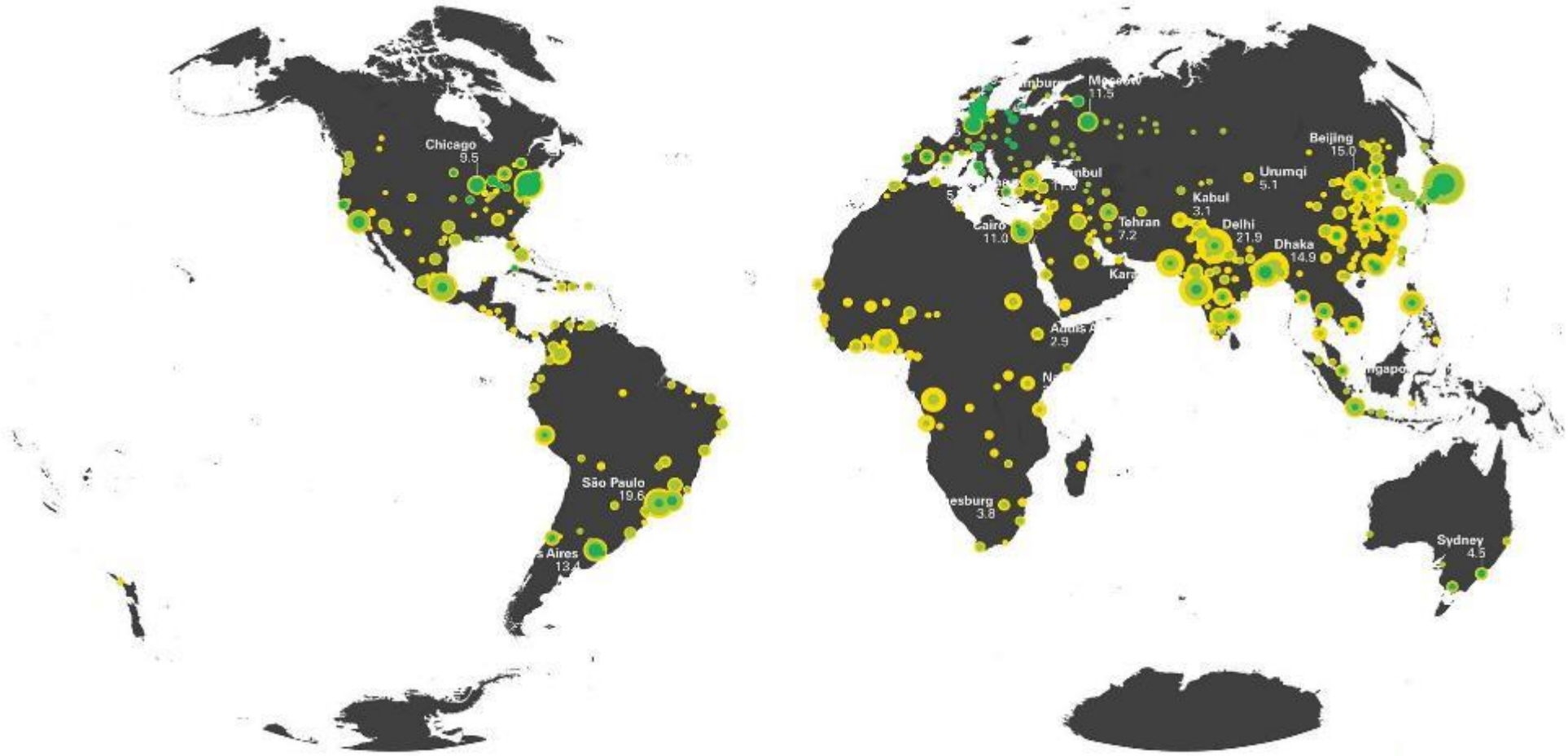
Integrated Urban Water Management – An Overview

Maria Angelica Sotomayor, Practice Manager
Tokyo, September 2017

WORLD BANK GROUP
Water

Rapid Urbanization and Competition for Water Resources

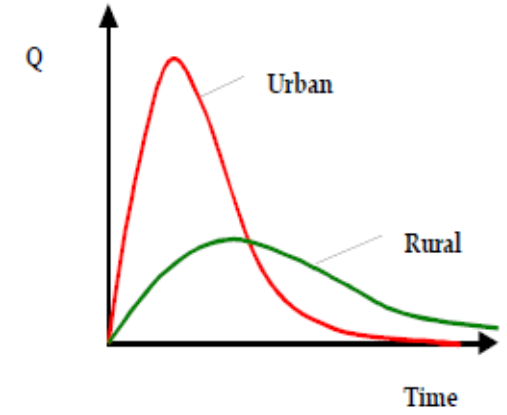
Projected metropolitan population by 2025



Source: United Nations, Department of Economic and Social Affairs, Population Division (2012). World Urbanization Prospects : The 2011 Revision.

