

Student Thesis Competition (STC) Season 5 on "Re-imagining Urban Rivers"

From Neglect to Transformation: Envisioning a Sustainable Future for Nag River, Nagpur through Urban River-Oriented Development (U-ROD)

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"If Transit-Oriented Development (TOD), then why not River-Oriented Development (ROD)?"



TOD



ROD

Historically central to cities, rivers today face neglect. ROD reimagines them as vital urban assets like transit in TOD fostering sustainability, resilience, and inclusive growth.

Multifaceted Role of Urban Rivers



Ecological



Economic



Social & Livability Role

Aim of the Research

To develop a comprehensive **Urban River-Oriented Development (U-ROD)** framework that leverages the potential of Nag River and its riparian zones to promote sustainable, river-centric urban growth in Nagpur.

Impacts of Urbanization on Rivers



Urbanization & Degradation



Impervious Surfaces



Riparian Zones = Hotspots



Structural Modifications

"70% urban population by 2050 will intensify these pressures."
– UN, 2019

Riparian Restoration in Urban Context

Restoration Goals: Rehabilitate riparian zones to restore ecological, hydrological, and social functions in cities.



Revegetation



Green Infrastructure



Floodplain Restoration

(González et al., 2017)

Nagpur CDP 2041



Urban River Degradation and Drainage Challenges



Land Use Pressures and Ecological Risks



Encroachment & Policy Gaps



Ecological Protection Measures

Calls for NDZs, ESZs, and afforestation to protect and restore river ecosystems.

Nag River: Profile & Challenges

Geographical Feature:



Length

17 km within Nagpur city.



Width

Varies from 12-40 m; depths of 2-4.5 m.



Function

Acts as a stormwater drain, managing urban runoff.



Origin

Begins at Lava Hills, outside Nagpur

Sewerage Management:-



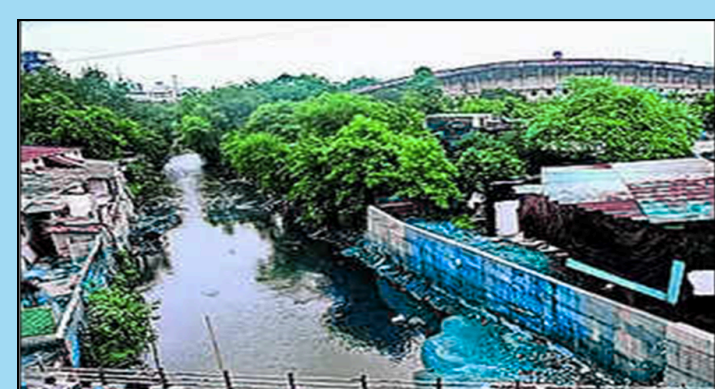
Inadequate treatment leads to direct discharge of untreated sewage into the river.



Delayed conservation projects exacerbate ecological degradation.



