



# Re-thinking urban upgrading – The Urban NEXUS approach to promote green and inclusive settlements

Irina Velasco, ICLEI Africa

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# Who we are

- Connecting Leaders
- Accelerating Action
- Pioneering Solutions



ICLEI is the leading global network of **more than 1,500 cities, towns and regions committed to building a sustainable future**. It has 280 staff working in 17 offices across regions.

## Work areas:

- Advocacy
- Policy development
- Implementation
- Capacity building
- Knowledge sharing
- Networking

A background image of a city skyline with a yellow circular overlay containing statistics. The statistics are as follows:

**12** *mega-cities*

**100** *super-cities and urban regions*

**450** *large cities*

**450** *small and medium-sized cities and towns*

**84** *countries*

# Towards Sustainable Cities:

ICLEI was founded in 1990, with the idea that a single municipality has a significant impact, and that cumulative local actions can achieve tangible improvements in global sustainability.



**Sustainable City**



**Low-carbon City**



**Resource-efficient and  
Productive City**



**Resilient City**



**BiodiverCity**



**Smart City**



**EcoMobile City**



**Happy, Healthy and  
Inclusive Communities**



**Sustainable Local Economy  
and Procurement**



**Sustainable City-Region  
Cooperation**

# ● ICLEI Africa

80 members in 20 countries

**Africa Secretariat** based in Cape Town, South Africa

## Workstreams:

- Low carbon development
- Resilience & adaptation
- Biodiversity and ecosystems
- Integrated Urban Water Management



