

# Is climate change adaptation all about water?



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# BACKGROUND AND ISSUES



## Background

- Rwanda's urban population (2,364,984 inhab.) is expected to grow to 30% in 2035: by 2050 it's expected to reach approximately 70%.
- Largest urban agglomeration is Kigali but **Secondary and satellite cities show** a growing trend in population and urbanization
- Poses huge **ecological impact** and magnate of **environmental hazards.....**due to **Climate change**
- The major environmental threats are **landslides and flooding.**
- Challenging topography
- The wetland was **degraded** and no longer capable of offering its ecosystem
- **Water resources degradation**

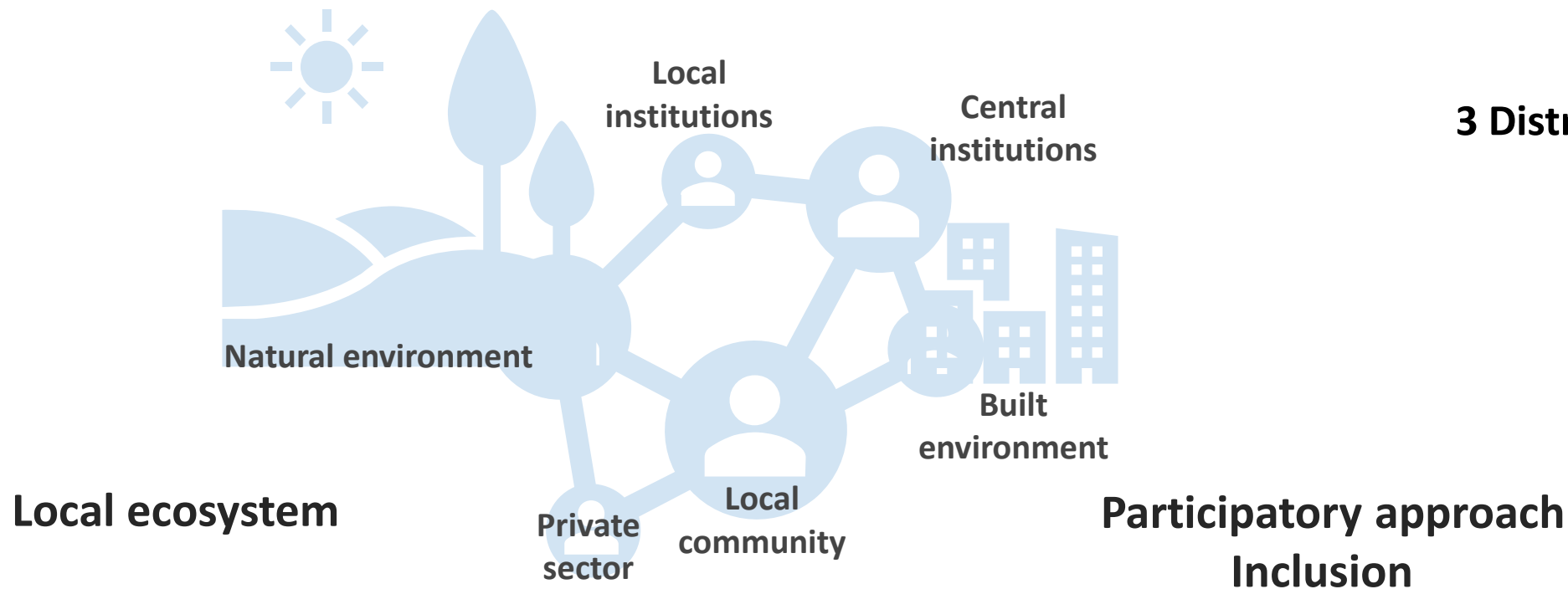
**...AND MOST OF THE SOLUTIONS ARE BASED ON OLD NEWS!**  
**EXISTING DATA VS DATA NEEDED (DATA QUALITY)**



# UEDi (Urban economic Development initiative): A holistic approach



to generate inclusive and sustainable economic development through urban infrastructure



