ROAD TO INDONESIA WATER 2025

Water Security for Indonesia:
From Scarcity to Solutions

2 September 2025

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NATURE-BASED SOLUTION FOR WATER-RELATED HAZARDS IN MALAYSIA

INTRODUCTION

What does NbS mean?

- Nature-based solutions (NbS) for water resilience in Malaysia focus on using natural ecosystems and processes to manage water resources, mitigate flooding, and ensure water security.

- These solutions work with nature to address challenges related to water management, climate change, and environmental sustainability.

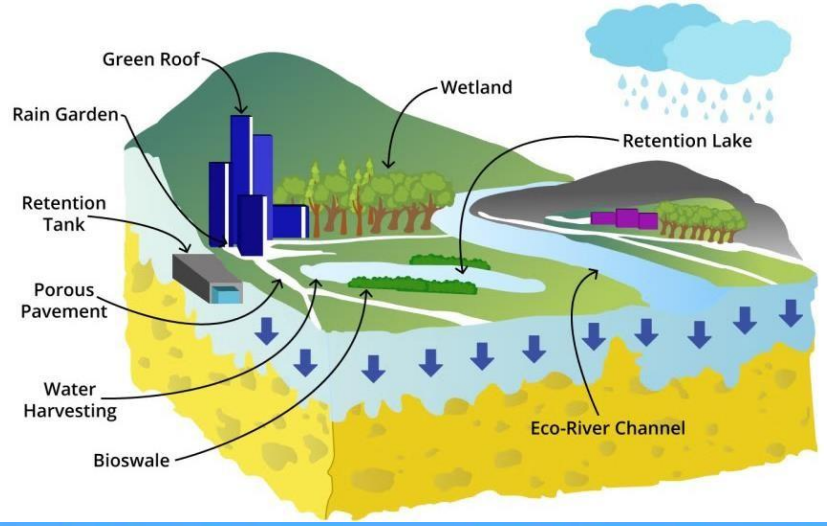
Objectives

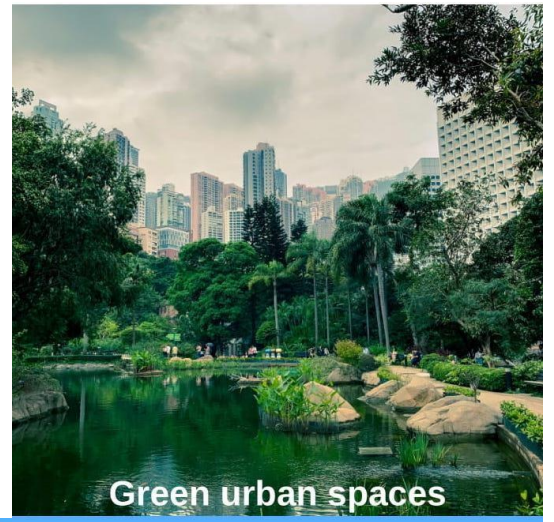
The key objectives of implementing NbS in water resilience include:

- Sustainability
- Cost-Effective solutions that complement traditional infrastructure.

Nature-Based Solutions: An Innovative Approach

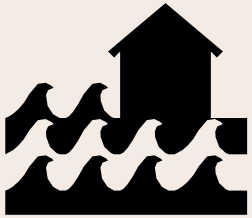
EXAMPLE OF NATURE – BASED SOLUTIONS



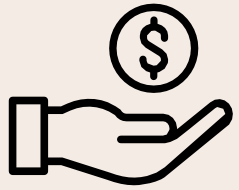


BENEFITS OF NBS

WATER QUALITY IMPROVEMENT

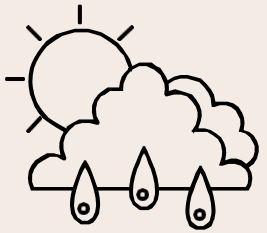


FLOOD MITIGATION



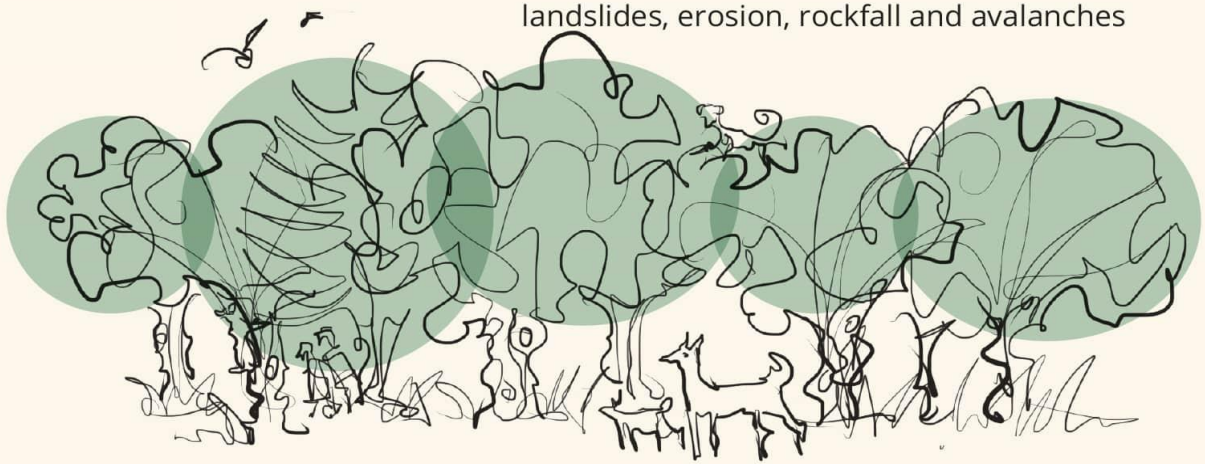
COST-EFFECTIVE (LONG TERM)

