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Nature-based Solutions

Leveraging **nature** and power of healthy ecosystems to **protect people**, optimize infrastructure and safeguard a stable and biodiverse future (*IUCN, 2024*)

Water Security

Availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies (*Grey and Sadoff, 2007*).

Our Shared Global Water Challenge

Current



- **2 Billion + people** live in extreme water stress.¹
- **Half of Cities Globally** are affected by moderate to severe declines in source watersheds.²

By 2050



- **Floods:** expected **50% increase** in inland flood risk.³
- **Droughts:** expected **5x increases** in drought losses.⁴

1. WRI Water Risk Atlas,
2. McDonald et al 2016,
3. Fathom,
4. UN Convention to Combat Desertification



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Our Shared Opportunity: Working *With* Nature for Water Security





























































➤ Nature-based Solutions (NbS)

Use the power of
nature to drive
benefits for **people &
environment**.

Watershed ➤
NbS Examples



NbS have proven benefits on Water Security

Water Security Challenge		Water Availability		Disaster Risk	Water Quality		Potential for other benefits
Ecosystem Benefit	Dry Season Flows	Groundwater Recharge	Flood Risk	Erosion & Sediment	Nutrients & Pollutants		
Protection							
1	Targeted Habitat Protection						
Restoration							
2	Revegetation						
3	Riparian Restoration						
4	Wetlands Restoration						
5	Floodplain Restoration						
Management							
6	Agricultural Best Management Practices (BMPs)						
7	Ranching BMPs						
8	Forestry BMPs						
9	Fire Management						
Created Habitats							
10	Artificial Wetlands						
11	Sustainable Urban Drainage Systems (SuDS)						

NbS portfolios can be customized to improve water security & generate multiple co-benefits



ADAPTATION & MITIGATION

- 1 Improved soil moisture & health
- 2 Urban heat reduction
- 3 Reduce frequency and intensity of forest fires, floods, and droughts
- 4 Carbon sequestration



LIVELIHOODS

- 1 Job creation
- 2 Improved agricultural & fisheries output
- 3 Support local economies, incl. tourism and recreation



HEALTH & WELLBEING

- 1 Improve food security and water access
- 2 Reduce exposure to harmful pollutants
- 3 Access & Use rights, e.g., to culturally significant plants
- 4 Cultural & Spiritual traditions



BIODIVERSITY

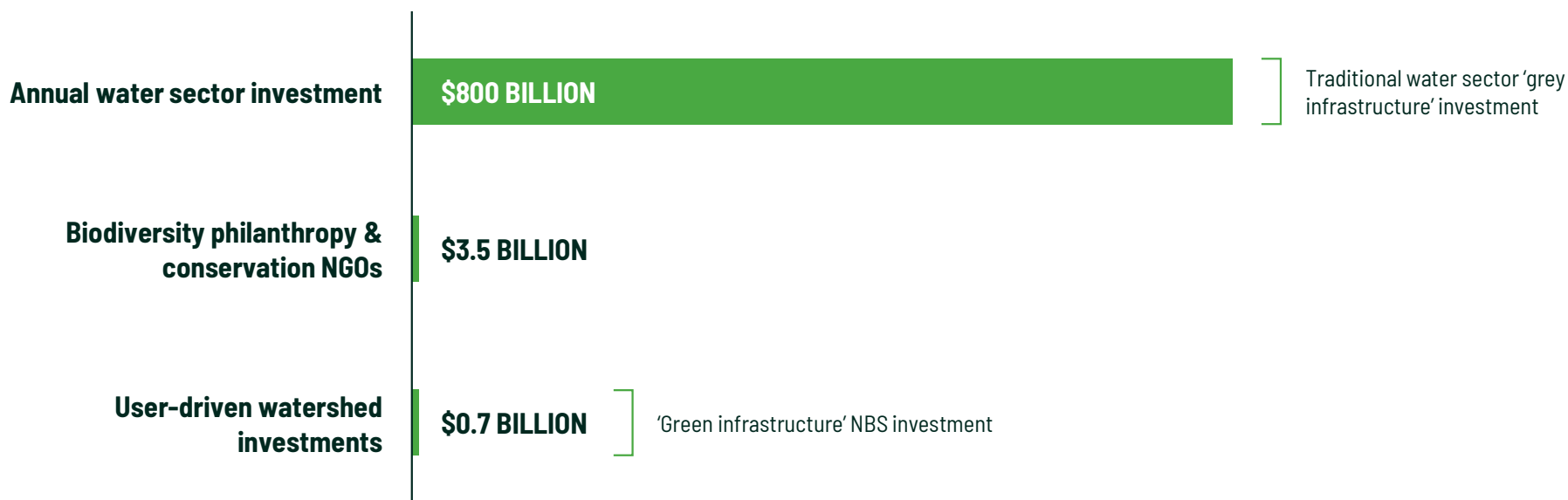
Improvement in Key Ecological Attributes:

- | | |
|----------------------|----------------------|
| 1 Hydrologic Regime | 4 Connectivity |
| 2 Sediment Flow | 5 Physical Structure |
| 3 Biotic Composition | 6 Water Quality |



Investments in NbS remain marginal when compared to broader water sector investments

Re-orienting just 1% of annual water sector investment toward nature-based solutions would eclipse all philanthropic spending on conservation combined.



Sources. Annual water sector investment: GWI 2018; philanthropy & conservation NGO funding: Deutz (2020) Financing Nature: Closing the Global Biodiversity Financing Gap; Salzman (2018) Payments for Ecosystem Services: Past, Present & Future

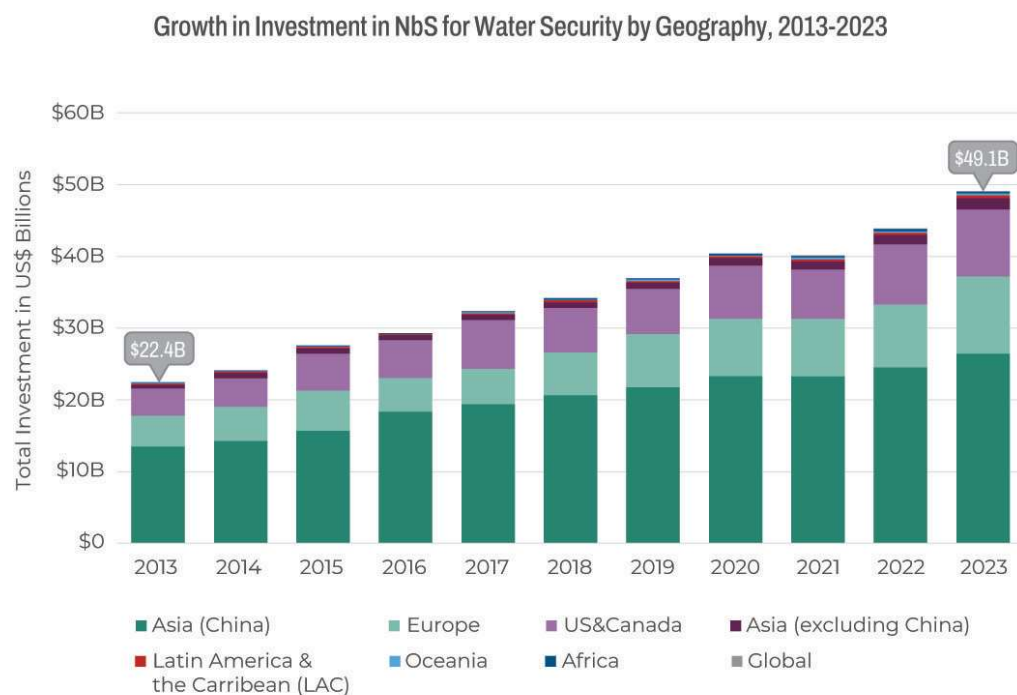
Mobilising funding from downstream beneficiaries can be essential to support investment upstream in the watershed



Watershed Investment Programs, are collective action governance platforms that bring together different water users – usually utilities, businesses, agriculture and local government – **to invest in ecosystem protection and upstream communities** within the catchments they depend on.

Investing in NbS at scale can be challenging





Smith et al. 2025. *Doubling Down on Nature: State of Investment in Nature-based Solutions for Water Security*, 2025.
Forest Trends and The Nature Conservancy

Global investments
in NbS for water
security **doubled**
over the past
decade, reaching
USD 49 billion (B)
in 2023.

