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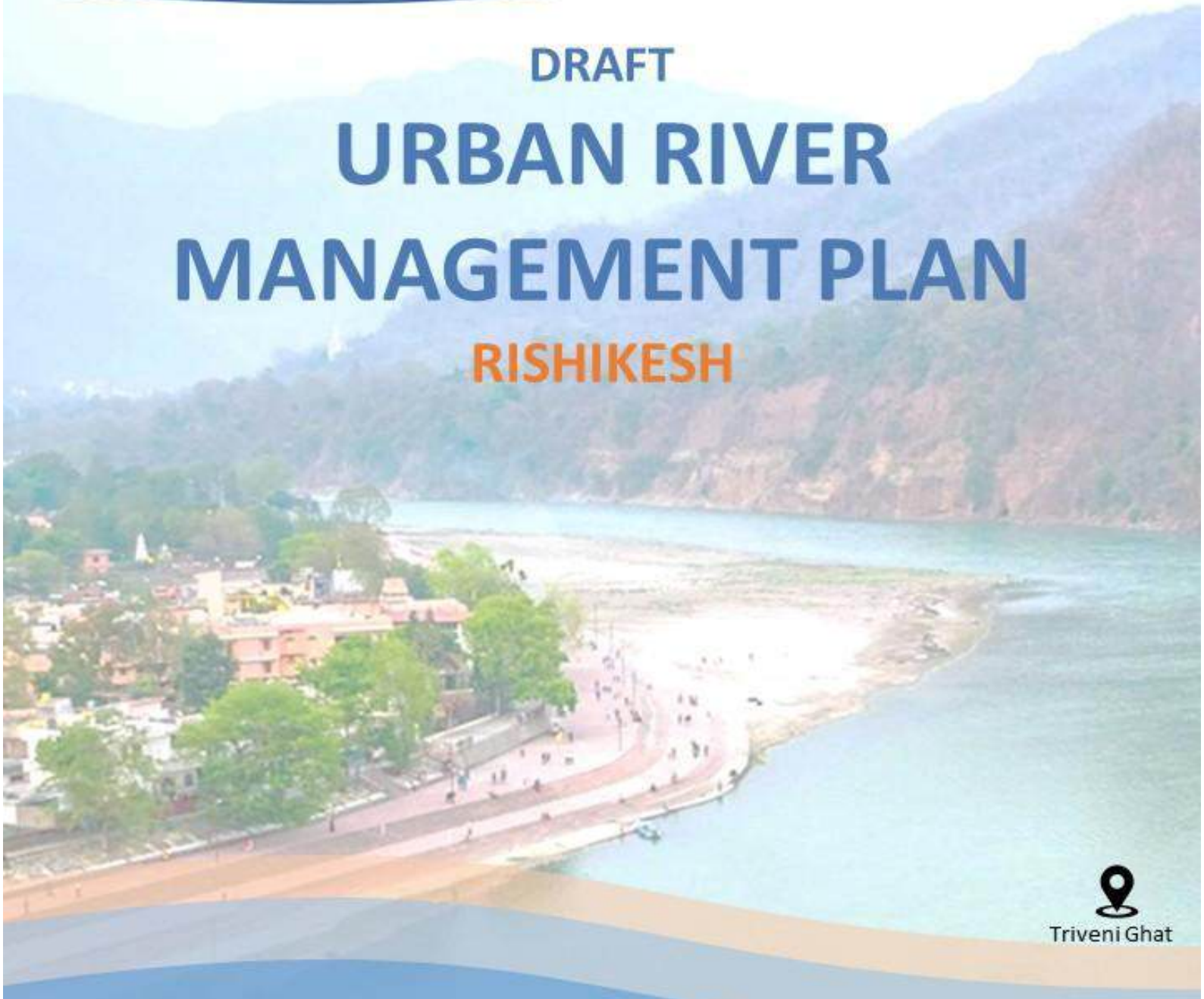
URBAN RIVER MANAGEMENT PLAN

RISHIKESH



NAMAMI GANGE

National Institute of Urban Affairs

LEA

RISHIKESH MUNICIPAL CORPORATION
UTTRAKHAND

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EXECUTIVE SUMMARY

A river and a city have a symbiotic relationship. The river provides the "life" (resources, climate regulation, identity) and in return, the city acts as the "steward" (protecting the catchment, managing flow and maintaining biodiversity). However, in recent times this relationship has devolved into parasitism, where the city extracts resources and dumps waste, slowly killing the host river. Urban River Management Plan (URMP) is a strategic framework designed to shift the urban-river dynamic from "exploitation" (parasitism) to "stewardship" (symbiosis).

The purpose of the Urban River Management Plan (URMP) Rishikesh is to develop a dedicated strategy for managing the River Ganga and its tributaries that flows through the city in an efficient and sustainable manner.

The purpose of this document (Urban River Management Plan, URMP of Rishikesh is to develop a dedicated strategy for managing the extent of River Ganga and its tributaries that flow through the city of Rishikesh in an efficient and sustainable manner. The document is based on the Strategic Framework for Managing Urban River Stretches developed by the National Institute of Urban Affairs (NIUA), in association with the National Mission for Clean Ganga (NMCG).

The URMP proposes **23 tangible and practical actions along with several recommendations under a ten-point agenda** (or objectives) to ensure the "Nirmal" (clean) and "Aviral" (continuous) nature of the rivers in the city. The level of detail for the interventions are presented is restricted to the concept idea level for general broad understanding, with Detailed Project Reports (DPRs) to be prepared subsequently. will be prepared for each intervention based on the concept ideas proposed in the document. The URMP document is a living document, evolving continuously to which will address emerging issues related to river management on continuous basis.

Approach adopted for preparing the URMP for Rishikesh

To prepare the URMP, a Multistakeholder Working Group (MSWG) comprising 15 members from different organizations, chaired by the Municipal Commissioner, Rishikesh Municipal Corporation was set up to lead the development of the URMP for Rishikesh. The team from NIUA and NMCG helped facilitate the MSWG meeting. This was followed by a rapid baseline assessment to understand river-related issues and challenges faced by the city and to identify opportunities for enhancing river-city interaction. The assessment was based on secondary data, published reports and ongoing projects. It covered planning provisions related to river, streams, drains etc; status of river pollution and groundwater, encroachments in floodplain and ongoing projects in the city and waterbodies.

A second MSWG meeting was held under the chairpersonship of chairpersonship of Mayor, Rishikesh Municipal Corporation to seek input from different actors for the development of the URMP. On the basis of the rapid baseline assessment and discussions with MSWG members, 23 projects/interventions were identified that will be taken up in Rishikesh URMP.

Envisaged benefits of the URMP for Rishikesh City

It is envisaged that implementing the URMP will yield several tangible and intangible benefits, as listed below.

1. It will improve climate resilience and environmental outlook of the city, making it more appealing to residents and visitors as well as help in providing ancillary benefits such as water pollution control, thriving biodiversity, flood mitigation and improved groundwater recharge.
2. It will improve the connect between the residents and the river by creating avenues for recreation, social bonding and leisure thereby improving the quality of life of the residents.
3. It will boost the city's river-related economy and provide livelihood for multiple stakeholders.
4. The URMP will create a premise for shared governance with key stakeholders and citizens and enable them to take on a more active role in managing the city's environmental assets and instilling a sense of ownership around actionable items.

Interventions proposed in URMP

The table below list the key details of the 23 interventions that includes the agencies responsible for implementation, estimated costs and the source of funding for each intervention.

Sl. No.	URMP Objective	Intervention	Responsible Agency	Estimated Cost (In rupees)	Potential Financing Sources
1	**Regulation of Activities in Flood Plains**	Intervention 1: Inclusion and strengthening of provisions in Master Plan of Rishikesh, 2031	Town & Country Planning Department, Dehradun; Irrigation Department, NNR	-	-
2	**To keep river free from pollution**	Intervention 2: Systematic Sewage Flow and Treatment Upgradation: De-Linking Dhalwala Nallah from Chandreshwar STP	Pey Jal Nigam	10 Cr	Namami Gange
		Intervention 3: Construction of I&D structure at Shanti Nagar Nallah	Pey Jal Nigam	1 Cr	Namami Gange
		Intervention 4: Conversion of wastewater ponds into Constructed Wetlands for Krishna Nagar and Barrage Colony	Pey Jal Nigam	1.5 Cr	Namami Gange
		Intervention 5: Comprehensive sewerage master plan for area between Song River	Pey Jal Nigam	1 Cr	Namami Gange

Sl. No.	URMP Objective	Intervention	Responsible Agency	Estimated Cost (In rupees)	Potential Financing Sources
		and Kharastrot Rao River			
		Intervention 6: Construction of 20 KLD Co-treatment plant at 8 MLD STP	Municipal Corporation Rishikesh	2.4 Cr	Namami Gange
		Intervention 7: Preparation of Faecal and Septage Management Plan	Municipal Corporation Rishikesh	0.5 Cr	Namami Gange
		Intervention 8: Removal of solid waste from the Dhalwala drain and Rambha River	Municipal Corporation Rishikesh	1.4 Cr	Municipal budget and CSR
3	**To rejuvenate waterbodies and wetlands in the city**	Intervention 9: Rambha River Constructed Wetland (Mira Neer Vatika)	MDDA and UK Peyjal Nigam	20 Cr	NMCG
5	**Reuse of treated used water**	Intervention 10: Reuse of treated wastewater in the city	Municipal Corporation Rishikesh, Pey jal Nigam	6 Cr	Municipal budget, AMRUT
7	**To develop eco-friendly riverfront projects**	Intervention 11: Establishing physical connection of ghats to anchors	Irrigation Department	55 Cr	State Grant ("Iconic City Rishikesh" Fund), CSR
		Intervention 12: Theme wise development of ghats with lower footfalls	Uttarakhand Tourism Development Board	3.75 Cr	Ministry of Tourism, GoI, MNRE (Ministry of New and Renewable Energy
9	**To inculcate river-sensitive behaviour among citizens**	Intervention 13: Interpretive Signage and QR-Coded Storytelling Boards	Municipal Corporation Rishikesh	13.5 Cr	SBM 2.0, CSR, community NGOs
		Intervention 14: Eco-Ritual Starter Kits at Ghats, temples & Tourist Resorts	Municipal Corporation Rishikesh	0.07 Cr	Municipal sanitation budget, CSR (local businesses, flower vendors), Temple trusts

Sl. No.	URMP Objective	Intervention	Responsible Agency	Estimated Cost (In rupees)	Potential Financing Sources
		Intervention 15: Digital River Engagement Platform ("Swachh Ganga")	Municipal Corporation Rishikesh	0.04 Cr	Municipal IEC budget, CSR (telecom partners, hotels)
		Intervention 16: Annual Celebration of "River Day"	Municipal Corporation Rishikesh	0.11 Cr	Municipal cultural budget, Tourism Dept., CSR (hotels, banks, safari operators)
		Intervention 17: Designated Cloth disposal Zones in Kunds "Arpan Kunds" (Ritual Tanks)	Municipal Corporation Rishikesh	0.11 Cr	Municipal sanitation budget, CSR (local businesses, flower vendors), Temple trusts
10	**To engage citizens in river management activities**	Intervention 18: Establishment of River Sabha Committees at the city level to promote participatory river governance	Municipal Corporation Rishikesh	0.05 Cr	Municipal budget, CSR contributions.
		Intervention 19: Riverbank Adoption by Schools, RWAs & Resorts	Municipal Corporation Rishikesh	0.09 Cr	Municipal IEC Budget, Education Department, CSR
		Intervention 20: Street Plays in Market, Temple & Tourist Places	Municipal Corporation Rishikesh	0.05 Cr	Municipal IEC Budget, CSR
		Intervention 21: Citizen & Tourist Monitoring Dashboard	Municipal Corporation Rishikesh	0.03 Cr	Municipal IEC budget allocation under SBM(U), CSR funds, Community contributions
		Intervention 22: "Ganga Gatha" Light and Sound show in triveni ghat	Municipal Corporation Rishikesh	0.06 Cr	Municipal IEC budget, CSR funds
		Intervention 23: "Swachhta Challan" (Cleanliness Fine) for Rishikesh	Municipal Corporation Rishikesh	0.15 Cr	Municipal IEC budget, CSR funds
	Total			**116.81 Cr**	

1 INTRODUCTION

The National Institute of Urban Affairs (NIUA) and the National Mission for Clean Ganga (NMCG) have collaborated to promote river-sensitive urban development across cities in the Ganga basin and other Indian river basins. This collaboration aims to harness the role of the cities to rejuvenate and restore river health. As part of this initiative, two major support systems have been developed: Urban River Management Plan (URMP) Framework and Guidelines for creating River-Sensitive Master Plans.

The framework was prepared to help cities improve and sustain river stretches within their boundaries through holistic, ecosystem-based interventions. It underscores that healthy river are essential for urban livability and productivity and its vision is organized around three elements environmental, economic and social, supported by ten objectives. These objectives are translated into city-specific projects, each tied to funding sources and institutional mechanisms for effective implementation.

Figure 1-1: Ten Objectives of the URMP

A total of sixty URMPs are planned in two phases with 25 in Phase I and 35 in Phase II, including five cities in Uttarakhand in the first phase. Funded by the World Bank under Namami Gange Mission II, this initiative is expected to guide Urban Local Bodies (ULBs) in addressing challenges such as drying rivers, poor waste management, loss of green cover, floodplain encroachment and industrial pollution through systematic, city-level planning. The three tiers of governance and monitoring committees at the center, state and city level is depicted in Figure 1-2.

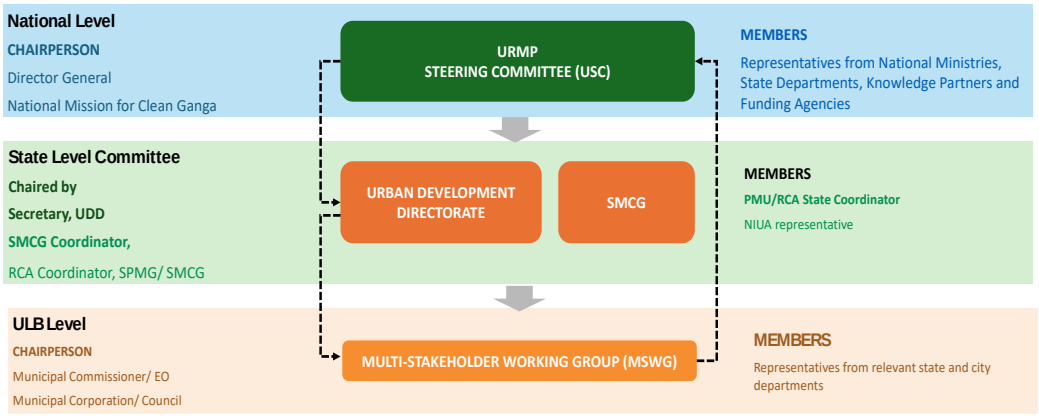


Figure 1-2: National, State & City Engagement for the URMP Preparation

1.1 Process for preparation of the URMP Rishikesh

The preparation of an URMP follows a systematic approach as per NIUA's URMP Components and Guidance Note 2020 and strategic guidelines for making River Sensitive Master Plans 2021 to ensure effective river conservation, sustainable management and stakeholder collaboration. The process involves multiple stages, each contributing to a comprehensive and actionable plan as depicted below.

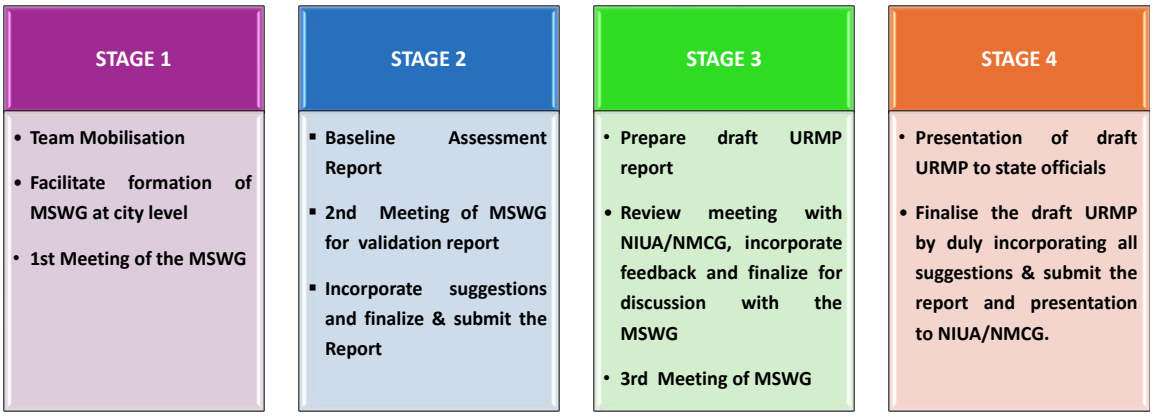


Figure 1-3: Process for preparation of URMP

In order to ensure that the plan is participatory and has involvement of concerned government agencies from the state to the city level, workshops and meetings have been carried out at all levels.

1.2 Status of work and contents of the present deliverable

Tasks one to three as listed in Figure 1-3,have been completed and findings are elaborated in the present deliverable of Draft URMP Report. The detailed content of the report includes the following:

- Key points discussed during URMP State level Steering Committee Meeting for Uttarakhand held on 6th February 2025 at Dehradun,
- Discussions during 1st Multistakeholder Working Group (MSWG) meeting at Rishikesh Municipal Corporation on 6th February 2025,
- Discussions during 2nd Multistakeholder Working Group (MSWG) meeting at Rishikesh Municipal Corporation on 15th January 2026,
- Analysis of the field visit, primary and secondary data available in the public domain and collected from various stakeholder departments post the MSWG meeting.

1.2.1 URMP State level Steering Committee

A State-level URMP Committee, chaired by the Secretary, Urban Development Department (UDD), Government of Uttarakhand has been constituted to oversee the URMP Process. The first State level Steering Committee meeting was held on 06 February 2025 in Dehradun, chaired by Director General, NMCG, with participation from Urban Development Department (UDD) Uttarakhand, State Mission for Clean Ganga (SMCG), City and Country Planning Office (TCPO), Pey Jal Nigam, NIUA, World Bank, School of Planning and Architecture (SPA) and project consultants.

The meeting presented the guiding principles, objectives and work plan for preparing URMPs in five cities of the state. Commissioners, Executive Officers and senior officials shared the current status,

challenges and future plans for river management in their cities.

Image 1-1: Steering Committee Meeting for Uttarakhand on 6th February 2025

1.2.2 Multistakeholder Working Group

To guide the development of city URMP, a Multistakeholder Working Group (MSWG) was formed comprising of 15 representatives from Municipal Corporation, City Magistrate, Forest Department, Tourism Development Board, Uttarakhand Urban Sector Development Agency, Forest Development Corporation, Irrigation Department, Pey Jal Nigam, Jal Sansthan, TCPO, SMCG, Pollution Control Board, Hotel Association and NGO. Post the state level workshop, the first MSWG meeting was held on 20th March 2025 under the chairmanship of Municipal Commissioner, Rishikesh Municipal Corporation, to notify the MSWG for the city and the nodal officer for the URMP (refer Image 1-2).

Image 1-2: MSWG held on 20th March 2025 in Rishikesh

The second MSWG meeting for finalization of the baseline report was held on 15th January 2026 under the chairpersonship of Mayor, Rishikesh Municipal Corporation (refer Image 1-3).

Image 1-3: 2nd MSWG held on 15th January 2026 in Rishikesh

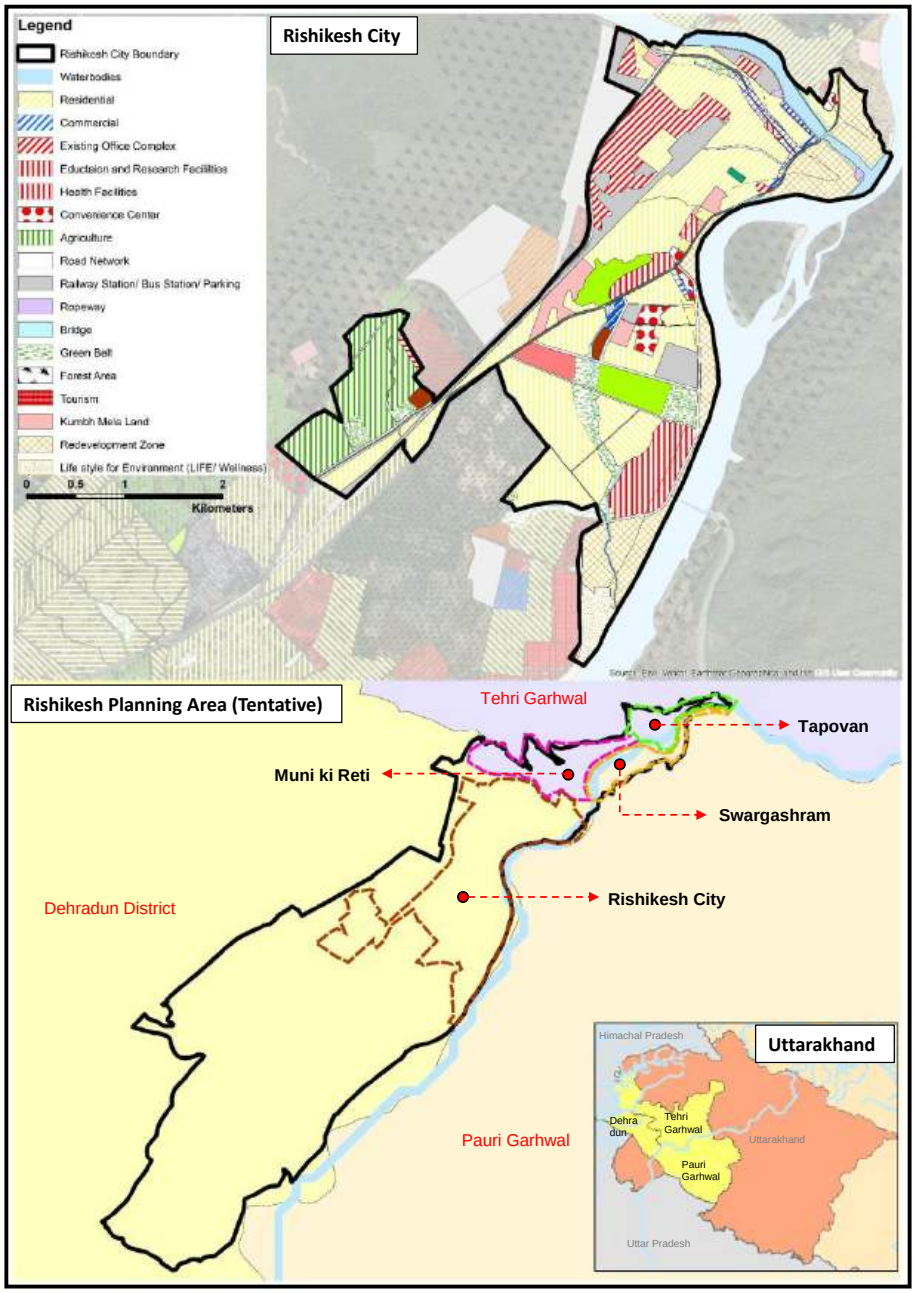
1.2.3 Draft URMP Report

The Draft URMP report includes tangible interventions for river conservation and management for each of the ten URMP objectives. Multiple meetings and consultations with concerned agencies along with site visits were conducted to assess the ground situation and identify opportunities for future interventions (refer Image 1-4). Based on the gaps and prioritized issues identified in the Baseline Assessment Report, this document outlines interventions and recommended actions. Each intervention is elaborated in detail, including the project rationale, conceptual framework, key components, broad cost estimates and the designated implementing agency.

Image 1-4: Consultation and Site Visits

2 CITY PROFILE

Rishikesh city is located in Dehradun District of Uttarakhand State. The city is known as the 'Yoga Capital of the World' and 'Gateway to the Himalayas'. It is situated at the foothills of the Himalayas on the western bank of river Ganga and Chandrabhaga river. The city is connected to Delhi, Meerut, Haridwar, Devprayag, Chamoli and Srinagar by National Highway 58 (new 34). The city lies 42 km from Dehradun and 142 km from Pauri. It is the terminal railway station of Garhwal Himalayas, with an extension to Karnaprayag underway to link major hill cities. The nearest airport is Jolly Grant International, 20 km northwest of the city.



Map 2-1: Contextual Setting of Rishikesh City

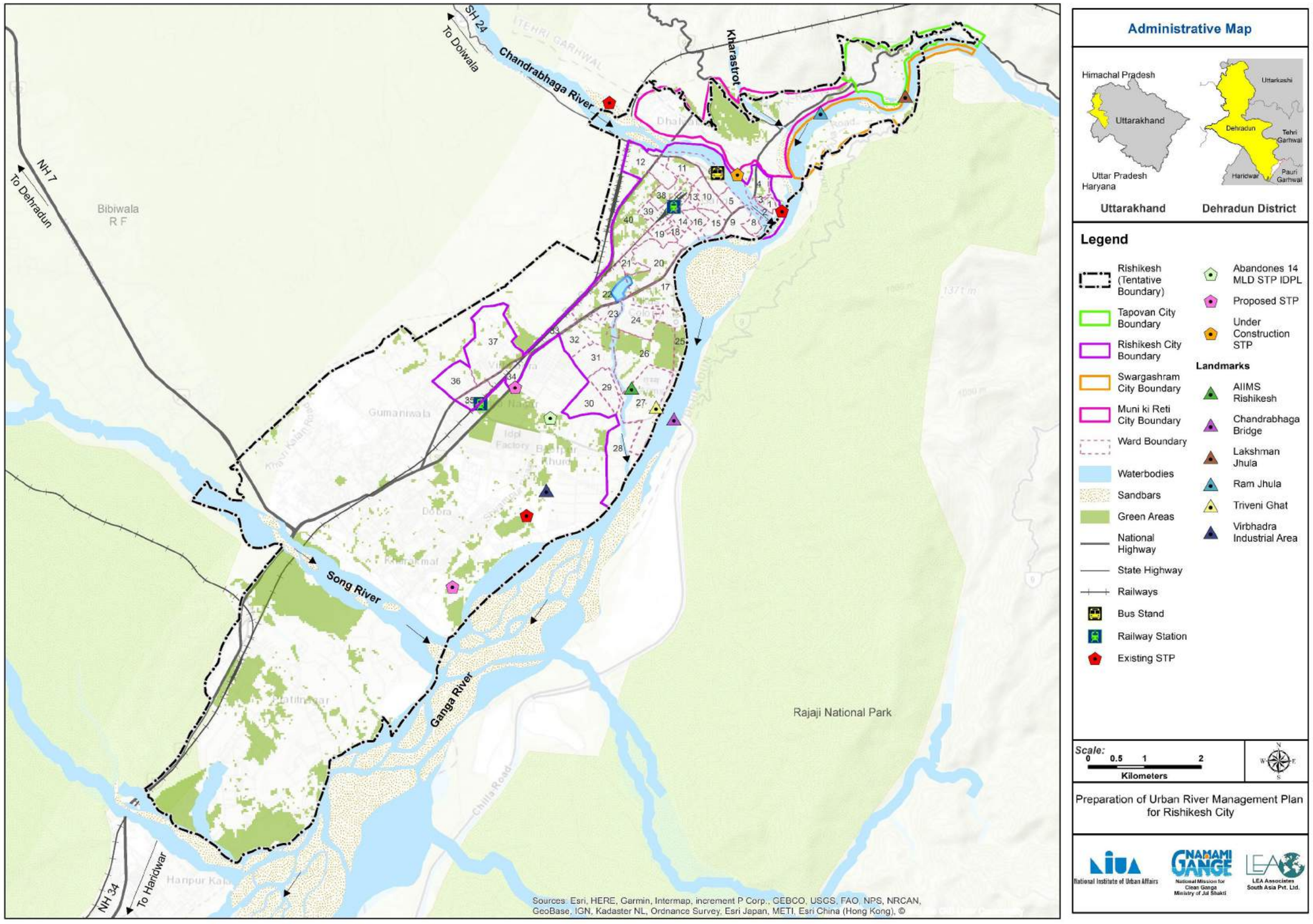
2.1 City administrative boundaries

The Rishikesh Planning area covers 54.26 sq.km. and falls under multiple administrative jurisdictions. It comprises of 4 ULBs i.e., Rishikesh, Tapovan, Munni ki Reti and Swarg Ashram. The planning area spans across Rishikesh, Narendranagar and Yamkeshwar tehsils, located within three districts, namely, Dehradun (Rishikesh ULB), Tehri Garhwal (Munni ki reti ULB and Tapovan ULB) and Pauri Garhwal (Swarg Ashram ULB) respectively. Tapovan ULB is now considered as a part of Munni ki reti ULB. Planning and development functions in this area are overseen by the Mussoorie Dehradun Development Authority (MDDA), responsible for development control and the provision of civic amenities. Its operations follow the standards of Town & Country Planning Organization (TCPO), ensuring alignment with national development goals.

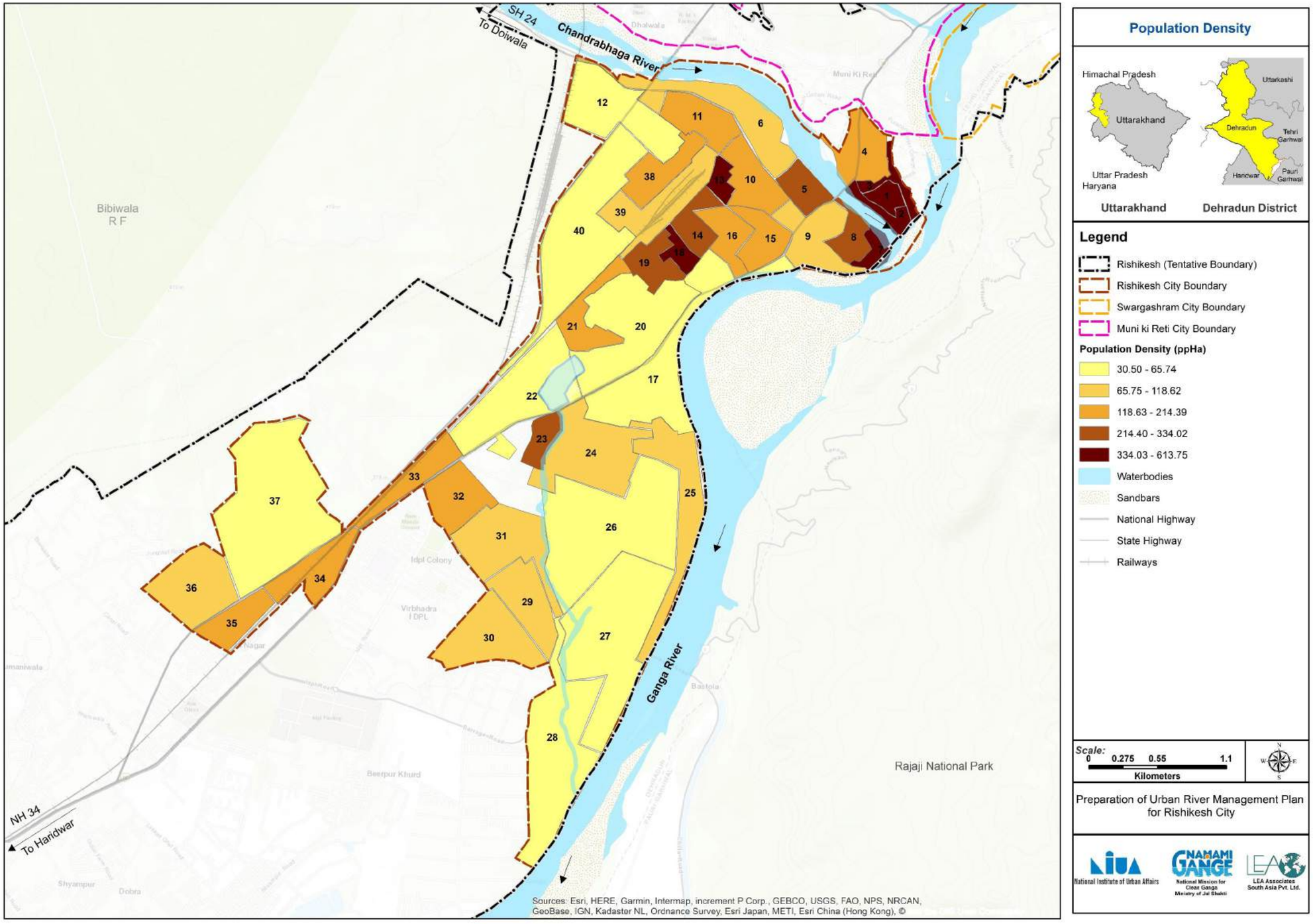
Rishikesh functioned as a Municipal Council with 20 wards before April 2018. The urban local body functioned as a municipal corporation in the year 2018 with 40 wards spreads over an area of 10 sq.km. The Rishikesh Municipal Corporation is responsible for the city's civic administration and infrastructure development.

2.2 Demography

The total population of the Rishikesh municipal corporation is 70,499 (Census 2011) and the population in the planning area is 1,73,655. Based on the current decadal growth trend, population for the year 2025 (base year) is estimated to be approximately 84,014 for the municipal area. The population of the city is expected to grow up to 3.98 lakhs in 2051. The urban expansion is restricted in east due to the presence of Rajaji National Park and Bibiwala reserved forest on west.



Map 2-2: Administrative Map of Rishikesh



Map 2-3: Population density map of Rishikesh

2.3 Physiography

Topography

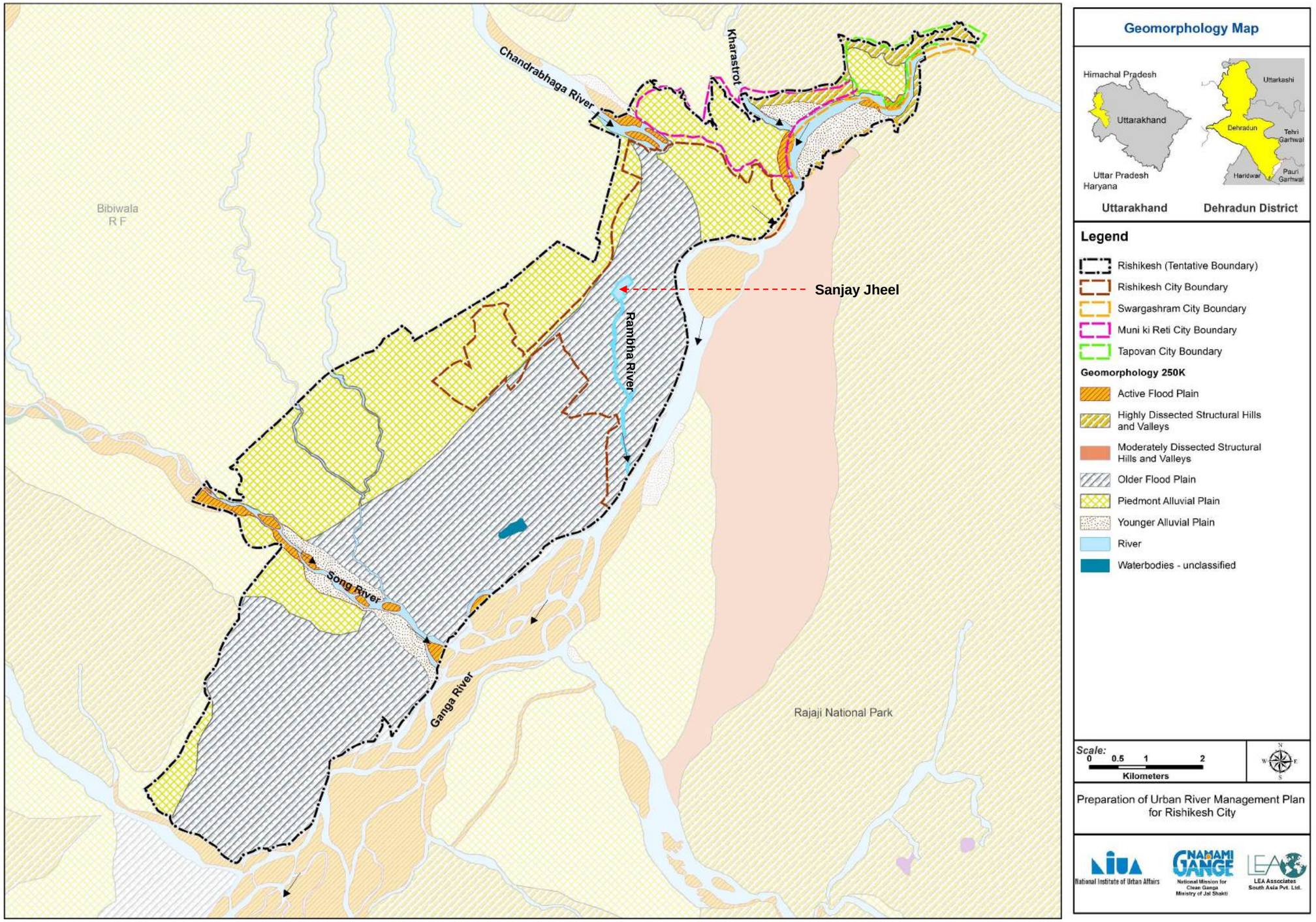
Rishikesh city is located in the Upper Ganga Basin, a sub-basin of Ganga River system originating from Gaumukh in Uttarakhand. The average elevation of Rishikesh ranges between 372 and 340 meters above sea level. The physiography of Rishikesh is marked by diverse terrain, transitioning between the mountainous terrain in the north to the Indo-Gangetic plains in the south.

