Revitalizing Urban Commons: A Geospatial and Policy-Driven Framework for Public Space Sustainability in Indian Cities

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ABSTRACT

The dynamic evolution of Indian urban environments has highlighted the critical role of public spaces as urban commons in shaping inclusive, sustainable, and resilient cities. This study explores the transformative potential of geospatial innovation and participatory governance in planning and managing public spaces across Indian contexts. Drawing from a comparative analysis of global frameworks—including the NSW Guide to Activation, URBACT Health & Greenspace Network, and the UN National Urban Policy Guidelines—this research integrates geospatial methodologies, such as GIS-based spatial analysis and urban morphology modelling, to assess accessibility, equity, and performance of urban public spaces.

Using a series of case studies—from Jaipur's cultural Chaupatis to the adaptive reuse of Seattle's Gas Works Park and Paris's Promenade Plantée—the study reveals best practices in design, management, and community-driven place making. The findings emphasize the importance of cross-sectorial collaboration, inclusive policy frameworks, and digital tools for monitoring and co-creating sustainable urban commons.

By aligning environmental impact assessments, urban sociology, and frontier spatial technologies, this study proposes a holistic framework to address fragmentation in urban landscapes, promote heritage-sensitive interventions, and foster socio-economic vibrancy. The derived approach from this study aims to inform Smart City missions and urban renewal programs through a lens of equitable and green urbanism.

1. Introduction

Public spaces are the collective memory of cities. These accessible, open areas—ranging from parks to market streets—enable social interaction, cultural expression, and environmental resilience. In Indian cities, public spaces serve both ceremonial and everyday functions, from spiritual ghats to urban haats, yet face increasing threats from privatization, neglect, and design exclusion.

This research investigates how Indian urban commons can be revitalized using geospatial technologies, policy reforms, and participatory planning. It positions public space not merely as physical infrastructure but as urban commons—shared resources governed collectively for long-term social benefit.

1.1 Conceptual Framework: Urban Commons in Indian Cities

Urban commons, inspired by Elinor (Ostrom, 1990)'s governance principles, reflect resources collectively accessed and co-managed. In urban settings, public spaces become commons when users, local authorities, and other stakeholders collaborate in design, maintenance, and stewardship.

1.2 Types of Urban Public Spaces in India

India's diversity is reflected in the types of public spaces:

Type	Examples
Parks and Gardens	Lodhi Garden (Delhi), Cubbon Park (Bengaluru)
Religious & Cultural Spaces	Golden Temple (Amritsar), Meenakshi Temple (Madurai)
Market Streets & Squares	Chandni Chowk (Delhi), Crawford Market (Mumbai)
Waterfronts & Ghats	Chandi Ghat (Haridwar), Marine Drive (Mumbai)
Heritage Precincts	Bhadra Chowk (Ahmedabad), Vasant Udyan (Delhi)

Table 1. Types of Urban Public Spaces in India

2. Literature Review

Research into public spaces spans diverse themes including urban sociology, policy, sustainability, equity, and spatial planning. Key insights from 40+ reviewed papers, journals, policy, guidelines include:

- Policy Deficiencies: A lack of integrated urban green space strategies and uneven distribution of public spaces in cities.
- Governance Models: Urban commons require a transition from top-down approaches to adaptive, participatory, and iterative planning.
- Smart Cities Impact: Indian Smart City projects have influenced public space design but often fail to prioritize marginalized communities.

- Spatial and Sociological Dimensions: The physical design of spaces and their usage patterns are deeply tied to socio-cultural and economic factors.

Sources such as (Ostrom, 1990)'s urban commons principles and Kevin Lynch's theories on city legibility enrich the theoretical grounding of this study.

2.1 Objectives

1. To investigate the components and implementation of public space policy frameworks in India and globally.
2. To explore geospatial mechanisms for enhancing infrastructure, amenities, and management of public spaces.
3. To propose sustainable, inclusive strategies for the creation, upkeep, and governance of public spaces.
4. To evaluate how Smart City missions and digital platforms influence public space development in Indian cities.

3. Research Methodology

The research utilizes a qualitative comparative framework, incorporating:

- Urban morphology mapping to understand historic layers and adaptive reuse potential.
- Policy document analysis including National Urban Policy, NSW Activation Guide, and URBACT health guidelines.
- Case study methodology, integrating international and Indian best practices.
- Participatory insights from field observations, digital archives, and COA training modules.