Governments investing domestically drive 97% of global investment, led by national governments

Global Investment in NbS for Water Security Including Volume and Payers by Geography, 2023



Government investment, at all levels, roughly doubled over the last decade

Smith et al. 2025. *Doubling Down on Nature: State of Investment in Nature-based Solutions for Water Security*, 2025.
Forest Trends and The Nature Conservancy

We saw increasing participation by **payers outside of government** -- reflecting growing confidence in NbS

Water Utilities &
User Fees
(USD 867 M)

Multilateral
institutions &
foreign
assistance
(USD 489 M)

Private
sector
(USD 345 M)

Growth over
10 years:

3x

10x

30x

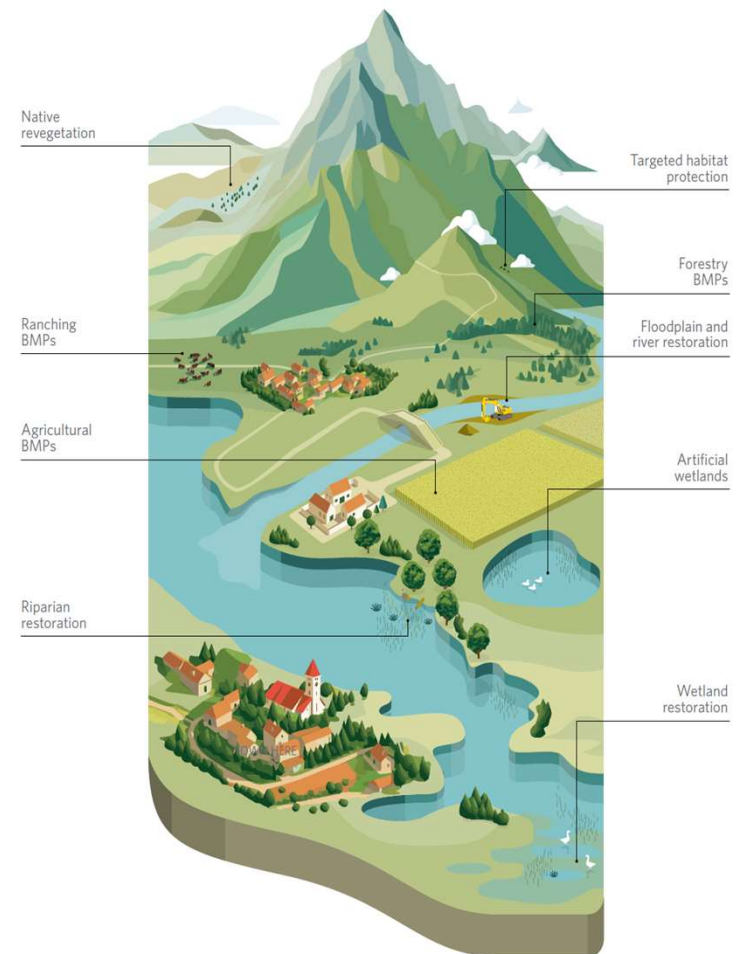
Nature-based solutions for water security

Nature-based solutions

Leveraging **nature** and power of healthy ecosystems to **protect people**, optimize infrastructure and safeguard a stable and biodiverse future (*IUCN, 2024*).

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Ecosystem Services

the **benefits** provided to people, both directly and indirectly, by ecosystems and biodiversity.

Four Categories of Ecosystem Services

1

Provisioning

A **provisioning service** is any type of benefit to people that can be extracted from nature

- Water (quantity and quality) for consumptive use, e.g., drinking, domestic use, and agriculture and industrial use
- Water for nonconsumptive use, e.g., generating power and transport/navigation
- Aquatic organisms for food and medicines

2

Regulating

A **regulating service** is the benefit provided by ecosystem processes that moderate natural phenomena

- Maintenance of water quality (natural filtration and water treatment)
- Regulating flows, including flood control and subsurface flows
- Erosion control through water/land interactions

3

Cultural

A **cultural service** is a non-material benefit that contributes to the development and cultural advancement of people

- Recreation (river rafting, kayaking, hiking, and fishing as a sport)
- Tourism (touring freshwater ecosystems, wildlife watching)
- Connection with nature
- Sacred freshwater ecosystems

4

Supporting

Supporting services are those necessary for the production or the maintenance of all other ecosystem services

- Role in nutrient cycling (e.g., role in maintenance of floodplain & delta fertility), primary production
- Predator/prey relationships and ecosystem resilience

Nature-based solutions types for water security



Protection is an intervention that prevents, or greatly limits, overexploitation of natural resources to achieve the long-term conservation of nature.



