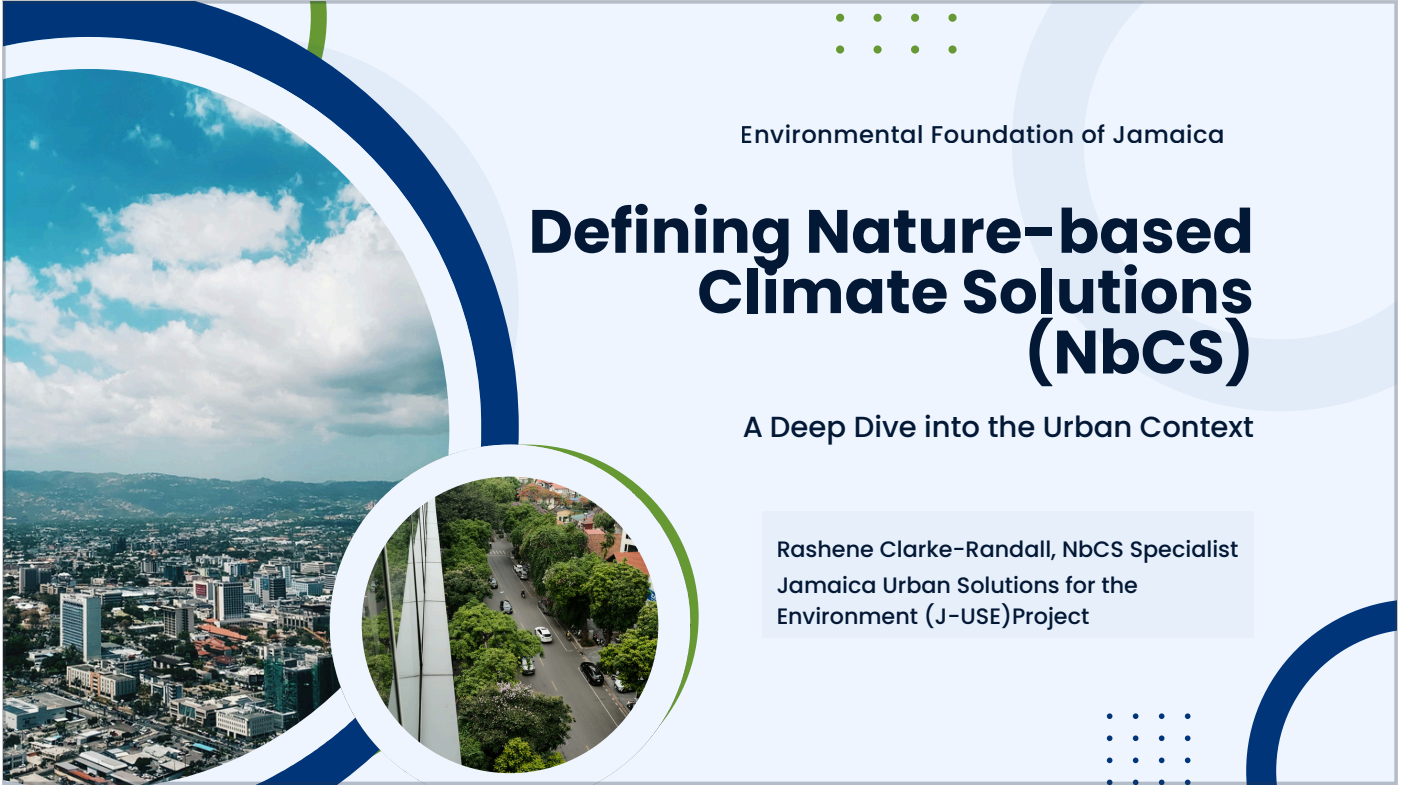


Environmental Foundation of Jamaica

Defining Nature-based Climate Solutions (NbCS)

A Deep Dive into the Urban Context

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What is NbCS?

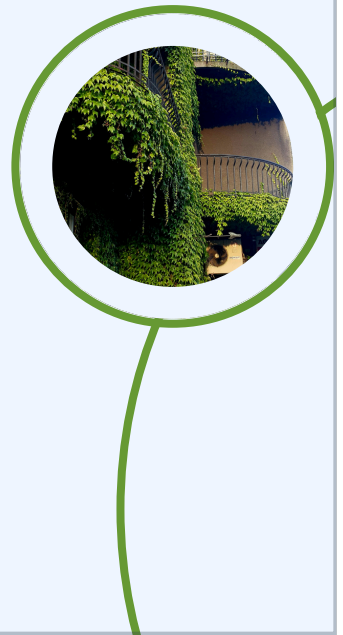
- **A Definition of Purpose:** NbS are deliberate actions to protect, sustainably manage, and restore ecosystems while simultaneously addressing urgent societal challenges like climate change or food security.

- **The "Dual-Benefit" Mandate:** To qualify as an NbS under J-USE, the intervention must provide measurable benefits to both society and the environment; one cannot exist without the other.