This study adopts a qualitative-comparative research framework, utilizing multi-scalar tools and triangulated datasets to investigate the revitalisation potential of urban commons.

First, urban morphology mapping is employed to decode historic spatial layers, land use change and built-form evolution in order to identify adaptive reuse opportunities within public space networks. This spatial enquiry is supported by a geospatial lens applied during academic training in urban sociology and geospatial science.

Second, a policy analysis reviews strategic documents and institutional guidelines — including the National Urban Policy, NSW Activation Guide, and URBACT Health Guidelines — to extract regulatory priorities, governance models and implementation mechanisms relevant to urban commons management.

Third, a case study methodology compares international best practices (such as Paris's Promenade Plantee to Buffalo's Central Park) with Indian models (e.g., Haridwar's Chandi Ghat to Ahmedabad's Bhadra Chowk), enabling contextual benchmarking of urban commons revitalisation approaches.

Lastly, participatory insights are integrated through field observations, digital archives, and Council of Architecture (COA) Smart City training modules, reflecting practitioner-oriented knowledge and lived realities. The researcher's training through SWAYAM/NPTEL coursework in economic planning and urban sociology further grounds the analysis in contemporary theoretical discourse.

Together, this mixed-method approach allows for a critical and nuanced understanding of public space sustainability across policy, spatial and socio-cultural dimensions.

4. Global Guidelines and Best Praxtices

Global frameworks for public space governance and activation offer critical insights for designing inclusive, adaptive, and sustainable urban environments. Four interrelated references—the NSW Guide to Activation (2021), URBACT Health & Greenspace Network (2020), UN National Urban Policy Guidelines (2019), and Ostrom's Principles on Commons Governance (1990)—provide complementary directions for integrating spatial equity, health, participation, and collective management into urban public space planning.

- **NSW Guide to Activation**:

The NSW Guide to Activation (Government of New South Wales, Australia) outlines a comprehensive model for the activation and adaptive management of public spaces, built upon three foundational pillars: Greening, Mixed-Use Programming, and Temporal Activation.

1. **Greening:** The framework emphasizes integrating ecological value into urban spaces through sustainable landscaping, biodiversity corridors, and microclimate-sensitive design. Streetscapes and plazas are viewed as dynamic ecosystems that require ongoing monitoring and adaptive maintenance.
2. **Mixed-Use and Inclusive Programming:** Rather than fixed-use design, the guide promotes flexible zoning that encourages coexistence of social, cultural, and commercial activities. This aligns with the concept of *'everyday urbanism'*, where spaces evolve based on user behaviour and local rhythms.
3. **Temporal Activation:** Recognizing that spatial vibrancy fluctuates across time, the framework encourages temporal interventions—such as night markets, seasonal festivals, or pop-up installations—to maintain year-round engagement.

In the Indian context, this framework holds relevance for Smart City projects that seek to revitalize underused spaces. For example, applying NSW's activation principles to Indian urban plazas—like Jaipur Chaupati or Ahmedabad's Kankaria Lakefront—could help balance economic activity with social inclusivity, enhancing the temporal and cultural life of public spaces.

- **URBACT Health & Greenspace**:

The URBACT Health & Greenspace Network (2020) advances a holistic approach to urban green planning by linking public health outcomes with spatial equity and environmental justice. Its core philosophy is that access to

nature is a human right and a fundamental determinant of well-being.

This framework proposes three strategic approaches:

1. **Designing for Health and Well-Being:** Urban green spaces should support both physical activity and mental restoration. Design principles include visual openness, walkable access, and provision of multi-sensory experiences (shade, water, soundscapes).
2. **Inclusive Accessibility:** URBACT stresses equitable distribution of green spaces using GIS-based mapping tools to identify spatial disparities, particularly for vulnerable populations such as children, the elderly, and low-income groups.
3. **Collaborative Governance:** Municipalities are urged to co-create greenspaces with local stakeholders and health departments, ensuring the long-term integration of health metrics into urban planning policies.

