RE-ESTABLISHING RIVER-CULTURE-NATURE CONTINUUM: A CASE OF REVITALIZING THE RIVER COMMONS IN NASHIK

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RE-ESTABLISHING RIVER-CULTURE-NATURE CONTINUUM: A CASE OF REVITALIZING THE RIVER COMMONS IN NASHIK

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Abstract

Water has played an important role in shaping Indian landscapes. India's relationship with water is a profound dialogue between humanity and the divine, where architecture, culture, and ecology converge, from the tranquil ghats to the vibrant riverfronts. This relationship has been taken for granted by the cities, thus looking at water as merely a resource and not as a sacred thread weaving together life, faith, and culture. Nashik, a cultural city, shaped by the sacred Godavari River and the dynamic character of the Kumbh Mela along the river, exists at the crossroads of tradition and modernity. The thesis aims to investigate this relationship of the city with the river by proposing a precinct redevelopment along the stretch of the Godavari River. Rooted in the philosophy of re-establishing the connection between the city and its river, the design incorporates the historical wadas of Nashik into a comprehensive cultural trail. The project aims to revitalize the Godavari through careful restoration of the riverfront, giving due importance to the rejuvenation of the lost Kunds of the city due to concretization and an appreciation for local craftsmanship, all while safeguarding the essence of the city. This proposal aims to transform Nashik into more than just a destination; it seeks to present the city as a dynamic narrative, where architecture, heritage, and humanity intersect harmoniously with the ecology and making the river the lung of the city.

Keywords: Precinct redesign, Riverfront development, Urban river revitalisation, Godavari Rejuvenation.

1. Background

The river has proved to be an important lifeline for the city since times immemorable. This intricate relationship highlights the indispensable role of rivers in shaping the destiny of human civilizations and their cities. Rivers in India are considered sacred and the relationship between a river and a city is multifaceted, influencing and enriching urban life in numerous ways. From fostering economic prosperity to enhancing cultural and social experiences, rivers are integral to the vitality of cities.

The river Godavari, also called as Vridha Ganga (literally translating to elder sister to Ganga), is fondly called Amchi Godavari, meaning “our Godavari”, by the locals in Nashik. The Godavari has seen a decline in its health over the years due to over concretization of the river banks, removal of vegetation cover, encroachments in the river banks, etc causing the river to fade into decline. Questions by various newspaper articles and local organisations have made people ask the question, “Aapli Godavari meli ka?” which literally translates into, “Is our Godavari dead?” This proposal attempts to restore the faith of the community in its river by re-establishing a communal threshold that interacts with the city and the river, bringing in people to the river edge and celebrate Godavari as a river by creating a punctuation in the city’s daily life. The proposal will investigate the lost connections of the Godavari River to the city and present a social hub in the existing fabric of the city that will act as an interface in the heart of Nashik city.

Nashik being a pilgrim town, boasts a profound cultural heritage, recognized for its religious importance, historical landmarks, and vibrant festivals. The city also boasts an intricate network of wadas around the river which stitch together to form the historic tapestry of the city. Each wada, a timeless artifact of architecture and community, serves as a portal to the past, where the stories of artisans and locals echo through intricately carved facades and bustling courtyards. The wadas are occupied by generational artisans well know for their filigree and silverware (*Chandi che kaam*), metal ware (*Tambat kaam*) and metal embossing (*Uthavache kaam*). These wadas act as bridges connecting the city to the river, which additionally host the Kumbh mela once in every 12 years. The river banks in Nashik also boast a rich cultural heritage and a historical

timeline that have modified the interaction of the people with the river by adding ‘Kunds’ at the thresholds which served specific functions. Overtime, these kunds have been concretized to accommodate the influx of the crowds during the Kumbh melas of 2003 and 2015. This action has not only affected the tangible aspects such as the sudden flooding in the monsoons and droughts in the summers but has also affected on an intangible level as it has caused a rift in the connection of the river’s edge with the city. Thus, this leads to the dialogue on the local need of each day by the community living there versus the changes that are done to fulfill the global needs to Kumbh. Hence, this proposal aims to understand this dichotomy and proposes to create an interface between the two needs over time, establishing an ephemeral relationship of the city with the river. Kumbh is one of the few global level ephemeral mass gathering that engages the city in an spiritual yet transcendent space.

The thesis aims to investigate this relationship of the city with the river by proposing an urban water linkage through the redesign of the riverfront that not only fulfills the requirements of the community but also reduces the stress of the ghats during the Kumbh by accepting the spillover, creating an ephemeral character along the river. Rooted in the philosophy of reestablishing the connection between the city and its river, the design incorporates the historical wadas of Nashik- the remnants of its architectural legacy- into a comprehensive cultural trail. The wadas occupied by the artisans and residents of Nashik, serve as bridges to the Godavari, linking the people of the city to its soul, the river.

The objective of the thesis will be to renew the connection of the city with the river rethinking this threshold to make it the lung of the city through revitalized kunds, wadas, vibrant courtyards and community spaces establishing a seamless connection between the natural and the cultural, the sacred and the mundane. The design will aim to create a network of water linkages through the urban streets. These water linkages will connect the existing kunds and act as arteries to the final lung of the city, the river. Thus, a micro to macro connection is established through these urban water networks. This will be achieved by a thorough primary study of the site and engaging with the community and river to map the different requirements and elaborating the problems

faced by both the river and the city. Literature studies will support the above findings. Case studies will provide a better understanding and insight to the strategies that can be adopted to create a good design. Finally, a final design proposal outlining the strategies that can revitalize the selected precinct and in turn rejuvenate the river Godavari, creating a culture as well as ecologically sensitive proposal.