WORLD BANK GROUP
Water

Increasing Vulnerability due to Disaster and Climate Change Risks



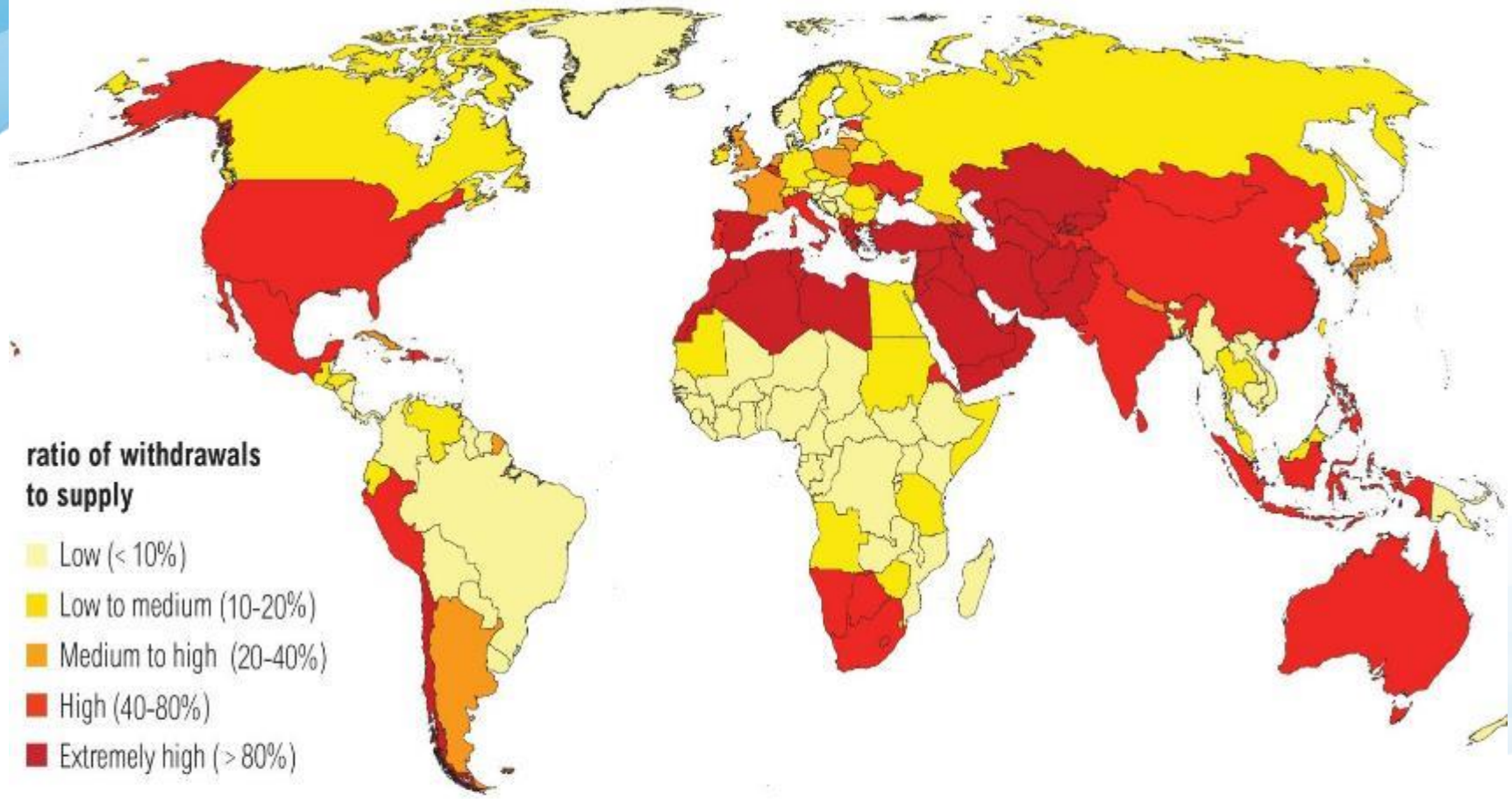
Flood increase due to urbanization

WATER INVESTMENTS FACE UNCERTAINTY

To adapt to climate change, developing countries would need **an additional $13 to $17 billion per year** in water infrastructure.