BIODIVERSITY ENHANCEMENT

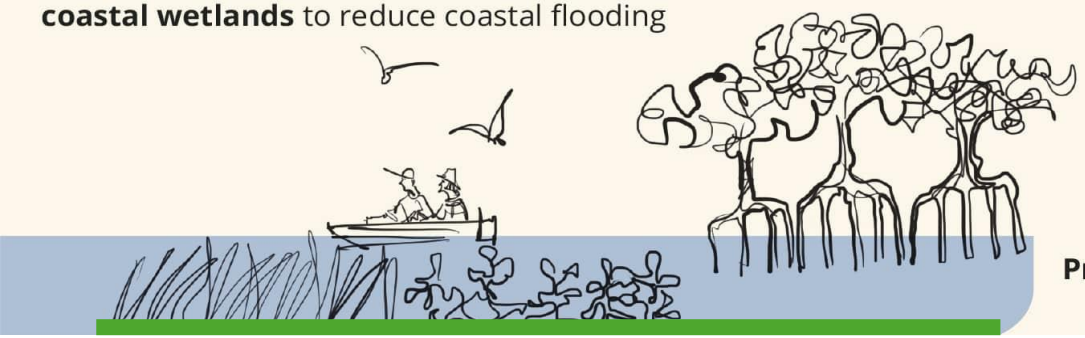


CLIMATE RESILIENCE

Forest restoration and **bio-engineering** to reduce landslides, erosion, rockfall and avalanches

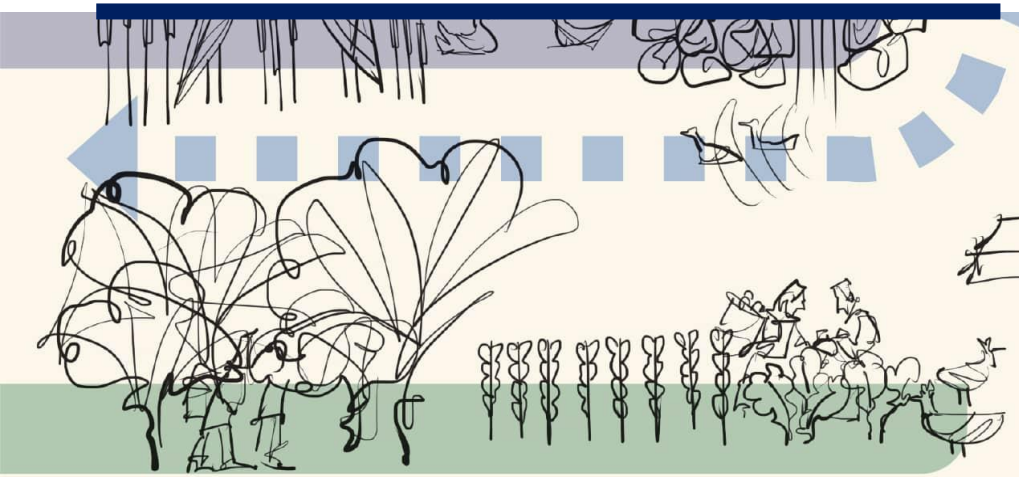


Protection and restoration of mangrove, coral reef and coastal wetlands to reduce coastal flooding



Providing space for rivers to flow naturally to enable flood protection and water security

Malaysia's Commitment to Nature-Based Solutions



Agroforestry systems for increased food security and environmental health

Green belts as shelters from sand and providing shade

Urban green and blue spaces to help climate regulation, health, social development and green jobs