In India, URBACT's health-centric approach resonates strongly with post-pandemic urban recovery efforts, where open spaces like Delhi's Central Vista or Bengaluru's Cubbon Park became critical for public well-being. Integrating URBACT's principles through geospatial accessibility mapping and health-based design audits could transform green spaces from aesthetic assets into health-promoting commons.

- **UN National Urban Policy Guidelines**:

The UN-Habitat's National Urban Policy (NUP) Guidelines (2019) position public spaces as the backbone of inclusive urban development. The guidelines advocate embedding public space planning at the national, regional, and city levels to ensure coherence between spatial, social, and economic policies.

The NUP framework emphasizes four strategic principles:

1. **Mainstreaming Public Spaces in Policy:** National governments are encouraged to treat public spaces not as residual land but as core infrastructure—essential for climate resilience, gender equity, and cultural identity.
2. **Participatory Decision-Making:** The framework institutionalizes stakeholder participation—urban local bodies, NGOs, and citizens—in every stage of public space planning.
3. **Urban Safety and Equity:** It recognizes safety and accessibility as measurable indicators of public space quality, especially for women and marginalized communities.
4. **Monitoring and Evaluation:** Adoption of performance-based indicators, such as the *Public Space Index* or *SDG 11.7*, enables evidence-driven decision-making through data analytics and GIS monitoring.

For India, these principles align with national missions like AMRUT and Smart Cities, which now integrate open space standards within development plans. Embedding NUP guidelines into state-level urban policies can bridge the persistent gap between macro-level planning and neighbourhood-level commons governance.

- **(Ostrom, 1990)'s Principles**:

Elinor **Ostrom's (1990)** theory on the governance of commons provides a seminal framework for understanding how communities can **self-organize to manage shared resources**. While originally conceptualized for rural and natural commons (like forests or fisheries), its adaptation to urban public spaces offers vital insights into participatory governance.

Ostrom identifies eight design principles—of which the following are particularly relevant to urban contexts:

1. **Clearly Defined Boundaries:** Identifying who has rights to use and manage the space (e.g., residents, vendors, local authorities).
2. **Collective Choice Arrangements:** Allowing users to participate in rule-making and design decisions.
3. **Monitoring and Sanctioning Mechanisms:** Ensuring responsible use and maintenance through community oversight or digital feedback loops.
4. **Conflict-Resolution Mechanisms:** Establishing transparent procedures for negotiation among diverse users.
5. **Nested Enterprises:** Coordinating across multiple governance levels—community groups, municipal bodies, and state departments.

Applying Ostrom's framework to Indian urban commons, such as the Bhadra Chowk redevelopment in Ahmedabad, demonstrates how collective decision-making and clearly defined stewardship roles can sustain shared urban assets. Integrating her principles into Smart City governance could foster a co-management model, where digital dashboards, citizen forums, and municipal planning converge to support the co-production of urban commons.

These frameworks emphasize activation, inclusivity, health-focus, and policy integration, offering templates for Indian urban renewal, holistic planning through digital monitoring, collective governance, and responsive design.

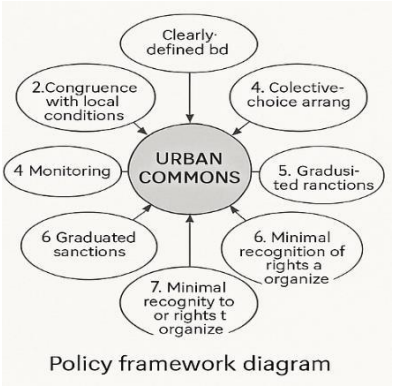

Figure 1. (Ostrom, 1990) commons framework.

4.1 Insights from Theoretical Context

- Governance and Policy: Need for decentralized and inclusive public space management.
- Health and Well-being: Correlation of green space access with physical/mental health.
- Social Inclusivity: Risks of exclusion of marginalized groups in Smart Cities.
- Ecological Design: EIA-driven frameworks for resilient landscapes.
- Urban Economics: Balancing revenue generation with commons stewardship.

