate strong environmental value but would benefit from more structured execution support. Multiple projects have encountered delays linked to litigation, encroachment, and demarcation ambiguities.

3.3.5 Inadequate Treatment Capacity and Underutilization of STPs

Several operational STPs are underutilized due to slow catchment network rollouts in peripheral or unauthorized areas, resulting in stranded capacity and reduced overall treatment effectiveness.

3.3.6 Delays in Rehabilitation and Upgradation Projects

STP upgrades have faced commissioning delays post civil completion, lower bidding issues and delayed ancillary approvals, often extending project timelines.

3.3.7 Incomplete Sewer Network in Unauthorized Colonies and JJ Clusters

While over 1,000 unauthorized colonies have been connected to sewer lines, several hundred remain pending due to feasibility constraints, forest NOCs, or tracing challenges. For JJ clusters, space limitations and infrastructure bottlenecks persist.

3.3.8 Slow Drain Trapping and Desilting Progress

Drain interception efforts—particularly for sub-drains of Najafgarh and Shahdara—have progressed slowly relative to targets. Desilting work too has lagged due to overlapping restrictions (e.g., GRAP) and administrative bottlenecks.

04 Best Practices

4.1. Rhine River (Germany)

4.1.1. Background

The Rhine River, flowing through six European countries, was once infamously known as "Europe's sewer" due to heavy industrial discharges, municipal waste, and agricultural runoff. The ecological crisis culminated in the 1986 Sandoz chemical spill in Switzerland, prompting the launch of the Rhine Action Programme (RAP) in 1987, a landmark shift toward coordinated basin-wide management. The institutional backbone of this revival is the International Commission for the Protection of the Rhine (ICPR), established in 1950 and significantly empowered by the 1999 Convention. Over time, the ICPR evolved from a technical forum into a comprehensive river basin authority, enabling cross-border emergency response, standardised monitoring, and integration of flood protection, biodiversity, and water quality governance.

4.1.2. Key Initiatives

4.1.1.1 Stringent Environmental Regulations: Germany and others, enforced strict laws requiring industries to treat their wastewater, disclose discharge contents, and adopt zero-liquid discharge (ZLD) systems.

4.1.1.2 Upgrading Wastewater Infrastructure: Massive public and private investments led to the modernization of wastewater treatment plants (WWTPs). Advanced systems like membrane bioreactors (MBRs) were installed to filter out nutrients and heavy metals. Interceptor sewers were also built to prevent raw sewage overflows during storms.

4.1.1.3 Real-Time Monitoring and Early Warning Systems: A network of automated sensors was deployed along the river to continuously monitor water quality. The International Warning and Alarm Plan (IWAP) enabled quick responses to pollution events and made real-time data publicly available, fostering transparency and cross-border accountability.

4.1.1.4 Ecological Restoration and Biodiversity Recovery: Floodplains, wetlands, and side channels were restored to improve natural water flow and habitat diversity. Migratory fish species such as salmon and eels were reintroduced, supported by cleaner water and improved habitats. Contaminated sediments were removed, and old river branches were reconnected to revive ecological functions.

4.1.1.5 Ongoing and Future Programmes: Follow-up initiatives like "Rhine 2020" and the ongoing "Rhine 2040" have set new targets focused on reducing nutrient and micro-pollutant inputs, improving sediment quality, continuing pollutant load reductions, modernising the warning and alarm system, and cutting plastic waste at source.

4.2. Han River (South Korea)

4.2.1. Background

During South Korea's industrial boom in the 1970s–80s, the Han River, which cuts through Seoul, suffered heavy degradation due to untreated domestic sewage, factory effluents, and uncontrolled land development. With Seoul preparing to host the 1988 Olympics, the deteriorating river conditions triggered national urgency. A major institutional turning point came in 2013 with the creation of the Han River Water Council, a participatory platform bringing together 600+ stakeholders, including local governments, scientists, NGOs, and citizens. Oversight rests with the Seoul Metropolitan Government, while strategic direction comes from the Han River Basin Management Committee under the Ministry of Environment. Civic participation is central to the governance model, supported by open-access water dashboards and frequent stakeholder consultations.

4.2.2 Key Initiatives

4.2.2.1 Introduced Total Maximum Daily Load (TMDL): TMDL focuses on the total amount of pollution that enters the river each day. This approach considers how much water is flowing, which helps create more accurate pollution limits. Using a simple formula—pollution limit = water quality target × river flow—the government set maximum daily loads for key pollutants like BOD and Total Phosphorus. Pollution limits are then shared among industries, sewage plants, and farming areas. Strict permits, financial incentives, and regular monitoring help ensure these targets are met.

4.2.2.2 Integrated Water Quality Index: The SMG compiles and publishes an integrated water quality index, making monitoring results accessible to the public through its website. This transparency fosters accountability and citizen engagement.

4.2.2.3 Dredging and Riverbed Engineering: Extensive dredging removed accumulated sludge, sandbars, and islets, which not only deepened and widened the river to improve water flow but also reduced pollution by eliminating contaminated sediments.

4.2.2.4 Sewage Treatment Infrastructure: The city built and upgraded sewage treatment plants to prevent untreated wastewater from entering the river.

4.2.2.5 Pollution Source Control: The government enforced stricter controls on upstream industrial discharges, closing or regulating polluting factories and redirecting waste streams away from the river.

4.2.2.6 Flood Control and Riverbank Development: A new barrage was constructed to regulate water flow and prevent seasonal flooding. Grassy areas and public walkways were created on both sides of the river, transforming the banks into recreational spaces for residents.

4.3. Thames River (United Kingdom)

4.3.1 Background

In 1957, the Natural History Museum declared Thames as "biologically dead". Decades of combined sewer overflows, untreated waste, and industrial discharges had rendered the river unfit for both aquatic life and public use. In response, the UK government and environmental stakeholders launched a series of modern interventions, from sewage treatment upgrades to the present £4.3 billion Thames Tideway Tunnel, aiming to reclaim the Thames as a clean and vibrant urban river. Today it is considered as one of the cleanest rivers running through an urban area, and it is a haven for more than 125 aquatic species.

4.3.3. Initiatives Undertaken

4.3.3.1 Infrastructure Modernisation: From the 1960s onward, London's major sewage treatment works were expanded and modernized to increase capacity and improve effluent quality. In the recent past, London has undertaken certain ambitious projects such as building of Lee Tunnel and Thames Tideway Tunnel.

4.3.3.2 Oxygenation Vessels and Hydrogen Peroxide Dosing: Temporary systems were deployed during tunnel construction to inject oxygen into the river and mitigate fish kills during pollution incidents. In 1980, the Thames Water Authority built a prototype river oxygenation craft which was deployed during or after periods of heavy rain when sudden storm water surges decreased the dissolved oxygen levels in Thames. This barge was replaced by "Thames Bubbler" in 1988 and launching of "Thames Vitality" in 1999.

4.3.3.3 Wetland and Habitat Restoration: Projects such as the River of Life I and II built new ponds, wetlands, meadows and wet woodland to enhance biodiversity, carbon sequestration, alleviate flooding downstream, and community engagement. Technical interventions such as building of Marsh Weir fish ladders were also undertaken to support habitat restoration.

4.3.3.4 Volunteer and Citizen Science Programs: Non-government initiatives like Thames21 and the Thames Rivers Trust have mobilized thousands of volunteers for riverbank cleanups and water quality monitoring, removing substantial volumes of plastic and other debris.

