NbS for Lake Rejuvenation in Coimbatore

Eco-Restoration of 8 Lakes

12th Oct 2022

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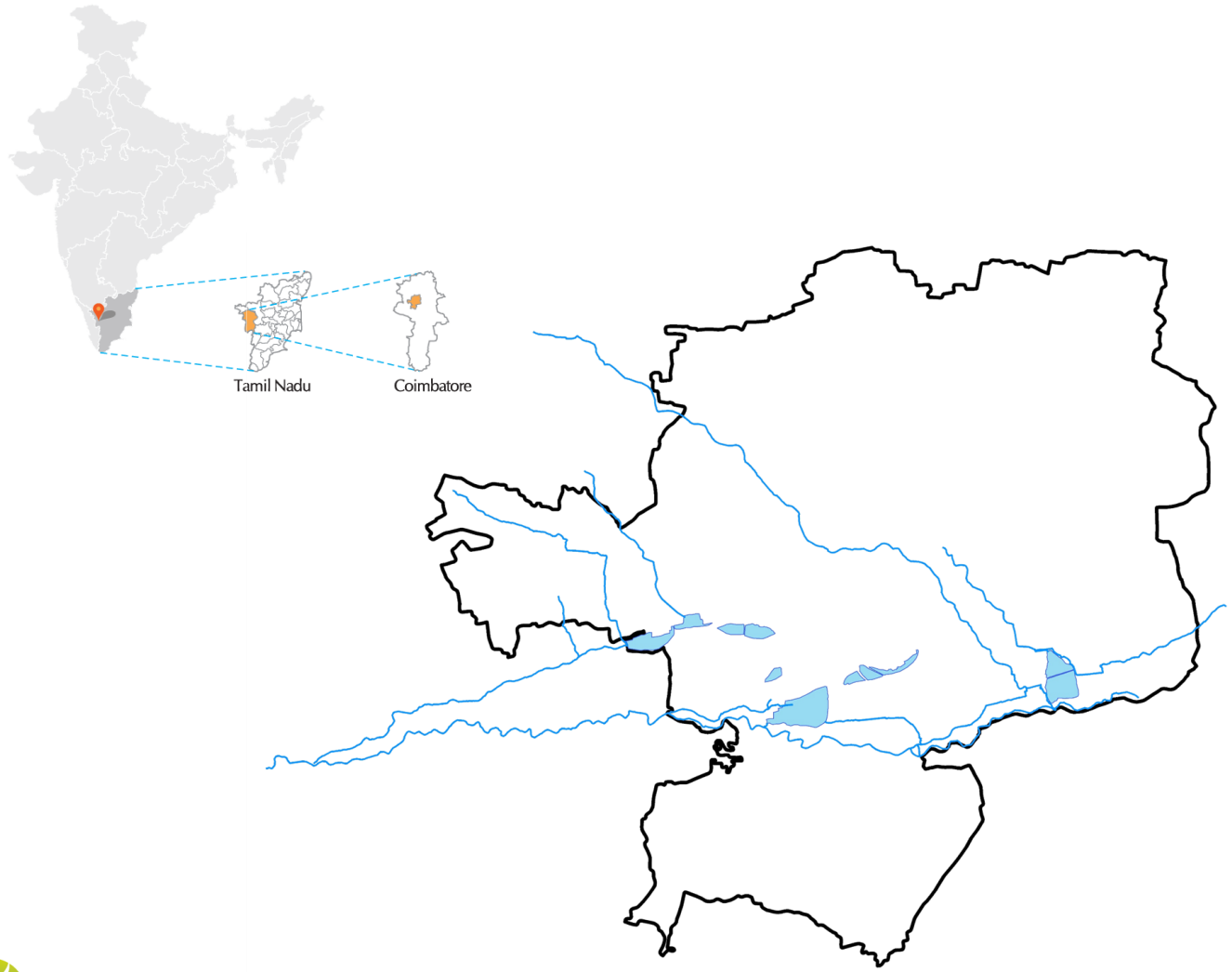
Senior Advisor
CDD India

Project Motivation

"To improve quality of life of citizens by creating vibrant public spaces around lakes"