The revitalisation of urban commons demands a multi-pronged approach that interweaves governance reform, socio-ecological resilience, and economic pragmatism. Contemporary urban policy indicates a shift toward decentralised, community-anchored governance, highlighting the necessity of inclusive public space management frameworks that empower local stakeholders – a critical gap in traditional top-down planning models. At the same time, emerging evidence underscores a direct link between access to green, open spaces and improved physical and mental well-being, reinforcing the need to embed health outcomes within urban design agendas. However, as Smart City initiatives accelerate, concerns around social inclusivity and the inadvertent exclusion of vulnerable and marginalised groups have intensified, making equitable access a central challenge. From an ecological standpoint, there is a growing consensus on integrating environmental impact assessment (EIA)-driven design frameworks to ensure climate-responsive, adaptive landscapes that can withstand environmental stresses. Yet, such resilience must be balanced with the imperatives of urban economics, as city governments often rely on land monetisation and revenue generation, risking commodification of the commons. This research positions Kevin Lynch's concept of city legibility – whereby the perceptual clarity of the urban environment enhances usability and identity – alongside Elinor (Ostrom, 1990)'s principles of commons governance, which advocate shared stewardship, clearly defined user rights, and collective decision-making. Together, these theoretical lenses shape a holistic understanding of urban commons as socio-spatial systems that require transparent governance, ecological wisdom, inclusive design, and sustainable economic logic.

4.2 Case Studies: Best Practices and Adaptive Approaches

4.2.1 International Models:

Promenade Plantée, Paris: The Promenade Plantée—often referred to as Coulée Verte René-Dumont—is among the first instances of raised urban green infrastructure. Constructed atop an abandoned 19th-century railway viaduct in the 12th arrondissement of Paris, the initiative illustrates the idea of adaptive reuse via ecological restoration and linear connectivity. Created by landscape architect Jacques Vergely and architect Philippe Mathieux, it converted outdated industrial structures into a 4.7-kilometre-long walkway that connects various urban areas. The layout incorporates tiered plant life, shaded seating areas, and visual links to nearby neighborhoods, improving ecological pathways in the compact urban center.
From a geospatial planning viewpoint, Promenade Plantée acts as a pioneering example of incorporating green infrastructure into urban form via spatial continuity and permeability analysis. It has set global examples such as New York's High Line, showcasing the possibilities of GIS-driven land reuse mapping and visibility analysis for urban revival. The initiative established a benchmark for policy innovation, as public–private partnerships and local heritage conservation organizations worked together for ongoing upkeep—demonstrating how shared governance can support adaptive reuse initiatives

Gas Works Park, Seattle:
Gas Works Park, created by Richard Haag and inaugurated in 1975, embodies the convergence of industrial history and ecological restoration. Constructed on the location of a past gasification facility by Lake Union, the initiative revitalizes contaminated brownfield areas using creative landscape design and phytoremediation methods. Instead of eliminating the site's industrial history, Haag preserved certain gasification towers and equipment as artistic artifacts, representing change and endurance.
The park's layout incorporates landform alteration and soil covering to tackle pollution, alongside open green spaces, recreational zones, and viewing hills that offer sweeping vistas of the city. This spatial change was guided by environmental impact evaluations and initial GIS-oriented terrain modeling. Gas Works Park exemplifies the possibility of converting brownfields into green spaces in a manner that is both ecologically sound and socially equitable. It remains a civic commons, supporting festivals and community events, thus reinforcing a shared connection with post-industrial environments

Buffalo Central Terminal, New York:
The Buffalo Central Terminal initiative highlights how heritage preservation can be utilized to revitalize public spaces in post-industrial cities. Initially a prominent railway station, it was neglected for many years until community groups began its transformation into a cultural and leisure center. The adaptive reuse strategy highlights multifunctional programming—organizing art exhibitions, farmers' markets, and community events that link residents to the city's industrial heritage. Geographically, the terminal's rejuvenation has depended on heritage-aware master planning and digital recording through LiDAR and GIS to inform conservation choices. From a governance perspective, the project's success is rooted in community-led stewardship—via the Central Terminal Restoration Corporation (CTRC)—that involves volunteers, local artists, and businesses in fundraising and programming activities. It serves as an example of how heritage resources can support urban commons, merging economic renewal with cultural preservation