Restoration is an active or passive intervention that involves returning degraded, damaged or destroyed ecosystems to pre-disturbance state.



Management covers all natural resource management interventions beyond protection and restoration.



Creation involves the establishment, protection or management of artificial ecosystems.

Examples

National park designation, fencing, support for park guards

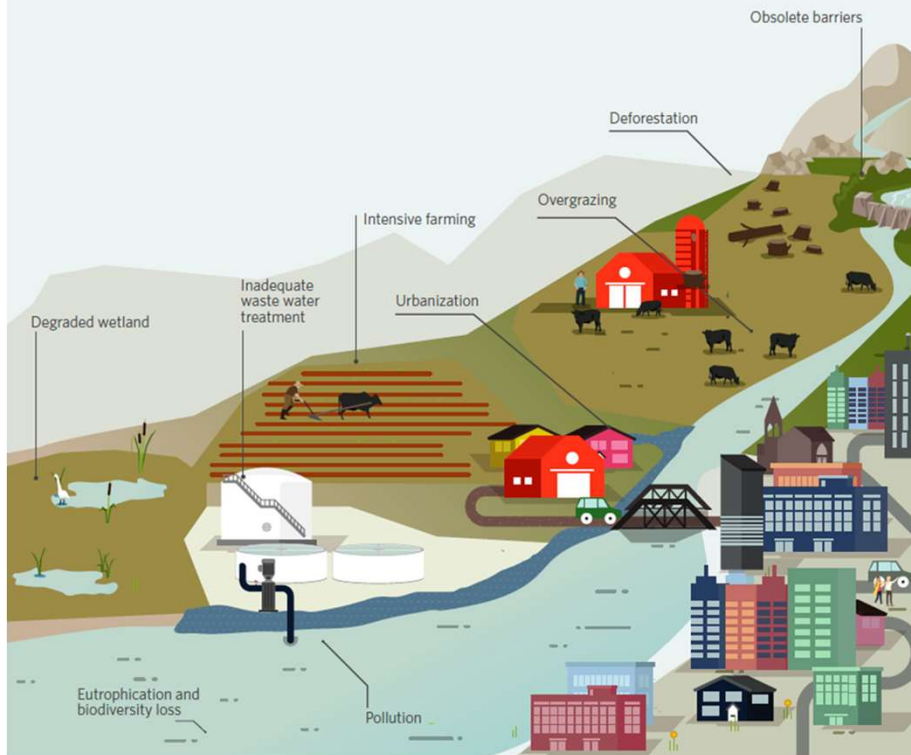
Reforestation, grassland revegetation, riparian restoration, wetlands restoration, floodplain restoration, invasive species removal, barrier removal

Agricultural best management practices, ranching best management practices, forestry best management practices, fire management

Artificial grasslands, created wetlands (not restored), urban green infrastructure (SUDS, bioswales, natural retention ponds)