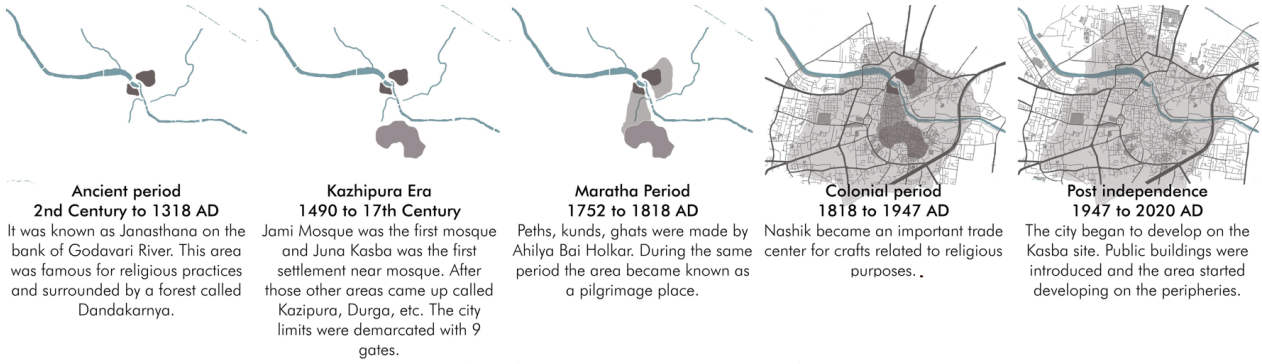

Figure 1 Timeline of Nashik

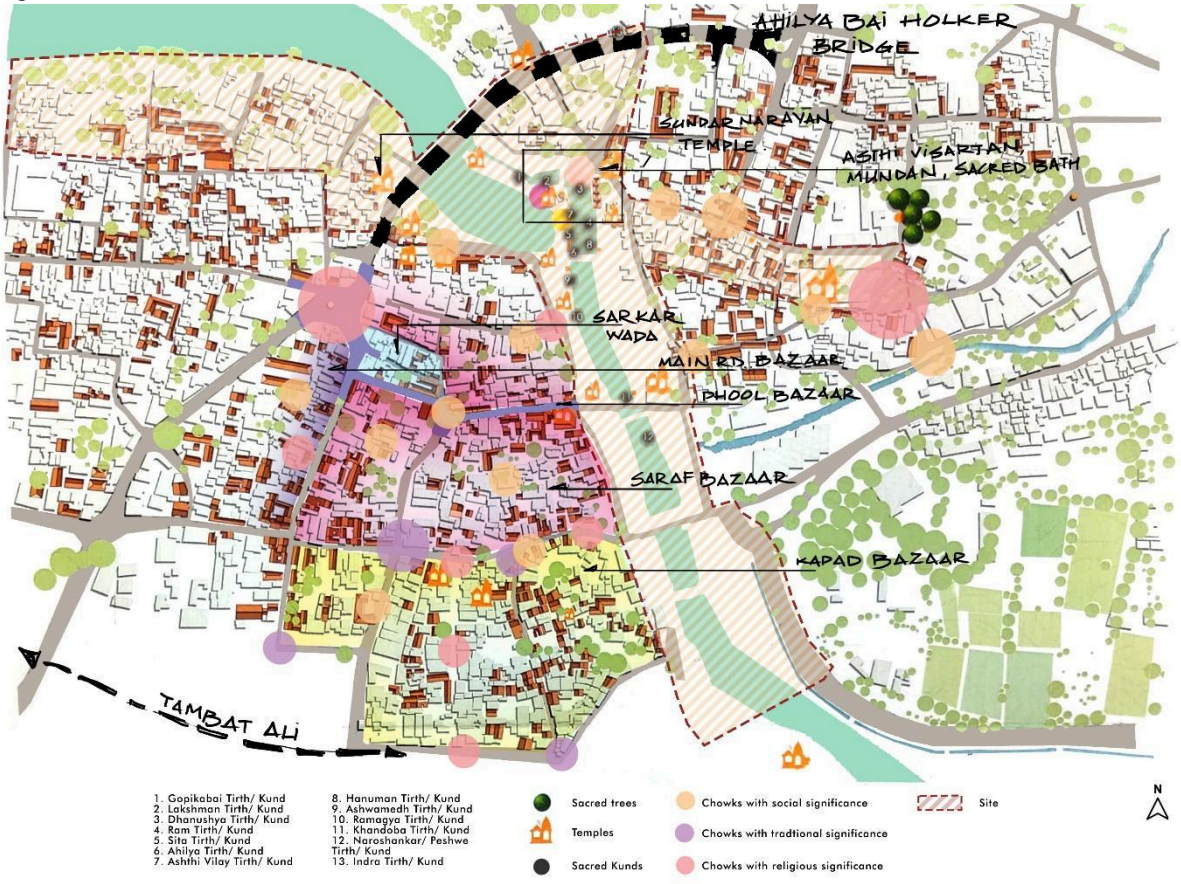

Figure 2 The sacred scape of Nashik

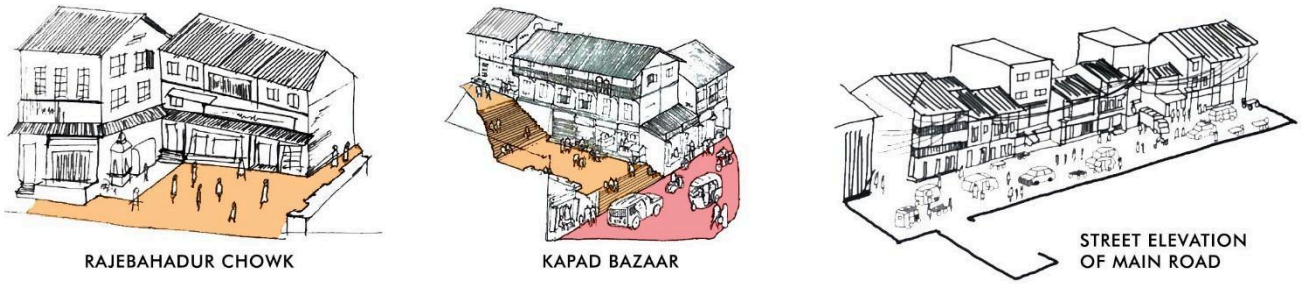

Figure 3 The architectural language of Nashik

The selected precinct is part of a strategic stretch identified by the Nashik Municipal Corporation for the proposed **redesign and revitalization of the Godavari riverfront**. This area holds immense potential as a focal point for ecological restoration, cultural rejuvenation, and community engagement, serving as a prototype for sustainable urban riverfront development. By addressing both environmental and social dimensions, the redesign aims to transform the riverfront into a vibrant public space that harmonizes Nashik's rich heritage with modern aspirations.

2. Research problem formulation

This study aims to fill the existing gap by formulating a comprehensive framework that is applicable to riverfront development initiatives on a global scale. This framework would evaluate a comprehensive array of parameters within the overarching themes of ecological systems and socio-cultural dynamics. This study seeks to conduct a comprehensive review of existing riverfront projects in order to elucidate best practices, challenges, and opportunities that may contribute to the formulation of a flexible and adaptable model for forthcoming urban riverfront developments.

- How has the relationship between people and the Godavari River changed over time in Nashik?
- What spatial strategies can revive the water–people connection along urban riverfronts?
- How can traditional spatial typologies like the *wada* or *ghat* be reinterpreted in contemporary civic architecture?

- What role can community-driven spaces play in activating underused riverfront edges?
- How can a riverfront common be designed to remain adaptable throughout the year, catering to both every day and festival use?
- How can architecture sensitize users to the ecological importance of riparian zones while integrating them into public use?

This research endeavours to tackle these inquiries, with the objective of offering an extensive framework for city planners, architects, and policymakers. The aim is to analyse the development of riverfronts that exhibit resilience while simultaneously fostering a profound connection to the cultural identity inherent in their respective cities.

3. Aim and Objectives

To design a community-cultural center along the Godavari riverfront in Nashik that re-establishes the historical and cultural relationship between people and the river, while addressing ecological sensitivity, seasonal transformations, and the spatial character of public life around water.

1. To examine the spatial and cultural transformations of the riverfront during events such as the Kumbh Mela and their effects on public and private areas.
2. To study the built-use patterns, building height distribution, and ecological vulnerabilities of the site to guide context-sensitive and flood-resilient design strategies.
3. To identify chances for rehabilitating underutilised or flood-prone river edges into multifunctional public places that can adjust to temporal urban dynamics.
4. To design an inclusive, multi-dimensional public space that enhances the connection between communities and the river through architecture, landscaping, and cultural initiatives.

4. Literature Study

4.1 Reconnecting City and River: A Comprehensive Study of Urban-Riverine Relationships with Focus on Godavari in Nashik

The intricate relationship between rivers and cities has been foundational to human civilization's growth, with waterways serving as lifelines for urban development across millennia. This extended literature study explores the multifaceted dimensions of the Godavari River's relationship with Nashik city, examining both historical significance and contemporary challenges while proposing sustainable approaches for revitalizing this sacred bond.

4.1.1 Historical and Cultural Significance of Riverscapes in Urban Development

Rivers have historically been the cradle of human civilizations, particularly in India where urban centers like Benares, Patna, Ahmedabad, and Delhi emerged along riverbanks. These settlements developed in harmony with their respective rivers, creating communities that both relied on and contributed to the health of these waterways (Aditi Rakhe, et.al.,2022). The relationship between rivers and urban spaces transcends mere pragmatic utility, embedding itself into the cultural, religious, and social fabric of cities.