4.2.2 Indian Exemplars:

Chandi Ghat, Haridwar:
The redevelopment of Chandi Ghat as part of the Namami Gange Mission signifies a thoughtful blend of spiritual ecology, inclusivity for genders, and designs resilient to flooding. The initiative revitalized a significant riverfront location along the Ganga by utilizing GIS-driven hydrological models to control varying river levels and reduce flood hazards. The area now features universal access ramps, women's changing facilities, and shaded gathering spaces intended for both worship and leisure. Material choices and landscape design harmonized cultural heritage with environmental goals, utilizing sandstone steps and indigenous plant species for ecological restoration. The project showcases how policy-driven design (Namami Gange and NIUA's Riverfront Guidelines) can integrate environmental sustainability with social equity in the development of public spaces

Jaipur Chaupati:
The Jaipur Chaupati project by the Jaipur Development Authority transforms urban recreation and economic micro-commons via a self-sustaining public dining plaza format. It showcases a different approach to traditional mall culture by promoting local sellers in a clean, aesthetically pleasing, and culturally meaningful outdoor setting.
The design highlights modular kiosks, shaded structures, and walkable pathways that adapt to climatic and cultural environments. A geospatial foot traffic analysis conducted by the authority informed the positioning of amenities, lighting, and pedestrian pathways to enhance accessibility and safety. The Chaupati fosters inclusive urbanism by combining income generation with public leisure, in line with Smart City goals of mixed-use activity and community entrepreneurship

Vasant Udyan, Delhi:
The revitalization initiative of Vasant Udyan highlights the evolution of a historic garden into a modern, multifunctional park that serves various demographics. Rejuvenated through the Delhi Development Authority's urban greening program, the project combines heritage landscape concepts with contemporary features

such as amphitheatres, outdoor gyms, and walking paths.
The design relies on biodiversity mapping and canopy assessment to enhance shade and plant density, while features like rain gardens and infiltration wells help regulate the microclimate. This example emphasizes how conventional landscape types—Mughal-influenced charbagh designs—can be adapted for modern communal requirements, preserving cultural significance while improving ecological efficiency

Bhadra Chowk, Ahmedabad:
The redevelopment of the Bhadra Fort area showcases an approach to urban commons governance centered on conflict resolution. The initiative, implemented through a partnership among Ahmedabad Municipal Corporation, CEPT University, and the Self-Employed Women's Association (SEWA), aimed to restore the historical Bhadra Plaza from traffic clutter and encroachment while acknowledging the existence of informal vendors.
By means of iterative stakeholder mapping and collaborative design workshops, the project established pedestrian-only pathways, seating areas, and vending spaces that acknowledge vendors as valid participants in the urban commons. Mapping of vending clusters using GIS was utilized to guarantee fair spatial distribution and reduce displacement.
The Bhadra case demonstrates how inclusive urban design, heritage conservation, and participatory governance can harmoniously coexist. It serves as a reproducible example for aligning formal planning goals with informal economic systems—a key challenge in managing urban commons in Indian cities

4.2.3 Comparative Insights

Across both international and Indian contexts, a shared theme emerges—**adaptive reuse, participatory governance, and spatial intelligence** are key drivers of successful urban commons. While global models emphasize ecological restoration and heritage reactivation, Indian cases foreground socio-economic inclusion and policy integration. Together, these examples demonstrate how geospatially-informed design and collaborative governance can transform neglected or contested urban spaces into vibrant, resilient, and equitable commons.

4.3 Challenges in Public Space Planning in India

Despite rich heritage and diverse types, Indian public spaces face:

- Fragmentation of land and governance
- Gender and class exclusion
- Environmental degradation
- Commercialization vs. public value
- Weak monitoring mechanisms

These are intensified by uneven Smart City implementations that often prioritize aesthetics over accessibility.

4.4 Proposed Geospatial and Policy-Driven framework

A four-pillar framework is proposed:

1. Participatory Governance: Engagement with users and stakeholders for co-creation and stewardship.
2. Geospatial Tools: Use of GIS to measure equity, visibility, and access across neighborhoods.
3. Policy Integration: Aligning Smart City objectives with public health, sustainability, and heritage conservation.
4. Monitoring and Impact Assessment: Tools such as digital dashboards, EIA protocols, and data visualizations to support adaptive management.