Geophysical Characteristic

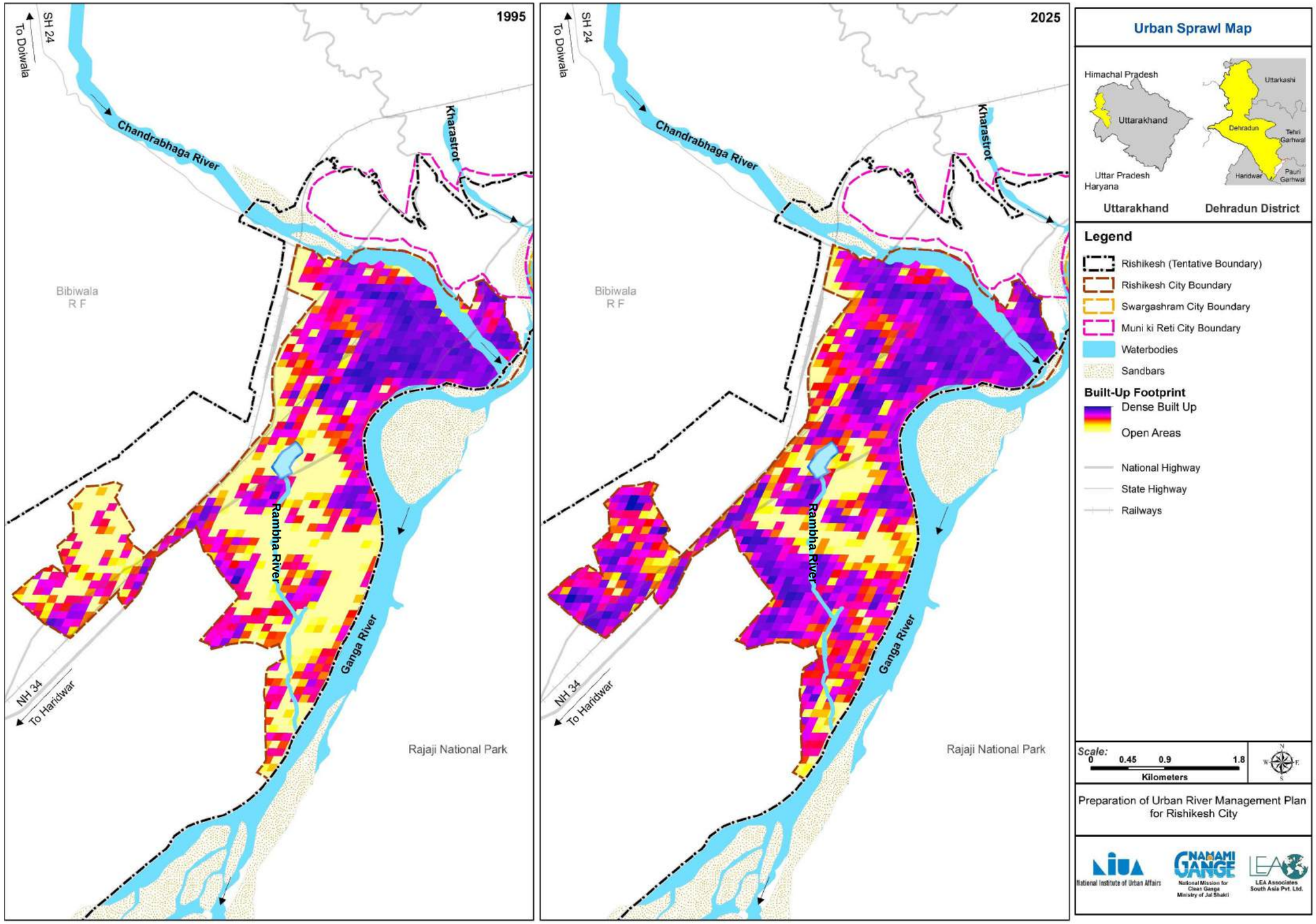
Rishikesh lies across the bhabhar zone characterized by porous alluvial soil and gently sloping terrain. The northern area features steep hills and ridges of shale, sandstone and conglomerates shaped by tectonic uplift and erosion. Southward, the Bhabhar belt consists of coarse alluvial deposits gravel, pebbles and boulders with high permeability that allows rivers to percolate underground before resurfacing downstream. Under the 2025 BIS classification, the city is situated in Seismic Zone VI, the highest hazard category, necessitating the most stringent structural safety and disaster-resilience measures.

2.4 Urban Sprawl

Rishikesh's spatial growth is constrained by the Himalayan foothills, the Ganga River and surrounding forests, leading to linear expansion along riverbanks and National Highway 58 toward Devprayag and Haridwar. With the historic core saturated, peripheral areas like Veerbhadra, Tapovan, Muni ki Reti and Swarg Ashram have urbanized rapidly. Land use has shifted from religious and residential to mixed patterns dominated by tourism, wellness centers, commerce and unplanned settlements, often encroaching forests and floodplains. Industrial activity at Virbhadra (IDPL) and resettlement of Tehri Dam displaced population have further driven dispersed, unregulated growth along highways and rural fringes.



Map 2-4: Geomorphology Map of Rishikesh



Map 2-5: Urban Sprawl of Rishikesh city

2.5 Historical and cultural profile

Rishikesh is renowned as a holy city with a rich spiritual heritage. According to mythology, sage Raibhya performed penance on the banks of river Ganga, where Lord appeared in the form of Rishikesh, bestowing the city with its name. In the 9th century, Adi Shankaracharya visited the city and his pilgrimage later became part of the Char Dham circuit, establishing Rishikesh as the gateway to the Himalayas and a revered starting point for holy shrines.

The Pashulok area of Rishikesh is historically significant as the site where Mira Behn (Madeleine Slade), a close disciple of Mahatma Gandhi, established her ashram after independence. Her work on cow protection, organic farming and Himalayan conservation reflected Gandhian ideals of simple living and ecological stewardship. She was among the earliest voices to warn against deforestation and river degradation in the upper Ganga basin.

Today, Rishikesh proudly holds the title of "Yoga Capital of the World". The city is dotted with temples, ashrams and ghats where rituals, meditation and yoga are integral part of daily life. Its cultural vibrancy is reflected in the International Yoga Festival, satsangs, local fairs, the Ganga Aarti at Triveni Ghat and traditional handicrafts, positioning Rishikesh as both a spiritual hub and a global center of wellness tourism.

Table 2-1: Festivals and events in Rishikesh

Festival Name	Month	Location	Cultural Significance
A. Festivals			
Makar Sankranti	January	Triveni Ghat	Sun's transition into Capricorn; ritual bathing and charity for purification.
Basant Panchami	February	Bharat Mandir	Worship of Goddess Saraswati; ancient idol of Lord Hrishikesh revered.
Baisakhi / Mesha Sankranti	April	Various Ghats	Harvest and solar new year; ritual bathing and community prayers.
Ganga Dussehra	May	Main Ghats	Celebrates Ganga's descent; holy dips and aarti for purification.
Deepawali	November	City-wide	Festival of lights; ghats illuminated, diyas floated for prosperity.
B. Events			
International Yoga Festival	March	Parmarth Niketan	Global yoga gathering; promotes Sanatana Dharma and Vedic sciences.
Kanwar Yatra	July	Pilgrimage Routes	Shiva pilgrimage; devotees carry Ganga water to shrines.
Kumbh Mela	Every 12 Years	Triveni Ghat, Neelkanth Mahadev Temple, Muni Ki Reti & Swarg Ashram	World's largest religious gathering; ritual bathing for liberation.
Ganga Aarti	Daily (Year-round)	Triveni Ghat & Parmarth Niketan	Evening ritual of devotion; gratitude and spiritual

Source –Draft Rishikesh Draft Master Plan, 2031

2.6 Tourism profile

The tourism profile of Rishikesh is shaped by its spiritual, cultural and adventure activities. Religious and spiritual tourism is primarily concentrated within Rishikesh Planning area whereas adventure tourism is along the river. The tourism sector is highly seasonal (June to November), with an annual footfall of approximately is 9.69 lakhs and a peak daily footfall of around 12,000 visitors 1. Recent initiatives such as the Uttarakhand Tourism Entrepreneur Promotion Scheme (2024) is expected to boost eco-tourism and schemes such as Skill India Mission and Pradhan Mantri Kaushal Vikas Yojana (PMKVY) under Ministry of Skill Development & Entrepreneurship (MSDE) strengthens vocational training and skill development.

2.7 Socio – economic profile of the city

Rishikesh possesses a local economy shaped by tourism, industrial and agriculture. The agro-climatic conditions of the city support horticulture, notably mango, guava aonla and ber cultivation. Its proximity to Rajaji National Park enables opportunities in eco-tourism, which in turn sustains modest service activities such as small hotels, eateries, tour operators and handicraft sellers.

a. **Economic activities along the river:** White-water rafting is the most popular water sport in the planning area. Active mainly from September to June, the sport is regulated for safety and environmental sustainability. Rafting commences from upstream areas like Kaudiyala, Marine Drive, Shivpuri and Brahmapuri, outside the planning boundary and ends at Ram Jhula or Laxman Jhula, outside the city boundary.

b. **Places & institutions along river:** Many prominent ghats are located along river Ganga in Rishikesh such as Triveni Ghat within municipal area and Parmarth Niketan, Swarg Ashram, Geeta Bhawan and Shatrughna within planning area. Apart from ghats there are many temples and ashrams located on the bank of river ganga. The temples or revered shrines are Trayambakeshwar, Raghunath and Shatrughna. The ashrams include Parmarth Niketan, Swarg Ashram, Shivananda, Geeta Bhawan, Yoga Niketan and Omkarananda.

c. **IEC and social engagement:** The Municipal Corporation undertakes Information, Education and Communication (IEC) activities to promote civic responsibility and river-sensitive practices such as Swachhta Pathshalas in schools to instil environmental responsibility and supports 25 Self-Help Groups (SHGs) engaged in waste management. It encourages waste collection drive organised by Triveni Sena, a women-led volunteer group associated with Triveni Ghat. women-led

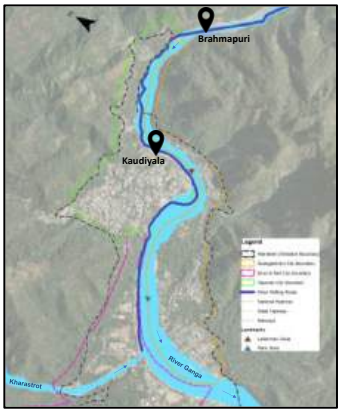


Image 2-1: River Rafting route along River Ganga

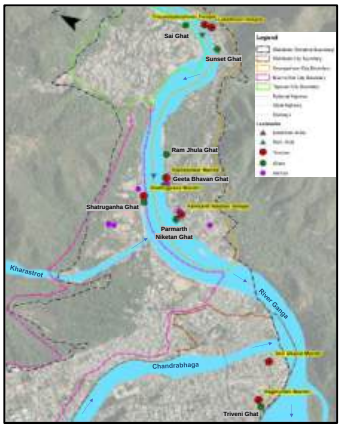


Image 2-2: Prominent Ghats & Temples along River Ganga

[1] SFD report, GIZ, 2018

initiatives like the Triveni Sena for door-to-door waste collection. Community efforts also extend to ecological restoration, exemplified by the release of two lakh fish eggs into the river.

2.8 Institutional Mechanism

The list of existing agencies responsible for planning, development and service delivery within the planning area are presented in Table 2-2.

Table 2-2: Role and responsibility of key government agencies for Rishikesh City

Sl. No.	Department	Key role and responsibilities	Nodal Officer	Applicable for URMP Objectives
A.	**Local Level Agencies**			
1	Municipal Corporation Rishikesh	• City governance and civic administration • Urban services and infrastructure – solid waste management, maintenance of road & drainage, management of water supply & sewerage • Environment and public welfare activities • Development and planning • Public interface and emergency services	Municipal Commissioner	Objective 2, objective 4, objective 5 and objective 9
2	City Magistrate Rishikesh	• Maintaining law and order, coordinating civic operations and ensuring regulatory compliance across the city.	City Magistrate	Objective 1
3	Local NGO/ Civil Society Member	• Educate local communities on river health, waste management and conservation practices. • Organize awareness drives, clean-up campaigns, Nukkad Natak, school sessions and public meetings. • Promote citizen participation in river protection initiatives. • Lead or support riverbank clean-ups, plantation drives, wetland restoration and lake rejuvenation activities. • Promote volunteerism in events like River Festival, Ganga Swachhta Pakhwada, etc.	Representative	Objective 10
4	Hotel Association	• Represent the hospitality industry and collaborate with government departments such as Tourism, Urban Development, Pollution Control, etc. • Provide input on state tourism policies, environmental regulations, pricing norms and sustainable tourism practices.	Presiding Officer	Objective 10
B.	**Regional/State level**			
5	Forest Department	• Protect wildlife habitat in nearby forest areas comprising Rishikesh Forest, Rajaji National Park. • Conserve water catchment areas, especially the River Ganga (vital for the region's water supply).	Divisional Forest Officer, Rishikesh	Objective 4, Objective 9

Sl. No.	Department	Key role and responsibilities	Nodal Officer	Applicable for URMP Objectives
6	Uttarakhand Tourism Development Board	• Formulate state tourism policies and long-term development strategies • Develop eco-tourism zones and nature trails with Forest Department coordination • Monitor environmental and social impact of tourism projects • Implement safety protocols and eco-friendly practices	Tourism Development Officer, Dehradun	Objective 8
7	Uttarakhand Urban Sector Development Agency	• Plan and execute projects related to water supply, sewerage, sanitation, solid waste management and drainage systems. • Prepare city development plans (CDPs), master plans and detailed project reports (DPRs) • Monitor progress and ensure timely execution of projects using digital tools and MIS systems • Mobilize and manage funds from multilateral agencies (e.g., ADB, World Bank) and government grants • Provide technical and managerial support to Urban Local Bodies (ULBs).	Project Manager	Objective 1
8	Uttarakhand Forest Development Corporation	• Supervise extraction of minor minerals (like s and, gravel, boulders) from forest riverbeds such as: Ganga, Song, Moti Chur and others. • Prevent illegal mining and support state revenue generation through transparent auctions and lease operations • Collection and sale of medicinal herbs, resin, honey, bamboo, etc. • Implement CAMPA and other greening projects across the state.	Divisional Land Management (DLM)	Objective 4, Objective 9 and Objective 3
9	State Mission for Clean Ganga, Uttarakhand	• Execute centrally funded projects for sewage treatment, river rejuvenation, drainage management and ghat development • Ensure timely completion of STPs (Sewage Treatment Plants), I&D (Interception & Diversion) works and faecal sludge management projects • Oversee construction and beautification of ghats, crematoria and riverfront amenities to enhance religious and tourism experiences while maintaining sanitation. • Run awareness campaigns, school programs and public outreach to encourage citizen participation in river conservation.	M&E Officer	Objective 2, objective7 and objective 9

Sl. No.	Department	Key role and responsibilities	Nodal Officer	Applicable for URMP Objectives
10	Uttarakhand Irrigation Department	• Construct and maintain embankments, spurs, check dams and anti-erosion works along rivers • Develop watershed projects to conserve soil and water in hilly terrain. • Plan, design and construct canals, dams, barrages, lift irrigation schemes and tube wells to support agriculture • Identify and mark the maximum flood level recorded or estimated during a major flood.	Executive Engineer	Objective 1
11	Uttarakhand Pey Jal Nigam	• Plan, design and construct drinking water supply, • Implement rural water schemes such as Jal Jivan Mission, • Install chlorination units, UV treatment, or filtration systems in contamination-prone zones, • Prepare Detailed Project Reports (DPRs) and execute works for sewer networks, sewage treatment plants (STPs) and drainage systems in coordination with Urban Development Department or Smart City Projects.	Executive Engineer	Objective 2
12	Uttarakhand Jal Sansthan	• Responsible for day-to-day operation and maintenance of urban and rural water supply systems.	Executive Engineer	Objective 2
13	Uttarakhand PWD	• Plan, construct and maintain state highways, district roads, rural roads and bridges.	Executive Engineer	Objective 1
14	City and Country Planning Department	• Prepare Master Plans, Zonal Development Plans and Land Use Maps for cities and notified areas, • Prevent unauthorized constructions and encroachments, • Conduct public consultations, hearings and surveys before finalizing plans.	Executive Engineer	Objective 1
15	Uttarakhand Pollution Control Board	• Enforce key environmental acts including: Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Pollution) Act, 1981, Environment Protection Act, 1986, Plastic Waste Management Rules, 2016, Biomedical Waste Rules, E-Waste Rules, Solid Waste Rules, etc. • Regularly monitor water quality of the rivers, • Actively support the Namami Gange program through monitoring and enforcement, • Ensure no untreated sewage or industrial waste is discharged into rivers, • Conduct regular inspections of industrial units, hotels, stone crushers, mining sites, etc.	Regional Officer	Objective 2

2.9 Conclusion

Rishikesh's profile underscores its pivotal role as a tourism gateway, cultural hub and ecological buffer. The city's constrained geography, seismic vulnerability and seasonal tourism highlight the need for resilient infrastructure and sustainable planning. The city's projected population growth and spatial constraints dem and compact and resilient planning. Its economic base, anchored in tourism and agriculture offers opportunities for diversification through eco-tourism, skill development and small-enterprise support. Balanced urban expansion, diversified tourism, enhanced civic stewardship and coordinated institutional action will be critical outcomes, positioning Rishikesh as a model for heritage-sensitive, environmentally sustainable and community-driven urban development.

3 ECOLOGICAL PROFILE OF THE CITY

3.1 River ecosystem

The planning area of Rishikesh is defined by four major rivers, i.e., Ganga, Chandrabhaga, Song and Rambha and one stream namely, Kharastrot that together shapes the city's landscape. Image 3-1 and Image 3-2 shows the river- city connect in Rishikesh.

i. **River Ganga-** It is a perennial river. It enters the planning area near Shivpuri and Tapovan. Within the planning boundary it spans 16.9 km, with 6.9 km flowing through Rishikesh city, where it passes beneath Laxman Jhula and Ram Jhula and alongside Triveni Ghat. Serving as the city's spiritual lifeline, the river transitions from rocky Himalayan terrain to widening plains as it flows toward Haridwar.

ii. **Chandrabhaga River-** It is a perennial river and a tributary of River Ganga. The river originates in the Tehri district at Banali-Kashmalidhar, flows towards the Ganga River in Rishikesh. The confluence of Chandrabhaga and River Ganga is at Mayakund. The river flows from Dhalwala to Chandeshwar Nagar, located within the municipal area. The length of the river is 3 kms.

iii. **Song River-** It is a spring-fed originating from the southern slopes of Mussoorie ridge near Radi top in Garhwal Himalayas. It flows southward through the Doon Valley; it traverses Dehradun and eventually merges with river ganga at Raiwala near Rishikesh. The river's flow is also seasonally influenced by snow melt and rainfall. The river flows from Shyampur to Khadri khadakmaf in the planning area, covering a length of approximately 3.6 kms.

iv. **Rambha River-** The river originates from Sanjay Jheel, a wetland located near Ganga Nagar in Rishikesh. The river passes areas like Kalika Dhal, Someshwar Mahadev Temple, Shivaji Nagar and Veerbhadra Mandir and then merges with River Ganga near the Pashulok Barrage. The length of the river from Sanjay Jheel to River Ganga is 3.6 kms.

v. **Kharastrot:** It originates in the Himalayan foothills of Uttarakhand, nourished by small springs, seasonal rainfall and runoff from forested slopes. It meanders through valleys and local settlements, serving as a natural drainage channel. Eventually, the Khastrot descends into the plains of Uttarakhand, where it merges with the Ganga, contributing to the larger river system.

Image 3-1: River Ganga

Image 3-2: Chandrabhaga River

Image 3-3: Song River

Image 3-4: Rambha River

The upper course of river ganga pans nearly 429 meters, flanked by the Haridwar–Rishikesh–Badrinath Road on the left bank and a smaller road on the right. Vegetative buffer is observed but constrained by road infrastructure. The elevation difference highlights the valley's gentle slope and its role in shaping urban connectivity.

The middle course of the river has dense settlements close to the river at low elevations, where increased flood vulnerability is observed during the monsoon season. The contrast between built-up areas and the opposite forested bank illustrates the delicate balance between human activity and ecological stability. This contrast becomes starker near the Chandrabhaga river, where the riverbank is entirely built-up, leaving little room for ecological buffers or natural flood absorption.

The lower course of the river becomes braided, with multiple channels, vegetated bars and agricultural land along the banks of the song and River Ganga.

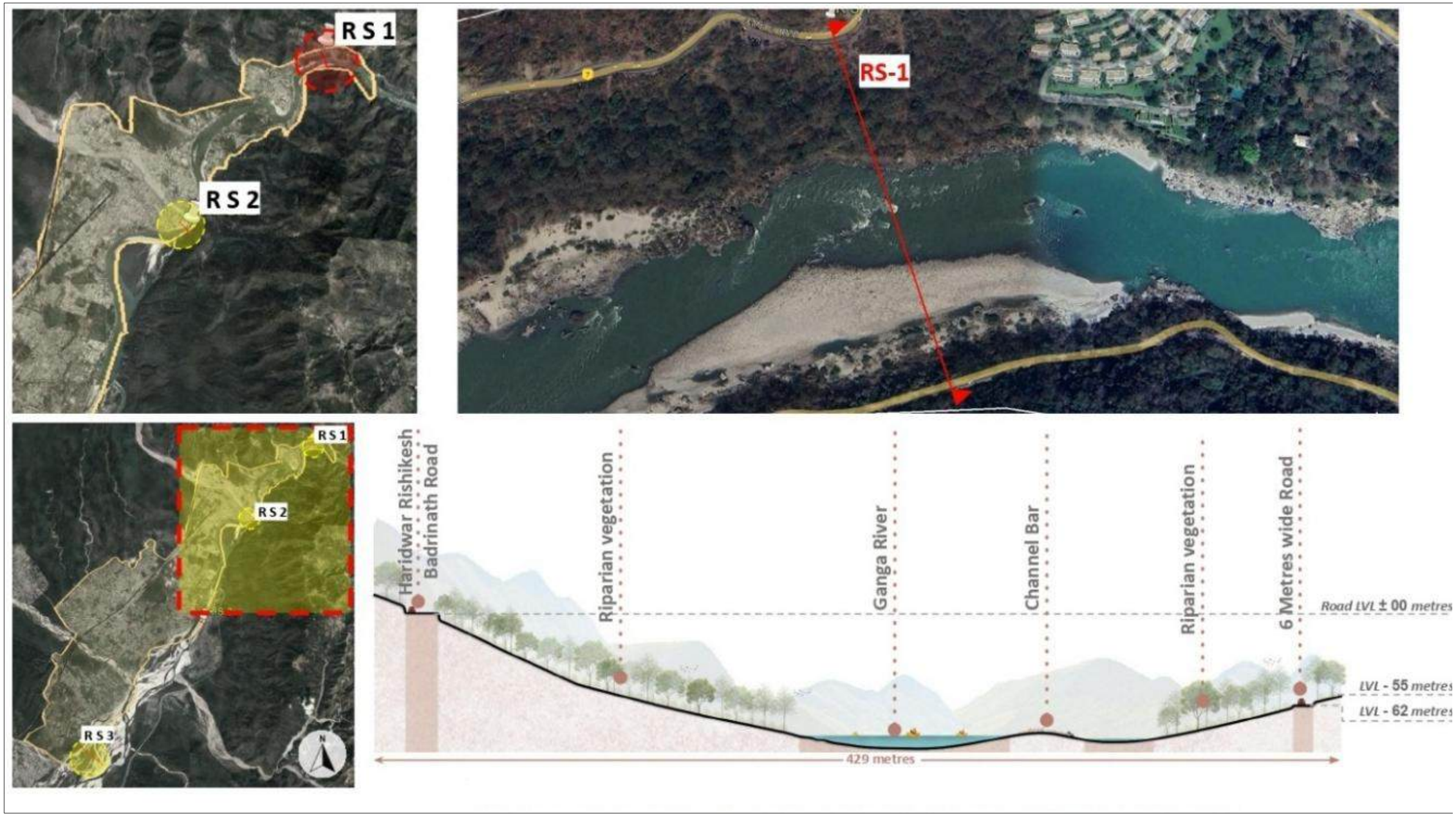


Image 3-5: Cross Section of Upper Ganga

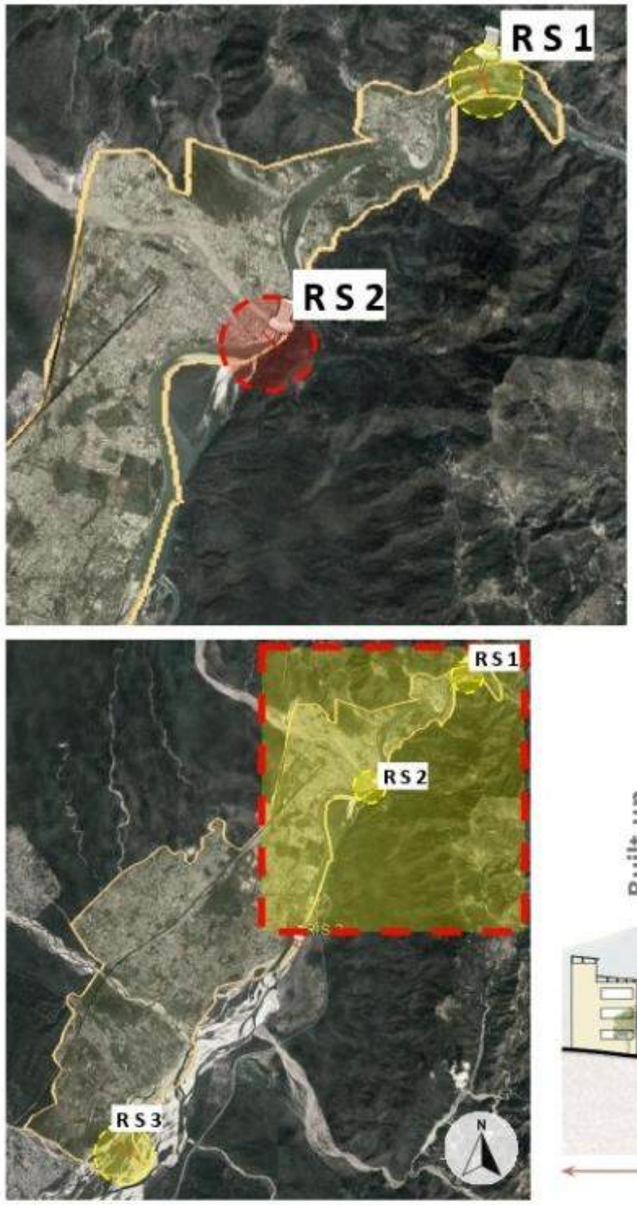
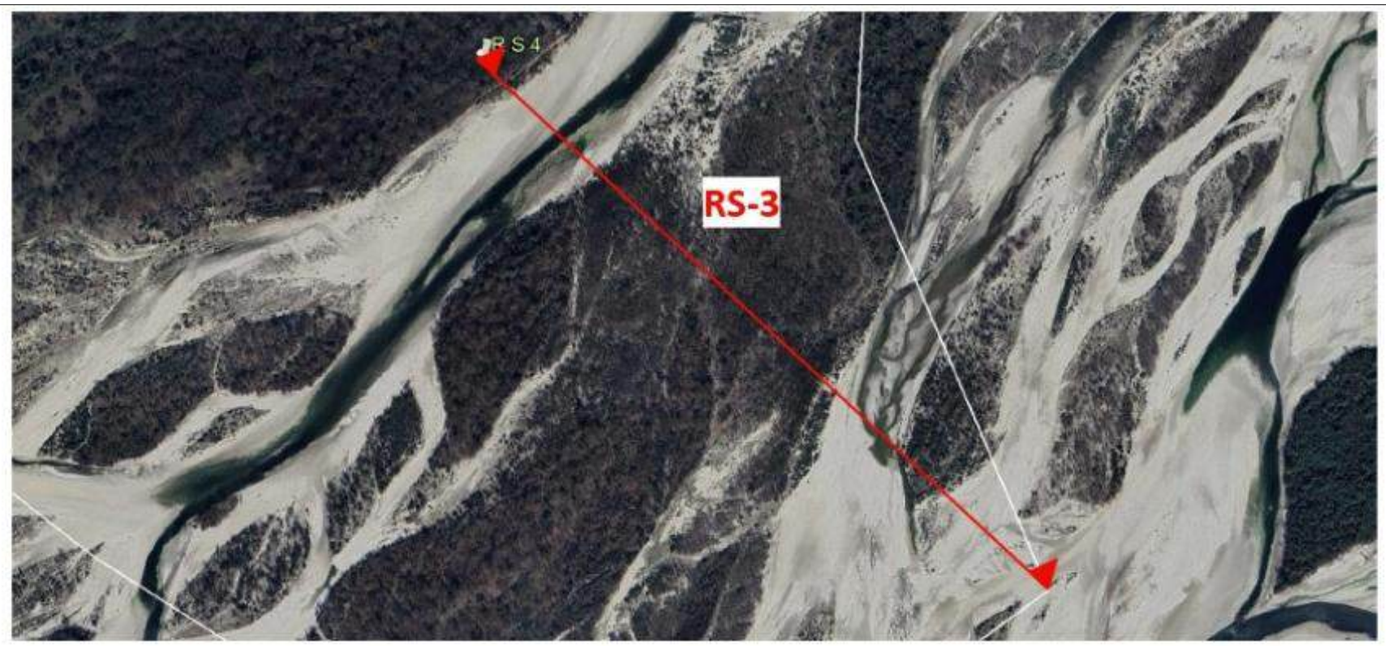
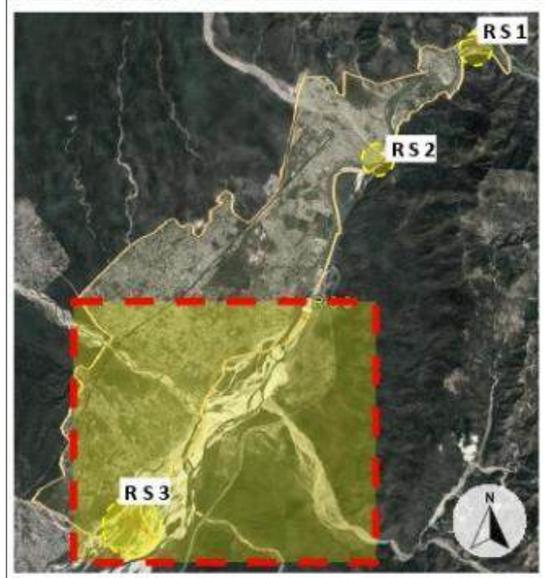


Image 3-6: Cross Section of Middle Ganga





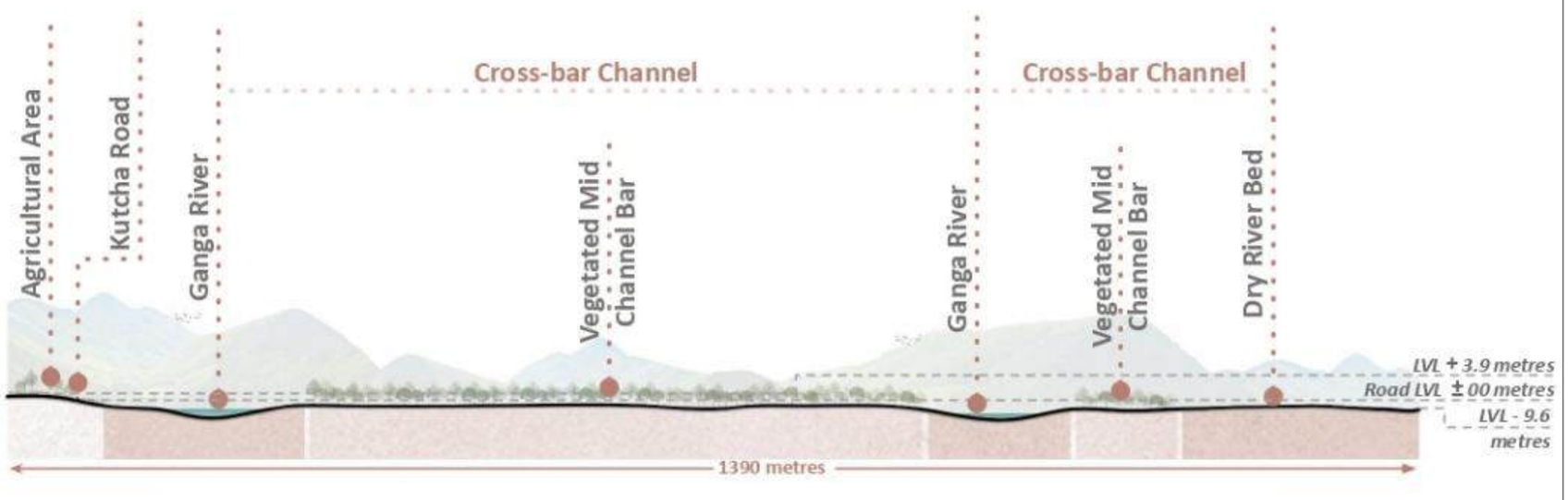


Image 3-7: Cross Section of Lower Ganga

3.2 Blue-Green resources in the city

3.2.1 Blue Resources:

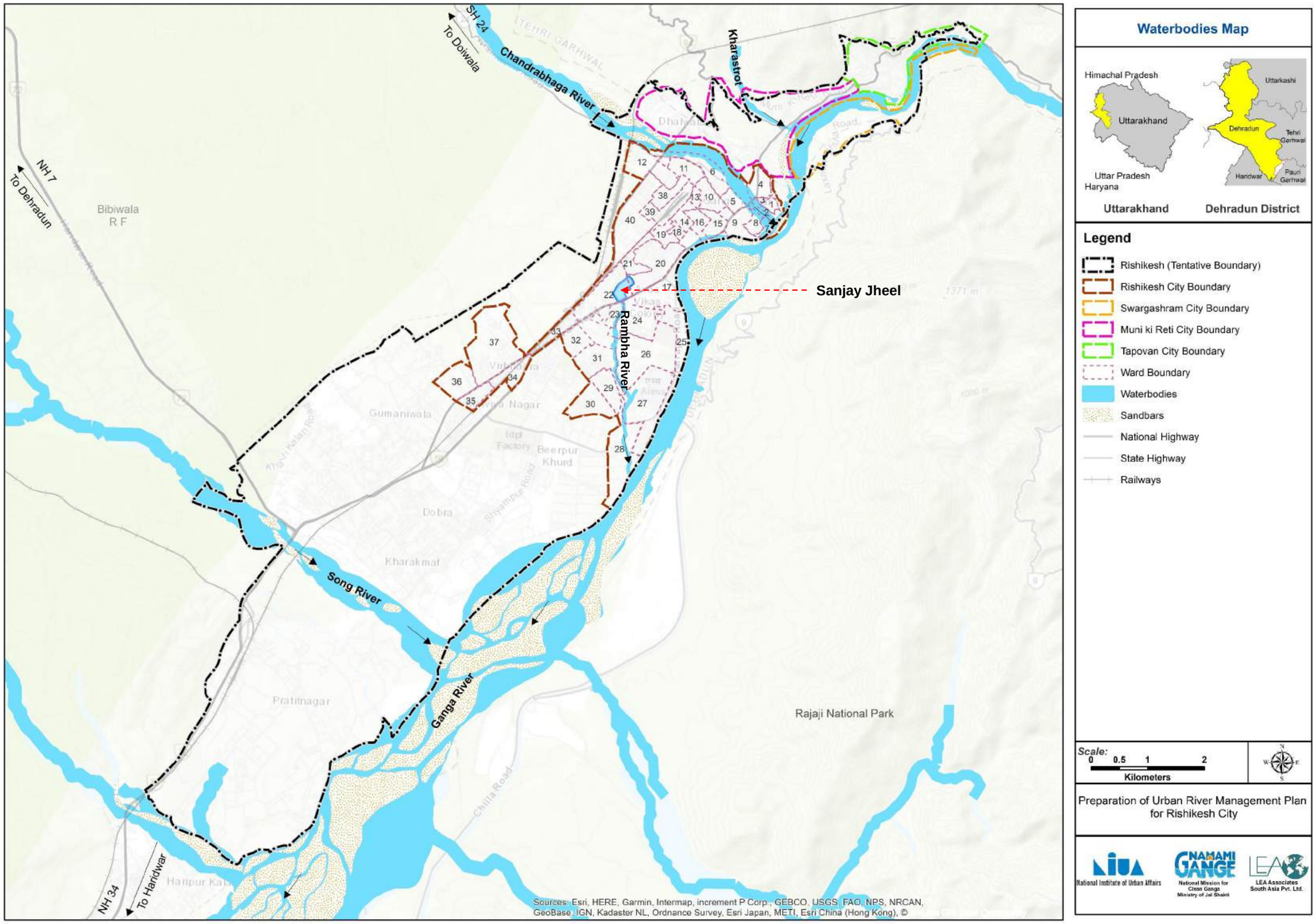
Apart from River Ganga, Sanjay Jheel also known as Rambha Kund located within the municipal area is a prominent natural feature of the city. It is not yet notified as wetland.

