Forests4Water: The Role of Forest Ecosystems in Safeguarding Water Resources – Session I

05 SEPTEMBER 2025

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AGENDA

- Welcome, Introduction and housekeeping
  Jaidev Joshi, Programme Officer, Water & Wetlands, IUCN
- The Crucial Role of Forests in Water Conservation: An Ecological Perspective on the Forest-Water link
  Dr. M Shah Hussain, Ecologist & Scientist Incharge, (CEMDE) , University of Delhi
- Healthy forests for thirsty cities
  Sahana Goswami, Senior Program Manager, WRI India
- Moderated Panel discussions including Q and A ,lessons learned, & Closing
  Afia Siddiqui, Learn Officer , IWA

INTRODUCTION

- The webinar series is co-organized by the International Water Association (IWA) and the International Union for Conservation of Nature (IUCN).

- It will showcase global and regional experiences on integrating ecosystem-based approaches that harnesses the combined power of forest and water ecosystems for improving city planning and adaptation strategies.

INTRODUCTION

- The first webinar will examine how **landlocked cities** can reconnect forests and water systems to strengthen urban resilience.

- The webinars will anchor discussions around three core dimensions: (1) science, knowledge, and policy to understand forest–water linkages; (2) planning and implementation challenges and solutions; and (3) community innovation and social resilience through inclusive governance, youth engagement, and localized actions

WEBINAR INFORMATION

- This webinar will be **recorded and made available "on-demand"** on the IWA Connect Plus platform and IWA Network website, with relevant information.
- The **speakers** are responsible for **securing copyright permissions** for any work that they will present of which they are not the legal copyright holder.
- The opinions, hypothesis, conclusions or recommendations contained in the presentations and other materials are the **sole responsibility of the speaker(s)** and do not necessarily reflect IWA & IUCN's opinion.

WEBINAR INFORMATION

- **'Chat' box**: please use this for general requests and for interactive activities.
- **'Q&A' box**: please use this to send questions to the panelists. (We will answer these during the discussions)

Please Note: *Attendees' microphones are muted. We cannot respond to 'Raise Hand'.*

SPEAKERS PROFILE

Dr. M Shah Hussain, Ecologist & Scientist Incharge, (CEMDE) , University of Delhi

Dr. M. Shah Hussain is an Ecologist and currently serves as the Scientist Incharge of the Aravalli and Neela Hauz Biodiversity Parks under the Biodiversity Parks Programme of CEMDE, a Centre of Excellence under MoEF&CC, Government of India at the University of Delhi. He holds a PhD in Wildlife Sciences and has over two decades of experience in ecosystem restoration, urban biodiversity conservation, and rejuvenation of degraded landscapes.

Sahana Goswami, Senior Program Manager, WRI India

Sahana is a Senior Program Manager with the Urban Water and Climate Resilience practice at WRI India. In her current role, she leads action research on water resilience with a focus on natural infrastructure and blue-green solutions, and circular economy approaches such as resource recovery from wastewater streams.

Aravalli Biodiversity Park

IWA the international water association SOUTH ASIA

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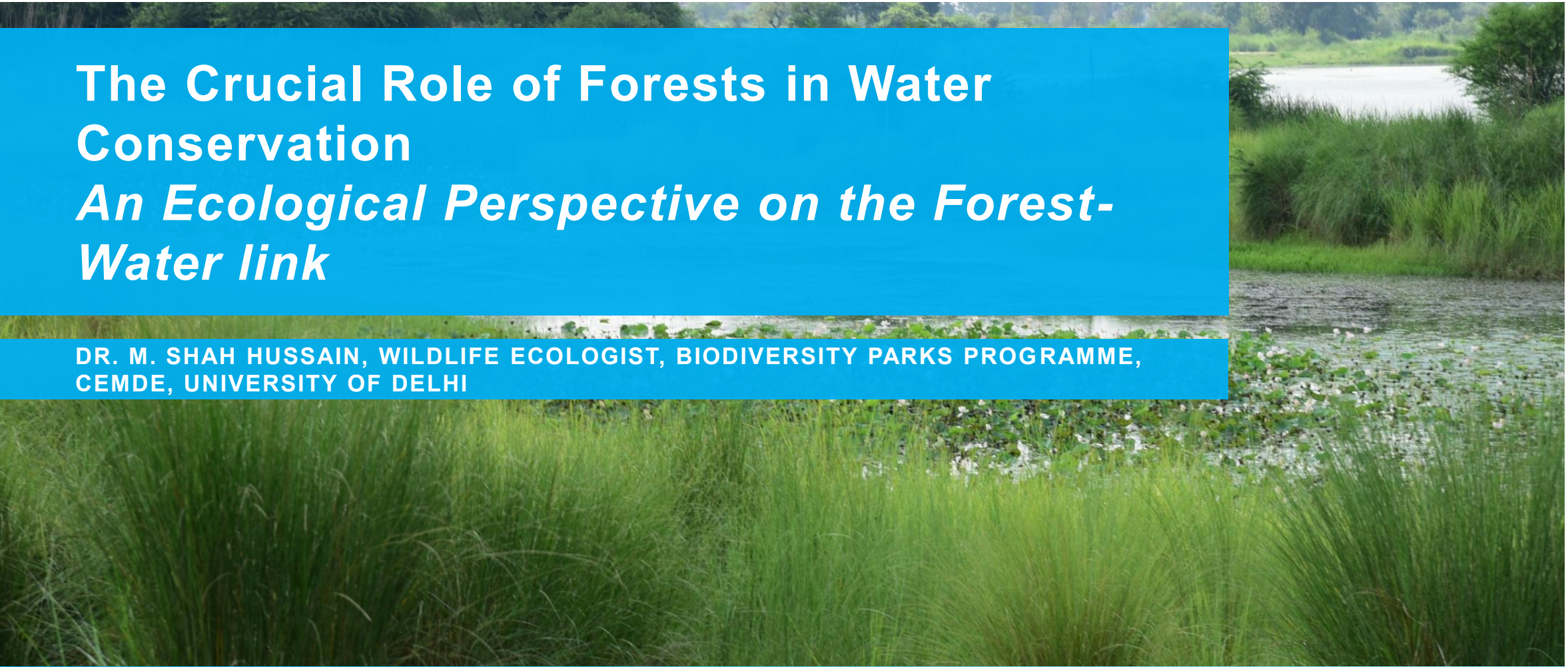
The Crucial Role of Forests in Water Conservation

An Ecological Perspective on the Forest-Water link



DR. M. SHAH HUSSAIN, WILDLIFE ECOLOGIST, BIODIVERSITY PARKS PROGRAMME, CEMDE, UNIVERSITY OF DELHI

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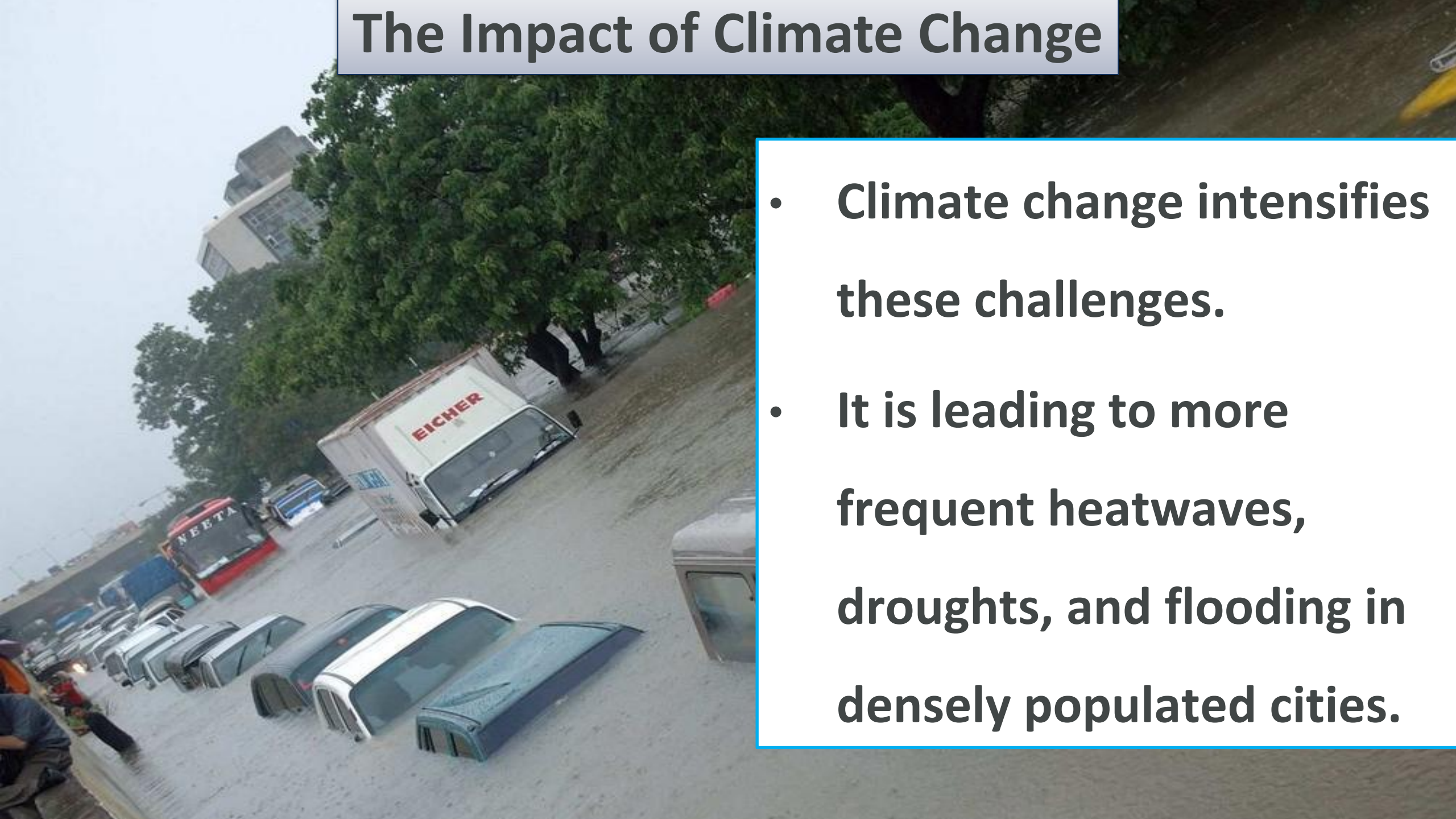
URBAN WATER CRISIS

- Urban areas face growing water stress, ecological degradation, and climate-related risks.
- Rapid land-use changes, deforestation, and the loss of wetlands disrupt natural urban water cycles.
- This leads to reduced natural recharge of groundwater and increased surface runoff.

The Impact of Climate Change

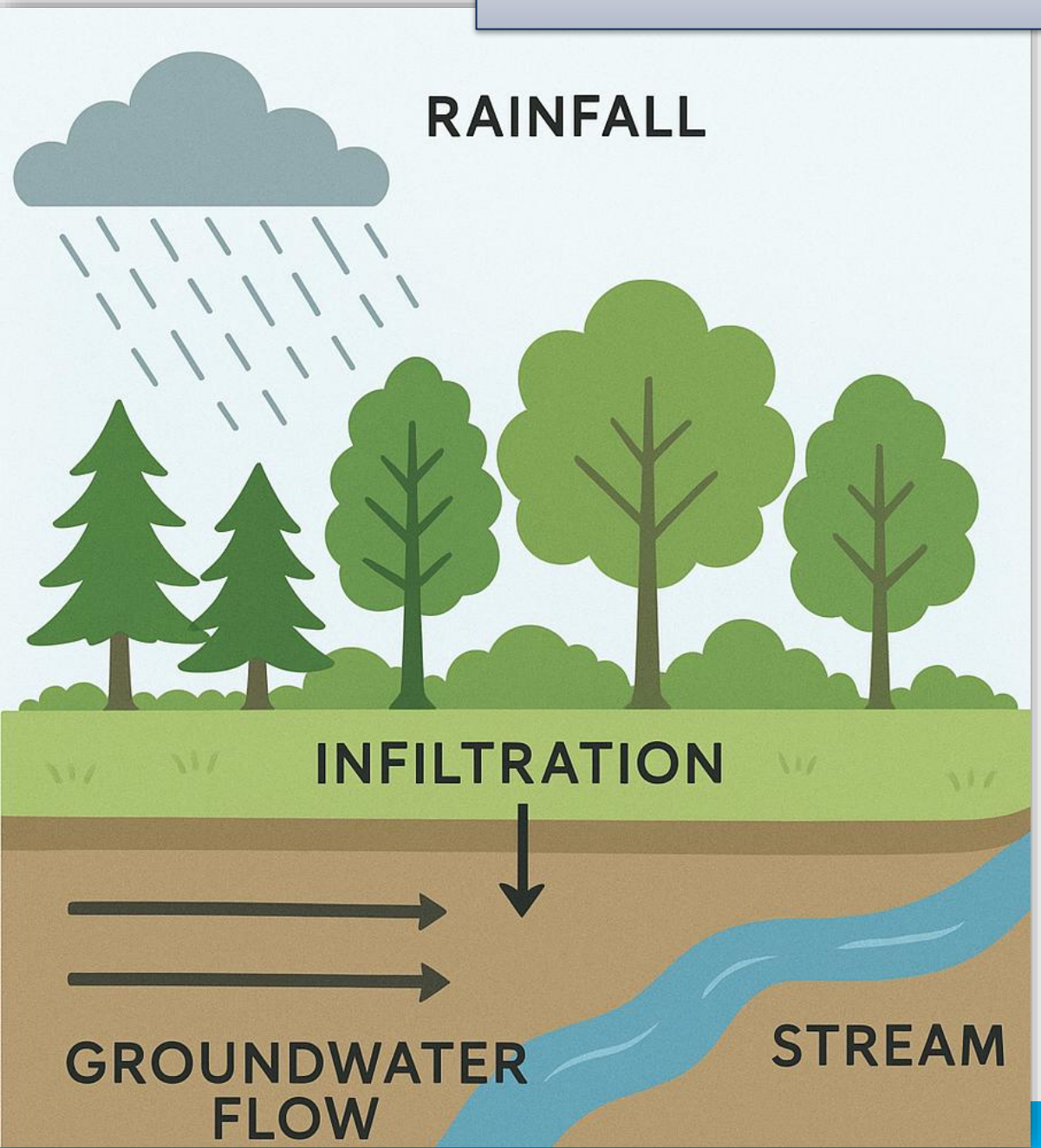


- Climate change intensifies these challenges.
- It is leading to more frequent heatwaves, droughts, and flooding in densely populated cities.

A Proven Solution: Forests

- Forests are a powerful and proven solution to urban water challenges.
- They function as critical green infrastructure, creating more resilient and liveable cities.

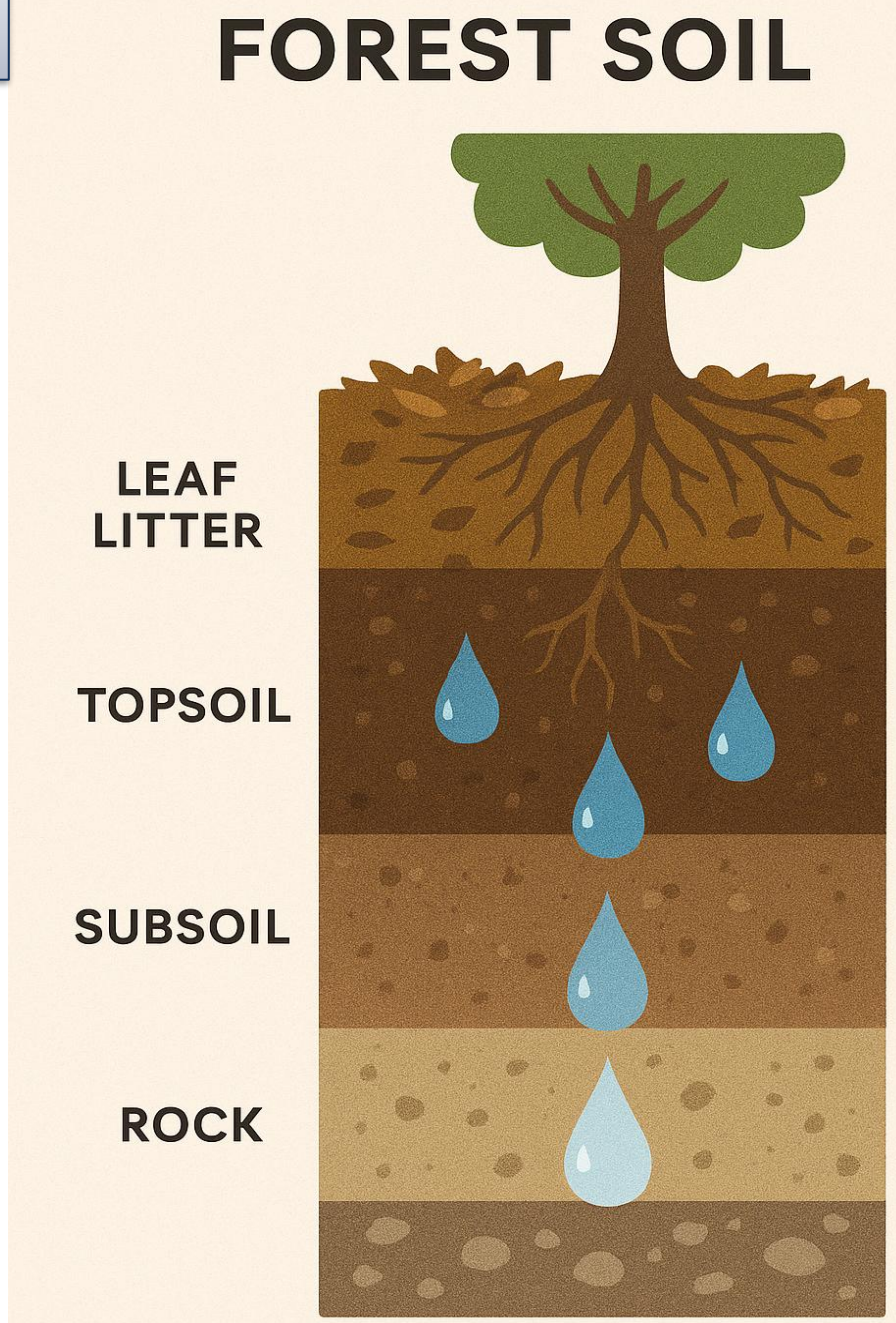
The Science of Forest Hydrology



- Forest ecosystems act as natural sponges.
- They regulate hydrological flows, absorbing rainwater and slowly releasing it.
- This process helps maintain a steady base flow in rivers and streams, preventing both floods and droughts.