Core Pillars of Design:

- **Societal Challenge:** The project must solve a specific human problem, such as localized flooding or the urban heat island effect.
- **Ecosystem Health:** The solution must actively support or restore biodiversity, rather than just using nature as a passive tool.
- **Adaptive Management:** Designs should be resilient enough to grow, self-repair, and change alongside the evolving urban environment.

- **The Key Message:** *NbS acts as a functional bridge between community needs and natural ecosystem services.*



The Urban Context – Why Now?



The Vulnerability of Cities

Urban areas face unique pressures, including high concrete density (gray infrastructure) that traps heat and lacks the natural permeability needed for drainage.



The Role of Green Infrastructure

NbS is used to complement or replace traditional concrete "gray" systems with "green" infrastructure, such as using mangroves for coastal protection instead of sea walls.



Understanding the Local Issue

A proposal cannot be effective without a diagnostic approach; you must clearly define whether your community is struggling with erosion, stagnant water, or air quality before selecting your NbS.



Shifting from Aesthetics to Function

The Pivot from Aesthetic Greening

- **Standard Greening:** Often focuses on "beautification" or general aesthetics, such as planting ornamental trees for shade without a specific environmental target.
- **Urban Nbs:** Focuses on systemic function, such as selecting specific native species that maximize water filtration or provide high-volume carbon sequestration.
- **The J-USE Expectation:** We are looking for "productive" infrastructure where every plant and soil layer has a defined role in mitigating a climate risk.
- **Understanding the problem:** You are not just planting a garden; you are deploying a natural technology to alleviate a documented community threat.



Flooding



Heat Stress



Biodiversity loss



Water Management



Exploring the Sponge City Concept

- **The Core Philosophy:** Moving away from "draining" water to "retaining" water.
- **The Urban Challenge:** In many Jamaican urban communities, heavy rainfall turns paved surfaces into torrents, leading to immediate localized flooding and property damage.
- **The NbS Intervention:** Implementation of Bioswales (sloped, vegetated channels)
 - or Permeable Pavement that allows water to soak into the earth rather than running off.
- **The Goal:** To create an urban environment that functions like a natural sponge, absorbing, filtering, and releasing water slowly





The Theoretical Underpinning



- **Philosophical Shift: Nature as Infrastructure**
- Moves away from the traditional "Gray Infrastructure" model of fast Drainage (using concrete to move water away as quickly as possible) toward slow infiltration.
- Treats rainwater as a resource to be harvested rather than a waste product to be discarded.
- **The "LID" Framework (Low Impact Development)**
- The Sponge City is built on the principle of source Control, managing stormwater at the exact point where it hits the ground.
- It utilizes the natural functions of absorption, Interception, and evapotranspiration to restore the pre-development water cycle of the urban site.
- **Mimicking Natural Hydrology**
- Permeability: Replacing impervious surfaces (asphalt/concrete) with porous materials to allow the earth to "breathe" and swallow water.
- Storage & Retention: Creating temporary "holding zones" (like wetlands or rain gardens) that mimic how a forest floor holds water after a storm.
- **The Triple Bottom Line**
- Hydrological: Restoring water balance and reducing flood peaks.
- Ecological: Promoting biodiversity and cooling the local climate.
- Social: Enhancing the livability and safety of the urban community.



Applied Scenario The "Gully-Side" Intervention



- **The Problem:** A high-density community in Kingston faces repetitive flooding because the local concrete gully overflows during heavy rains, sending debris and stagnant water into homes.
- **The NBS Intervention:** Instead of just raising the concrete walls, the project implements a Linear Bioswale Network along the gully's edge.
- **How it Works:**
 - Step 1: The bioswale captures surface runoff from the road before it reaches the gully.
 - Step 2: Native, deep-rooted vegetation slows the water and filters out trash and oils.
 - Step 3: Excess water is stored in underground gravel "soak-aways," recharging the groundwater.
- **The Result:**
 - Societal Benefit: Reduced flood damage to homes and improved public health by removing stagnant water.
 - Environmental Benefit: Restoration of local plant biodiversity and cleaner water entering the marine environment.

Examples of Nature-based Solutions (NbS)



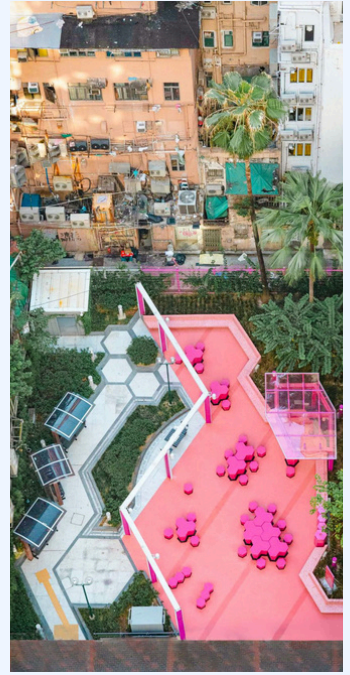
Biodiversity corridor



rain garden



bioswale



pocket park



The Takeaway



Nature-based Solutions are functional, engineered infrastructure designed to solve human problems through the power of ecosystems.



We are moving from viewing nature as something to "manage" to viewing nature as a "partner" in urban resilience.