Covering 34.59 acres (14 hectares), with 14.82 acres of natural lake, the Jheel serves as the origin of Rambha River and is under the ownership of the Forest Department. The Jheel is situated amidst a densely populated settlement. It attracts many avian species such as red-whiskered bulbul, white-breasted waterhen, grey hornbill, rose-ringed parakeet and pied kingfisher among others.

Manu swamp is a tropical freshwater swamp located in the Koyal Ghati area which is hydrologically connected to the Sanjay Jheel.

During the Stakeholder consultation, it was stated that the Uttarakhand government has recognized its ecological significance and tourism potential; and have initiated a beautification project proposing 1.4-kilometer green pathway and recreational activities like boating. However, progress has been limited due to budget constraints with only 210 meters of pathway completed as of July 2022.

Image 3-8: Wetland (Sanjay Jheel) in Rishikesh



Map 3-1: Waterbodies within Rishikesh planning area

3.2.2 Green Resources:

1. **Forest:** The eastern and western side of Rishikesh planning area is surrounded by forests. These forests are part of the Shivalik range and extend to the Rajaji Tiger Reserve. Rajaji National Park, in Rishikesh is approximately 10 to 15 kilometres. The forest is home to numerous rivers, streams and springs that support local biodiversity, maintain ecological balance and recharge groundwater. The flora species primarily found are kanju, arjun, gutel, teak, sal. The other plant species found in the National Park are rambha, khair, sheesham, haldu, rohini, celix and semal.
2. **Wildlife:** Rajaji National Park is home to 450 Asian elephants. The Park also shelters predators like the Bengal tiger and leopard, alongside other mammals such as Himalayan black bear, sloth bear, striped hyena, sambar deer, barking deer, goral (mountain goat), wild boar and langurs. There are 315 bird species within the park such as the great hornbill, peafowl, woodpeckers and various other migratory birds during winter months. The park's diverse habitats, ranging from dense deciduous forests to grasslands, support this extensive biodiversity.
3. **Urban green belt/ parks:** The city has less than 1% green as against a required minimum of 12% as per Urban and Regional Development Plans Formulation and Implementation (URDPFI) guidelines. Some of the small parks in the city include Parks like Shivay Park**,** Sai Park and Saka Park in the Avas Vikas Colony.
4. **Agriculture:** Total agricultural area in Rishikesh Planning Area is 45.23%, the region supports cultivation of cereals, sugarcane, mustard, seasonal vegetables such as tomato, brinjal and cauliflower forming the backbone of local farming. The area is also known for horticulture, particularly mangoes, litchis, guavas and citrus orchards, which are marketed across Uttarakhand and neighbouring states.

Image 3-9: Agriculture area near Tapovan

Image 3-10: Rajaji National Park

3.2.3 Riparian Buffer

Riparian buffer along the riverbanks indicates the domination of built-up and embankments, particularly along the right bank of river Ganga and the entire stretch of Chandrabhaga river, leaving limited scope for ecological or recreational use. The Song and Rambha rivers retain moderate vegetation and some agricultural activity, mainly on their left banks, while the Kharastrot supports patches of dense vegetation but also faces pressure from built-up development refer Map 3-2.

Further detailing the limited green cover observed on both banks of the rivers, Table 3-1 provides an inventory of the discontinuous riparian buffer stretches currently existing along the 4 rivers and 1 stream. The vegetative buffer is composed by native grasses, shrubs and aquatic vegetation. Most of the land along the banks of rivers is under the ownership of the Irrigation Department and Forest Department.

Table 3-1: Existing Riparian Buffer along the Banks of Rivers

River	Ganga		Song		Rambha		Chandrabhaga		Kharastrot	
Type	**Left Bank (m)**	**Right Bank (m)**	**Left Bank (m)**	**Right Bank (m)**	**Left Bank (m)**	**Right Bank (m)**	**Left Bank (m)**	**Right Bank (m)**	**Left Bank (m)**	**Right Bank (m)**
Dense Vegetation	265	3182	2331	1930	482	455	0	0	1225	0
Degraded Vegetation	299	2980	1821	1723	782	506	0	0	0	737
Agricultural Land	0	1458	1597	0	460	0	0	0	0	0
Built Up/ Embankment	3767	13305	0	2161	1961	2404	3263	3760	703	1257
Sandbar/ Barren Land	0	1616	0	0	0	0	393	0	0	0
Total	4331	22541	5749	5814	3684	3365	3655	3760	1928	1994

Source: *Consultant's analysis from site observation & satellite imagery*

3.2.4 Biodiversity

The typology of flora and fauna found along the River Ganga, Chandrabhaga, Song and Rambha include native species like Sal (Shorea robusta), Sheesham (Dalbergia sissoo), Bamboo and Ficus varieties that stabilize banks and filter runoff. The common flora species has been listed as under

Table 3-2: List of Flora and Fauna Along the Rivers

Parameter	River Ganga	Chandrabhaga River	Song River	Rambha River
Riparian Vegetation Composition	Diverse vegetation with grasses, herbs, shrubs and mature trees such as Ficus religiosa (Peepal), Dalbergia sissoo (Shisham) and Mangifera indica (Mango). Sacred groves and planted species along ghats enhance ecological and cultural value. Vegetation zones range from grasses/herbs near ghats to tree cover in less disturbed stretches.	Dominated by grasses and scattered shrubs. Limited tree covers due to urban encroachment near Muni ki Reti. Native species like Acacia catechu (Khair) and shrubs provide soil stability.	Vegetation includes grasses, reeds and riparian shrubs with scattered Sal (Shorea robusta) and Bamboo groves. More natural cover compared to urban rivers, supporting soil conservation.	Sparse vegetation, mostly grasses and herbs with scattered shrubs. Agricultural activity along banks reduces tree presence; native species like Neem and Acacia occur in patches.
Buffer Width and Condition	Buffer width varies widely (20–150 m). Wider buffers near Tapovan and Shivpuri provide erosion control, while urban stretches near Triveni Ghat are fragmented by settlements and tourism infrastructure.	Narrow buffer (<40 m) with high fragmentation due to urbanization. Encroachment by ashrams and residential colonies reduces ecological buffering capacity.	Moderate buffer (50–120 m) with relatively intact vegetation in rural stretches. Agricultural expansion causes localized narrowing.	Very narrow buffer (<30 m), highly fragmented by agriculture and rural settlements. Limited structural vegetation reduces ecological resilience.

Parameter	River Ganga	Chandrabhaga River	Song River	Rambha River
Faunal Presence	Rich faunal diversity including Smooth-coated Otter, Rhesus Monkey and birds like Brahminy Kite, Kingfishers and Egrets. Reptiles such as Monitor Lizard and Cobra are also present. Aquatic fauna includes Mahseer fish, supporting river ecology.	Limited fauna due to urban pressures. Common species include Kingfishers, Egrets and Rhesus Monkeys. Occasional reptiles like Monitor Lizard observed.	Supports diverse birdlife such as Herons, Parakeets and Drongos. Amphibians and reptiles like Monitor Lizard are common. Mammals like Jackals occasionally sighted near forested stretches.	Faunal presence is minimal, with common birds (Egrets, Herons) and amphibians. Agricultural activity restricts larger fauna; occasional reptiles like Monitor Lizard observed.

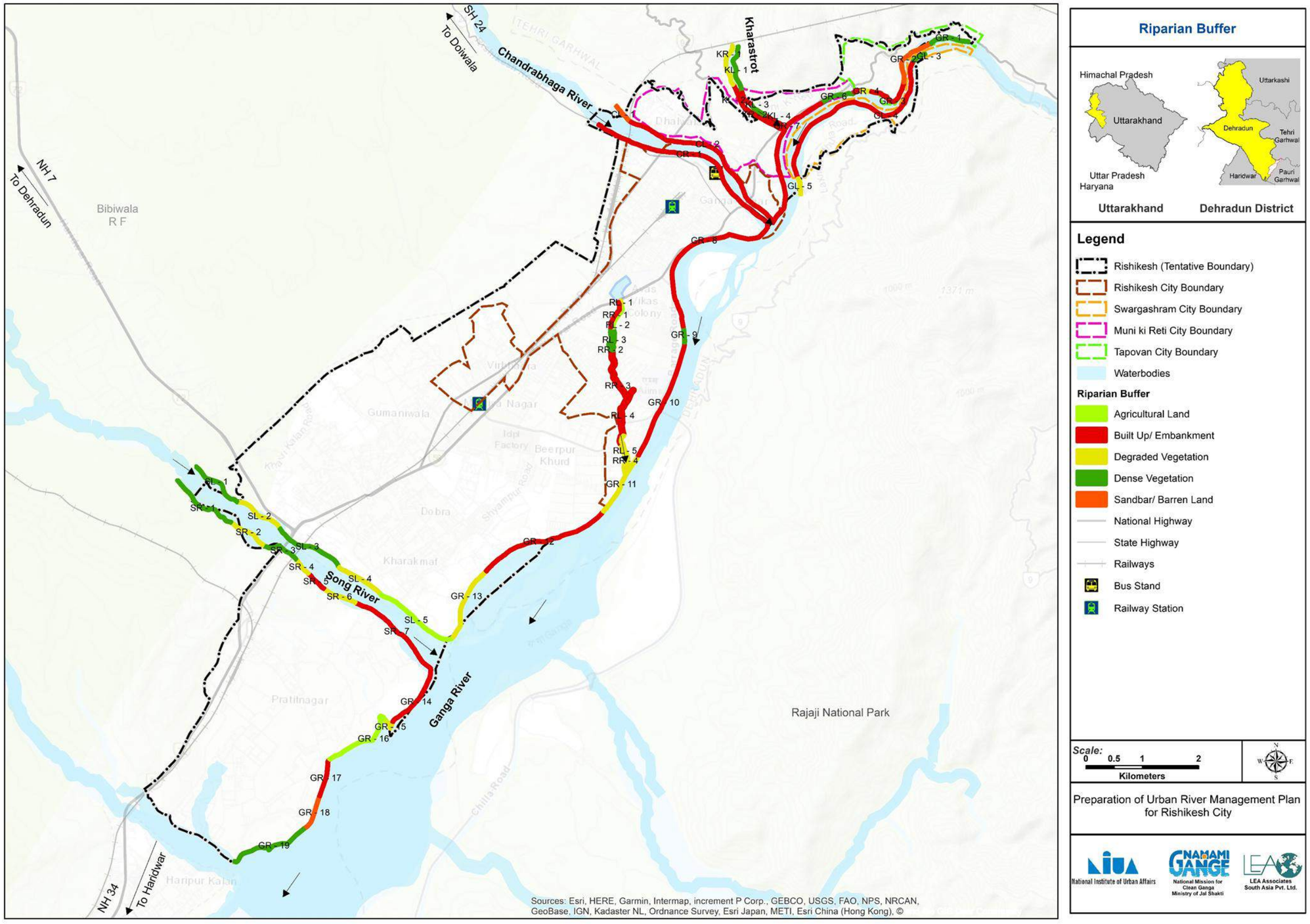
Image 3-11: Native species along the river

The Rajaji National Park hosts remarkable diversity of fauna due to its rich habitat. The summary of various faunal classes along with the common name and ecological role of species found in the forest division is as under in Table 3-3.

Table 3-3: List of Fauna Species Available in city

Sl. No	Scientific Name	Common Name	Specific Ecological Role in Riparian Buffer
1	Panthera Tigris (Royal Bengal Tiger)	Royal Bengal Tiger	Maintains balance in forest ecosystems.
2	Hyaena Hyaena	Striped Hyena	Supports nutrient cycling.
3	Sarcpgyps Calvus	Red-headed Vulture	Crucial for ecosystem hygiene and disease control.
4	Cyps bengalensis	White-rumped Vulture	Prevents contamination and disease outbreaks.
5	Melursus ursinus	Sloth Bear	Forest regeneration.

Source: Rishikesh masterplan report, 2031



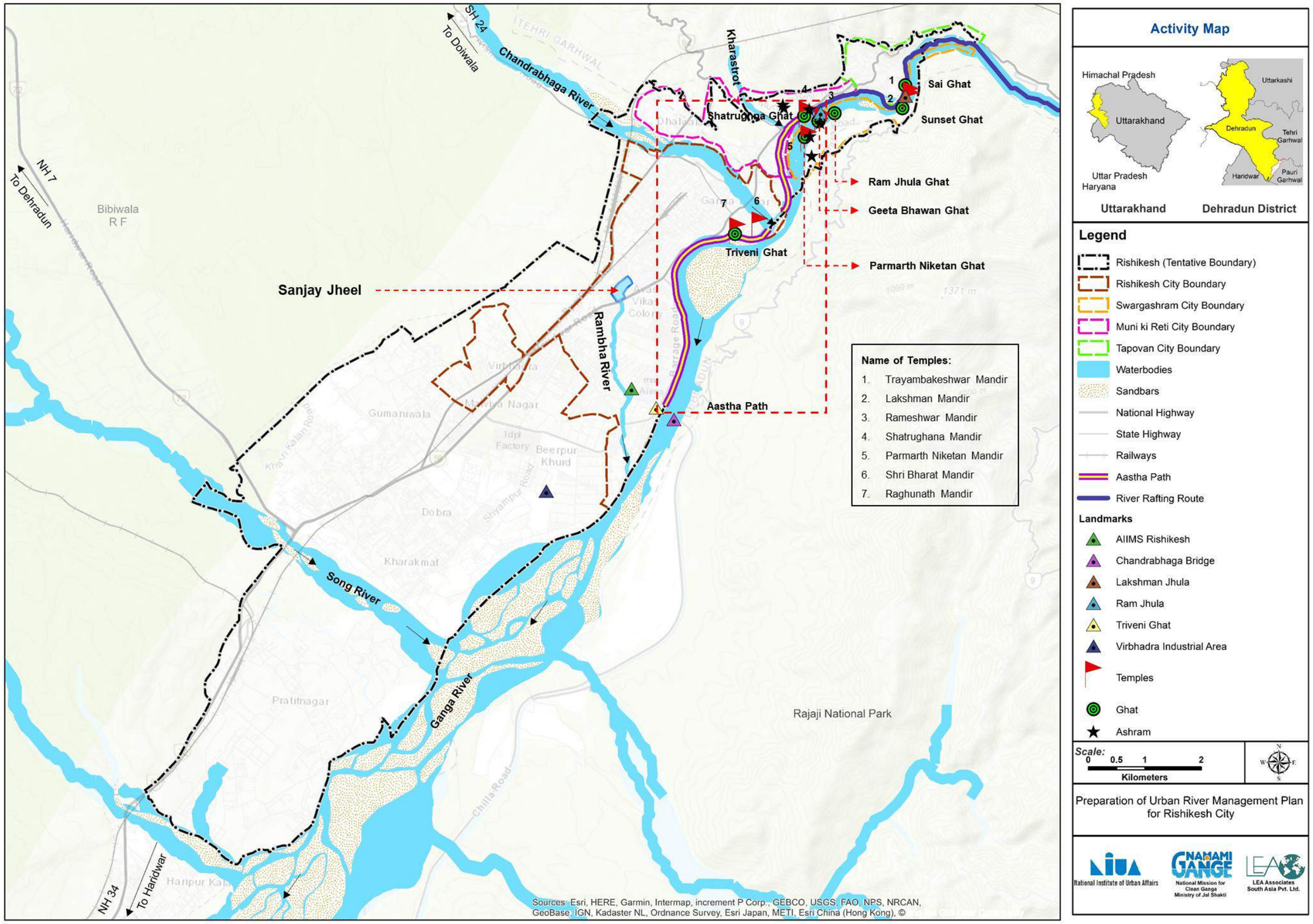
Map 3-2: Riparian stretch along Rivers in Rishikesh

3.3 Activity mapping along the river

As mentioned in 3.2.1, a total of 4 rivers flow within the planning area. The major activities are observed along the River Ganga (refer Map 3-3), which are as under. No significant activities were observed along the banks of Chandrabhaga, Song and Rambha River. The riverbed of Chandrabhaga remains largely dry, making such activities unfeasible. Built-up areas along either bank of the river further restrict potential interventions. Similarly, the adjoining areas of Rambha River are predominantly built-up.

1. **Ghat –** Triveni Ghat is city's most prominent riverfront, spiritual and cultural hub hosting the famous Ganga Aarti. It serves as a vital city river interaction point for rituals, bathing and devotion.
2. **Recreational Path –** The Aastha Path along the Ganga on western bank is a riverfront promenade for walking, yoga and meditation, offering scenic views and birdwatching while blending wellness with nature as a serene public space.
3. **Pashulok Barrage –** Also known as Chilla Barrage, is a major hydraulic structure on River Ganga just south of Rishikesh. Built in 1980, it diverts water to the Chilla Power Plant and also serves as a public space with scenic views, attracting visitors daily.
4. **Water sports activity:** As discussed in section 2.7, river rafting within the planning area boosts tourism, provides livelihood opportunities and reinforces Rishikesh's identity as a global hub for adventure and wellness tourism.

Temples and Ashrams: As discussed in section 2.7, there are 7 temples and 6 ashrams which are spiritual and cultural landmarks, attracting pilgrims, yoga practitioners and global seekers.



Map 3-3: Activity mapping along the River Ganga

3.4 Flooding

Rishikesh is highly vulnerable to both fluvial and pluvial flooding. Fluvial flooding, driven by the swelling of the Ganga and its tributaries during the monsoon season whereas pluvial flooding is caused by intense local rainfall overwhelming urban drainage systems.

3.4.1 Fluvial Flooding

Rishikesh primarily experiences fluvial flooding, resulting from the overflow of the River Ganga. The floodplain zone assessment for the River Ganga has been conducted in compliance with NGT directives and the Uttarakhand Flood Plain Zoning Act, 2012. The Irrigation Department has completed the delineation of the Red Line (100-year return period) and Blue Line (25-year return period) for the River Ganga and for other rivers (i.e., Chandrabhaga, song and Rambha River) are yet to be done. The area near Pashulok Barrage is not marked with the red flood line because the barrage functions as a reservoir and the water level can be regulated through gate operations. These zones have also been officially notified. The flood lines marked by Irrigation Department is shown in the Image 3-12.

- **Developments within Blue Line:** No developments were observed within the stretch, which primarily comprises of Ghat and bank protection measures.

Image 3-12: Showcasing 25-year floodplain boundaries as shared by Irrigation Department

Developments within Red Line: Image 3-13 Presence of residential in the southern part of the planning area, stretches of vegetation Institutional and residential area in the planning area has been observed.

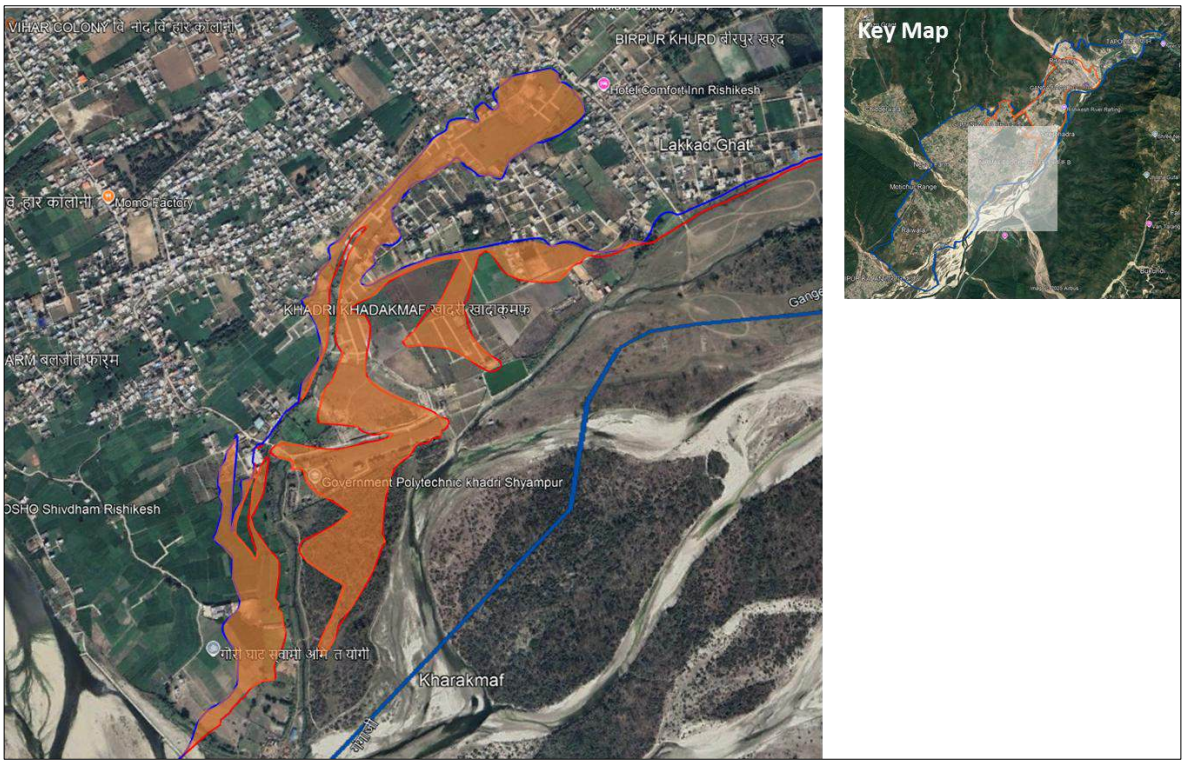


Image 3-13: Showcasing 25-year and 100- year floodplain boundaries as shared by Irrigation Department

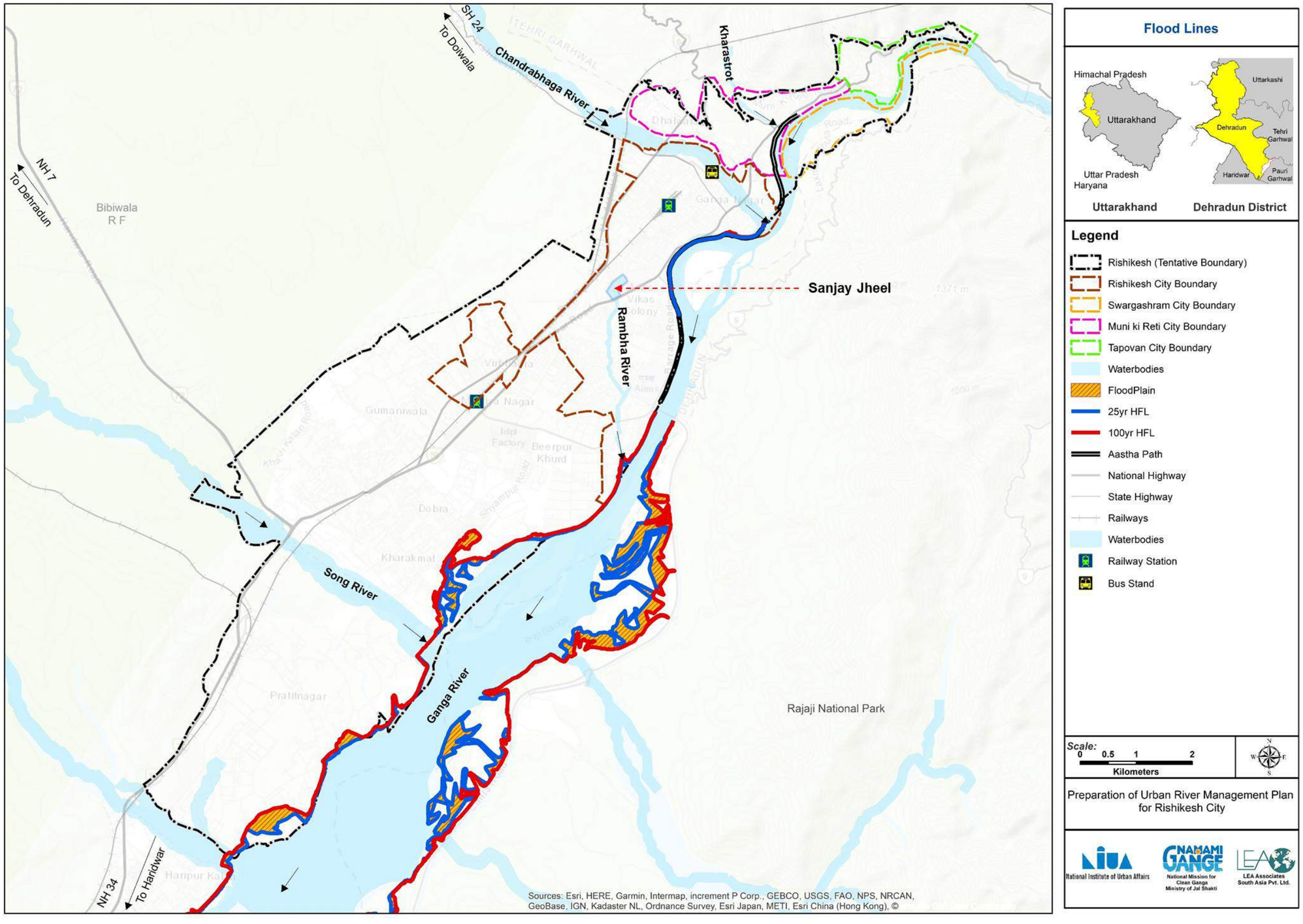
As per Stakeholder consultation, the low-lying areas of Wards 1 ,2, 9 southern parts of the city, near the Government Polytechnic College along the River Ganga are susceptible to flooding during monsoon season. These concerned areas are presented in Map 3-6.

Settlements/ Activity: The dry riverbed of the Chandrabhaga River and Kharastrot is being used to park vehicles. With the riverbed remaining dry for significant periods, individuals and local vendors have started utilizing this open space for parking private and commercial vehicles. The compacting of soil due to vehicle movement can lead to long-term damage to the riverbed's structure, affecting its water absorption and flow patterns during monsoon seasons.

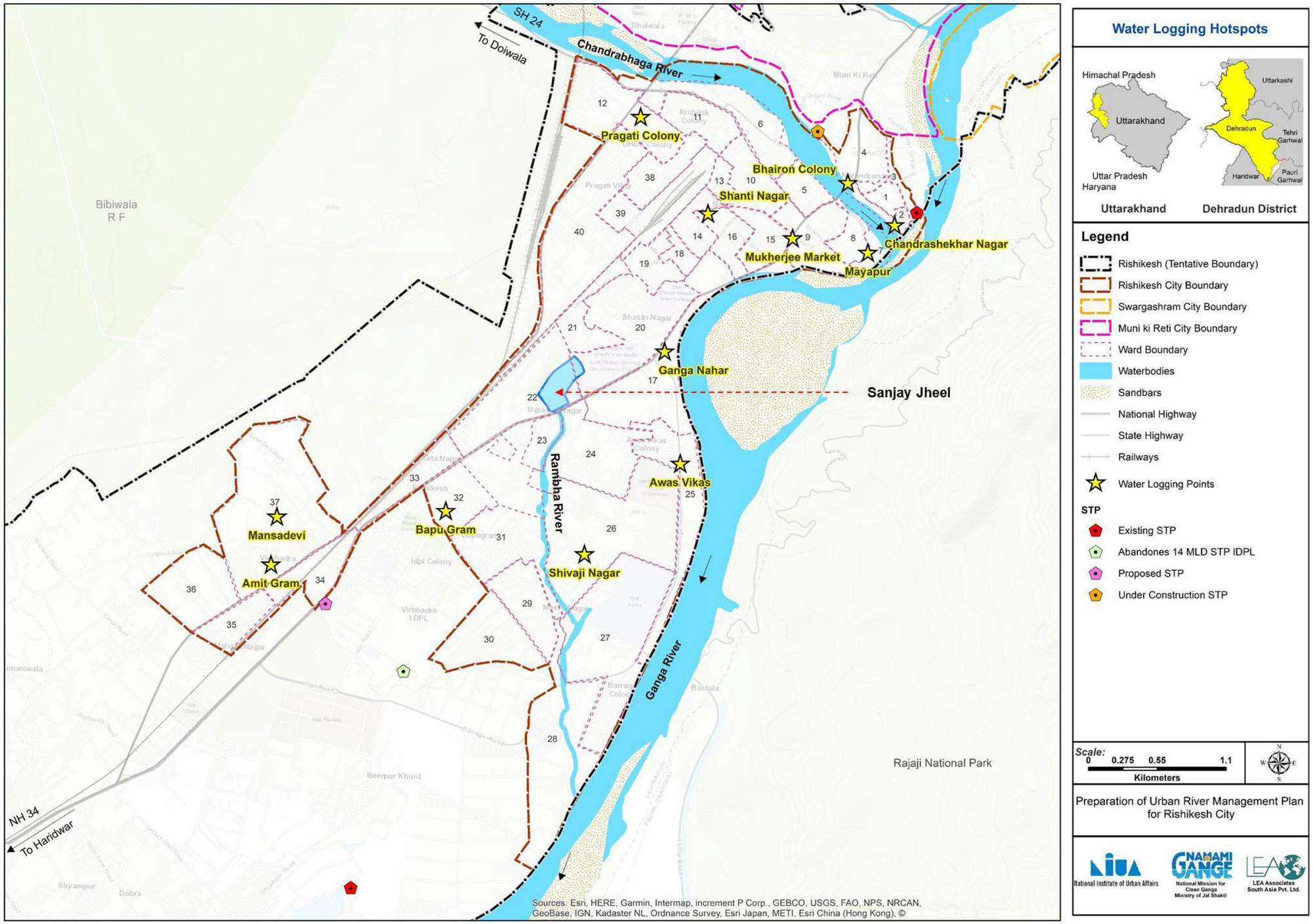
Physical Infrastructure: The construction of Dhalwala 8 MLD STPs directly on the Chandrabhaga riverbed disrupts natural hydrology, reduces flood capacity, damages ecological habitats, risks contamination and violates regulatory norms.

3.4.2 Pluvial Flooding

Rishikesh is highly vulnerable to recurrent seasonal floods and chronic waterlogging during intense monsoon surges, with densely built wards such as Mansadevi, Bapu Gram, Shivaji Nagar, Awas Vikas, Mukherjee Market, Shanti Nagar and Bhairon Colony facing the greatest risk. Inadequate stormwater infrastructure combined with rapid urban expansion has intensified runoff accumulation (refer Map 3-5).



Map 3-4: Map of 25 year and 100-year Flood lines



Water Logging Hotspots

Uttarakhand | Dehradun District

Legend

- Rishikesh (Tentative Boundary)
- Rishikesh City Boundary
- Swargashram City Boundary
- Muni ki Reti City Boundary
- Ward Boundary
- Waterbodies
- Sandbars
- National Highway
- State Highway
- Railways
- Water Logging Points

STP

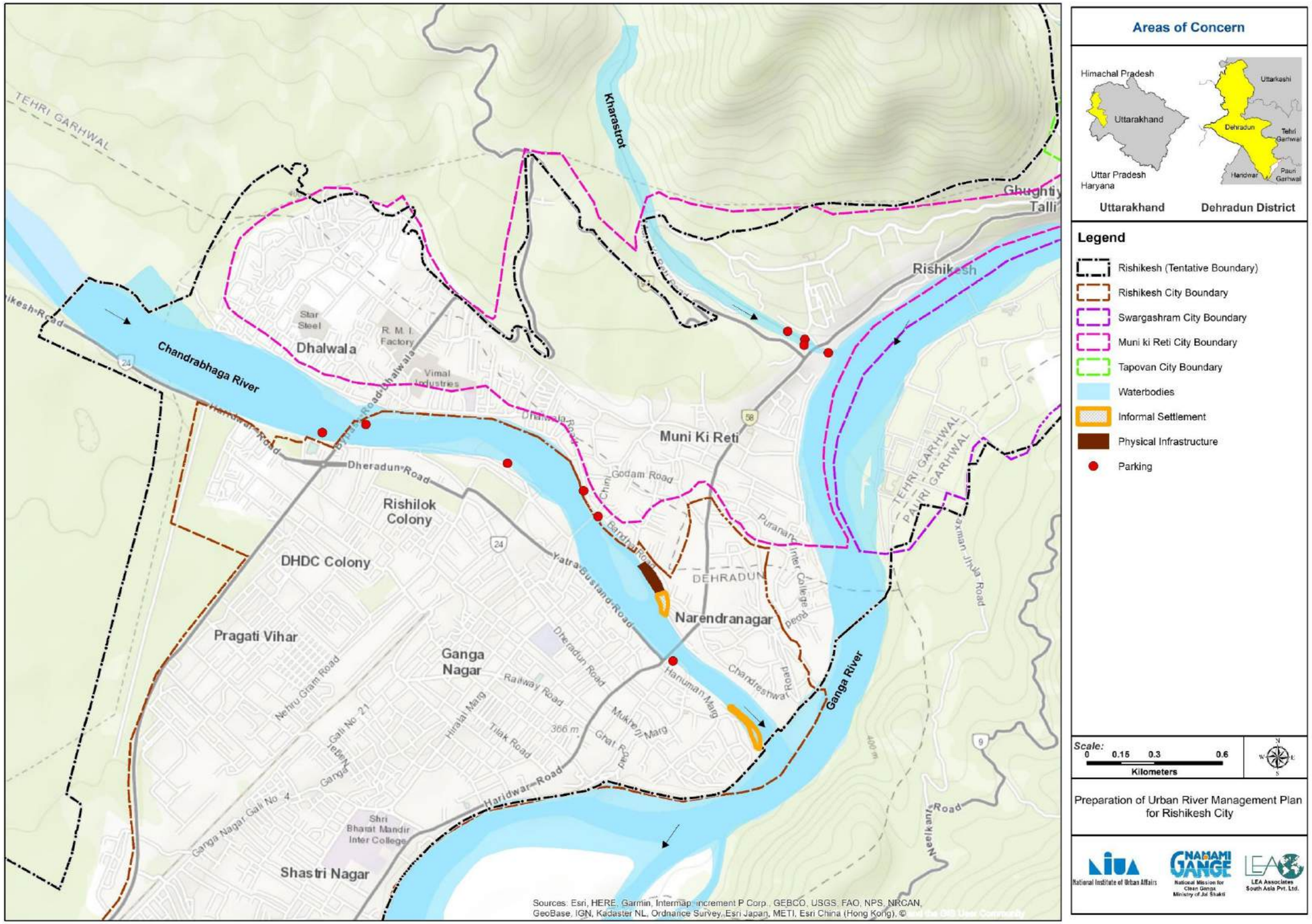
- Existing STP
- Abandones 14 MLD STP IDPL
- Proposed STP
- Under Construction STP

Scale: 0 0.275 0.55 1.1 Kilometers

Preparation of Urban River Management Plan for Rishikesh City

National Institute of Urban Affairs | National Mission for Clean Ganga Ministry of Jal Shakti | LEA Associates South Asia Pvt. Ltd.