HOW FORESTS FILTER AND RECHARGE

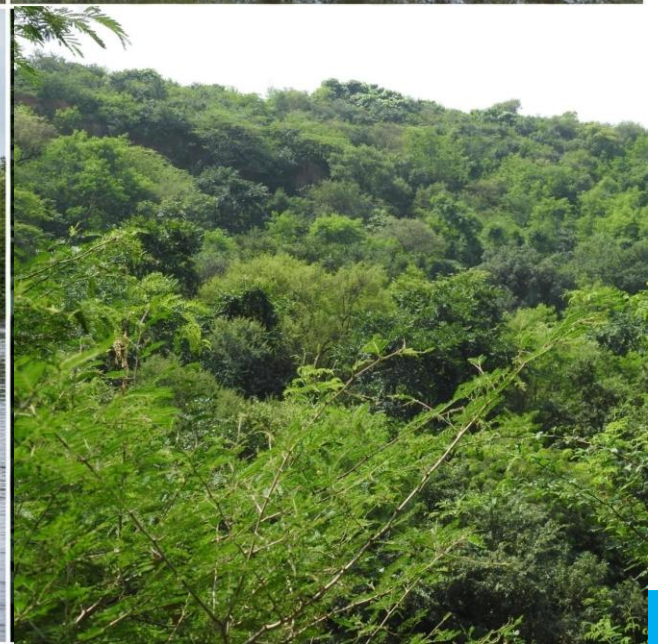
- Forest soils and root systems act as natural filters, removing pollutants and contaminants.
- This biological and physical filtration improves water quality.
- They also facilitate the recharge of groundwater aquifers, which is crucial for urban water supply.



Reducing Erosion and Sediment

- Forests and their dense ground cover significantly reduce soil erosion.
- This prevents sediment from entering water bodies, which helps maintain water quality.
- It also reduces the risk of landslides in hilly regions and protects critical infrastructure downstream.

Forests as “Green Infrastructure”



- Forests within urban areas provide multiple ecological services.
- Examples include: urban ridges, mangroves, riparian zones, and Biodiversity or Eco parks.
- These are essential for urban resilience and climate adaptation.

The Urban Green Space Deficit

- Most cities in India fall below the WHO norm of 9 m^2 of green space per capita.
- Examples: Chennai (0.81 m^2) and Pune (1.4 m^2).
- Only around half of Indian cities meet the URDPFI guidelines of 12-18% green cover.

URDPFI (Urban and Regional Development Plans Formulation and Implementation Guidelines)

The Urgency of Reconnecting

- Urban decisions have impacts on distant ecosystems.
- Climate change is intensifying hydrological extremes.
- We urgently need to re-establish the forest-water connection in urban policy and planning.

Landlocked Cities & Their Challenges

- These cities often suffer from shrinking green cover and degraded seasonal rivers.
- Over-extraction of groundwater compromises natural recharge.
- This intensifies urban heat and flood risks and threatens long-term water security.

Coastal Cities & Their Challenges

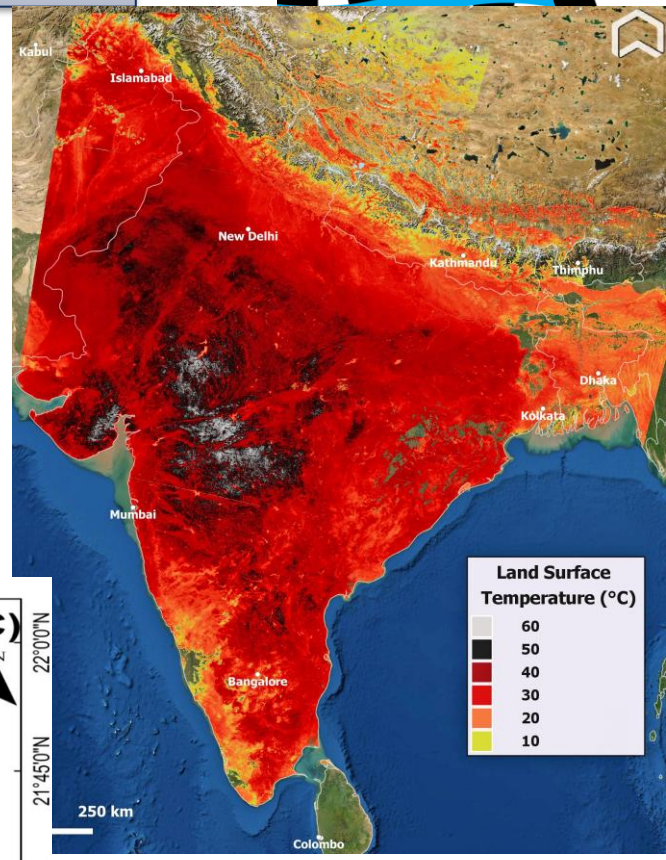
- Coastal cities are vulnerable to saline intrusion and tidal flooding.
- Loss of mangrove ecosystems, sea-level rise, and land-use changes heavily influence their hydrology.

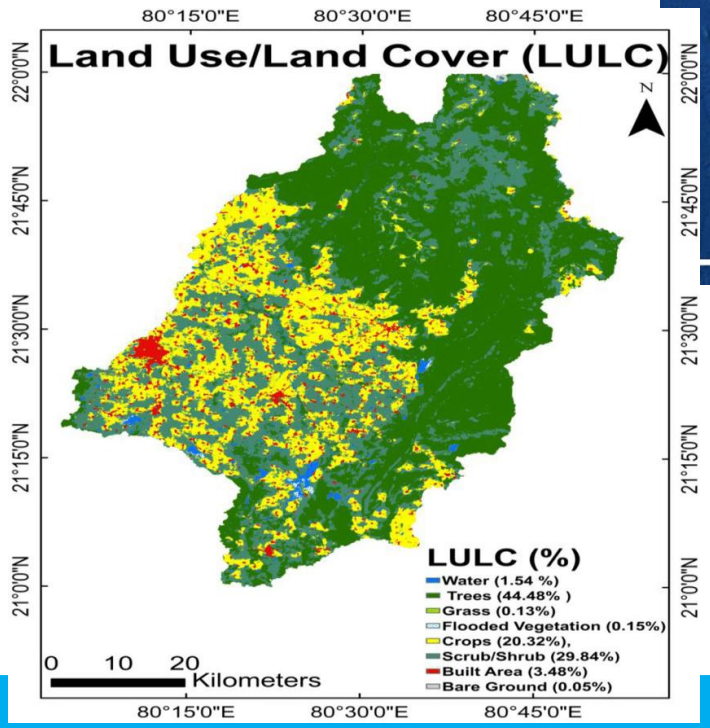
Mountain Cities & Their Challenges

- Mountain cities rely on upstream forests for water regulation and slope stability.
- They face high sensitivity to deforestation, landslides, and reduced base flows, affecting both local and downstream populations.

Integrating Science into Planning

- Integrating forest ecosystems into city planning requires a scientific basis.
- Tools like GIS-based forest mapping and land-use change analysis are crucial for informed decisions.





Implementing Solutions on the Ground

- Successful interventions include Biodiversity Parks, riparian buffers, urban afforestation, and wetland restoration.
- These solutions can be scaled up to address city-wide challenges.

National & State Programs

- Schemes like the Nagar Van Yojana, Green India Mission, and the Compensatory Fund Act (CAMPA) can support urban forestry interventions.
- Their effectiveness depends on how they are integrated at the city level.

Community Innovation & Resilience, Participatory Governance

- The critical role of people and partnerships in sustaining ecological outcomes cannot be overstated.
- Community-led efforts and eco-literacy initiatives build social resilience.

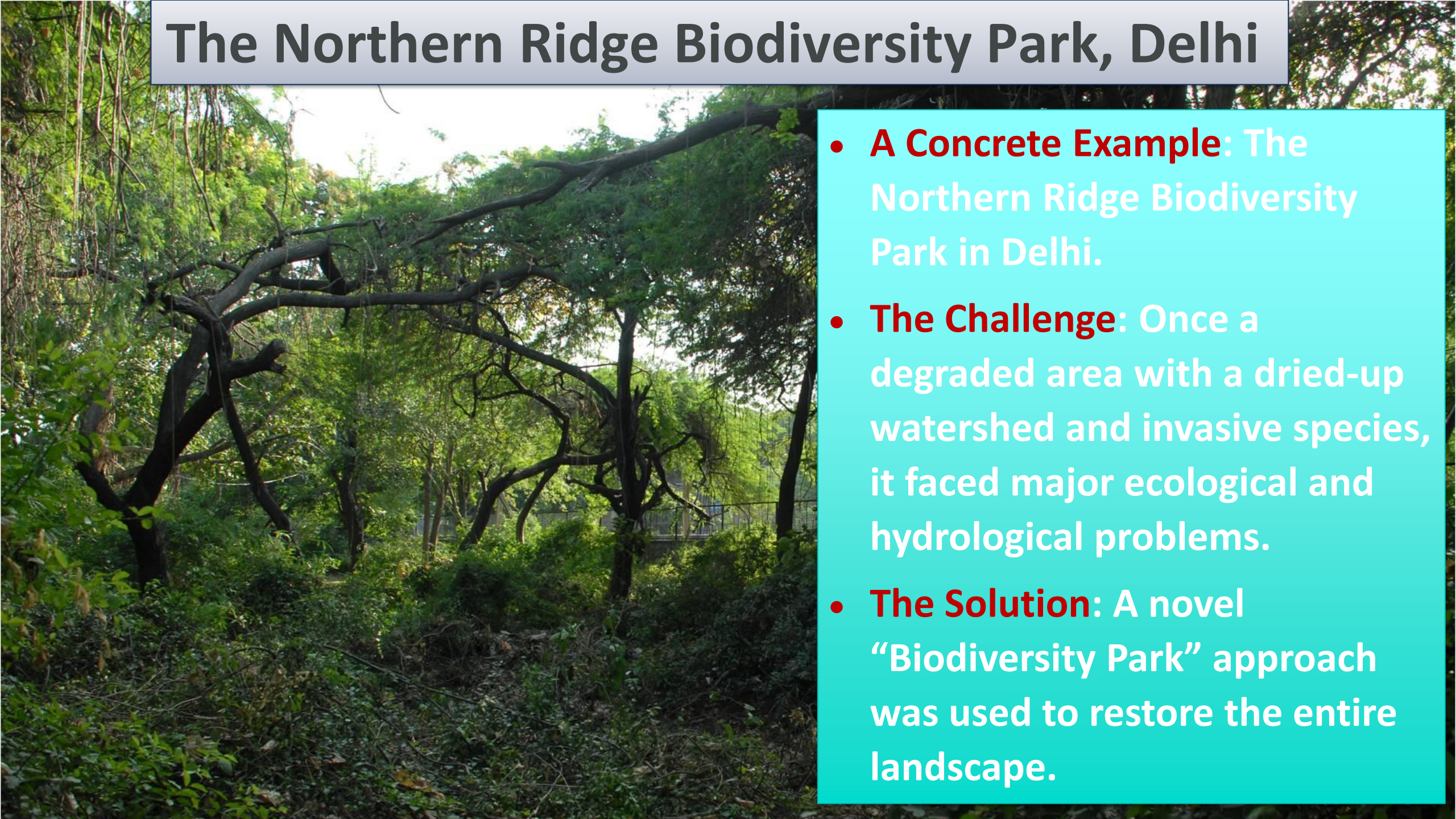
- Inclusive planning and community leadership are key to restoring forests and water systems.
- This is especially important for vulnerable groups most affected by climate impacts.

The Audience: A Call to Collaboration

- **Urban & Regional Planners:** Integrate forests into your designs.
- **Water Utility Professionals:** Recognise the value of forests as natural water infrastructure.
- **Policymakers:** Champion policies that protect and restore forest ecosystems.

CASE STUDIES

The Northern Ridge Biodiversity Park, Delhi



- **A Concrete Example**: The Northern Ridge Biodiversity Park in Delhi.
- **The Challenge**: Once a degraded area with a dried-up watershed and invasive species, it faced major ecological and hydrological problems.
- **The Solution**: A novel “Biodiversity Park” approach was used to restore the entire landscape.

Planning & Assessment

- **Baseline Survey**: A comprehensive ecological survey to understand the site's original state.
- **Hydrological Mapping**: Mapping of original drainage networks and water flow patterns.
- **Scientific Collaboration**: An interdisciplinary team of botanists, zoologists, and hydrologists was crucial.

The “Biodiversity Park” Approach

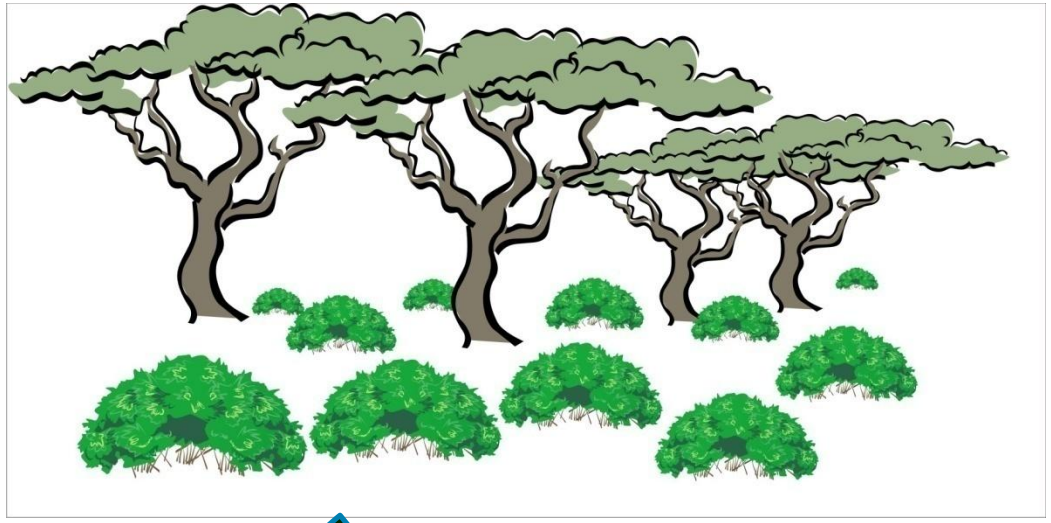
- **A Holistic, Landscape-Level Restoration Model.**
- It integrates hydrological recovery with the re-establishment of native plant and animal communities.
- Aims for long-term ecological resilience and functional recovery.

Implementation - Hydrological Restoration

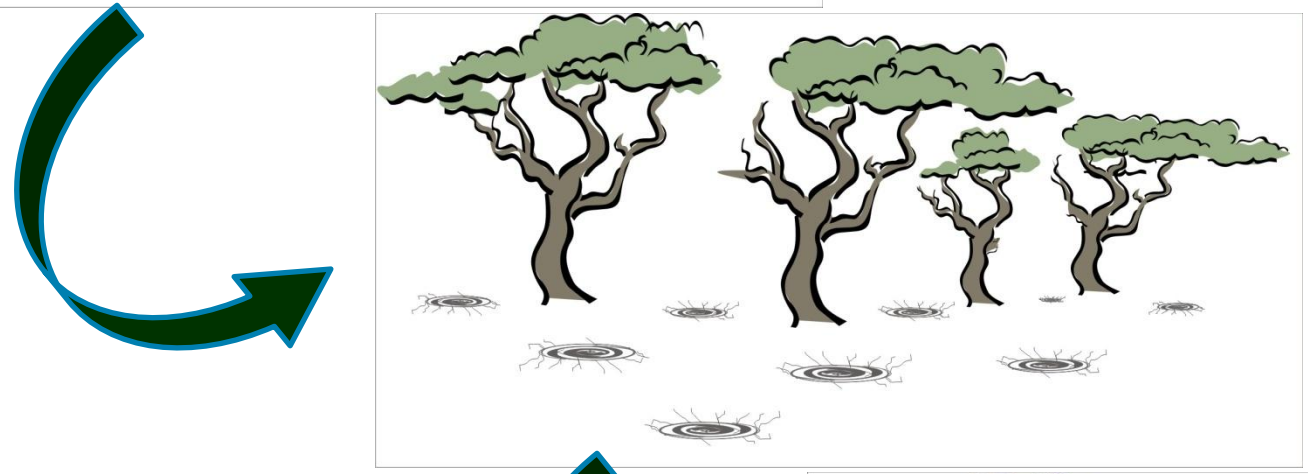
- **Restoring Drainage**: Re-excavating and clearing original drainage networks to manage surface runoff.
- **Constructing Check Dams & Bunds**: Using natural, locally sourced materials to slow water flow and prevent erosion.
- **Re-establishing Wetlands**: Creating natural depressions and wetlands to capture and store rainwater.

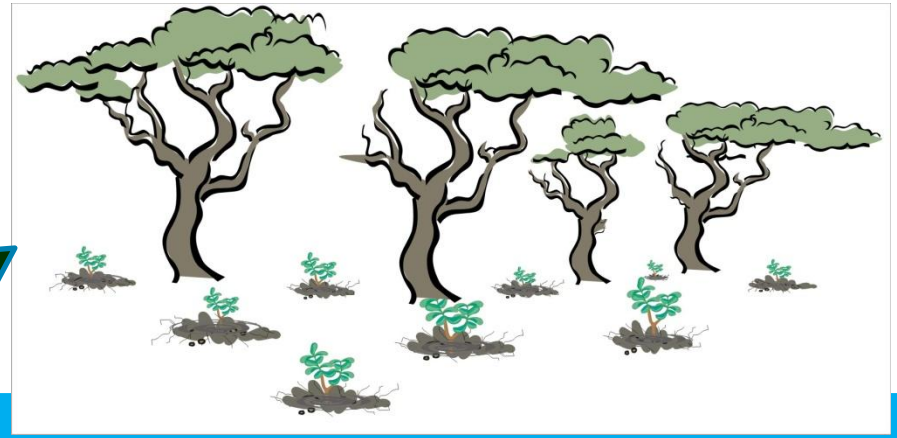
Implementation - Ecological Restoration

- **Invasive Species Management**: Using innovative methods like the "Canopy Opening Method" to remove invasive weeds.
- **Native Species Reintroduction**: Replanting tens of thousands of native trees and shrubs that were once characteristic of the Aravalli range.
- **Habitat Creation**: Creating diverse habitats for different species, including aquatic life and ground-dwelling animals.