But these services are threatened

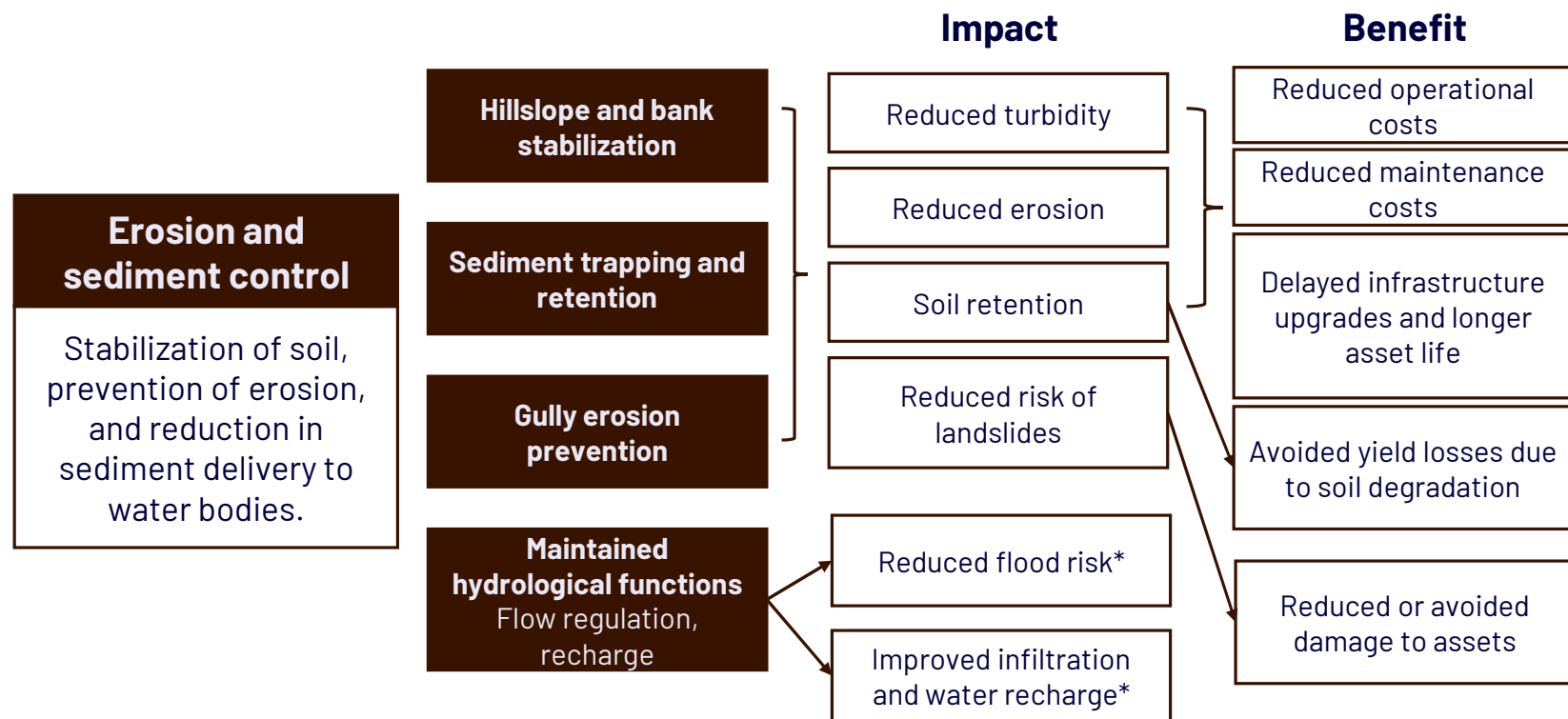
The challenges



What we strive for



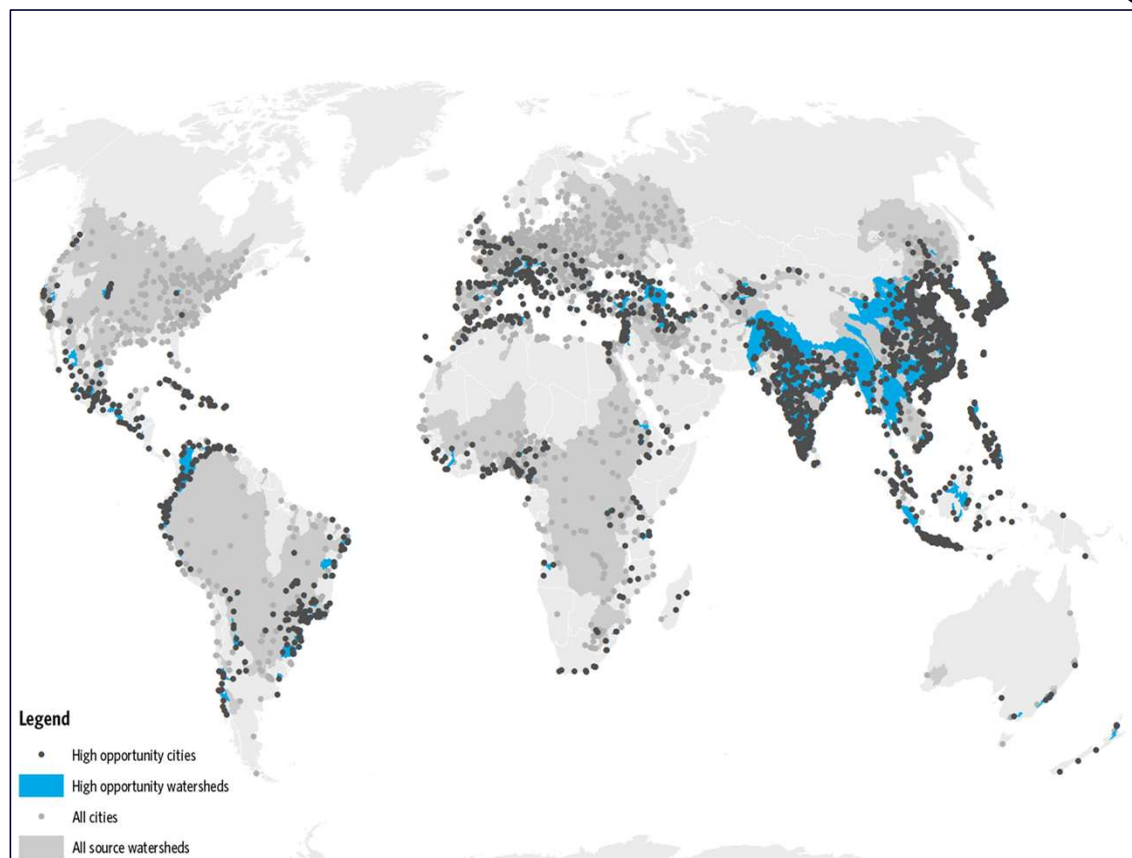
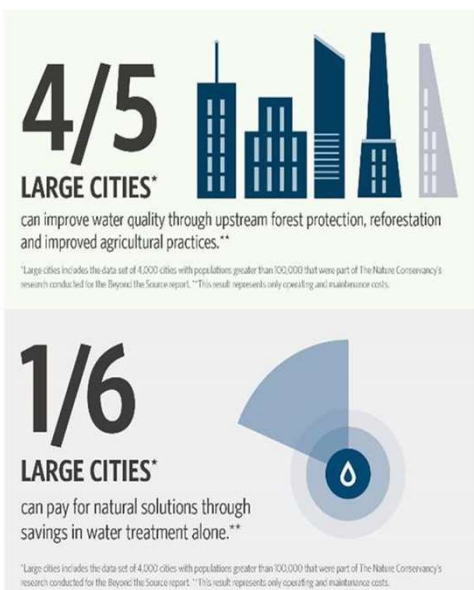