# Why the Urban NEXUS?

## Global trends

- Urbanisation
- Climate change
- Sustainable Development Goals

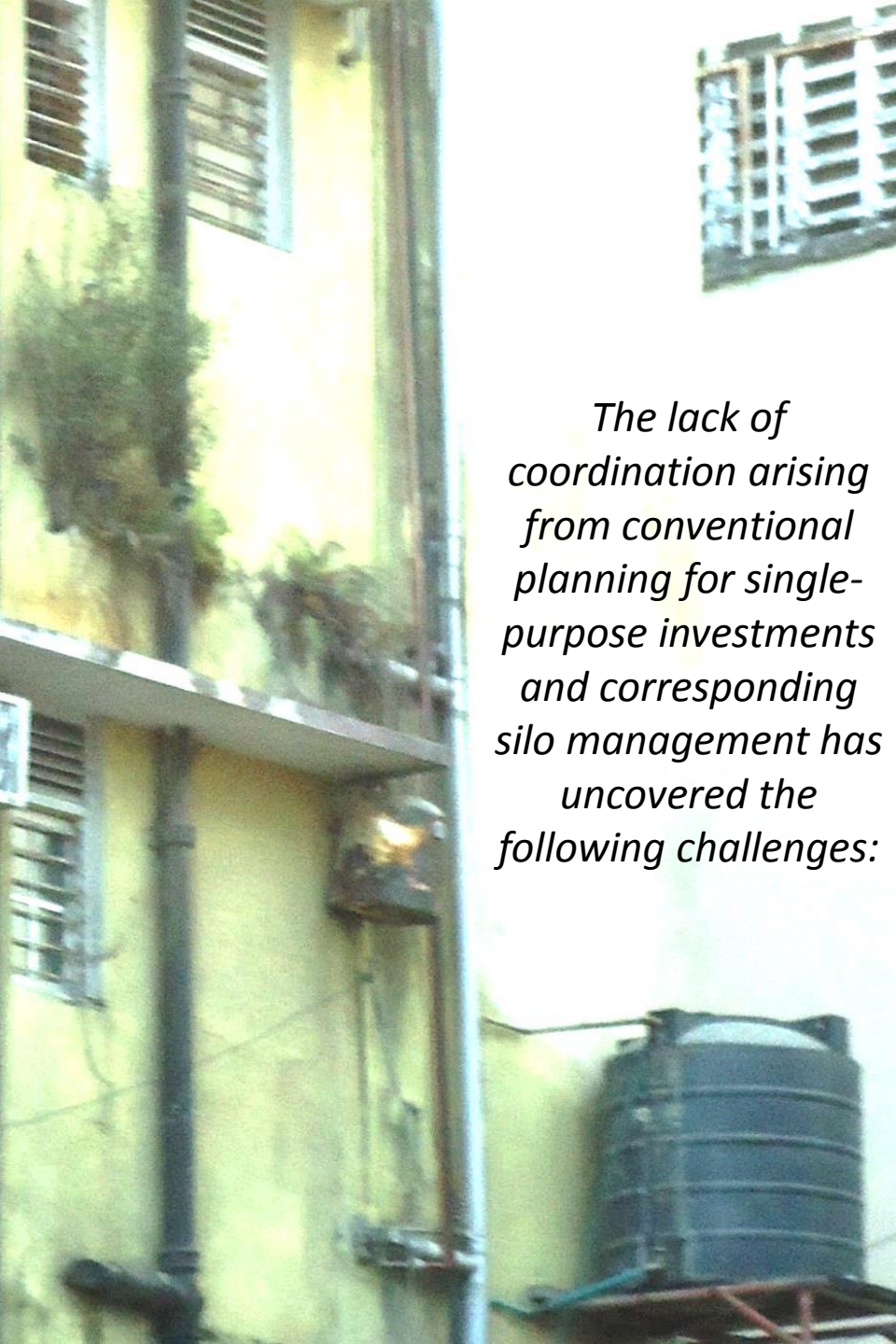
## Local action

- Compact of Mayors
- New Urban Agenda

*A time when urban development practice requires the **optimization** of urban places and systems – rather than just their construction*



*The Urban NEXUS stems from an understanding of **cities and urban regions as complex systems of systems— as agglomerations of political, market, infrastructure, resource, legal and institutional, ecological, community and cultural systems** that are connected and connecting on a worldwide basis*



*The lack of coordination arising from conventional planning for single-purpose investments and corresponding silo management has uncovered the following challenges:*

### **Efficacy**

- Delays and duplication
- Risk of trade-offs

### **Suitability**

- External standards that can limit customizing solutions for local context
- Supply-driven rather than a demand-side perspective

### **Efficiency**

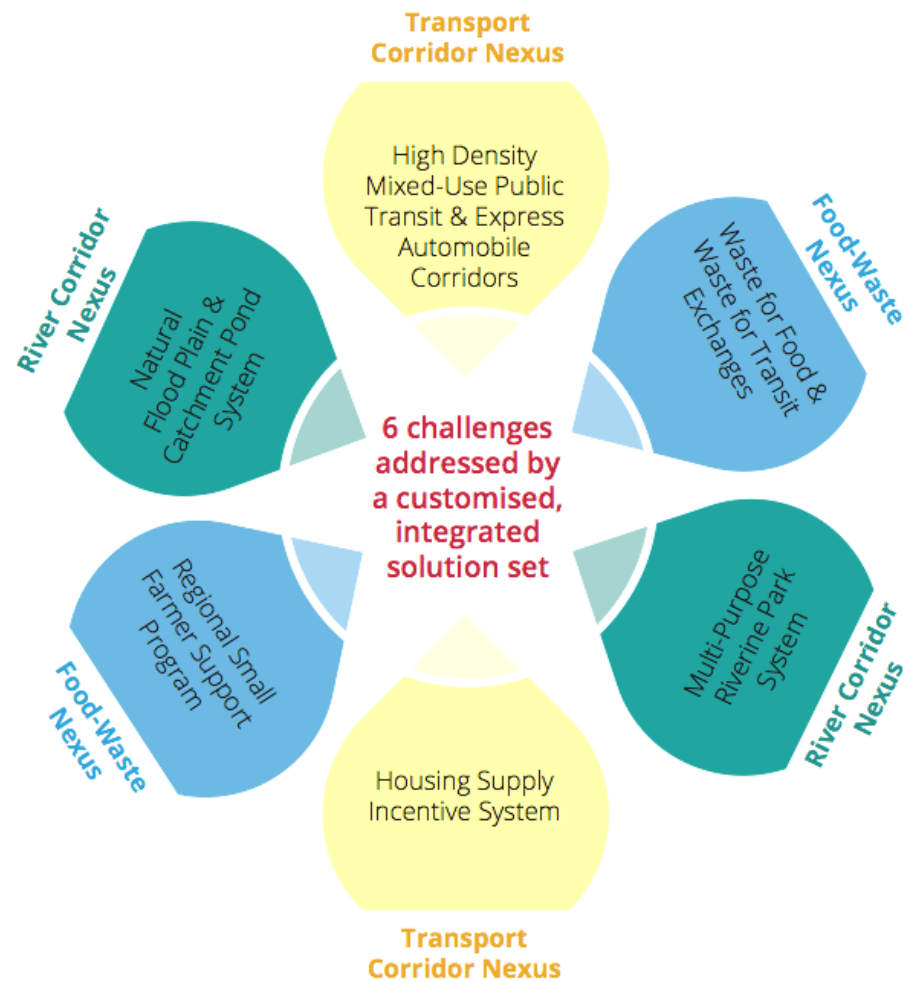
- Increased overall capital requirements and operating costs
- Underutilised infrastructure investments