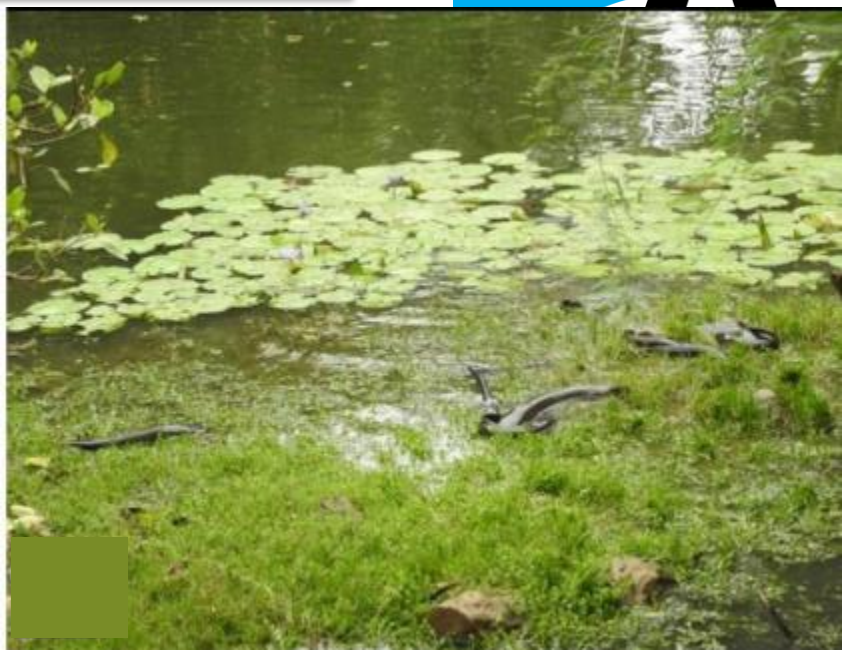


Canopy-opening and cut root stock methods are being used to restore the native forest communities of Northern Ridge





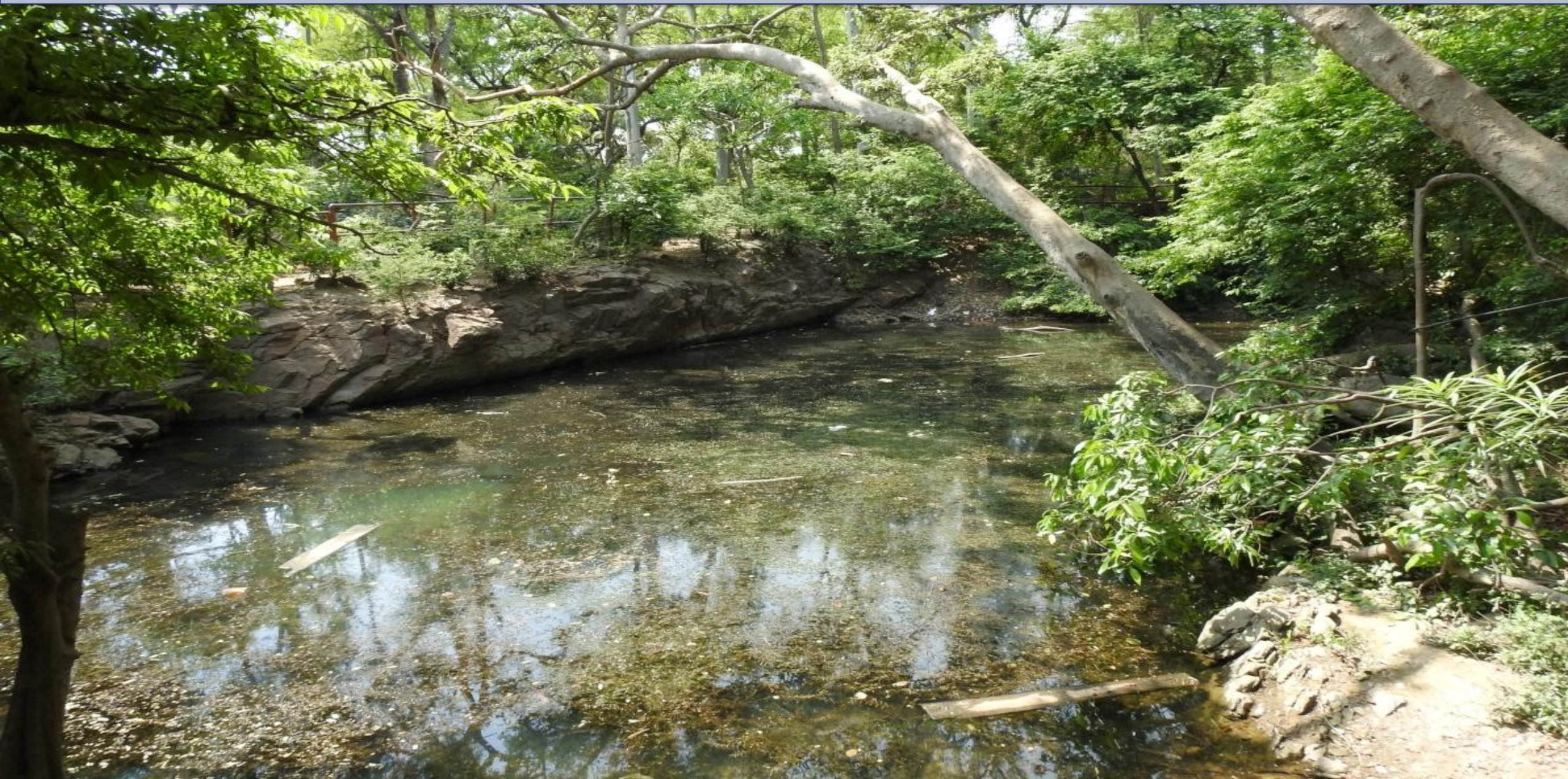
The Findings - Hydrological Results



- **Peak Discharge:** The natural potential of the watershed was estimated at a peak discharge of 9.10 cubic meters per second.
- **Water Storage:** The restored wetland stores up to 14,183 cubic meters of water during the monsoon season.
- **Groundwater Recharge:** The unique rocky substrate facilitates rapid infiltration, directly recharging Delhi's aquifers.

Singh et al. (2025). https://doi.org/10.1093/jue/juaf009

Rejuvenated wetland: Surface runoff is drained into it which promote recharging of ground water and serve as water holes for primates



The Findings - Biodiversity Results

- **Aquatic vegetation**: Native aquatic plants like *Hydrilla verticillata* and *Nymphaea* species were re-established.
- **Faunal diversity**: The number of bird, butterfly, and herpetofauna species increased significantly.
- **Breeding populations**: Breeding populations of native species, such as the Indian flapshell turtle, were observed.

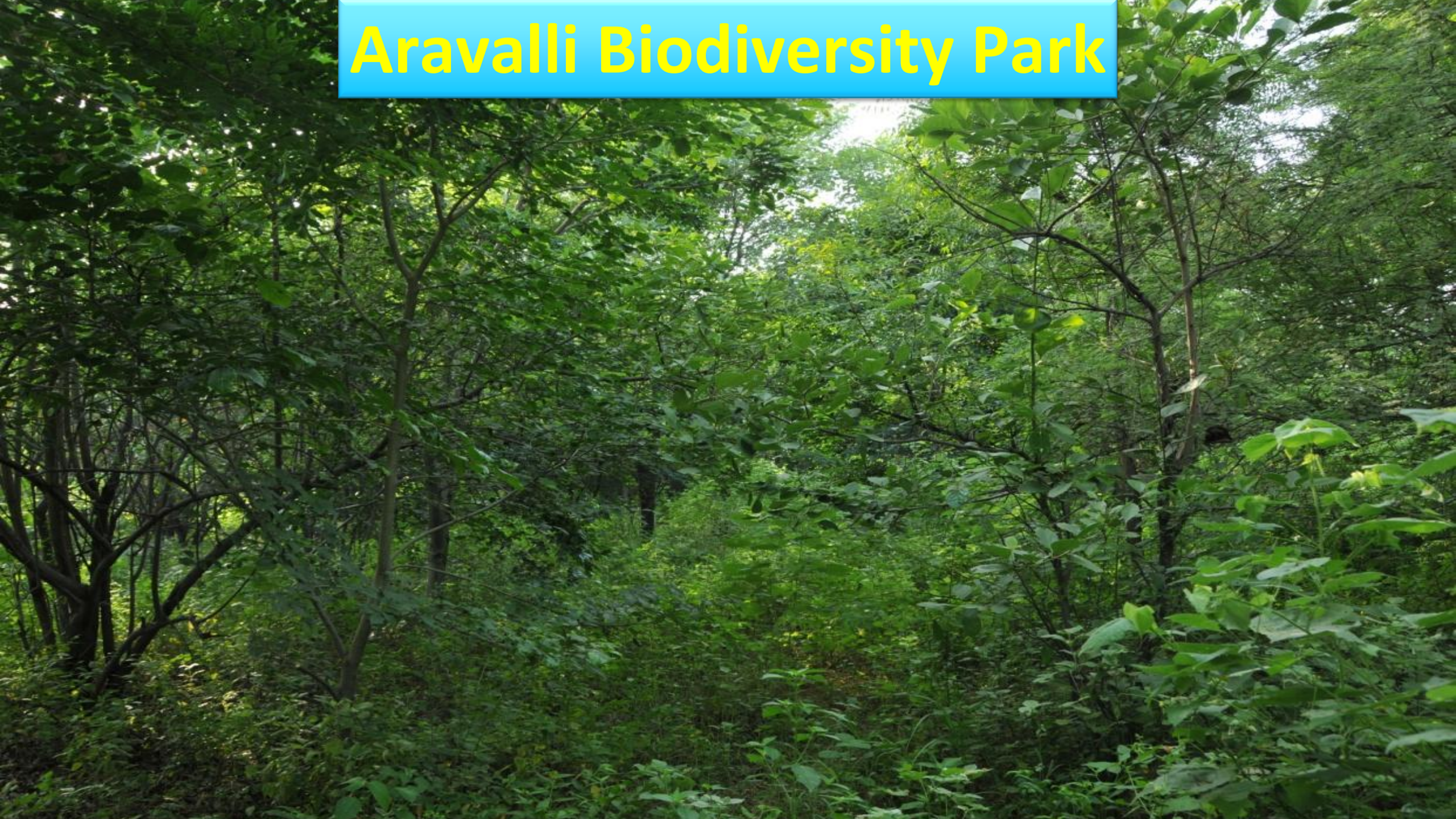
Long-Term Management & Community Involvement

- **Public Awareness**: The work involved continuous public awareness programs and events.
- **Community involvement**: Residents were educated on the ecology of the Ridge and the importance of conservation.
- **Direct participation**: Public events encouraged participation and discouraged harmful activities like waste dumping.

Key Takeaways and Implications

- **Holistic Approach**: A comprehensive, landscape-level approach is more effective than small, fragmented projects.
- **Nature-Based Solutions**: Ecological restoration is a powerful and cost-effective solution for urban water challenges.
- **Water Harvesting**: The Northern Ridge is a proven rainwater harvester, showcasing the potential of natural systems to recharge groundwater.
- **Sustainable and Resilient Cities**: A future where urban ecosystems are an integral part of city infrastructure.
- **A New Mindset**: Shifting from a gray infrastructure model to a green infrastructure model.

Aravalli Biodiversity Park

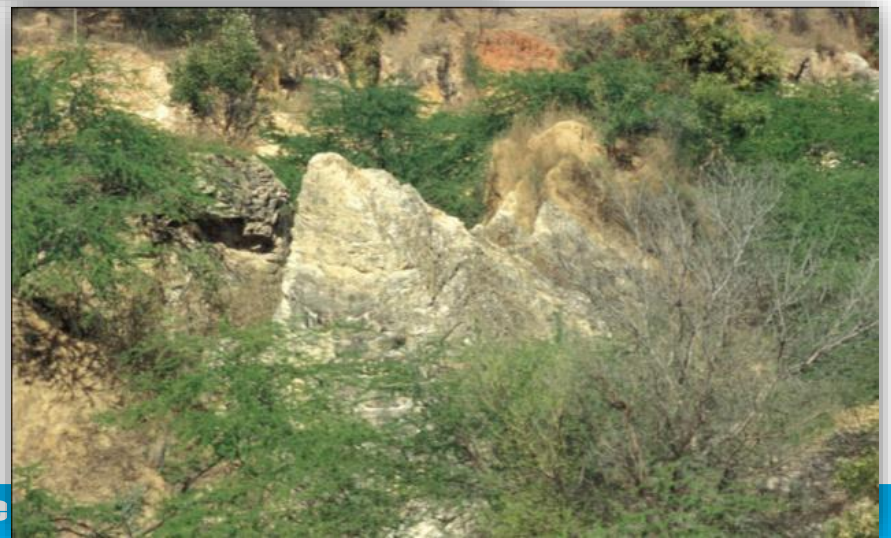


Topographic Features

Sharply undulating and rugged terrain with deep pits of varying sizes having very steep to moderately steep slopes; low ridges present

Central flat lands with small and shallow depressions and undulating terrain; pits are few and shallow

Area with high moisture retaining capacity, with small [illegible]s; mildly undulating terrain with small hillocks, low ridges and shallow depressions



Morrum mined pit

the international water association

Developed as *Wrightia* dominated community

Morrum mined pit

the international water association

Developed as riparian vegetation and water body

Barren degraded area

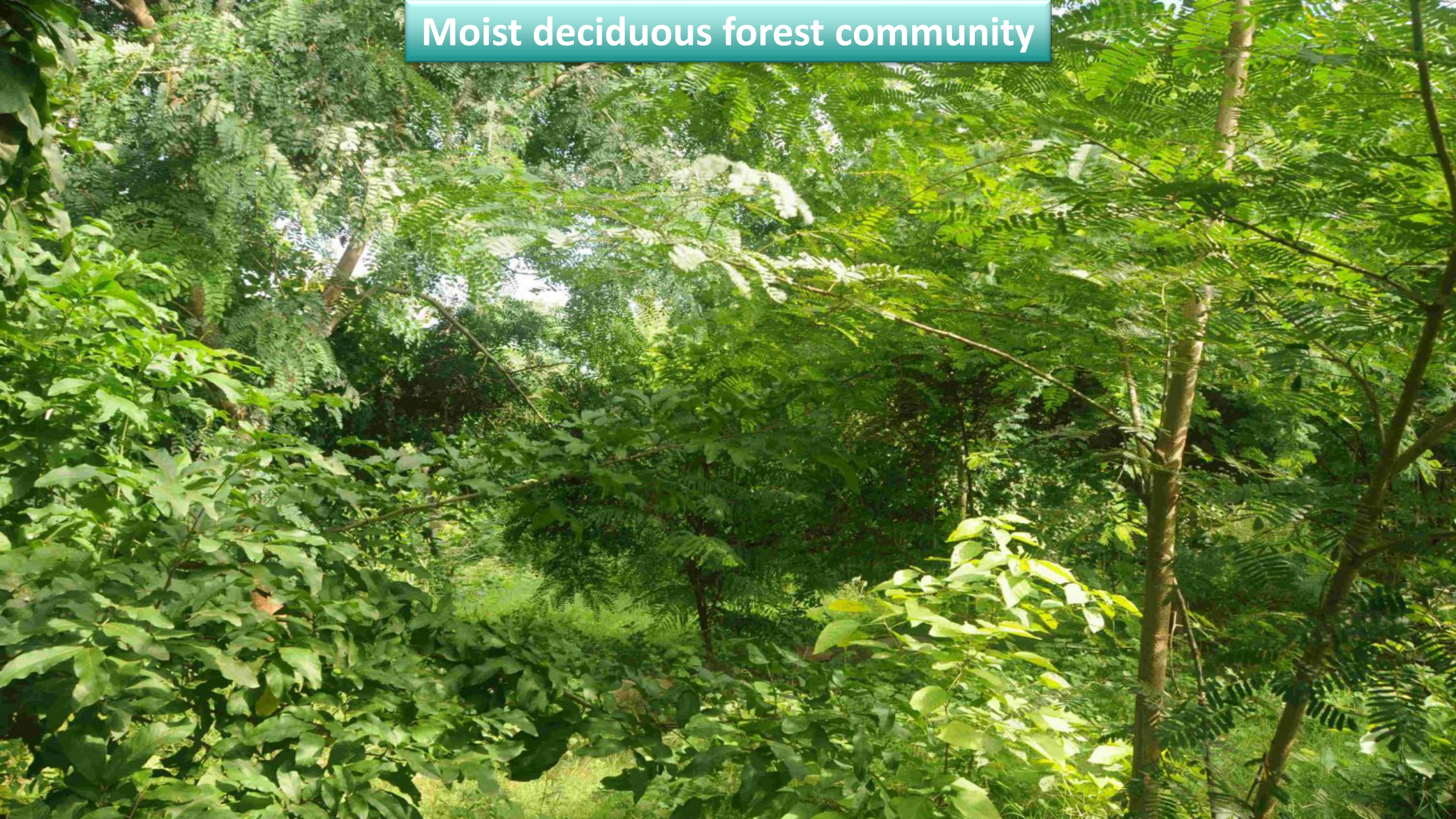
the international water association

Developed as Moist deciduous forest

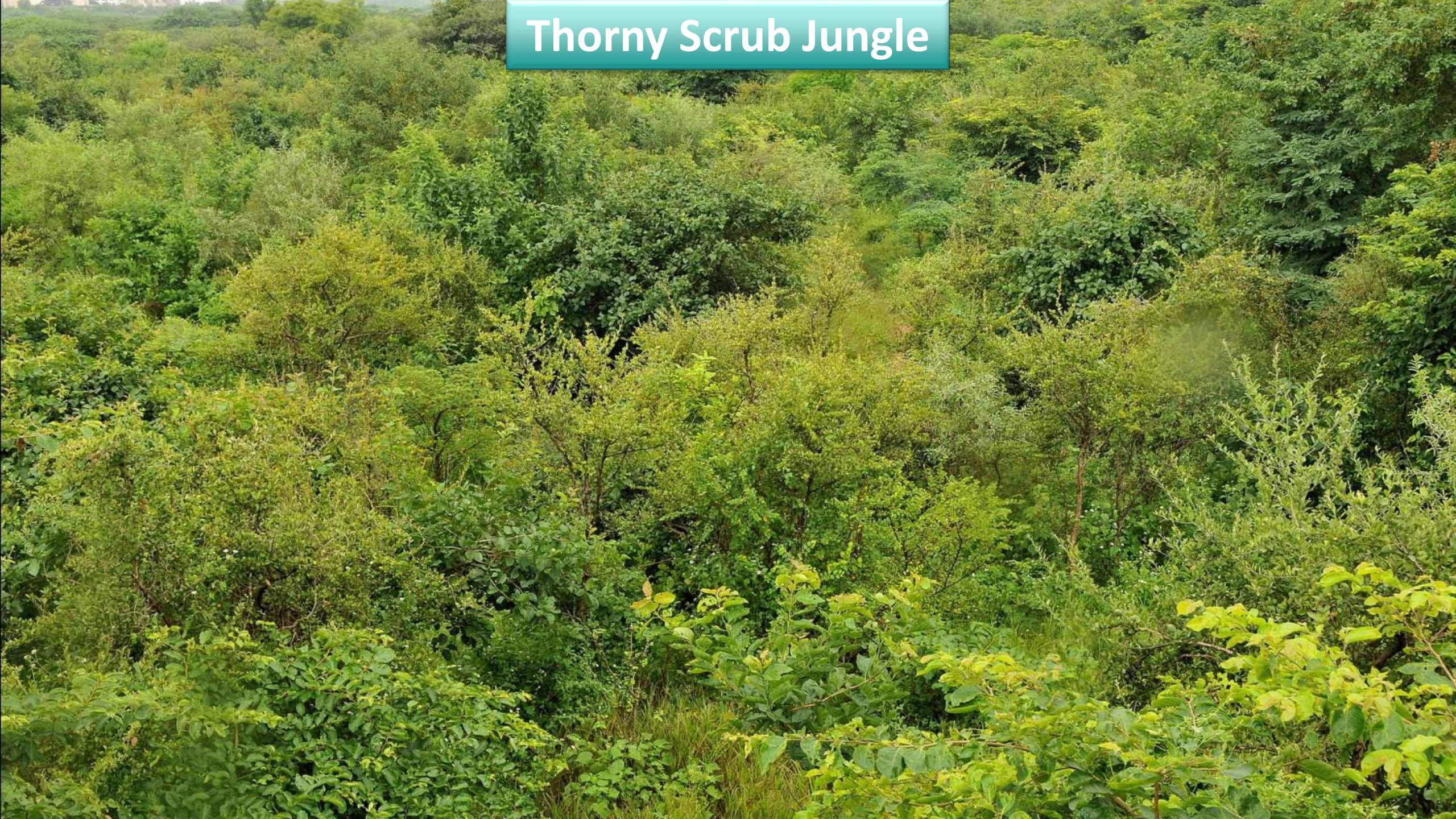
Wrightia-Holarrhena plant community

Garuga -Anogeissus plant community

Moist deciduous forest community



Alangium dominated plant community


Thorny Scrub Jungle

Aravalli Biodiversity Park

Environmental Impact of ABP's 2,02,100 Trees in 500 acres of restored land

Carbon Storage & Sequestration:

- **Stores:** 8,360.24 tonnes of carbon (valued at approximately ₹11.34 crores).
- **Sequestered Annually:** 7,24,781 kg of carbon.