City context

Industrialised city, Transport hub, Educational hub

Lacked green spaces

Smart City Initiative

Eco-restoration of 8 lakes

$70 Million allocated of $135 Million smart city fund to restore lakes

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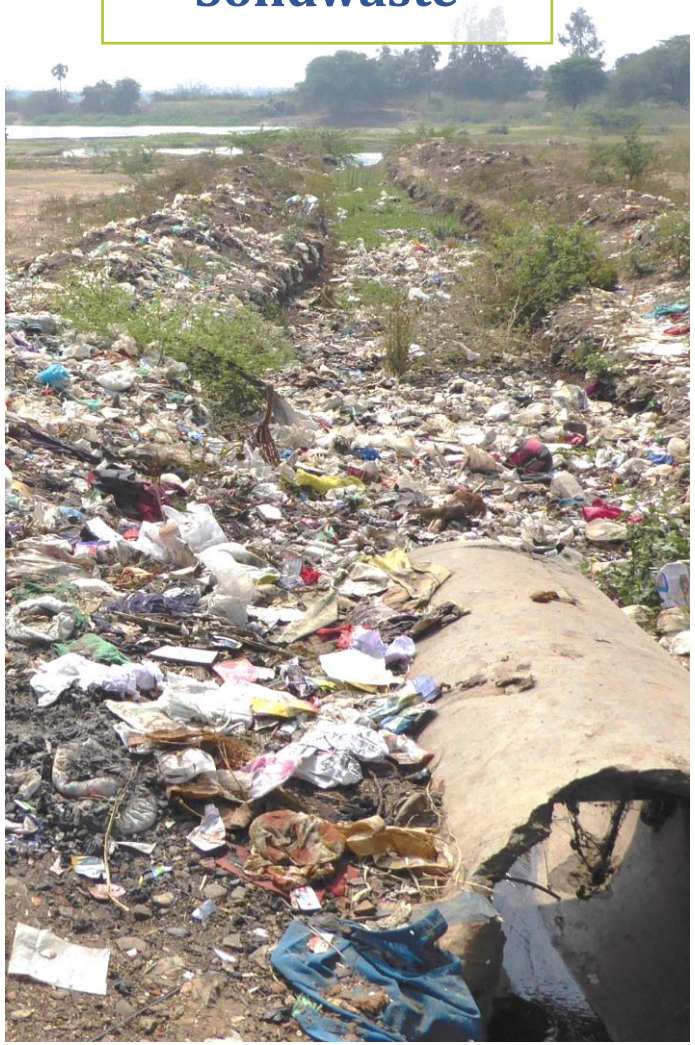
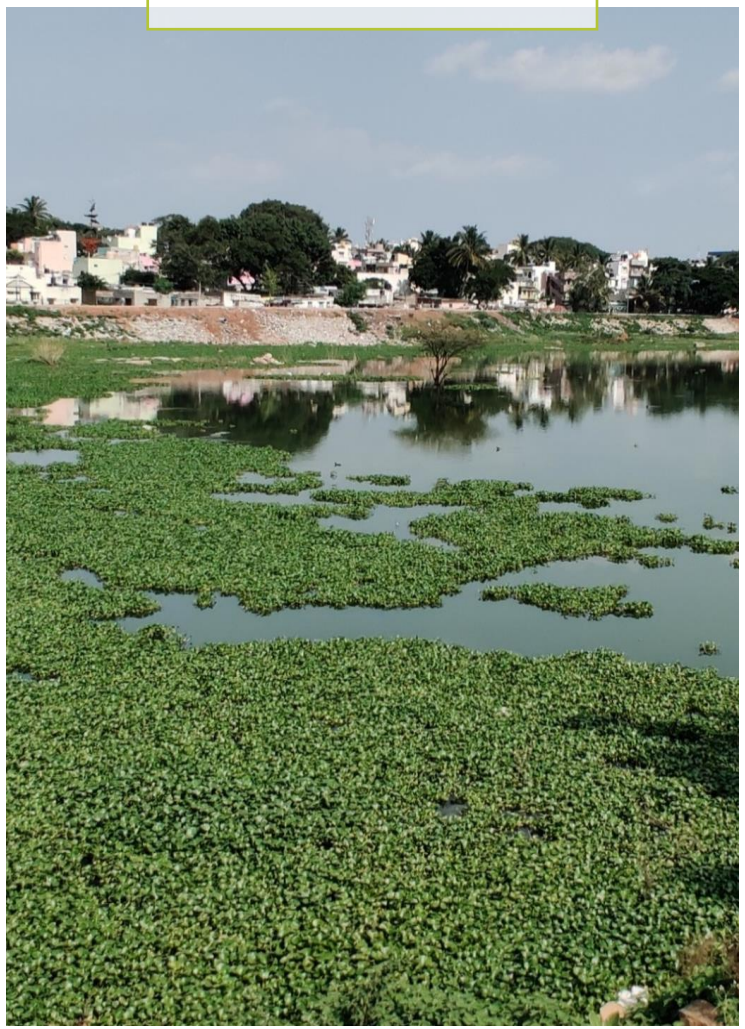
Key challenges

Solidwaste



Wastewater

Weeds



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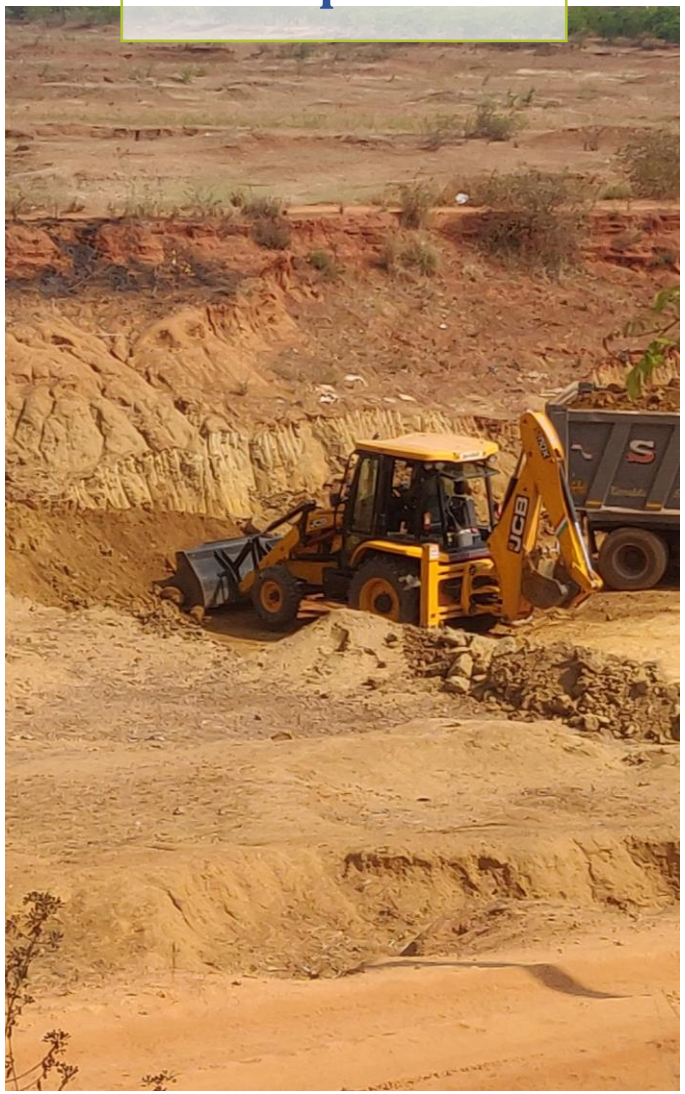
Key challenges