### **Resiliency**

- Adaptability of fixed infrastructures
- Exposure to costly failures in the face of changing risks and extreme events



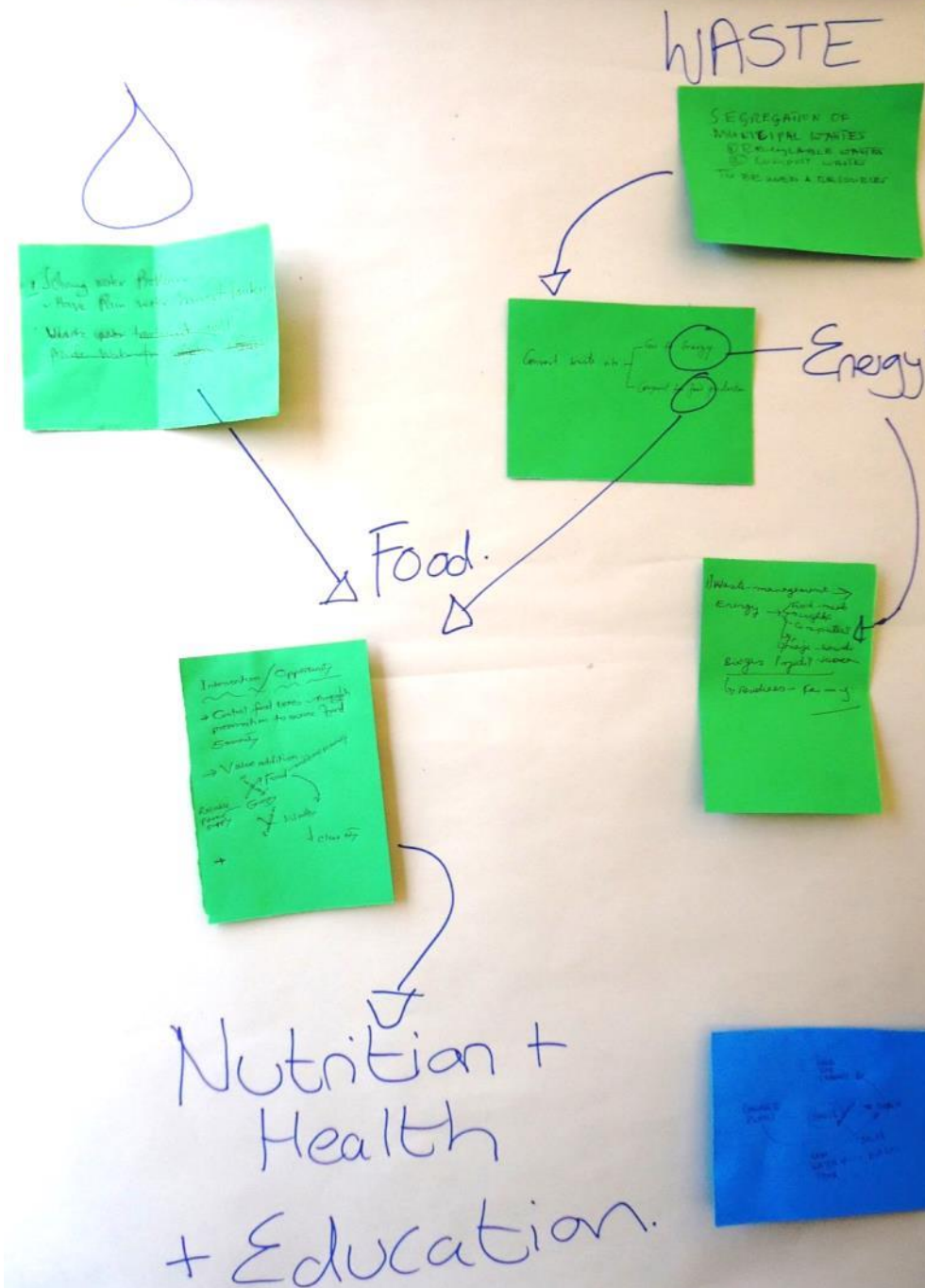
A Conventional Urban Management Approach implements separate, single-purpose solutions through administratively distinct units