### 3 Districts:

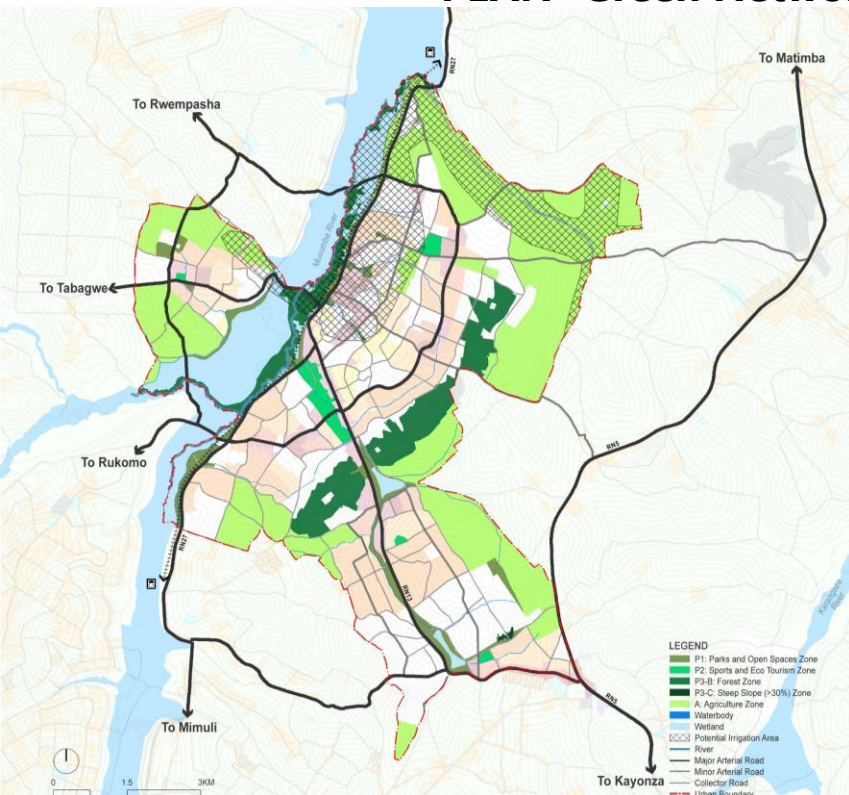
Rubavu  
Musanze  
Rwamagana  
*+ Bugesera master plan*

a holistic approach that considers **the city as a living being, a complex ecosystem**

# UEDi Project in Rwamagana District

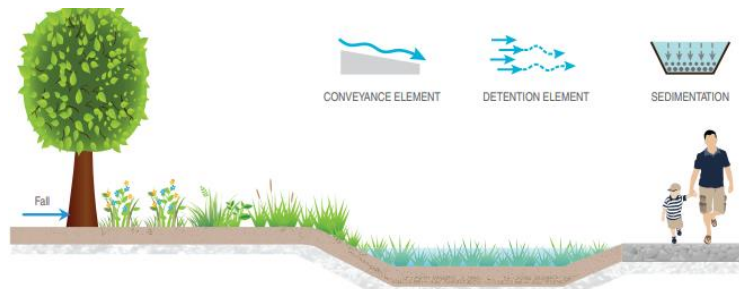


## 1. LOCAL LAND DEVELOPMENT MASTER PLAN- Green Network

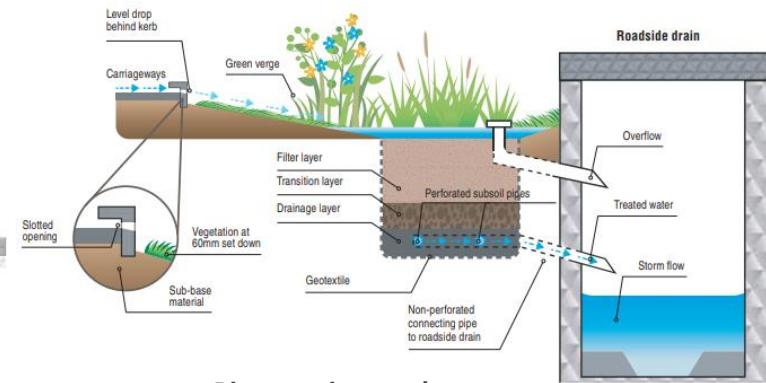


Large-scale integration of blue-green infrastructure has been looked into for satellite cities