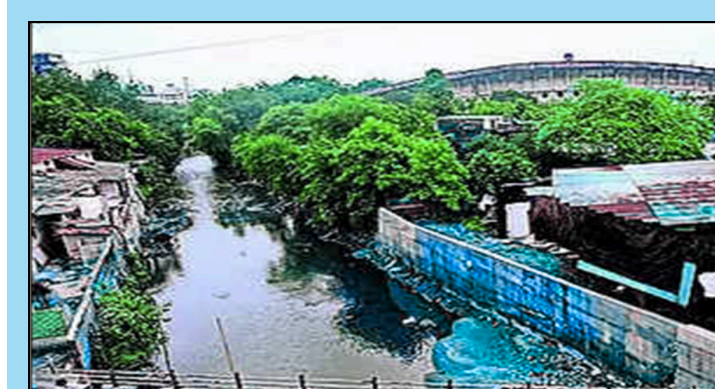
Threat of Periodic Floods



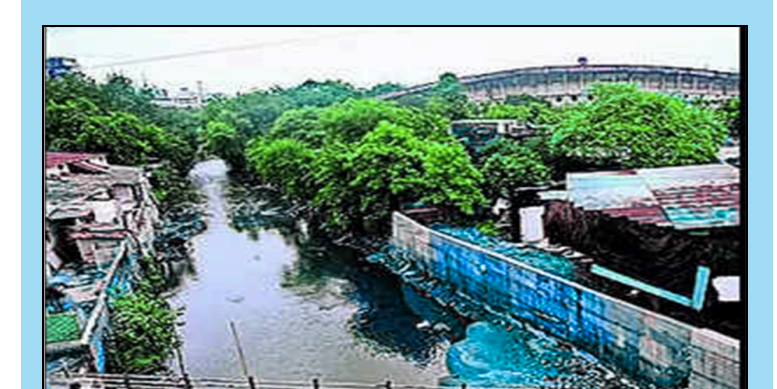
Choked by development



Polluted nallas

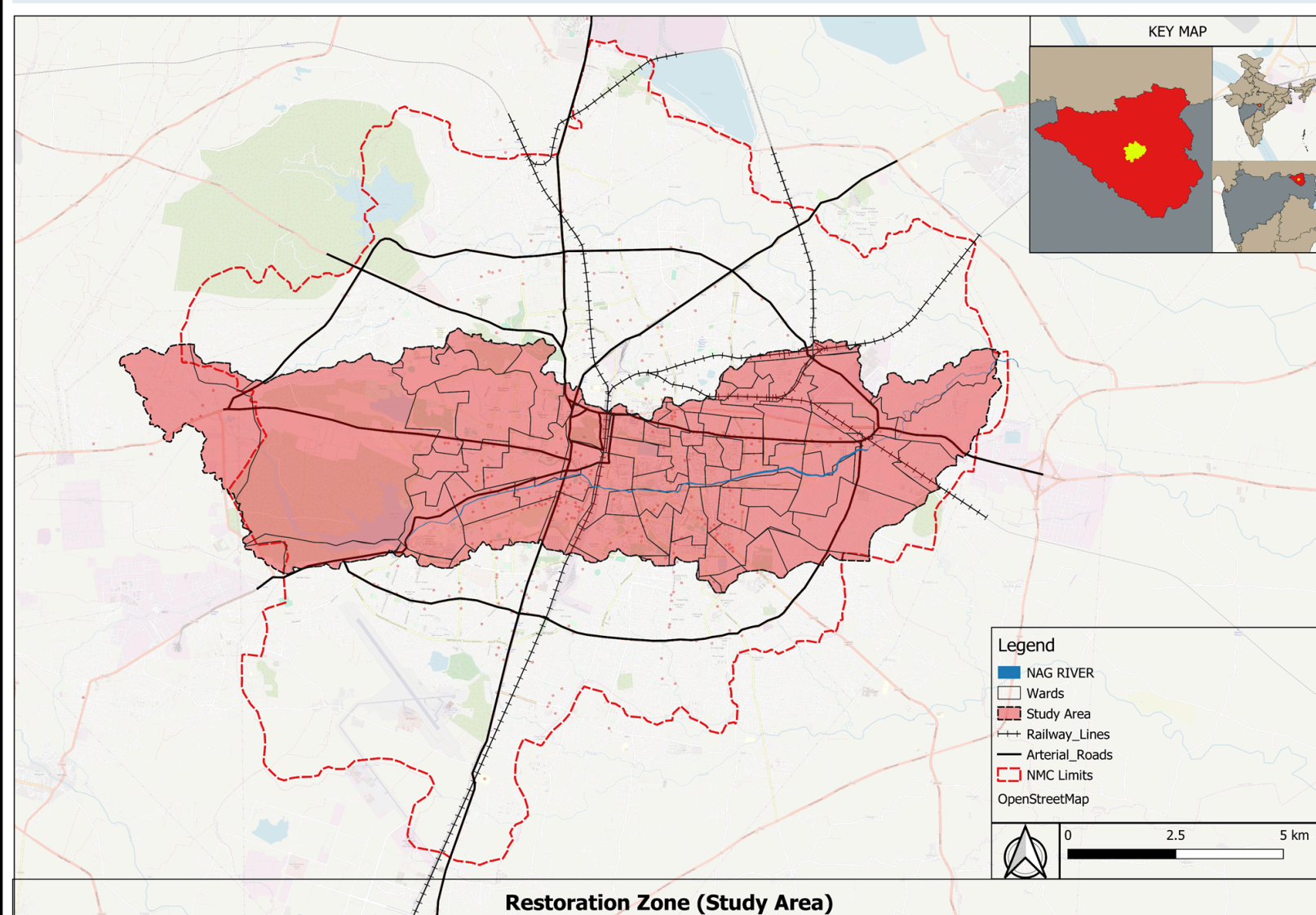


Polluted by outfalls



Inaccessible Banks

Study Area