Example: erosion & sediment



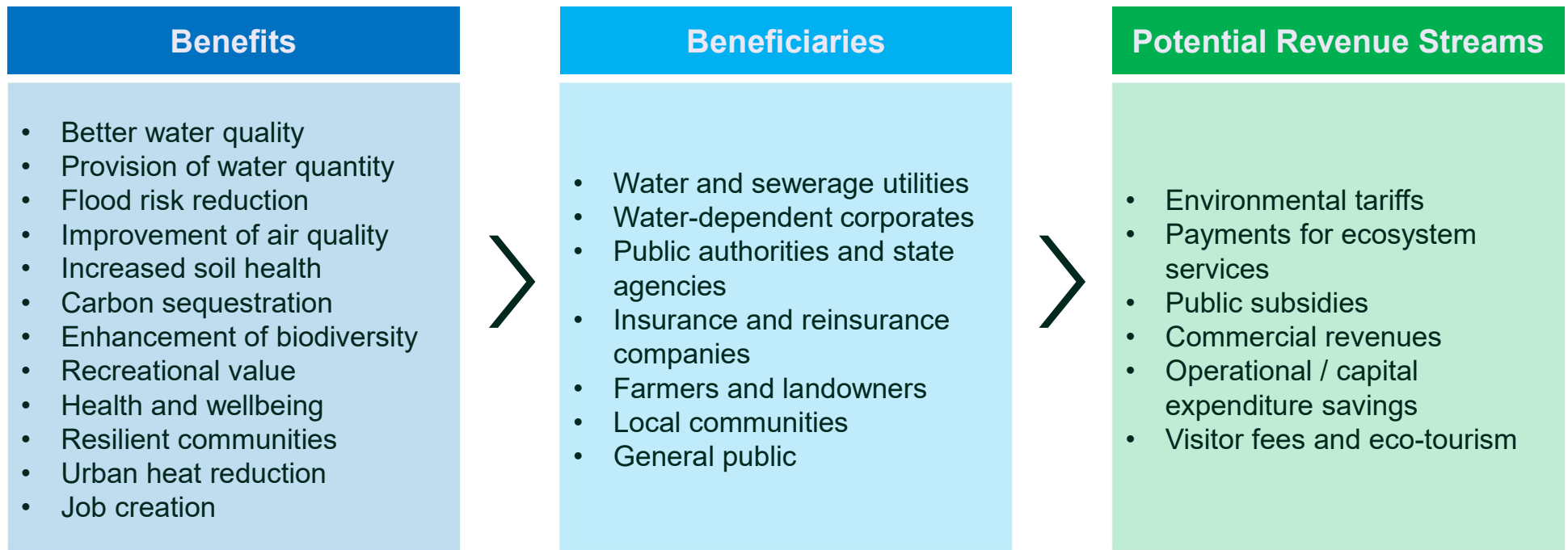
Investing in NbS for nutrient and erosion control significantly reduces water treatment costs for more than 2000 cities, globally