The Godavari River, affectionately known as "Amchi Godavari" (Our Godavari) by Nashik residents and reverently called "Vridha Ganga" (elder sister to Ganga), represents this profound connection. Originating at Brahmagiri hills in Tryambakeshwar of Nashik District in Maharashtra, the river flows through approximately 13 kilometers of Nashik city, creating a mesmerizing intersection of land and water (Bhamburdekar, 2025). This riverscape has shaped Nashik's identity as a sacred pilgrimage center, drawing thousands of devotees daily to its banks.

However, the contemporary reality reveals a disconnect between reverence and practice. As Dr. Kailas Kamod aptly observes, "Since the rivers are sacred for us, thus, there is a Ganga in our minds, and in reality, there is one another Ganga... Similarly, we celebrate the religiosity of Godavari symbolically... but we do not respect the materiality of the river... By elaborately emphasizing the religiosity of Godavari, we consider ourselves to be free to pollute the river in any way we want." (Botekar, 2025) This

dichotomy between spiritual veneration and environmental degradation forms the central paradox in the river-city relationship.

4.1.2 The Sacred Geography and Cultural Landscape

Varanasi's example illustrates how cities develop unique identities through their relationship with rivers. The riverine planning strategy for this sacred city acknowledges it as a "blessed land" positioned above normal flood levels. The strategy incorporates soil management techniques to build "fingers" that enable water drainage during monsoons while supporting urban agriculture during the remainder of the year3. This approach demonstrates how traditional wisdom can inform modern urban planning solutions.

Similarly, Nashik's identity is inextricably linked to the Godavari. The city owes its recognition as an important religious center to this sacred river, which hosts the Kumbh Mela every twelve years. The riverbanks in Nashik feature a rich cultural heritage, including traditional structures like 'kunds' that served specific functions at the thresholds between city and river (Center, 2025). This cultural landscape forms a unique urban tapestry that merits preservation and revitalization.

4.1.3 Decline of Godavari: Anthropogenic Interventions & Environmental Consequences

The contemporary approach to river management in Indian cities marks a stark departure from historical practices. Urban development now follows a statist framework characterized by master plans and zoning regulations that impose strict controls on human activities in river floodplains (Aditi Rakhe, et.al.,2022). While ostensibly aimed at environmental protection, these approaches often exclude traditional communities and disrupt established relationships with the river.

4.1.4 Concretization and Its Impacts

The Godavari in Nashik exemplifies the detrimental effects of inappropriate riverfront development. The 1992 Kumbh Mela marked a watershed moment when concretization began along Goda Ghat to address issues with the basalt bedrock. This process accelerated before the 2003 Kumbh Mela, with extensive re-concretization for beautification and safety purposes (A.D.Chavan, et.al.). These interventions destroyed

riverine ecology and blocked 17 kunds with four natural springs, significantly reducing the river's width and altering its natural hydraulic flow (A.D. Chavan, et.al.).

The consequences of these actions became evident in 2008 when Nashik experienced one of its worst floods, attributed directly to the concretization of the riverbed (A.D. Chavan, et.al.). Subsequent droughts and floods, including notable events in 2016, further demonstrated the ecological damage caused by these interventions. Local experts identified the concretization of the riverbed and the confluence of major sewerage systems around Goda Ghat as primary factors in these environmental disasters (A.D. Chavan, et.al.).

4.1.5 Water Quality and Pollution

The deterioration of the Godavari extends beyond physical alterations to include severe water quality issues. The river faces pollution from untreated sewage, industrial waste, and general refuse entering the waterway daily (S.Chen, et.al., 2024). Despite significant investments in infrastructure- approximately Rs 400 crores for 300 kilometers of drainage under JNNURM and construction of sewerage treatment plants under AMRUT- these projects have failed to improve the river's condition (Dubey, 2024). These failures stem from fundamental planning oversights, including the lack of separated stormwater and sewerage drainage systems and disregard for the natural surface geomorphology of the city (Dubey, 2024). Consequently, sewerage infrastructure in Nashik's core discharges within 500 meters of the sacred Ram Kund, directly polluting this revered site (Dubey, 2024). Comprehensive water quality monitoring at four strategic locations along Nashik's Godavari stretch reveals critical contamination patterns:

1. **Gangapur Dam Downstream (Station 1):** Dissolved Oxygen (DO) levels plummet to 3.2 mg/L post-monsoon, against the CPCB standard of 6 mg/L for bathing waters (Dutta,et.al., 2021). This hypoxic condition correlates with algal blooms from agricultural runoff containing NPK fertilizers (Nashik district uses 248 kg/ha of fertilizers annually)1.
2. **Someshwar Temple Segment (Station 2):** Biochemical Oxygen Demand (BOD) peaks at 28 mg/L during summer, exceeding the 3 mg/L permissible limit1. The

contamination originates from 17 MLD of untreated sewage entering through the Nasardi nullah, carrying organic load from 45,000 households in dense urban ward (ET Hospitality, 2024).

3. **Ramkund Area (Station 3):** Fecal coliform counts reach 23,000 MPN/100mL during pilgrimage seasons (Dutta,et.al., 2021), directly linked to 22 ghats lacking proper sanitation facilities. The concrete-lined banks prevent natural filtration, creating pathogen reservoirs.

4. **Gangawadi Downstream (Station 4):** Total Dissolved Solids (TDS) escalate to 1,842 mg/L near industrial clusters (ET Hospitality, 2024), reflecting effluents from 127 registered SMEs discharging heavy metals (lead: 0.48 mg/L, chromium: 0.32 mg/L). This mineral loading increases water treatment costs by 40% for downstream users like the Nashik Thermal Power Station.

The pollution matrix demonstrates spatial-temporal variations: 68% of contamination loads occur during monsoon runoffs, while 55% of toxic pollutants manifest in low-flow summer months (Follmann 2014). This duality complicates remediation strategies, requiring seasonally adaptive treatment protocols.

4.1.6 Hydrological Transformations and Their Urban Implications

The Godavari River's hydrological regime has undergone significant transformations due to anthropogenic interventions, particularly in the Nasik region. The construction of Gangapur Dam in 1954, with an initial storage capacity of 204.07 million cubic meters (MCum), now holds only 159.42 MCum due to siltation – a 22% reduction in water-holding capacity (Gujral & Kaur, 2019). This sediment accumulation alters floodplain hydrology, reducing groundwater recharge rates critical for maintaining baseflows during dry seasons. The dam's operations prioritize urban water supply (reserving 136 MCum for Nashik Municipal Corporation and MIDC) (G.Initiative, 2025), creating a systemic bias toward urban needs over ecological flows.

Concurrently, Nashik's water distribution network spans 2,100 km of pipelines (M.R. Patel, et.al. 2020), yet faces 40-50% non-revenue water (NRW) losses from leakages and illegal connections (M.R. Patel, et.al. 2020). This inefficiency exacerbates demand

pressures on the Godavari, forcing increased withdrawals that disrupt the river's natural discharge cycles. The city's water audit initiatives reveal that 12 ESR (Elevated Service Reservoir) zones exhibit NRW patterns mirroring the broader urban system, with flow measurements showing 35% physical losses in aging distribution infrastructure (M.R. Patel, et.al. 2020). Such systemic losses create a paradox: while the city struggles with water distribution efficiency, riverine ecosystems bear the burden of compensatory over-extraction.