Shoreline Management

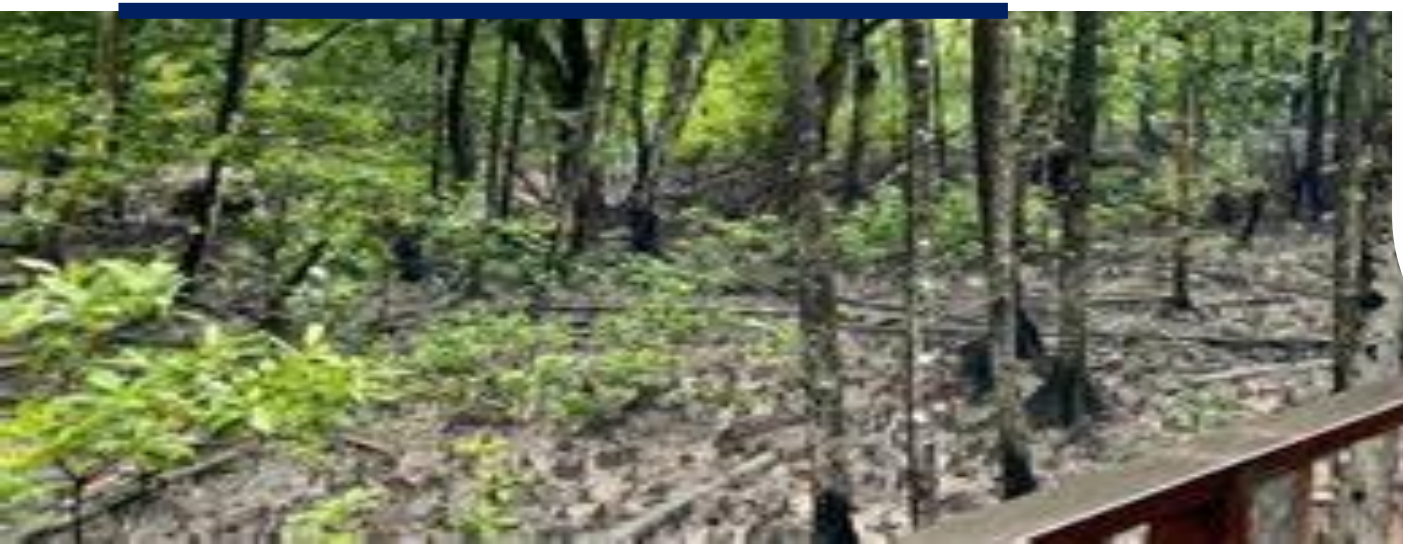
NBS in practice

PORT DICKSON BEACH NOURISHMENT

NBS in practice

BEACH
NOURISHMENT
TELUK
CEMPEDAK

Mangroves Restoration and Conservation in Malaysia



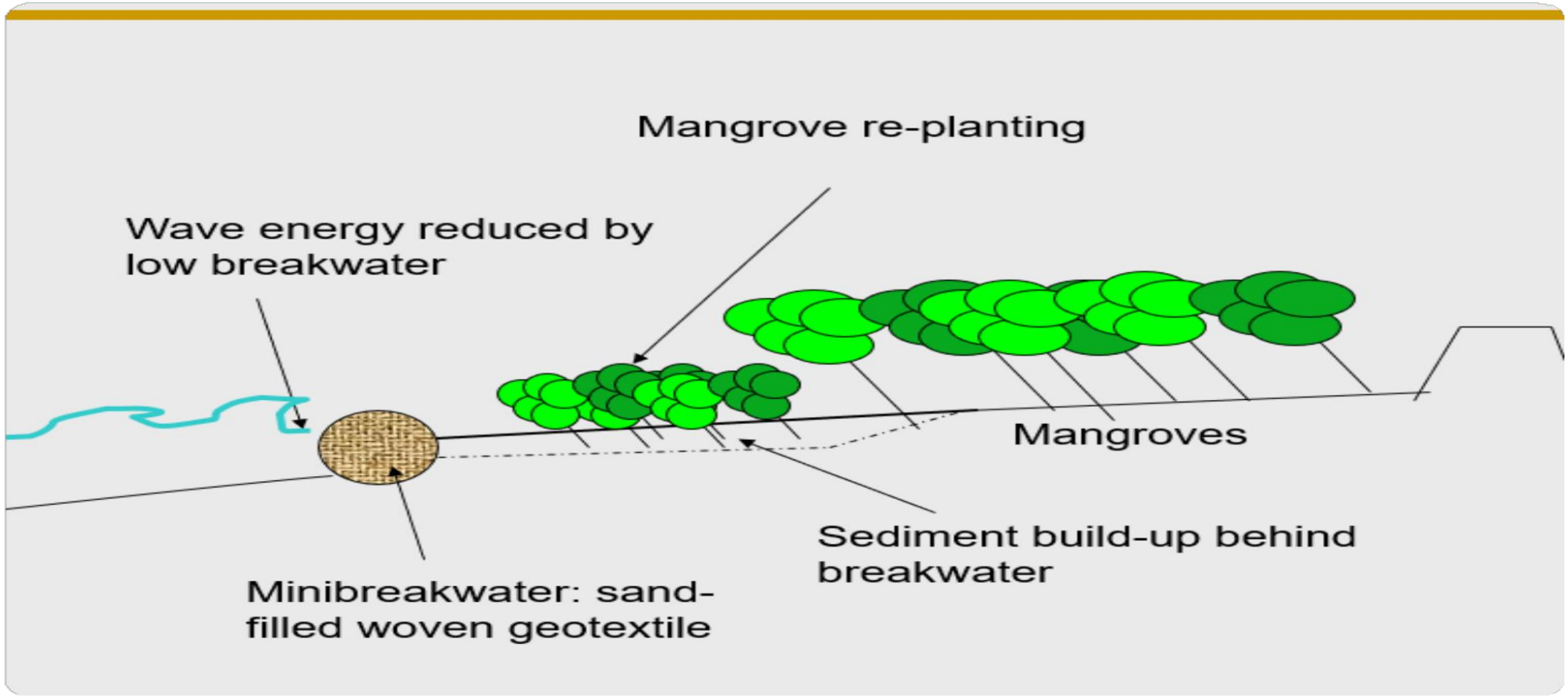
Wetland Conservation

NBS in practice

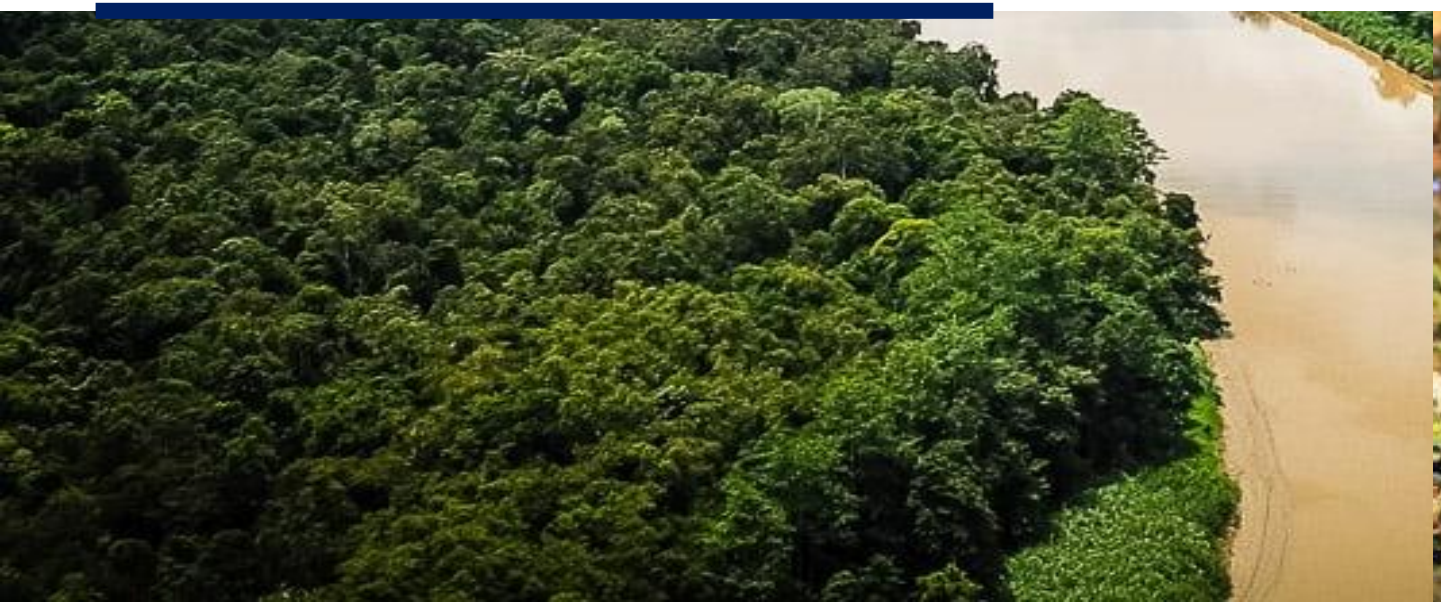
MANGROVE RESTORATION IN KUALA SELANGOR

PUTRAJAYA WETLAND

NBS in practice



Kinabatangan River



Benefits of Integrating Mangrove Conservation with Urban Water Management

Flood Control:

- Mangroves absorb stormwater and reduce peak flow rates during heavy rains.

Water Quality Improvement:

- Mangroves filter pollutants from urban runoff, reducing contamination in rivers and coastal waters.

Ecosystem Services:

- Support biodiversity, enhance fish nurseries, and promote ecotourism opportunities.

Cost Efficiency:

- Mangrove-based solutions are less expensive than constructing or maintaining artificial infrastructure like levees or flood barriers.

Rainwater harvesting

Benefits of Harvesting Rainwater

- Conserves water
- Decreases your bills
- Lowers demand on freshwater resources
- Slows erosion in dry environments
- Reduces flooding in low-lying areas

Treehugger

Rainwater Harvesting Ssystem in Practice

Malaysia Alam Damai Residential Home

Rainwater Harvesting System in Practice

Toyota Plant ASSB Package 2, Bukit Raja

TRX Mall

Spice Arena

IOI City Mall 2 Putrajaya

KPJ Kajang

KDU College, Glenmarie Campus

RAINWATER HARVESTING SYSTEM GUIDELINES IN MALAYSIA

No.	Guidelines	Department/Agencies
1.	Rainwater Harvesting Guidebook on Planning and Design,2009	Department of Irrigation and Drainage, Malaysia
2.	Technical Guide – The Design Guide for Rainwater Harvesting System, 2015	National Water Research Institute, Malaysia
3.	Guidelines for Installing Rainwater Collection and Utilisation System,1999	Ministry of Housing and Local Government
4.	Rainwater Collection and Use System Guidelines, 2013	Town and Country Planning Dept.