4.3.3.5 Catchment-Based Partnerships: These are community-led approach that engages people and groups from across communities at a local level to help improve water environments. The Environment Agency, Port of London Authority (PLA), water companies, councils, and NGOs collaborate on pollution response, restoration planning, and public education.

4.3.3.6 Water Framework Directive: Since March 2009, the River Thames and 15 of its key tributaries have been monitored on a weekly basis. The monitoring covers a wide range of parameters, including nutrient fractions, anions, cations, metals, pH, alkalinity, and chlorophyll.

Learnings for Yamuna

Categories	Global Experience	Criteria
Institutional Frameworks	Centralized bodies like ICPR (Rhine) and the Han River Basin Management Authority aligned stakeholders and ensured continuity across political and administrative changes.	Evolving a legally empowered basin authority with cross-agency representation is crucial.
Target-Based Planning	Clear, measurable goals—reducing pollutant loads (Han), restoring migratory species (Rhine), meeting standards (Thames)—drove accountability and progress.	Yamuna needs quantifiable objectives such as BOD targets, nutrient reduction goals, and ecological health indicators.
Integrated Approaches	Successful projects combined grey infrastructure (tunnels, treatment plants) with green solutions (floodplain restoration, wetlands) to enhance resilience.	Yamuna's strategy must integrate sewage management with ecological rejuvenation and nature-based solutions.
Community Engagement	Programs like Thames21 and Han River Water Council mobilized volunteers, improved monitoring through citizen science, and built strong local ownership.	Citizen involvement in monitoring, cleanup, and river stewardship can build accountability and sustain momentum for Yamuna.
Data & Transparency	Real-time monitoring and public disclosure of discharge data in Thames and Rhine built trust, enabled quick action, and empowered communities.	Expanding automated monitoring and making pollution data publicly accessible is vital for Yamuna's responsive governance.
Long-Term Vision	Frameworks like Rhine 2040, Han's phased TMDL plans, and Thames 2040 targets provided direction across political cycles and environmental changes.	Yamuna requires a long-term, adaptive, basin-wide strategy that evolves with shifting environmental and urban pressures.

05 Voices from the Banks: Ground Realities Along the Yamuna in Delhi

5.1. Introduction: Why Primary Voices Matter

The Yamuna River has long shaped the cultural and physical landscape of Delhi. Mentioned in the Mahabharata and the Puranas, the river has been revered for centuries, its banks once lined with ghats that served as places of ritual, recreation, and rest. Thirty-two such ghats dotted the capital, hosting early morning baths, cremations, and festivals like Chhath Puja.

However, all of this slowly faded away as concerns over the Yamuna's worsening pollution came to the forefront. As the river became increasingly contaminated, daily visits to the ghats declined, and the once-thriving communal spaces fell into neglect. The sounds of laughter, chants, and morning routines gradually gave way to silence.

What was once a vibrant cultural and spiritual lifeline now stands as a quiet reminder of a lost connection between the city and its river. River rejuvenation plans are often shaped by policy and engineering frameworks that overlook the lived realities of those who depend on the river daily. The Yamuna is not just a polluted water body—it is a source of livelihood, a site of worship, and a cultural anchor for thousands who live along its banks. Yet, their voices rarely inform decisions. This chapter brings these overlooked perspectives to light, arguing that effective river restoration must go beyond technical solutions. It must engage with the people who live, work, pray, and survive along the river—placing their experiences at the heart of the solution

> This isn't just water; it's our history, our spirit, turning toxic. We borrowed too much and polluted too freely. My heart aches for what we've let her become.

Brijmohan Lal
Resident in Yamuna Ghat Area

5.2. Listening to the River's People

To understand the Yamuna River's significance to local communities, we engaged with a diverse group of individuals living and working along its banks. Our conversations, held at ghats, in fields, along service lanes, and beside drains feeding the river, allowed us to gather both socio-economic data and perception-based insights. We met men and women, including boatmen, priests, fishermen, farmers, and street vendors—whose livelihoods are intimately tied to the Yamuna, gaining firsthand understanding of how the river shapes their daily routines, memories, and decisions.

The fieldwork spanned eight key locations along the Yamuna, stretching from the northern ghats to the agricultural floodplains in the south and east. Key sites included Yamuna Ghat, Kalindi Kunj Ghat, Nigambodh Ghat, and Vasudev Ghat, alongside settlements and agricultural zones such as Jagatpur, Sonia Vihar, Yamuna Khadar, and Chilla Khadar. These locations were strategically selected to reflect a range of experiences, from ceremonial and religious use of the river to more everyday forms of livelihood, such as fishing and farming. Many of these sites represented a combination of these activities, reflecting the complex and overlapping relationships that people maintain with the river.

Site-wise Distribution of Interactions

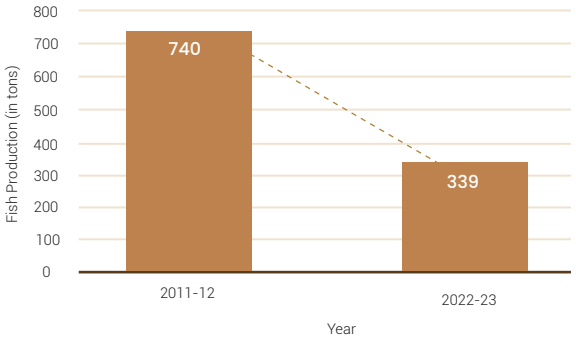
Location	Occupation	No of responses
Yamuna Ghat	Boatmen	22
Yamuna Ghat	Vendors	21
Yamuna Ghat	Priests	9
Nigambodh Ghat	Priests	2
Kalindikunj Ghat	Priests	4
Jagatpur	Priests	3
Jagatpur	Fishermen	21
Sonia Vihar	Priests	4
Soniya Vihar	Fishermen	17
Yamuna Khadar	Farmers	16
Chilla Khadar	Farmers	13
Vasudev Ghat	Vendors	6
		138

5.3. People of the River: Key Insights by Stakeholder Group

What does it mean to live beside a river that is sacred, yet toxic? As we spoke to communities along the Yamuna, a complex portrait emerged, of people continuing old ways while adapting to new realities, of resilience mixed with resignation.

5.3.1 Fishermen

In places like Jagatpur and Sonia Vihar, upstream of Wazirabad barrage, fishing remains a visible, if fading, practice. Here, fishing is not just a livelihood but a tradition handed down through generations. All fishermen are required to hold annual licenses issued by the Delhi Development Ministry, but the paperwork has done little to protect the trade from decline.



Source: Economic Survey of Delhi 2023-24

Fishermen are among the most affected riverine communities, facing twin pressures of: fewer fish and fewer kinds. A decade ago, fishermen regularly caught 10 to 12 types of fish. Today, only Tilapia, China Rohu, and Pothi remain in any significant numbers. The drop in volume is even more severe. Where boats once brought in 4 to 5 quintals a day, they now return with just 40 to 50 kilograms. Individual fishermen who used to catch 10 to 15 kilograms daily now speak of managing just 4 or 5 kilograms.

The consequences are visible in how lives have shifted. Families who once relied on fishing now look elsewhere. Many men have taken up work as rickshaw pullers, factory labourers, or in construction. Some have moved away altogether.

The Yamuna was our inheritance, our identity. Now, she's sick, dying. Every cast of the net brings back despair, not fish. We are fishermen in a world without fish.