Water Management:

- **Prevents:** Approximately 30 lakh litres of surface runoff each year.
- **Benefit:** This aids in groundwater recharge, valued at ₹5.90 lakhs annually.

Air Quality:

- **Removes:** 12,688.85 kg of air pollutants annually.
- **Benefit:** This provides an environmental benefit of around ₹1.89 crores per year.

Plant Communities developed are used as food base by animals









Forest Communities developed are used for breeding and shelter by animal species









Successful nesting of birds in Aravalli Biodiversity Park

House Sparrow Conservatory

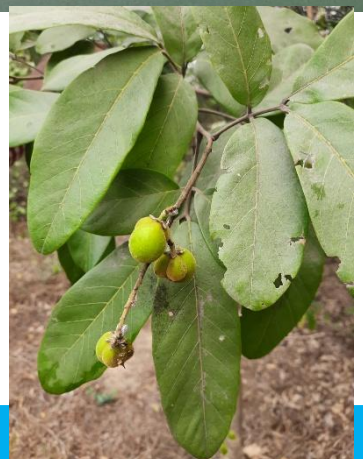
House Sparrow-State bird of Delhi is surviving very well in ABP

Pollinators' Conservatory- First in Delhi




Succulent Plant Species Conservatory

Neela Hauz Biodiversity Park



A Nature Trail has taken shape with full-grown trees beside the lake.

Earlier

Now


Thanks

WRI INDIA

IWA the international water association SOUTH ASIA

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Healthy forests for thirsty cities

SAHANA GOSWAMI, SENIOR PROGRAM MANAGER, WRI INDIA

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CONTENTS

- About WRI India
- Forests as natural water managers
- Forests and water in the Indian context – urban dependencies
  - India's water and forest scenario
  - Watershed - Exploring forest linkages in the Kaveri watershed to Bengaluru's water supply
- Global examples
  - Valuing ecosystem services provided by forests in Sao Paulo's water supply
  - Potential of leveraging ecosystem services for Rio de Janeiro
  - New York City's Filtration Avoidance Determination
- Cities4Forests Initiative

ABOUT WRI INDIA

WRI INDIA

the international water association SOUTH ASIA

IUCN

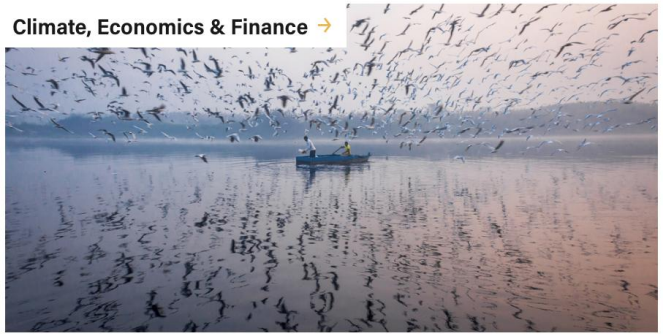
WRI INDIA PROGRAMS RESEARCH PERSPECTIVES About Our Approach

What We Do

WRI India works to improve people's lives, protect and restore nature, and address climate change. As an independent research organization, we leverage our data and expertise to catalyze change across systems like food, land and water; energy and cities. To accelerate progress at scale, we also engage with the economic, finance and governance systems that are key to enabling this change. Learn more about our focus areas:

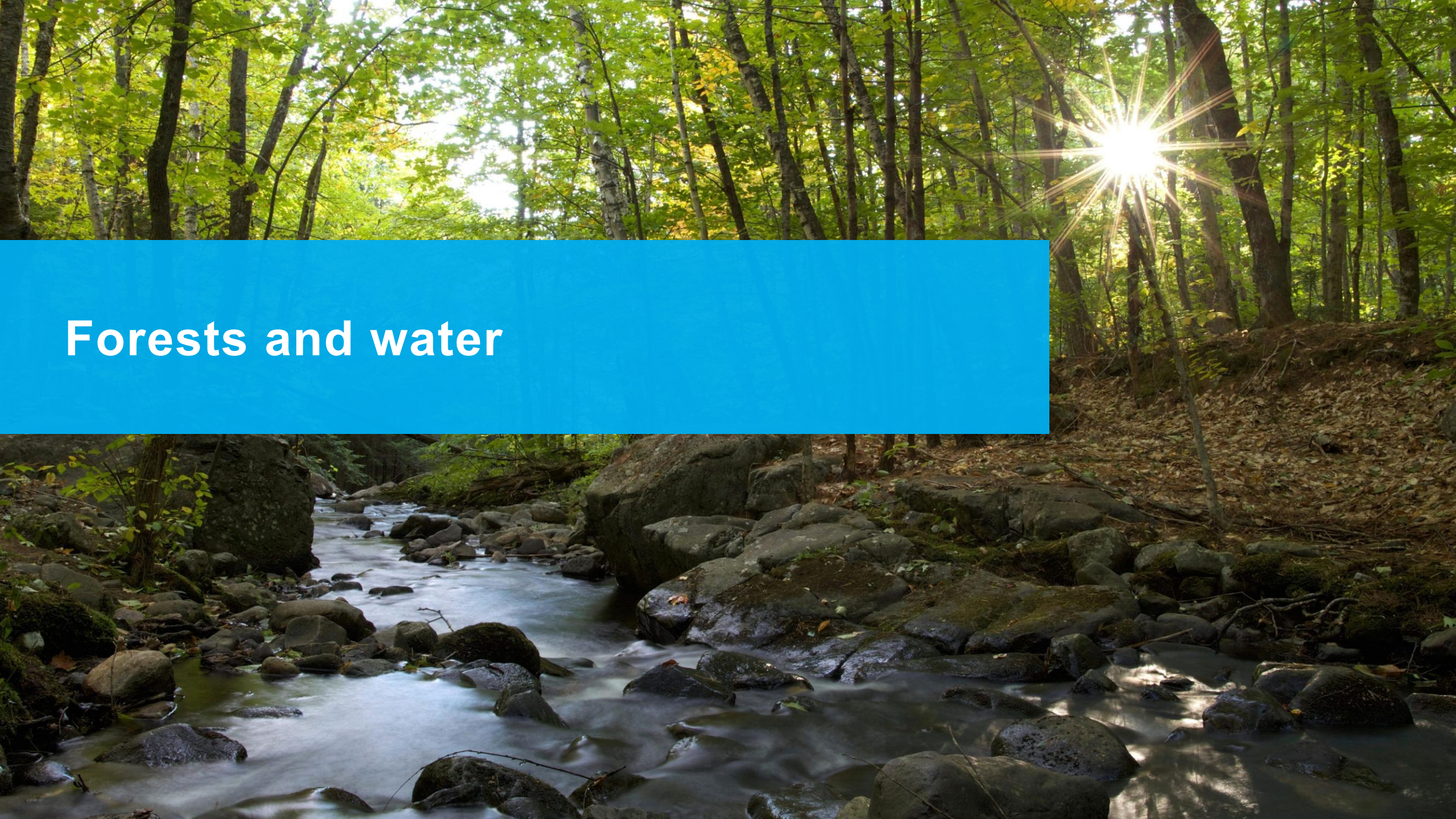
Cities →

Climate, Economics & Finance →



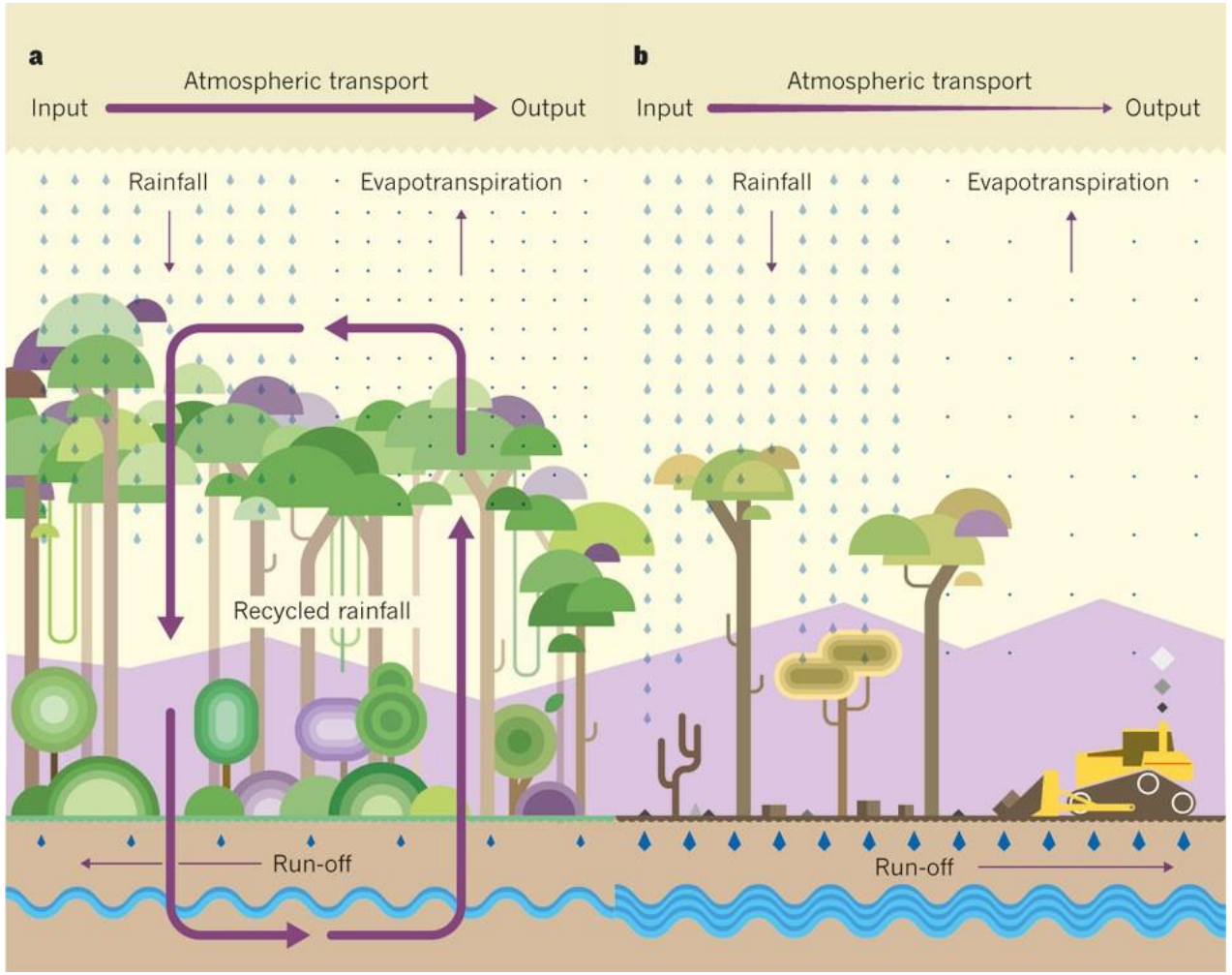
Energy →

Food, Land & Water →



Forests and water

FORESTS AND THE WATER CYCLE



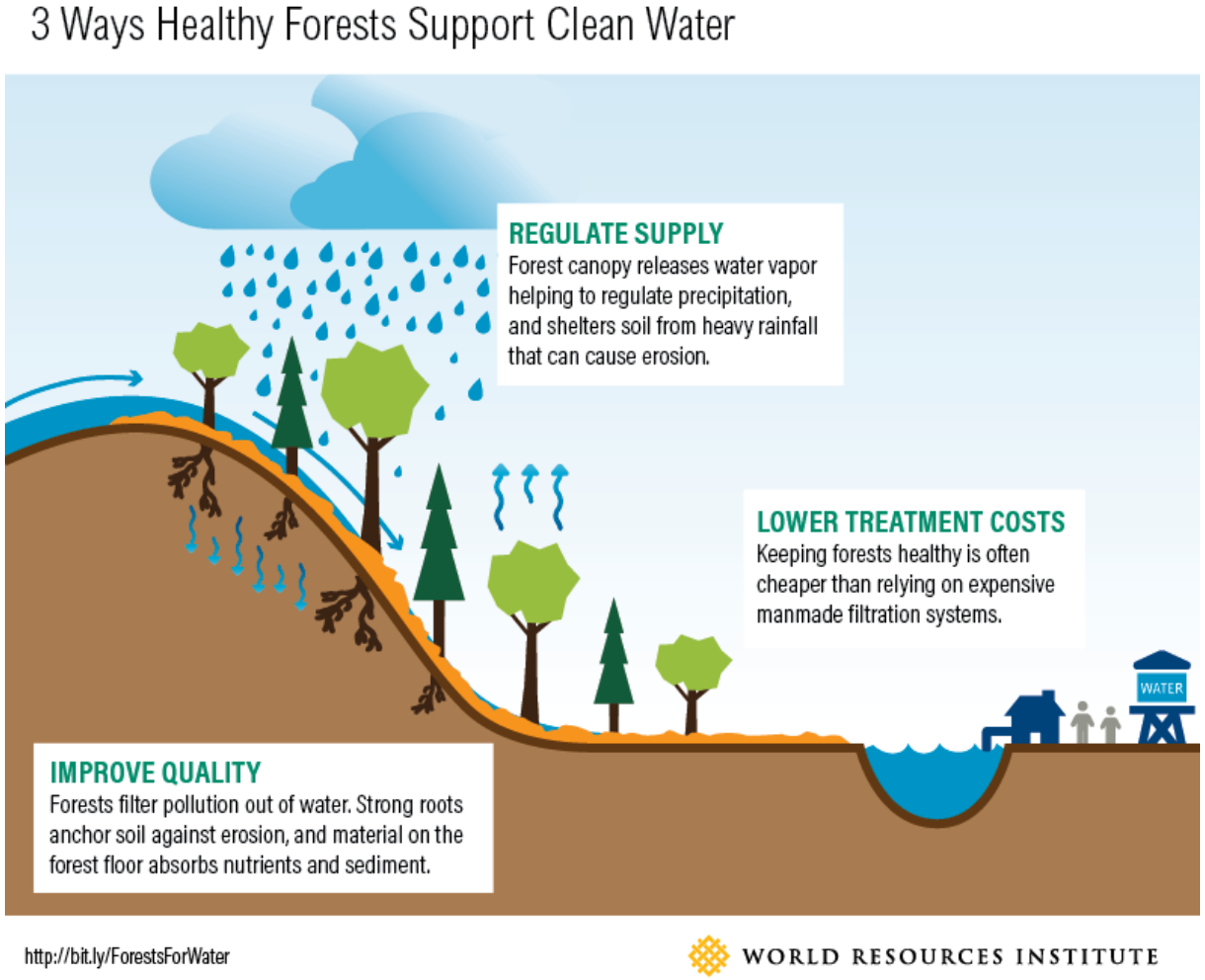
Source: Luiz Aragão (2012). Environmental science: The rainforest's water pump. Nature 05 September 2012 doi:10.1038/nature11485

The world's large and intact forests play an important role in cycling and transporting water, thereby shaping global and regional weather patterns.

Forests—especially intact tropical forests—affect large-scale weather patterns.