4.1.7 Institutional Frameworks and Governance Challenges

The Godavari River Management Board (GRMB), established under the 2016 Godavari Water Disputes Tribunal, faces jurisdictional complexities in Nashik:

- **Multi-Agency Overlaps:** 14 agencies including MPCB, NMC, MIDC, and Irrigation Department share management responsibilities
- **Policy Conflicts:** JNNURM's focus on concrete infrastructure (₹60 crore for walkways) (PrcIndia, 2024) vs. NMC's 2017 River Policy emphasizing natural buffers
- **Data Silos:** Water quality data from MPCB, flow data from Irrigation Department, and urban usage stats from NMC remain unintegrated

The Godavari Initiative (TGI)'s 2024 Nashik Regional Consultation marked progress, bringing together 87 stakeholders from industries, NGOs, and academia (Ritika Rajput, 2022). Key outcomes included:

- Consensus on IoT-based water quality monitoring (12 sensors deployed)
- Corporate Social Responsibility (CSR) commitments of ₹18.7 crore for wetland restoration (Ritika Rajput, 2022)
- Farmer Producer Organizations (FPOs) adopting organic farming across 640 ha riverside lands (Ritika Rajput, 2022)

However, institutionalizing these partnerships remains challenging due to electoral cycles and shifting bureaucratic priorities.

4.2 Traditional Urban Forms and Their Relationship with Rivers

4.2.1 Wadas: Architectural Heritage of Maharashtra

Wadas represent a rich architectural tradition in Maharashtra, reflecting the pride, religion, culture, traditions, and history of the Maratha people. These traditional housing forms now serve as cultural and architectural heritage sites. The distinctive design elements of wadas- including their spatial planning, ornamentation, fenestrations, and religious influences- contribute to Maharashtra's unique architectural identity (S. Simons, 2023).

In Nashik, wadas create an intricate network around the Godavari, forming the historic tapestry of the city. Each wada functions as a timeless artifact of architecture and community, connecting residents to their heritage through intricately carved facades and communal courtyards. These structures house generational artisans known for their filigree, silverware, metalwork, and metal embossing, serving as cultural bridges between the city and the river.

4.2.2 Kunds and Ghats: Ritualistic Interfaces

The traditional kunds along the Godavari in Nashik served as vital thresholds between the city and the river, facilitating various community functions. Over time, many of these kunds have been concretized, particularly to accommodate the large crowds during Kumbh Melas in 2003 and 2015. This modification has disrupted both the tangible aspects of the river-city relationship (causing flooding during monsoons and droughts in summers) and the intangible connection between the riverbank and urban fabric.

The Godavari Initiative has worked to restore some of these traditional water structures. Their team has desilted six ancient kunds and one well, with several already showing signs of revival and providing water to human settlements and wildlife on Brahmagiri, the river's source (PrcIndia, 2024). These efforts demonstrate the potential for revitalizing traditional water systems as part of a comprehensive approach to river restoration.

4.3 The Dichotomy Between Daily Use and Periodic Events

4.3.1 Kumbh Mela and Its Impacts on Urban Planning

The Kumbh Mela in Nashik presents a unique planning challenge, requiring infrastructure that can accommodate millions of visitors during a brief period while remaining relevant for everyday use by local residents. This tension between local and global needs has driven many of the riverfront modifications, particularly the extensive concretization before the 2003 and 2015 events. The Kumbh Mela of 2015 demonstrated both positive and negative aspects of event-driven urban transformation. While the city achieved unprecedented cleanliness during the festival, the permanent modifications to accommodate the event have had lasting environmental consequences (Sahapedia, n.d.). This highlights the need for more flexible, adaptive approaches that can accommodate periodic mass gatherings without compromising everyday ecological functions.

4.3.2 Cultural Hydrology: Ritual Practices and Hydrological Impacts

Nashik's Kumbh Mela, hosting 30 million pilgrims over 49 days, imposes unique hydrological stresses (Botekar, 2025):

- **Water Withdrawals:** 45 MLD extra demand during peak days, drawing down reservoir levels by 1.2 m
- **Ritual Offerings:** 18 tonnes/day of organic matter (flowers, coconut husks) increasing BOD by 6 mg/L
- **Footfall Erosion:** 12 cm sediment displacement at major ghats per event, altering channel morphology

The 2015 Mela's "Clean Godavari Campaign" temporarily reduced pollution through 5,000 community volunteers and 22 mobile STPs, but post-event monitoring showed pollutant rebounds within 90 days. This illustrates the conflict between ephemeral event management and sustained river stewardship.

4.3.3 Daily Community Needs and River Health

The everyday relationship between Nashik's residents and the Godavari involves various activities including bathing, worship, and leisure. However, the decline in water

quality and access has strained this relationship. The question posed by a young participant in a 2017 river walk- "Is our Godavari really dead?"- reflects growing community concern about the river's condition (Aditi Rakhe, et.al., 2022).

Addressing daily community needs requires attention to water quality, access, and the cultural significance of the river. The farmers of Bela Estate who once thrived along the Yamuna's banks but now face eviction due to riverfront development projects illustrate the human cost of interventions that prioritize aesthetics over traditional livelihoods. Similarly, in Nashik, urban development should consider the needs of communities who have long-standing relationships with the Godavari.

4.4 Towards Sustainable Riverfront Development: Integrated Approaches

4.4.1 Ecological Restoration and Nature-Based Solutions

Sustainable riverfront development must prioritize ecological restoration alongside recreational and aesthetic considerations. The Godavari Initiative (TGI) exemplifies this approach with its five-pronged strategy designed to protect and restore the river's health while empowering local communities and fostering sustainable practices.

Nature-based solutions offer promising alternatives to conventional engineering approaches. TGI promotes such solutions by sharing expertise and insights through their knowledge repository. These approaches work with ecosystems rather than against them, using natural processes to address water management challenges. Examples include planting trees along riverbanks to prevent erosion, restoring wetlands to filter pollutants, and recharging aquifers to ensure long-term water security (Aditi Rakhe, et.al., 2022).

4.4.2 Community Engagement and Collective Action

Successful river restoration requires active community involvement. TGI demonstrates this principle by bringing together corporates, government agencies, and civil society to address water challenges through collective action. Their Nashik Regional Consultation in September 2024 brought together diverse stakeholders including industrial bodies, government officials, and corporate representatives to tackle the ecological challenges facing the Godavari (Chen, et.al., 2024).

This collaborative approach recognizes that river health depends on the actions of multiple stakeholders across various sectors. As Navdeep Singh Mehram, Head of CSR & Sustainability at Diageo India, noted: "Initiatives like this consultation are critical because they bring together government, industries, nonprofits, academia, and communities- to collaborate on practical solutions."

4.4.3 Urban Water Linkages and Network-Based Approaches

The concept of urban water linkages offers a promising framework for reconnecting cities with their rivers. This approach views water systems as networks that can be integrated into urban fabric, creating connections between various water bodies and the main river. In Nashik, this could involve connecting the existing kunds through water channels that serve as arteries leading to the Godavari, establishing a micro-to-macro connection through urban water networks.

The Godavari riverfront development proposal for Nashik has included various components aimed at creating a unified waterfront, such as riverfront roads with parking and public amenities, promenades at the river edge, treatment of polluted drain channels, community spaces, sports centers, fair grounds, urban ghats, commercial development, and water transport options. However, these elements must be designed with ecological sensitivity and community input to avoid the pitfalls of previous interventions. (Diageo, n.d.)

4.5 Reconnecting the City with its Lifeline

The relationship between Nashik and the Godavari exemplifies both the challenges and opportunities in urban-riverine interactions. Decades of inappropriate development have strained this relationship, leading to environmental degradation and community disconnection. However, emerging initiatives demonstrate the potential for restoration through holistic approaches that integrate ecological, social, and cultural considerations.

The proposed framework for urban water linkages, revitalization of traditional structures like wadas and kunds, and creation of community spaces along the riverfront offers a promising path forward. By establishing a seamless connection between the natural and cultural, the sacred and mundane, Nashik can renew its bond with the Godavari, transforming the river once again into the lung of the city.