Mahesh Kumar
Fisherman, Sonia Vihar

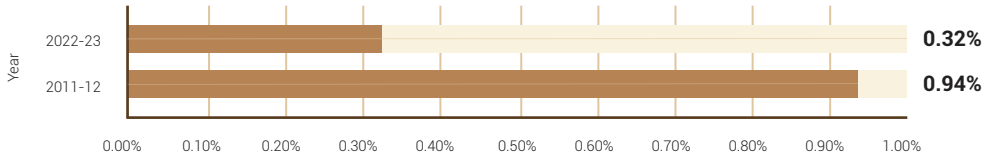
5.3.2 Farmers

Urban farming still exists in Delhi, especially for the cultivation of horticulture crops including many varieties of vegetables and flowers. The floodplains at Yamuna Khadar and Chilla Khadar are still cultivated, mainly for vegetables. Farmers grow vegetables such as peas, radish, cauliflower, bhindi, tori, ghiya, lobiya, chorai, and fai among others, selling them in local mandis and even directly to households through roadside markets. But even in these green stretches, the river is kept at a distance.

None of the farmers we spoke to use Yamuna water for irrigation. The polluted water is known to have an especially harmful effect on crops with shallow roots and leafy greens, which absorb contaminants more easily. It is too risky, they said. Instead, they rely on groundwater, accessed through diesel-powered pumps that draw from 30 to 40 feet below the surface.

During the monsoon, however, no technology helps. Entire fields get submerged. Families move to higher ground for weeks and some families are forced to return to their native villages. Their children miss school for weeks, sometimes longer if the family decides to move to their native village.

Contribution of Agriculture in Delhi's GSVA at current price



Source: Source: Economic Survey of Delhi 2023-24

The Yamuna defines us, feeds our fields. Without her water, our fields turn to dust, our crops wither, and our very way of life perishes.

Ramveer Singh
Farmer, Chilla Khadar

5.3.3. Priests

In Hindu tradition, rivers are not just water bodies. They are sacred sites where life events are consecrated — from birth to death. Of the sixteen major sanskars, several are tied to rivers: ritual dips for purification, offering prayers to ancestors, feeding fish as an act of charity, and post-cremation rites. The Yamuna, as one of India's holiest rivers, has long held a central place in these customs.

In Delhi, this reverence once translated into practice. The city had 32 functional ghats along the Yamuna, each with its own priest, temple, and rhythm of rituals. People came from across the capital to perform rites on its banks.

That presence has thinned. At places like Yamuna Ghat and Kalindikunj Ghat, priests spoke of a marked decline in footfall over the past few years. Pollution is a major reason. The dark, frothy water deters devotees from entering the river. Ritual dips have become symbolic gestures. Fish-feeding has reduced as fish themselves have grown scarce. Even during peak seasons, the ghats no longer see the crowds they once did.

Tourists, too, have dropped off. Pre-wedding shoots, once a lucrative part of the ghat economy, are fewer. Vendors who depended on ritual-related trade now earn less and see less activity overall. The atmosphere that once gave Yamuna Ghat its character has dimmed.

At Nigambodh Ghat, the story is slightly different. The number of cremations remains steady, as the ghat continues to be a major site for last rites in Delhi. But the way these rites are performed has changed. Earlier, it was customary for family members to take a dip in the Yamuna after the cremation — a symbolic gesture of closure and purification. Today, most skip the ritual altogether or restrict themselves to sprinkling a few drops of bottled water.

The faith remains. But the river, in its current state, no longer supports the ritual intimacy it once offered.

> The name 'Nigambodh' comes from an ancient legend—when Lord Brahma lost his knowledge of the Vedas, he came to this very ghat and took a sacred dip in the Yamuna, and regained his wisdom. Today, it's painful to see that same sacred spot too polluted to even step into.
>
> **Panditji**
> **Nigambodh Ghat**

5.3.4 Boatmen

Boating on the Yamuna has long been a popular recreational activity enjoyed by both children and adults. The river becomes especially picturesque during winters, when flocks of migratory birds arrive in Delhi, drawing visitors eager to experience the serene landscape and capture photographs up close. Boats are also commonly hired for religious rituals, offering a quiet setting on the river for personal prayers and ceremonies. In recent years, one of the most in-demand services by boatmen has been for pre-wedding photoshoots. Young couples find the Yamuna's natural beauty and affordability ideal for creating lasting memories.

However, the increasing pollution in the river has significantly dampened its appeal. The foul smell from the water discourages many visitors, parents who once brought their children for evening boat rides during summer vacations now avoid the area altogether. Boatmen at Yamuna Ghat shared that the number of rides has dropped by nearly 50%; where they once had 7–8 rides a day, they now get just 3–4, and during lean summer months, sometimes none at all. While photoshoots still happen, boatmen believe the experience would improve drastically if the river were cleaner. Many have been forced to take up second jobs, and some have left the profession entirely.

We were born of these waters, our boats served her, our families lived by her. We swam for sport, for a livelihood. Now, the Yamuna is too choked for our children to even touch. We wait for rain, for a glimpse of her old self.

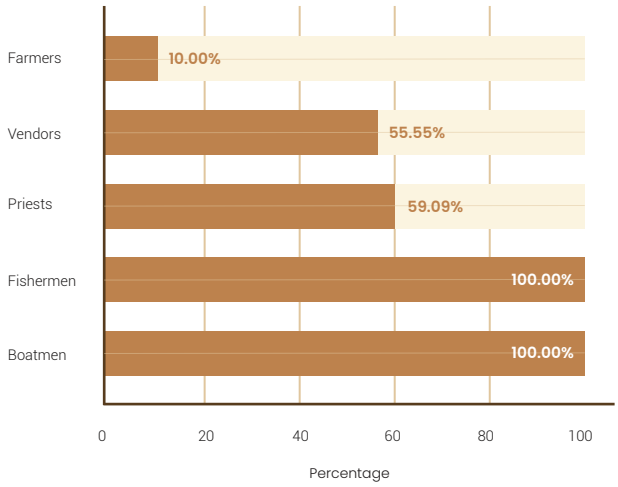
Raju
Boatman, Yamuna Ghat

5.3.5. Vendors

Yamuna Ghat has traditionally been a bustling site, not just for religious and recreational activities, but also for the informal economy it supports. A wide range of vendors—selling flower garlands, prasad, tea, and snacks—depend on the steady flow of visitors to sustain their livelihoods. However, in recent years, a noticeable decline in footfall has affected these vendors to varying degrees. Flower sellers, who once catered to ritual needs at the ghat, report a nearly 70% drop in income. In response, many have pivoted their business by supplying garlands to temples located outside the ghat area. Eateries that served devotees and tourists have seen around a 50% decline in sales and have started focusing more on serving passersby and local workers. Tea stalls and general shops, less dependent on ritual-based traffic, have not seen major losses but have also adapted by catering to a more general customer base.

Meanwhile, vendors near the newly developed Vasudev Ghat have benefited from increased footfall, underscoring how riverfront development can positively impact local livelihoods and inspire new opportunities for adaptation.

Percent of Cohort which saw decrease in their notional income



I remember the energy, the fairs, the roar of Yamuna Bazar. The ghat, once alive with laughter and commerce, now stands empty. Yamuna Bazar's spirit, drowned in pollution.