An "Urban NEXUS" approach to urban management in Curitiba collaboratively addressed multiple urban policy aims through each integrated solution and investment

# Urban NEXUS approach

- The Urban NEXUS is an **approach to the design** of sustainable urban development solutions.
- Seeking **integrated solutions that minimize risks and maximize opportunities** in the context of limited resources and competing development priorities (exacerbated by climate change)
- Projects based upon the **Urban NEXUS build on established concepts and practices of integrated planning**, while moving towards a new practice of policy, project and solutions design
- It focuses on the **strategic re-design of places, assets, and operations**



*The approach guides stakeholders to identify and pursue possible synergies between sectors, jurisdictions, and technical domains, so as to increase institutional performance, optimize resource management, and service quality.*

## Why

### 1. URBAN NEXUS OBJECTIVES

**Increase the effectiveness, suitability, efficiency and resilience of urban projects and investments.**

*What are the targeted increases in organisational and resource productivity?  
How will we measure 'nexus' success?*

## What

### 2. URBAN NEXUS INTEGRATION AREAS

1. Scales
2. Systems & Resources
3. Services & Facilities
4. Silos
5. Social Behaviors

*What are the possible productivity enhancing synergies and benefits that can be gained by integrating two or more operations or systems?*

## How

### 3. URBAN NEXUS DEVELOPMENT CYCLE

- Stage A: Identify  
Stage B: Innovate  
Stage C: Design & Deliver  
Stage D: Capacitate & Communicate  
Stage E: Mainstream

*What process will be used to accelerate the preparation, testing, monitoring & evaluation, and scaling of the nexus solution?*

