Technical Deep Dive on
Integrated Urban Water Management (IUWM)

Framing IUWM

Integrated Urban Water Management

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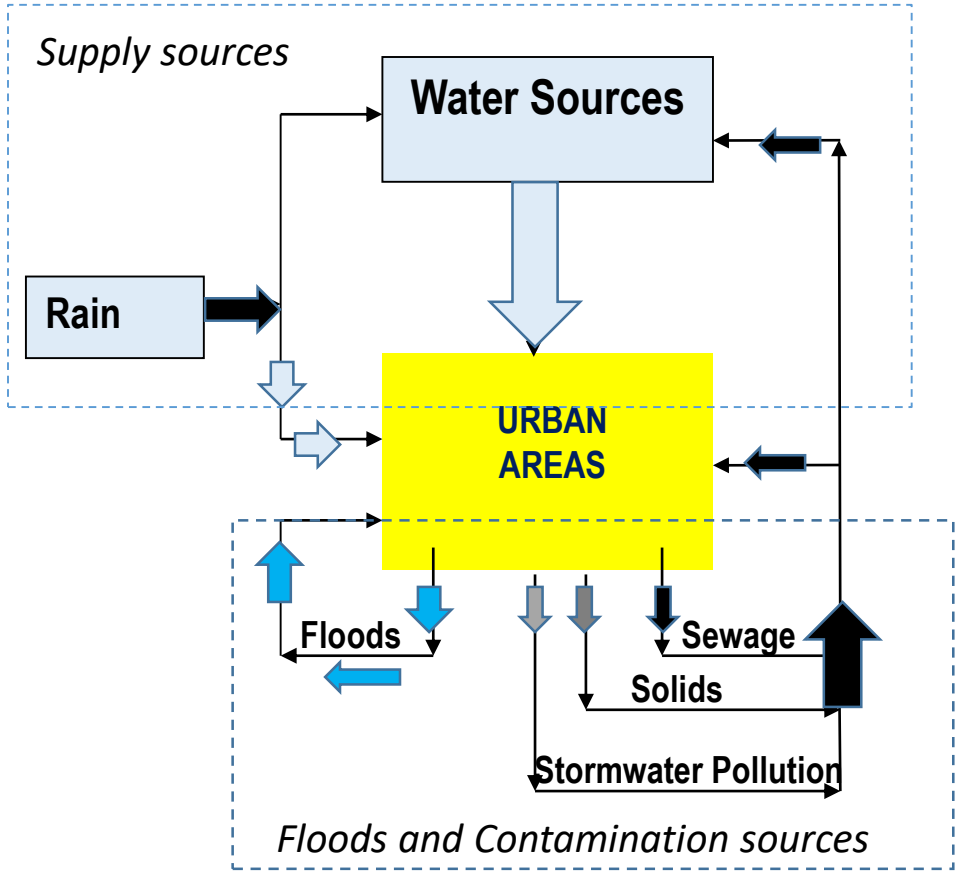
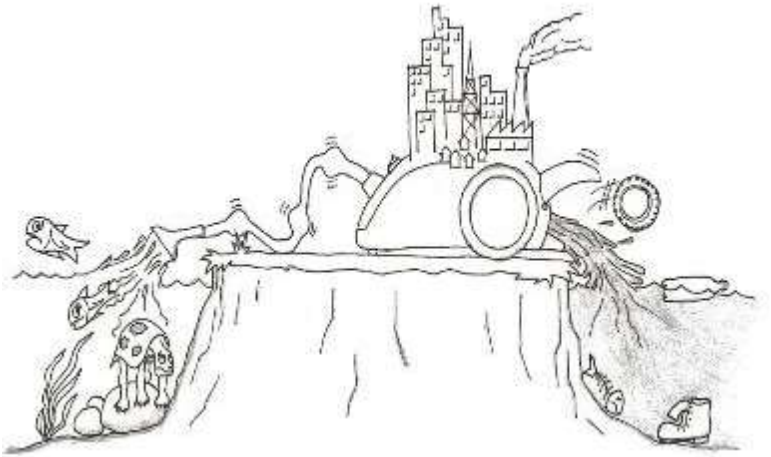
Outline