Map 3-5: Waterlogging Hotspots within city



Map 3-6: Areas of concerns within the flood plain

3.5 Existing/ upcoming/ proposed projects

Currently, Irrigation Department has outlined a comprehensive approach to river and flood management in Rishikesh by proposing a total of 17 projects focused on Solid Waste Management system, Sewage Treatment Plant (STP), Ghat Development and River Front Development (RFD) projects and flood protection and mitigation. Listed of proposed projects taken up by the irrigation department in the floodplain are mentioned in Annexure 1.

3.6 Institutional mechanism

The Forest Department oversees ecological planning, plantation and conservation activities while the Municipal Corporation handles public amenities, maintenance and urban integration. This urban green retreat for recreation and wellness features lawns, bamboo huts, walking trails, open-air gym with a focus on native green species.

Table 3-4: Roles and responsibilities of government agencies in ecological management for Rishikesh City

Departments	Role
Irrigation Department	Lead agency for river bank protection, embankment construction and flood mitigation
Municipal Corporation	Responsible for land regulation, solid waste management and informal settlement control along the river banks
Forest Department	Custodian of forested riparian zones and biodiversity conservation

4 PHYSICAL INFRASTRUCTURE

4.1 Water supply

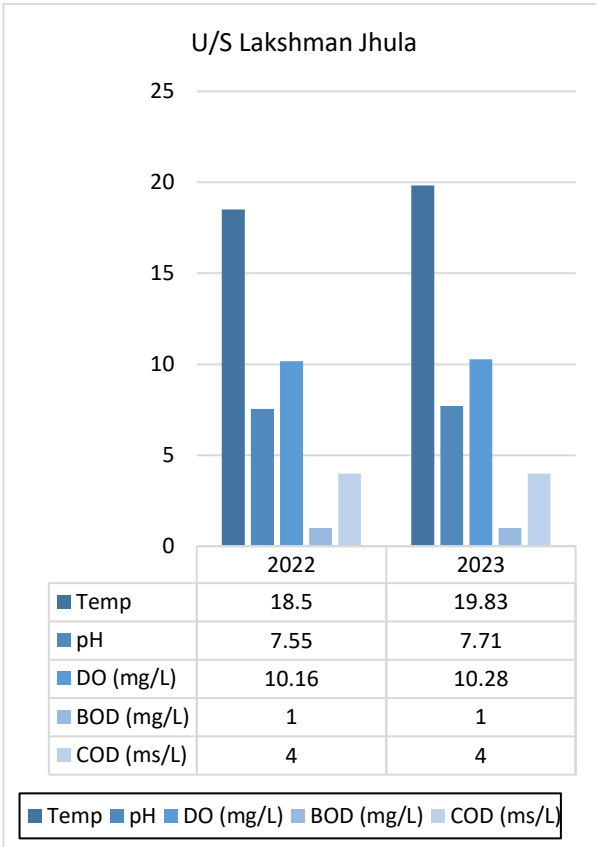
Rishikesh's water supply is entirely dependent on groundwater. It is extracted through tube wells within the municipal area.

4.1.1 Water Demand Supply

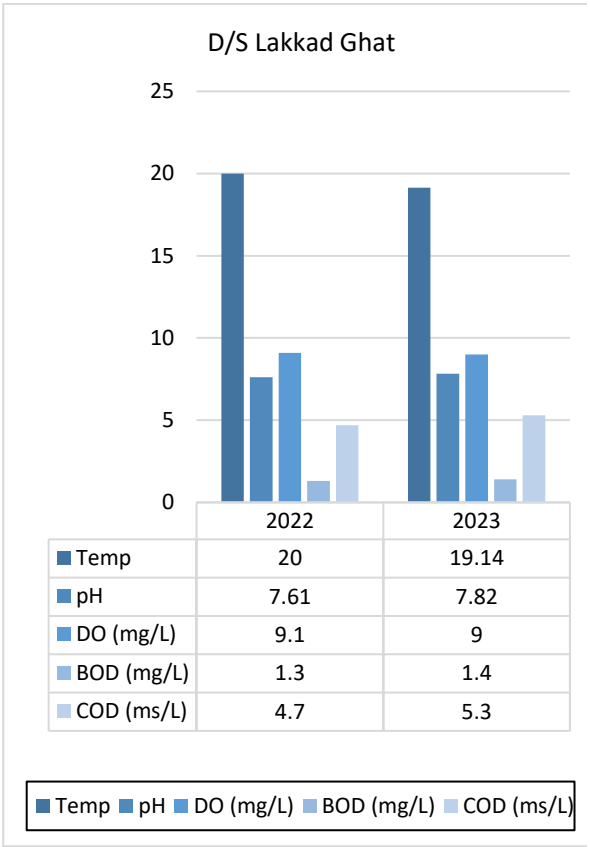
Ground water is the only source of water supply for the city, with a total extraction of 22 MLD. As per Jal Sansthan, the current water demand of Rishikesh city is 18 MLD. Water extracted from the tube wells is stored in tanks, where it undergoes chlorination before being pumped to overhead tanks for distribution across the city.

4.1.2 Water Quality

Over the past decade, results indicate that Dissolved Oxygen (DO) and Biochemical Oxygen Dem and (BOD) levels remain within CPCB standards. The river is classified under Category B, denoting suitability for outdoor bathing. The river water quality taken at upstream and downstream is presented in Figure 4-1 below.



	2022	2023
Temp	18.5	19.83
pH	7.55	7.71
DO (mg/L)	10.16	10.28
BOD (mg/L)	1	1
COD (ms/L)	4	4



	2022	2023
Temp	20	19.14
pH	7.61	7.82
DO (mg/L)	9.1	9
BOD (mg/L)	1.3	1.4
COD (ms/L)	4.7	5.3

Figure 4-1 : River water quality of River Ganga U/S Lakshman jhula and D/S Lakkad Ghat from 2022 -2024

4.1.3 Groundwater

As mentioned above, ground water is the primary source of water supply in the city. The water is extracted through 36 tube wells, of which 26 supply water to 26 wards under the management of the Jal Sansthan and remaining 10 serves 14 wards managed by Field Implementation Unit (FIU) funded by KfW.

As per the Dynamic Ground Water Resources Report, 2023 of Central Ground Water Board (CGWB), Rishikesh falls within the 'safe' category of ground water extraction shown in Image 4-2. The likely reasons for Rishikesh being in the safe category are as follows:

- High natural recharge capacity due to city's location in the bhabar zone allowing rapid infiltration of rainfall and surface water in aquifer recharge.
- Rishikesh has lower industrial demand which reduces the dependence on groundwater.

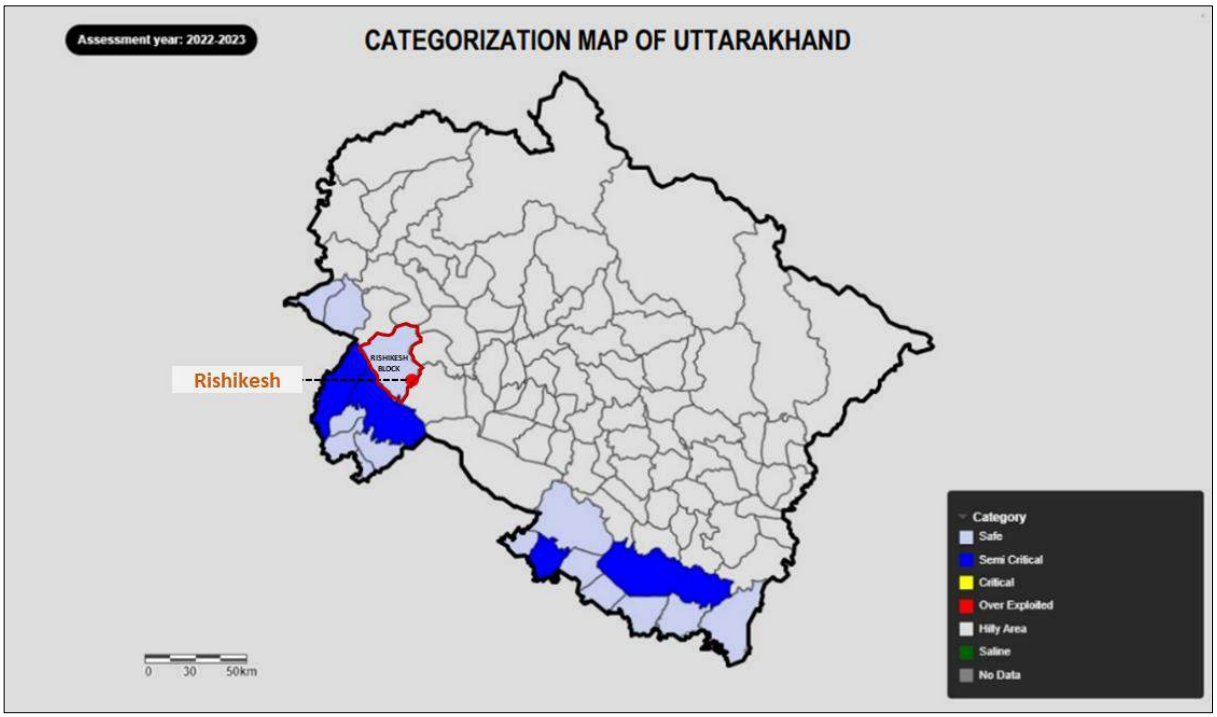


Image 4-1: Dynamic Ground Water Resources, 2023 Uttarakhand, CGWB

There is potential for recharge of ground water due to the presence of local/ discontinued aquifers, as is evident from the hydrogeological map indicating the aquifers in the region.

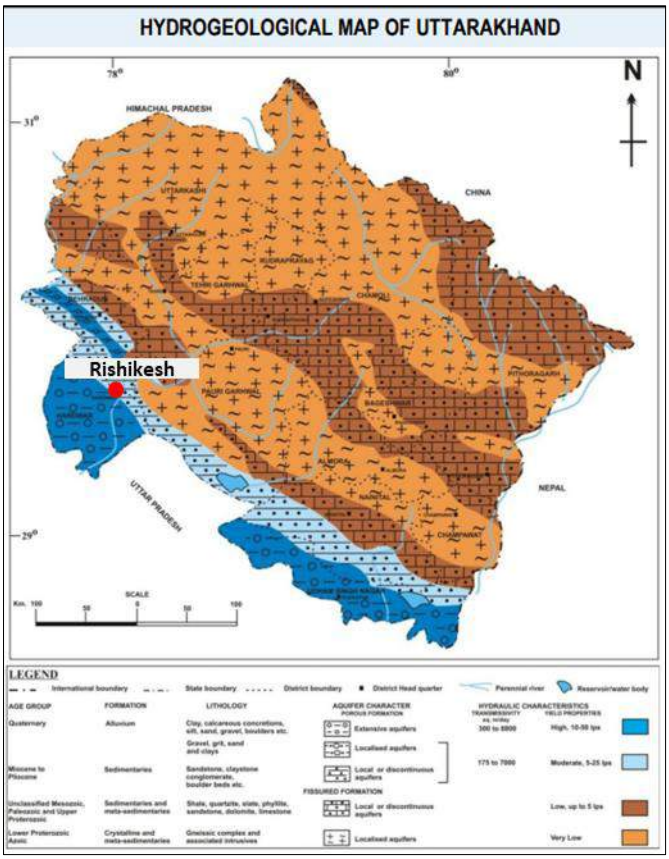


Image 4-2: Dynamic Ground Water Resources, 2023 Uttarakhand, CGWB

4.1.4 Institutional Mechanism

Department	Role
Uttarakhand Pey Jal Nigam	Authority in charge of project design, planning and implementation of water supply projects
Uttarakhand Jal Sansthan	Operation and maintenance of the projects upon their transfer from Pey Jal Nigam for water supply projects

4.2 Sewerage system

4.2.1 Sewage Generation and Coverage

Rishikesh city generates approximately 14 MLD of sewage, of which 50% is conveyed through the existing sewer network, while the remaining 50% flows through drains. Thus, all the 6 major drains are tapped, however 2 drains i.e., Shanti Nagar and Bangla Drain continue to discharge untreated used water directly into River Ganga. In addition, dhalwala drain located at the northern edge of the municipal boundary also discharges untreated used water directly into river ganga also after being tapped by chandreshwar nagar STP. The combined flow from sewered areas and tapped drains (approx. 9 MLD) is treated at the Lakkad ghat STP, which has a capacity of 26 MLD. Additionally, approx. 3 MLD from Muni-ki-Reti and approx. 7.5 MLD from upstream streams augment the inflow, resulting in a cumulative load of approx. 19.5 MLD at the STP. Treated water is discharged approximately 4 km downstream into the River Ganga. A separate 7.5 MLD STP at Chandreshwar Nagar within city limits receives partial inflows from the Muni-Ki-Reti catchment via minor drains, sewer lines and partial from Dhalwala Nallah, while residual untreated flows continue to enter the river directly. Refer Figure 4-2.

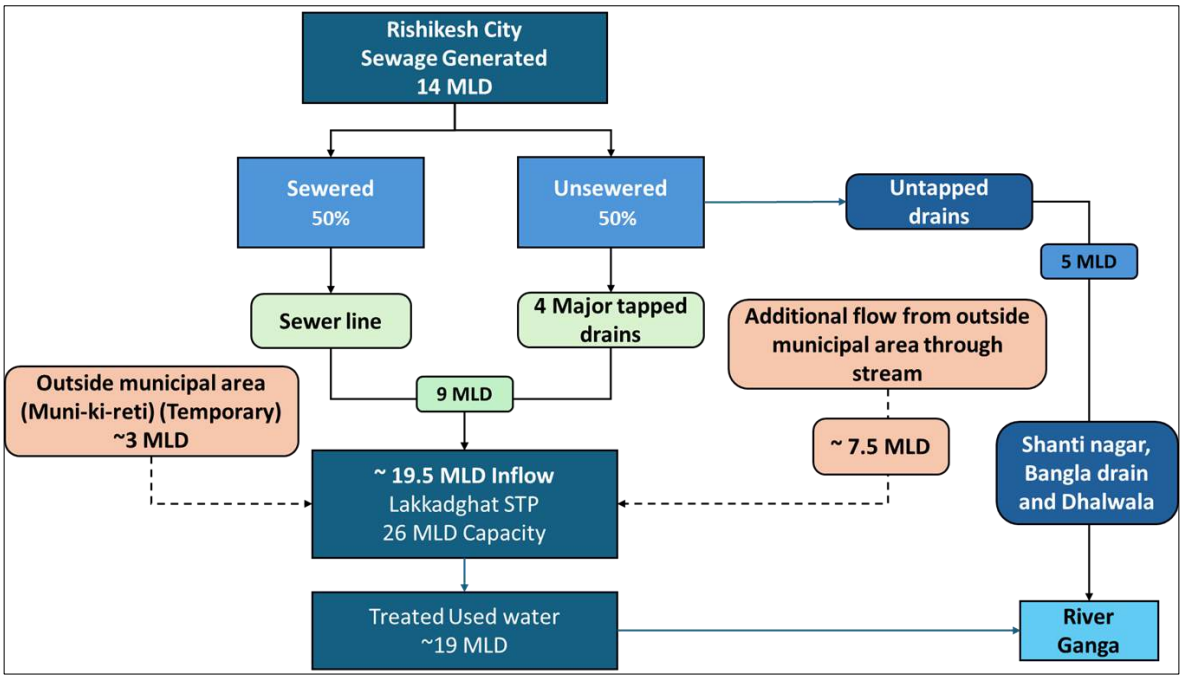


Figure 4-2 :Sewage Generation and Coverage

4.2.2 Existing Sewage infrastructure

The Rishikesh planning area has 5 STPs with a total existing capacity of 45 MLD. Two STP is based on MBBR technology and other 3 are on SBR. Out of the 5 STPs, STP at Dhalwala is running in full capacity and the remaining 3 STPs are functioning at an average capacity of 67%. The treated wastewater is directly discharged into the river. Sewage generation in Tapovan town is 2.64 MLD. The town is catered by 1 STP having capacity of 3.5 MLD. Swarg Ashram has one STP with a capacity of 3 MLD of which the intake of STP is 2.50 MLD. The STPs, its inflow & outflow and the outfall location are listed in Table 4-1.

Table 4-1: Inflow and outflow of STPs

Sl. No	Name of STP	ULBs	Technology	STP Capacity (in MLD)	Inflow (in MLD)	Outflow (in MLD)	Outfall Location	Distance (In Km)
	A. Existing							
1	STP at Dhalwala (Chandreshwar Nagar)	Rishikesh	MBBR	7.50	7.50	7.0	Chandrabhaga River	0.08
2	STP at Lakkad ghat	Rishikesh	SBR	26	19.50	19.0	Ganga River	4
3	STP at Swarg Ashram,	Swarg Ashram	SBR	3.0	2.50	2.50	Ganga River	0.33
4	STP at Tapovan,	Tapovan	SBR	3.5	2.00	2.00	Neem Beach, Ganga River	0.04
5	STP at Chorpani	Muni ki reti	MBBR	5	-	-	chandrabhaga	0.24
	B. Abandoned							
1	STP at IDPL Colony	Rishikesh	ASP	14	-	-	-	-
2	Polishing Pond at Lakkad ghat STP	Rishikesh	-	6	-	-	-	-

Source: Pey Jal Nigam Department, Rishikesh, 2025

Approximately 50% of the city relies on septic tanks, generating an estimated 19 KLD of faecal sludge. A 50 KLD co-treatment plant is located inside the premises of 26MLD STP at Lakkad Ghat, which has sufficient capacity to handle the current load. However, operational integration remains weak. Six private desludging vehicles are registered with the Municipal Corporation, but they operate without GPS-based tracking or monitoring systems. Consultations with the co-treatment facility operator stated that these vehicles are not discharging sludge at the designated facility. Instead, faecal sludge is being dumped into manholes and drains. In addition, desludging vehicles from peri-urban areas also discharge the faecal sludge into manholes and open drains. This practice results in untreated sludge entering the sewer network and rivers, creating significant environmental and public health risks.

4.2.3 Ongoing and Proposed Projects

Presently, three STPs have been proposed in Rishikesh under different funding schemes. The details are presented in the table below.

Table 4-2: List of proposed and ongoing STPs

Sl.No	Name of STP	ULBs	Status	Technology	STP Capacity (in MLD)	Funding Source
1	STP at Amit Gram	Rishikesh	Proposed	-	4	KfW
2	STP at Khadk Mafi	Rishikesh	Proposed	-	5	KfW
3	STP at 14 Bigha	Munni Ki Reti	Under Construction	SBR	8	World bank

Source: Pey Jal Nigam, 2025

4.2.4 Institutional Mechanism

Department	Role
Uttarakhand Pey Jal Nigam	Authority in charge of project design, planning and implementation of sewerage projects
Uttarakhand Jal Sansthan	Operation and maintenance of the projects upon their transfer from Pey Jal Nigam for sewerage projects

4.3 Storm water management/ Drains

As per Pey Jal Nigam, there are a total of 48 stormwater drains in the planning area, of which all are tapped. Out of these, 6 drains are connected to the Rishikesh Lakkad Ghat STP. However, the Shanti Nagar drain flows into the Rambha River, while the Dhalwala and Bagla drains discharge directly into the Ganga River, as observed during site visits. Additionally, 15 drains are connected to the Munni Ki Reti STP, 12 drains to the Tapovan STP and 15 drains to the Swarg Ashram STP. These drains are intercepted at sewage pumping stations and conveyed for treatment at the respective sewage treatment plants.

Image 4-3: Shanti Nagar Nallah

Image 4-4: Dhalwala Nallah

Institutional Mechanism

Department	Role
Uttarakhand Pey Jal Nigam	Authority in charge of project design, planning and implementation of sewerage projects

4.4 Solid waste management

Residential Waste

Rishikesh Municipal Area: As per the Dehradun District Environment Plan, the city generates 80.85 metric tonnes per day (MTPD) of solid waste which includes 25% dry waste and 55% wet waste. As per the draft Master Plan 2031, the solid waste generated in the city for the year 2041 has been projected to be 82.25 MTPD. There is 100% door to door collection of waste.

Planning Area: As per the District Environment Plan, Tehri, the total solid waste generated is 13 MTPD of which 38% dry waste and 62% wet waste in Munni Ki Reti & Tapovan. The total solid waste generated in Swarg Ashram is 13 metric tonnes per day of which 38% dry waste and 62% wet waste. There is 100% door to door collection of waste along with collection of waste through community bins in all the ULBs. The solid waste generated in Munni ki Reti & Swarg Ashram for the year 2041 has been projected as under:

Table 4-3: Solid waste Generation in Planning Area in (MTPD)

Sl. No.	Area	2041
1	Muni Ki Reti	17.20
2	Swarg Ashram	2.43
	Total	**101.88**

Source: Rishikesh Draft Master Plan Report,2031

Waste Processing Facilities

Rishikesh Municipal Area: Approximately 40% of the waste collected is transported in a segregated manner. Solid waste is dumped at a 3.58-acre site in Govind Nagar, where segregation takes place. Wet waste is sent to compost pits near Hattal Park and Smriti-1 Rishikesh, while dry waste goes to the nearby MRF centre. Biomedical waste is handled by the Medical Pollution Control Committee. However, e-waste remains unsegregated and is dumped directly in the yard. Municipal Corporation has proposed scientific disposal of solid waste management and processing plan at Lal Pani. Map 4-2

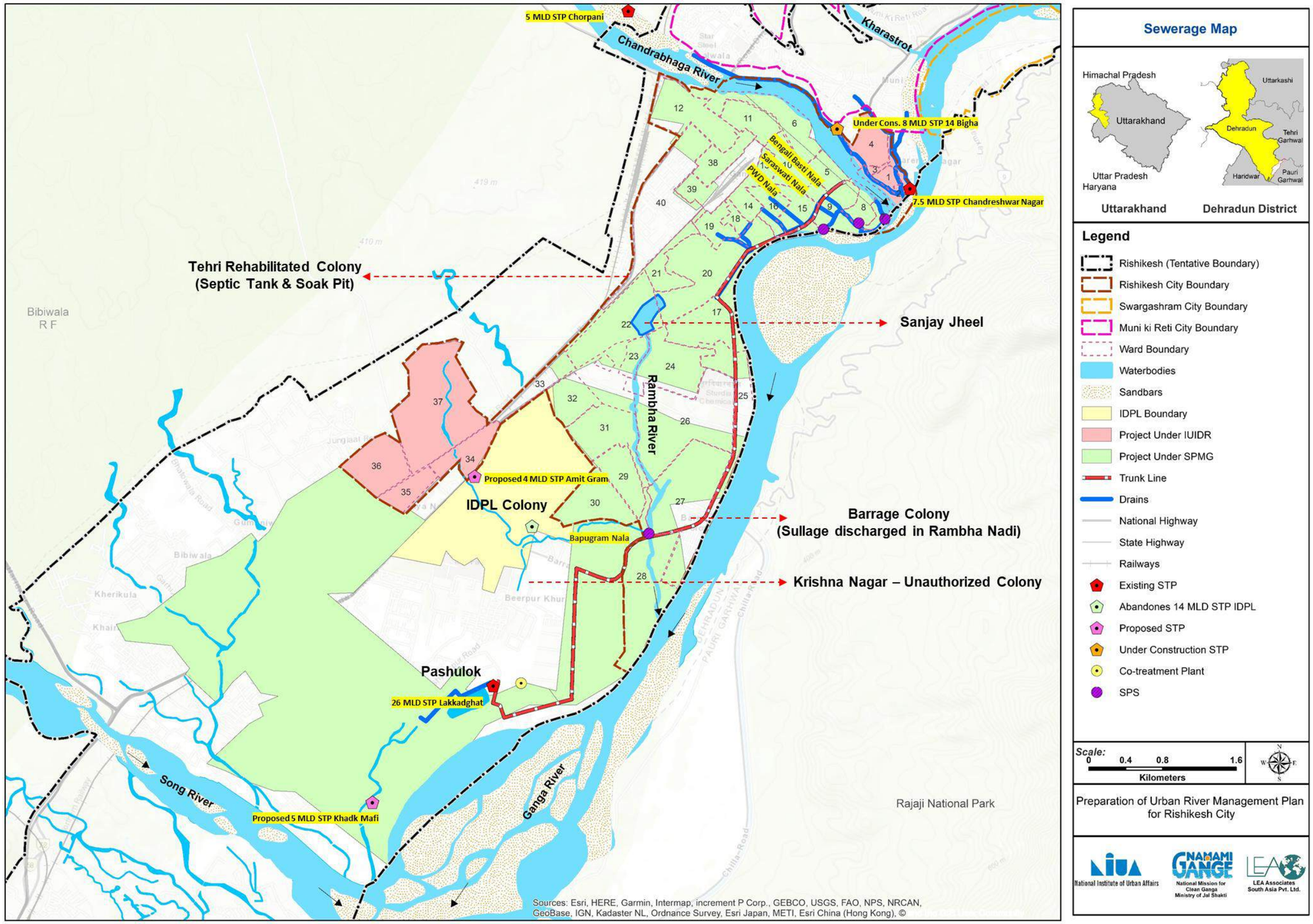
As per site observation, the waste collection vehicles are not able to access settlements such as Bairav basti located along chandrabhaga river. Solid waste is being dumped along the Rambha River. Solid waste accumulation was also observed on roads, rail tracks and riverbanks, eventually entering the river and causing blockages, contamination of water and urban flooding. Community consultations indicated reliance on municipal drain cleaning during the monsoon, but clogged drains lead to flooding of the river and nallas.

Image 4-5: Solid Waste Dumping Site near Govind Nagar

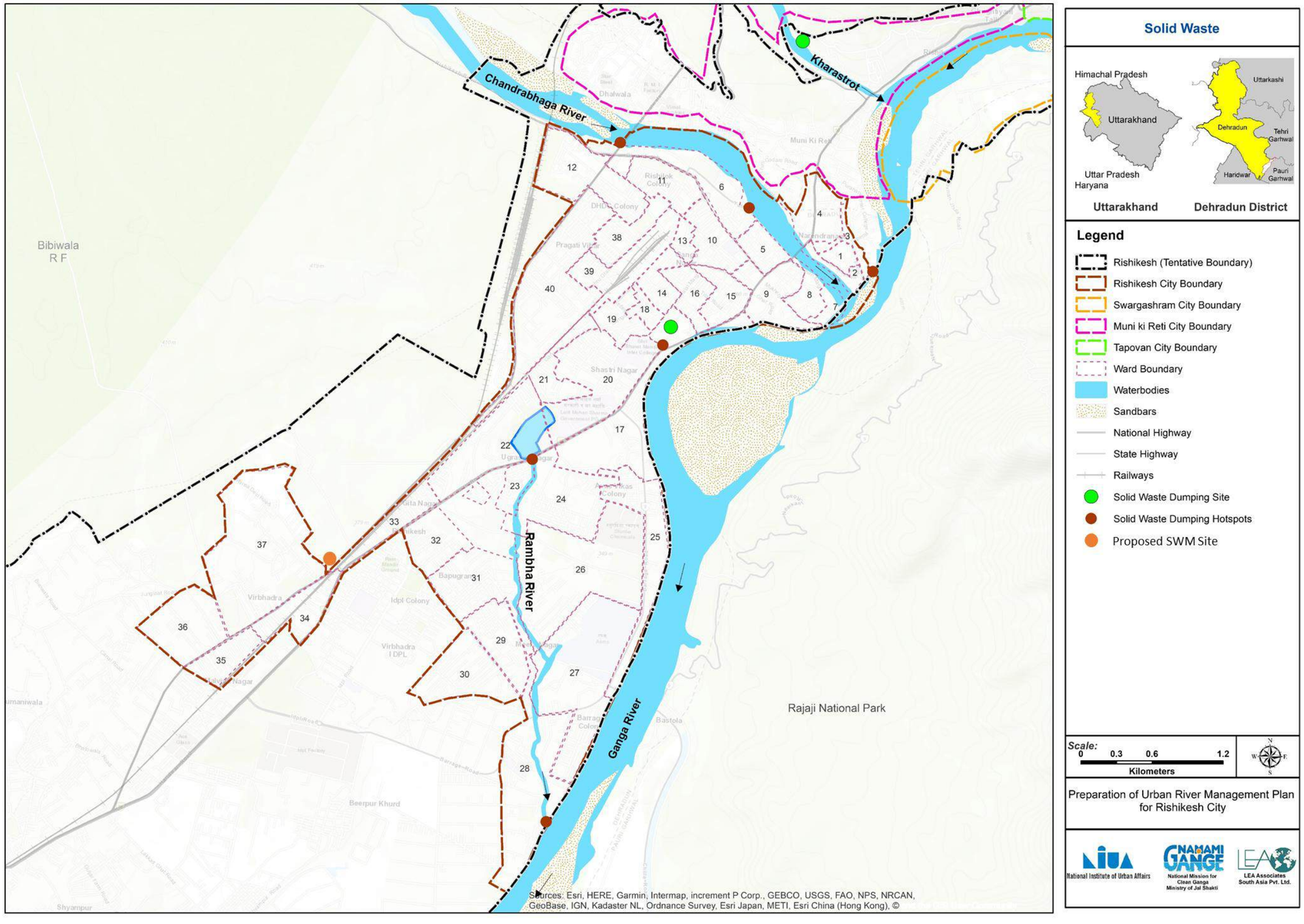
Image 4-6: Location of Solid Waste dumping along the Rambha River

Institutional Mechanism

Solid Waste Management in Rishikesh city is being carried out by Municipal Corporation and handling components of door-to-door waste collection and processing through agencies hired on contracts. The source of funding of the city for waste management, is received from SBM 2.0.



Map 4-1: Physical Infrastructure Map



Map 4-2: Solid Waste Map

5 SWOC ANALYSIS AND URM INDEXING OF THE CITY

5.1 SWOC Analysis

Based on the baseline assessment of Rishikesh City, various issues and gaps have been identified. Based on this, a SWOC analysis has been done and presented below:

	**STRENGTHS** • 25 & 100-years flood lines are delineated for River Ganga. • 5 STPs with total capacity of 45 MLD (MBBR and SBR technologies), plus polishing pond at Lakkad Ghat and abundant 14 MLD STP at IDPL. • The STPs currently operate at 67% capacity, allowing for additional used water treatment without immediate expansion. • River water quality remains within permissible limits for bathing. • Ghats functions as a riverfront, supporting small hospitality businesses and attracting visitors. • Municipal outreach programs, including rallies, ward meetings, college sensitization and youth-focused events, foster long-term stewardship of the river.
	**WEAKNESS** • Flood Lines are yet to be finalized and notified for Chandrabhaga, Song and Rambha River. • Informal settlements observed on river bed of Chandrabhaga river and Kharastrot. • Due to unauthorized settlements, it is difficult to implement a proper sewerage plan. • Solid waste and religious waste dumping on the banks of River near the Aastha Path and Ghats. • Currently sewerage treatment is poor due to (a) About 50% being unsewered and (b) The existing STP is not running on full capacity. • Shanti Nagar, Dhalwala and Bagla drains discharge untreated greywater directly into Rambha and Ganga rivers. • Rambha river flows from a densely populated area which witnesses solid waste dumping and used water before falling into River Ganga. • Open defecation on the riverbed of Chandrabhaga river. • The Chandrabhaga river bed is dry, feed during post monsoon. • Over dependency on Ground Water. • No river and people connect.
	**OPPORTUNITIES** • Rishikesh has ample opportunity for tourism including eco-tourism, river front development subject to return flow in the river in the lean season.

	• The existing nature of slope is ideal for designing of gravity-based infrastructure like water supply, drainage etc. • Projects of water supply, sewerage and drainage in pipeline through KfW funding, • Residents of the city visit the mandirs located near the river during pujas and festivals
	**CHALLENGES** • High tourist influx during seasons strains the city's sanitation and waste management systems. • Problem of flooding and bank erosion due to heavy rainfall. • There is an absence of existing demand for reuse of treated water. • Several parts of Rishikesh areas such as Tapovan, Muni ki reti are vulnerable to landslides.

5.2 URM Indexing of the City

The URMP framework provides a clear indexing/ scoring mechanism to monitor progress of project implementation recommended under URMP vis-à-vis its objectives. The implementation of the URMP is monitored through 10 indicators, one for each objective of the URMP framework. The URM_{index} is measured on a scale of one to five and is useful to paint a snapshot of the situation, which can be used to monitor the implementation of the URMP and develop overall strategies and policies for enhancement.

In order to understand the present status of water resources in the city, an assessment has been made using the URM_{index}. With a score of 2.6, Rishikesh is at elementary level of urban river management. This score shall improve upon implementation of proposed interventions against each objective. The Figure 5-1 below shows the current status of the city against each of the objectives of urban river management.