Encroachments

Silt deposition



Poor lake infrastructure

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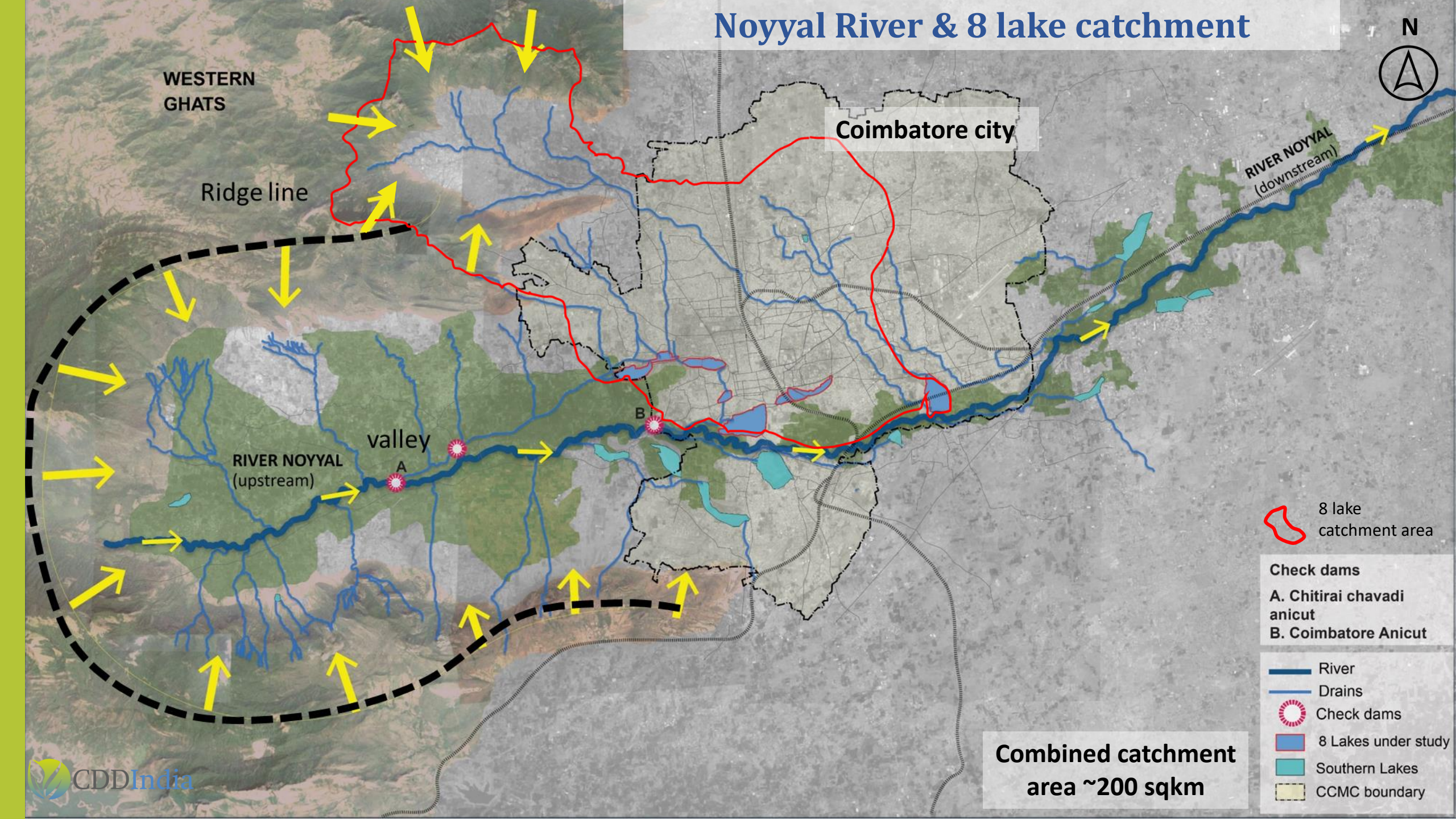
Noyyal River & 8 lake catchment
N
WESTERN GHATS
Ridge line
Coimbatore city
RIVER NOYYAL (downstream)
valley
RIVER NOYYAL (upstream)
A
B
8 lake catchment area
Check dams
A. Chitirai chavadi anicut
B. Coimbatore Anicut
River
Drains
Check dams
8 Lakes under study
Southern Lakes
CCMC boundary
Combined catchment area ~200 sqkm
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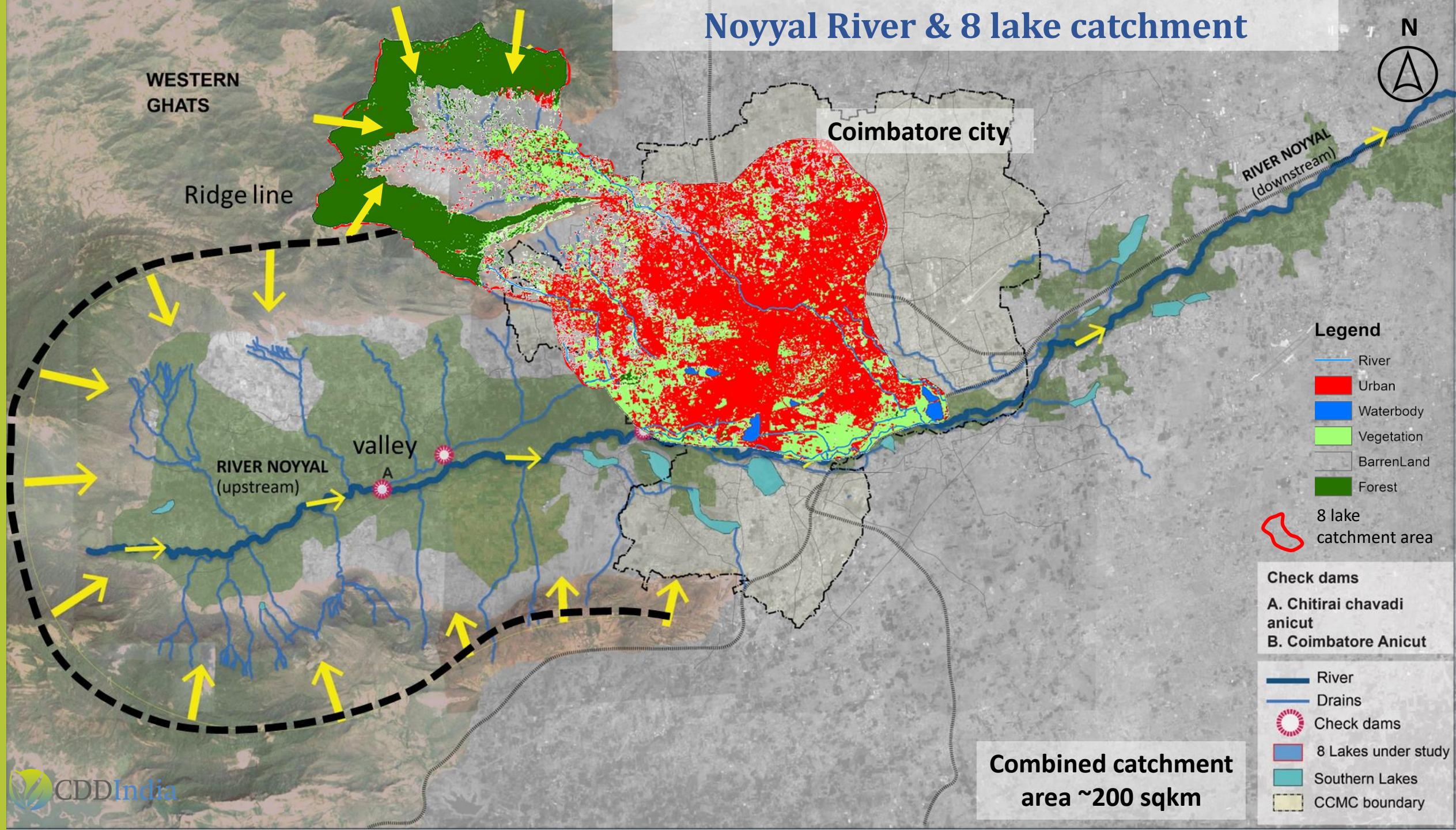
Noyyal River & 8 lake catchment