Meena Devi
Vendor, Yamuna Ghat

5.3.6. Perception on Yamuna by Riverine Communities

Despite everything, the emotional connection to the Yamuna remains strong. Every person we spoke to referred to the river with reverence. And almost all expressed anger, sadness, or deep discomfort about its condition.

Most believe the pollution is caused by drains and sewage. Many specifically pointed to industrial effluents as the main problem, more than household waste. This view, while common, reflects a perception gap when compared with technical assessments.

5.3.7 Disruptions to Education

Monsoon flooding poses a quiet but consistent disruption to education in riverbank communities. During peak rains, areas like Yamuna Ghat, Chilla Khadar, and Yamuna Khadar get flooded. Families are displaced. Children miss school, lose materials, and fall behind.

Some manage to recover. A few teachers, we were told, have stepped in with extra notebooks and guidance. But the pattern is clear. Every year, for weeks or sometimes months, the floodwaters wash away routine.

5.4 Pulse of the City: What Do Citizens Feel About the Yamuna?

5.4.1. Background and Purpose

Cleaning and restoring the Yamuna River is not just a technical challenge — it also depends on how people think and feel about the river, and therefore, a Citizen Perception Survey was undertaken, to generate insights into three broad themes:

(A) Awareness: How well-informed citizens are about the river's health and government-led clean-up efforts;

(B) Perception: What they believe are the impacts of Yamuna pollution and their personal connection to Yamuna;

(C) Engagement potential: The public's willingness to get more involved in restoration initiatives.

These findings help us understand how to improve public engagement and build stronger support for the river's revival.

5.4.2. Awareness

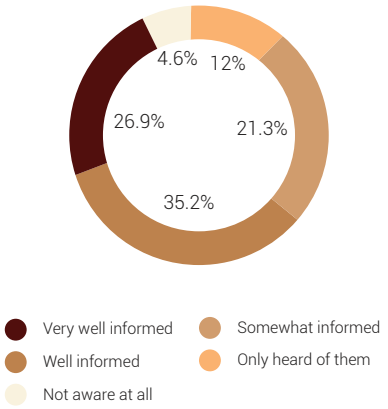
To assess the level of awareness among respondents, two questions were posed. The first asked individuals to self-assess their familiarity with various government initiatives aimed at cleaning the Yamuna. The second sought their opinion on the top three sources contributing to the river's pollution.

Responses to the first question reveal that only about one-third of participants consider themselves well-informed about the government's efforts. Another third reported having some knowledge, while the remaining respondents admitted to being largely unaware of these initiatives.

In response to the second question, most respondents correctly identified key sources of pollution. However, over 30 percent did not include household sewage among the top three causes. This is notable, as household sewage is widely acknowledged by experts and official reports as the principal contributor to Yamuna's pollution. Moreover, very few respondents identified the lack of environmental flow (e-flow) as a cause, while a significant number pointed to religious offerings, a relatively minor source, as one of the major pollutants.

This pattern suggests that public awareness is shaped more by visible factors and personal observation than by scientific evidence or official communication. It reflects a critical gap between perception and reality.

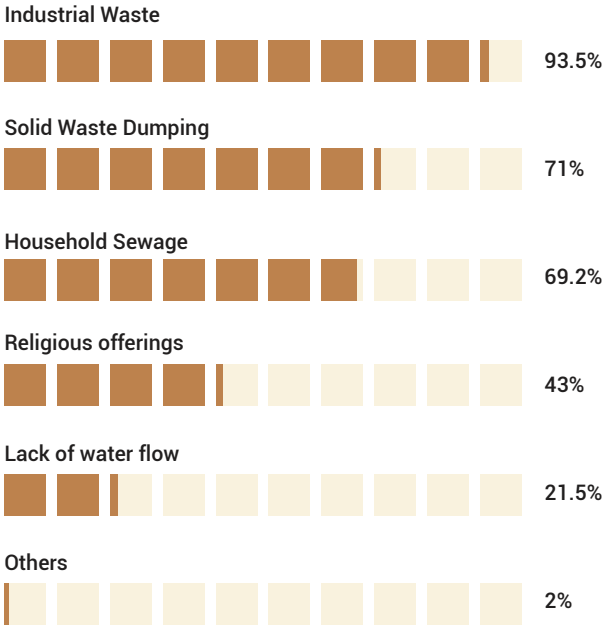
How well informed do you feel about goverment effort to clean the Yamuna river?



Such a gap has important implications for government outreach and public engagement. A significant portion of the population is either unaware of the actual causes of pollution or lacks understanding of the rationale behind the government's interventions. This asymmetry of information undermines the public's ability to critically evaluate policy efforts, and may also reduce their willingness to comply with official guidelines or adapt their behaviour.

Addressing this challenge requires a focused and sustained Information, Communication, and Education (ICE) campaign. Without targeted awareness-building, the success of river rejuvenation efforts may remain limited by public misunderstanding and disengagement.

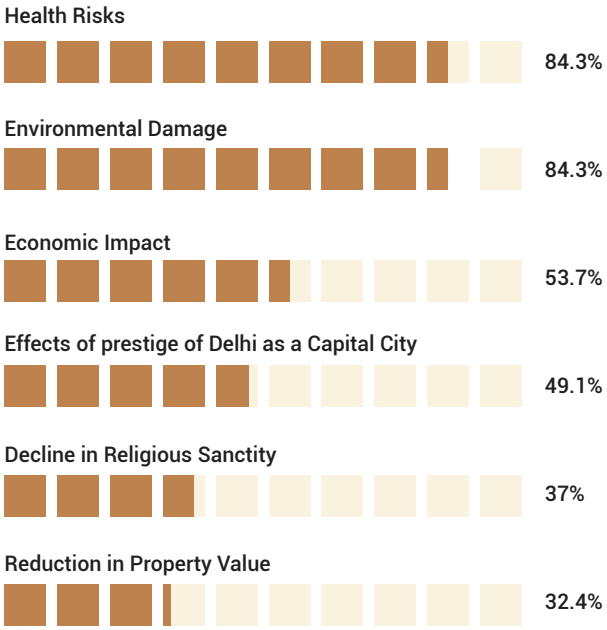
What do you believe are the Top 3 causes of pollution in the Yamuna River?



5.4.3. Perception

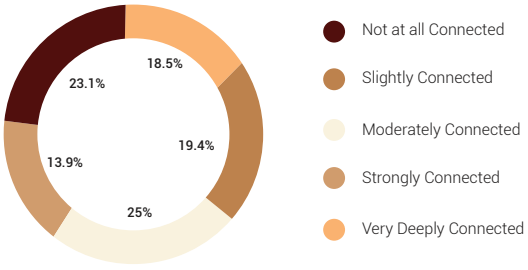
Two questions were asked viz., what they believe are the impacts of Yamuna pollution and their personal connection to Yamuna.

As a resident of Delhi, what do you think is the impact of Yamuna's Pollution?



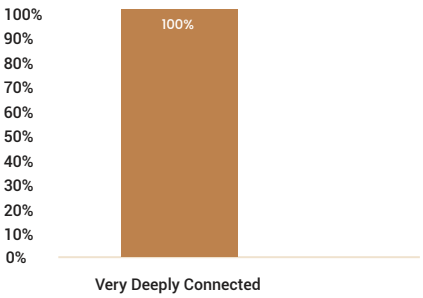
The chart highlights how residents of Delhi perceive the impact of Yamuna's pollution. A vast majority associate it with health risks and environmental damage, while more than half also recognize economic consequences. Fewer link it to broader effects such as the city's prestige, religious sanctity, or property value. These insights offer a clear direction for government communication strategies. By explicitly connecting Yamuna rejuvenation efforts with the high-concern areas identified by the public—such as health, environment, and economy—campaigns can be made more relatable and persuasive, ensuring greater public engagement and long-term behavioural change.