WORLD BANK GROUP
Water

Climate Change – Projected Water Stressed Regions by 2040

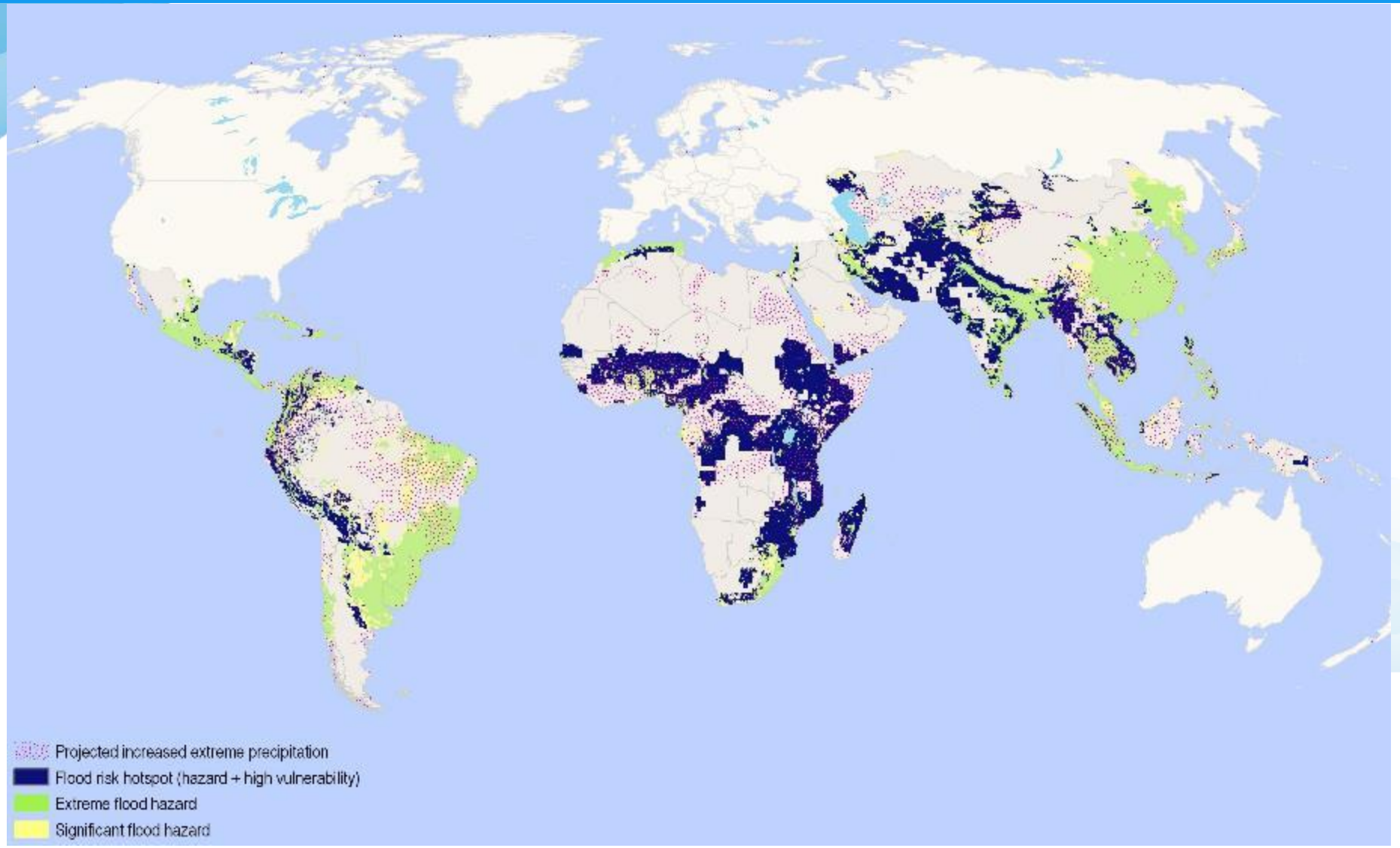


NOTE: Projections are based on a business-as-usual scenario using SSP2 and RCP8.5.