Forests regulate regional and global precipitation patterns, which impact both city water supply and the production of food to city residents in key agricultural regions

FORESTS AND ECOSYSTEM SERVICES



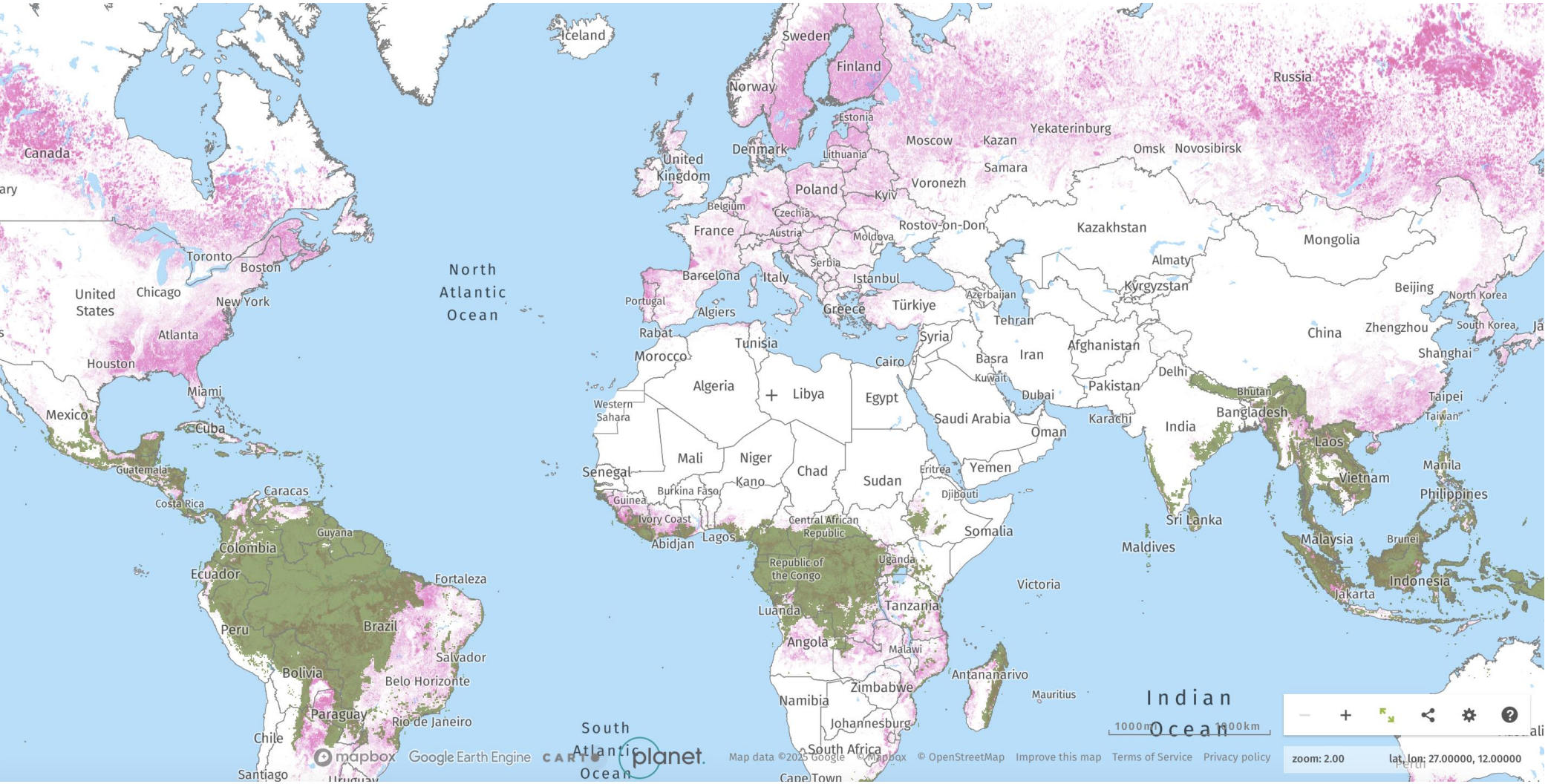
Healthy forests are critical to providing clean water.

Forests can positively impact the quantity, quality and filtration costs associated with a city's water, sometimes even reducing the need for costly concrete and steel infrastructure.

Today, about 31 percent of the world's watershed area is covered by forests.

Deforestation in these watersheds, often caused by commodity and agricultural production, can contaminate water, fuel floods and drought, and lead to higher water treatment costs.

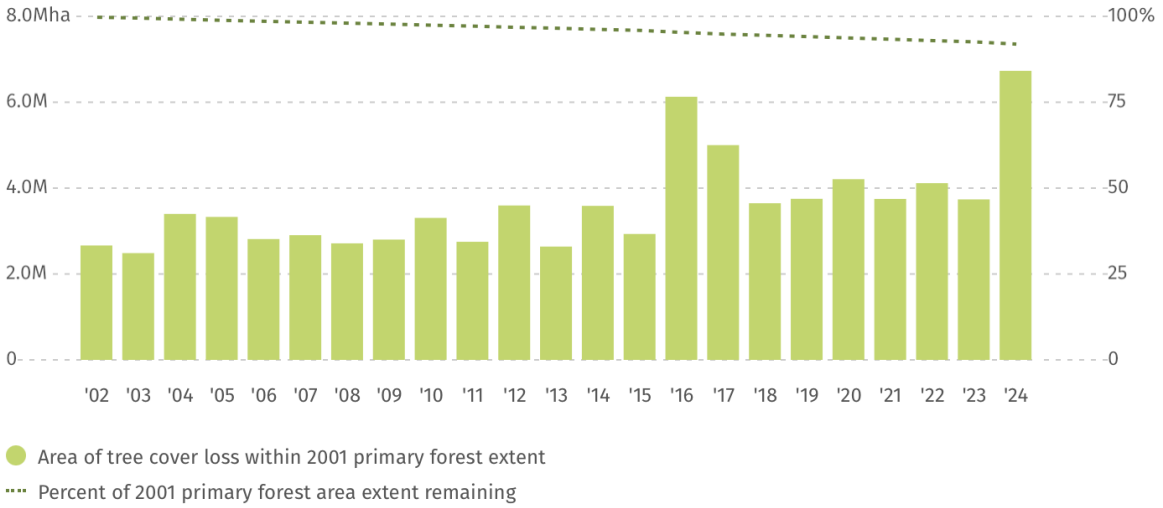
GLOBAL FOREST LOSSES



GLOBAL FOREST LOSSES

GLOBAL PRIMARY FOREST LOSS

From **2002** to **2024**, there was a total of **83.0 Mha humid primary forest lost globally**, making up **16%** of its total tree cover loss in the same time period. Total area of humid primary forest decreased **globally** by **8.1%** in this time period.



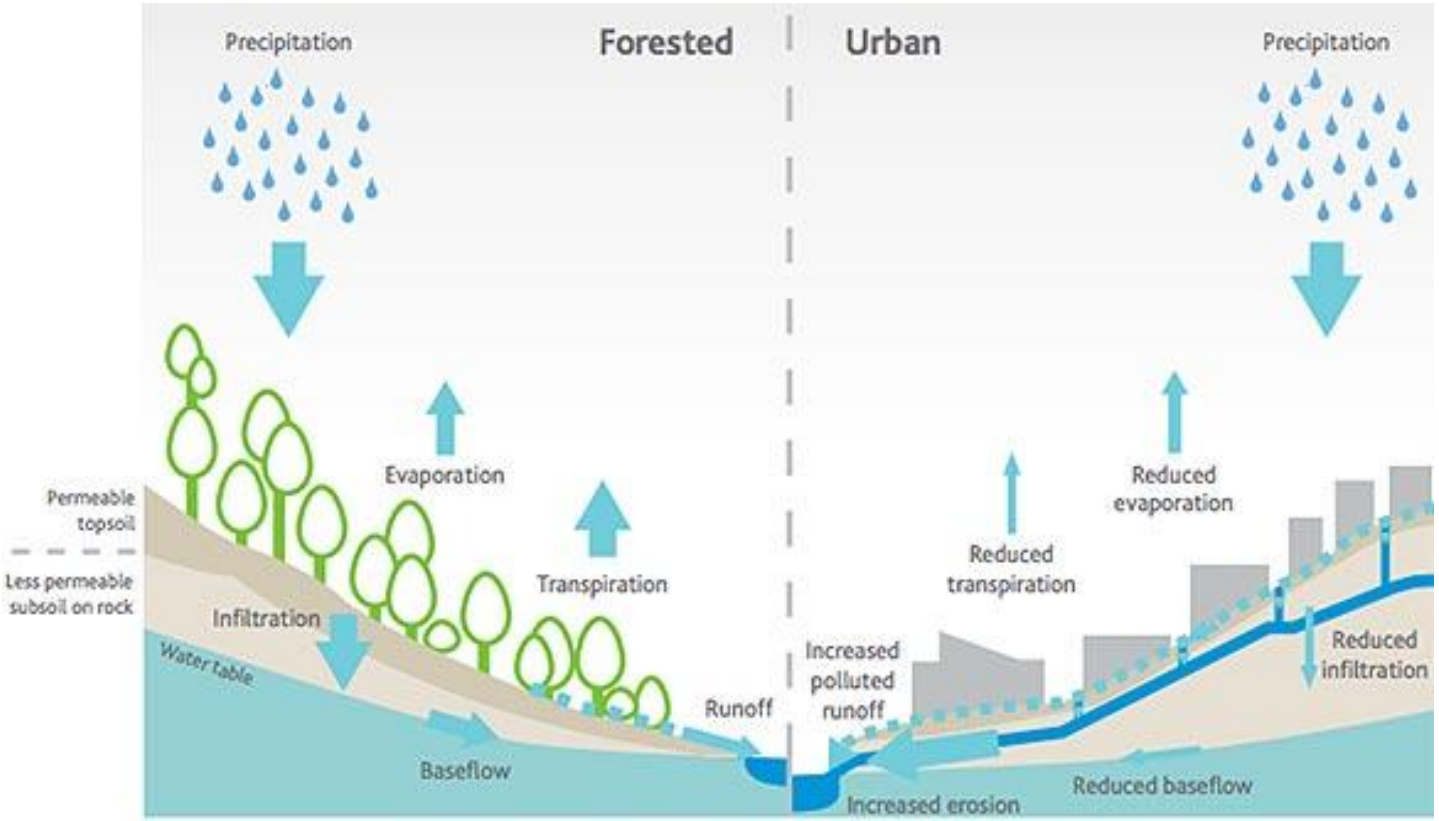
⚠ The methods behind this data have changed over time. Be cautious comparing old and new data, especially before/after 2015. Read more here.

2001 primary forest extent remaining | >30% tree canopy

About 31 percent of the world's watershed area is covered by forests.

Deforestation in these watersheds, often caused by commodity and agricultural production, can contaminate water, fuel floods and drought, and lead to higher water treatment costs.

LAND CONVERSION AND IMPACTS ON WATER FLOWS



Source: Melbourne Water, Australia

Extensive urbanization and population growth, land conversion, and water diversion put pressure on local and regional water supplies in and around cities and changes rainwater flows

Forests and water in India

INDIA WATER SCENARIO

WRI INDIA

the international water association SOUTH ASIA

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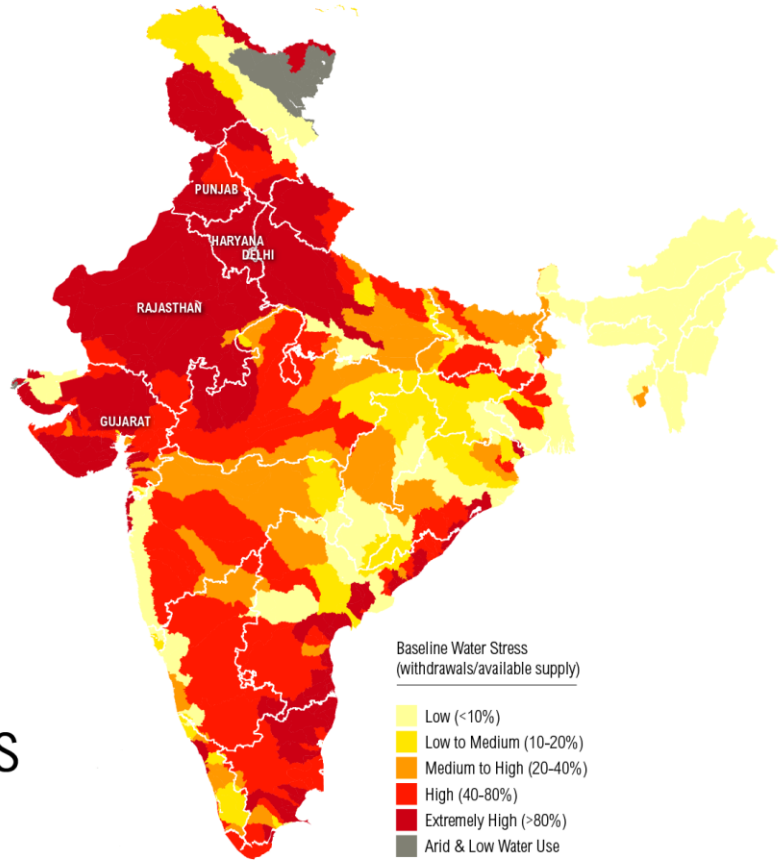
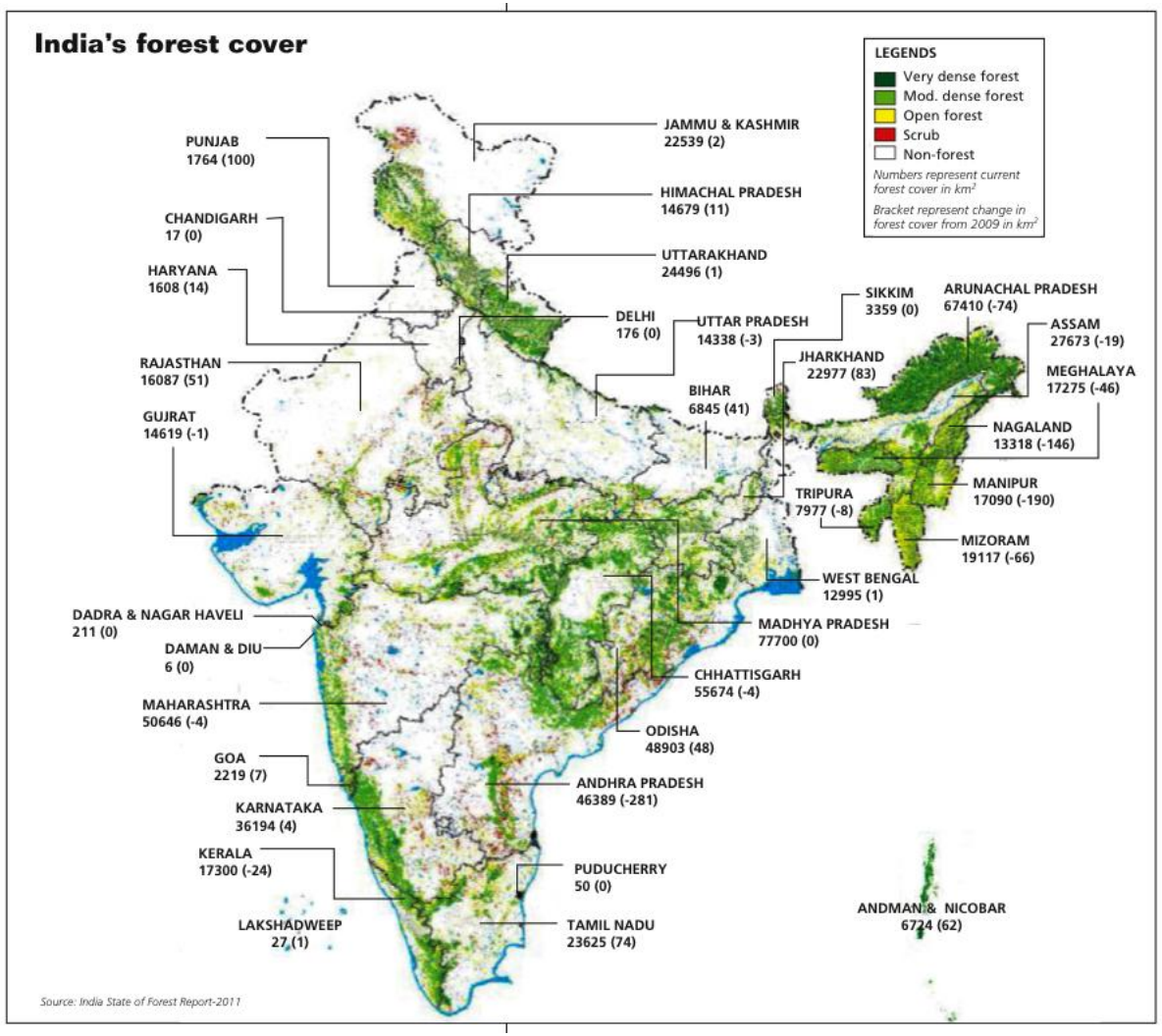
54% of India Faces **High** to **Extremely High** Water Stress



www.indiawatertool.in

WORLD RESOURCES INSTITUTE

FORESTS IN INDIA



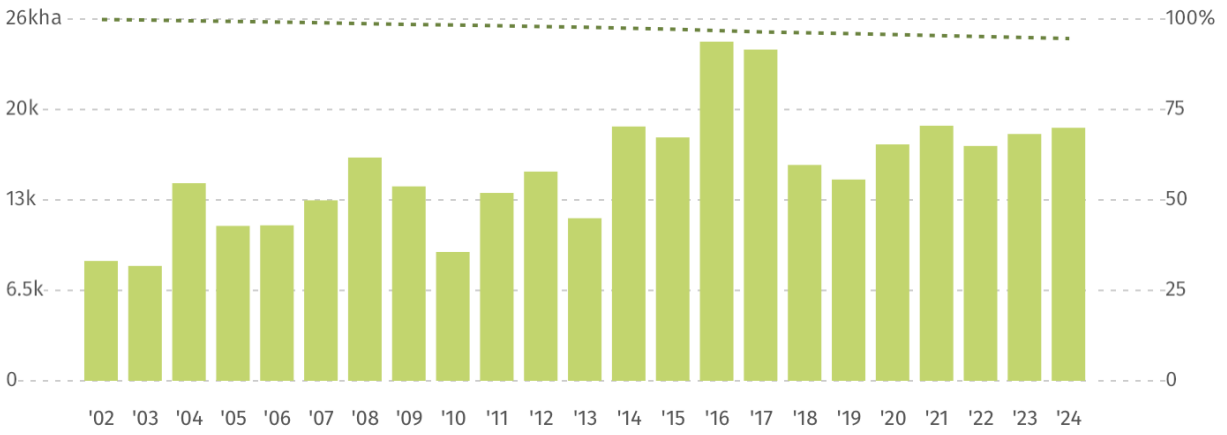
Rainfed rivers, like those in peninsular India, depend heavily on runoff from forested catchment areas.

Forests are essential to ensure the perennial flow of water in these rivers.
Increasingly, peninsular rivers are becoming ephemeral, with forest degradation in upstream headwater reaches being a major contributor.

FORESTS IN INDIA

PRIMARY FOREST LOSS IN INDIA

From **2002** to **2024**, **India lost 348 kha of humid primary forest**, making up **15%** of its total tree cover loss in the same time period. **Total area of humid primary forest in India decreased by 5.4%** in this time period.



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2001 primary forest extent remaining | >30% tree canopy

FORESTS IN INDIA

WRI INDIA

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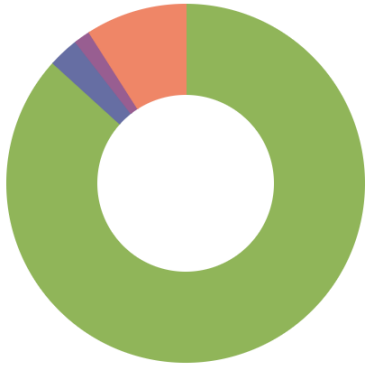
COMPONENTS OF NET CHANGE IN TREE COVER IN INDIA

From 2000 to 2020, **India** experienced a net change of **874 kha** (**1.3%**) in tree cover.