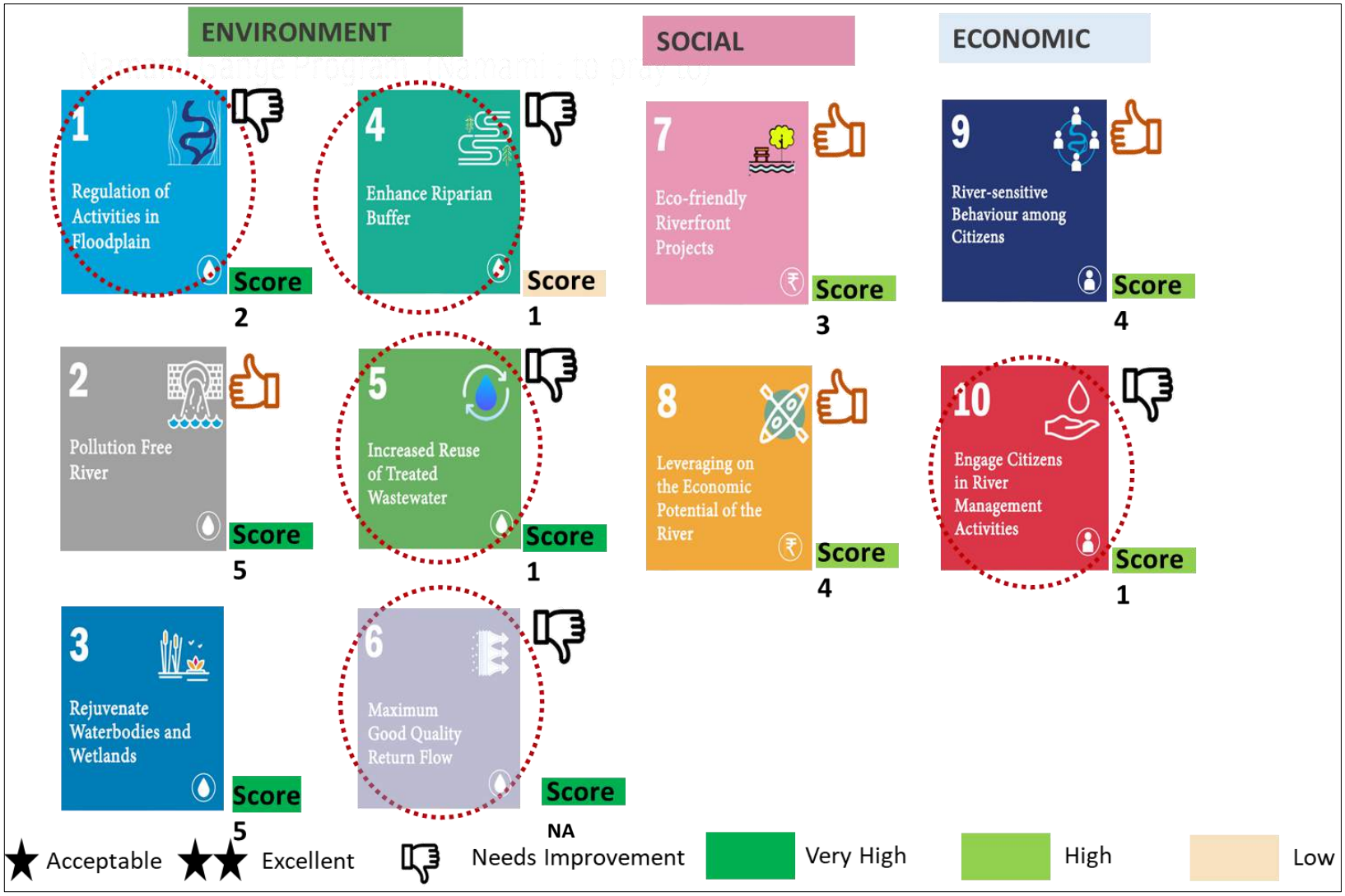


Figure 5-1: Prioritization Matrix

6 URMP VISION FOR THE CITY

The URMP vision for the city of Rishikesh is to establish river Ganga as a 'sacred ecological corridor' that converges spirituality, ecology, adventure and resilience, strengthening the city's spiritual heritage while safeguarding its ecological integrity.

River front zoning – Rishikesh Municipal Corporation

River Ganga shapes both the economic and ecological character and urban fabric of Rishikesh city. The city's dependency on the river and its dynamic behaviour demands differentiated planning approaches across distinct stretches of the Ganga riverfront.

Based on the river characteristics and nature of river city interaction the entire stretch of River Ganga along the planning area has been divided into two stretches.

- Stretch A (Upstream): Tapovan to Pashulok Barrage
- Stretch B (Downstream): Pashulok Barrage to Raiwala

Details of the two stretches are presented in the following table and Image 6-1.

Stretch A (Up Stream): The Adventure & Eco-Tourism Gateway		
Location	:	Tapovan to Pashulok Barrage (Approx. 12 km)
Theme	:	Adventure, Leisure & Eco-sensitive Tourism
Description	:	Globally renowned for rafting, yoga retreats and eco-tourism, this stretch attracts international visitors seeking adventure and wellness. The vision is to formalize adventure tourism while embedding ecological safeguards.
Key Strategies	:	Develop strict regulation of rafting camps, restore vegetative buffer with native vegetation for bank stabilization, conduct awareness programme for tourists on river sanctity, digital monitoring of visitors during peak season and licensing of adventure operators under municipal oversight
Stretch B (Down Stream): The Resilient Urban Interface		
Location	:	Pashulok Barrage to Raiwala (Approx. 12 km)
Theme	:	Pollution Control and Flood Buffers
Description	:	This downstream stretch transitions into wider floodplains and forest edges. It faces sewage inflows and flood vulnerability but offers opportunities for recreation and ecological restoration.
Key Strategies	:	Interception and treatment of polluted drains, wetland conservation as ecological buffers, floodplain zoning to reduce disaster risk, green belts integrated into city planning, inclusive recreation spaces, digital dashboard for flood alerts and water quality monitoring; community stewardship programs with schools and NGOs.

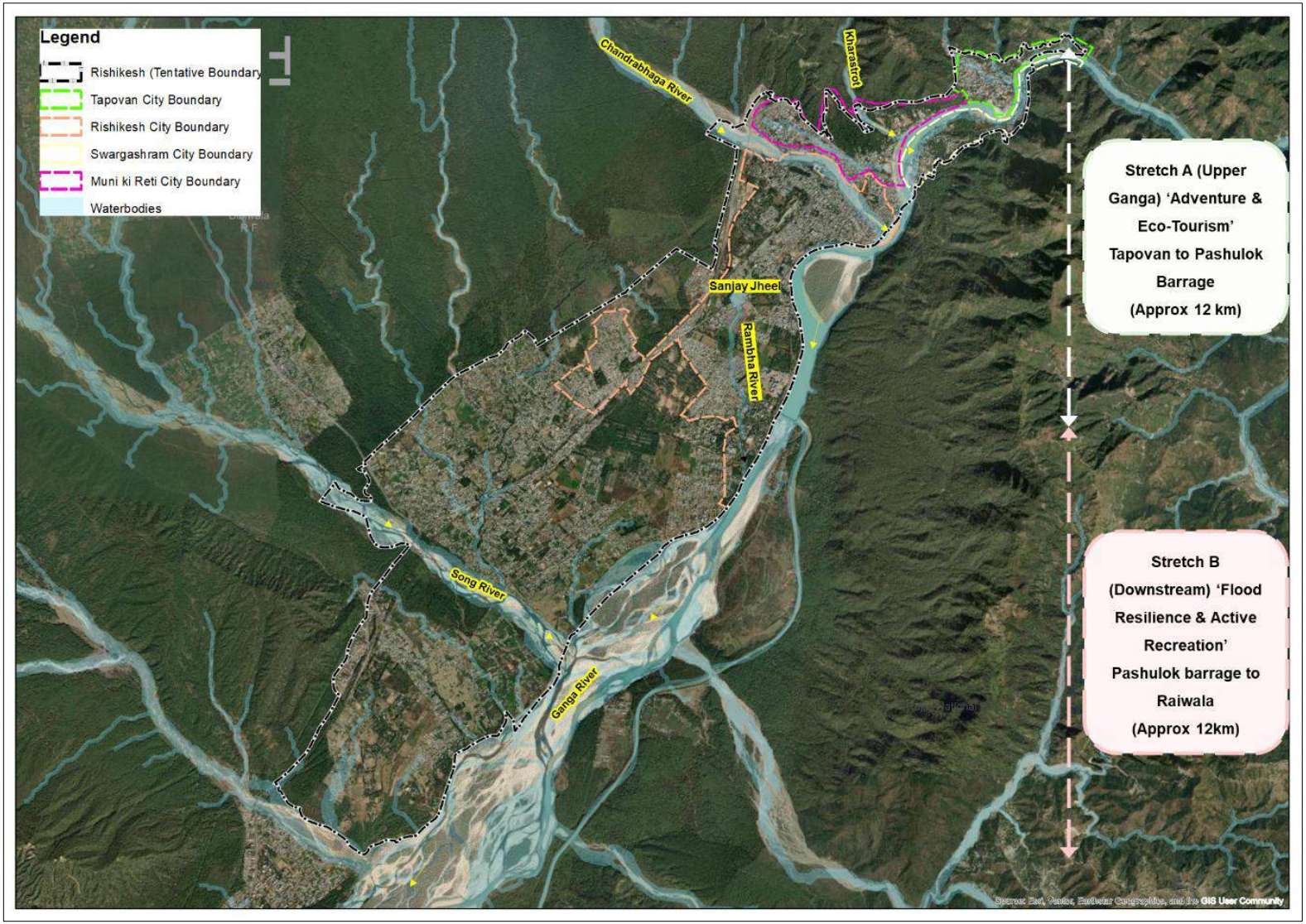


Image 6-1: Spatial Division of the city – Sacred Ecological Corridor

7 PROPOSED INTERVENTIONS

7.1 Objective 1 Interventions to ensure effective regulation of activities in Floodplain

Interventions under Objective 1 are designed to strengthen the Rishikesh Draft Master Plan 2031 by embedding flood resilience, ecological restoration and sustainable water management into core planning framework of the city. Measures such as validated flood lines, encroachment free flood pains, river and stream buffer conservation, naturalized bank protection, ground water recharge will enhance resilience, reduce disaster risks, safeguard communities and protect critical infrastructure. Aligned with national floodplain zoning and climate adaptation guidelines, these planning interventions will ensure balanced urban growth with long term sustainability.

7.1.1 Intervention 1: Inclusion and strengthening of provisions in Master Plan of Rishikesh, 2031

The Rishikesh Draft Master Plan, 2031 lays down river centric provisions for planning i.e., buffer zones shall be delineated along all four rivers, namely the Ganga, Chandrabhaga, Song and Rambha and these areas have been designated as 'No Development Zones.'

Table 7-1: Distance of Construction from Protected Areas

Sl. No.	Protected Area	Distance (In meters)
1	Minimum distance from the banks of River Ganga and other Flowing Rivers	200
2	Notified River (Distance from river bank)/Forest area	30
3	Other river /streams	10
4	Natural reservoirs and water sources	15

Source: Rishikesh Draft Master Plan, 2031

Gaps in the Rishikesh Masterplan

- The Uttarakhand Irrigation Department has delineated 25 year and 100-year return period flood lines in accordance with NGT guidelines. however, it has not been incorporated in the Draft Master Plan.
- The Draft Master Plan 2031 was prepared prior to the release of the Technical Guidelines of Flood Plain Zoning (CWC, Ministry of Jal Shakti, July 2025), resulting in the following gaps that require alignment with the updated standards:
    - Revision of Land Use map: Proposed land uses do not incorporate the delineated flood lines and therefore fail to exclude prohibited activities within flood plains.
    - Updation of Building Byelaw: Existing byelaws lack flood-resilient design provisions such as higher plinth levels, floodproofing measures and differentiated standards for various flood plain zones.
- The city is in highly porous Bhabar region and is also facing ground water scarcity. However, the Master Plan does not have mandatory rainwater harvesting provisions as recommended in the Model Building Bye-Laws, 2016 (MoHUA). The Draft Master Plan does not mandate rainwater harvesting provisions for new constructions.

- The trenching ground is 180 meters from the river bank of Ganga without demonstrating compliance with the 500-meter floodplain buffer required by NGT guidelines which poses a severe risk of leachate contamination.

The following recommendations shall also be incorporated in the Rishikesh Draft Master Plan 2031.

Table 7-2: Proposed Interventions for Flood and Water Management in Rishikesh Draft Master Plan 2031.

S.no.	Aspects	Section Name & Reference in Master Plan	Current Vision	Recommendation	Rationale/Justification
1	Flood Management	Ch.8, section 8.3 – Natural Disaster & Ch. 12 – Zoning regulations	No explicit mention of flood returns periods, flood zoning, or delineation of flood lines	▪ Integrate baseline hydrological assessment covering flood lines for 5, 25 and 100-year return periods. ▪ Adopt Flood Plain Zoning guidelines (MoJS, July 2025 – Sec. 7, para 7.2, pp. 23–24). ▪ Incorporate GIS-based flood hazard mapping. ▪ Define regulatory zones (prohibited, restricted, regulated use) within floodplains.	Provides scientific delineation of flood-prone areas along 4 Rivers.
2	Land Use Plan Revision	Ch. 11 – Proposed Land Use	No separate designated land use category as a Waterbodies and wetland.	▪ Explicitly include rivers and wetland a separate landuse categories. ▪ Relocate informal/slum settlements along Chandrabhaga River banks to safer resettlement zones. ▪ Define institutional arrangements for floodplain and buffer management. ▪ Introduce encroachment control mechanisms and pollution	Maintains hydrological connectivity and biodiversity corridors. Provides governance framework for long-term conservation. Aligns with MoEFCC Wetlands Rules (2017).

S.no.	Aspects	Section Name & Reference in Master Plan	Current Vision	Recommendation	Rationale/Justification
				abatement measures.	
3	Riparian Buffers & Drainage Channels	Ch. 12 – Zoning regulations Sec. 12.4	Riparian buffer along the river and drains is not mentioned	▪ No multi-zone riparian buffer or bio-engineering guidance. ▪ 10-meter buffer along the drains	Introduce multi-zone riparian buffers and treat feeder drains as extensions of floodplains
4	Protection of Wetlands & swamp	Ch. 12 – Zoning regulations Sec. 12.4	Sanjay jheel & manu swamp not mentioned	▪ Sanjay jheel & manu swamp shall be considered as eco-sensitive zone ▪ Development of baseline data and catchment integration study	Conduct baseline inventory, hydrological & ecological assessment of wetland; integrate findings into zoning
5	Monitoring & Adaptive Flood Management	-	No floodplain-specific monitoring framework	Establish GIS-based floodplain monitoring, 5-year review of flood lines and zoning	Adaptive, climate-resilient river management

7.1.2 Recommendation 1: Suggestions and recommendations for the development within the flood plain

Rationale: As mentioned in section 3.4, dry stretches of the Chandrabhaga and Kharastrot rivers are being misused as informal parking zones, violating NGT and NMCG directives that prohibit vehicular activity in riverbeds. At the confluence of the Chandrabhaga and Ganga, informal settlements have emerged, obstructing natural flows, degrading floodplain ecology and contributing to waste accumulation, thereby posing risks to both river health and community safety. Additionally, 8 MLD STP constructed directly on the Chandrabhaga riverbed further compromise hydrological processes and heighten flood hazards. Safeguarding these rivers requires strict enforcement of national guidelines, relocation of inappropriate infrastructure and settlements and continuous monitoring to ensure eco-sensitive land use. Connectivity solutions must avoid forcing a road through the fragile Chandrabhaga riverbed, prioritizing sustainable alternatives instead.

Recommendations:

- Strict enforcement and regulation are essential to safeguard river health and floodplain integrity. While designated parking zones outside floodplains should be introduced to eliminate informal parking on dry stretches. Install bio-fencing, bollards and boundary markers to restrict vehicle access.
- Relocation and rehabilitation of informal settlements at the Chandrabhaga - Ganga confluence should be shifted to planned housing clusters equipped with basic amenities, supported by

livelihood opportunities and integration programmes to enable a smooth transition. Develop walls or green belts to prevent the spread of informal settlements along the bank of the river.

- Restrict development of infrastructure such as STP, roads, permanent settlements, parking, bus stand, industries and landfill site on and along the riverbed. These facilities shall be located outside sensitive river zones, which is critical for maintaining flood resilience, groundwater safety and compliance with regulatory norms.
- To safeguard the fragile Chandrabhaga riverbed, it is recommended to avoid constructing a new road through this sensitive area. Instead, a dedicated parking hub near Natraj Hotel can be developed, supported by frequent electric shuttle services to Triveni Ghat via existing road networks. This approach would significantly reduce private vehicle traffic along the riverfront. In parallel, enhancing connectivity to Chandreshwar Ghat and establishing a causeway link between Chandreshwar and Triveni Ghat would enable Chandreshwar to function as a supplementary ghat. This dual strategy would help ease congestion, improve accessibility and create a more sustainable flow of pilgrims across the riverfront.

7.2 Objective 2 Interventions to keep the river free from pollution

Objective 2 Interventions focus on ensuring that the River Ganga, its tributaries and the nallahs feeding into it remain free from both liquid and solid waste pollution. In Rishikesh, the predominant source of liquid waste contamination is the direct discharge of untreated sewage from households into local streams and drains. Likewise, the indiscriminate disposal of municipal solid waste into these water channels constitutes a major contributor to solid waste pollution.

7.2.1 Intervention 2: Systematic Sewage Flow and Treatment Upgradation: De-Linking Dhalwala Nallah from Chandreshwar STP

The 7.5 MLD STP at Chandreshwar Nagar includes:

- Approx. 2 MLD from small drains and household sewer lines, with high BOD load.
- Approx. 5.5 MLD tapped from the nallah with diluted BOD of about 40-50 mg/L.

As mentioned in section 4.2.2, the Dhalwala Nallah originates from upstream springs and catchment areas, carrying a total flow of approx. 15 MLD including greywater from the unsewered households is partially tapped (5.5 MLD) at chandreshwar Nagar STP. The remaining flow of approx. 9.5 MLD from this nallah continues to discharge untreated water into the Ganga River, with BOD levels in the range of 40–50 mg/L. The Chandreshwar Nagar STP receives the influent at 100 mg/L BOD, however, the total flow from the nallah cannot be diverted to the STP because a significant proportion comprises of spring water, which is not intended for treatment and therefore bypasses the facility. The key concerns are listed below:

- Absence of sewage–stormwater segregation in the Dhalwala catchment.
- Direct household discharges into the nallah in the absence of sufficient sewerage system.
- Diluted BOD used water is being discharged into the Ganga via Dhalwala Nallah due to excess flow that exceeds the treatment capacity of the Chandreshwar STP.
- Unsafe discharge practices at the riverbank, exposing communities to health risks.

Image 7-1: Dhalwala Nalla

Image 7-2: Chandreshwar Nagar 7.5 MLD STP and dhalwala nallah outflow point

Proposed Intervention:

A. Segregation of Sewage and Stormwater in Dhalwala Nallah

To optimize treatment efficiency, sewage and stormwater must be conveyed separately:

- Household Tapping: Connect lateral outlets into a dedicated sewer pipeline with inspection chambers at suitable intervals for monitoring.

- Dual Conveyance System: Construct an RCC box culvert for stormwater (designed for peak monsoon discharge) and lay a parallel HDPE/RCC pipeline for sewage.

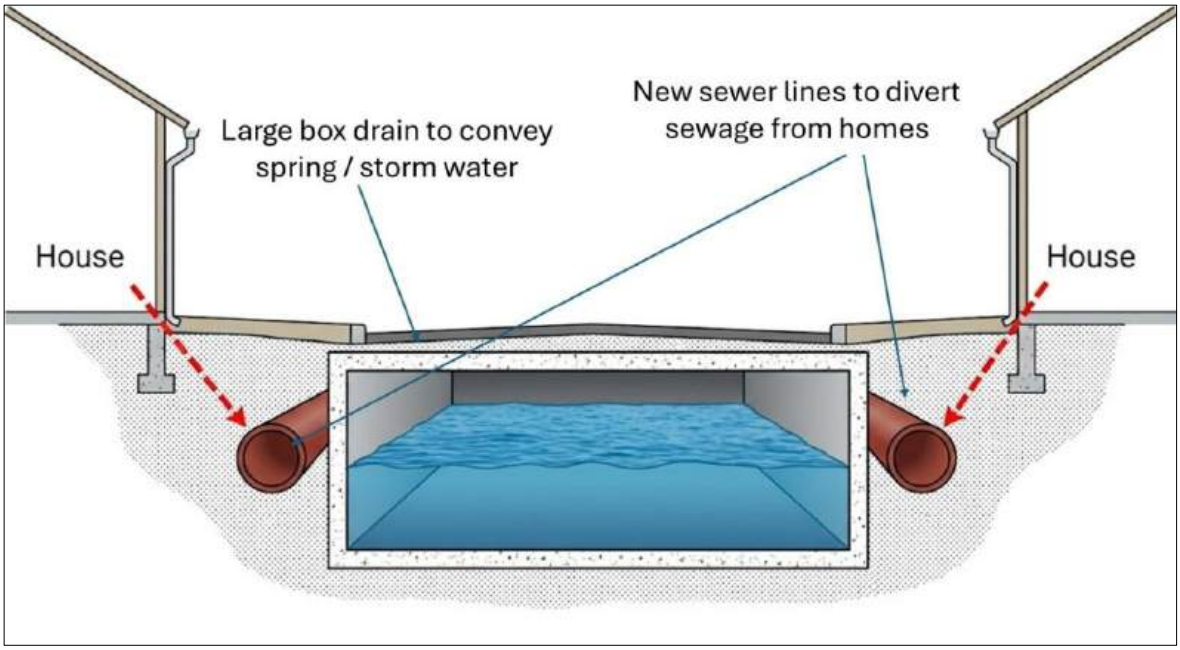


Image 7-3 : Conceptual plan of separating sewer and storm water

B. Retrofitting of Chandreshwar Nagar 7.5 MLD STP

The STP requires targeted retrofitting to handle concentrated sewage loads:

- **Process Upgradation:** Incorporation of MBBR technology with media upgrading will enhance biological treatment capacity.
- **Mechanical Enhancements:** Blower capacity will be increased to effectively treat influent BOD levels up to 230 mg/L.

Following segregation of sewage and stormwater, the hydraulic load to the STP will reduce to approx. 4 MLD, with concentrated sewage of 230 mg/L BOD. This adjustment creates a residual treatment capacity gap of about 2 MLD of concentrated sewage, which can be strategically utilized for future sewerage connections under the IUIDR project. By channeling these additional flows into the retrofitted Chandreshwar Nagar STP, the facility can utilize its optimum capacity strengthening integrated sewage management for the Dhalwala catchment.

Accordingly, the IUIDR DPR (under preparation) should commit the new sewer line to the Chandreshwar Nagar STP first before diverting flows to the under-construction 8 MLD STP at 14 Bigha, Muni Ki Reti. This approach ensures that existing assets are maximized, avoids duplication of treatment facilities and provides a sustainable framework for long-term sewage management.

C. Extension of Treated Water Discharge Outlet

While the STP's treated used water meets environmental discharge standards, it is not safe for direct human contact. Field observations (refer Image 7-4) show children interacting with water near the discharge point, posing risks of hand-to-mouth exposure, splashing and infection.

To mitigate these public health risks, the treated water discharge pipe shall be extended by approximately 50 meters, running below the riverbank up to the lean-period river edge, as illustrated

in Image 7-5 This structural intervention will:

- Relocate the discharge point away from shallow, accessible zones.
- Ensure safe dispersion into deeper flow channels with higher velocity.
- Minimize human exposure and reduce the likelihood of waterborne infections.
- Align with best practice standards for used water disposal in urban river systems.

Image 7-4: Outlet of treated used water flowing into Ganga River

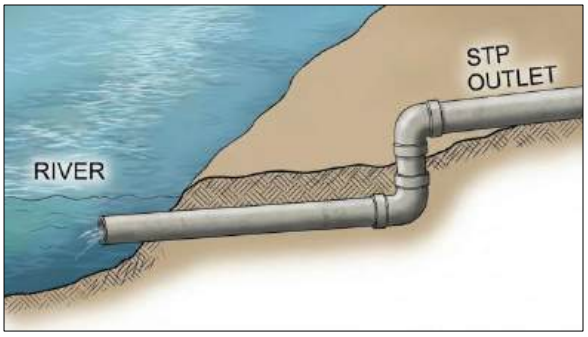
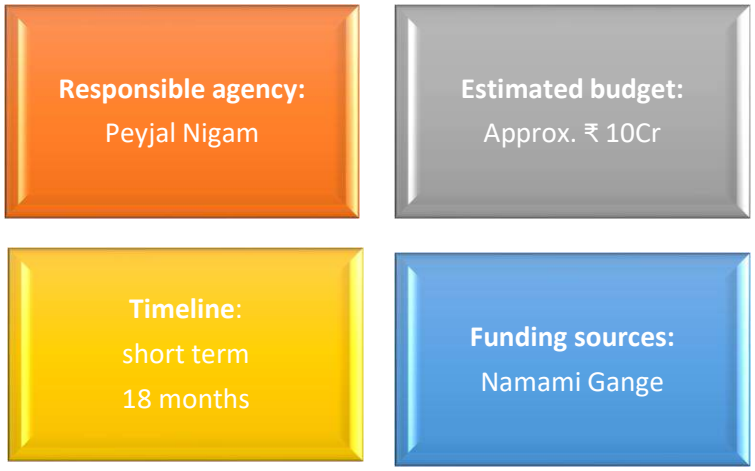


Image 7-5: Illustration of extended outlet pipe from STP

Implementation framework:



7.2.2 Intervention 3: Construction of I&D structure at Shanti Nagar Nallah

Shanti Nagar Nallah carries approximately 2 MLD of used water generated from shanti Nagar area. The flow runs underground along Haridwar Road and ultimately discharges into the Rambha River. Although a long-term sewerage system has been proposed under the State Program Management Group (SPMG) framework, its implementation is expected to take time. In this interim period, Interception and Diversion (I&D) measures are proposed to prevent untreated discharge into the river and redirect the flow toward existing treatment infrastructure.

Proposed Intervention:

It is proposed to construct a single Interception and Diversion (I&D) structure of approx. 2 MLD (to be measured and designed as required during DPR Stage) capacity beside Koyal Grand Restaurant, which will intercept the underground flow from Shanti Nagar Nallah and divert it into the existing trunk sewer. This trunk sewer presently conveys sewage to the 26 MLD Lakkad Ghat STP, thereby ensuring

that the used water is treated before discharge into the Rambha River. The I&D structure can construct on Haridwar Road right-of-way and its outlet shall be connected directly to the trunk sewer for treatment at the Lakkad Ghat STP (refer Image 7-7).

The flow arrangement is presented in Image 7-6 and the conceptual arrangement of the I&D components is presented in Image 7-8.

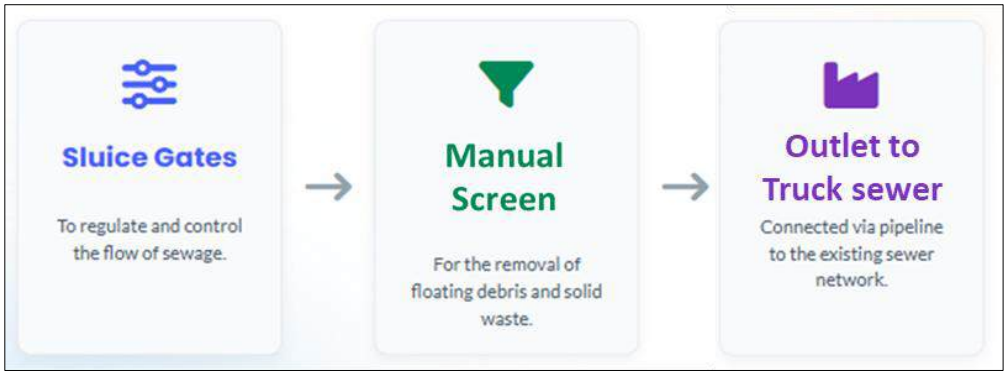


Image 7-6: Flow arrangement of proposed I &D Structure

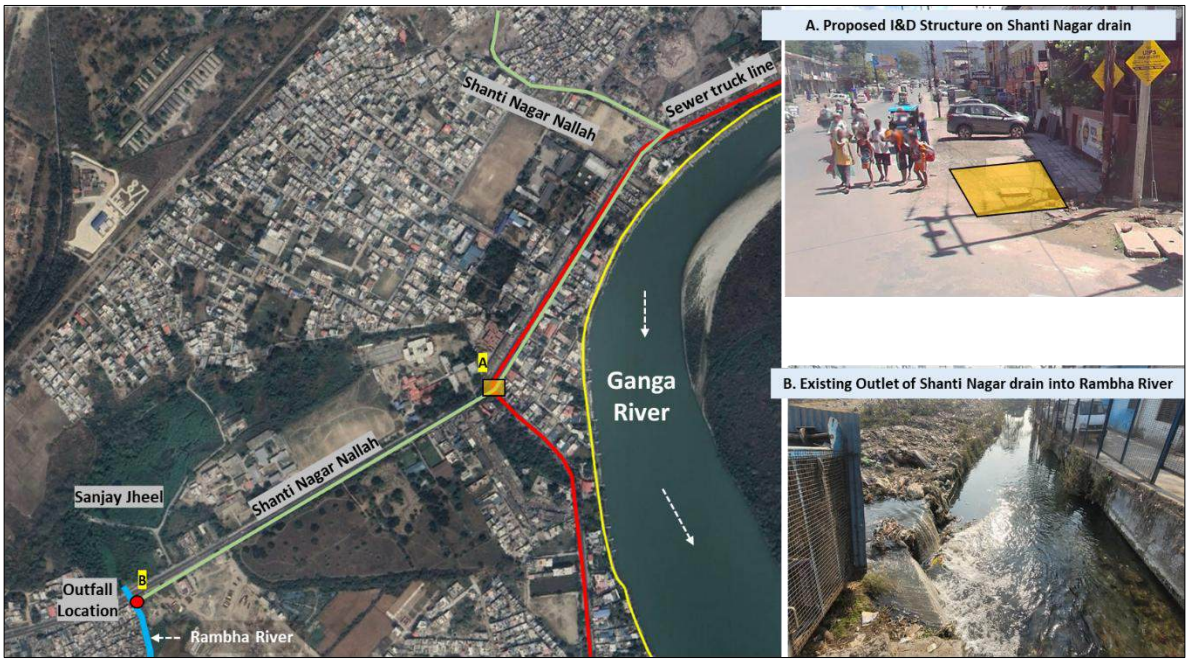


Image 7-7: Showing discharge and proposed I&D location of Shanti Nagar Nallah

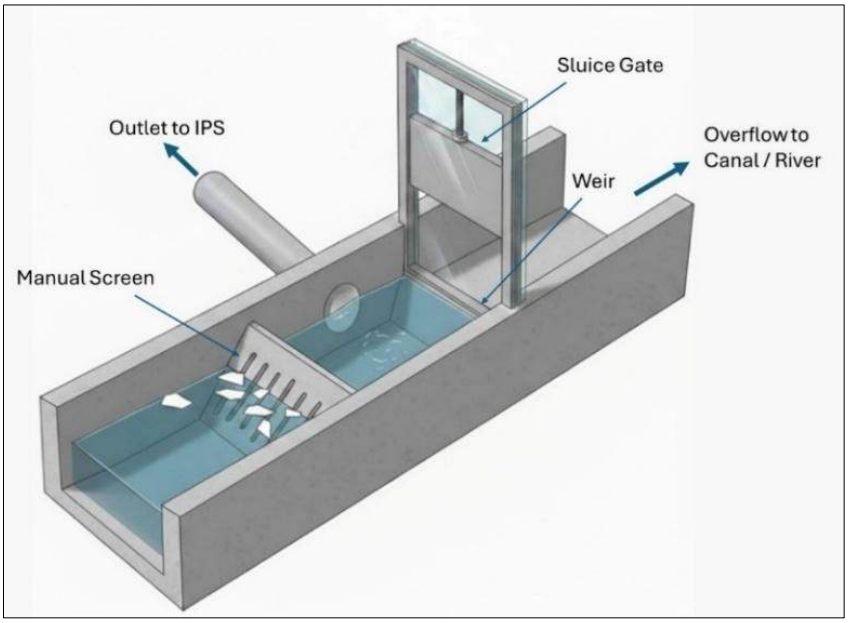
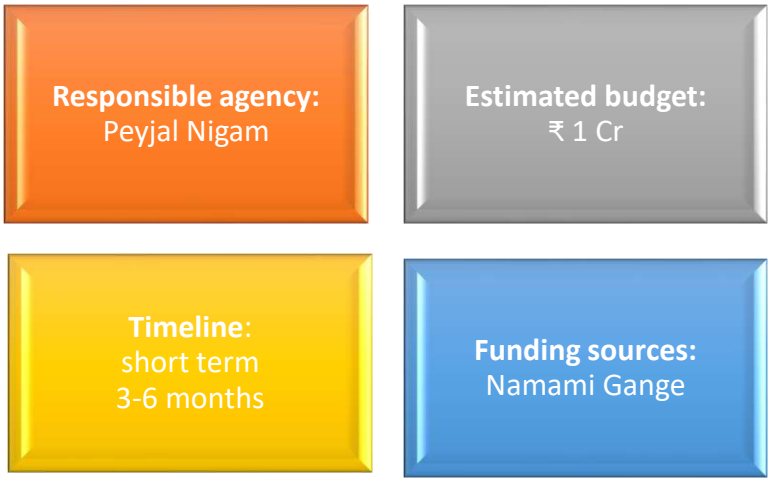


Image 7-8: Proposed I &D Structure

Implementation framework:



7.2.3 Intervention 4: Conversion of wastewater ponds into Constructed Wetlands for Krishna Nagar and Barrage Colony

Despite the presence of multiple STPs under UIDSR and SPMG, few pockets in Rishikesh remain unserved due to topographical constraints, informal settlements and fragmented drainage networks. Notably, the Barrage Colony and Krishna Nagar areas highlighted in Map 4-1 are excluded from formal sewerage planning and continue to discharge untreated greywater into natural water bodies and low-lying areas.

- **Barrage Colony:** Located along the Rambha River corridor, this area generates approximately 0.2 MLD of greywater flowing through septic tanks connected to roadside stormwater drains. The greywater from the drain is discharged directly into the Rambha River before merging into the Ganga, bypassing any treatment infrastructure (refer Image 7-9).
- **Krishna Nagar:** Krishna Nagar is considered to be an unauthorized settlement, restricting the extension of municipal sewerage infrastructure. It contributes approx. 0.3 MLD of greywater

from three minor outlets, each discharging approx. 0.1 MLD into open low-lying areas based on slope. Field visits and stakeholder consultations confirm continuous discharge and localized ponding, posing risks to water quality and public health refer Image 7-10.

Image 7-9: Greywater discharge into Rambha River near Barrage Colony

Image 7-10: Stagnant greywater in low-lying area near Krishna Nagar

Proposed Intervention of construction of 'Constructed Wetland'[2]:

- **Barrage colony:** Approximately 0.2 MLD of greywater, originating from septic tank overflows and conveyed through roadside stormwater drains, shall be consolidated into a single conveyance channel. The flow is proposed to be treated in a subsurface horizontal flow constructed wetland of 0.4 ha, strategically located on the dry riverbed adjacent to the Rambha River (refer Image 7-11). The site remains largely dry except during monsoon flooding, ensuring suitability for year-round treatment operations.
- **Krishna Nagar area:** Each of the three minor outlets will be intercepted and diverted to a sub-surface horizontal flow constructed wetland of 0.2 ha, positioned along the natural slope (refer Image 7-12). These decentralized wetlands will provide continuous treatment and reduce pollution loads, with functionality maintained outside flood periods.

To prevent issues of mosquito breeding next to the settlement, sub-surface horizontal flow constructed wetlands have been proposed (refer Figure 7-1). Robust emergent plants like Common Reed (Phragmites australis), Cattails (Typha species like T. latifolia, T. angustifolia) and Bulrushes (Scirpus species), along with ornamental options like Canna indica have been proposed in the gravel substrate. These native species are very effective with regards to wastewater treatment, nutrient uptake and aeration.