Source: World Resources Institute

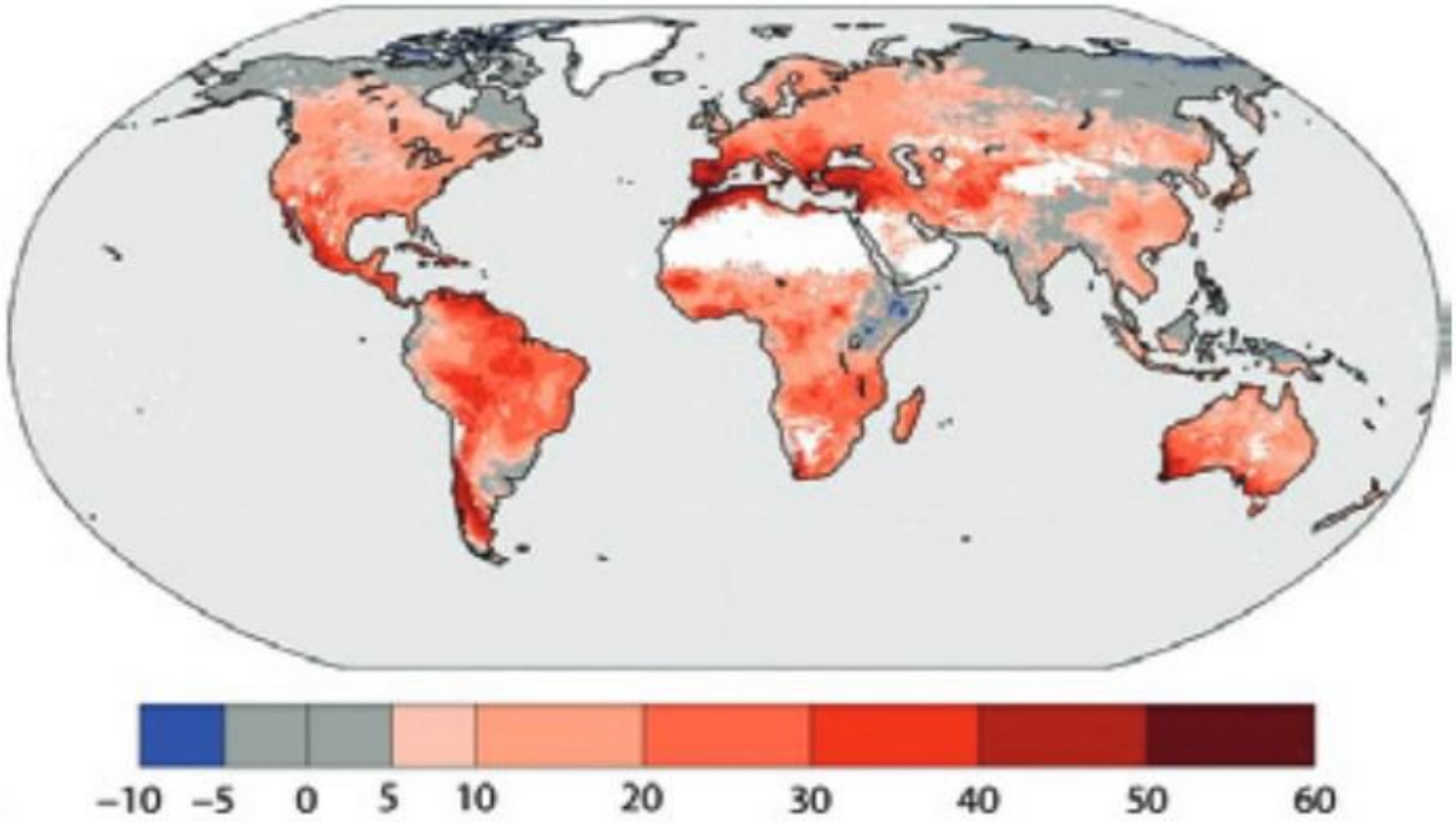
WORLD BANK GROUP
Water

Global Flood Risk



WORLD BANK GROUP
Water

Global Drought Risk



Notes: Drought days are defined as days during which the river runoff is below 10 percent of the 1976–2005 average. Regions in white are those that experience very low runoff today and in the

Source: Prudhomme et al. 2014

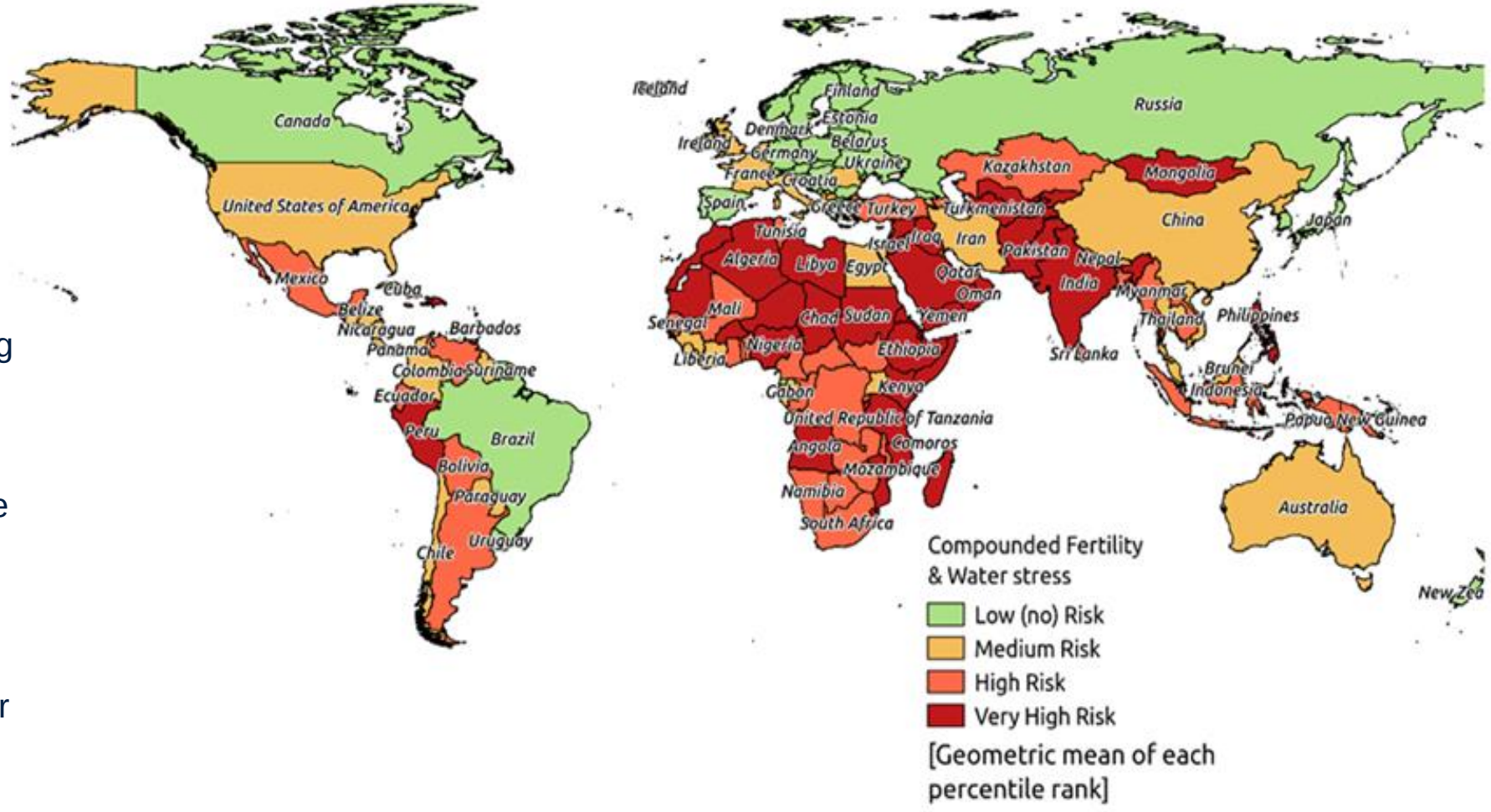
WORLD BANK GROUP
Water

The Water Crisis - Unchartered Waters

1. Growing demands driven by demography, urbanization, rising incomes & warmer climate

2. Reduced availability & quality: Less precipitation & runoff, more variability, higher intensity/frequency of water-related disasters