How personally connected to you feel to Yamuna today?



The same question was posed to members of riverine communities during our field interactions, allowing us to contrast their responses with those of the broader Delhi population. The findings clearly indicate that individuals residing near the Yamuna, particularly those whose livelihoods are directly linked to the river, report a significantly stronger personal connection to it than other residents. This suggests that riverine communities are likely to be more vigilant and proactive in protecting the river. Their traditional knowledge, practices, and lived experience represent valuable assets that the government can meaningfully integrate into the design and execution of river rejuvenation initiatives.

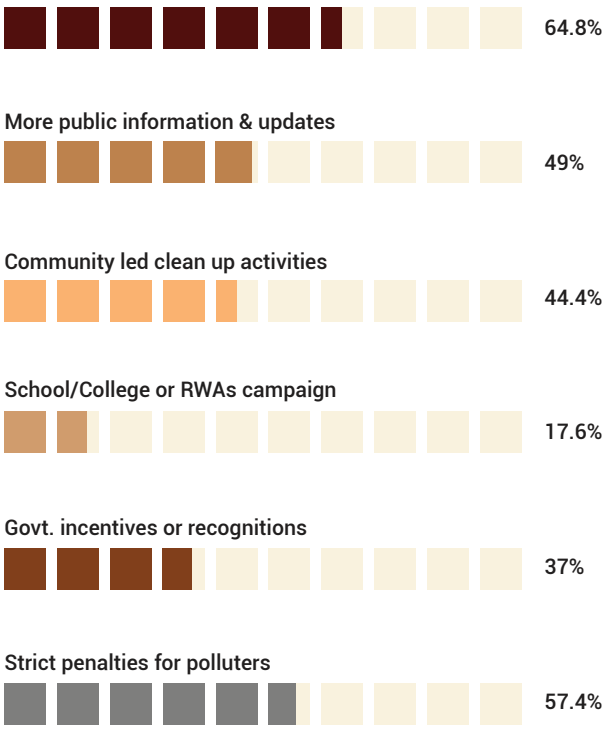
Response by Riverine Community



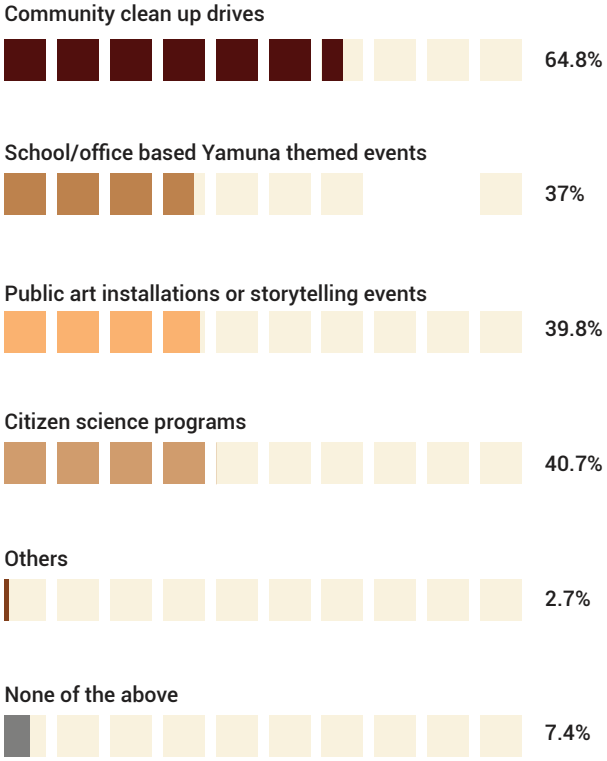
5.4.4. Engagement Potential

When we asked people what might encourage them to get involved in cleaning the Yamuna, one message came through clearly: they want to see real change. The most common response was that visible improvement in water quality would motivate them to act. Many also said they would be more likely to participate if there were stricter penalties for polluters and more regular updates from the government. What stood out wasn't just willingness, but a desire for meaningful engagement. A large number of respondents showed interest in joining community clean-up drives, contributing to citizen science efforts like water testing, or even participating in creative activities such as public art and storytelling events about the river. School- and office-based programs also appealed to many. Only a small fraction said they wouldn't want to take part at all. Overall, it's clear that people are looking for signs of progress and for opportunities that feel practical, relevant, and rooted in community.

What would make you more likely to participate Yamuna cleaning efforts?



Would you or anyone in your household be interested in participating in any of the following?



5.5. Implications for Policy and Practice

The narratives emerging from Delhi's riverbank communities provide urgent and grounded insights into what a truly effective Yamuna rejuvenation strategy must include. First and foremost, these voices underscore that pollution is not merely a technical or environmental issue but rather it is a social, cultural, and economic crisis with far-reaching consequences. The lived experiences of fishermen, farmers, priests, boatmen, and vendors reveal a pattern of neglect: the people most affected by the river's decline are often excluded from decisions about its future. This top-down approach must shift.

What needs to change is the way we define "restoration." Policy must move beyond engineering to embrace inclusive planning frameworks that prioritize the voices of river-dependent communities. Their knowledge, experience, and cultural practices are not peripheral—they are central to any sustainable solution.

One key implication is the need for community engagement. Residents living along the Yamuna must not only be consulted but empowered as stakeholders and stewards of the river. Decentralized initiatives like community monitoring of water quality, localized waste management, and participatory mapping can create ownership and accountability from the ground up. Youth engagement, in particular, can help bridge the growing disconnect between the river and newer generations.

Another urgent need is for behavioural change strategies that address how citizens interact with the river. Public campaigns should move beyond awareness to action, helping shift cultural practices that contribute to degradation like ritual dumping, while reviving others that can support conservation. Schools, religious institutions, and resident welfare associations (RWAs) can be powerful sites for such transformation.

Finally, the findings show that cultural and livelihood linkages must be preserved and revived. The Yamuna is not just a water body, it is a lifeline for priests conducting rituals, boatmen guiding pilgrims, and farmers growing food. Policies must protect and adapt these traditional roles rather than erase them. Restoration cannot succeed if it leads to further dispossession.

The path to a cleaner Yamuna runs not just through cleaner drains, but through reconnected lives. A river can only be revived when its people are, and that begins by listening to them.

06 Reclaiming the Yamuna: A Two-Pronged Approach for Delhi

The Yamuna River, long considered sacred and central to Delhi's identity, now flows through the city as a lifeless drain. Reviving it demands more than infrastructure; it requires systemic reform and societal reawakening.

Therefore, it's necessary to take a two-pronged approach that addresses both the structural causes of pollution and the deep disconnect between the people of Delhi and the river itself.

6.1. Part I: Addressing Structural and Systemic Issues

The first step is to resolve the long-standing infrastructure and governance bottlenecks that have reduced the Yamuna to one of the most polluted rivers in India. Based on the Central Pollution Control Board (CPCB) benchmarks, the Delhi stretch of Yamuna consistently fails to meet the minimum water quality standards (Class C), particularly for Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), and Faecal Coliform (FC).