This approach recognizes rivers not merely as resources to be exploited or ornamental features to be beautified, but as living systems that sustain urban life in multiple dimensions. Through thoughtful design that respects ecological processes, honors cultural heritage, and engages communities, Nashik can create a model for sustainable urban-riverine relationships that serves both everyday needs and periodic celebrations like the Kumbh Mela.

The question posed by that young participant- "Is our Godavari really dead?"- need not be answered in the affirmative. With committed collective action, informed by traditional wisdom and contemporary science, the Godavari can once again flow vibrantly through Nashik, nourishing both the land and the cultural life of this historic city.

4.6 Setbacks of the selected precinct

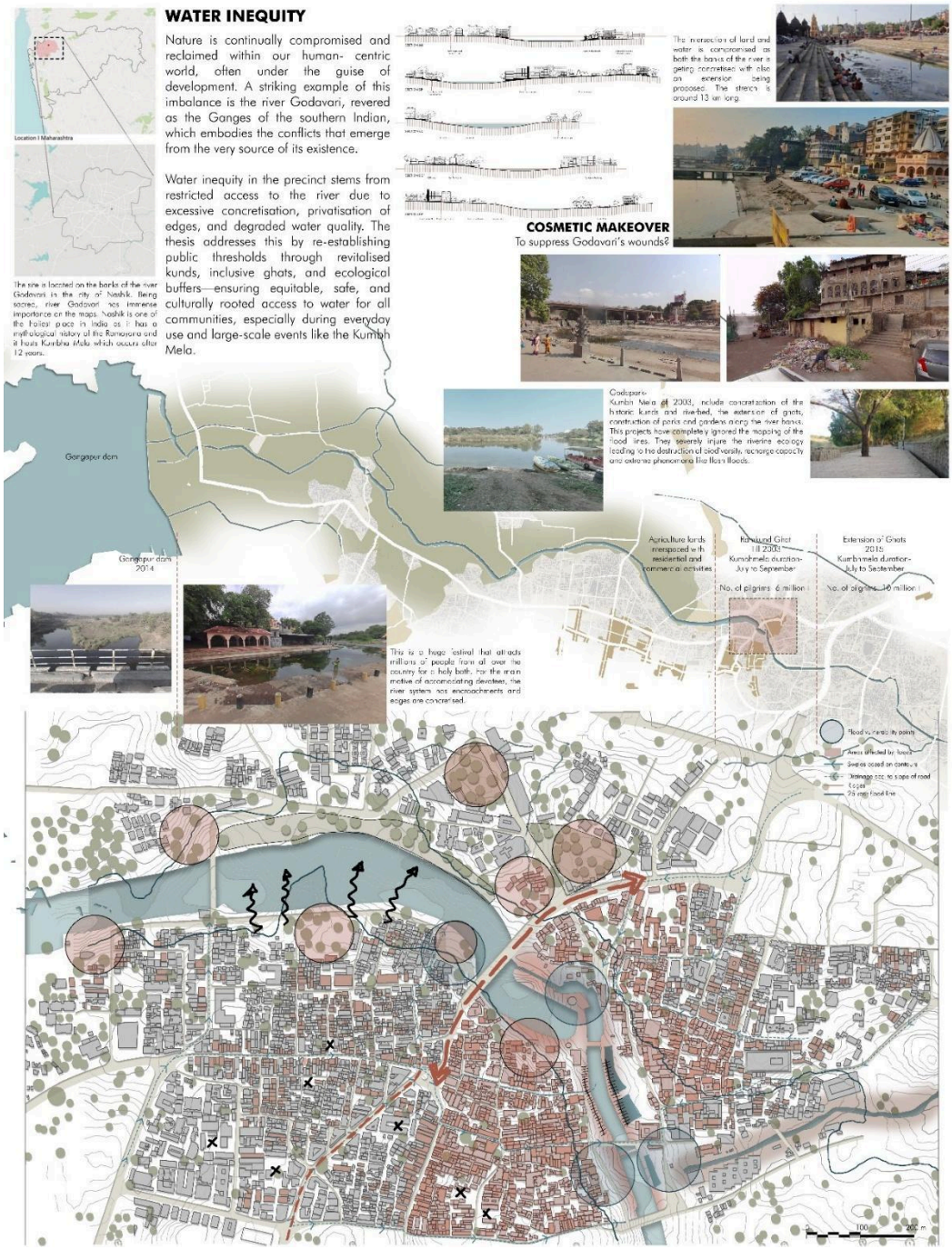

Figure 4 Setbacks of the selected precinct

The compilation of maps and illustrations offers a sophisticated and detailed comprehension of the Godavari riverfront in Nashik, illustrating the complex interactions among built-use patterns, cultural dynamics, urban morphology, and ecological vulnerabilities. The investigation commences with built-use mapping, delineating the

spatial arrangement of commercial, residential, religious, and public zones, thereby uncovering a dense, historically significant fabric that has developed around the river, yet currently experiences fragmented accessibility and functional disjunctions.

The activity mapping highlights this fragmentation by recording how ancient communal practices- rituals, religious assemblies, and marketplaces- have been progressively replaced or eclipsed by automobile infrastructure and parking requirements. This transition underscores the steady diminishment of the river's function as a public commons and cultural focal point, transforming lively social engagement into fragmented, utilitarian areas. The Kumbh character section examines temporal variations in roadway utilisation and residential patterns, especially during and subsequent to the Kumbh Mela. It illustrates how ordinary spaces are altered by the demands of the mega-event, frequently leading to enduring spatial changes that prioritise transient configurations over sustainable community advantages. These modifications are illustrated in both street-level and house-level graphics, highlighting the conflict between tradition and modern urban requirements. The constructed height map incorporates a vertical component to the spatial narrative, illustrating a dense accumulation along the riverbanks, particularly of 2-3 story edifices. This layout exacerbates microclimatic stresses, congestion, and restricts the permeability of the urban boundary to the river. Finally, the sectoral and ecological map offers essential insights into the physical landscape and environmental stresses. Sections and flood hazard mapping reveal that some low-lying regions, especially adjacent to Saraf Bazaar and informal settlements, are very susceptible to monsoon flooding. Inadequate drainage systems and unregulated development intensify this susceptibility, resulting in hazardous living conditions and environmental strain. In conclusion, these interrelated analyses expose a significant disparity between the cultural-historical importance of the Godavari riverbank and its present urban state. The riverbank, once a site of communal memory and ritual, today faces ecological threats and social erosion due to erratic planning, flood dangers, and automobile predominance. The results highlight the pressing necessity for a redefined riverside common that restores human-water connections via integrated design, ecological resilience, and community-focused planning.

5. Proposal

The planned precinct reinterprets a vital segment of the Godavari riverfront in Nashik as a multifaceted cultural and ecological commons. This once-vibrant landscape of kunds, ghats, and wada clusters has seen over-concretization, ecological deterioration, and disjointed public access. The concept addresses the issue by reinstating the river–culture–nature link through spatial techniques grounded in history and resilience.

The design fundamentally incorporates blue-green networks that link natural swales, rehabilitated kunds, and pedestrian routes, facilitating the harmonious movement of water, environment, and individuals throughout the site. Existing trees and site slopes are utilized to direct movement, establish halt points, and control surface runoff via bioswales and tiered interventions. The riverbank is softened and designed to accommodate flooding. Ghats are reconfigured as adaptable, permeable terrains that permit seasonal inundation while maintaining accessibility for rituals, recreation, and contemplation. Kunds are revitalized not merely as spiritual entities, but also as miniature water reservoirs- connecting holy rituals to hydrological functions. A cultural community center constitutes the civic core of the precinct. It contains artisan workshops, vocational training areas, dorms, and temporary accommodation facilities. The design incorporates the spatial vernacular of ancient wadas via modular courtyards and communal terraces, while providing adaptable infrastructure capable of expansion during significant events such as the Kumbh Mela.