3. Transboundary rivers as a major issue: 90% of major rivers are shared



WB 2017 "Uncharted Waters, the Economics of Water Scarcity and Variability"

WORLD BANK GROUP
Water

Environmental Degradation

- Inefficient water management and urban development due to uncoordinated sector-specific approaches.

- Higher risk of water contamination through changes in land use patterns, poor solid waste management, inadequate sanitation including wastewater collection & treatment, inadequate stormwater management, and ageing infrastructure.

- Watershed approaches to urban water management, where they exist, are often fragmented and not well coordinated with urban planning and with the provision of other urban services.

WORLD BANK GROUP
Water

A Paradigm Shift is Needed!

- Urban form created with little input from water professionals – we just plumb it up later!
- Water professionals tend to design systems with fixed, centralized designs without taking into account the urban landscape nor the interconnectivity of urban water
- Stormwater and wastewater treated as ‘waste’
- Institutional landscape not conducive for holistic approach
- Regulations are inflexible – can’t deal well with resource efficiency….

Traditional education reinforces these principles

WORLD BANK GROUP
Water

Integrated Urban Water Management – IUWM

Graphic Source:
http://www.neorsd.org/images/RestoredUrbanWatershed_large.jpg

Holistic strategic planning that takes a landscape approach and manages competing water users at the level of the watershed, recognizing the needs of the city, as well as those of upstream and downstream users

WORLD BANK GROUP
Water

Key Principles of Integrated Urban Water Management

Integration across the water cycle

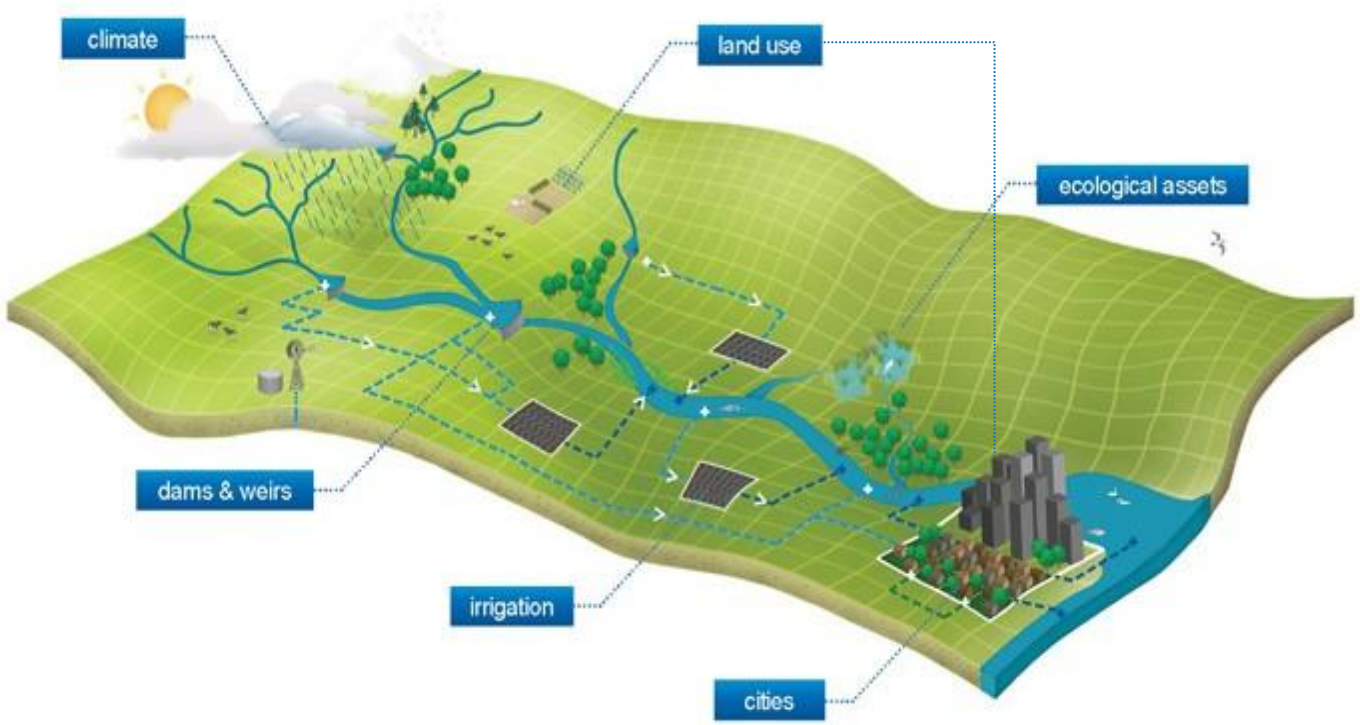
- Wastewater and stormwater: a resource
- Water cycle as one system
- Matching water quality with intended use