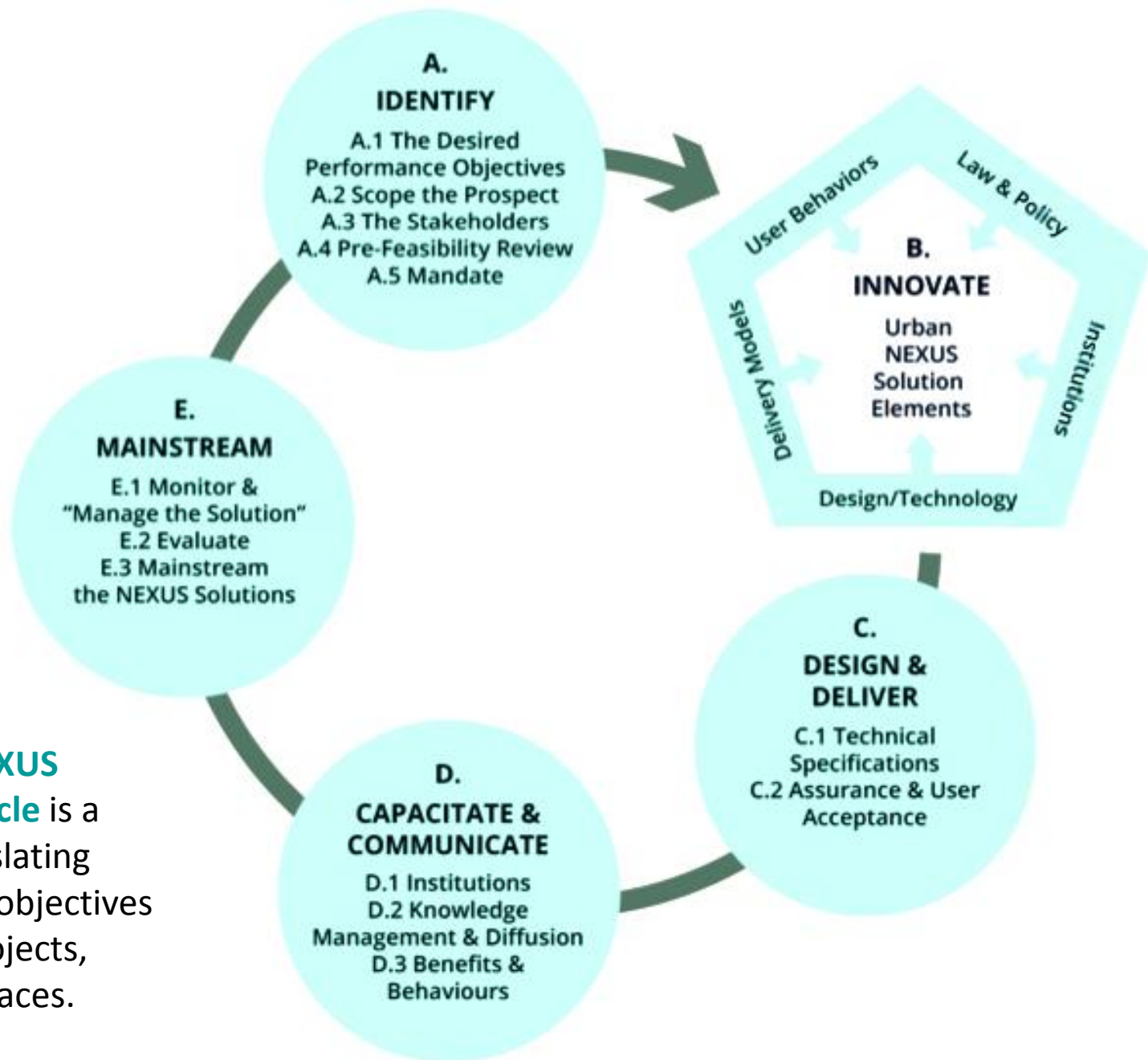
## Where

### 4. URBAN NEXUS INNOVATION AREAS

1. Law & Policy
2. Design & Technology
3. Delivery Models
4. Communications & User Behaviors
5. Institutional Development

*What measures and reforms are required to enable the productivity enhancing solution?*

The **Urban NEXUS Development Cycle** is a process for translating integrated planning objectives into policies, projects, systems, and places.



**A.**  
**IDENTIFY**

- A.1 The Desired Performance Objectives
- A.2 Scope the Prospect
- A.3 The Stakeholders
- A.4 Pre-Feasibility Review
- A.5 Mandate

## Key steps in identifying the Urban NEXUS prospect

*Integrating one or more systems, services/products, facilities, policies, or organizational silos to achieve integrated planning goals and targeted productivity outcomes*

**A.1**

Translate the general Urban NEXUS **objectives** into **context specific objectives** for the initiative

NEXUS Objectives:

- efficiency
- suitability
- effectiveness
- resilience



*Identification of prospects for integration*

**A.2**

Scope the **potential Urban NEXUS integration areas** to support the achievement of the objectives

Integration areas:

- systems
- scales
- services
- silos
- social behaviors



*Evaluation of strategic feasibility, under current conditions*

**A.3**

Identify the **stakeholders** who would need to be involved in developing and supporting the innovations, reforms and other measures in each of these areas

Potential partners:

- Department officials
- Private sector
- Community
- Academe



*Identification and early engagement of the stakeholders needed to develop, implement, and benefit from the prospective intervention*

**A.4**

Work with stakeholders to do **pre-feasibility or strategic reviews** of the **identified measures**

Methodology:

- Mapping
- Visioning
- Workshops

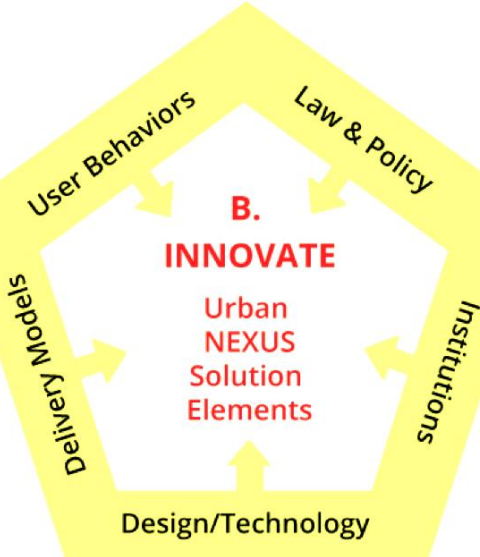


**A.5**

Recommend the **areas** to be further explored and establish the **formal mandate** required to support collaborative **innovation** of a solution to achieve the initiative's objectives

Sample solutions:

- a set of Urban NEXUS integration measures
- performance metrics to guide design



## Five main Urban NEXUS Innovation Areas

*Stakeholders collaborate in a structured innovation process to develop a set of politically, institutionally, and economically viable measures in areas spanning the range of policy, technology, planning, finance, business models, communications, and institutional design.*

### B.1

#### Law & Policy

support and regulate the market for existing solutions and systems

#### Examples:

- building standards
- legal instruments support behavioural incentives

### B.2

#### Design & Technology

optimize current systems, services, institutional arrangements, and scales of operations