Within the precinct, routine utilization and large-scale festivities coexist. The design provides uninterrupted civic and cultural interaction with the river through shaded pedestrian pathways, ceremonial areas, and biologically diverse rest areas such as bird habitats and observation decks. It not only revitalizes the essence of Nashik’s hallowed riverfront but also reinterprets the relationship between urban environments and their rivers, promoting coexistence rather than conflict.

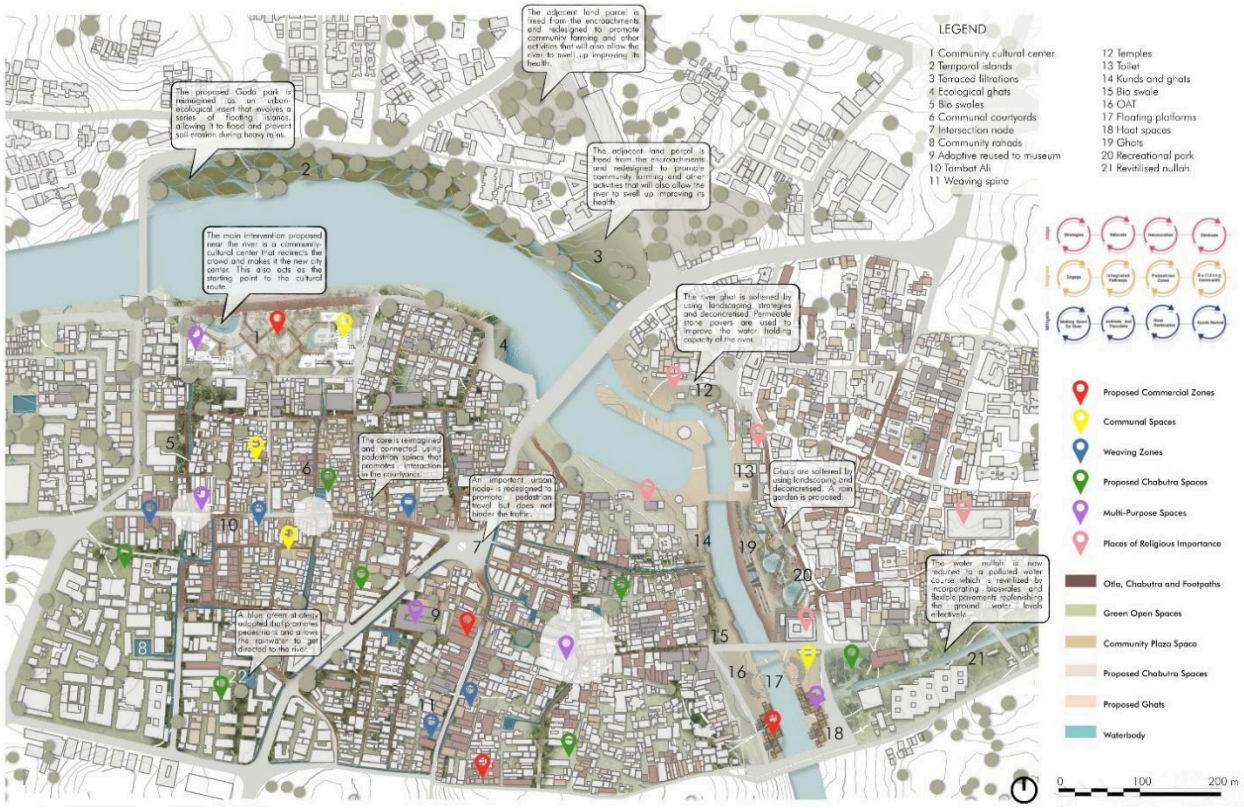

Figure 5 Proposed precinct redesign

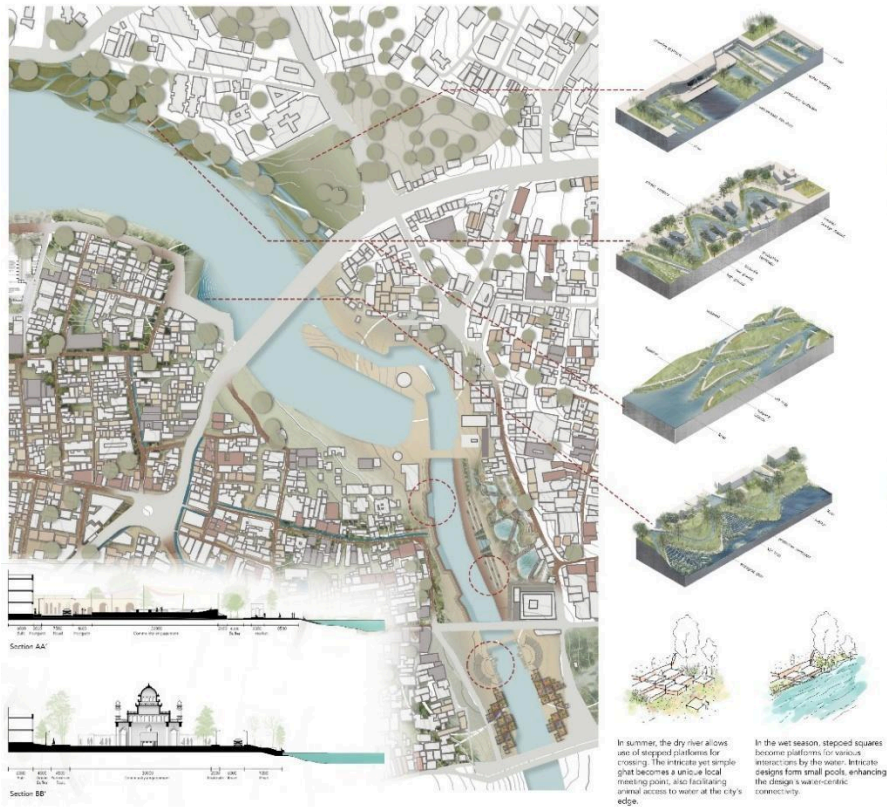

Figure 6 Strategies employed for ghat redesign

6. Phasing and Policy making

The effective implementation of the precinct idea depends on a systematic, phased methodology that transitions from restoring degraded riverbanks to revitalizing them as inclusive, resilient, and environmentally dynamic communal spaces. The phasing aims to facilitate both physical transformation and institutional preparedness, guaranteeing sustainable implementation via flexible policy frameworks. The progression occurs in four interrelated stages: Reclaim, Integrate, Restore, and Revive.

The Reclaim phase emphasizes the identification and rectification of damage resulting from excessive concretization, encroachments, and altered hydrology. Interventions commence with the elimination of impermeable surfaces at critical nodes- such as ghats converted into parking areas- and the restoration of traditional kunds and sacred routes. This phase necessitates assistance via policies such as the establishment of a "River Commons" designation in urban planning and the incorporation of river-edge inventory within Smart City GIS frameworks.

The Integrate phase reestablishes ecological and cultural networks throughout the precinct. Blue-green infrastructure, shaded walkways, and adaptable ceremonial areas are employed to connect disjointed temple zones, kunds, and wadas. Community stewardship programs encourage social engagement through methods such as "Adopt-a-Kund" initiatives and precinct-level mobility plans. Policy endorsement is necessary via revisions to Local Area Plans (LAPs) and urban planning schemes, in conjunction with frameworks for community engagement.