- Stable forest
  59.2 Mha
- Gain
  1.88 Mha
- Loss
  1.01 Mha
- Disturbed
  6.17 Mha



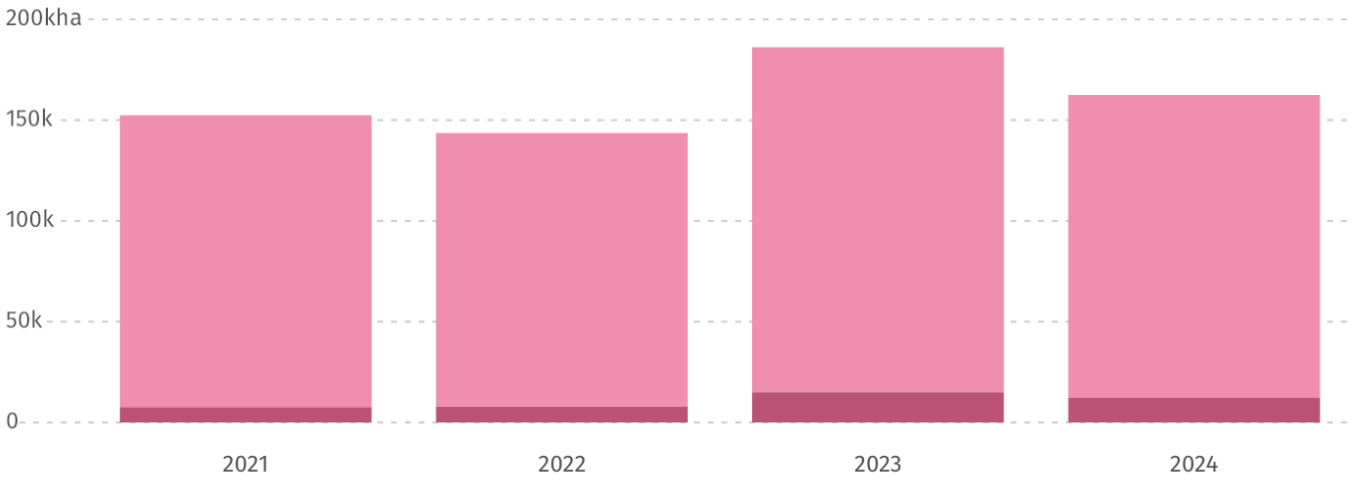
⚠ The loss total is different from annual tree cover loss, as this data was created using a different method and forest definition. For gross or annual loss information, please see the tree cover loss widget.

Disturbance represents areas that experienced both loss and gain between 2000 and 2020

FORESTS IN INDIA

FOREST LOSS IN NATURAL FOREST IN INDIA

From **2021** to **2024**, **93%** of tree cover loss in **India** occurred within **natural forest**. The total loss within natural forest was **602kha**, equivalent to **273 Mt** of CO_2e emissions.



⚠ Not all natural forest area can be monitored with existing data on tree cover loss. See the metadata for more information.

WHAT ARE THE IMPLICATIONS OF CHANGES IN INDIA'S FORESTS TO CITIES

Forests and vegetation are dynamic natural elements where losses and gains occur simultaneously

Disturbance in forests even if not outright losses impacts ecosystem services provided by forests (like microclimate control, rainfall amount, aquifer recharge, release into streams and rivers and more.

WHAT ARE THE IMPLICATIONS OF CHANGES IN INDIA'S FORESTS TO CITIES

WRI INDIA

IWA the international water association SOUTH ASIA

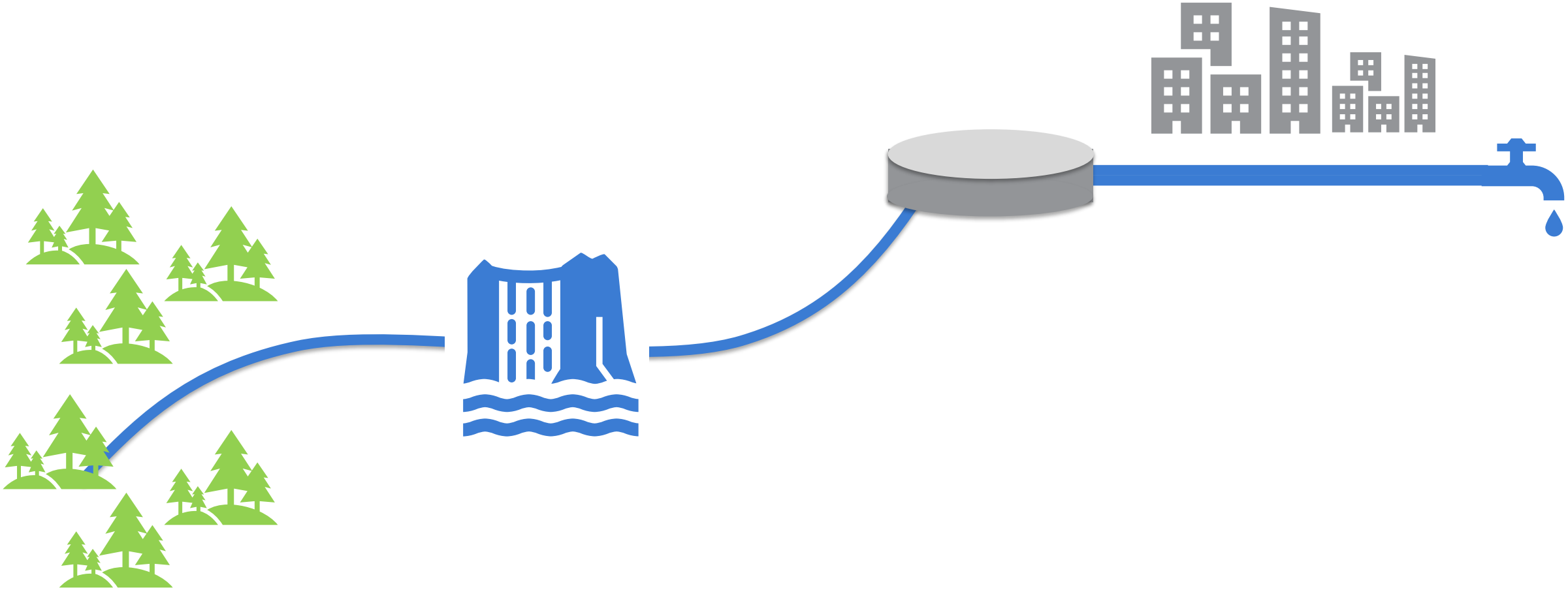
IUCN

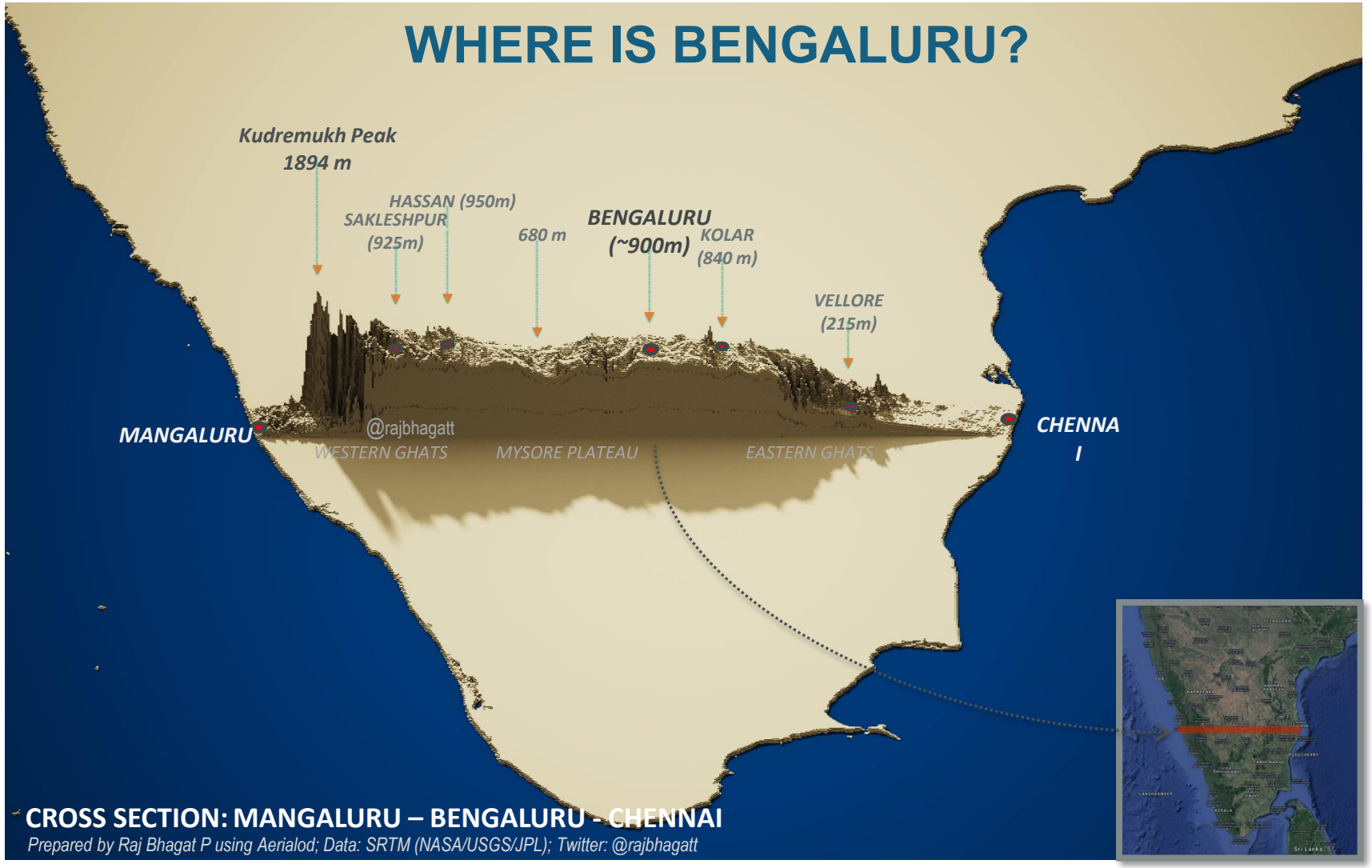
Too much
Too little
Too erratic
Too dirty

Bengaluru City and its forest-water relation

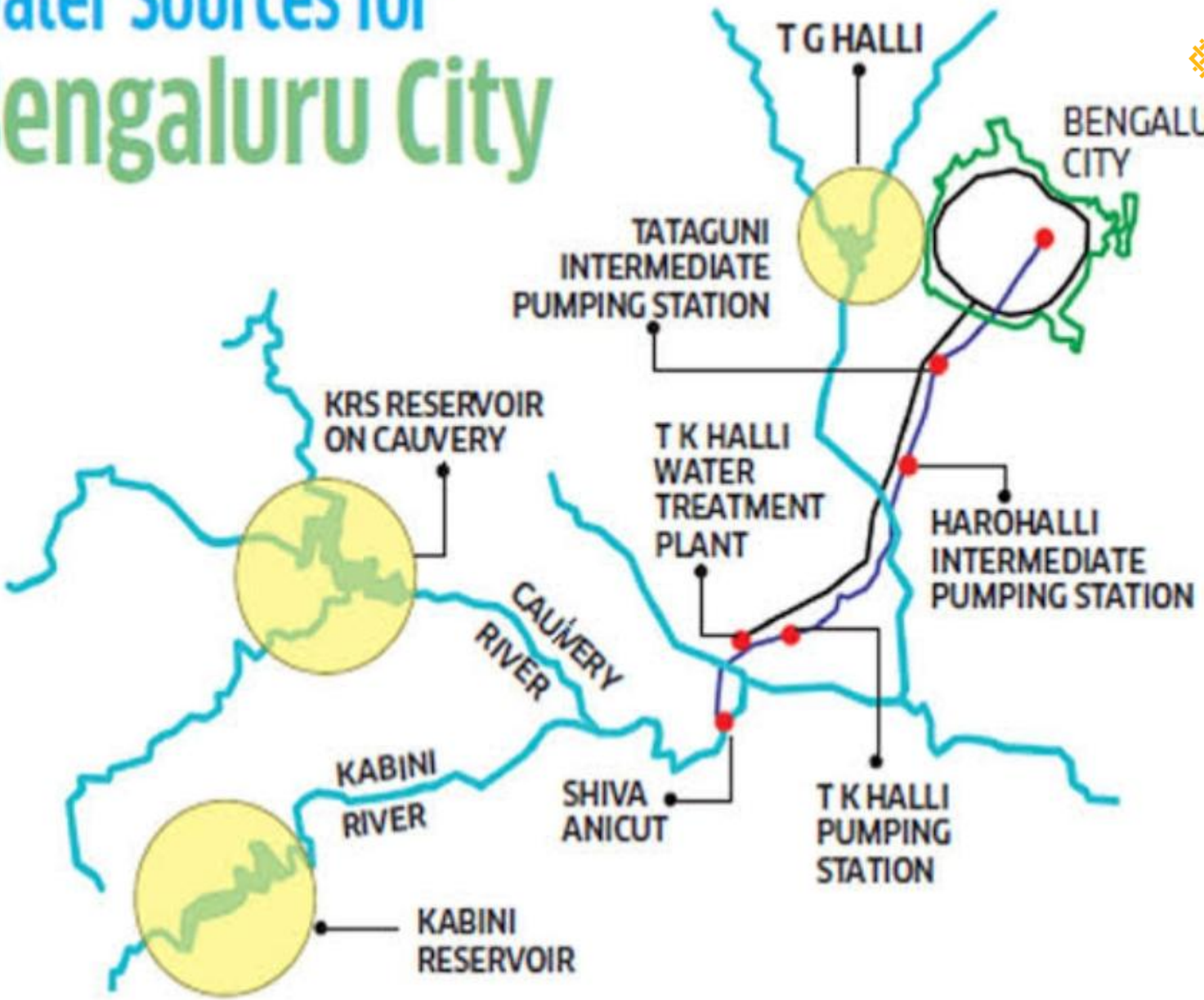
WHERE DOES YOUR WATER COME FROM?

FORESTS AND WATER IN THE INDIAN CONTEXT – URBAN DEPENDENCIES

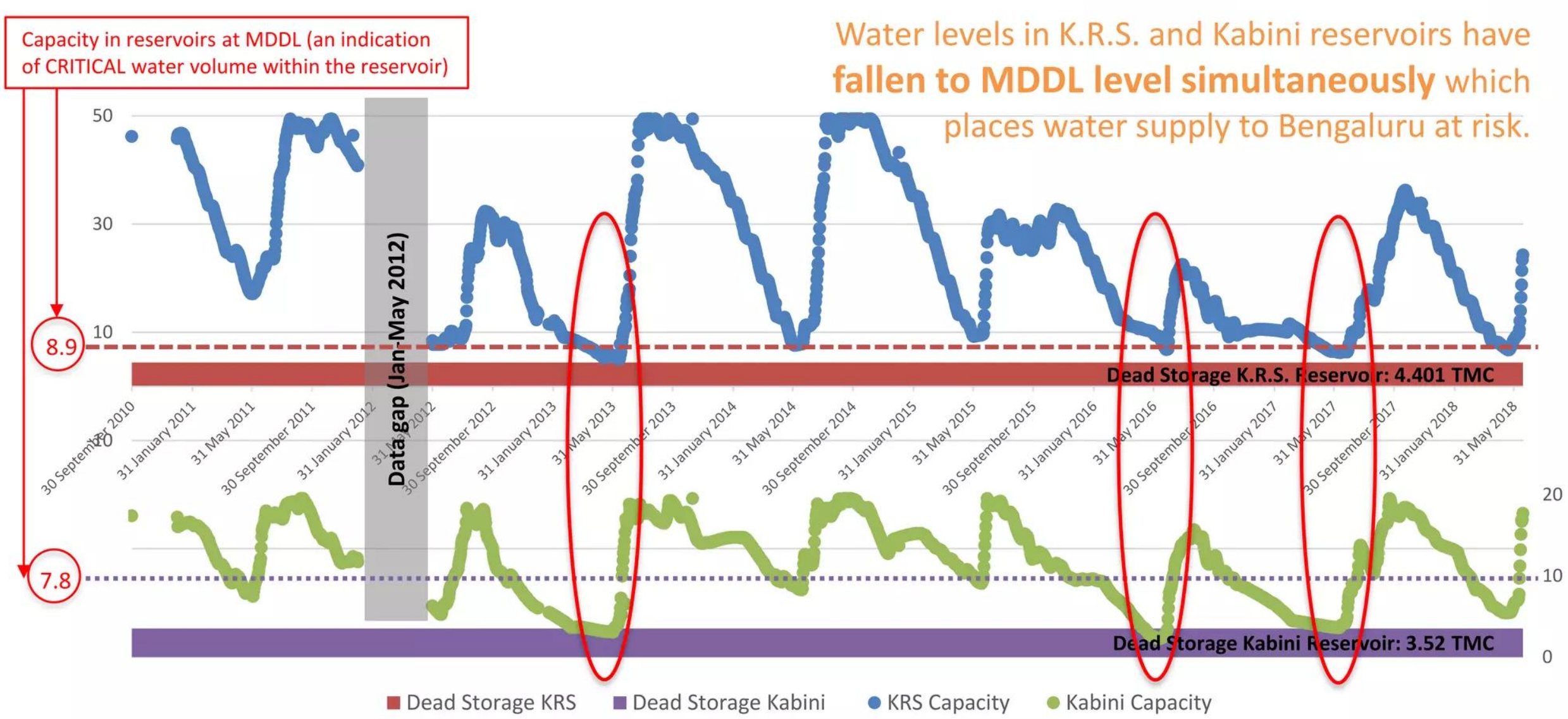



WHERE IS BENGALURU?
Kudremukh Peak
1894 m
HASSAN (950m)
SAKLESHPUR
(925m)
680 m
BENGALURU
(~900m)
KOLAR
(840 m)
VELLORE
(215m)
MANGALURU
@rajbhagatt
WESTERN GHATS
MYSORE PLATEAU
EASTERN GHATS
CHENNA
I
CROSS SECTION: MANGALURU – BENGALURU - CHENNAI
Prepared by Raj Bhagat P using Aerialod; Data: SRTM (NASA/USGS/JPL); Twitter: @rajbhagatt