#### Examples:

- innovation in design of waste management systems (bins, collection transport, etc)

### B.3

#### Delivery Models

optimize the efficiency of the service according to local conditions

#### Examples:

- extent of service delivery (eg provision, landscape, education)
- partnerships (PPPs, civil society)

### B.4

#### Communications & User Behaviors

educate and secure the benefits of the solution

#### Examples:

- awareness raising
- skills development

### B.5

#### Institutional Development

coordinate the integration of different systems and stakeholders, or to manage an entirely new kind of system

#### Examples:

- task force/agency
- steering committee

**C.  
DESIGN &  
DELIVER**

- C.1 Technical Specifications
- C.2 Assurance & User Acceptance

**Design considerations**

- metrics for evaluating performance, in relation to the defined objectives
- performance targets established in the initial initiative mandate (i.e. from Stage A: Identify)

Effectiveness of **each measure** should be tracked and evaluated

Applying resources and effort to **understanding the end user's response to the solution**

**D.  
CAPACITATE &  
COMMUNICATE**

- D.1 Institutions
- D.2 Knowledge Management & Diffusion
- D.3 Benefits & Behaviours

**Three main areas of capacity building**

- training operational staff on managing their parts of the solution
- end-users:
  - benefits
  - required skills
- enabling the relevant institutions to establish a systematic process to enable up-scaling in other areas

Urban NEXUS thinking in the **curriculum** of urban planning and management courses, training institutions, and professional associations

**E.  
MAINSTREAM**

- E.1 Monitor & “Manage the Solution”
- E.2 Evaluate
- E.3 Mainstream the NEXUS Solutions

**Innovative institutional solutions and mandates**

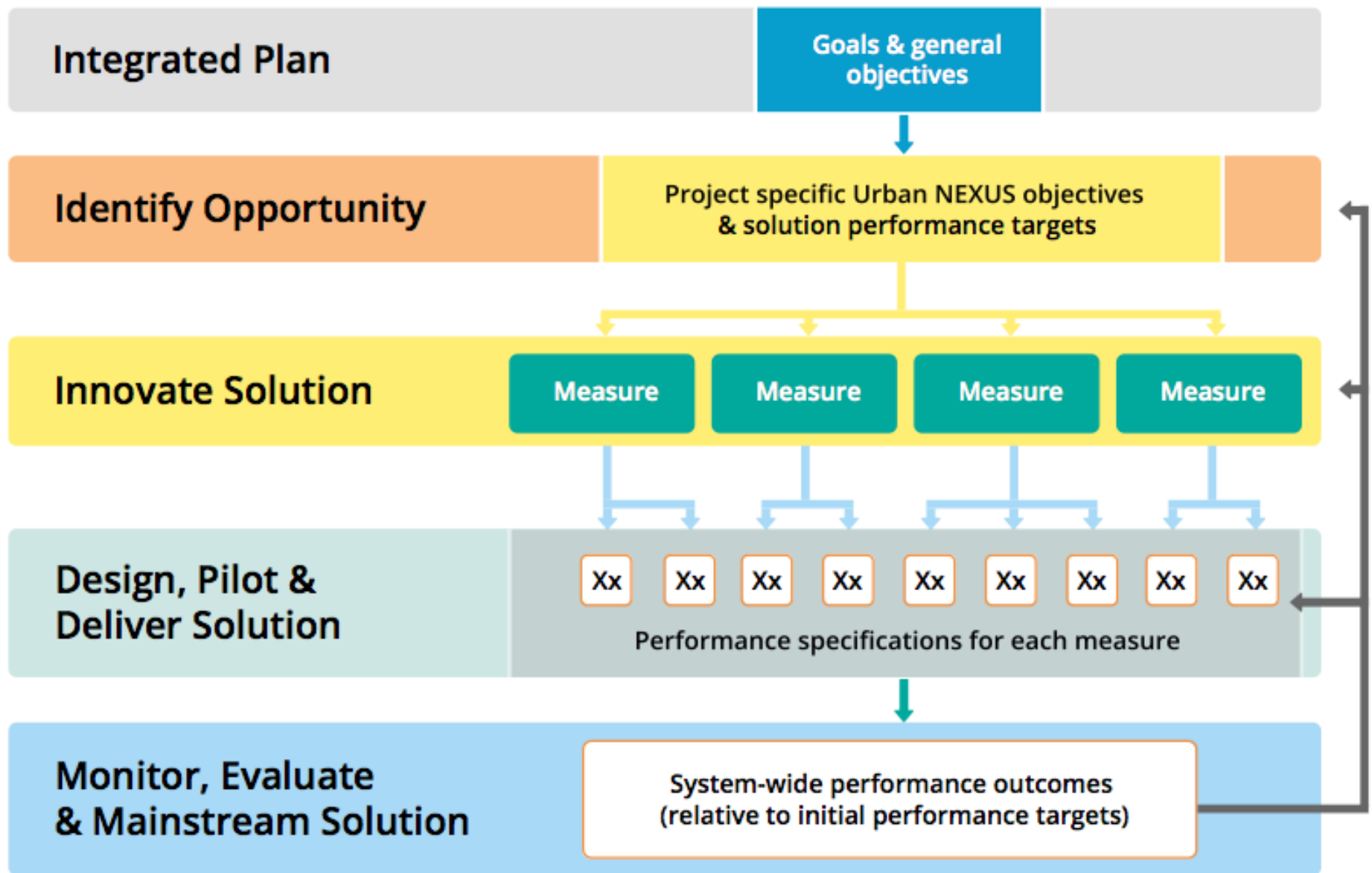
- upscale, address challenges and manage different contexts
- enable innovations to be the new “conventional” practice