During the Restore phase, the emphasis is on enhancing ecological performance. Riparian buffers, bioswales, and indigenous vegetation restore biodiversity and enhance seasonal flood absorption capacity. Kunds are revitalized not merely as cultural elements but also as decentralized water management systems. This phase necessitates the incorporation of Ecological Overlay Zones in development control rules (DCRs) and the allocation of financing for riparian restoration via AMRUT 2.0 or Jal Shakti projects.

Ultimately, the Revive phase transforms the precinct into a civic and cultural commons. The location accommodates both daily activities and large-scale events like the Kumbh Mela through adaptable, soft-infrastructure approaches. Temporary overlays, communal celebration areas, and informal markets coexist alongside spiritual and ecological purposes. The concluding phase necessitates regulations like event-sensitive urban design codes, precinct activation plans, and the formal designation of the place as a Model Sacred Riverfront Precinct.

The phasing and policy strategy collectively guarantee that the precinct functions as a dynamic, changing urban system rather than a just static design intervention. It establishes a framework in which governance, ecology, and community engagement converge- reintegrating the river into the urban fabric with resilience, inclusion, and respect.

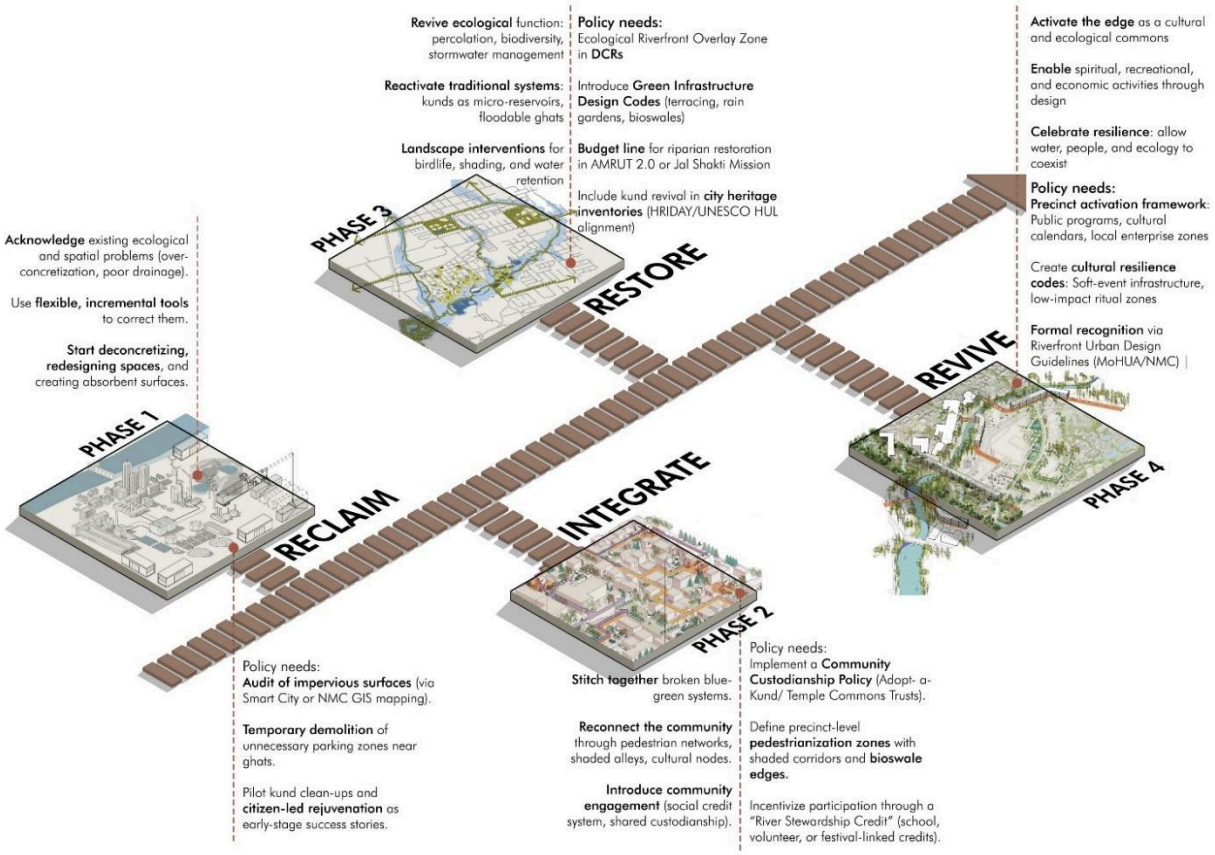

Figure 7 Policy framework and phasing strategy

7. Alignment with national and international missions

The precinct proposal closely matches with national urban development objectives and international sustainability standards, establishing itself as a repeatable model for river-focused urban redevelopment. At the national level, it targets essential objectives from initiatives such as Namami Gange, Smart Cities Mission, AMRUT 2.0, HRIDAY, and Jal Shakti Abhiyan, employing tactics that amalgamate cultural heritage, ecological restoration, water-sensitive planning, and inclusive public spaces. The initiative aligns with the UN-Habitat New Urban Agenda, the Sendai Framework for Disaster Risk Reduction, the UNESCO Historic Urban Landscape approach, and the IUCN Nature-based Solutions Framework on an international scale. These alignments demonstrate the project's emphasis on resilience, historical preservation, biodiversity improvement, and participatory urbanization. The subsequent tables elucidate how the plan aligns with specific goals, targets, and policy objectives within different national and global contexts.

Sr. No.	Scheme	Aspect Addressed	Rationale for Project Alignment	Proposal/ Policy outcomes
1	Namami Gange Programme	River rejuvenation, ghat redevelopment, public access	The project enhances the Godavari waterfront through ecological ghats, kund restoration, and improved public access, aligning with Namami Gange's objective to comprehensively regenerate rivers, encompassing cultural and ecological dimensions.	Precinct-Level River Commons Strategy: Proposing a reproducible paradigm for ecological ghat design and kund restoration in tier-2 cities, grounded in cultural and hydrological principles.
2	AMRUT 2.0 (Atal Mission for Rejuvenation and Urban Transformation)	Urban water security, green infrastructure	The plan incorporates blue-green networks for stormwater management, kunds as local recharge structures, and soft mobility corridors, thereby enhancing water resilience and green urbanism.	Ward-Level Blue-Green Overlay Plan: Implementing a regulatory framework in urban planning that emphasizes bioswales, permeable paths, and interconnected stormwater management systems.
3	Smart Cities Mission	Integrated, inclusive urban design; public realm enhancement	The project provides a paradigm for urban riverside architecture that integrates cultural legacy, practical utility, and climate adaptability – embodying the Smart City concept. The cultural-community center serves as an institutional cornerstone for civic life.	Smart Riverfront Playbook: Disseminating a design framework for multifunctional riverbanks that include cultural commons, natural zones, and adaptable infrastructure.
4	Swachh Bharat Mission – Urban	Sanitation, greywater, solid-waste management near water bodies	Ritualistic and quotidian water utilization is regulated via greywater filtration systems, allocated waste areas, and decentralized sanitation methods at ghats, thereby averting direct contamination of the river.	Eco-Ritual Waste Management Toolkit: A policy framework for the management of religious trash, soap zones, and greywater through landscape filtration systems and designated clean ritual areas.
5	HRIDAY (Heritage City Development and Augmentation Yojana)	Conservation of cultural and spiritual landscapes	The project conserves and reinterprets cultural features such as ghats, kunds, and wadas, facilitating modern community engagement in accordance with HRIDAY's objectives of revitalizing living heritage.	Wada-to-River Cultural Corridor Guidelines: Advocate for policies facilitating the adaptive reuse of heritage wadas and their connection to rejuvenated public waterfronts.
6	Jal Shakti Abhiyan	Rainwater harvesting, aquifer recharge, community water ownership	The restored kunds, sunken courts, and bioswales serve as decentralized water collecting systems, incorporating cultural and community engagement—integrating water into public memory and the landscape.	"Adopt-a-Kund" Program: A collaborative civic initiative for rainwater gathering in which local communities oversee and utilize seasonal water infrastructure.
7	National Mission for Clean Ganga (NMCG)	Riverfront conservation, environmental flows, public education	Although Nashik is situated outside the Ganga basin, the proposals embody the objectives of the NMCG: establishment of riparian buffers, ecological restoration, participatory planning, and pollution mitigation through design.	River Commons Planning Framework: Introducing a versatile toolset applicable to various sacred rivers (such as Shipra, Saraswati, Krishna) for egalitarian and ecological riverfront design.
8	National Biodiversity Action Plan (NBAP)	Ecosystem restoration and urban biodiversity	The project implements native vegetation, avian habitats, and sponge landscapes, thereby augmenting riparian biodiversity in accordance with NBAP's urban ecological objectives.	Urban Riparian Biodiversity Code: Establishing ecological performance benchmarks for new riverside developments, encompassing minimum green buffers and the incorporation of native species.
9	National Water Policy	Water as a community asset, urban water reuse, soft infrastructure	The project conceptualizes the riverbank as a communal space with public access, ecological drainage, and passive treatment systems, exemplifying the spatial application of the policy's water-sensitive development strategy.	Water Thresholds Regulation for Sacred Precincts: Incorporate soft boundaries, adaptable flood zones, and landscape-oriented water management into local development control regulations (DCRs).