Water Sources for Bengaluru City

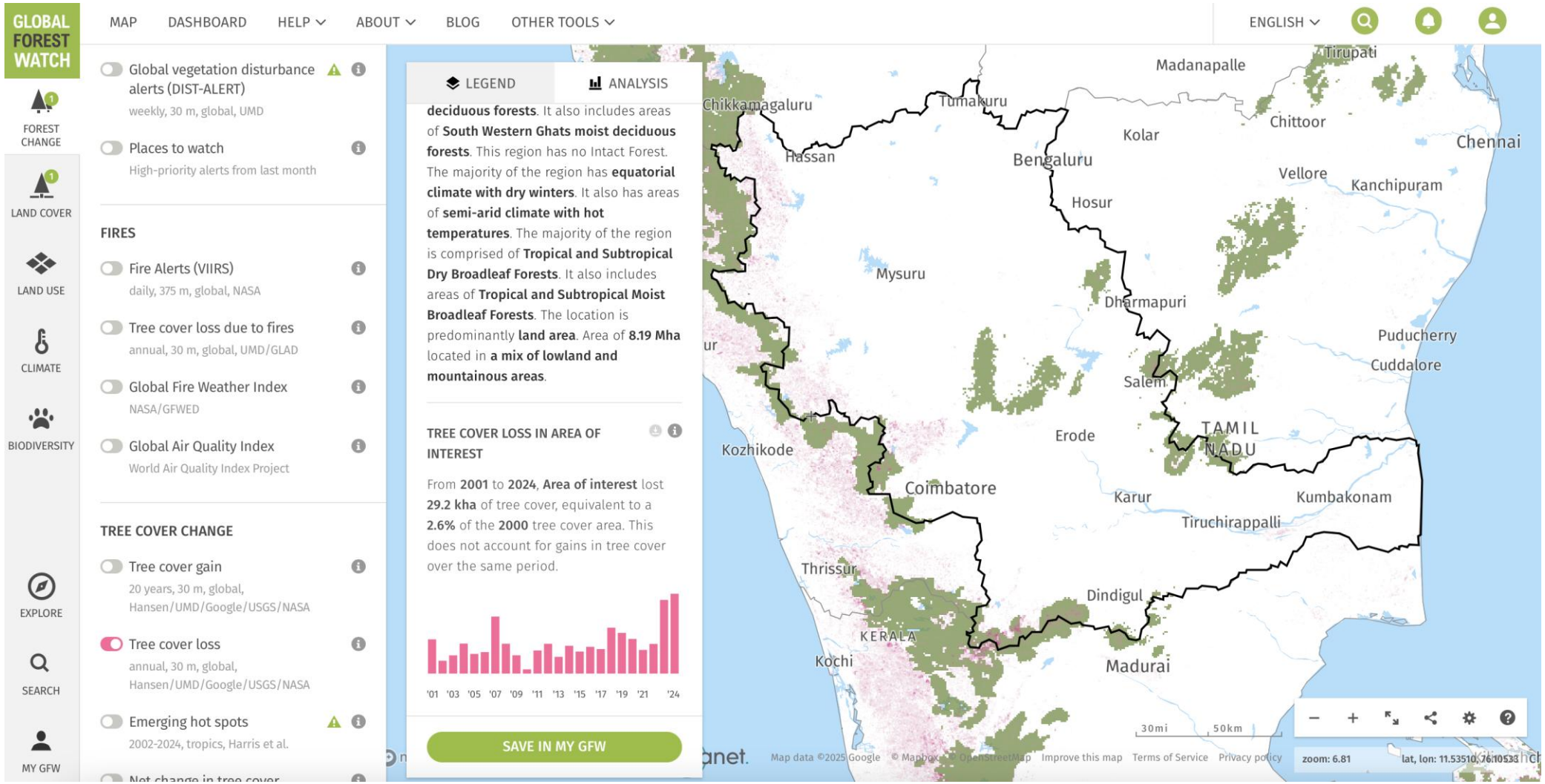


RESERVOIR LEVELS HISTORY



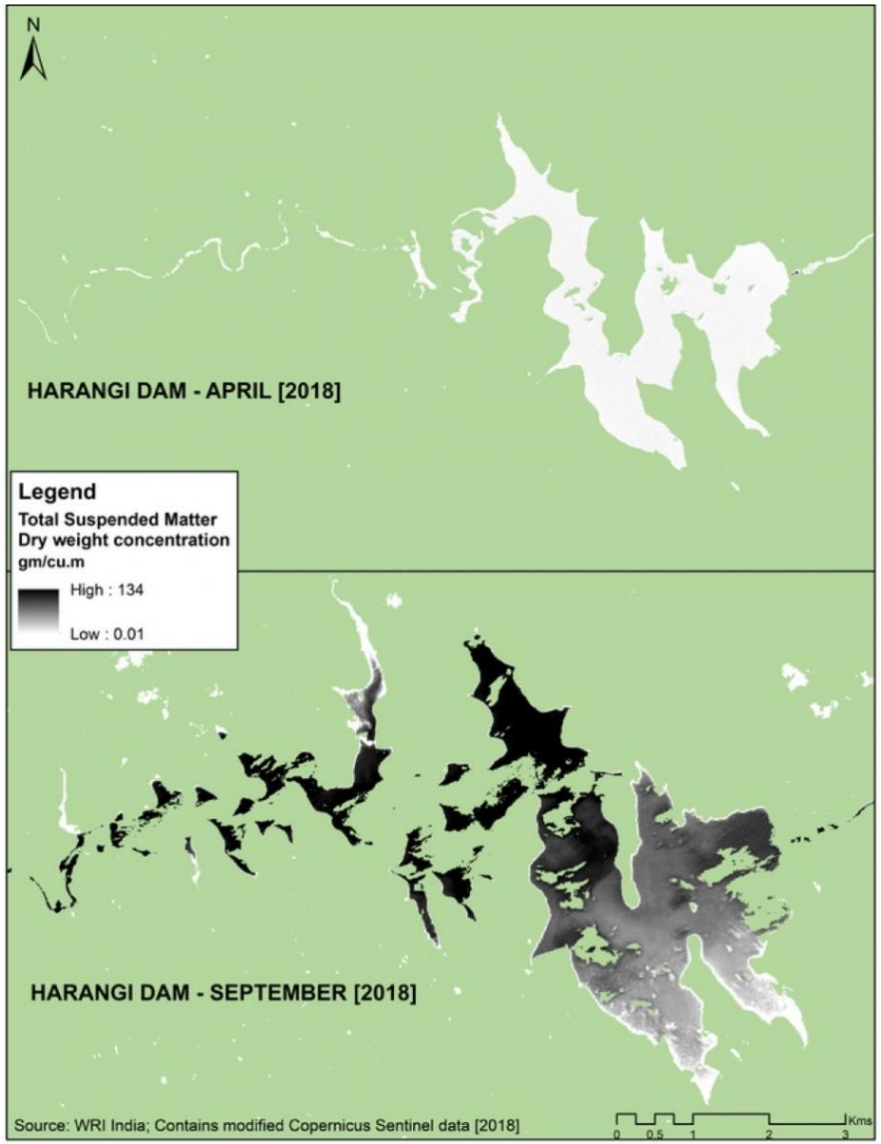
Source: WRI India using KSNDMC and others. All numbers in Thousand Million Cubic Cubic Feet

CHANGE IN CAUVERY WATERSHED CONDITION



Sourced from Global Forest Watch | http://bit.ly/423j6uO

OF FOREST LOSS AND RESERVOIR IMPACTS



Heavy rainfall on unforested hillsides can trigger landslides. This brings significant sediment load within the drainage channels and connected water reservoirs.

One such impacted reservoir studied following the 2018 rain events in Karnataka is the Harangi reservoir, which is located close to the northern impacted areas of the Kodagu district.

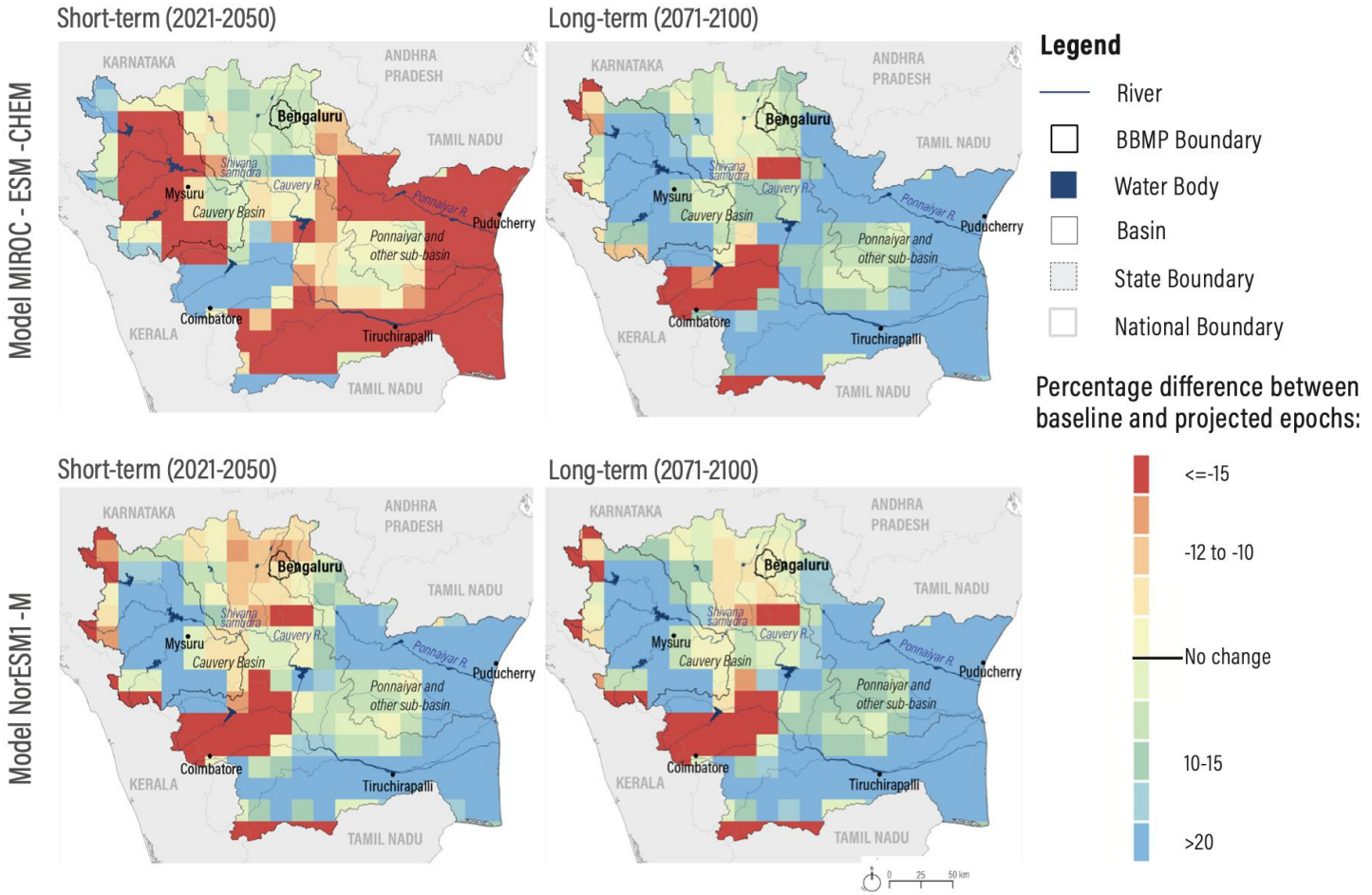
Using pre- and post-landslide open source satellite images and advanced GIS image processing, WRI India generated map showing Total Suspended Solid (TSS) concentration within the Harangi reservoir.

The post landslide TSS concentration has increased by almost 100 times due to flow of increased load of soil and sediment within the reservoir. Such high load of soil and sediment inflow causes sedimentation within the reservoir and thereby, significantly reduces the water holding capacity of the reservoir.

Sourced Embracing Environmentally-Sensitive Development to Sustain Future Livelihoods, WRI India (2018 | https://bit.ly/4p7ITw1

THE FUTURE OF RAINS: PROJECTED PATHWAYS

Figure 13 | Percentage change in projected rainfall based on RCP 4.5 for short-term and long-term epochs (select GCMs)

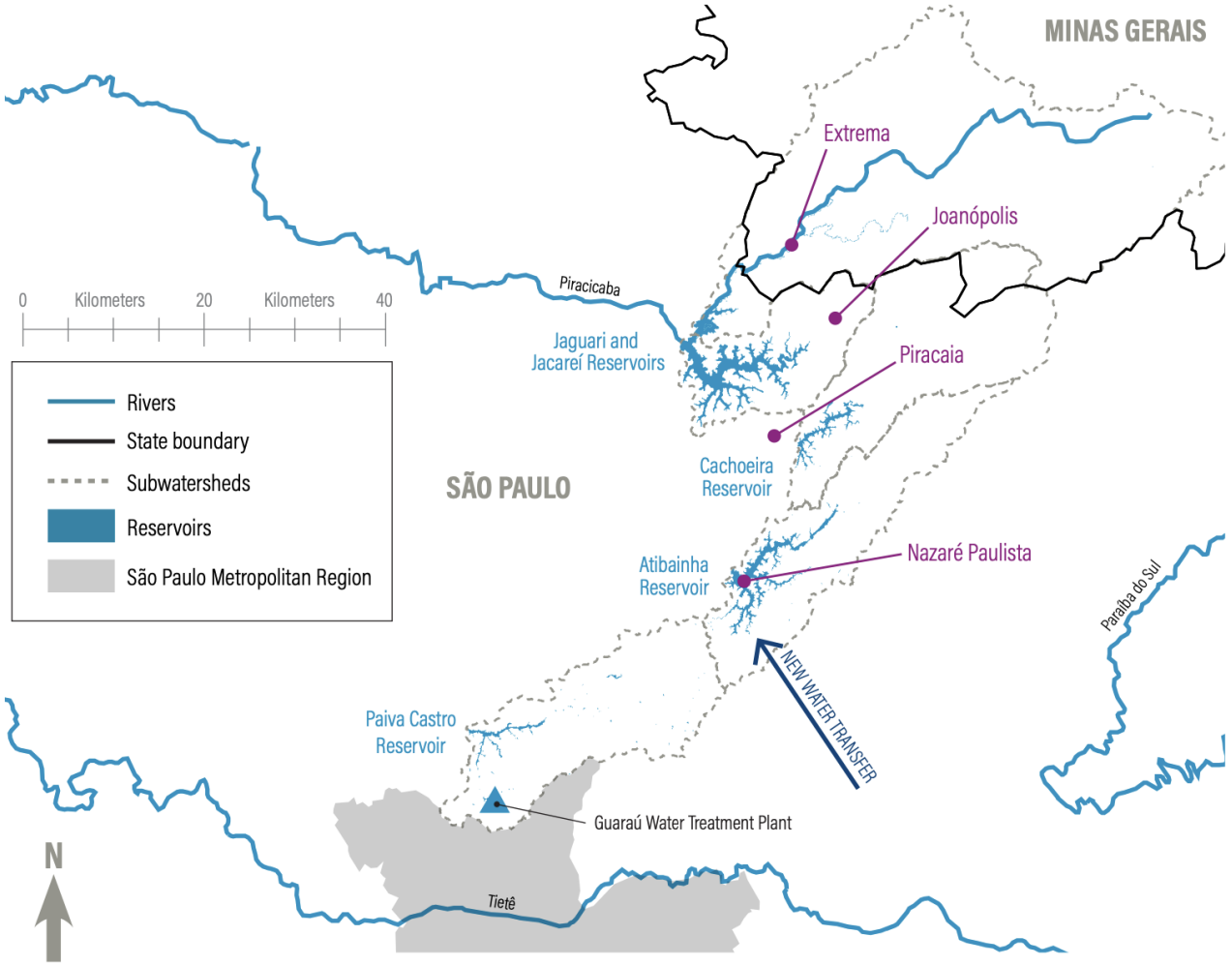


Source: WRI India analysis using ECMWF ERA5, and NEX-GDDP (NASA) processed in Google Earth Engine (refer to CCRA-VA report for details)

WHAT DOES A CITY OWE ITS FORESTS?

Forests and water – two global cases

VALUING ECOSYSTEM SERVICES PROVIDED BY FORESTS IN SAO PAULO'S WATER SUPPLY



Notes: São Paulo's state water company, Sabesp, operates the built infrastructure system; the PCJ and Alto Tietê basin committees govern the 228,000-hectare watersheds that feed the system.
Source: Adapted from ANA 2016a.

The Cantareira System is the largest of five water supply systems that feed São Paulo, providing almost half of the total water used by the 22 million inhabitants of the metropolitan area.

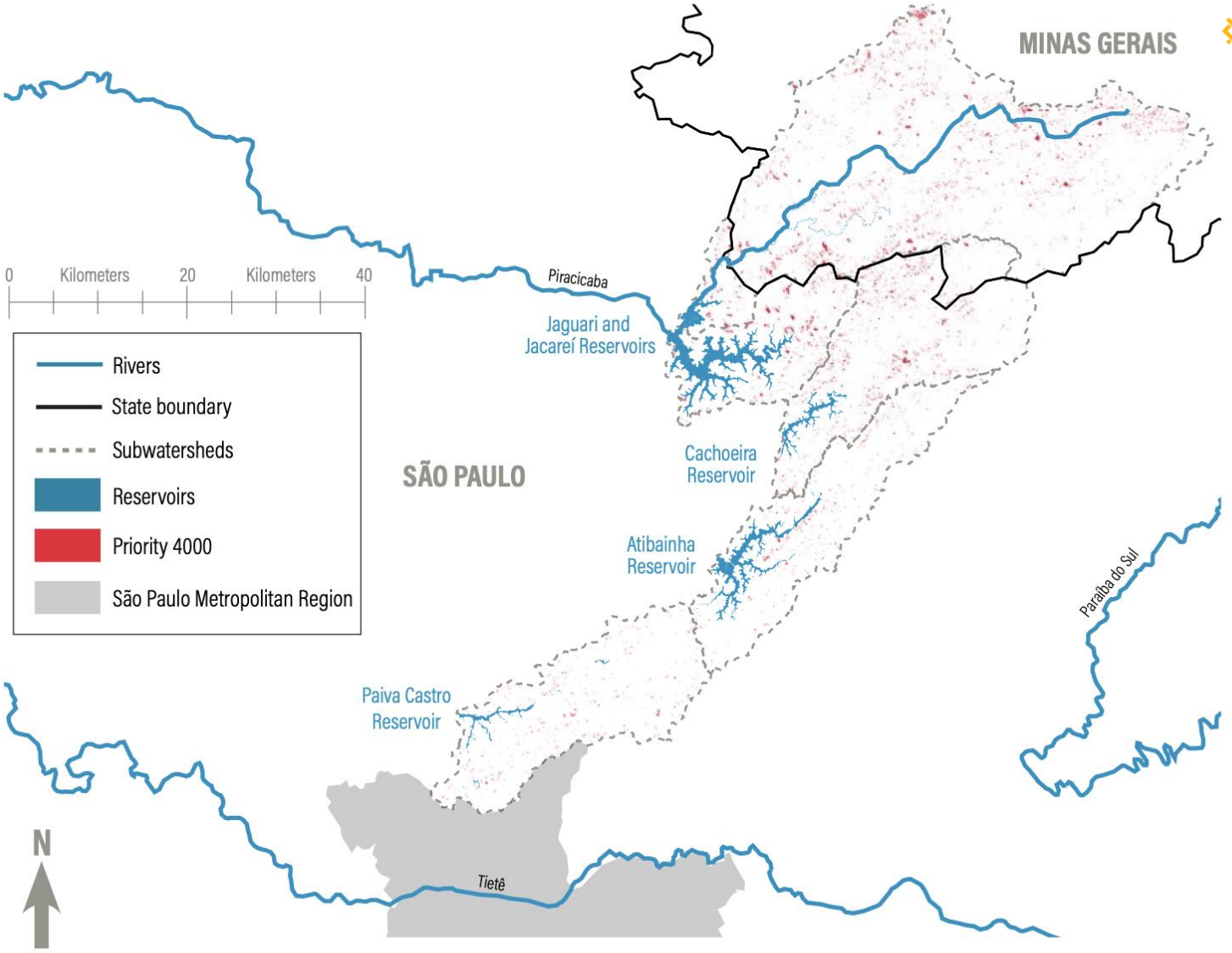
The Cantareira System was designed to help guarantee a clean and ample water supply in the face of environmental changes, water stress, and pollution.