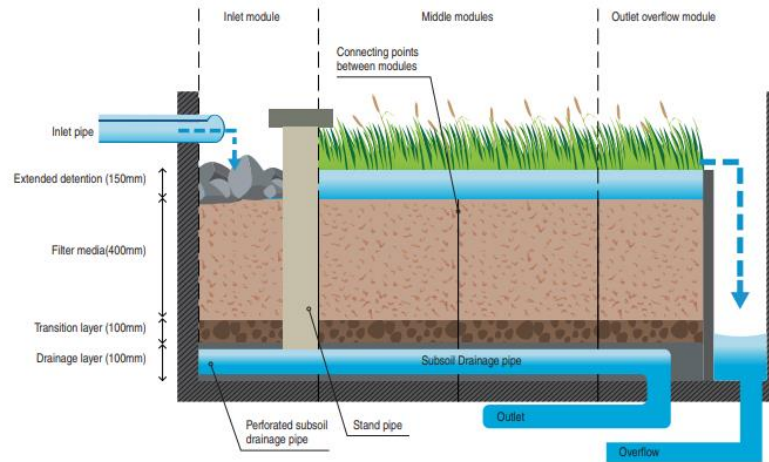
## 2. Resilient and climate responsive road infrastructure/Integrated road profile



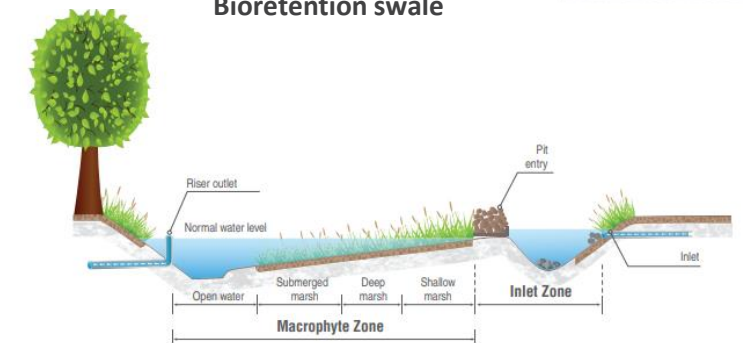
Vegetated swale:



Bioretention swale



Bioretention basin



Constructed Wetland

NBS techniques are integrated into infrastructure detailed design

Source: ABC Water guideline

# UEDi Project in Musanze district



## Musanze Storm water management plan Project

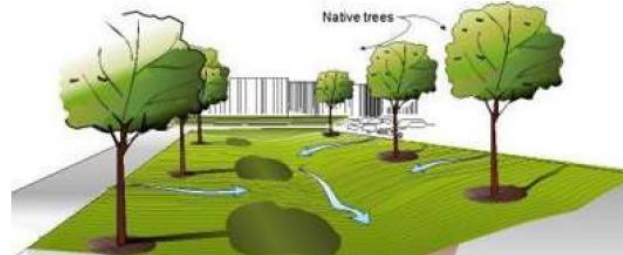
- *Vision at the horizon 2050;*
- *Frequent flooding due to lack of proper SWMP*
- *Detailed hydrological model of city;*
- *Flood line analysis to inform developments;*
- *Flood-prone area identification*

## Categories of solutions

- Provide storage for peak flows using NBS
- Upgrade channel sections of river
- Replace/upgrade existing wooden bridge crossings which overflow with stone arch bridge
- Provide NBS solutions for the Agri-market and the food court