**Monitoring & Evaluation**

- system-wide assessment of performance outcomes
- context- and initiative-specific objectives to customize solutions
- support learning amongst stakeholders in the process of developing, piloting and mainstreaming

**Evaluation with stakeholders at each stage**

- the process of conceptualization and specification of Urban NEXUS solutions
- lessons from pilot activities on different measures and how to improve them
- document and jointly evaluate the journey



# Exploring Possibilities for Nexus Initiatives in Metropolitan Regions: Piloting the food-energy-water nexus in Dar es Salaam schools



**Scale:** Facility (two schools), Kinondoni District

**Urban NEXUS Sectors** Water-Food- Energy-Education

**Period** February 2014-August 2014

## **NEXUS Objectives**

**Main activities** baseline assessment, stakeholder engagement, technical installation (rainwater harvesting, vertical gardens, improved cookstoves)

- Effectiveness: service delivery
- Suitability: social issues (nutrition, security, waste)
- Efficiency: investments, capacity
- Resilience: food security, water management, energy efficiency

**Partners:** GIZ, Kinondoni Municipality, EEPKO

## **Urban NEXUS Innovations**

Institutions, Design and Technology, Communication and User Behaviors, Service Delivery Models

# A NEXUS initiative in Dar es Salaam



**Water:** The two schools on the site have extensive roofs that can harvest water and also extensive need for fresh water.

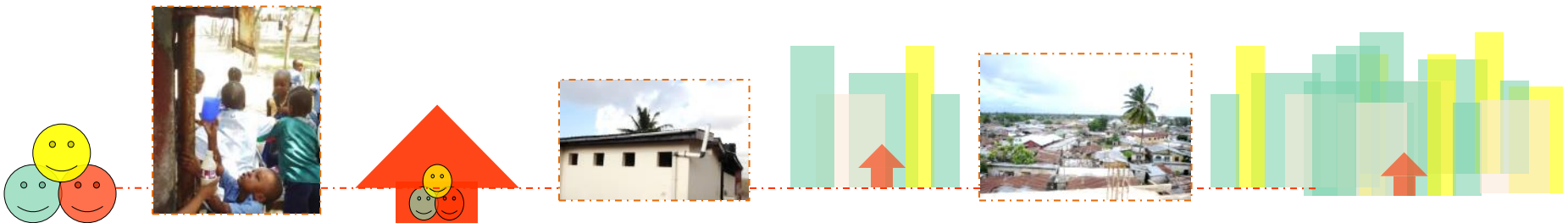
**Extension:** Municipal and ward agricultural extension workers can then help improve urban agricultural outputs;

**Urban Agriculture:** The schools have extensive grounds that can be used for vegetable and fruit tree growing that need urea and organic waste inputs

**Sanitation:** School children using eco-san toilets produce substantial waste that can fuel biodigesters with sludge used for soil

**Upscaling:** Once established in the school grounds, the system can be extended to local communities and small businesses established to buy and process wastes, biogas and agricultural produce

**Dissemination of Results:** In learning NEXUS by seeing and doing, school children can disseminate the procedures to parents and schools can also lead in changing mindsets and capacity-building