Key Suggestions	Concerned Authority
Institutional Reform	
1. Interstate Yamuna Rejuvenation Compact: The health of the Yamuna River, particularly in its Delhi stretch, is intrinsically tied to upstream and downstream actions in Haryana and Uttar Pradesh. Without shared accountability and coordinated action across state lines, isolated interventions by Delhi alone will be insufficient. To address this, the Central Government (preferably through MoEFCC or NMCG) can facilitate creation of an Interstate Yamuna Rejuvenation Compact, involving Delhi, Haryana, and Uttar Pradesh-modeled on mechanisms used for the Ganga River Basin Management Authority. The compact should: a. Set state-specific targets for pollution control and STP upgrades. b. Enable a dashboard for river health and shared water bodies monitored jointly by CPCB and SPCBs. c. Establish a joint task force for coordination and funding alignment. d. Introduce penalties and incentives linked to performance. With the 1994 Memorandum of Understanding, which governs water allocation among Uttar Pradesh, Haryana, Rajasthan, Himachal Pradesh and the NCT of Delhi and forms the legal basis for the Upper Yamuna River Board, becoming eligible for renegotiation after 2025, this presents a timely opportunity to integrate provisions for environmental flows and align water-sharing arrangements with the evolving realities of climate change. This renewed agreement can complement the proposed Interstate Yamuna Rejuvenation Compact by promoting basin-wide coordination and sustainability.	MoEFCC/NMCG to coordinate with Uttarakhand, Delhi, Haryana, UP, & Rajasthan for cross-state river health targets.
2. Yamuna Cleaning Board: A. A major bottleneck in effective Yamuna management is the fragmented governance structure involving multiple departments such as DJB, MCD, DDA, IFCD, and DPCC, which leads to duplication of responsibilities and inter-departmental coordination issues. B. To address this, establish a Yamuna Cleaning Board with representatives from all key departments and agencies.This cleaning board should 1. Align functions and define complementary Key Responsibility Areas (KRAs) to avoid overlap and ensure accountability. 2. Develop a Standard Operating Procedure (SOP) for grievance redressal, issue escalation, and timely resolution. 3. Enable robust, tech-enabled progress monitoring to ensure timely execution and course correction.	GNCTD to form inter-agency Board with DJB, DPCC, MCD, DDA and others for task alignment.

Key Suggestions	Concerned Authority
Governance and Enforcement	
3. Zero Liquid Discharge (ZLD) Mandate for GPIs: Delhi must adopt a stricter regulatory regime to manage pollution from Grossly Polluting Industries (GPIs) such as dyeing units, tanneries, electroplating units, and chemical processing facilities. These industries are high-load contributors to water pollution, often located in industrial clusters near the Najafgarh and Shahdara drain basins. A. Currently, most GPIs are mandated to send their effluents to Common Effluent Treatment Plants (CETPs). However, this model has certain limitations: 1. If an industry shifts location (formally or informally) away from its CETP catchment area - whether due to land pressure, lease expiry, or informality - there is no binding mechanism to ensure it is connected to a new treatment facility. This creates a loophole that allows untreated discharges directly into drains, especially in peri-urban or unauthorized industrial pockets. 2. Additionally, many CETPs operate below capacity or with insufficient tertiary treatment, making them ineffective for true discharge compliance. B. To address this, the CPCB and DPCC may: 1. Mandate Zero Liquid Discharge (ZLD) or near-ZLD systems within industrial premises for specific high-risk sectors, regardless of their CETP linkage. 2. Enforce location-sensitive compliance, requiring all GPIs to register changes in operational address and prove alternate effluent treatment arrangements. 3. Introduce a license renewal condition tied to effluent treatment compliance, with real-time discharge monitoring via online systems. 4. Create a central tracking system for industrial wastewater movement, including third-party audits and performance-based disclosures.	CPCB and DPCC to enforce on-site treatment compliance and license-linked ZLD norms.

Key Suggestions	Concerned Authority
Governance and Enforcement	
4. Treated Wastewater Reuse Policy to Enable Water Circularity: Despite the existence of several Sewage Treatment Plants (STPs) in Delhi, a large volume of even treated wastewater is discharged directly into the Yamuna. In many cases, the water is either under-treated or not reused, representing a major missed opportunity in urban water circularity. There is an urgent need for a city-level Treated Wastewater Reuse Policy that: A. Defines quality standards for various levels of treatment (e.g., tertiary, chlorinated) and aligns them with end-use applications. B. Specifies permissible reuse sectors - such as: i. Construction (curing, dust control) ii. Horticulture and landscaping (parks, green belts) iii. Cooling in thermal power plants and commercial buildings iv. Flushing in high-rise residential and institutional buildings v. Industrial processes (e.g., in CETP zones) C. Mandates reuse targets for bulk generators and ULBs (Urban Local Bodies), especially in water-stressed zones. D. Creates an incentive framework for treated water offtake and distribution infrastructure. E. Promotes Decentralized Wastewater Reuse Zones in new urban developments and large public spaces.	DJB and DPCC to draft reuse standards and incentivize treated water distribution.
5. Central Land Pooling Mechanism (with MoHUA and DDA): A. A major bottleneck in urban wastewater treatment is the unavailability of land for building full-scale or decentralized STPs, especially in dense unauthorized colonies or low-income settlements. B. To address this, a Central Land Pooling Mechanism may be developed in coordination with MoHUA (Ministry of Housing and Urban Affairs) and DDA (Delhi Development Authority). This mechanism should: 1. Identify and earmark small, underutilized, or vacant land parcels near natural drains and nullahs using satellite data and masterplan overlays. 2. Enable pooled ownership or incentivized contribution from RWAs, landowners, or local bodies for public purpose infrastructure. 3. Design modular DSTPs that require minimal land and can be set up in parks, community centers, or open green spaces with low visual impact. 4. Build a priority deployment plan in wards/colonies with high discharge but no formal sewerage network. 5. Ensure that these localized treatment systems feed treated water back into the ground or reuse systems (construction, horticulture, etc.), helping plug both coverage gaps and support urban water circularity. c. This approach would integrate urban planning, environmental infrastructure, and legal mechanisms, creating a replicable model for other Indian cities struggling with wastewater-linked river pollution.	MoHUA and DDA to identify pooled land for modular treatment near high-discharge zones.