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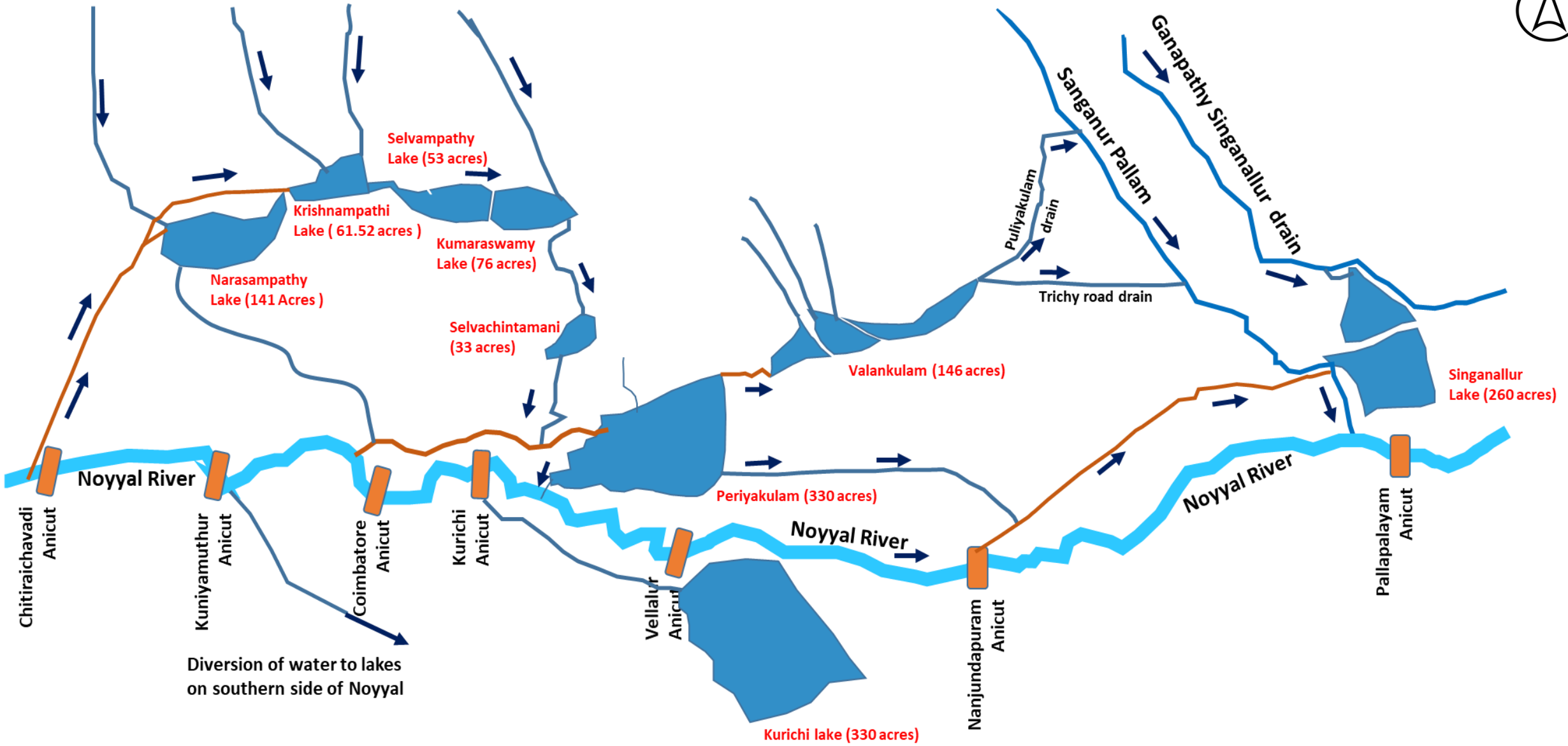
Noyyal River & 8 lake catchment



Combined area of 8 Northern lakes ~1,100 acres

Nature based Solutions(NbS) for

Urban Placemaking

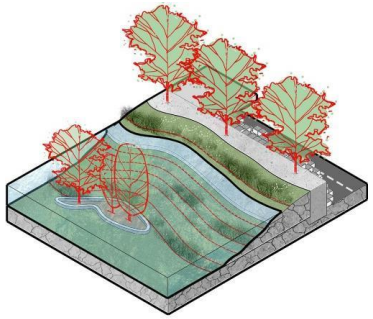
- Waterfront development
- Cycle tracks
- Food courts and public amenities

Wastewater management

- Setting up Sewage Treatment Plants
- Treatment wetlands for pollution abatement