The proposed four-pillar framework offers a pragmatic approach to translating the conceptual understanding of urban commons into actionable planning and management strategies. By prioritising participatory governance, it moves beyond tokenistic consultation toward genuine co-ownership between municipalities and community stakeholders — essential for ensuring that interventions reflect local needs and remain socially sustainable over time. The inclusion of geospatial tools provides a scientific basis for decision-making, enabling planners to map spatial inequalities, assess neighbourhood-level accessibility, and design targeted improvements that enhance visibility and reach of public spaces. Policy integration acts as the glue that connects diverse government agendas — from Smart City digitisation and heritage preservation to climate resilience and public health — ensuring cohesive, cross-sectoral outcomes rather than isolated or conflicting initiatives. Finally, the monitoring and impact assessment pillar embeds a culture of continual learning and adaptation through digital dashboards, environmental assessment protocols, and performance-based metrics. Together, these four pillars form a cyclical, responsive system that seeks not only to revitalise urban commons, but to ensure their long-term resilience, inclusivity, and socio-ecological value in rapidly growing cities.

Based on (Ostrom, 1990)'s principles, the paper proposes a 5-point Urban Commons Policy Framework:

- Collective Governance: Community-led design reviews
- Enabling State: Municipal facilitation of co-managed spaces
- Social-Economic Pooling: Resource-sharing across stakeholders
- Experimentalism: Tactical urbanism (pop-ups, pilots)
- Tech Justice: GIS dashboards, digital citizen feedback

4.4.1 Findings and Discussion

- Successful public spaces integrate historical identity, community needs, and environmental functionality.
- International practices offer scalable insights but require contextual adaptation.
- Smart City projects provide a starting point but must evolve beyond infrastructure toward inclusive commons.
- A major gap lies in stakeholder integration—vendors, women, elderly—into planning processes.

Successful public spaces are those that synthesize historical identity with contemporary community needs and ecological performance, ensuring they are culturally rooted, socially relevant, and environmentally resilient. While international best practices provide valuable, scalable models for urban commons revitalisation, their application in Indian cities necessitates careful contextual adaptation to socio-economic, cultural, and climatic realities. Smart City initiatives offer a useful infrastructural foundation, yet must evolve toward more inclusive and people-centred commons management paradigms. A persistent gap lies in the meaningful integration of diverse stakeholders — particularly informal vendors, women, and the elderly — whose everyday experiences and needs are often overlooked in conventional top-down planning processes.

4.5 Conclusion and Way Forward

Revitalizing urban commons in Indian cities demands a confluence of spatial intelligence, socio-political awareness, and ecological foresight. This research contributes a holistic, participatory, and technology-enabled model that aligns with national ambitions like the Smart City Mission while respecting local needs and cultural identities.

Indian cities are at a turning point. Urban commons must not be seen as residual spaces but as vital civic assets. A geospatial and policy-driven framework can harmonize inclusivity, sustainability, and adaptability. Future research will focus on implementing pilot projects with real-time geospatial dashboards, stakeholder interviews, and post-occupancy evaluations. Policy recommendations will aim to embed public space planning within national and state urban missions.

Future research will deepen into longitudinal monitoring of these interventions, develop participatory GIS tools, and explore financial models for sustainable public space governance.

5. References

Ostrom, E. (1990). Governing the commons: The evolution of institutions for collective action. Cambridge University Press.
Harvey, D. (2012). Rebel cities: From the right to the city to the urban revolution. Verso Books.
Foster, S. R. (2011). Collective action and the urban commons. Notre Dame Law Review, 87(1), 57-133.
NSW Guide to Activation Public Spaces, 2021
URBACT Health & Greenspace Network Guide, 2020
UN National Urban Policy Guidelines, 2019
(Ostrom, 1990), E. (2017). The Nature of Cities
Lynch, K. (1960). The Image of the City
ISPRS Annals of Photogrammetry, Remote Sensing, and Spatial Info. Sciences (2022)
NIUA Reports on Chandi Ghat, Jaipur Chaupati, and Vasant Udyan
COA Smart City Training by Ar. Pallabhi Roy Gupta and Ar. Abhishek Xavier
Project for Public Spaces: Buffalo Central Terminal, Market Square, City Hall Courtyard
Urban Design Lab, Global Case Studies in Placemaking
Swayam/NPTEL Courses: EIA, Urban Sociology, Geospatial Analysis