URBAN STORMWATER MANAGEMENT MANUAL FOR MALAYSIA

MSMA *2nd* Edition

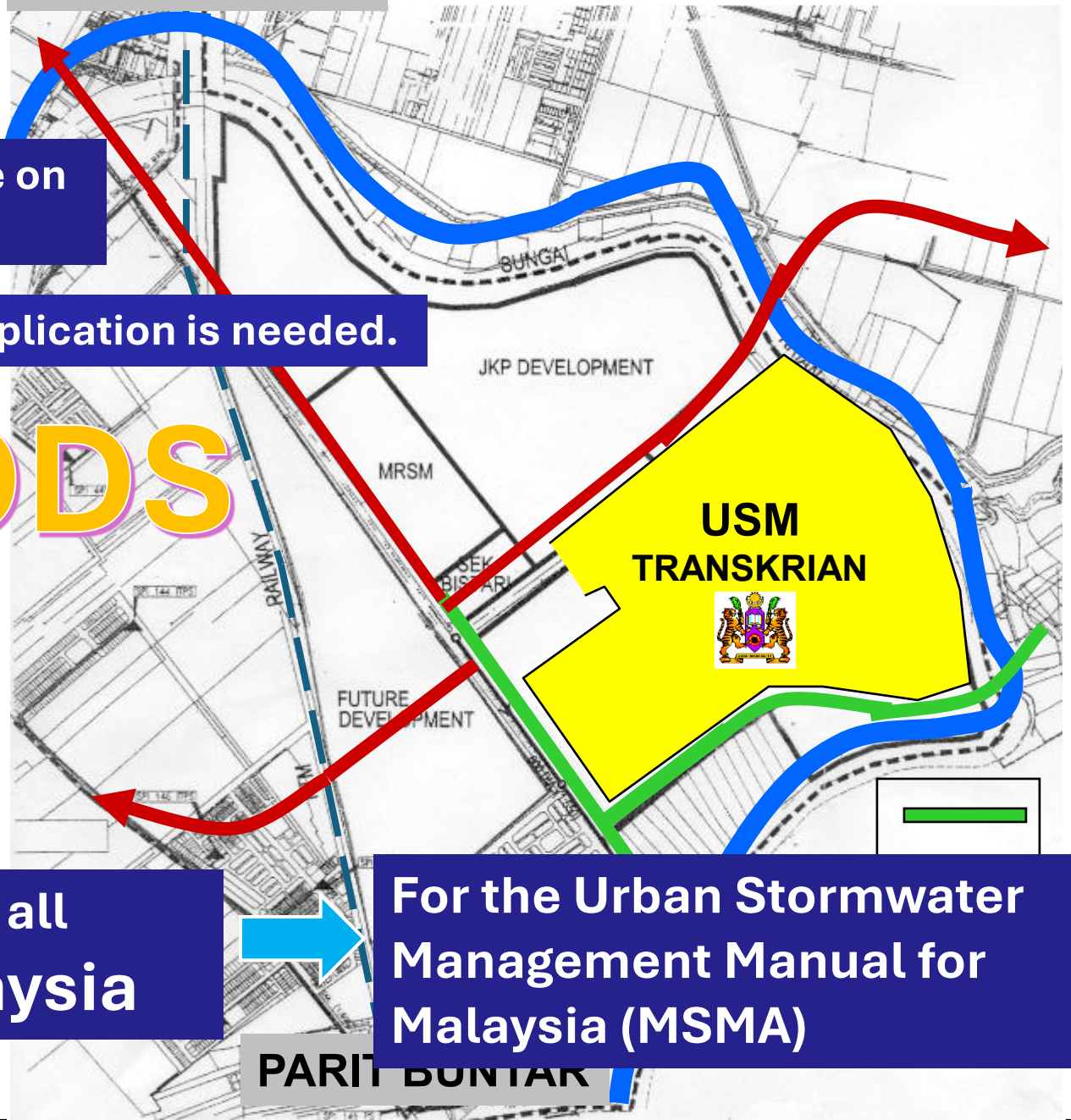
To solve this national issue on stormwater management

An Ecohydrology-based application is needed.

BIOECODS

Not only to solve the surrounding issues

Can be a reference for all development in **Malaysia**



For the Urban Stormwater Management Manual for Malaysia (MSMA)