Biodiversity enhancement

- Development of active edges
- Setting up of eco zones
- Bird islands



Urban Flood management

- Refurbishment of hydraulic structures and drains

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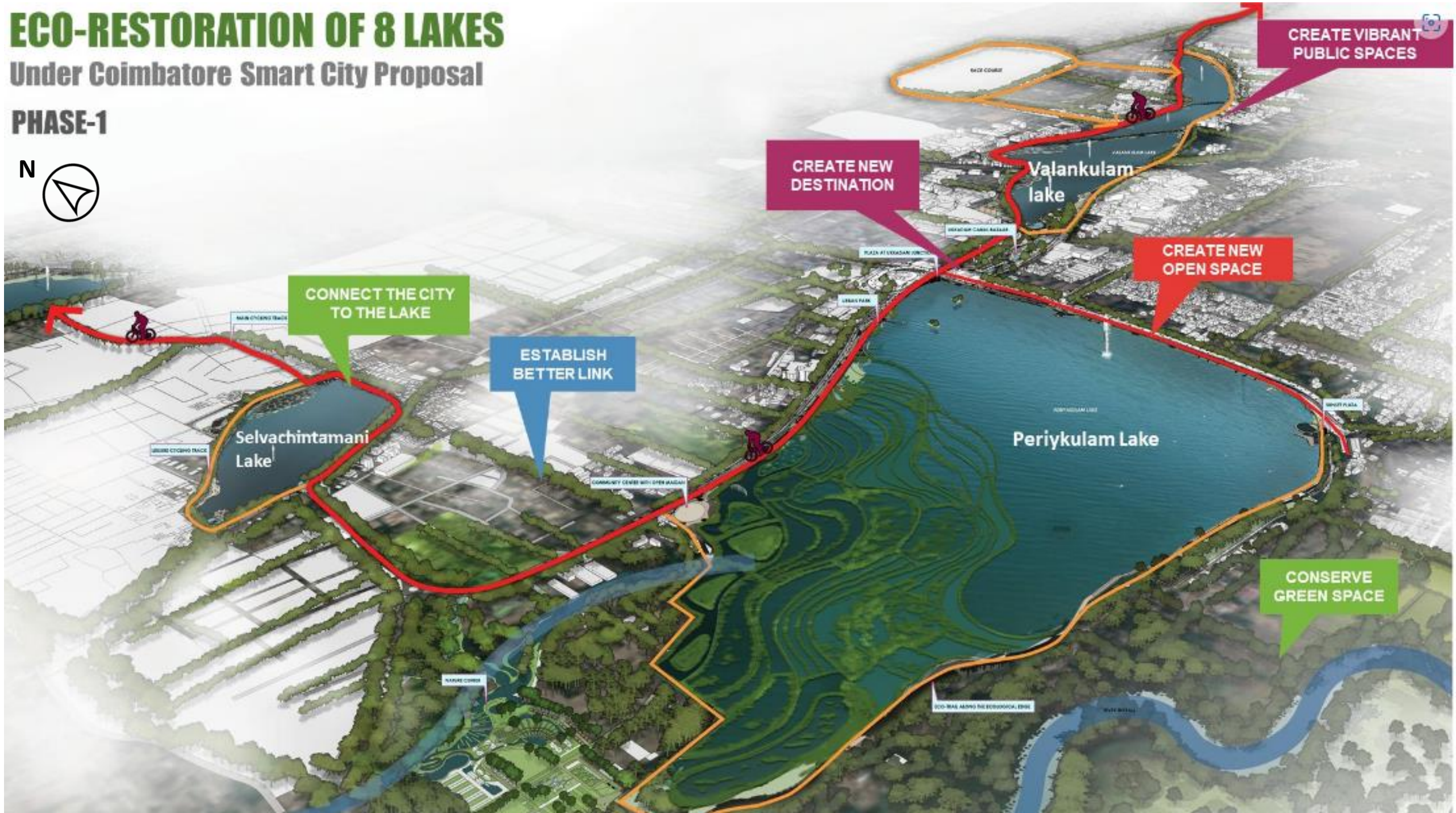
ECO-RESTORATION OF 8 LAKES

Under Coimbatore Smart City Proposal

PHASE-1



Urban place making

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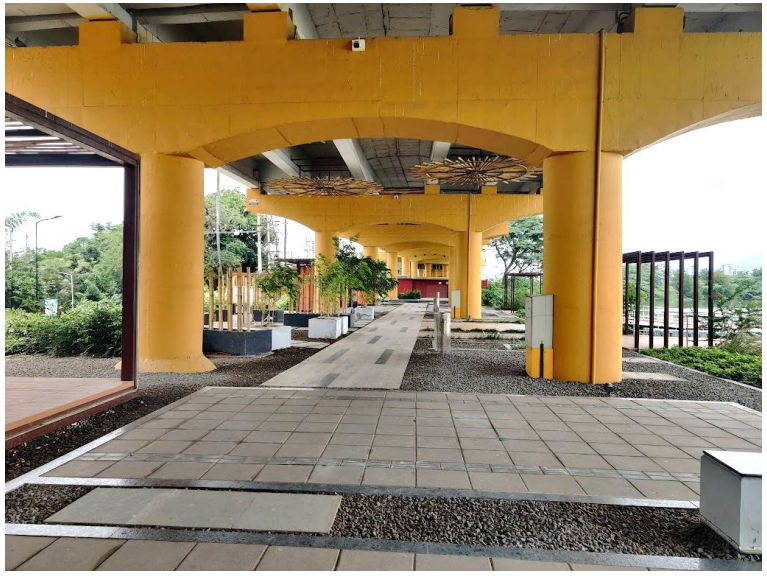
Valankulam Lake

Under flyover Park



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Periyakulam lake

North Promenade

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Selvachintamani lake

Park

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Wastewater Management

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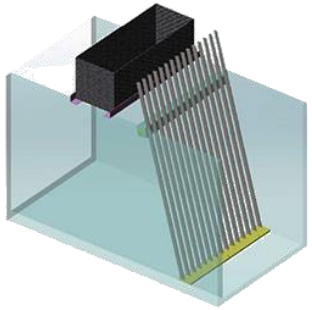
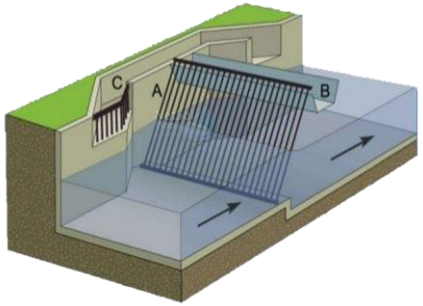
Approach to Wastewater Management