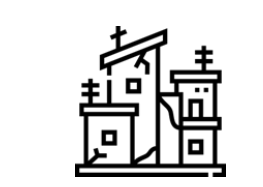
Nag River Mapping



Anthropogenic Activities



Solid Waste in River



Slum Encroachment



37 Wards



Encroachment due to Urbanization



Waste Disposal

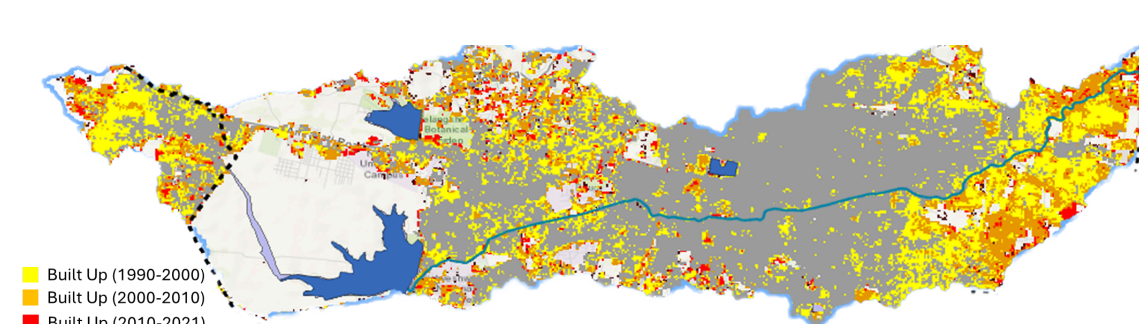
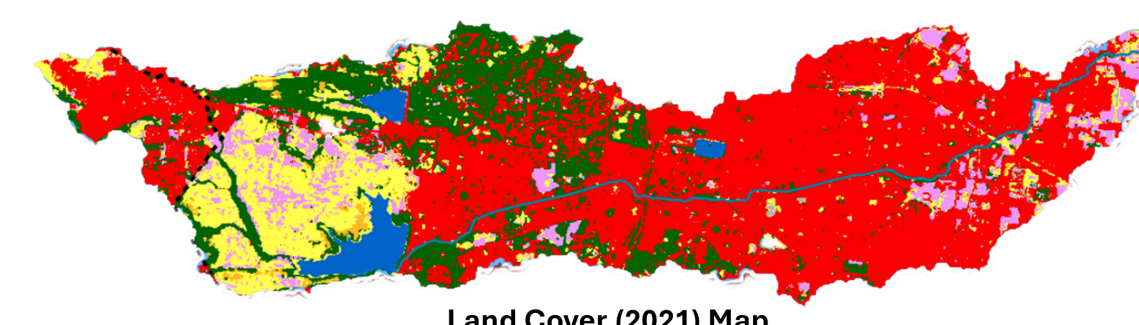