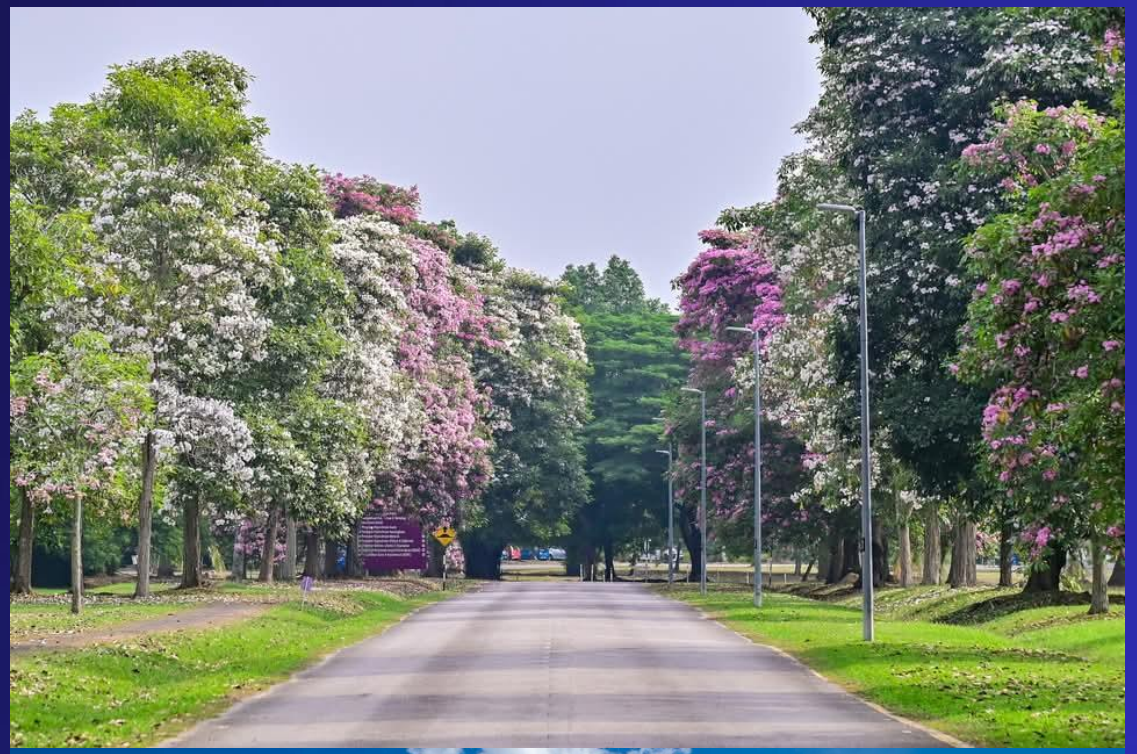
CONCEPT OF BIOECODS

ECOLOGICAL SWALE

BIOECODS

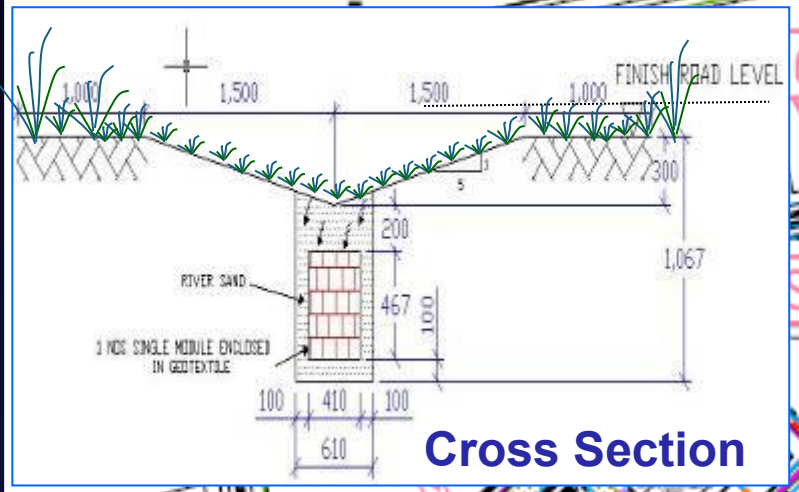
(Bio-Ecological Drainage System)