Key Suggestions	Concerned Authority
Sewage and Drain Management	
6. Integrated Sewerage Master Plan (with PM Gati Shakti support): A. To truly address the root of river pollution, especially in dense urban environments like Delhi, an integrated sewerage master plan should be developed and aligned with the PM Gati Shakti National Master Plan. This would involve end-to-end mapping of trunk sewers, peripheral sewers, pumping stations, manholes, and existing STPs/DSTPs using satellite imagery, geotagged infrastructure datasets, and IoT-linked monitoring tools. B. The master plan should: 1. Digitally map all existing and planned sewerage assets to assess gaps in coverage, redundancies, and underutilized capacities. 2. Overlay population density, informal settlements, and flood risk zones to identify priority intervention areas. 3. Enable real-time monitoring of flow, blockages, and overflow risks using smart flow meters and predictive analytics tools. 4. Create a phased infrastructure upgrade plan to target critical stretches draining into the Yamuna - particularly between Wazirabad and Okhla. PM Gati Shakti's integrated geospatial platform can help bring together all departments (DJB, MCD, ULBs, HSPCB, etc.) on a common operating picture, improving infrastructure coordination, investment prioritization, and seamless execution.	DJB with PM Gati Shakti to map, monitor and upgrade sewerage infrastructure.
7. A hybrid approach combining STPs, DSTPs, and FSTPs: Delhi's urban fabric is too heterogeneous for a one-size-fits-all solution to sanitation. A hybrid approach combining large-scale Sewage Treatment Plants (STPs), Decentralized Sewage Treatment Plants (DSTPs), and Faecal Sludge Treatment Plants (FSTPs) is necessary to build a comprehensive, resilient, and context-responsive sanitation ecosystem. A. Currently, over 575 unauthorized colonies in Delhi remain outside the formal sewerage grid due to legacy issues, space constraints, or lack of integration with city planning. In such areas, Faecal Sludge and Septage Management (FSSM) provides a feasible alternative. B. To implement this: 1. The Delhi Jal Board (DJB) may develop and notify a Delhi Faecal Sludge Management Policy, aligned with national FSSM guidelines. 2. All septic tanks may be registered and brought under a mandatory desludging regime, serviced by certified operators. 3. FSTPs should be established near high-density unsewered zones using small land parcels, with Public-Private Partnerships (PPPs) encouraged for operation and maintenance. 4. Colonies with partial grid access can be supported via DSTPs, especially in peri-urban areas, educational campuses, and dense clusters. This integrated model ensures inclusive sanitation, faster expansion, and reduced untreated discharge into stormwater drains and ultimately, the Yamuna	DJB to notify and implement inclusive sanitation models and infrastructure

Key Suggestions	Concerned Authority
Sewage and Drain Management	
8. Incentivized Connection to Sewer Network: One of the key reasons for underutilization of Delhi's existing STP infrastructure is the low rate of household-level sewer connections, especially in unauthorized colonies. Even where trunk infrastructure exists, many residents rely on septic tanks or release greywater into open drains. To accelerate household sewer connectivity: A. The DJB and Delhi Government can launch a targeted incentive scheme offering: 1. Capital subsidies to low-income households and RWAs to cover connection costs. 2. Property tax rebates or sewer charge waivers for early adopters. 3. One-time connection fee waivers in priority zones identified by pollution load or STP catchment coverage. B. An awareness and mobilization campaign should be run using local influencers, RWAs, municipal councillors, and ward-level champions to educate residents on health, financial, and environmental benefits. C. DJB can also consider creating a "Sewer Connection Facilitation Cell" for handholding residents with approvals, vendor access, and grievance redressal. D. This approach improves the return on investment of public sewerage infrastructure, enhances operational efficiency of STPs, and directly contributes to improved water quality in the Yamuna.	DJB and GNCTD to subsidize connections, waive fees, and mobilize RWAs

Key Suggestions	Concerned Authority
Sewage and Drain Management	
9. Najafgarh & Shahdara Drain Cleanup Project (Under NMCG): Prioritize the cleanup of Najafgarh and Shahdara drains, which contribute over 70% of pollution to the Yamuna in Delhi. A. Leverage Namami Gange Phase 2 funding to: 1. Upgrade all STPs and interceptor sewers along these drain corridors 2. Improve real-time flow monitoring, desilting, and operation & maintenance 3. Integrate community engagement and enforcement to reduce illegal discharge This focused investment can significantly reduce the pollution load entering the river and create a model corridor for drain rejuvenation in urban India.	DJB to execute the projects
Solid Waste Management	
10. Construction Waste Drop-off Points: Identify and mark dedicated drop-off points near high-infra-areas (e.g. under bridges, near ghats) at key floodplain peripheries along the Yamuna to prevent illegal dumping, which degrades embankments and obstructs natural drainage.	MCD and DDA to establish legal drop zones near riverbanks to curb dumping.
Monitoring & Surveillance System	
11. SCADA-Based Dashboard for Real-Time Monitoring, Project Management and Data Transparency A. To ensure better internal coordination and public accountability, a centralized SCADA-based dashboard should be developed for the Yamuna: 1. This dashboard should provide real-time data on key parameters such as flow rates, pollution loads, STP performance, sewer connectivity, and river health indicators (DO, BOD, FC, metals, pharmaceutical residues etc). 2. It should be designed for dual use—supporting internal planning and monitoring by relevant departments (DJB, DPCC, MCD, etc.) while also offering public-facing transparency through an open data portal. 3. Alerts and predictive analytics features can help identify bottlenecks, infrastructure failures, or unusual discharge events for timely response and mitigation. 4. A common interface will enable improved decision-making, progress tracking, and citizen engagement—aligning with the broader goals of digital governance and participatory river management.	DJB to host real-time platform with DPCC, MCD input and public dashboard access.

Key Suggestions	Concerned Authority
Monitoring & Surveillance System	
12. Independent Third-Party Audits for Monitoring and Accountability	
A. Alongside internal monitoring, it is essential to institutionalize regular third-party audits to build trust and verify compliance: 1. Accredited agencies should be appointed to conduct independent audits of water quality, STP and CETP performance, sewer network functionality, and riverbank 2. conditions. These audits should be scheduled at fixed intervals (e.g., quarterly or bi-annually) and 3. follow uniform protocols aligned with CPCB and DPCC standards. Findings should be publicly disclosed and integrated with the SCADA dashboard to ensure transparency and enable public and parliamentary oversight. 4. This mechanism will enhance institutional accountability and help identify systemic gaps, promoting course correction where needed.	DPCC to oversee independent audits with and publish compliance scores.

6.2. Part 2: Rebuilding the People-River Relationship

Despite Yamuna's ecological and spiritual significance, Delhi's residents remain largely disconnected from the river. Unlike Ganga in Varanasi or Sabarmati in Ahmedabad, the Yamuna in Delhi has very less emotional or recreational engagement from its citizens. Therefore, there is a need to launch a Yamuna-Citizen Connect Campaign, **नदी से नाता** (Nadi Se Naata), focused on cultural revival of the River Yamuna.

Cohort	Key Suggestions	Concerned Authorities
Schools	Establishing an annual/bi-annual "Sustainability Week" across Delhi schools with Yamuna as the thematic anchor. A. **Climate tech hackathons:** On themes such as river restoration, air-water sensors, decentralized wastewater reuse, water budgeting apps, etc. Partnering with tech incubators & VCs for judging and seed grants for top ideas. B. **Form school-level "River Parliament" groups to research and present Yamuna's challenges and propose solutions.** Organize inter-school competitions and a final city-level convention. C. **Blue Delhi Retrofit Mission in Schools:** This is to ensure that schools have functional rainwater harvesting system.	Education Department, GNCT of Delhi
Residents, Tourists, Local visitors	1. **Yamuna in Art Installations:** Invite artists to create public sculptures, murals, or light installations around Yamuna ghats and bridges to narrate her story. 2. **Social Media series for नदी से नाता (Nadi Se Naata):** Weekly episodes featuring voices of boatmen, washerwomen, fishermen, historians, scientists, and activists. 3. **Baat Yamuna Ki- Influencer Shorts:** Instagram Reels or YouTube Shorts where climate influencers, actors, chefs, or athletes talk about water use or their "Yamuna habit." 4. **Animated Explainers / 2D Infographics:** Explain STPs, untreated sewage, Yamuna zones, and how citizens unknowingly pollute it. End with a "Did You Know?" fact.	DJB, MCD, Department of Tourism, Art Culture & Language Department
College Students and Youth	**Startups and Innovation Challenge for RiverTech Solutions** To catalyze interest and action among young professionals, entrepreneurs, and engineers, Delhi should promote a RiverTech Innovation Challenge focused on sewage, faecal sludge, and urban liquid waste management: 1. Partner with existing incubators, research institutions, and VCs to host open calls for tech-based solutions—ranging from AI-driven sewer monitoring and compact STP designs to circular economy models for wastewater reuse. 2. Provide seed funding, co-working spaces, and pilot access on government infrastructure for shortlisted startups through Delhi Jal Board or NMCG-backed support. 3. Encourage student teams, innovators, and local businesses to co-develop frugal, scalable prototypes that can be deployed in informal settlements or low-resource environments. 4. As economic interest in this sector grows, more people—especially youth—are likely to engage meaningfully with the river's revival, creating a virtuous cycle of innovation, employment, and civic pride.	Office of Comissioner of Industries, GNCTD can collaborate with incubators.