Integration of urban and water systems

- Pursuing economic efficiency, social equity and environmental sustainability
- Integrating water resources, land-use planning and key urban services (e.g., solid waste, housing, transport)

Integrated planning and implementation

- Stakeholder involvement instead of top-down
- Multidisciplinary planning teams



Source-http://www.ewater.org.au/uploads/images/source-composite-web.jpg

WORLD BANK GROUP
Water

Benefits of Integrated Urban Water Management

Costs savings through coordination & synergies, promoting alternative technologies & approaches

Leveraging complementary financing different sectors; different levels of government, bringing in alternative financing (private sector, payment for environmental services)

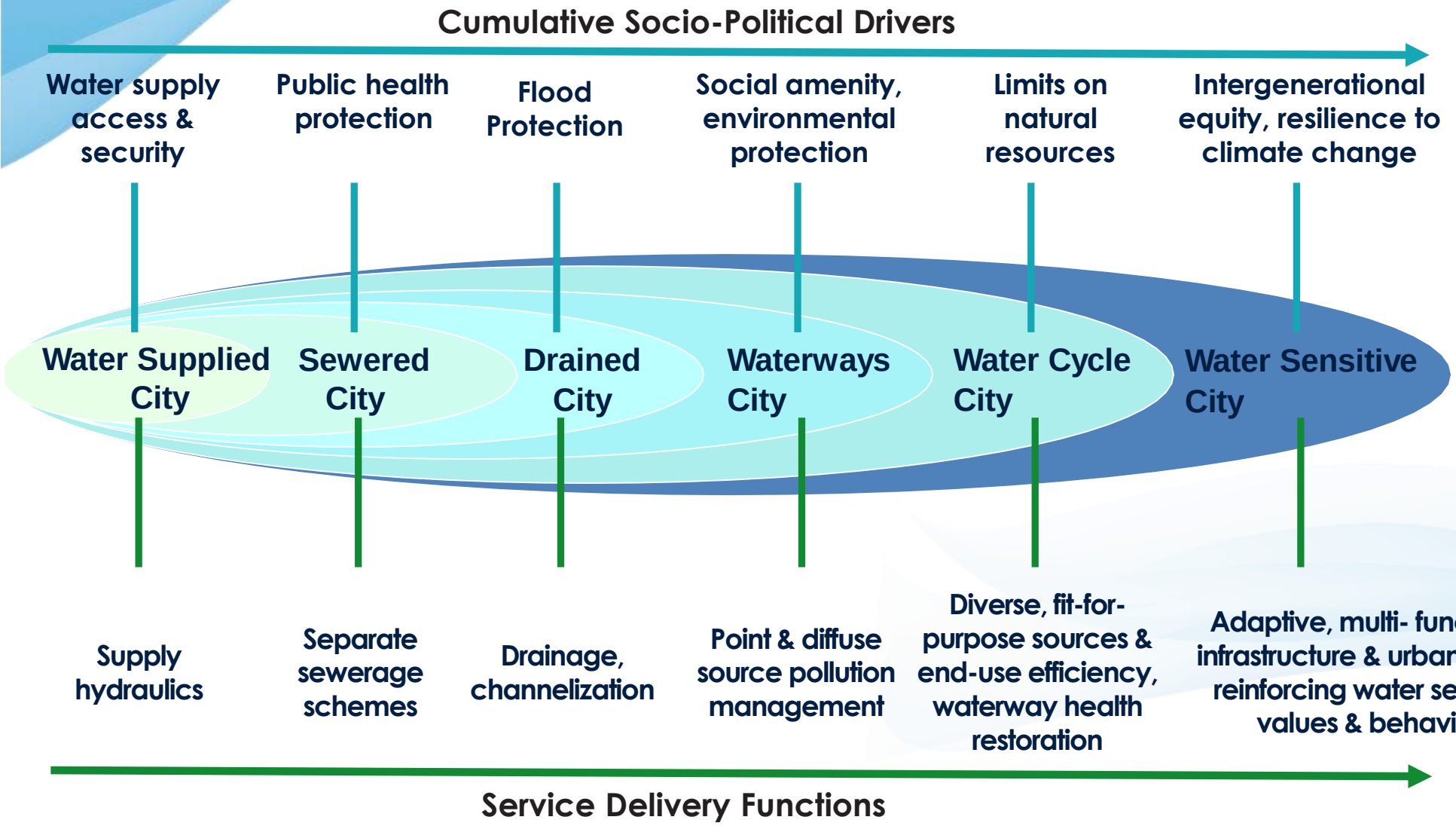
Improved living conditions, quality of life, economic stimulation, etc., through urban transformation, including green & cultural aspects

Before

After

WORLD BANK GROUP
Water

Fast Growing Cities can 'leap-frog' to Water Sensitive Cities …



… and avoid mistakes of most developed cities

WORLD BANK GROUP
Water

Source: Brown *et al* (2009), and Wong and Brown (2009)