ECOHYDROLOGY DEMONSTRATION SITE MALAYSIA



LANDSCAPE AESTHETICS

Ecological Swale

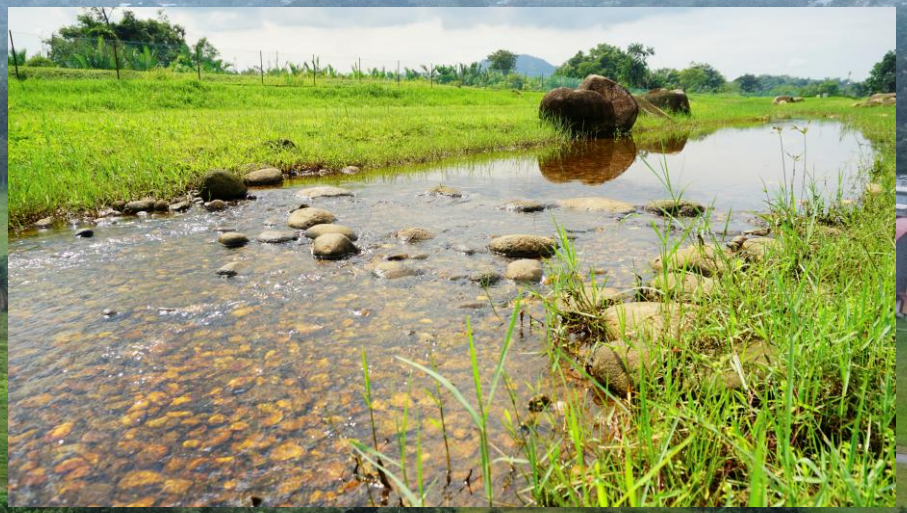


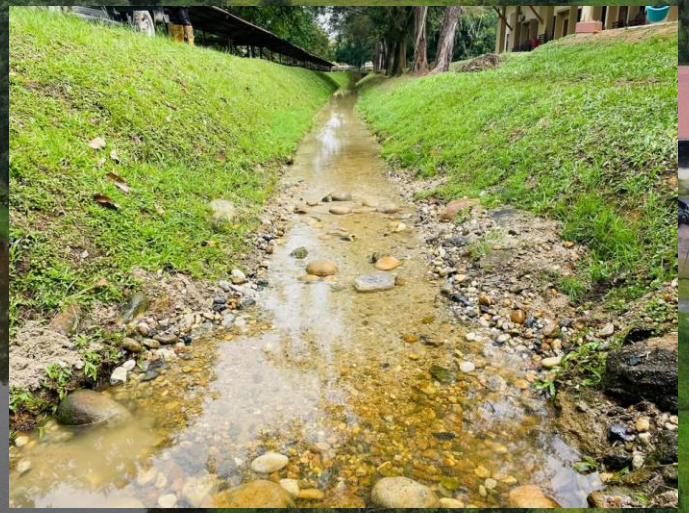
Cross Section

During dry

After rain

KERIAN RIVER

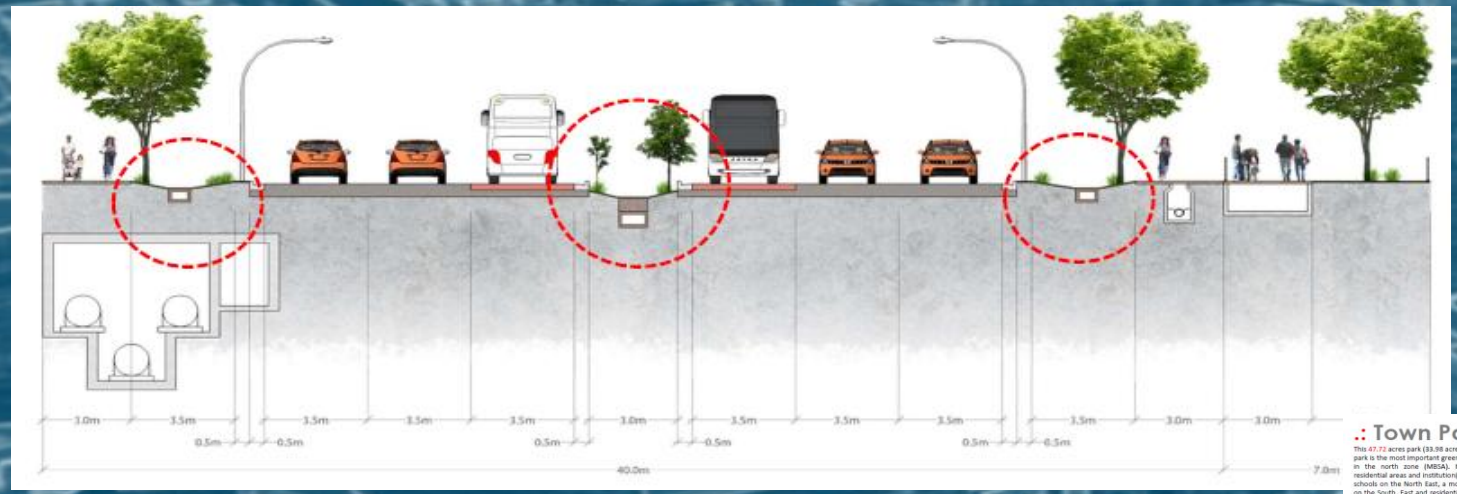


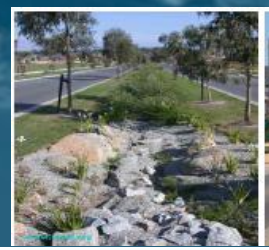


Class IIB National Water Quality Standard of Malaysia
From BIOECODS SYSTEM

IMPROVE QUALITY AND CONTROL QUANTITY OF THE WATER

KWASA DAMANSARA TOWNSHIP MASTER PLAN

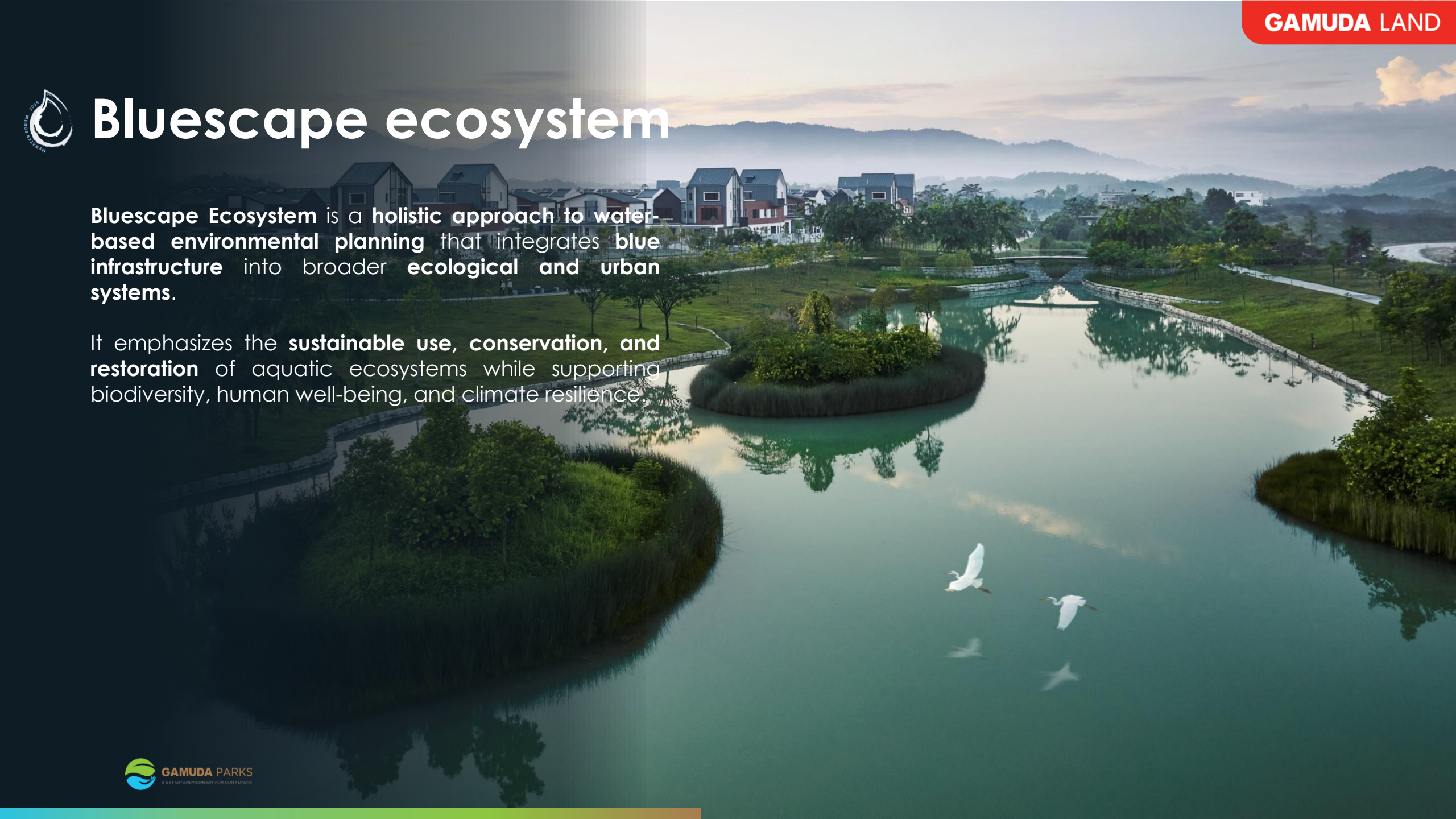




Bluescape ecosystem

Bluescape Ecosystem is a **holistic approach to water-based environmental planning** that integrates **blue infrastructure** into broader **ecological and urban systems**.

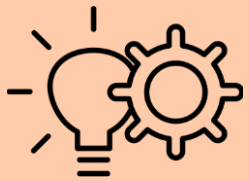
It emphasizes the **sustainable use, conservation, and restoration** of aquatic ecosystems while supporting biodiversity, human well-being, and climate resilience.



Challenges and Barriers to Implementation