Recent risks are declining water levels during drought years and increasing load and associated costs of managing sediment pollution

VALUING ECOSYSTEM SERVICES PROVIDED BY FORESTS IN SAO PAULO'S WATER SUPPLY

- Targeted restoration of 4,000 hectares (ha) of native forest could reduce the amount of sediment entering the water system by more than one-third.
- This restoration effort for 4,000 hectares of native forest would require an investment of about US$37 million and generate avoided costs of $106 million for a net benefit of $69 million over 30 years; an estimated 28 percent return on investment (ROI) in 30 years
- Natural infrastructure reduces soil erosion by roughly 36 percent, avoiding sediment pollution costs for a 28 percent return on investment. In general, this return is on a par with the Brazilian water sector's financial performance.

| Sediment Export in the Cantareira System

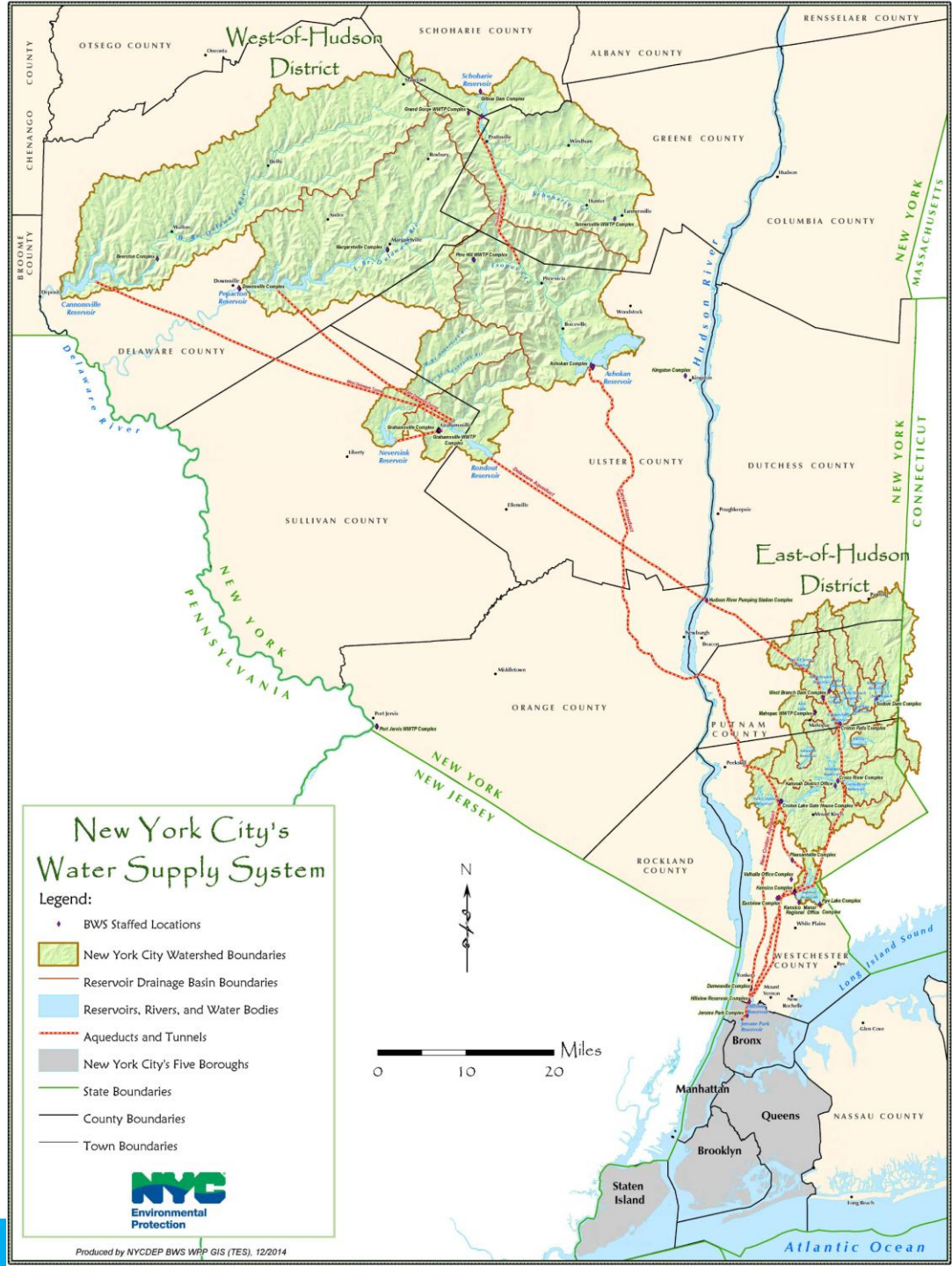


Note: This map identifies non-forested hectares that are large sources of sediment, which we deem to be priority areas for reforestation.
Source: InVEST Sediment Yield Model (Sharp et al. 2016; see Appendix B).

NEW YORK CITY'S WATER SOURCES

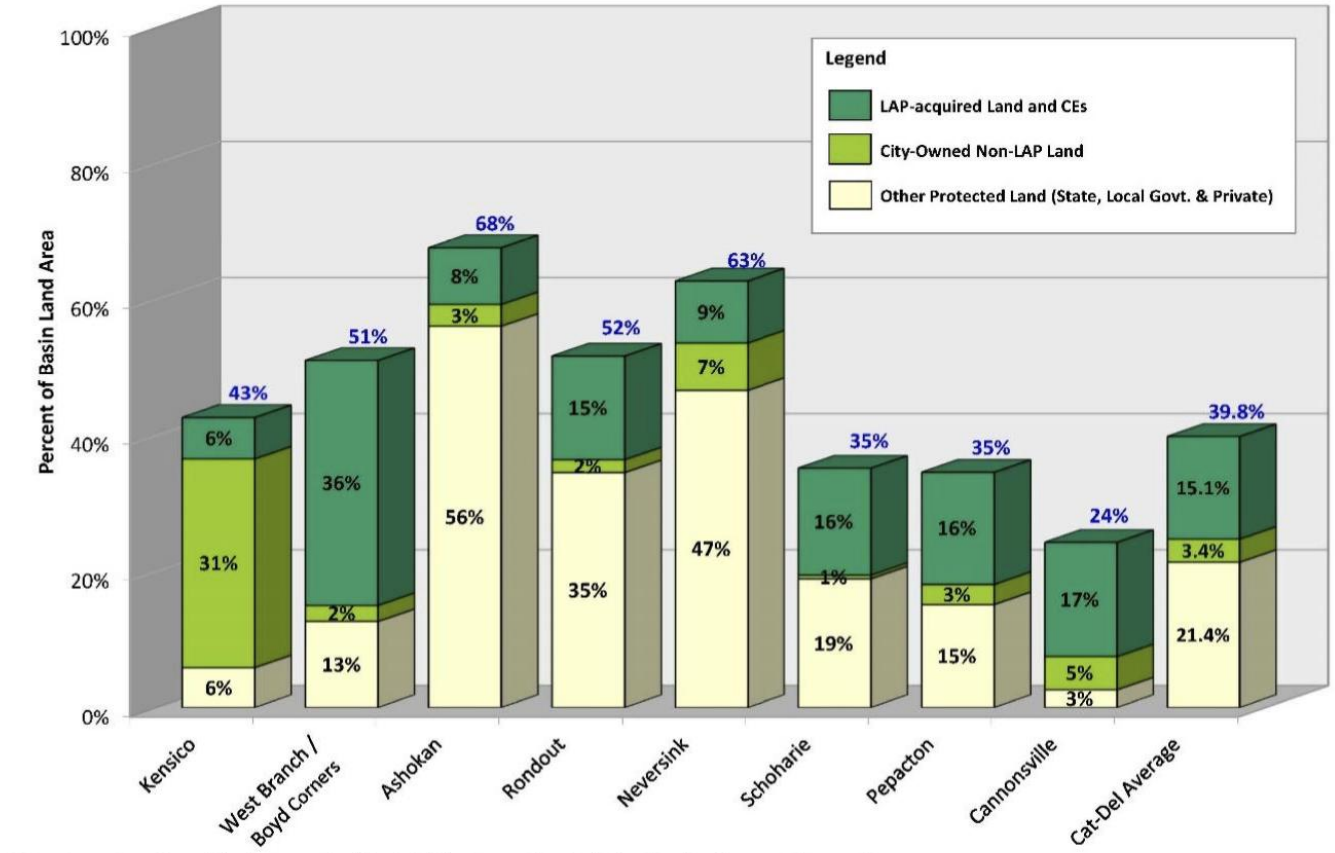
New York City's water supply system collects and transports surface water, by gravity, from 2,000 square miles of land in three upstate watersheds—the Delaware, the Catskill and the Croton watersheds—as far as 125 miles from New York City.

Ninety percent of the supply, from the Catskill and Delaware portions of the system, is delivered without filtration and treated only by chemical and ultraviolet disinfection prior to distribution.



Source: https://www.frontiersin.org/files/Articles/545967/fmars-07-00425-HTML/image_m/fmars-07-00425-g005.jpg

PROTECTING NEW YORK CITY'S WATER SOURCE WATERSHEDS



Note: Percentages in each basin may not add to total due to rounding. Includes closed and executed properties.

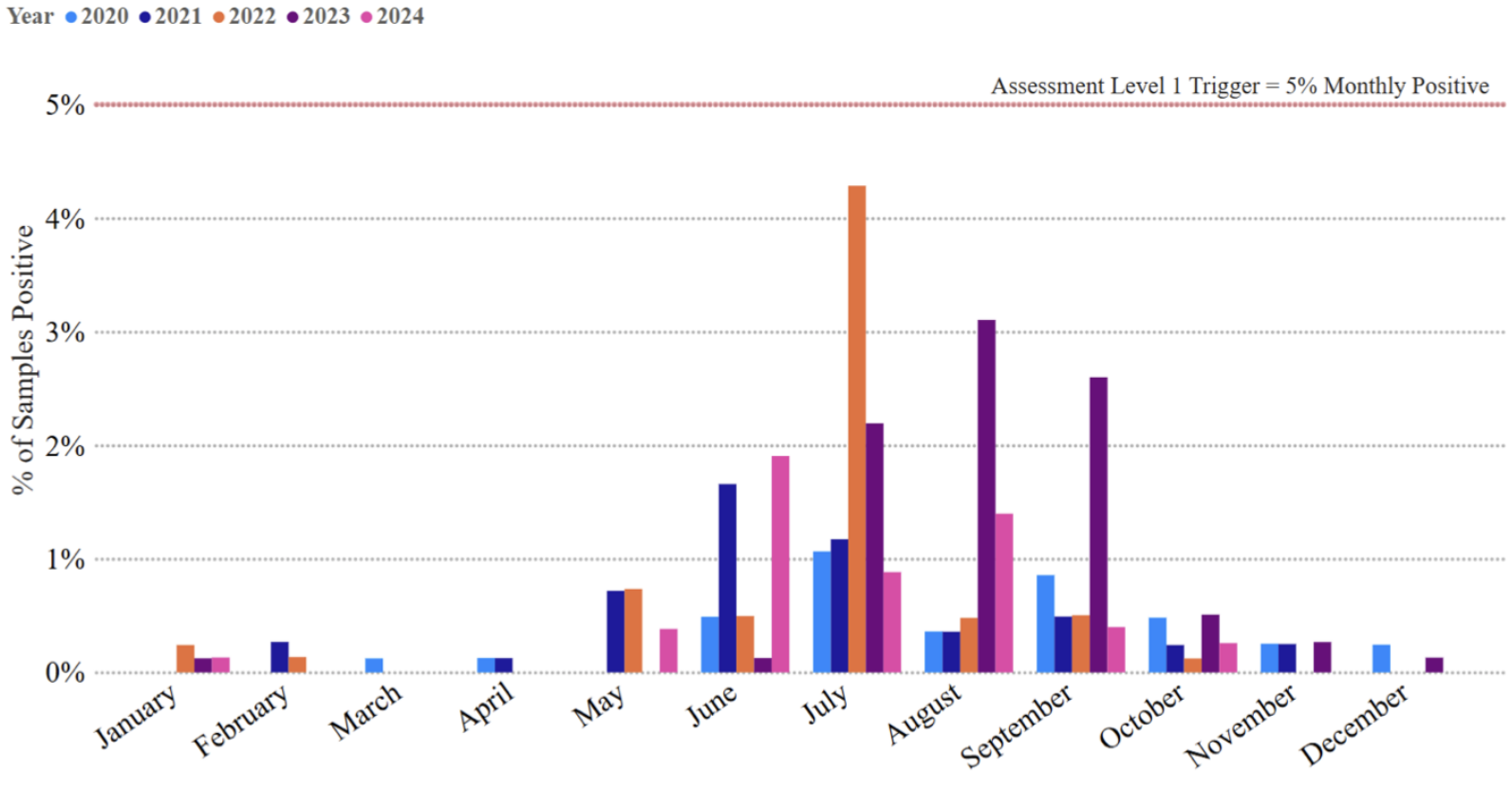
http://kingstonsp/sites/Kingston/WPP/LAP/Protected%20Lands/work/city_owned_land.xls

Percent of land protected in each Catskill/Delaware basin as of December 31, 2024.

- In 1905, the New York State legislature approved the Water Supply Act of 1905 and created the NYC Board of Water Supply (BWS), empowering the board to develop water supply facilities in the Catskills region.
- The Water Supply Act of 1905 also required the City to allow local communities to connect to the water supply infrastructure and required the City to allow boating and fishing on the water supply reservoirs.
- Concurrently, the State legislature passed the state Public Health Law of 1905, allowing the City to regulate land use in the upstate watershed to protect City drinking water and providing the City eminent domain to acquire land needed for the water supply.
- This legislation also authorized the State Department of Health (DOH) to promulgate rules and regulations to protect the City's drinking water.

Source: https://www.ncbi.nlm.nih.gov/books/NBK566285/ | https://www.nyc.gov/assets/dep/downloads/pdf/about/filtration-avoidance-determination/2024_fad_annual.pdf

NEW YORK CITY'S FILTRATION AVOIDANCE DETERMINATION



Monthly percent positive total coliform samples, NYC distribution system, 2020-2024.

Source: https://www.nyc.gov/assets/dep/downloads/pdf/about/filtration-avoidance-determination/2024_fad_annual.pdf

Since 1993, New York City ("the City") has met the requirements of the 1989 Surface Water Treatment Rule and, after 1998, the Interim Enhanced Surface Water Treatment Rule.

This has allowed the City to avoid filtering its Catskill/Delaware water supply. The conditions that the City must meet to maintain filtration avoidance are described in the City's Filtration Avoidance Determination (FAD).

The current Revised 2017 FAD was issued by the New York State Department of Health in December 2022.

Cities4Forests Initiative

CITIES4FORESTS

- Cities4Forests helps cities around the world to connect with and invest in inner forests (such as city trees and urban parks), nearby forests (such as green corridors and watersheds) and faraway forests (such as tropical and boreal forests).
- We encourage our cities to better conserve, manage, and restore these forests, and we provide technical assistance for them to align local policy, share knowledge, and access peer-to-peer learning and communication activities.
- Conserving, restoring and sustainably managing forests in and around cities can provide cleaner water, help reduce flooding, and protect water supplies. The world's large, intact forests also contribute to the maintenance of global hydrological cycles, moving water thousands of kilometers around the world and producing rainfall in important agricultural and urban areas.

https://cities4forests.com

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WRI INDIA

IWA the international water association SOUTH ASIA

IUCN

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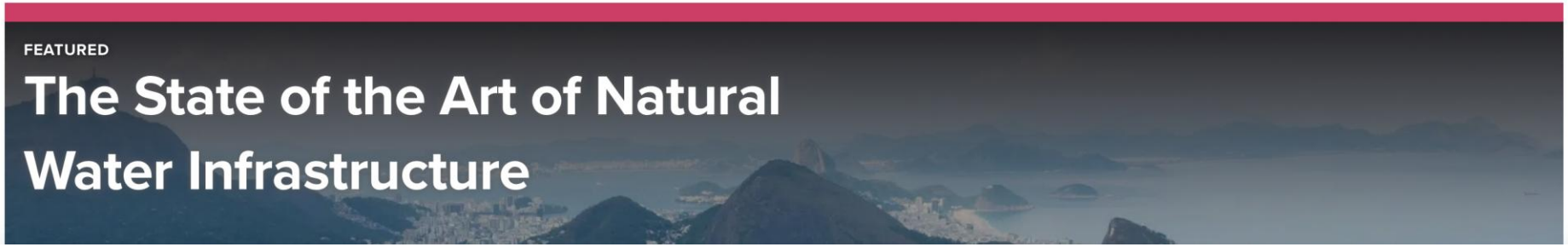
Providing knowledge and data to harness the power of forests and nature

Cities4Forests' work is grounded in peer-reviewed research, in line with the World Resources Institute's rigorous research quality standards. Explore our catalogue of research products including reports, guidelines, and methodologies below.



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- The second webinar will spotlight **coastal cities**, increasingly threatened by saline intrusion, tidal flooding, and sea-level rise, and will explore how mangrove and forest ecosystems can safeguard water security and strengthen urban resilience.

- Meet Our Speakers :

1. Ajanta Dey - *Joint Secretary & Programme Director ,Nature Environment & Wildlife Society (NEWS) , Kolkata, India*

2. Ferdin Sylvester – *Director , OneEarth Foundation, Goa*

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