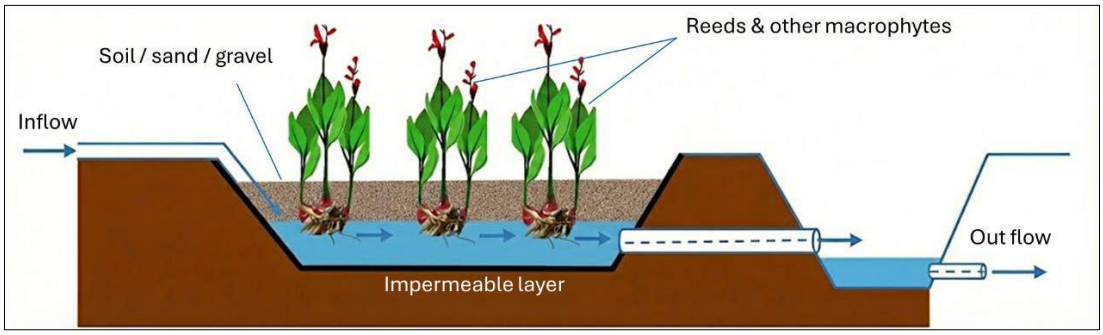


Figure 7-1: Schematic diagram of subsurface horizontal flow constructed wetland

2 **Links for more details about constructed weltands:**
https://sswm.info/sites/default/files/reference_attachments/UN%20HABITAT%202008%20Constructed%20Wetlands%20Manual.pdf

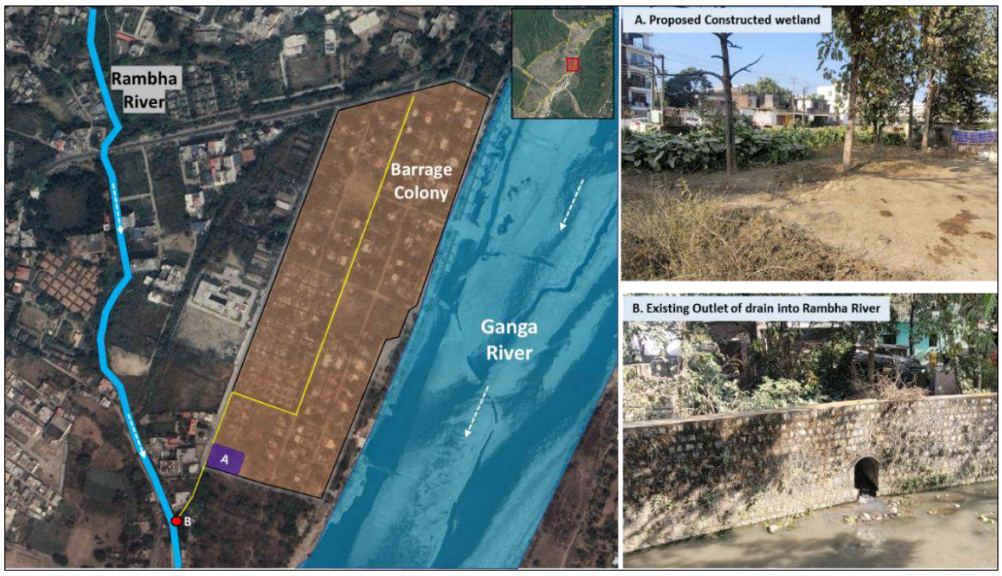


Image 7-11: Proposed constructed wetland at barrage colony

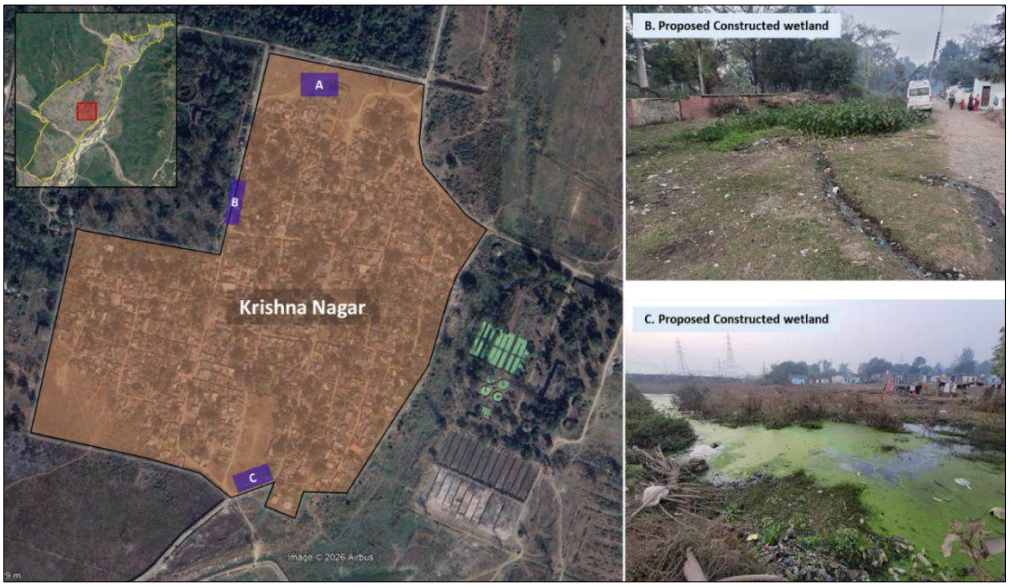


Image 7-12: Proposed constructed wetland at Krishna Nagar area

Implementetion framework:

Responsible agency: Peyjal Nigam	**Estimated budget:** ₹ 1.5 Cr
Timeline: Short term 6-9 months	**Funding sources:** Namami Gange

7.2.4 Intervention 5: Comprehensive sewerage master plan for area between Song River and Kharastrot Rao River

As mentioned in Section 4.2.2, Rishikesh and its peripheral settlements including Tehri Rehabilitated Colony, Krishna Nagar, IDPL Colony, Pashulok, Barrage Colony and Shyampur are experiencing rapid urbanization and population growth (Refer Map 7-1). This has led to increased used water generation and mounting stress on the existing sewerage infrastructure. Several existing and proposed STPs and SPS's have been developed under IUIDR and SPMG (Table 4-2)

Despite these investments, gaps remain in coverage, capacity utilization and operational efficiency:

- Peripheral colonies lack adequate sewerage connectivity.
- The 14 MLD STP at IDPL and the 6 MLD polishing pond have been abandoned; however, the land at this location should be made available for the construction of a new STP.
- Fragmented responsibilities between UJS and Pey Jal Nigam hinder timely desludging and consistent O&M.
- Unauthorized constructions and peri-urban growth have outpaced planned coverage, creating untreated discharge points into the nallah and open space.
- Septage from unserved areas is discharged into drains, adding to pollution loads.

This context underscores the urgent need for a comprehensive sewerage master plan that consolidates ongoing schemes, rehabilitates unused assets, expands coverage to unserved colonies and integrates peri-urban areas into a unified framework.

Proposed Intervention:

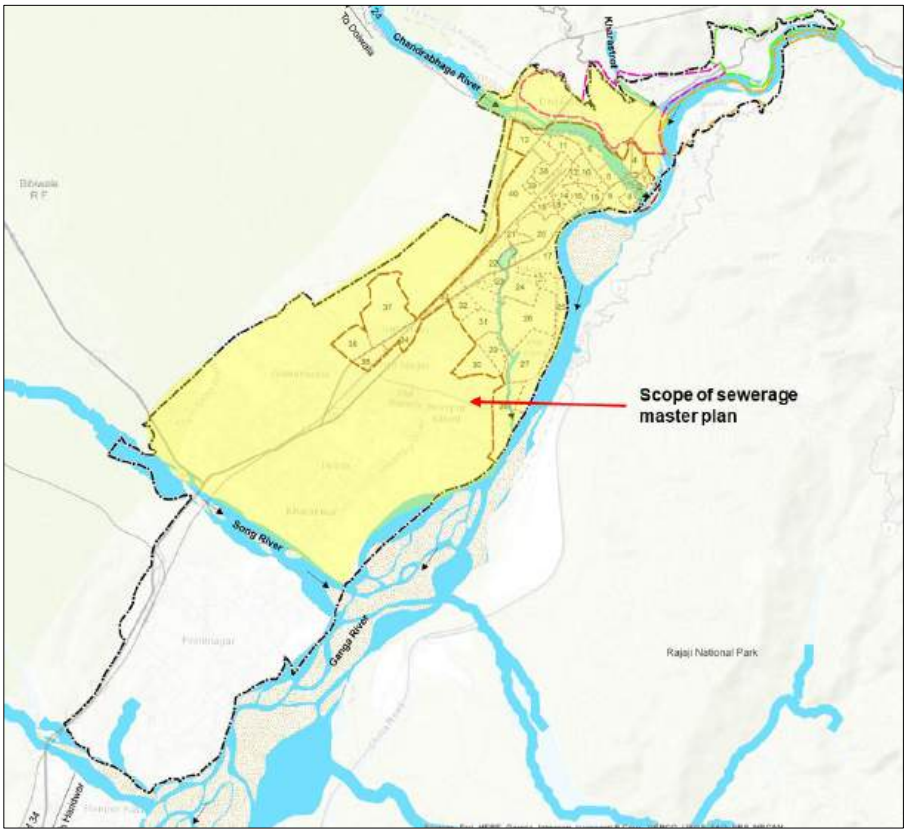
The proposed intervention is to prepare and implement a Comprehensive Sewerage Master Plan that will:

- Rehabilitate unused assets, particularly the 14 MLD STP at IDPL, to optimize investments and decentralize treatment.
- Expand sewerage coverage to peripheral and rehabilitated colonies, ensuring universal household connectivity.
- Integrate existing and planned STPs into a unified framework for load balancing and improved efficiency.
- Implement septage management, with designated receiving points at STPs, scheduled desludging cycles and GPS-enabled monitoring of desludging vehicles.
- Establish inter-ULB coordination, enabling shared infrastructure use with cost-sharing and accountability mechanisms.
- Strengthen institutional arrangements, mandating operator registration, clarifying roles between UJS, Pey Jal Nigam and Jal Santhanam introducing Service Level Agreements (SLAs) for O&M.
- Promote treated wastewater reuse for non-potable applications (gardening, flushing, construction, industry), supported by reuse guidelines and incentives.
- Introduce monitoring and compliance systems, including online dashboards, used water quality monitoring and periodic audits aligned with CPCB/SPCB standards.

These interventions are designed in accordance with the Terms of Reference (ToR) for the

Comprehensive Sewerage Master Plan (Annexure 2), ensuring alignment with the agreed scope, objectives and compliance requirements.

The Comprehensive Sewerage Master Plan for the corridor between the Song River and Kharastrot Rao River will ensure universal sewerage coverage, including peripheral and rehabilitated colonies, while optimizing existing and unused infrastructure to reduce inefficiencies. It will minimize untreated discharges into rivers and Nallahs, strengthen accountability and coordination among agencies and conserve freshwater resources through the reuse of treated used water. By integrating peri-urban areas into a unified framework, the plan will enhance public health, improve environmental sustainability and build resilience across Rishikesh and its surrounding settlements.



Map 7-1 : Demarcation of scope for comprehensive sewerage master plan

Implementation Framework:

Responsible agency: Peyjal Nigam	**Estimated budget:** ₹1 Cr
Timeline: Short term 12 months	**Funding sources:** Jal Jeevan Urban

7.2.5 Intervention 6: Construction of 20 KLD Co-treatment plant at 8 MLD STP at 14 Bigha

As mentioned in Section 4.2.2, In Rishikesh, faecal sludge management remains a challenge despite the presence of a 50 KLD co-treatment facility at the 26 MLD STP in Lakkad Ghat. Desludging vehicles operating in peri-urban and urban areas often discharge faecal sludge into drains and manholes instead of utilizing the co-treatment plant. This practice results in untreated sludge entering the environment, causing pollution, health risks and undermining the city's sanitation goals.

Furthermore, ongoing sewerage proposals under various schemes do not fully cover peri-urban areas and will take time to complete, particularly for connecting households in upstream locations such as Muni-ki-Reti, Tapovan, Swarg Ashram and certain parts of Rishikesh city. These areas continue to rely on 'On-Site' Sanitation (OSS) systems, generating faecal sludge that requires safe treatment. By 2031, Muni-ki-Reti alone is projected to generate approximately 8.3 KLD of faecal sludge. Downstream uncovered areas such as Shyampur and Bhattonwala also remain dependent on OSS systems. Strengthening treatment capacity and improving collection efficiency are critical for sustainable faecal sludge management in Rishikesh.

Proposed Intervention

To address the above challenges, a combined intervention is proposed:

a) Construction of 20 KLD Co-Treatment Plant within the 8 MLD STP at 14 Bigha, Muni-ki-Reti.

b) Optimization of the existing 50 KLD Co-Treatment Plant at the 26 MLD STP in Lakkad Ghat to serve downstream uncovered areas.

Intervention A: Construction of 20 KLD Co-Treatment Plant at 8 MLD STP at Muni-ki-Reti

A 20 KLD co-treatment unit is proposed to be constructed within the premises of the under-construction 8 MLD STP at Muni Ki Reti. This facility will serve upstream settlements including Muni-ki-Reti, Tapovan, Swarg Ashram and uncovered parts of Rishikesh city. With a service radius of approximately 6 km, the plant will provide safe treatment for the projected 8.3 KLD faecal sludge load by 2031, while also accommodating additional dem and from surrounding areas.

Vacuum trucks will discharge faecal sludge into the co-treatment unit, beginning with a Screen Chamber for removal of coarse solids. The sludge will then pass into a Homogenisation Tank to ensure uniform consistency before separation. Solids will be directed to a Dewatering Unit and then to Sludge Drying Beds for safe disposal or reuse. Liquids and filtrate will be routed to the STP's Inlet Chamber for biological treatment alongside sewage. This structured flow ensures controlled integration, prevents shock loading and maintains treatment efficiency (refer Figure 7-2).

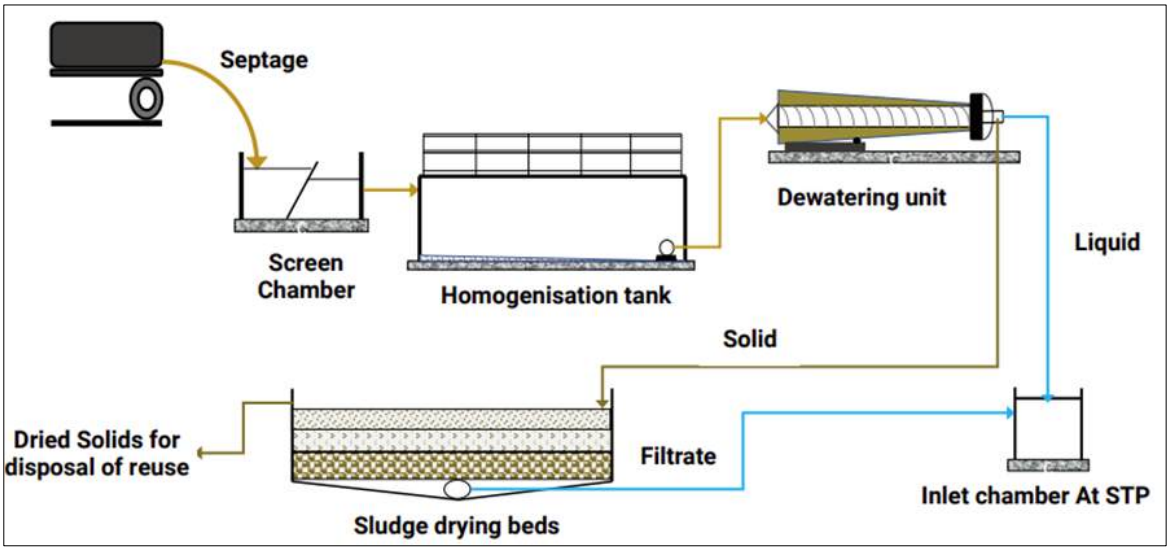


Figure 7-2: Process flow diagram of co-treatment units

Intervention B: Optimization of Existing 50 KLD Co-Treatment Plant at Lakkad Ghat (26 MLD STP)

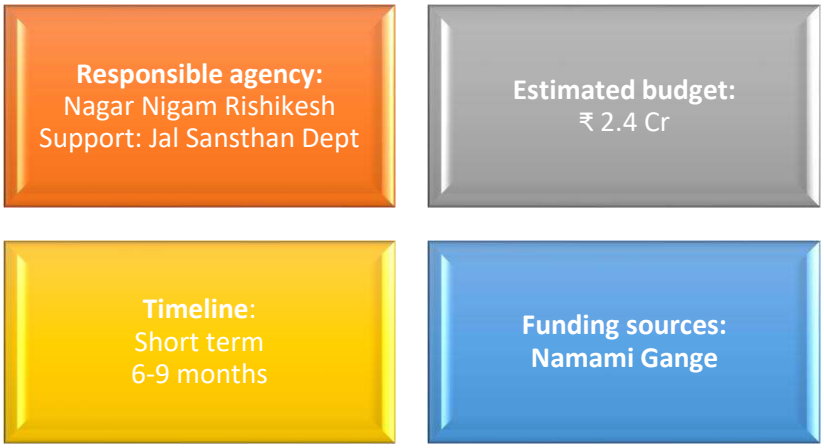
The existing 50 KLD co-treatment facility at the 26 MLD STP in Lakkad Ghat will be optimized to ensure full utilization of its treatment capacity. This plant will continue to serve the core city of Rishikesh as well as downstream peri-urban areas such as Shyampur, Pashulok and Bhattonwala, etc.

It is estimated that approximately 19 KLD of faecal sludge will be generated from households within the city limits, while an additional 22 KLD will be collected from peri-urban areas extending up to the Song River. Together, this accounts for a total inflow of 41 KLD, which will effectively utilize the plant's 50 KLD capacity. After completion of the proposed sewerage network, the utilization capacity of the co-treatment plant will reduce and the resulting gap can be reserved to serve future population growth of uncovered sewer line areas, thereby ensuring long-term sustainability.

- To strengthen operations and ensure accountability, the following measures will be implemented:
- Improved scheduling and routing of desludging vehicles.
- Strict enforcement of mandatory disposal at co-treatment plants, including ensuring that desludging tankers discharge at the existing 50 KLD co-treatment facility within the 26 MLD STP at Lakkad Ghat to serve downstream uncovered areas up to the Song River.
- Registration of private desludging vehicles from peri-urban areas under the Rishikesh Municipal Corporation, ensuring accountability, monitoring and compliance with safe disposal practices.
- Awareness and IEC campaigns for households and desludging operators to promote safe and regulated faecal sludge management.

These measures will improve collection efficiency, reduce unsafe discharge into drains and open lands and enhance the overall performance of the faecal sludge management system in Rishikesh.

Implementation Framework:



7.2.6 Intervention 7: Preparation of Faecal and Septage Management Plan

Rishikesh is a rapidly growing pilgrimage and tourism city with scattered settlements. Sewerage coverage remains partial and a large share of households continue to depend on septic tanks. Although a co-treatment facility exists at the Lakkad Ghat Sewage Treatment Plant (STP), its utilization is negligible due to weak integration with desludging operations. The sanitation service chain is fragmented, resulting in environmental, health and governance risks.

1. **Containment:** The city has approximately 23,000 households, of which nearly 11,500 (around 50 percent) are connected to septic tanks. Many of these tanks are poorly designed, not watertight and lack baffles and there is no municipal registry to record septic tank size, desludging frequency, or maintenance condition.
2. **Storage:** There is no mechanism in place to measure sludge volume or assess used water quality and manual access points expose desludging workers to occupational health and safety risks. Monitoring of containment system performance is absent.
3. **Transport:** The city operates six private desludging vehicles registered with the Municipal Corporation. However, desludging remains demand-based with no scheduled cycle, enforcement of discharge protocols is weak and GPS or digital tracking systems are not in place. Consultations further indicate that vehicles are not discharging into the designated co-treatment facility.
4. **Treatment:** A 50 KLD co-treatment unit is integrated with the 26 MLD STP at Lakkad Ghat, but the facility is significantly underutilised as desludging vehicles bypass the designated discharge point. There is no monitoring framework to record inflow volumes or evaluate treatment efficiency for septage.
5. **Reuse:** At present, there is no reuse of treated faecal sludge. Composting, fertilizer production and market linkages have not been established, leaving the potential for biosolids recovery and circular economy integration untapped.

Proposed Intervention

To bridge the identified gaps in containment, storage, transport, treatment and reuse, Rishikesh Planning area must adopt a structured Faecal Sludge and Septage Management (FSSM) Plan from tapovan to shyampur at downstream. This plan should be anchored in clear municipal bylaws,

licensing of service providers and ring-fenced O&M funding, ensuring accountability and sustainability in line with the Faecal Sludge and Septage Management in Urban Areas of India – Standard Operating Procedures (SOPs) and the Operationalization of Uttarakhand State Septage Management Protocol (2025). The interventions below combine baseline findings with SOP-mandated best practices to ensure technical compliance, environmental safety and institutional accountability.

Intervention in Detail

1. **Safe Containment**

- Septic tanks serving nearly 11,500 households must be retrofitted to watertight standards with baffles, venting and inspection ports.
- Tanks should be accessible for periodic desludging and designed to prevent leakage into drains or groundwater.
- A household registry capturing tank size, desludging history and used water pathway must be mandated.

Best Practices: Tiruchirappalli (Tamil Nadu) has successfully implemented watertight septic tank retrofits and household registries under its citywide FSSM program.

City Application: Rishikesh requires retrofitting and a centralized geo-tagged database of all onsite containment systems, consistent with the SSMP directive for municipal registries.

2. Scheduled and Regulated Desludging

- Municipal bylaws should mandate desludging cycles of 3–5 years, with licensed service providers operating GPS-equipped desludging vehicles to minimize illegal dumping.

Best Practices: Navi Mumbai (Maharashtra) has implemented a regulated desludging schedule with licensed operators and municipal monitoring.

City Application: Current practice in Rishikesh is reactive desludging, with six private vehicles operating on dem and. A regulated schedule will ensure safe handling of faecal sludge and compliance with the SSMP's emphasis on scheduled desludging.

3. Transport and Tracking

- A digital tracking system (GPS + mobile app) should be deployed for all desludging vehicles, with trip logs integrated into municipal dashboards.
- Geo-tagged proof of discharge at designated treatment points must be required.

Best Practices: Bhubaneswar (Odisha) has adopted GPS-based tracking of desludging vehicles, ensuring transparency and accountability.

City Application: In Rishikesh, trucks currently bypass the co-treatment facility and discharge informally, creating risks of uncontrolled disposal. GPS-based tracking will prevent illegal dumping and enforce discharge at the Lakkad Ghat STP co-treatment unit.

4. Treatment Infrastructure

Decentralized Faecal Sludge Treatment Plants (FSTPs) should be established at strategic locations to intercept untreated sludge before it enters drains and rivers. Co-treatment at the Lakkad Ghat STP must be optimized through controlled inlet dosing to prevent shock loading and maintain stable

performance.

City Application: Rishikesh has a 50 KLD co-treatment unit integrated with the 26 MLD STP at Lakkad Ghat, which remains underutilized and a 20 KLD co-treatment plant is proposed within the premises of the under-construction 8 MLD STP at Muni Ki Reti; integration of desludging operations with these facilities, supported by SOP-mandated monitoring protocols, will maximize resource use, strengthen decentralized septage management and reduce capital expenditure.

5. Reuse and Resource Recovery

- Treated sludge should be converted into compost in compliance with Fertilizer Control Order (FCO) standards, with MoUs established for offtake by horticulture, forestry and municipal parks.

Best Practices: Indore (Madhya Pradesh) has pioneered reuse of treated sludge as compost for municipal parks and agriculture.

City Application: Rishikesh currently has zero reuse, losing potential recovery of 10–15 tons/month of compostable material. Resource recovery initiatives will align with SSMP's emphasis on circular economy integration.

6. Operation & Maintenance (O&M)

- Continuous funding must be ensured through ring-fenced municipal budgets dedicated to FSSM operations.
- Trained staff should undergo quarterly refresher courses on SOPs, PPE use and emergency response. Service contracts with private operators for plant operation, desludging and transport must be tied to performance indicators, with preventive maintenance schedules and independent audits instituted.

Best Practices: Warangal (Telangana) has successfully ring-fenced O&M budgets and contracted trained operators for its FSTPs, ensuring >95% uptime.

City Application: Rishikesh currently lacks dedicated O&M funding and trained staff for faecal sludge treatment. To sustain the 50 KLD co-treatment facility and any proposed decentralized FSTPs, the city must adopt ring-fenced budgets, operator training and service contracts to ensure long-term viability.

7. Policy, Regulation & Institutional Framework

- Clear municipal bylaws regulating desludging frequencies, service standards, licensing and fines for illegal disposal must be drafted and notified.
- A dedicated FSSM Cell within the municipality should coordinate containment, desludging, transport, treatment and reuse.
- Citizen dashboards for service requests, compliance monitoring and grievance redressal should be launched.

Best Practices: Devanahalli (Karnataka) has adopted municipal bylaws for desludging cycles and established a dedicated sanitation cell, ensuring compliance and transparency.

City Application: Rishikesh currently operates with weak enforcement, leading to informal desludging and bypassing of treatment facilities. Adoption of bylaws regulating 3–5-year desludging cycles,

licensing of private desludging vehicles and penalties for illegal dumping will institutionalize accountability and align with the *Operationalisation of Uttarakhand State Septage Management Protocol (2025)*.

Implementation Framework

Responsible agency: Nagar Nigam Rishikesh	**Estimated budget:** ₹ 0.5 Cr
Timeline: Short term 6-9 months	**Funding sources:** AMRUT, SBM(U)

7.2.7 Intervention 8: Removal of solid waste from the Dhalwala Nallah and Rambha River

As highlighted in Section 4.3.1, Drains and rivers carry stormwater and sewage along with substantial quantities of floating solid waste. This waste, comprising plastics, packaging materials and organic debris, often accumulates in river stretches, obstructing hydraulic flow and degrading ecological health. The downstream dispersion of plastics and floating debris creates localized pollution hotspots, adversely impacting water quality and riverine ecosystems. The key concerns from the baseline assessment are mentioned below;

- Continuous inflow of plastics, bottles and organic debris into storm drains and rivers.
- Seasonal surges during monsoon leading to high floating waste loads.
- Solid waste dumping in uncovered drain stretches, particularly near outfalls.
- Risk of clogging and operational inefficiencies in downstream at chandreshwar nagar STP.
- Need for interim measures until long-term solid waste management infrastructure is strengthened.

In line with the Urban River Management Plan (URMP) objective of preventing solid waste entry into rivers and protecting downstream used water infrastructure, floating barrier systems are proposed at two critical locations at Dhalwala nallah and Rambha River, where waste can be intercepted effectively before entering sensitive river stretches.

Image 7-13: Solid waste flows through Dhalwala drain into Ganga River

Image 7-14: Solid waste flows through Rambha River into Ganga River

Proposal Intervention:

A floating trash barrier system offers a practical solution to intercept waste before it disperses further into the river system.

Intervention A: Floating Barrier and Riser Type at Dhalwala Nallah

The Dhalwala nallah carries both stormwater and sewage from densely populated areas. While most of the drain is covered, the last 150 m stretch near the outfall remains uncovered, where solid waste is frequently dumped and flows directly into Ganga River.

It is proposed to install a riser-type floating barrier system at the outfall location, just before discharge into the river at Chandreshwar Nagar, adjacent to the 7.5 MLD STP (refer Image 7-15)

- **Mechanism:** The riser-type trap will adjust vertically with changing water levels, ensuring uninterrupted interception during both dry-weather and monsoon flows.
- **Collection:** Floating waste will be guided towards designated collection points along the drain bank.
- **Removal:** Waste will be removed regularly by sanitation teams and transferred to municipal treatment facilities.
- **Monitoring and Maintenance:**
    - CCTV surveillance at hotspots to monitor illegal dumping and waste accumulation in real time.
    - Integration of CCTV footage with municipal challan mechanisms to penalize violators.
    - Daily/weekly removal of intercepted waste depending on load, supervised for quality checks.

Benefit: Prevents direct entry of solid waste into the Ganga River, reduces downstream pollution and safeguards the functioning of the Chandreshwar Nagar STP.

Intervention B: Floating Barrier and Enhancer Type at Rambha River

The Rambha River flows through a densely populated area, receiving mixed sewage and stormwater, along with inflows from the Sanjay Jheel wetland. Solid waste accumulation is significant near drain outfalls.

It is proposed to install a floating barrier with integrated manual removal cages at Virabhadra Road, beside the pumping station (refer Image 7-15). This location is chosen for accessibility and operational convenience, as downstream stretches are difficult to manage and have no major settlements.

- **Installation of Floating Trash Barriers:** Barriers will be deployed across strategic stretches of the Rambha River near Virabhadra Road to trap plastics, bottles and floating debris without obstructing water flow.
- **Manual Removal Mechanism Cage:** A cage structure will collect intercepted waste, which sanitation workers will manually remove at scheduled intervals. Collected waste will be transported to municipal treatment facilities.
- **Monitoring and Maintenance:**
    - CCTV surveillance at hotspots to monitor illegal dumping and waste accumulation in real time.

- Integration of CCTV footage with municipal challan mechanisms to penalize violators.
- Daily/weekly removal of intercepted waste depending on load, supervised for quality checks.

Benefit: Provides systematic interception and removal of floating debris, ensures accessibility for maintenance and protects Rambha River water quality upstream of sensitive stretches.

Image 7-15: Proposed locations of floating barriers

Implementation Framework:

Responsible agency: Nagar Nigam Rishikesh	**Estimated budget:** ₹ 1.4 Cr (₹ 0.95 Cr + 0.45 Cr)
Timeline: Short term 6-9 months	**Funding sources:** Municipal budget and CSR

7.3 Objective 3 Interventions to rejuvenate waterbodies and wetlands

Sanjay Jheel, the only wetland under this objective, is proposed to be restored as a functional urban sponge through spring shed management, wetland restoration and biodiversity enhancement. Complementing this, the Rambha River intervention Mira Neer Vatika will serve as a constructed wetland to intercept pollution, revive ecological flows and provide eco-education and community spaces. Together, these measures promote eco-sensitive land use, hydrological security and nature-based tourism in line with the Rishikesh Draft Master Plan.

7.3.1 Intervention 9: Rambha River Constructed Wetland (Mira Neer Vatika)

The clean spring-fed Rambha River during its course from the Sanjay Jheel to Ganga River is polluted by city nallahs such as the Shanti Nagar Nallah that flows along the Rishikesh Haridwar road and discharges next to Sarvaraha Nagar. As part of the ongoing efforts by the State Project Management Group (SPMG) this nallah is proposed to be intercepted and diverted to the Lakkad Ghat STP.

However, as an intermediate solution and to treat overflows from I&D structure during monsoons, it is proposed to convert the Rambha River swamp within the Baba Kali Kamli Wala Panchayat Kshetra into a constructed wetland.

Image 7-16: Shanti Nagar Nallah discharges large volumes of wastewater into Rambha River

Image 7-17: Polluted Rambha River passes through swampy land within Baba Kali Kamli Wala Panchayat Kshetra

Clean water from this constructed wetland shall flow through Bapugram and Shivaji Nagar where no major nallahs drain into the river, prior to its convergence with the River Ganga at Nirmal Bagh.

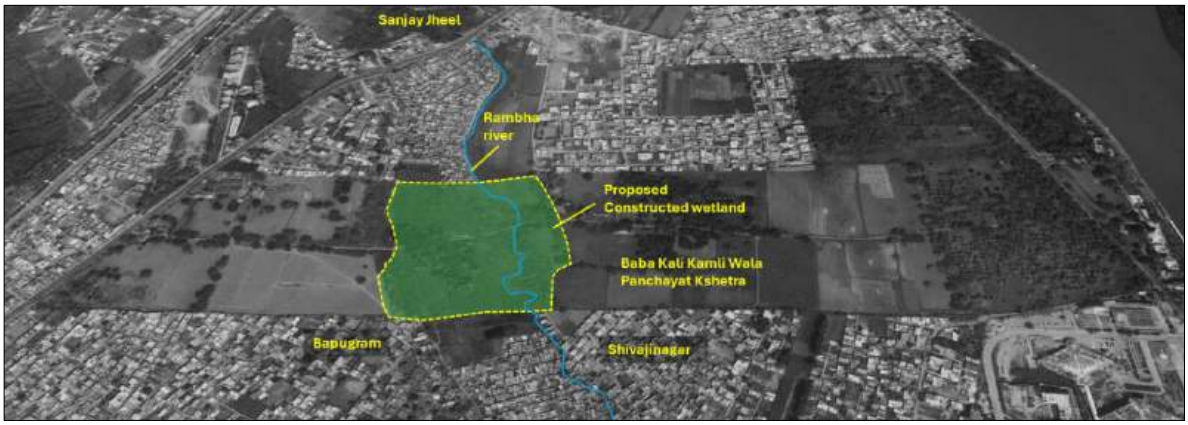


Image 7-18: Rambha River swamp

Further, since the Rishikesh Draft Master Plan 2011 had identified this zone as Green Belt, it may be

further expanded into as a city park. The Park may be named Mira Neer Vatika in memory of Mirabehn (Madeleine Slade) given her deep connection to the Rishikesh area (specifically the founding of the nearby Pashulok Ashram) and her prophetic role as one of India's first environmentalists who linked deforestation to water crises.

The key components of the park are as follows (refer Image 7-19):

1. A weir on the Rambha River to channelize the water during lean season into a constructed wetland for purification,
2. Eco-education zone comprising a board walk along the constructed wetland,
3. Picnic grove among the existing tree clusters and
4. Parks for the adjacent Ugrasen Nagar and Bapugram settlements.

1. Rambha River flowing southwards from Sanjay Jheel
2. Weir to channelise river water into constructed wetland
3. Overflow channel
4. Rambha River Constructed Wetland
5. Exit channel from constructed wetland
6. Eco-education zone of Rambha River swamp
7. Board walk through Rambha River swamp
8. Picnic grove and local species plantation
9. Park for the adjacent Ugrasen Nagar
10. Park for the adjacent Bapugram
11. East-west Road to the park
12. Agricultural fields of Baba Kali Kamli Wala Panchayat Kshetra

Image 7-19: Components of Mira Neer Vatika within Baba Kali Kamli Wala Panchayat Kshetra

Implementation Framework:

Responsible agency: MDDA and UK Peyjal Nigam	**Estimated budget:** ₹15 - 25 crores
Timeline: Medium term 24 - 30 months	**Funding sources:** NMCG

7.3.2 Recommendation 2: Restore Sanjay Jheel as a functional urban sponge

As mentioned in 3.1 and 3.2.1, Rambha River (also known locally as the Kali River or Kala Pani) originates from Sanjay jheel. Manu swamp is a tropical freshwater swamp located in the Koyal Ghati area, sits in a depression (likely an old riverbed) near the Barkot Forest Range and is geographically and hydrologically connected to the Sanjay Jheel, forming part of a unique freshwater ecosystem.

Image 7-20: Eastern edge of Manu swamp

Image 7-21: Manu swamp (to the left) not fenced

A DPR for Nature Based Tourism at Sanjay Jheel is prepared and pending approval for implementation. However, it only includes part of the Sanjay Jheel with interventions such as diversion of grey water to prevent entry into the lake, pathway and walking trails, bird observatories and watching towers, floating deck and boardwalk, public conveniences, etc.

The recommended URMP objective is to restore the Sanjay Jheel as a functional 'Urban Sponge' rather than just a recreational water body. This included ensuring water security of the springs through Spring Shed Management. Further, enhancement of biodiversity and reduction in maintenance cost can be achieved by using bio-engineered edges to the lake.

Image 7-22: Spring water flowing out from foothills

Image 7-23: Rich flora and fauna of Sanjay Jheel

The following measures are proposed to ensure a comprehensive wetland conservation and eco-tourism approach for rejuvenation of Manu swamp and Sanjay Jheel:

1. Delineate and undertake a spring fed management plan and include its catchment area recommendations to the Rishikesh Draft Master Plan,
2. Shift from Lake Beautification to Wetland Complex Restoration and
3. Use flora and fauna of wetland as ecological anchors and interpretive focal points

Delineate and undertake a spring shed management plan: The wetland is located at the foothills and is fed by sub-surface springs and seepage lines (local choyas) rather than just surface rain. Developments such as Ganga Nagar in the catchment will lead to blockage of the underground veins resulting in drying of the lake. It is recommended that a spring shed management plan be prepared to identify the following:

- A hydro-geological survey of the spring shed to identify recharge zones in the slopes above the lake and discharge zones at the lake edge (the lake bottom springs).
- Implementation of infiltration trenches and percolation pits in the catchment area to feed the aquifers that sustain the lake springs.