Table 1 Alignment with national missions

Goal	Target	Target Description	Indicator for Target	Indicator Description	Rationale for Project Alignment	Proposal/ Policy outcomes	Quantified Impact from Project
3	3.9	By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination	3.9.2	Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)	Mitigates contamination by ecological remediation, spiritual water ceremonies, and strategic water-access planning.	Propose the use of spiritual-ecological water rituals alongside waste management strategies within Smart Riverfront Programs. Implement health - sensitive water infrastructure design for ghats, including designated foot-washing zones, prohibition of open soap usage, and filtered ablution facilities.	Minimized exposure to contaminated water by establishing ritual entry locations apart from polluted zones.
							The establishment of secure, shaded communal areas enhances thermal comfort, psychological well-being, and sanitation.
							Pedestrian-friendly and shaded pathways promote active engagement and enhanced physical exercise.
6	6.3	By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	6.3.1	Proportion of domestic and industrial wastewater flows safely treated	Introduces kunds and bioswales as natural filtration systems; establishes blue-green corridors for the management of runoff and greywater prior to their entry into the river.	Advocate for decentralized greywater filtration via landscape systems and repurpose water for kunds and communal gardens. Policy for the segregation of greywater in public edifices.	30–40% of precinct runoff redirected through bioswales, permeable ghats, and kund-fed filtration systems.
							Greywater separated and reused in landscape irrigation, reducing direct river discharge.
	6.6	By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	6.6.1	Change in the extent of water-related ecosystems over time	Restores banks, softens river edges, and provides natural riparian buffers to stabilize and rejuvenate aquatic ecosystems.	Incorporate blue-green planning into municipal precinct planning regulations and establish "river ecosystem buffer zones." Establishing a municipal kund conservation initiative featuring public accessibility and local stewardship, alongside a mandate for buffer zone preservation.	Restoration of 4–5 historical kunds within the precinct.
							Establishment of 1.2–1.5 km of new riparian buffer zones.
							20-25 indigenous species planted each 100-meter segment.
11	11.4	Strengthen efforts to protect and safeguard the world's cultural and natural heritage	11.4.1	Total per capita expenditure on the preservation, protection and conservation of all cultural and natural heritage, by source of funding (public, private), type of heritage (cultural, natural) and level of government (national, regional, and local/municipal)	Restores old spatial forms (kunds, ghats, wadas) and integrates them into the contemporary urban environment.	Utilize HRIDAY or Smart Cities heritage criteria to finance precinct-specific cultural conservation and interpretation.	Reintegration of three to four principal temple forecourts into public space.
							Organized annual cultural events and markets.
							Adaptive repurposing of wada-edge cloth for public facilities.
	11.7	By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities	11.7.1	Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities	Establishes multi-tiered public areas at ghats, haats, and shaded walkways with continuous accessibility throughout the year.	Develop urban design standards for soft ghats and communal civic-river interfaces. Urban design guidelines for adaptive floodplain parks, a minimum of 20% permeable riverfront development standard, and festival overlay zones.	3.2 hectares of riverfront area rendered accessible, shaded, and available for public use.
							Accessible entry points to the river at around eight locations.
							Multi-purpose open areas engineered to accommodate both regular and celebratory crowds (about 5,000–10,000 individuals).
13	13.1	Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	13.1.3	Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies	Structures the riverbank as a seasonal, flood - responsive infrastructure, capable of absorbing water during peak monsoon periods.	Advocate for riverfront flood zoning and landscape-oriented climate mitigation in the City Development Plan. Advocate for precinct-level sponge zone planning and seasonal adaptive landscape regulations for Kumbh-sensitive river areas.	All lower ghats are engineered as floodable terraces, thereby diminishing runoff velocity.
							Implementation of permeable pavements in 70–80% of newly paved areas.
							Seasonal accumulation of rainwater in kunds and sunken courts, approximately 10 to 20 lakh liters annually.
15	15.1	By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	15.1.1	Forest area as a proportion of total land area	Promotes riparian flora, indigenous species, and habitat-conducive measures in communal areas.	Implement a policy for "urban ecological corridors" to preserve riparian green buffers. Development of an Urban Riparian Ecological Code for Nashik and its incorporation into local green cover index reporting.	Establishment of urban avian habitat zones (e.g., tiered amphitheater-birdwatching platforms).
							Incorporation of a minimum of 25–30% vegetative buffer along the riverbank.
							Zones for pollinator-friendly planting to facilitate biodiversity reintroduction.

Table 2 Alignment with UN Sustainable Development Goals and targets

8. Conclusion and vision of the precinct

The proposed precinct design encapsulates a comprehensive concept that harmonizes environment, culture, and sustainable urban growth. The project reinstates a symbiotic relationship between water and landscape by maintaining the site's natural drainage pattern and implementing a decentralized water management system that includes kunds, bioswales, and bio-ponds. The design alleviates the issues of urban runoff and water scarcity while reconceptualizing public space as a vehicle for ecological restoration, community involvement, and sensory enhancement.

The stratification of indigenous flora across many types- ravine woodlands, food gardens, seasonal floral beds, and therapeutic landscapes- encourages biodiversity,

improves microclimatic comfort, and cultivates a robust urban ecology. Every planting method is intentionally designed to enhance soil health, facilitate water absorption, provide shade, and promote community connection. This method transforms dormant green spaces into dynamic environmental infrastructure.

The overarching objective is to establish a dynamic precinct that exemplifies regenerative urbanization. This will serve as a precedent for how towns such as Nashik might integrate traditional wisdom and ecological systems thinking into modern urban design. The precinct becomes a dynamic classroom and restorative landscape- where water cycles are visible and celebrated, native ecology is nurtured, and communities reconnect with nature and each other.

By shifting from an extractive to a regenerative design approach, the project sets a new benchmark for sustainable urban living- where every drop of water is valued, every plant has a role, and every space contributes to the collective health of the ecosystem and the people within it.

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