2000 cities could generate a positive ROI if they invested at scale in NBS in their watersheds, potentially impacting **664 million people** around the world.

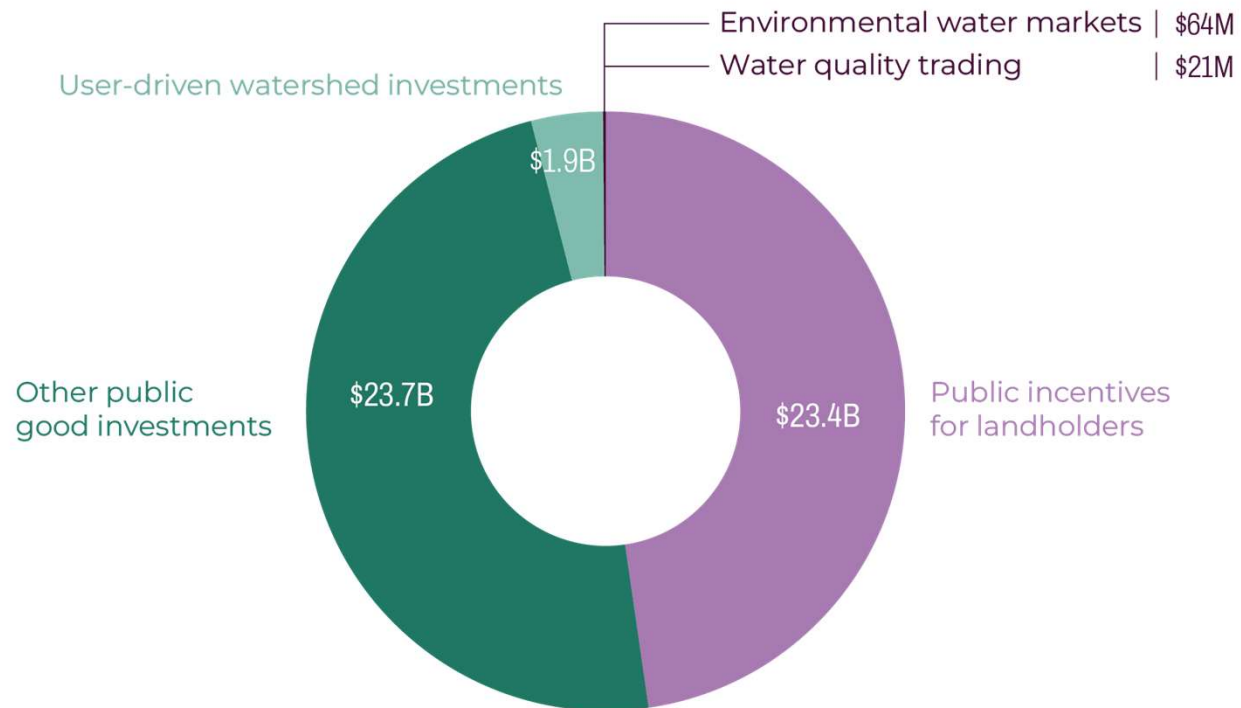
This would be possible for half of all cities for less than \$2/person/year



By leveraging co-benefits, NbS can attract multiple potential revenue streams to cover CAPEX and, crucially, OPEX



Volume of Investment in NbS for Water Security by Mechanism Type, 2023



Smith et al. 2025. *Doubling Down on Nature: State of Investment in Nature-based Solutions for Water Security*, 2025.