## Typical Swale (Agri-market)



Existing detention basins to be rehabilitated

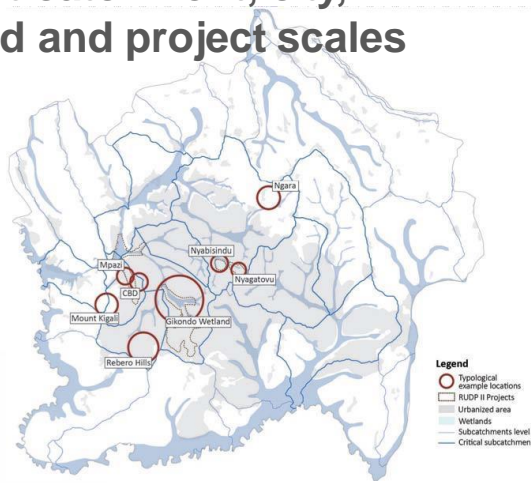




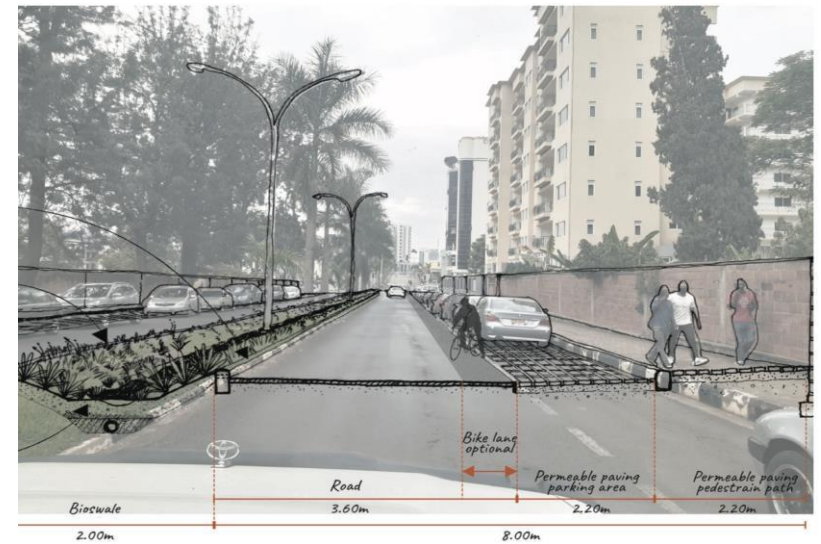
# SECOND RWANDA URBAN DEVELOPMENT PROJECT (RUDP-II)

## A Landscape Analysis and Pre-Feasibility Study of Urban NBS to Reduce Flood Risk and Strengthen Resilience in Kigali

### I. Assessment catchment, city, neighborhood and project scales



### II. Twenty-seven NBS in Toolbox, design & implementation guidance



### III. Neighborhood and project recommendations



### IV. City-wide strategy for Kigali

**Big difference:** The wetland system is the city's most important NBS and should (together with the forest) be protected and cherished as such.

**1000 x 1 measures:** By including NBS in ongoing developments, the flood risk reduction system can grow over time, in a cost-effective way.



Defacto urbanism

# INVESTING IN NATURE BASED SOLUTIONS: THE CREATION OF NYANDUNGU WETLAND ECO-PARK IN KIGALI



**The 121-ha constructed urban wetland is now flourishing with fauna and flora.**

**It provides walking/cycling trails, fishponds, and botanical gardens, restaurants, Information center etc**



# Lessons Learnt/Recommendation



- Overwhelming dominance of **grey-infrastructure solutions** for water management
- Co-Design ensure active **engagement of local communities** and active participation
- Lack of **Sectoral coordination**
- Lack of technical tools and **knowledge among professionals** to offer alternatives to ‘conventional’ grey solutions.
- **Traditional and local knowledge**, including indigenous peoples.
- NBS: **conflict with alternative land uses**



Figure 4.11: Green Fingers Concept Option - Impression of the Central Plaza in the New CBD Core.  
Source: SCS&P

## URGENCY of transition from old ” to New Urban Agenda.

- Urbanism: From ‘ housing ’ to **cities**
- From national to city level for **delivery and innovation**
- From the ‘standard’ to **local context**.
- From statutory planning to **flexible planning**
- From hierarchical decision making to **multi stakeholder engagement and citizen involvement**