Aquatic Life Found



6.16 Lakhs (Study Area)

Hydrological Analysis



2447494
Total City Population

171645
Slum Household

858983
Total Slum Population

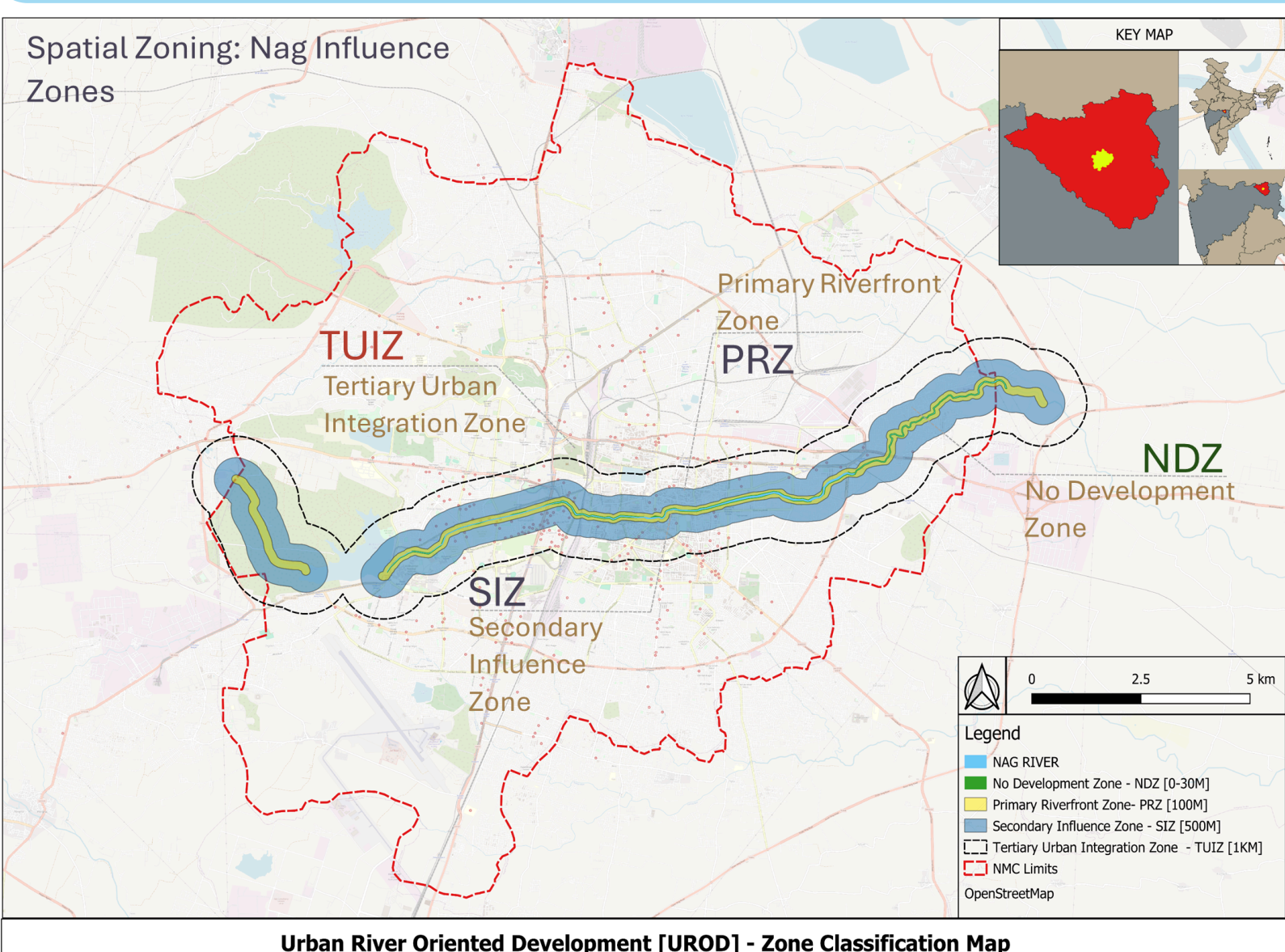
379
Total Slums

4th
Most Slum Populated City

42
Notified Slum in Study Area

12
Non-Notified Slum in Study Area

Nagpur Urban River-Oriented Development (UROD) Strategy



Core Ecological Setback (0-30 m)

Preservation First

Primary Riverfront Zone (30-100 m)

Cultural Regeneration

Secondary Influence Zone (100-500 m)

TOD-Led Redevelopment

Tertiary Urban Integration Zone (500 m-1 km)

Citywide Convergence

Unique Value Proposition of UROD