CHALLENGES IN NBS IMPLEMENTATION

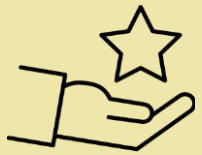
1. POLICY AND REGULATORY FRAMEWORK



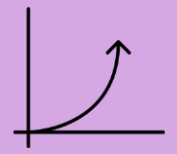
2. POLITICAL WILL AND PRIORITISATION

3. FINANCIAL AND ECONOMIC CONSTRAINT

4. TECHNICAL CHALLENGES



5. SOCIETAL AND CULTURAL BARRIERS



6. ENVIROMENTAL AND ECOLOGICAL CONSTRAINTS

7. MONITORING AND EVALUATION

8. COORDINATION BETWEEN STAKEHOLDERS

Way Forward

The Next Step

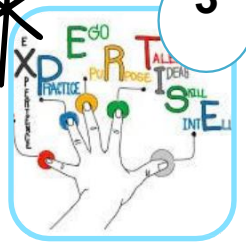
1 Strengthen Policies

- Integrate NbS in all water and environmental policies.

2 Increase Funding

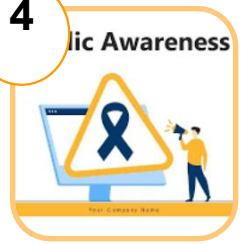
- Develop sustainable financing for long-term NbS projects.

3 Build Expertise



- Invest in capacity building and training programs.

4 Public Awareness



- Educate on the benefits and importance of NbS.

5 Collaborative Approach

- Engage communities, private sector, and government in NbS projects.


THANK
YOU