Pre-treatment

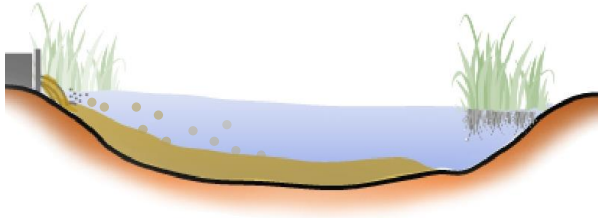
Screen and diversion chambers



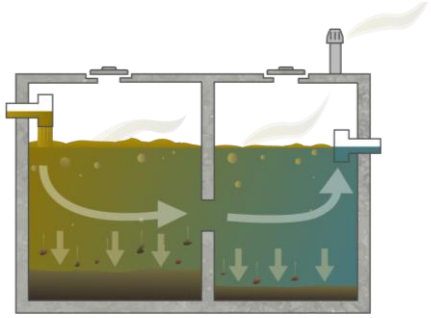


Primary treatment

Sedimentation ponds/tanks

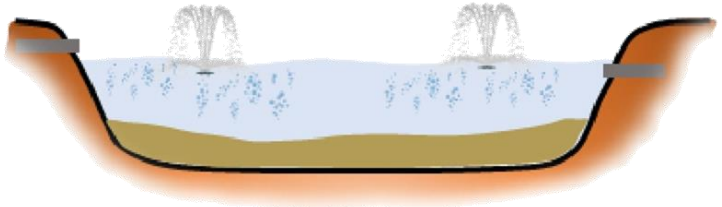


Settlers / settling tanks



Secondary treatment

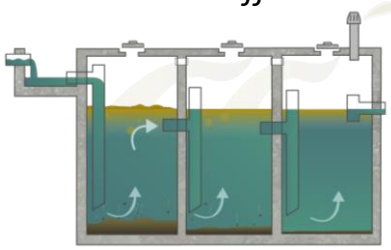
Aerobic



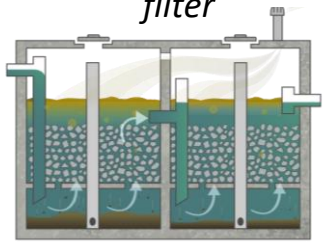
Removal of BOD, COD,TSS & Nitrification

Anaerobic

Anaerobic baffled reactor



Anaerobic filter

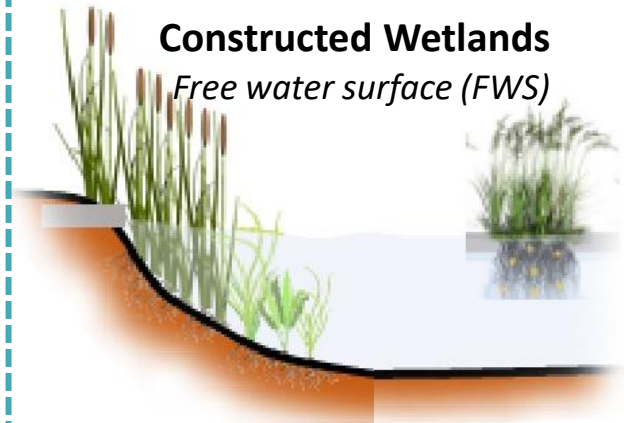


Removal of BOD, COD,TSS

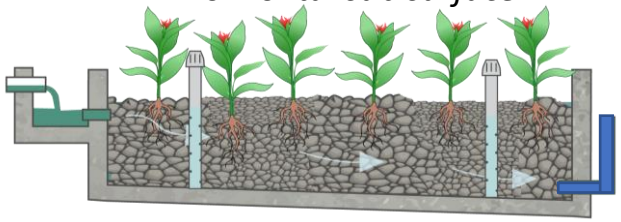
Tertiary treatment

Constructed Wetlands

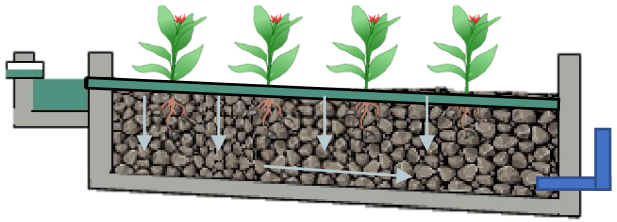
Free water surface (FWS)



Horizontal sub surface



Vertical wetlands



Purpose	Removal of solid waste	Removal of settable solids and separation of scum	Removal of BOD, COD,TSS & Nitrification	Nutrient uptake
Location	In drain	On lake bund/inside the lake	BOD>120 mg/l Outside the lake/ bund	BOD<40 mg/l Inside the lake/bund

Wastewater treatment system for Selvachintamani lake

WW inlet

Intercept & Divert

Treatment
Primary
Secondary
Tertiary

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Wastewater treatment system for Selvampathy lake

Sedimentation ponds and Treatment wetlands as wastewater treatment system (under construction)

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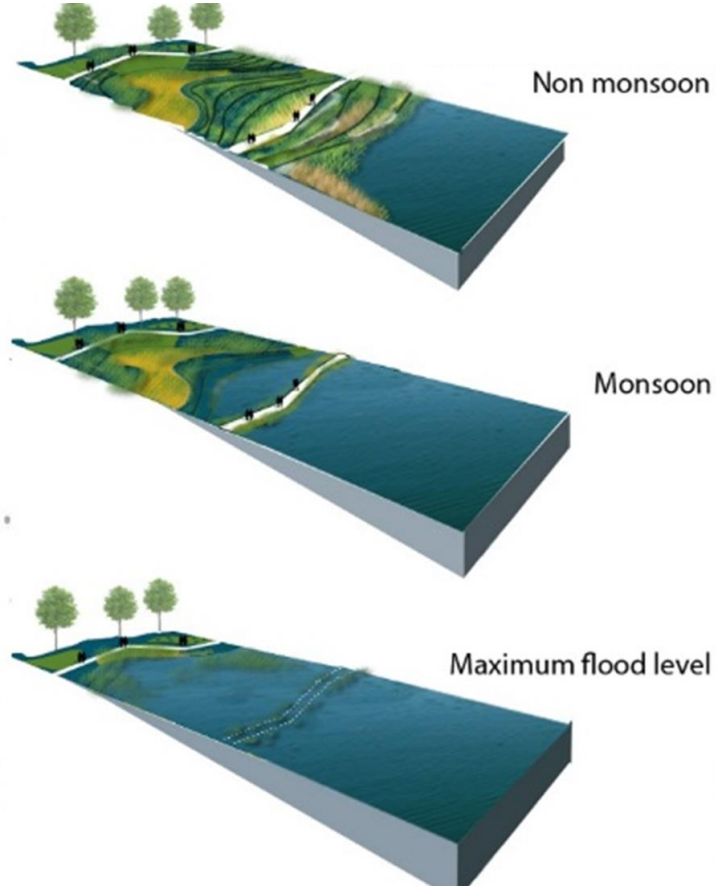
Treatment Wetlands at Periyakulam lake