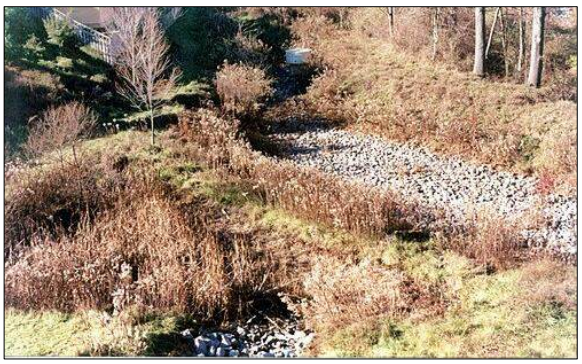


Image 7-24: Infiltration trenches

Image 7-25: Percolation pits

Shift from Lake Beautification to Wetland Complex Restoration: It is recommended that a comprehensive Wetland Complex Restoration approach be adopted rather than mere Lake Beautification by including the following components:

- Inclusion of the adjacent Manu swamp area within the Sanjay Jheel improvement area.

- Maintain Bathymetric Diversity by leaving the shallow swampy end untouched at it serves the purpose cleaning the lake water. Only the central channel may be desilted, if required.
- Use of Bioengineering (coir logs, willow fascines) to stabilize the lake banks to help create a "littoral zone" essential for fish breeding and turtle basking.
- Plant native species of Doon Valley swamps in the riparian buffer of the lake like Salix tetrasperma (Indian Willow), Syzygium cumini (Jamun) and Ficus racemosa (Gular) to hold soil and cool the water.
- Spring Box Protection: If specific spring eyes are visible in the swampy sections, they must be declogged and protected from silt, not paved over.

Image 7-26: Inclusion of Manu Swamp to the Sanjay Jheel intervention area

Image 7-27: Coir logs

Image 7-28: Fascines

Use flora and fauna of wetland as ecological anchors and interpretive focal points:

- **Springs:** Springs within the wetland should be treated in a manner to make them visible and educational without compromising their hydrologic integrity. The spring stretch is proposed to be separated into three distinct zones as presented in the following.

Zone	Primary Function	Visitor Access	Design Features
Zone A: The Eye	Discharge and Water Purity	None (Visual only)	Dense native planting, diversion berms and hidden spring box
Zone B: The Buffer	Filtration and Habitat	Restricted (Boardwalks)	Elevated paths, interpretive rail signage and bird blinds
Zone C: The Stream	Education and Recreation	Open	Stepping stones, touching pools and seating areas

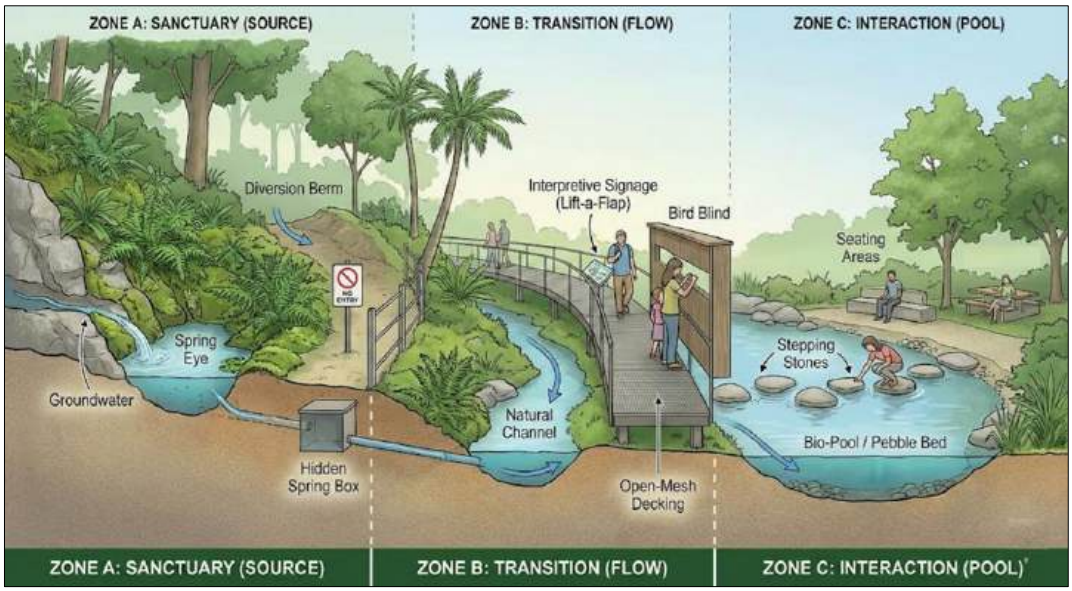


Figure 7-3: Transect boardwalk for swamp

- **Swamp vegetation:** Swamp vegetation changes drastically based on water depth from submerged plants, floating leaves, emergent, shrubs to canopy trees. This zonation is the anchor for biodiversity, providing different niches for different animals and can be displayed through a straight "section cut" path that forces visitors to walk through every zone in sequence.

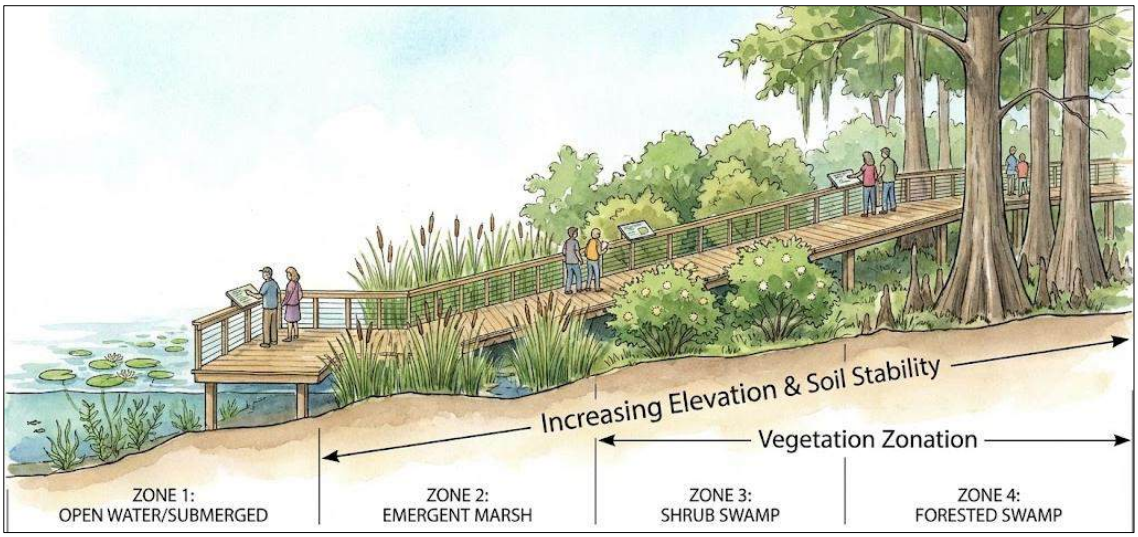


Figure 7-4: Transect boardwalk for swamp

- **Birds and Fishes:** Bird nesting areas and native fish populations are vital indicators of ecosystem health but displaying them requires a different set of design strategies because these "anchors" are living, moving and easily startled. The following measure are proposed to transform them into ecological anchors and interpretive focal points while ensuring their protection.

Feature	The Ecological "Anchor"	The "Protection" Mechanism	The "Display" Technique
Birds	Nesting Island / Snag (Breeding ground)	Water Moat (Stops predators/humans)	Bird Blinds that hide the viewer
Fish	Root Wad / Nursery (Shelter/Food)	Deep Water Zones (Cool, dark retreat)	Polarized Overlook that help in viewing fishes

Image 7-29: Bird Blind for viewing birds

Image 7-30: Polarized glasses for viewing fist

7.4 Objective 4 Interventions to enhance riparian buffer along river bank

Riparian stretches comprising vegetated strips alongside rivers and natural drains are essential "living infrastructure" in cities because they perform critical services that cannot be provided by concrete edges. These include:

- **Flood Control:** Riparian stretches absorb excess rainwater and slow down runoff, preventing downstream flooding.
- **Water Purification:** The soil and roots filter out toxic urban pollutants and sediments before they reach the river.
- **Climate Regulation:** They cool the surrounding area thereby combating "Urban Heat Island" effect.
- **Biodiversity and Recreation:** They serve as the primary corridors for wildlife movement and provide valuable green space for human mental health and recreation.

The riparian stretch on banks of all Rivers healthy stretches was analyzed. Conservation and preservation recommendations have been proposed for the relatively healthy stretches in the following paragraphs.

Image 7-31: Riparian stretches along River Ganga

Image 7-32: Riparian stretches along Chandrabhaga river

Image 7-33: Riparian stretches along song river

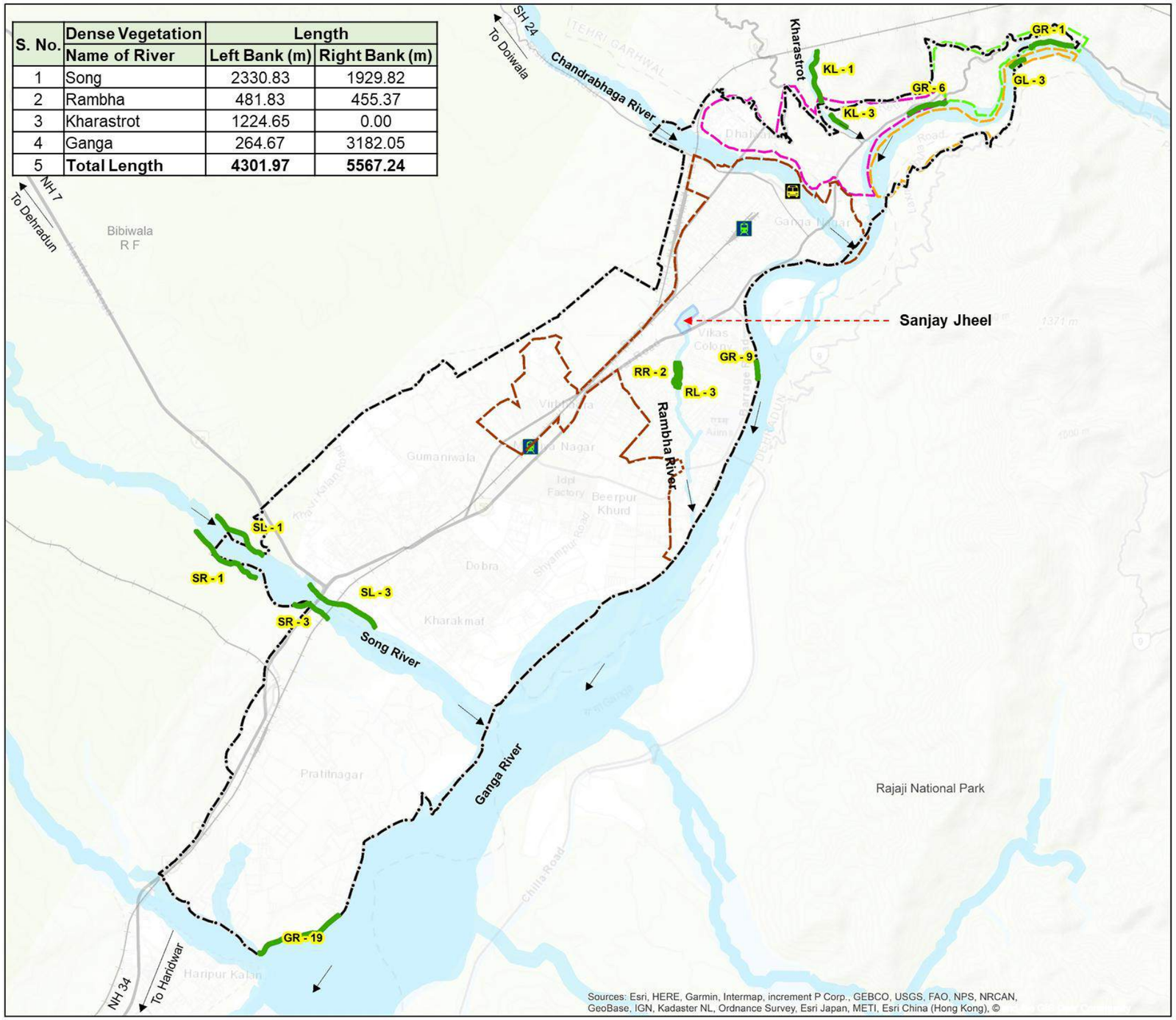
Image 7-34: Riparian stretches along rambha river

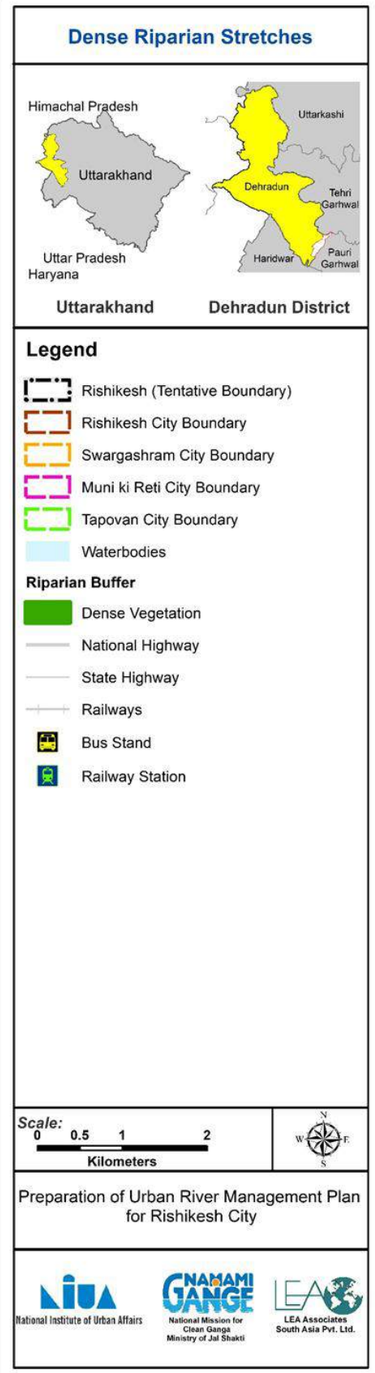
7.4.1 Recommendation 3: Conservation and preservation of natural dense riparian buffer

Strict conservation measures are recommended for the ecologically intact stretches of the 4 Rivers i.e., River Ganga, Chandrabhaga, song, Rambha River and Kharastrot, where riparian vegetation remains largely undisturbed. Among these, Kharastrot exhibits the highest vegetation coverage on the left bank (63.52%) but none on the right, highlighting a clear imbalance. The Song River shows

moderate and relatively balanced vegetation, with 40.55% on the left and 33.19% on the right. Rambha, however, records very low cover on both sides at around 13%, while the Ganga remains sparse overall, with slightly greater vegetation on the right bank (14.12%) compared to the left (6.11%). These priority conservation zones are illustrated in the accompanying Map 7-2 These zones provide critical reference conditions (baseline or "benchmark" sites) against which restoration outcomes in degraded reaches can be evaluated and therefore should be protected from clearing, encroachment, grazing and unnecessary disturbance.

S. No.	Dense Vegetation	Length	
	Name of River	Left Bank (m)	Right Bank (m)
1	Song	2330.83	1929.82
2	Rambha	481.83	455.37
3	Kharastrot	1224.65	0.00
4	Ganga	264.67	3182.05
5	**Total Length**	**4301.97**	**5567.24**





Map 7-2: Existing Dense Riparian Stretches

The table below presents the key management actions proposed for the existing riparian buffer along the 4 Rivers. These measures prioritize conservation of healthy stretches, restoration of degraded banks and targeted interventions to maintain ecological stability and long-term river resilience.

Recommendation for existing riparian stretch conservation and preservation
Well-developed, ecologically functional riparian vegetation that must be preserved in its current state. The key recommended actions are given below: • Integration of buffer width into flood plain zoning regulations. • Prohibited Permanent construction mining, dumping and river bank encroachment. • Control grazing and fencing in sensitive stretches. • GIS based demarcation and geo fencing of buffer stretches. • Periodic drone and satellite monitoring. • Formation of Community level protection committee. • Penalty, restoration liability and compensatory plantation for violation.

7.5 Objective 5 Intervention for reuse of treated used water

7.5.1 Intervention 10: Reuse of treated wastewater in the city

As mentioned in the section 4.2.2, Rishikesh city has two Sewage Treatment Plants (STPs) within its municipal limits. However, neither facility has a provision for the reuse of treated water. The 26 MLD STP located at Lakkad Ghat, which consistently produces approximately 19 MLD of treated used water daily, presents a significant opportunity for initiating reuse. At present, this treated water is discharged into the Ganga River approx. 4 kms downstream without any beneficial application.

The treated water from the Lakkad Ghat STP meets CPHEEO norms, achieving Biological Oxygen Dem and (BOD) levels below 10 mg/L. This quality is suitable for reuse in irrigation, landscaping, horticulture and select industrial processes. Despite this compliance, reuse remains negligible, resulting in a missed opportunity for resource optimization and environmental protection.

Under AMRUT 2.0 guidelines, Rishikesh is required to reuse at least 20% of its treated wastewater equivalent to approximately 3.8 MLD. The current reuse volume falls significantly short of this mandate, highlighting a compliance gap that necessitates immediate intervention.

Proposed Intervention:

To address this gap and initiate sustainable reuse, the following measures are proposed, focusing on the reuse potential of the Lakkad Ghat STP:

- **Reuse of treated water in irrigation:** The entire outflow of 19 MLD of treated used water shall be allocated for the irrigation of approximately 38 hectares of agricultural land situated adjacent to the STP. This exceeds the mandated reuse threshold and ensures productive utilization of the available supply.
- **Conveyance System**: Constructing 26MLD pumping station at the treated water outlet in 26 MLD STP Campus to ensure reliable lifting of used water. Convey treated water through a flexible HDPE pipeline (300mm diameter, approx.3 km in length) to transport treated water from the STP outlet to the designated irrigation site. The proposed alignment and feasibility are illustrated in Image 7-35.
- **Distribution Network**: Develop a field-level irrigation distribution system to ensure uniform coverage across the 38-hectare comm and area. The system will be designed for efficient water delivery and optimized usage, with technical specifications to be finalized during the Detailed Project Report (DPR) stage.

The map provided below outlines the tentative irrigation coverage and conveyance alignment. These details will be refined during DPR preparation, incorporating hydraulic modelling, land ownership verification and stakeholder consultations.

Image 7-35: Proposed Pipeline for reuse of treated used water

Implementation Framework:

Responsible agencies: Nagar Nigam Rishikesh, Pey jal Nigam	**Estimated budget:** ₹6 Cr
Timeline: Short term 12 months	**Funding sources:** Municiapl budget, AMRUT

7.6 Objective 7 Interventions to develop eco-friendly riverfront projects

The riverfront of Rishikesh Municipal Corporation is fully developed from Chandreshwar ghat in the north to the Pashulok Barrage in the south. To the south of the Pashulok Barrage a new Shiva Ghat is presently under construction past the barrage gates and the turbulent discharge zone. The Astha Path along the western bank of River Ganga seamlessly connects all the ghats except Chandreshwar Ghat which lies to the north across the Chandrabhaga River and the Shiva Ghat which lies across the barrage. Presently, most ghat related religious activities are concentrated at the Triveni Ghat with limited footfalls in the other smaller ghats of the city.

To connect the ghats of the city and to decongest the Triveni Ghat by activating the other underutilized ghats the following interventions are proposed.

1. Establishing physical connection of ghats to the two anchors at either end – Chandreshwar temple in the north and Virbhadra Temple to the south,
2. Theme wise development of ghats with lower footfalls to decongest Triveni Ghat and utilize the remaining ghats of the city.

Image 7-36: Chandreshwar Mahadev Temple

Image 7-37: Virbhadra Temple

7.6.1 Intervention 11: Establishing physical connection of ghats to anchors

Causeway connection between Triveni and Chandreshwar ghats: Since the Chandrabhaga River is a seasonal stream which is dry for about 8 to 9 months of the year and only floods during the monsoon (July–September), a full-height bridge is considered unnecessary for pedestrian connectivity. Hence, a causeway is proposed as a low-cost method to link Chandreshwar Ghat and Triveni Ghat. It consists of a paved concrete path laid directly on the riverbed with Hume pipes to allow water to flow underneath during lean season.

For the 2–3 months of heavy rain, the river shall flow over the causeway and the crossing is closed during which people must use the main road bridge. For the rest of the year, it shall act as a seamless walking path connecting the two ghats (refer Image 7-38).

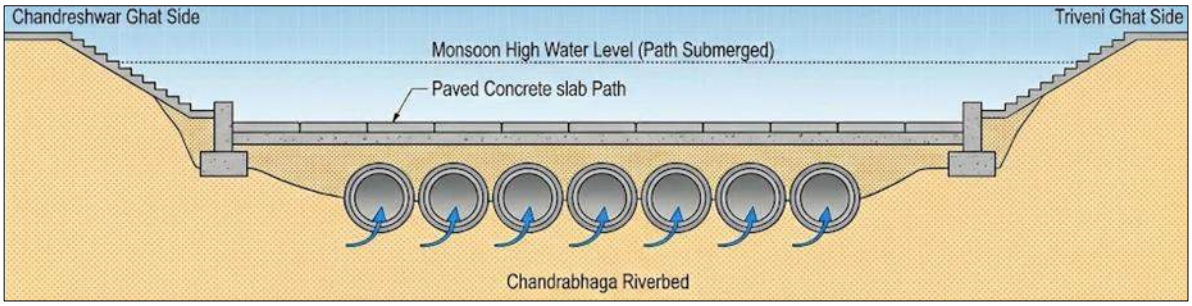


Image 7-38: Causeway across Chandrabhaga riverbed connecting Triveni and Chandreshwar Ghats

Implementation Framework:

Responsible agencies: PWD, Uttarakhand.	**Estimated budget:** ₹3-3.5 Crores
Timeline: Medium term 9 - 12 months	**Funding sources:** State Urban Development Department (UDD) / Special Central Assistance

Linking the riverfront Barrage colony road with Virbhadra temple: Veerbhadra temple forms the southern anchor of Rishikesh's riverfront. It lies along the southern bank of the Rambha River and is assessable by an internal road. It is proposed to connect the Shiva Ghat on the banks of Ganga River to this temple by extending the barrage riverfront road with a pedestrian pathway and a small foot bridge across the Rambha River.

Image 7-39: Proposed pedestrian pathway linking Shiva Ghat to Virbhadra Temple

Implementation Framework:

Responsible agencies: Irrigation Department, Uttarakhand.	**Estimated budget:** ₹50 - 60 Lakhs
Timeline: Medium term 6 - 8 months	**Funding sources:** State Grant ("Iconic City Rishikesh" Fund), CSR

7.6.2 Intervention 12: Theme wise development of ghats with lower footfalls

Chandreshwar Ghat as extension of Triveni Ghat: After establishing seamless connectivity with Triveni Ghat via a causeway across the Chandrabhaga River this ghat can function as a spillover ghat to the Triveni Ghat during peak periods. Further, the following interventions can lead to increase footfalls in this ghat.

- Screening of the adjacent crematorium with soft wall comprising bamboo or tall native grasses along the edge shared with the crematorium,
- Softening the hard paved areas of the ghat with tree and shrub cutouts,
- Encourage morning and evening Yoga / Meditation and the use of street paint to create board games, court lines, etc. for kids to play on the ghat surface,
- Arrange art Competitions like "Paint the River" Sunday for the local kids at the ghat,
- Introduce warm solar festoon lights strung between poles to make the space feel safe and inviting for families in the evening.

Image 7-40: Chandreshwar Ghat before and after intervention measures

Bhagirathi Ghat as Boating boarding point: Boating may be introduced in the stretch from Bhagirathi Ghat (1.5 km upstream of Pashulok Barrage) northwards to the Triveni Ghat as confirmed by representatives of the Irrigation department. However, due to high currents in the River Ganga at

Rishikesh, upstream movement of boats would need engines. Hence, silent Electric Solar Catamarans are being proposed for introduction of boating in the River Ganga at Rishikesh.

The proposed project would require procurement of boats, floating jetties, charging infrastructure and works related to limited dredging and river training for ensuring adequate draft for operation of the boats as described in the following table.

Component	Specifications
Solar Electric Catamarans	24-Seater, Twin Hull, Lithium-ion Battery, 6–8 knots speed. (e.g., Navalt / Samudra make)
Floating Jetties (Pontoon)	HDPE/ FRP Modular Jetties (rise/fall with water level). Required at both ghats
Charging Infrastructure	Fast DC Charger (30kW) at the "Night Halt" terminal
Dredging/River Training	Minor channel clearing near ghats

Image 7-41: Introduction of Electric Solar Catamarans for boating

Implementation Framework:

Responsible agencies:
Uttarakhand Tourism Development Board (UTDB).

Estimated budget:
₹3.5-4.0 Crores

Timeline:
Medium term
12 - 14 months

Funding sources:
Ministry of Tourism, GoI, MNRE (Ministry of New and Renewable Energy

Shiva Ghat as Aranya Sanskriti Ghat: Shiva Ghat is recommended to be developed as an "Eco-Spiritual" zone with quiet, meditative and rustic vibe for serious meditators, yoga practitioners, nature walkers (bird watchers) and pilgrims seeking solitude. The forest buffer stretches, along which the 400m pathway is proposed connecting the Shiva Ghat with the ancient spiritual site of Virbhadra Temple may be upgraded as "Rudra Vana" (Shiva's Forest) with interpretive signage displaying shlokas from the Vedas about nature.

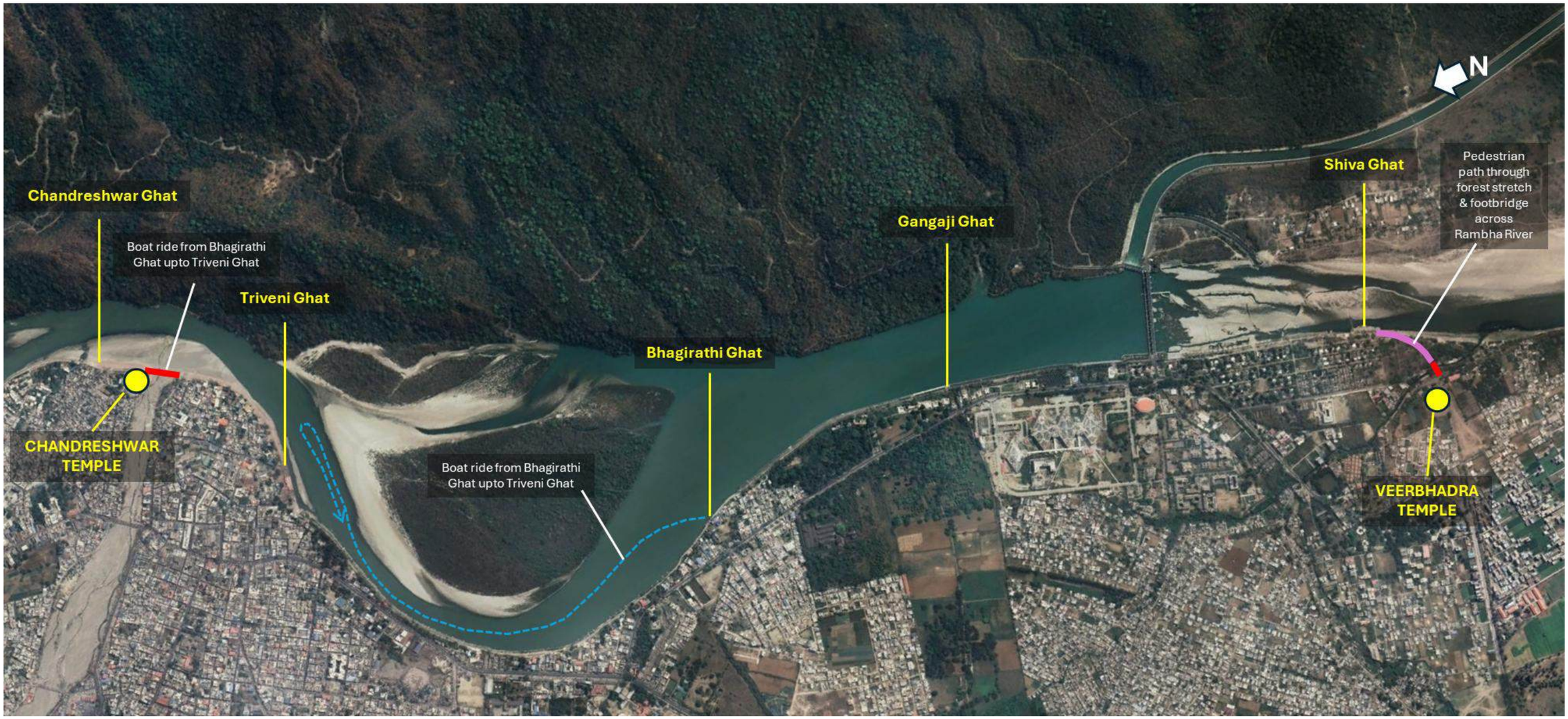


Image 7-42: Riverfront stretch within Rishikesh Municipal Corporation showing key intervention areas

7.7 Objective 8 Interventions to leverage the economic potential of river

7.7.1 Recommendation 4: Riverfront Tourism & Recreation

Leverage the proposed economic activity to generate tourism centric economy for the local people such as:

1. **Boating:** It drives local economic growth by attracting tourists through boat rides, eco-cruises and cultural packages, while boosting demand for nearby hotels, restaurants and handicrafts. It creates jobs for boat operators, guides and support staff and encourages skill development in hospitality and water safety. Infrastructure improvements such as jetties, seating areas and eco-friendly lighting enhance visitor experience and draw investment. The resulting multiplier effect strengthens local markets, transport services and cultural events, positioning the ghat as a safe, eco-friendly hub that supports tourism circuits, fosters community pride and generates sustainable livelihoods.

7.8 Objective 9 Interventions to inculcate river-sensitive behavior among citizens

The interventions under Objective 9 aim to embed ecological awareness and cultural pride into everyday life in Rishikesh, encouraging residents and visitors to adopt river-sensitive behaviors. As the gateway to Rajaji National Park, the city experiences seasonal tourist influx, making awareness measures essential for both citizens and visitors interacting with River Ganga and its tributaries. Initiatives such as awareness corners in schools and tourist entry points, biodegradable kits at temples and resorts, digital IEC platforms and annual "River Day" collectively strengthen emotional, cultural and behavioural ties with the rivers. The detailed interventions are outlined in the following sections.

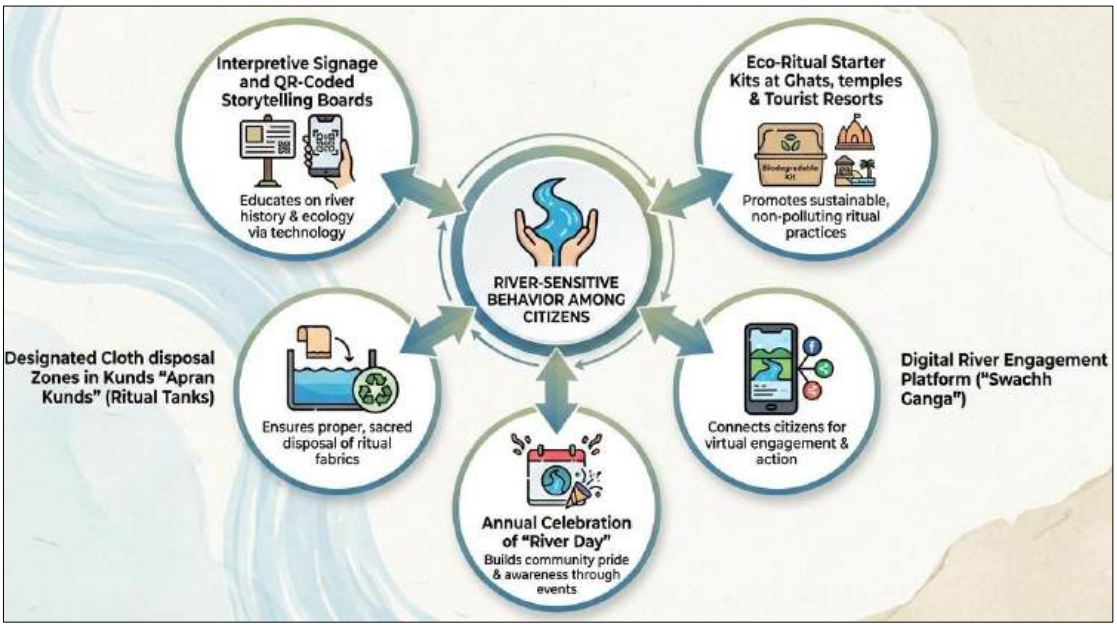


Image 7-43: River-sensitive practices and cultural awareness

7.8.1 Intervention 13: Interpretive Signage and QR-Coded Storytelling Boards

Rishikesh municipal corporation is undertaking several IEC campaigns, however, there is no interpretive signages at that visually or digitally connects citizens and tourists to the ecological and cultural significance of the River Ganga, Chandrahbhaga and Rambha. The absence of interpretive signage at high-footfall zones limits awareness, while lack of QR-linked storytelling tools prevents sustained engagement and behavioural change. The baseline assessment highlights the following key concerns:

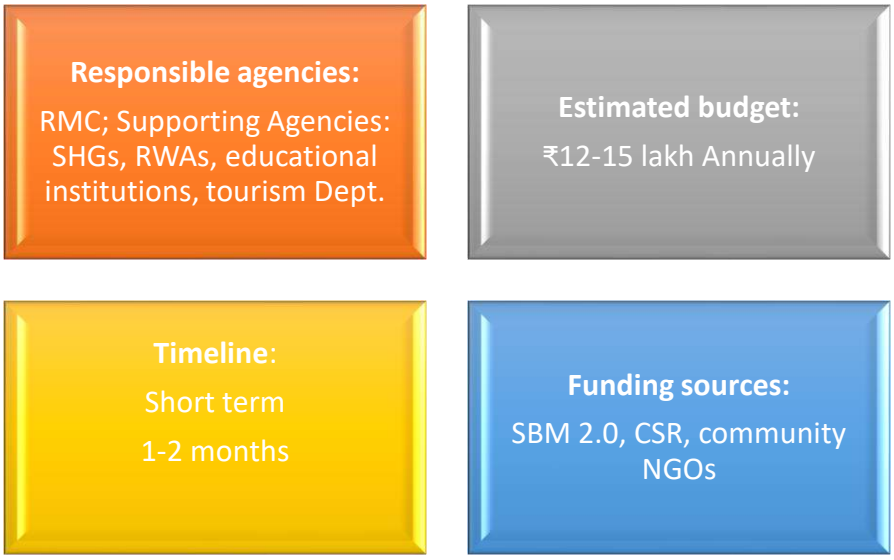
- No river-centric interpretive signage s at major tourist and civic locations.
- IEC efforts remain episodic and lack spatial continuity across the city.
- Absence of digital storytelling platforms reduces long-term citizen and tourist engagement.
- Limited community involvement in content creation reduces authenticity and ownership.

Proposed Intervention:

- Installation of Boards: 20–25 multilingual interpretive boards to be placed at Ghats, Aastha path, bus stand, railway station, Rajaji entry gates, municipal parks and bridges over the Chandrabhaga.