Forest Trends and The Nature Conservancy

NbS for water are no longer fringe – but they do still face key challenges

NbS are not integrated into grey infrastructure planning

Long-term OPEX funding remains a major gap

Capacity to implement lags demand

Public funding dominates, but is vulnerable

Private investment constrained

Project preparation & transaction costs difficult to fund

Indigenous and local community leadership lacking

Data gaps hinder uptake

Why do NbS need scale?



Widespread implementation is essential

Unlike grey infrastructure, NbS typically require large-scale deployment to deliver expected benefits.



Disaster risk reduction

Coastal wetlands, forests, and floodplains need scale to protect against storms, erosion, and landslides. Same is true for urban NbS.



Cumulative & synergistic effects

Multiple interventions interact to enhance water retention, carbon storage, and biodiversity.



Carbon sequestration impact

Only large-scale restoration efforts contribute meaningfully to climate mitigation.



Hydrological & ecological connectivity

Large-scale NbS restore natural water flows and ecosystem functions.



Biodiversity conservation

Small, fragmented habitats are ineffective; large areas support species survival.



Resilience to climate change

In rural landscapes

Bigger, connected areas withstand floods, droughts, and land-use pressures better.

In urban settings

Scaling NbS is necessary to ensure widespread, continuous impact, effectively managing climate risks like heatwaves and floods across entire urban areas.

Key considerations for scale



1. **Stakeholders:** Building local engagement and ownership



2. **Governance:** Finding the right vehicle and processes



3. **Operations:** Implementing, maintaining and managing at scale



4. **Funding:** Devising and securing a long-term funding strategy

Funding



Devise and secure a long-term funding strategy

- ✓ Build a **compelling, at-scale 'project offer'** which offers **meaningful benefits** and can **attract and then deploy large-scale funding**.
- ✓ Ensure funding models account for the **entire lifecycle of NbS**, from design to implementation to ongoing maintenance and monitoring.
- ✓ **Secure and blend a mix** of public, private, and philanthropic funds to create financial stability.
- ✓ **Engage the 'beneficiaries'** identified in your economic and other analyses to explore funding options.
- ✓ Develop structural funding mechanisms to create **recurring, predictable resources**.



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1

Build reliable and resilient revenue models

Long-term funding is critical, especially as centralized public funding becomes less predictable. Models involving direct beneficiaries (e.g., water users, property owners) offer the most promise for sustainable growth.

For the purposes of

- **Mainstream Revenue Models Based on User Fees:** Successful, obligatory user fee models—like those in South Korea, France, Brazil, Peru, the UK, and the US—are often integrated into tariffs and managed by public agencies or utilities. Ministries and regulators should replicate these.
- **Leverage Co-Benefits to Diversify Funding Pool:** NbS benefits like carbon sequestration, livelihood benefits, and property value gains, can attract ecosystem market or public revenue funding.
- **Bridge Gaps in Low-Resource Settings:** In least developed countries, foreign assistance and philanthropy remains vital to build legal and financial foundations for long-term NbS investment.

The Nature
Conservancy



FOREST
TRENDS

3

Grow and steer private investment to highest-value use

The private sector currently accounts for less than one percent of global investment in NbS for water security. While it won't replace public funding, it can be catalytic when strategically aligned.

Strengthen Policy and Regulatory Incentives: Where politically feasible, regulations are the most effective tool to expand private participation in NbS. Successful models include:

- Requiring contributions to publicly-run initiatives based on water use (e.g., Vietnam's Forest Protection and Development Fund)
- Creating frameworks that link compliance with ecosystem outcomes (e.g., state-led water quality trading programs in the U.S.)
- Requiring companies to disclose water and nature-related risks and mitigation measures
- Offering tax breaks associated with NbS

Leverage Collective Action and Public-Private Delivery Models to mobilize private investment, coordinate action, and lower transaction costs. Performance-based approaches (e.g., DC Water's bond) align returns with environmental outcomes and boost innovation and can attract private sector capital and delivery capacity.

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