Treatment Wetlands at Periyakulam lake (under construction)

Biodiversity Enhancement measures

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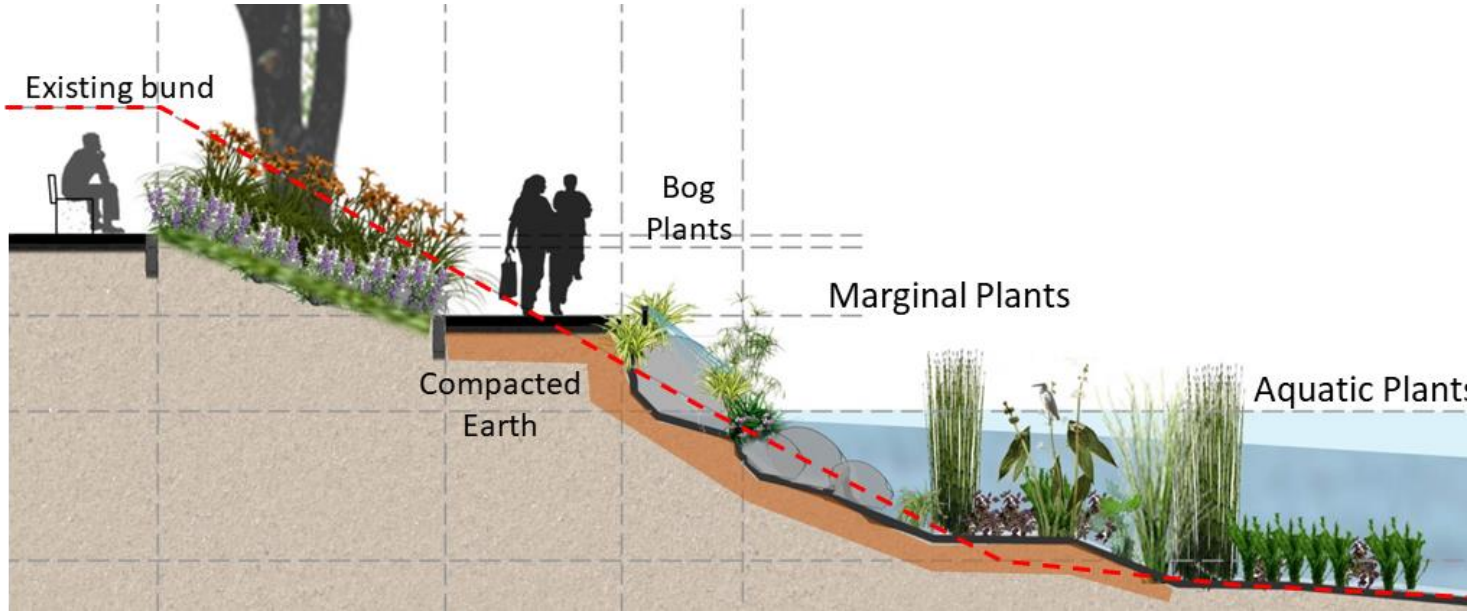
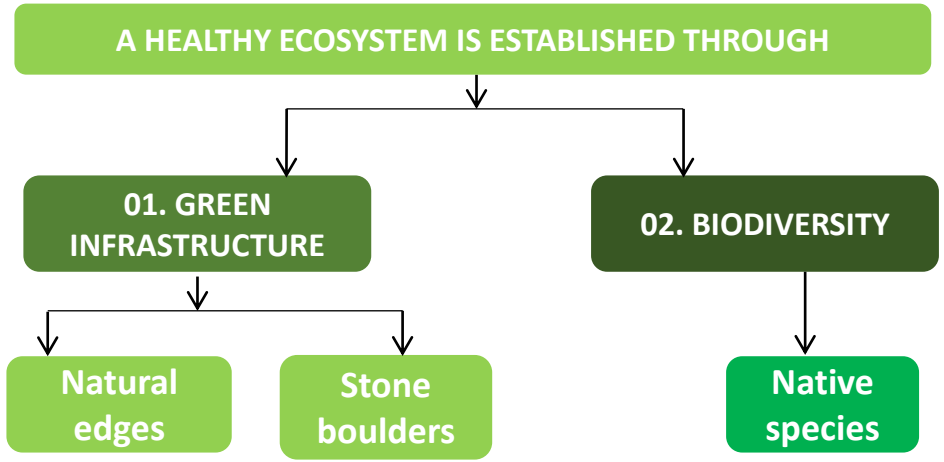
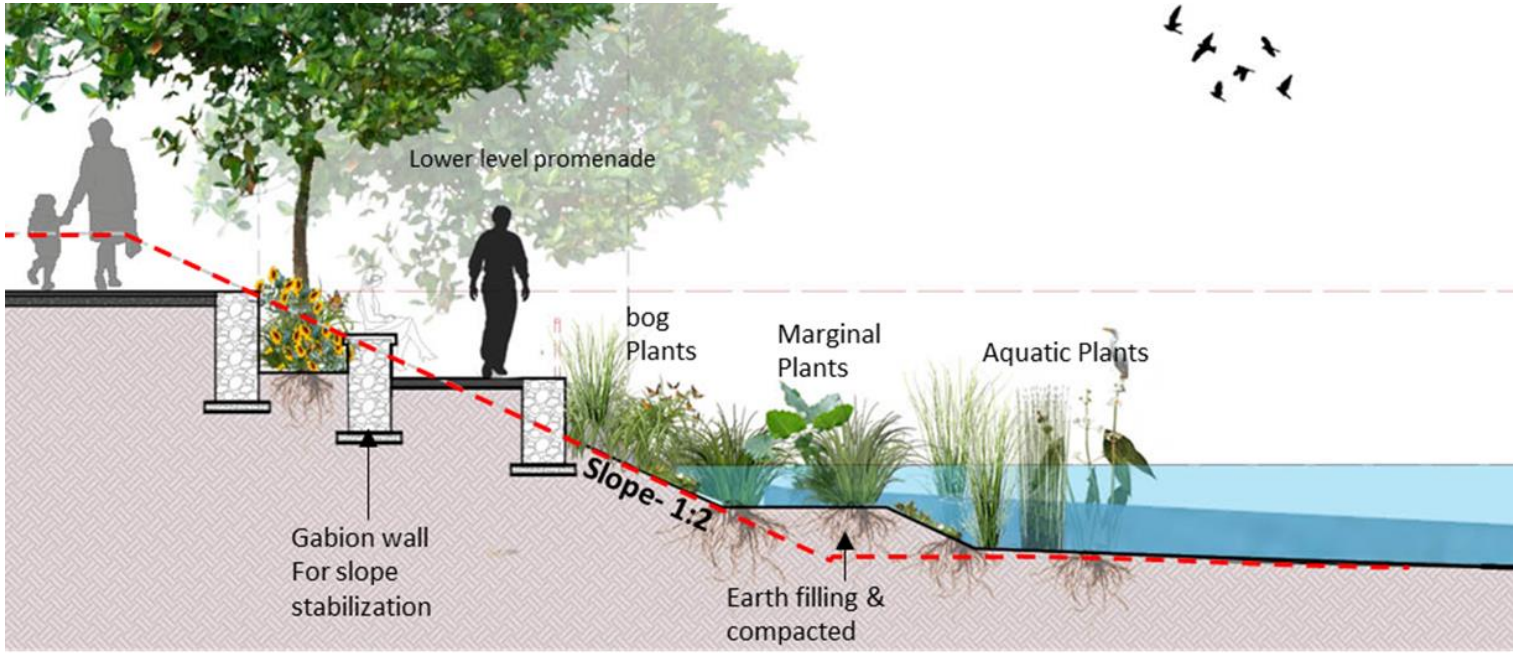
Active green edges