- Visual Storytelling: Each board will narrate folklore, biodiversity and river history, with QR codes linking to "Swachh Ganga" digital content (pledges, conservation tips, heritage stories).
- Tourist Integration: Resorts, hotels and ashrams will display QR codes in lobbies, encouraging visitors to engage with river stories.
- Community Engagement: Schools, RWAs and SHGs will co-create content, ensuring local ownership and authenticity.
- Monitoring: QR analytics tracked by RMC to measure citizen and tourist interaction.

Implementation Framework:



7.8.2 Intervention 14: Eco-Ritual Starter Kits at Ghats, temples & Tourist Resorts

Ritual practices at temples and ghats continue to generate plastic waste due to the use of non-biodegradable offerings. Despite seasonal tourist inflow, there is no structured mechanism to promote eco-sensitive rituals or empower SHGs and temple committees to distribute sustainable kits. The baseline assessment highlights the following key concerns:

- Ritual waste contributes significantly to plastic accumulation along riverbanks.
- SHGs lack formal training and roles in eco-kit preparation and distribution.
- Priests and temple committees are not mobilized to advocate sustainable practices.
- Tourist resorts are not integrated into eco-ritual outreach strategies.

Proposed Intervention:

- **Kit Preparation:** SHGs shall be trained to prepare biodegradable kits comprising of dried flowers, tulsi leaves in compostable containers.
- **Distribution Channels:** Kits sold at temple kiosks, SHG stalls, cremation ghats, mela grounds, resorts, ghats and marketplaces.
- **Priest Advocacy:** Temple committees and priests promote eco-kits during rituals, encouraging devotees and tourists to adopt sustainable practices.

- **Tourist Outreach:** Resorts include kits in welcome packages for visitors, linking religious practice with eco-tourism.
- **IEC Messaging:** Slogans such as "*Offer devotion, not pollution*" displayed at kiosks, temples, resort lobbies and stalls.
- **Monitoring:** Municipal staff and Waste Warriors track kit usage during festivals to assess reduction in plastic waste, with feedback loops on demand and adoption.

Implementation Framework:

Responsible agencies: RMC; **Supporting Agencies:** Temple committees, SHGs	**Estimated budget:** First-year cost: ₹6 - 8 lakh Annual recurring cost: ₹5 - 6 lakh
Timeline: Short term 1-2 years	**Funding sources:** 1. Municipal sanitation budget 2. CSR (local businesses, flower vendors) 3. Temple trusts

7.8.3 Intervention 15: Digital River Engagement Platform ("Swachh Ganga")

IEC activities remain offline, limiting outreach to digitally active youth and tourists. There is no centralized platform for sharing river-related content, pledges or clean-up schedules and citizen reporting of violations lacks structured response mechanisms. The baseline assessment highlights the following key concerns:

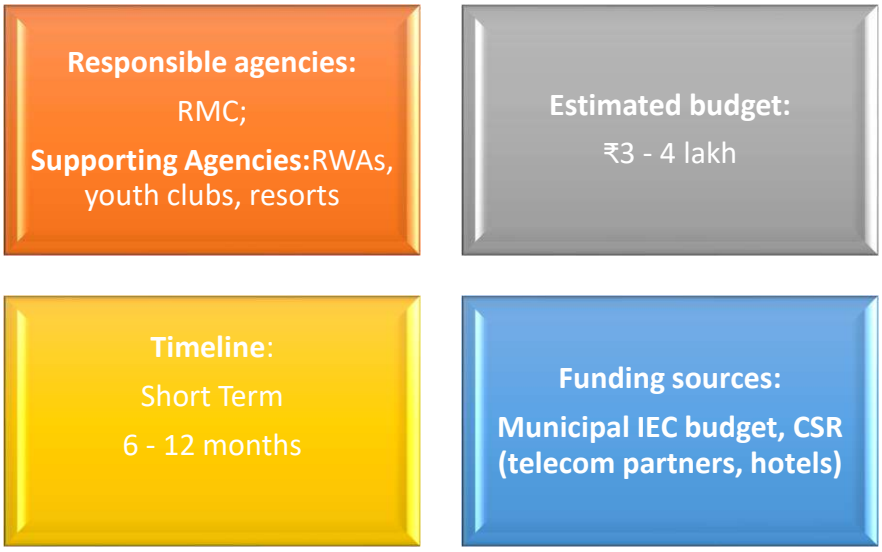
- No digital platform exists for river awareness, citizen pledges or reporting.
- Youth and RWAs are not engaged in content creation or dissemination.
- Tourist engagement is minimal due to lack of QR-linked digital access points.
- Municipal response to citizen reports is unstructured and lacks accountability.

Proposed Intervention:

- Platform Launch: Create WhatsApp/Telegram channel "Swachh Ganga" managed by RMC.
- River Specific Dashboard: Create River specific dashboard within the MC website managed by RMC.
- Weekly Content: Share reels on waste segregation, citizen pledges, clean-up schedules and eco-tourism tips.
- Tourist Integration: QR codes at bus stand, railway station, Rajaji Park gates and resorts link visitors directly to the platform.

- Citizen Content: Youth clubs and RWAs contribute videos.
- Reporting: Platform doubles as tool for reporting waste dumping along Ganga, with municipal staff responding.

Implementation Framework:



7.8.4 Intervention 16: Annual Celebration of "River Day"

Rishikesh lacks a symbolic cultural event that anchors river stewardship in public consciousness. Without a dedicated celebration, the River Ganga remains peripheral to the city's identity and tourism branding. The baseline assessment highlights the following key concerns:

- No annual event exists to culturally connect citizens and tourists to the river.
- IEC activities are disconnected from seasonal tourism cycles.
- SHGs, RWAs and schools lack platforms to showcase river-related contributions.
- Tourism calendars do not feature river-centric events, limiting visibility.

Proposed Intervention:

- Annual Event: Organize "River Day" in March–April, aligned with peak tourist season.
- River Walks: Guided walks along Aastha Path stretch highlighting biodiversity and heritage.
- Cultural Activities: Eco-art exhibitions in municipal parks, folk performances at ghats and temples, competitions at school level.
- Tourist Participation: Resorts host eco-awareness booths; visitors join clean-up drives.
- Community Showcases: SHGs display eco-products; RWAs present segregation initiatives.
- Tourism Branding: Position "River Day" as part of Rishikesh's tourism calendar, attracting visitors beyond wildlife safaris.

Implementation Framework:

7.8.5 Intervention 17: Designated Cloth disposal Zones in Kunds "Arpan Kunds" (Ritual Tanks)

Ritual Tanks act as **safe, designated cloth disposal points** at Triveni Ghat, supported by infrastructure, recycling partnerships, priest advocacy, IEC messaging and monitoring. This intervention reduces ritual waste entering the Ganga while empowering SHGs and reinforcing eco-sensitive practices.

Proposed Interventions

- Dedicated Ritual Tanks (Arpan Kunds): Construct or retrofit dedicated kunds in the shape of an urn (Kalash) at Triveni Ghat for cloth disposal with proper lining to prevent seepage into the river refer Image 7-44.
- **Segregation & Collection System:** Provide separate bins with compartments for cloth offerings and biodegradable ritual waste, with daily collection by municipal staff or contracted NGOs to prevent overflow.
- **Recycling & Repurposing Pathways:** Partner with SHGs and textile recyclers to convert collected cloth into reusable products such as bags, mats and rags, while exploring composting for natural fibers and ensuring safe disposal of synthetic materials.
- **Awareness & IEC Messaging:** Install clear signage at ghat entry points stating, 'Dispose ritual cloth in Arpan Kunds – Protect the Ganga,' and engage priests and temple committees to guide devotees during rituals.
- **Monitoring & Reporting:** Municipal staff and NGOs shall daily monitor cloth disposal volumes during peak festivals and periodically during other days. A bi-monthly reporting should be done to assess reductions in waste entering the river.
- **Tourist & Resort Outreach:** Resorts and wellness centres should include information on Arpan Kunds in their visitor guides and encourage tourists to participate in eco-sensitive rituals by using designated disposal zones.

Image 7-44: Ritual Tanks (Arpan Kunds) at Triveni Ghat

Implementation Framework:

Responsible agencies:
RMC;
Supporting Agencies: Temple committees, SHGs

Estimated budget:
cost: ₹8 - 15 lakh

Timeline:
Short term
1-2 years

Funding sources:
1. Municipal sanitation budget
2. CSR (local businesses, flower vendors)
3. Temple trusts

7.9 Objective 10 Intervention to engage citizens in river management activities

Objective 10 focuses on active citizen participation and structured stewardship of the river. Through River Sabha Committees, creative competitions, street plays and clean-up drives, these interventions institutionalize community involvement, empower youth & residents and ensure accountability in river governance. Together, they transform citizens into custodians of river health and resilience. The detailed interventions are outlined in the following sections.

Image 7-45: Citizen participation in river management

7.9.1 Intervention 18: Establishment of River Sabha Committees at the city level to promote participatory river governance

Community participation in river governance is fragmented, with limited institutional platforms for collective decision-making. As part of its ongoing commitment to urban cleanliness, the Rishikesh Municipal Corporation is actively engaged with Resident Welfare Associations (RWA) and Bulk Waste Generators (BWG) to reform local waste management strategies. The current environmental strategy emphasizes the importance of source segregation through community-led initiatives; however, it also highlights the urgent necessity for more robust interventions to safeguard the city's rivers and waterbodies. Addressing this gap is a priority, as basic waste management to a holistic 'ridge-to-river' approach will actively prevents the pollution.

The baseline assessment highlights the following concerns:

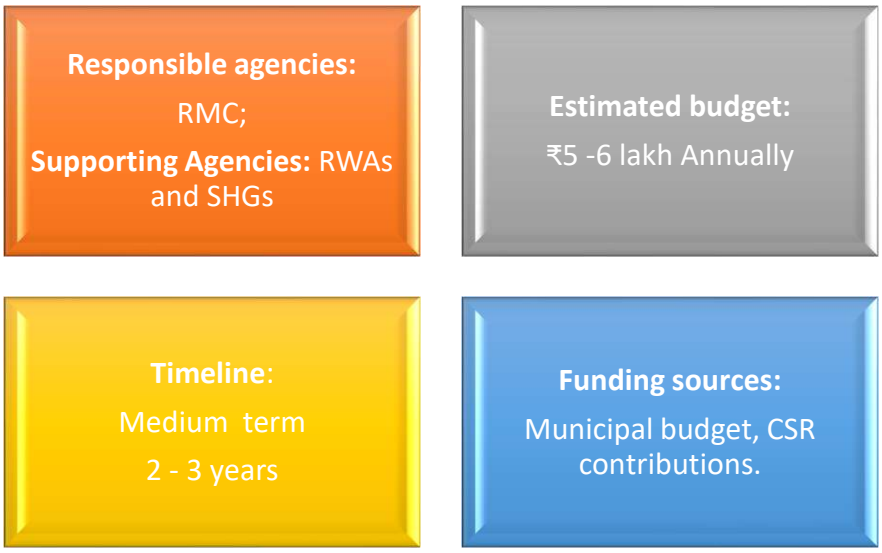
1. Absence of a formalized citizen-led body to coordinate river stewardship and provide consistent environmental monitoring.

2. Limited accountability and transparency in the mechanisms for reporting solid waste dumping in nallahs and rivers.
3. Youth engagement remains inconsistent.

Proposed Intervention:

- **Establishment of Multi-Tier Governance**: Establish River Sabha Committees at both city and ward levels, ensuring each tier has clearly defined roles and operational mandates.
- **Inclusive Stakeholder Representation**: Ensure a diverse composition within each committee by integrating representatives from Self-Help Groups (SHGs), youth leaders, Resident Welfare Associations (RWAs) and ward officials.
- **Enhanced Digital Accountability**: Formalize transparency by integrating committee reporting and monitoring data into the SBM (Swachh Bharat Mission) and URMP (Urban River Management Plan) dashboards.
- **Capacity Building for "River Ganga Guardians":** Train a dedicated volunteer force of " River Ganga Guardians" to spearhead community awareness initiatives, monitor environmental violations and report illegal dumping.
- **Structured Youth Engagement**: Mobilize NSS and NCC units to conduct monthly riverbank clean-up campaigns, providing a consistent framework for youth-led environmental action.

Implementation Framework:



7.9.2 Intervention 19: Riverbank Adoption by Schools, RWAs & Resorts

Clean-up drives are sporadic and lack continuity due to absence of institutional ownership. Schools, RWAs and resorts are not assigned responsibility for specific river stretches, leading to inconsistent maintenance and visibility. The baseline assessment highlights the following key concerns:

- No formal adoption model exists for riverbank stewardship.
- Citizen and tourist contributions fade post-campaign due to lack of continuity.
- Resorts are not integrated into long-term clean-up frameworks.
- Absence of signage and recognition reduces public accountability.

Proposed Intervention:

- Adoption Model: Schools, RWAs and resorts adopt 2 – 3 km stretches of River Ganga riverbank (e.g., near pashulok barrage till triveni ghat).
- Monthly Clean-Ups: Organized by students, residents and resort staff, supported by municipal staff.
- Signage: Boards installed stating "Adopted by [School/RWA/Resort]."
- Recognition: Annual "Best Adopted Stretch" award during River Day.

Implementation Framework:

Responsible agencies:
RMC, Education Dept.;
Supporting Agencies: Schools, RWAs, NSS/NCC units

Estimated budget:
Annual cost: ₹8 -10 lakh

Timeline:
Short term
1-2 years

Funding sources:
Education Department, Municipal IEC Budget, CSR contributions from schools and coaching institutes and NGO.

7.9.3 Intervention 20: Street Plays in Market, Temple & Tourist Places

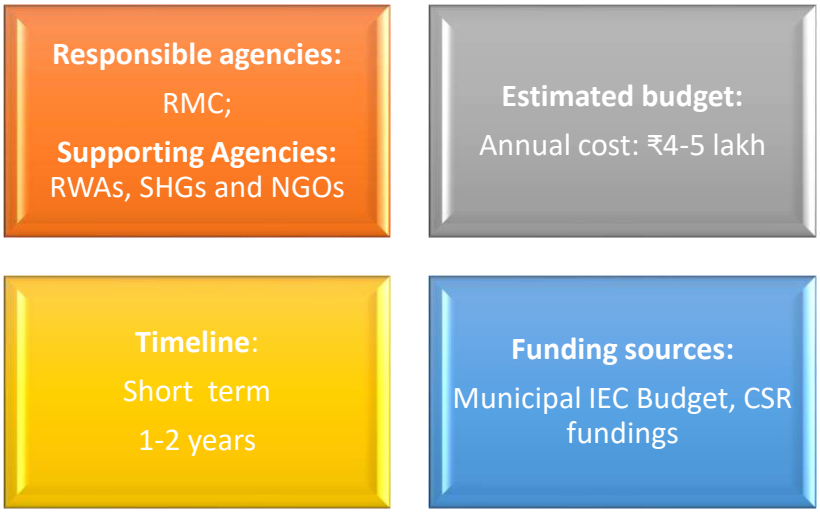
IEC campaigns rely on static mediums that fail to culturally resonate with diverse audiences. There is no structured program to train youth and SHGs in creative formats like street theatre, limiting emotional impact and reach. The baseline assessment highlights the following key concerns:

- IEC messaging lacks cultural depth and creative delivery formats.
- Youth clubs and SHGs are not trained in performance-based outreach.
- Tourist zones and markets are underutilized for thematic storytelling.
- No recognition framework exists for impactful performers or groups.

Proposed Intervention:

- Training: SHGs and youth clubs trained to perform monthly Nukkad Nataks.
- Performance Venues: Rishikesh bazaar, mela days and resort courtyards during peak season.
- Themes: Scripts dramatize plastic pollution, segregation, eco-spiritual values.
- Rotation: Plays rotated across wards and tourist hubs for wider reach.
- Recognition: Annual awards for impactful performers during River Day.

Implementation Framework:



7.9.4 Intervention 21: Citizen & Tourist Monitoring Dashboard

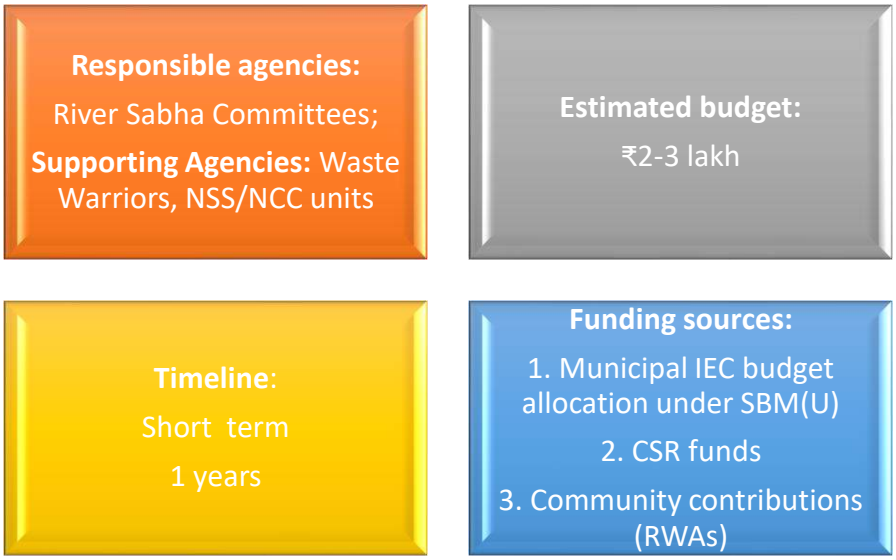
Despite frequent IEC activities, there is no integrated system to monitor participation, waste collection or CSR contributions. Lack of public access to data reduces transparency and limits civic feedback. The baseline assessment highlights the following key concerns:

- No centralized dashboard exists to track river-related citizen and tourist activities.
- Resorts and Adventure Tour operators are not mandated to report visitor involvement.
- IEC and clean-up data are not publicly visible or regularly updated.
- Absence of feedback limits transparency and adaptive planning.

Proposed Intervention:

- Dashboard Creation: Develop online dashboard (Google Sheets/municipal portal) to track clean-ups, IEC and CSR activities investments and tourist participation.
- IEC Cell: Create IEC cell within the RMC which will look after the monthly training, IEC calendars and ensuring that the dashboard updated.
- Data Entry: Updated monthly by RMC IEC cell.
- Tourist Inputs: Resorts and adventure tour operators report visitor involvement in clean-ups.
- Public Access: Dashboard displayed at Municipal Corporation office and shared via "Swachh Ganga" platform.
- Transparency: Ensures visibility of citizen and tourist contributions.

Implementation Framework:



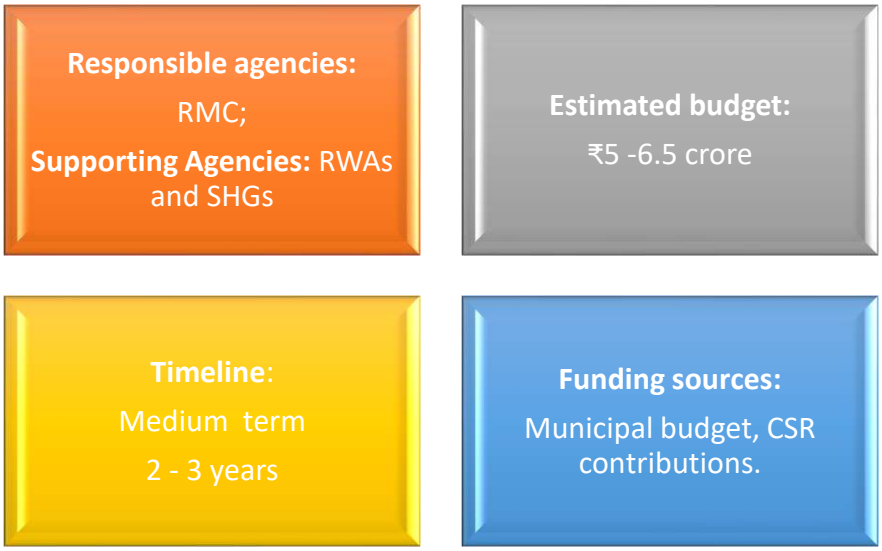
7.9.5 Intervention 22: "Ganga Gatha" Light and Sound show in triveni ghat

The "Ganga Gatha" Light and Sound Show will serve as a cultural-ecological intervention, combining heritage storytelling with sustainability messaging. It will strengthen Rishikesh's identity as a spiritual-ecological hub while engaging tourists, locals and institutions in river stewardship.

Proposed Intervention:

- **Community & Cultural Participation:** Engage local artists, priests and storytellers to enrich the narrative, involve SHGs and youth groups in managing visitor flow and eco-awareness kiosks and link show themes with eco-sensitive rituals and Arpan Kunds to reinforce sustainability.
- **Tourism Integration:** Align show timings with the evening Ganga Aarti, include tickets in resort and wellness packages and provide interpretive signage and brochures linking the show to eco-tourism.
- **IEC & Messaging:** "Use key slogans such as 'Ganga Gatha – A Story of Devotion and Conservation,' display eco-messages like 'Offer devotion, not pollution,' and promote biodegradable ritual kits and cloth disposal zones through the show."
- **Monitoring & Evaluation:** Collect visitor feedback via kiosks and apps, assess impacts on awareness, waste reduction and community pride and conduct annual reviews to update content with new ecological themes.

Implementation Framework:



7.9.6 Intervention 23: "Swachhta Challan" (Cleanliness Fine) for Rishikesh

The *Swachhta Challan* initiative in Rishikesh has been proposed to enforce cleanliness along ghats, temples and riverbanks by penalizing littering, plastic use and improper ritual waste disposal. It empowers Municipal Corporation to levy fines on pilgrims, vendors, tourists and resorts, ensuring accountability and compliance with solid waste management rules. Implementation involves on-the-spot challans through digital systems, visible signage and monitoring by municipal staff, SHGs and youth volunteers.

Proposed Intervention:

Regulatory Enforcement: Impose fines for littering, plastic use and open disposal of ritual waste along ghats and riverbanks, with penalties for resorts, shops and eateries that violate solid waste management norms.

Temple & Ghat Monitoring: Deploy municipal staff and volunteers at Triveni Ghat and Aastha Path to monitor ritual waste and On-the-spot challans for devotees using non-biodegradable offerings.

Tourist & Resort Accountability: Resorts and wellness centers fined for improper disposal of tourist-generated waste. Mandatory segregation of biodegradable and non-biodegradable waste at source.

Plastic Ban Enforcement: Strict challans for vendors selling single-use plastics near ghats, temples and mela grounds. Confiscation of banned items during festivals and tourist seasons.

Digital Monitoring & Transparency: QR-code based challan system for transparency and tracking. Monthly reporting of challan collections and reinvestment into cleanliness drives.

Implementation Framework:

Responsible agencies:
RMC;
Supporting Agencies: RWAs and SHGs

Estimated budget:
₹10 - 12 lakh

Timeline:
Medium term
2 - 3 years

Funding sources:
Municipal budget, CSR contributions.

ANNEXURE

Annexure 1: List of ongoing and proposed projects

Sl. No	Proposed Projects
1	Flood protection work plan for Gram Sabha Khairi Khurd and Gandhi Maychak from Bangla Nallah and Sevala Nallah
2	Flood protection work and drainage work from Rambha River of AIIMS Rishikesh campus
3	Construction work of Aastha Path on Chandrabhaga River in Rishikesh area under Doiwala development block of Dehradun district.
4	Flood protection work from Bangla Nallah in village Thakurpur, Khairikhurd and Khadri Khadak Maaf under Doiwala development block of Dehradun district.
5	Flood protection work from Goyala Nallah in the village councils Gandhi mayachak, Shyampur and Bhalla farm under Doiwala development block of Dehradun district.
6	Scheme for restoration of Chhidarwala Khadri and Gulrani Canal in Doiwala development block of Dehradun district.
7	Scheme for renovation and construction of Thakurpur Canal, Khairi Khurd Canal, Garhi Maychak Canal, Shyampur and Khairi Kalan Canal in Doiwala development block of Dehradun district.
8	Flood protection scheme of Jakhan village, Nepali settlement on the left bank of Jakhan river near Fun valley under Doiwala development block of Dehradun district.
9	Flood protection scheme of Chakjogiwala, Tuniwala situated on the left bank of Jakhan, a tributary of Song River, under Doiwala development block of Dehradun district.
10	Flood protection work from Bangala drain in village Bhattowala Gumanivala under Doiwala development block of Dehradun district.
11	Restoration of flood protection works of Sahabnagar Dadi village situated on the left bank of Song River in Doiwala development block of Dehradun district.
12	Rain water drainage work at Advani Plot in Raiwala area.
13	Flood protection work in Gumaniwala area from Mansa Devi drain on ward no. 37 under Rishikesh Municipal Corporation area of Dehradun district.
14	Restoration of flood protection work sahabnagar, dandi village left bank of Song River.
15	Flood protection scheme of Suswa river in Gauharimafi, Pratit Nagar, Raiwala in Doiwala development block of Dehradun district.
16	Flood protection scheme in Raiwala cantonment area situated on the right bank of river Ganga
17	Renovation of Aastha Path & various Ghats situated along Aastha Path from Triveni Ghat to Pashulok Barrage Rishikesh.
Sl.No.	**Ongoing Projects**
1	Redevelopment of Ghat under the schemes of SASCI with 661 lakhs costing.

Source: Irrigation Department Rishikesh, 2025

Annexure 2: ToR for Sewerage Master Plan

1. Background and Context

- Brief description of the city/region (e.g., Rishikesh between Song River and Kharastrot Rao River).
- Current situation: rapid urbanization, wastewater generation, existing STPs/SPSs, coverage gaps and environmental concerns.
- Reference to ongoing schemes (UIIDB, SPMG, Namami Gange, etc.).

2. Objectives

- Prepare a comprehensive sewerage master plan covering the entire catchment area.
- Consolidate ongoing and planned projects into a unified framework.
- Optimize existing and unused infrastructure (e.g., IDPL STP).
- Expand coverage to unserved and peri-urban colonies.
- Integrate septage management and treated wastewater reuse.

3. Scope of Work

- Assessment of Existing Infrastructure: STPs, SPSs, sewer lines, Nallahs, coverage status.
- Gap Analysis: Coverage, capacity utilization, operational challenges, institutional overlaps.
- Catchment Rationalization: Identify and delineate clear catchment areas for each STP to eliminate inefficiencies such as long-distance pumping (e.g., wastewater transfer from Muni Ki Reti to Lakkad ghat) and ensure optimal load distribution and infrastructure utilization.
- Planning Interventions: Rehabilitation, expansion, integration, reuse, green infrastructure.
- Stakeholder Engagement: Coordination with ULBs, agencies (UJS, Pey Jal Nigam, Jal Sansthan) and community groups.
- Environmental & Social Considerations: River health, noise mitigation, awareness campaigns.
- Financial & Institutional Framework: Cost estimates, phasing, O&M responsibilities, regulatory measures.

4. Methodology

- Data collection (primary surveys, secondary data, GIS mapping).
- Technical analysis (hydrology, load projections, treatment capacity).
- Stakeholder consultations.
- Drafting and validation of master plan.

5. Deliverables

- Inception Report (baseline data, methodology).
- Interim Reports (gap analysis, draft interventions).

- Draft Sewerage Master Plan (with DPR-style details).
- Final Sewerage Master Plan (approved and stakeholder-validated).
- Annexures: maps, cost tables, institutional framework, monitoring indicators.

6. Expected Outcomes

- Universal sewerage coverage for city and peripheral colonies.
- Optimized use of existing and abandoned infrastructure.
- Reduced untreated discharges into rivers and Nallahs.
- Strengthened institutional accountability and O&M practices.
- Sustainable wastewater reuse and green infrastructure integration.

7. Roles and Responsibilities

- Consultant/agency: technical studies, plan preparation, stakeholder engagement.
- Municipal Corporation/ULBs: data provision, facilitation, approvals.
- State agencies (UIIDB, SPMG): oversight, funding, compliance.

8. Timeline

- Define phases (e.g., 3–6 months for draft, 9–12 months for final plan).

9. Budget/Resources

- Indicative cost for preparation, surveys, stakeholder workshops and documentation.

Annexure 3: Draft Scope of Work for Faecal Sludge and Septage Management (FSSM)

Scope of Work for Faecal Sludge and Septage Management (FSSM) study for Rishikesh Planning Area

Objective: To undertake Sanitation Value Chain Assessment and evaluate the adequacy of ongoing sanitation infrastructure projects in the Rishikesh Planning Area and formulate a supplementary plan to bridge the gap between committed capacity and projected future demand.

Scope of works:

1. **Sanitation Value Chain Assessment (The "As-Is" Analysis)**

- **A. Containment (The Capture):**
    - Structural Audit: Survey a representative sample (5-10%) to determine the percentage of "Properly Built Septic Tanks" vs. "Single Pits" vs. "Direct Discharge to Nallah."
    - Terrain-Specific Checks: Specifically, for Kathgodam (Rocky/Hilly terrain), assess if soak pits are failing due to low soil permeability or high-water table, leading to groundwater contamination.
- **B. Emptying (The Service):**
    - Accessibility Mapping: GIS mapping of road widths to quantify households that are "Inaccessible" to standard 3000L vacuum trucks (often a major issue in older unplanned colonies).
    - Mechanization Index: Determine the ratio of mechanical emptying (vacuum trucks) vs. manual emptying.
- **C. Transport (The Logistics):**
    - Illegal Dumping Surveillance: Identify "Hotspots" where private operators dump sludge illegally (e.g., banks of the river or forest edges) to save fuel.
    - Travel Time Analysis: Measure the turnaround time from the furthest peripheral ward to the designated disposal site to determine if "Transfer Stations" are needed.
- **D. Treatment & Disposal (The Endgame):**
    - Used water Quality: Test the final output of current disposal methods (if any) against NGT/CPCB discharge standards.
    - Reuse Potential: Specific assessment of the local market for treated biosolids (co-compost) in the nearby Terai agricultural belt.

2. Review of Ongoing Initiatives (Infrastructure Audit)

- **Review of Active Tenders & Contracts:**
    - Analyse the Detailed Project Reports (DPRs) of ongoing sewerage/STP works (specifically UUSDA/ADB Package-2 or Package-3) to determine the committed Faecal Sludge Co-treatment capacity.

- Key Check: Specific design parameters of the "Septage Receiving Stations" in currently under-construction STPs (e.g., screening mechanism, holding tank volume).

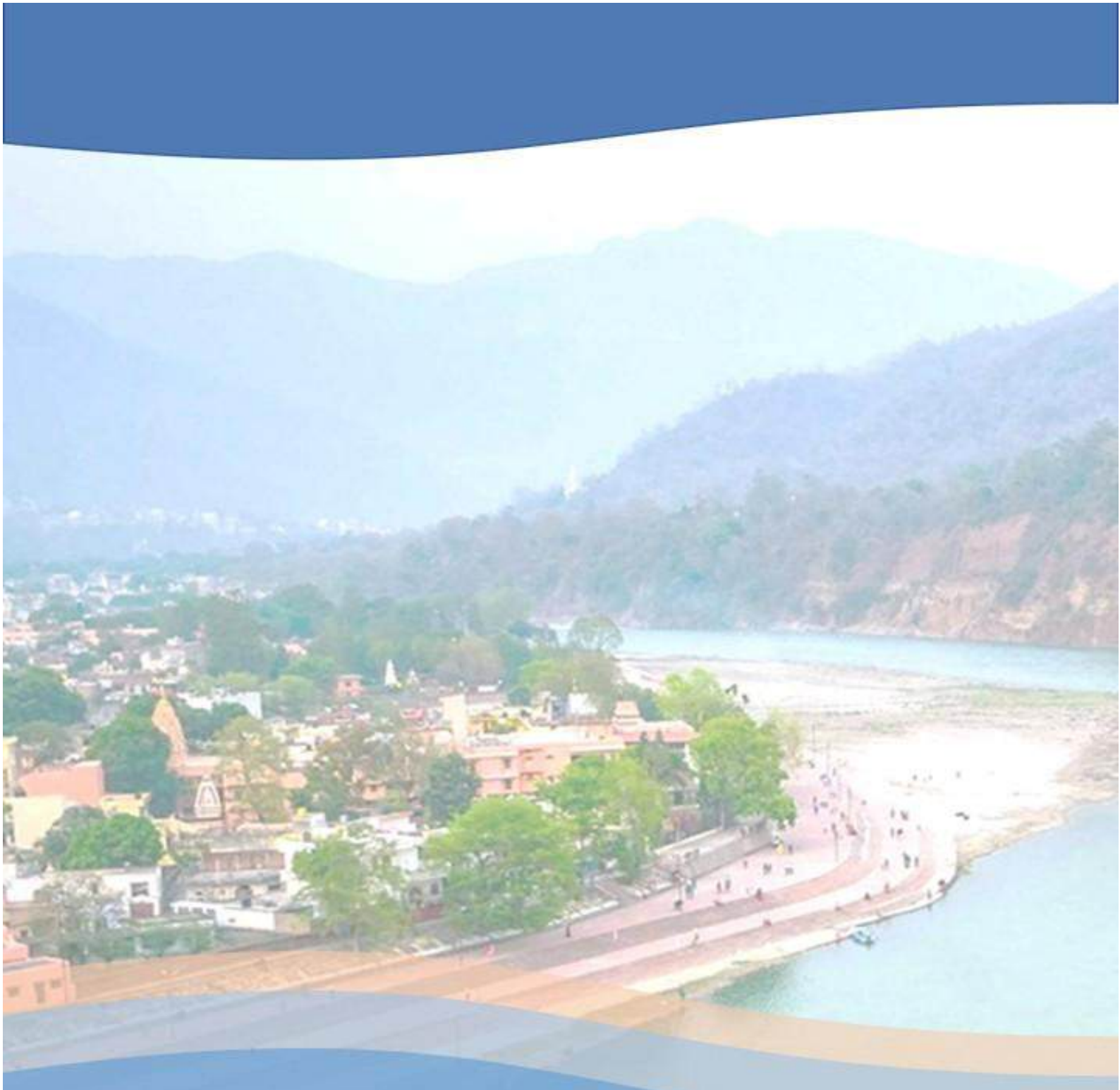
- **Technology Compatibility Check:**
  - Assess if the ongoing STP technology (e.g., SBR/MBBR) is chemically and biologically compatible with the projected characteristics of septage from the un-sewered peripheral wards.
- **Timeline Synchronization:**
  - Map the "Commissioning Timeline" of ongoing plants against the immediate sludge disposal needs of the city to identify interim bottlenecks.

3. Dem and Forecasting & Gap Analysis

- Future Generation Scenarios (Horizon Years: 2030, 2040, 2055): Forecast population growth for the Core City vs. Peri-urban outgrowth (Kathgodam/Bhotia Parao areas).
- Estimate the "Shift Factor": Assess of the number of households likely to move from septic tanks to the sewer network once ongoing sewerage projects are complete.
- Net Residual Septage Load: Calculate the volume of sludge that will *remain* outside the sewer network (the true FSSM demand).
- Determine if the ongoing STP augmentations are sufficient or if a Satellite FSTP (new standalone plant) is required for distant wards.

4. Strategic Planning for Future Capacity

- **Scenario A: Augmentation of Ongoing Projects (Retrofitting)**
  - If the gap is small (<10-20 KLD): Propose specific "Retrofits" to the current STP designs (e.g., adding a larger equalization tank or a specialized dewatering unit) before construction is finalized.
- **Scenario B: Decentralized Expansion (New Nodes)**
  - If the gap is large or spatially disconnected: Identify land parcels for Decentralized FSTPs in growth corridors (e.g., towards Lalkuan or Kaladhungi road) to reduce truck travel time.
- **Phasing Plan:**
  - **Phase 1 (Immediate - 0 to 2 Years):** Operationalize co-treatment at existing/upgrading STPs.
  - **Phase 2 (Medium Term - 2 to 5 Years):** Commission satellite FSTPs for peri-urban gaps identified in the analysis.
  - **Phase 3 (Long Term):** Transition FSSM infrastructure to handle "sewer mining" or specialized industrial sludge if sewerage coverage hits 100%.



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