Cohort	Key Suggestions	Concerned Authorities
Riverine Communities	**Involving community in rejuvenation efforts** The people living near Yamuna and people depending on Yamuna for their livelihood have a stronger connection to Yamuna than other residents of Delhi. Therefore, A. Create small, community-led groups along different stretches of the Yamuna made up of fishermen, farmers, priests, boatmen, and vendors. These circles would meet regularly (e.g., monthly "River Sabhas") to identify local issues, track changes, and advise on restoration actions. B. Equip community members,—especially youth—with basic tools (like mobile apps or test kits) to monitor water quality, illegal discharge points, and seasonal changes. These can feed into open-source city dashboards or citizen science platforms. C. Further, the traditional knowledge and skill sets of these communities can be used to develop, restore and preserve Yamuna. D. Representatives from these communities could be nominated to participate in city-level Yamuna Task Force meetings, ensuring ground-up inputs into decision-making processes. E. Small cultural micro-grants can support the revival of river-linked traditions and oral histories.	DJB and MCD

6.3. Yamuna Transformation Quadrant

The Yamuna Transformation Quadrant positions our key Yamuna rejuvenation recommendations along two dimensions: the impact on river cleaning (horizontal axis) and the level of public engagement (vertical axis). The horizontal axis captures how significantly an initiative contributes to improving Yamuna's ecological health, while the vertical axis reflects the degree to which it mobilizes or involves the public. Based on their placement, initiatives are grouped into four strategic categories:

- **Transformative levers (high impact, high engagement):** system-shifting interventions that drive both environmental and civic change.
- **Governance foundation (high impact, low engagement):** regulatory, infrastructural, or institutional reforms essential for long-term river health.
- **Community catalysts (low impact, high engagement):** localized or behavioral initiatives that foster public ownership and grassroots momentum.
- **Tactical enablers (low impact, low engagement):** supportive measures that improve execution or fill immediate operational gaps.

This classification can help prioritize actions that are not only effective but also socially resonant and sustainable.

YAMUNA TRANSFORMATION QUADRANT

Framing Interventions by Reach and Reform Potential

6.4. Conclusion

The story of the Yamuna in Delhi is not only about pollution levels or treatment capacity. It is also about the lives, memories, and practices that have been disrupted as the river has declined. This chapter shows that the people most affected by the Yamuna's condition—fishermen, farmers, priests, boatmen, and vendors—are often left out of restoration efforts. Their daily experiences reflect a growing gap between the river's symbolic importance and its actual state. Rituals that once involved direct contact with the water are now performed at a distance, and entire occupations have become unviable.

Despite these challenges, there is still a strong connection between people and the river. Community members express frustration and disappointment, but also a willingness to adapt and contribute to change.

Many want to see improvements, and would engage more if they felt included and informed. The Citizen Perception Survey also showed that people across Delhi care deeply about the Yamuna's future, even if their understanding of technical issues varies. There is clear potential to build a stronger public role in the river's revival.

The way forward requires shifting from top-down planning to a more inclusive and grounded approach. Restoration should not only focus on infrastructure and enforcement. It should also support cultural practices, protect livelihoods, and create spaces for communities to lead. Listening to the people of the river is not optional. It is central to any effort that hopes to succeed.

Contributors

Sameer Jain
Managing Director,
Primus Partners

Ramakrishnan
Managing Director,
Primus Partners

Pooja Lahri
Vice President,
Primus Partners

Nipun Matreja
Vice President,
Primus Partners

Siddharth Singh
Manager,
Primus Partners

Tavishi Darbari
Manager,
Primus Partners

Harshpreet Kaur
Senior Consultant,
Primus Partners

Jayaditya Mallik
Research Intern,
Primus Partners

Dis**claimer**

The document is prepared using information of a general nature and is not intended to address the circumstances of any particular individual or entity.

The report has been prepared from various public sources and the information received from these sources is believed to be reliable. The information available in the report is selective and subject to updation, revision and amendment. While the information provided herein is believed to be accurate and reliable, Primus Partners Pvt. Ltd. do not make any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and data available in the public domain.

While due care has been taken while preparing the report, Primus Partners Pvt. Ltd. do not accept any liability whatsoever, for any direct or consequential loss arising from this document or its contents. The IP and Copyright of all the Logos used in the documents reside with their individual owners only.

PASSION
for providing solutions to help clients achieve their goals

RESPECT
for all and alternate viewpoints

INTEGRITY
of thoughts and actions

MASTERY
of our chosen subject to drive innovative and insightful solutions

US
representing the Primus collective, where each individual matters

STEWARDSHIP
for building a better tomorrow

PRIMUS PARTNERS®

Solutions for **Tomorrow**

Primus Partners has been set up to partner with clients in 'navigating' India, by experts with decades of experience in doing so for large global firms. Set up on the principle of 'Idea Realization', it brings to bear 'experience in action'. 'Idea Realization'— a unique approach to examine futuristic ideas required for the growth of an organization or a sector or geography, from the perspective of assured on ground implementability.

Our core strength comes from our founding partners, who are goal-oriented, with extensive hands-on experience and subject-matter expertise, which is well recognized in the industry. Established by seasoned industry leaders with extensive experience in global organizations, Primus Partners boasts a team of over 250 consultants and additional advisors, showcasing some of the finest talent in the nation.

The firm has a presence across multiple cities in India, as well as Dubai, UAE. In addition, the firm has successfully executed projects across Africa, Asia Pacific and the Americas.

India Offices

Bengaluru
91 Springboard
Business Hub 175, 176
Bannerghatta Rd,
Dollars Colony,
Bengaluru – 560076

Chandigarh
2nd Floor, Netsmartz,
Plot No. 10, Rajiv
Gandhi Chandigarh
Technology Park,
Chandigarh – 160019

Chennai
147, Pathari Rd, Door #3,
WorkEz Hansa Building,
RK Swamy Centre,
Thousand Lights,
Chennai, TN - 600006

Delhi
1 to 7, UG Floor,
Tolstoy House,
Tolstoy Road,
Connaught Place
New Delhi - 110001

Kolkata
2/1, Russel St,
Park Street area,
Kolkata,
West Bengal – 700071

Mumbai
601, 6th floor,
Raheja Centre,
Nariman Point,
Mumbai,
MH - 400021

International Offices

Dubai
United Arab Emirates
(UAE)

Dammam
Kingdom of Saudi Arabia
(KSA)

Washington D.C
United States of America
(USA)

www.primuspartners.in | info@primuspartners.in | Primus Partners India | @partners_primus | @primuspartners7128