Key Elements

Main Drivers:
Urban Planning and Land Use
as well as…

Cross-Sector Tailored Solutions

Coordinated Execution

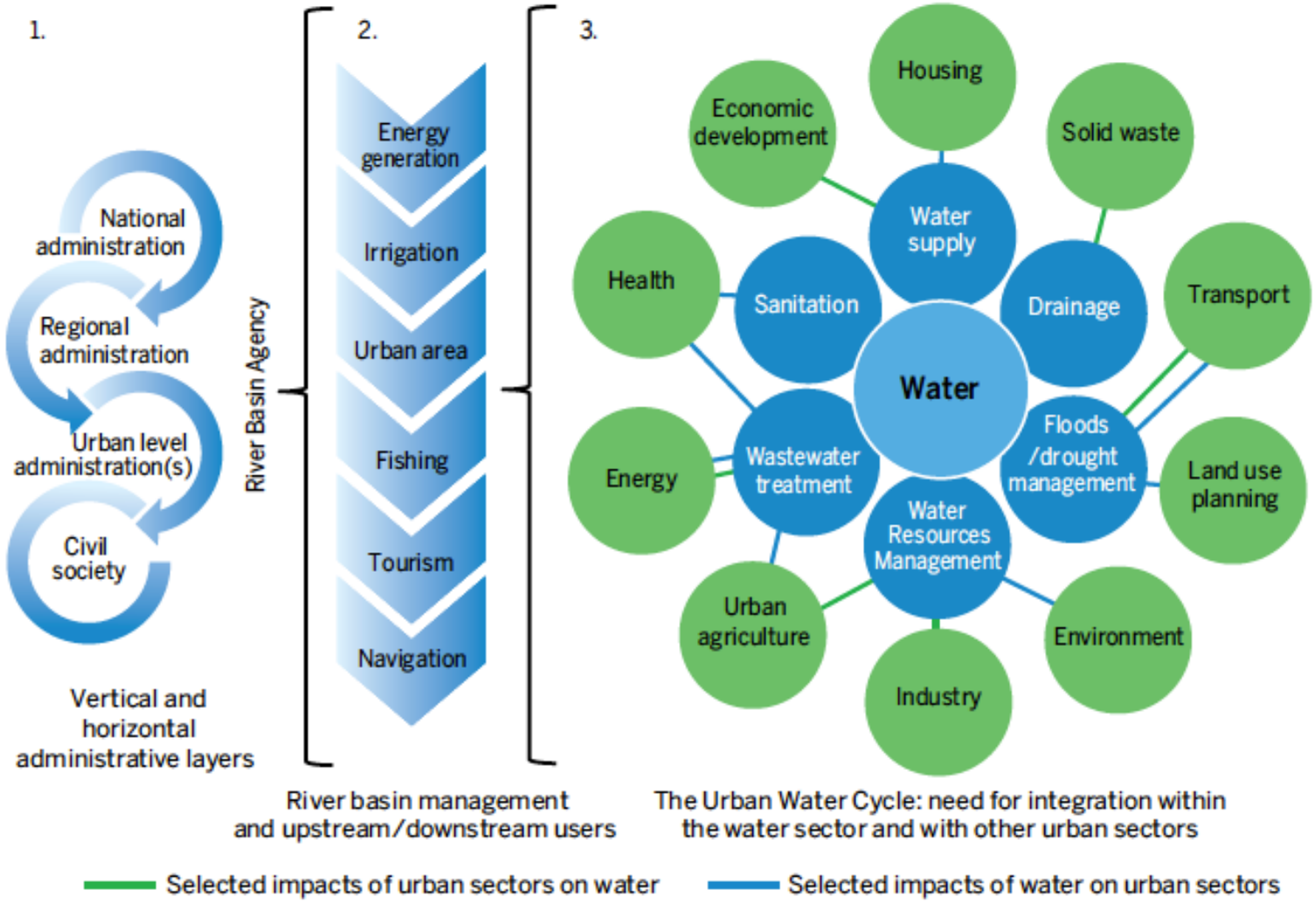
Integrated Participatory Planning

For the improvement of quality of life and the environment

…stakeholder and community engagement

WORLD BANK GROUP
Water

Multiple Layers of Integration



(1) National/local government level

(2) Watershed/basin level

(3) City level

Source: World Bank (2016) IUWM Guidance Note, based on ICLEI (2011)