Promotes Biodiversity Enhancement across the littoral and upland zone

Slope stabilisation



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Plantation of Native species

Native plants are planted in stratified layers and varying character to create active edges and also habitat for different species


Barleria grandiflora

Bacopa monnieri

Alangium salvifolium

Mesua nagassarium


Sansevieria roxburghiana


Clematis triloba


Barringtonia acutangula


Calophyllum inophyllum


Buchanania axillaris


Arundo donax


Papyrus


Colocasia esculenta


Juncus effusus


Typha


Acorus calamus


Sagittaria guyanensis


Ipomoea aquatica


Geissaspis cristata


Ottelia alismoides


Hydrocera triflora


Aeschynomene aspera


Aponogeton natans


Blyxa aubertii

Valankulam and Selvachintamani lakes

Active edges and Native planting

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Eco-Zones

No human zone

Zone for exclusive biodiversity

Guided tours for schools

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Urban Flood Management

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- Redesign – surplus weirs to handle current flood Discharges
- Provision of Sluice gates for management of water levels in the lake – flood management regime and lake maintenance
- Improve the carrying capacity of drains
- Suggest alternative drainage routes for flood management

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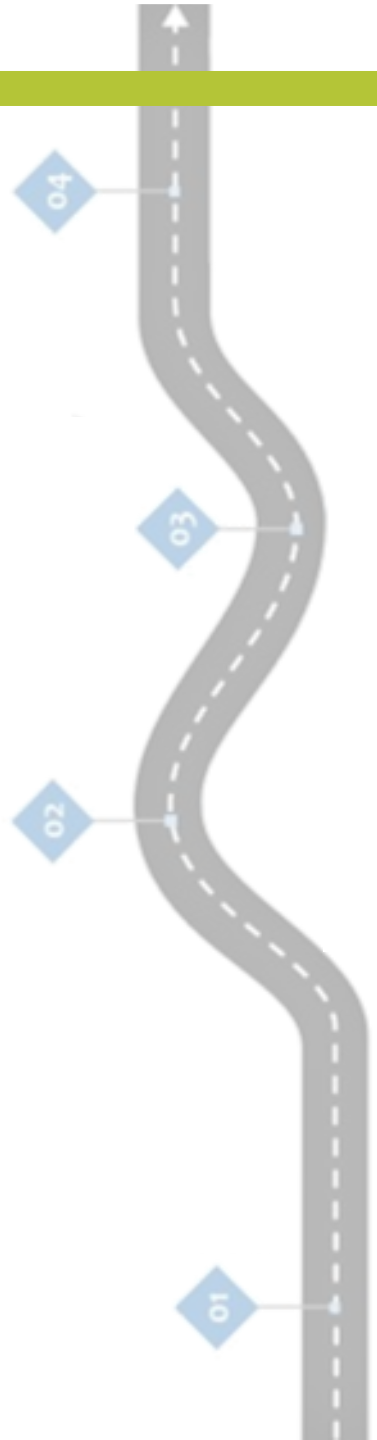
Key lessons & Obstacles faced

- It is possible to imagine Nature based solutions(NbS) in India
- Waste water Infrastructure – Majority were conventional secondary treatment systems due to space constraints, followed by tertiary treatment wetlands(NbS)
- Frequent changes in project personnel(Government and PMC)
  - Led to execution delays
  - Deviation from original design
- Water components delayed/Redesigned
- Workmanship challenges



Recommendations Scaling up

- Need more pilots and live demonstrations
- NbS to be justified economic sense
  - Capital and operation expenses
- NbS should be justified on ease of maintenance
- Developing ecosystem of contractors
- Working on mindset changes
  - Decision makers in Government
  - Contractors/Engineers to unlearn, accept & adapt to NbS

Thank You

Source: Tour explore India

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