1. Biogas at  
1 school:  
most feasible

2. Mini-Biogas  
(Not meet Energy  
Needs)

3. Food gardens  
+ composting +  
Solar pump  
+ cook stove (?)

4. Rainwater harvesting  
to larger system.

5. Food Gardens  
+ composting + solar stove  
+ Rainwater Harvest  
(smaller).

## Approaches to community and municipal decision-making workshops



### Decision making workshop at the school:

Representatives from Kinondoni Municipality Council, Tandale ward, Tandale and Hekima Primary Schools, academia and leaders of religious groups

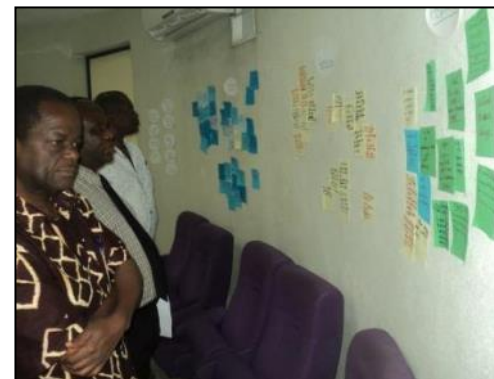
- increase understanding of the project and Nexus concepts **“Resource Walk”** where stakeholders identified food, energy, and water resource flows on site
- increase and ensure secure stakeholder buy-in through a visioning exercise and decision-making on appropriate interventions

### Decision making workshop at the municipality:

- increase capacity of understanding the Nexus, and to link with and learn from the school pilot implementation
- assessment of **Strengths, Opportunities, Aspiration, and Results (SOAR)** methodology of technology, policy, incentives, planning, institutions, culture and behaviour

### Other stakeholders:

PMORALG, ALAT, Academia (Ardhi University, Institute of Environmental and Sustainable Development), BORDA



# MRADI WA NEXUS

**Design & deliver** drawing from a limited investment, municipal co-financing and in kind contributions from the schools:

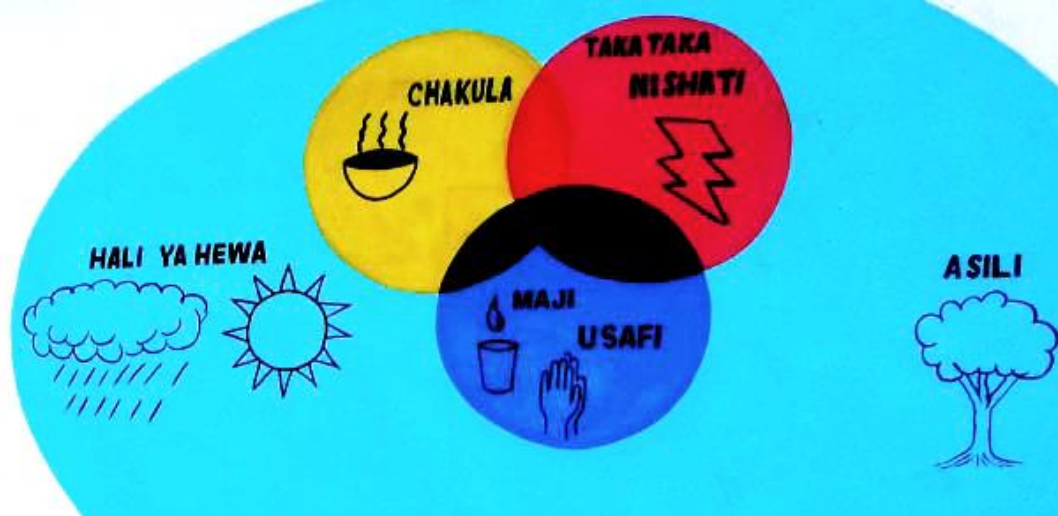
- improved water access through infrastructure upgrades (borehole and connections), rainwater harvesting and tanks for storage
- vertical food gardens and drip irrigation
- improved cookstoves
- school wall for safety & awareness raising

## Capacity & communicate

- Community stakeholder workshops (inception, decision-making, showcase)
- Training of school workers
- Schools: infrastructure and curriculum

## Mainstreaming

- Replication in other wards
- Urban Nexus steering group
- Publications (Case Study, UNEP Capstone)



# AHSANTENI Thank you Vielen Dank

For more information  
and examples, please visit:  
<http://www.iclei.org/urbannexus.html>



Contact: [irina.velasco@iclei.org](mailto:irina.velasco@iclei.org) | <http://africa.iclei.org>