Process

Range of players and sectors involved for…

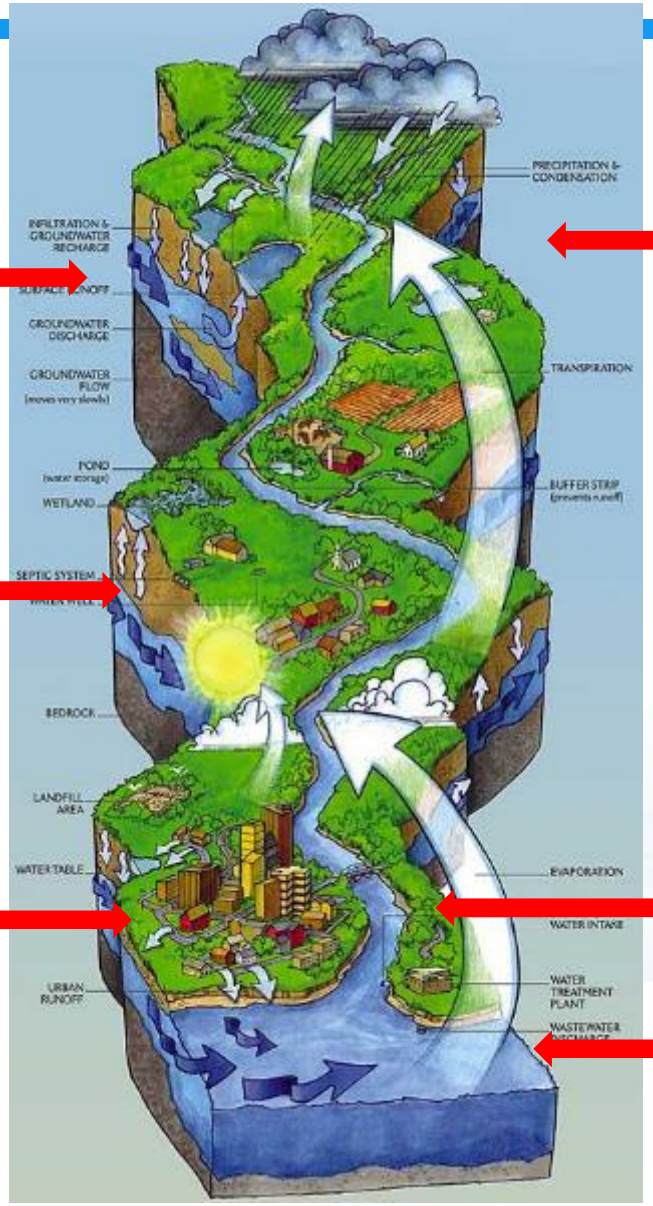
…an integrated solution tailored to local context and dynamics

Example: Brazil – Espírito Santo
Integrated Sustainable Water Management Project

Basin Planning and Management

Wastewater collection and treatment
Small towns upstream of Metro Vitória and Caparaó - CESAN

Wastewater collection and treatment
Metropolitan Vitória - CESAN



Watershed Management
(Scaling up Payment for Environmental Services)

Strengthening institutions for integrated planning and management, including monitoring of risks, contingency planning and response to disasters, and continued work on utility efficiency improvements

Urban Drainage in Metro Vitória

Coastline management

Reflorestar
PROGRAMA ESTADUAL DE AMPLIAÇÃO DA COBERTURA FLORESTAL

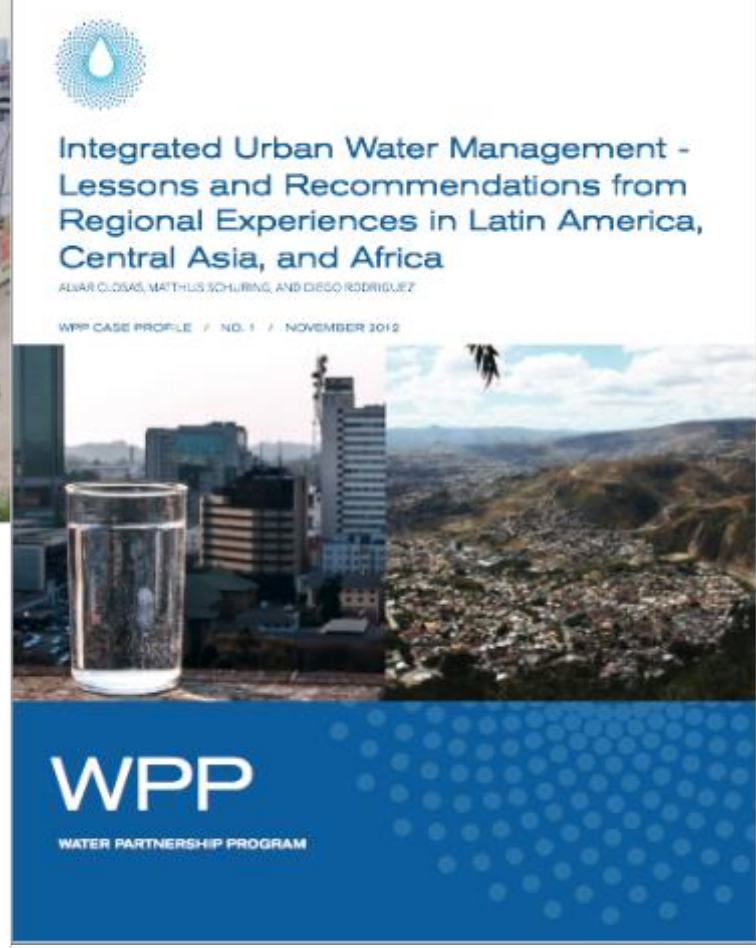
WORLD BANK GROUP
Water

THANK YOU

MAINSTREAMING WATER RESOURCES MANAGEMENT IN URBAN PROJECTS: TAKING AN INTEGRATED URBAN WATER MANAGEMENT APPROACH

A GUIDANCE NOTE

A product of the IUWM Knowledge Silo Breaker, supported by the Urban, Environment and Water Global Practices



WORLD BANK GROUP
Water

www.worldbank.org/water | www.blogs.worldbank.org/water | @WorldBankWater

Implementing Integrated Urban Water Management

Sustainable Solutions

- Water Resources Management
- Water Supply & Sanitation
- Stormwater

… and beyond water …

- Urban Planning, Land use
- Solid waste
- Environment, recreational
- Housing
- Regulations, policies, non-structural measures (e.g., flood zoning, permits, etc.)

Before

After

WORLD BANK GROUP
Water