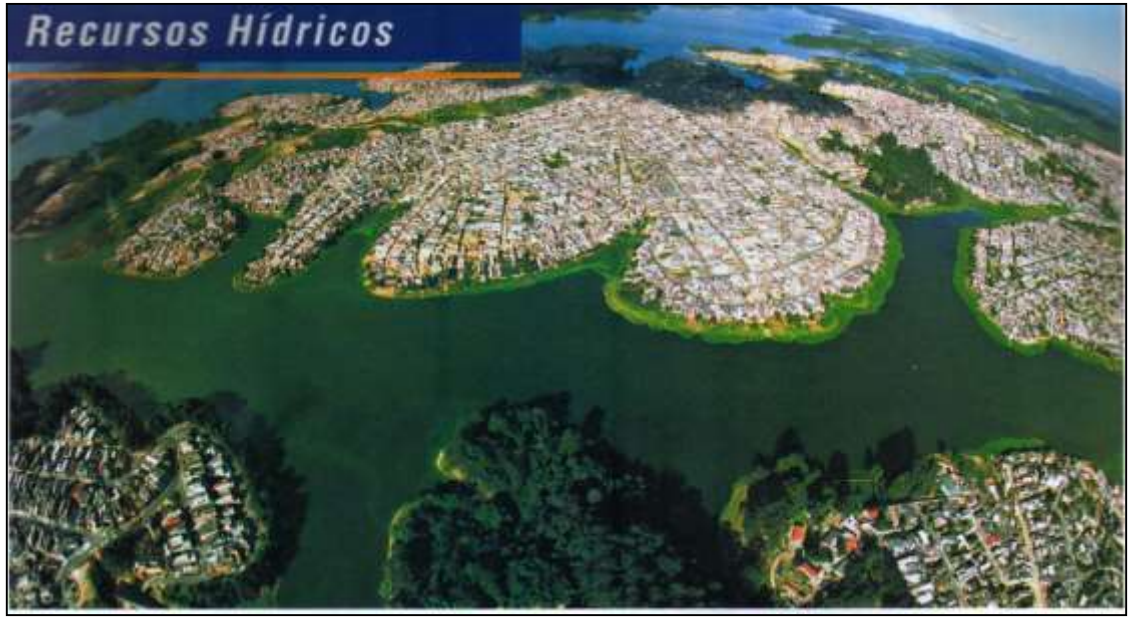
- Main impacts and causes in developing countries cities
- IUWM framework – concepts of sustainability and integration
- Levels of interventions – private and public
- Opportunities in the integrated solutions: *urban recovery and flood management*

Main challenges

- Contamination of water sources – *agriculture and urban areas*
- Inappropriate land use: *unregular land occupation and flood risk areas*
- Lack of basic urban services – *lack of sanitation, solids and stormwater services*
- Increasing floods – *stormwater increasing floods due to urbanization*
- Negative environmental impacts -solid waste, degraded areas, water contamination
- Water related diseases and poor quality of live

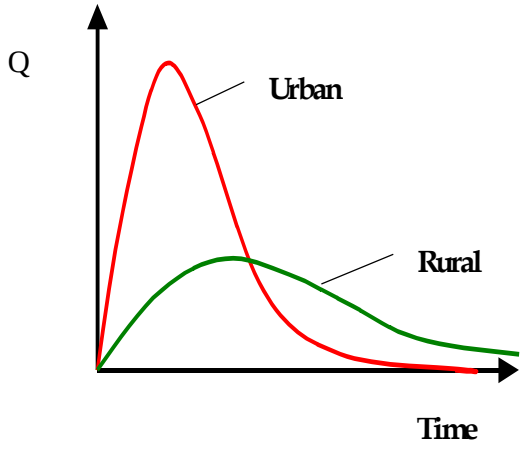






Contamination of water sources with unregular occupation

River and channels Water quality contamination



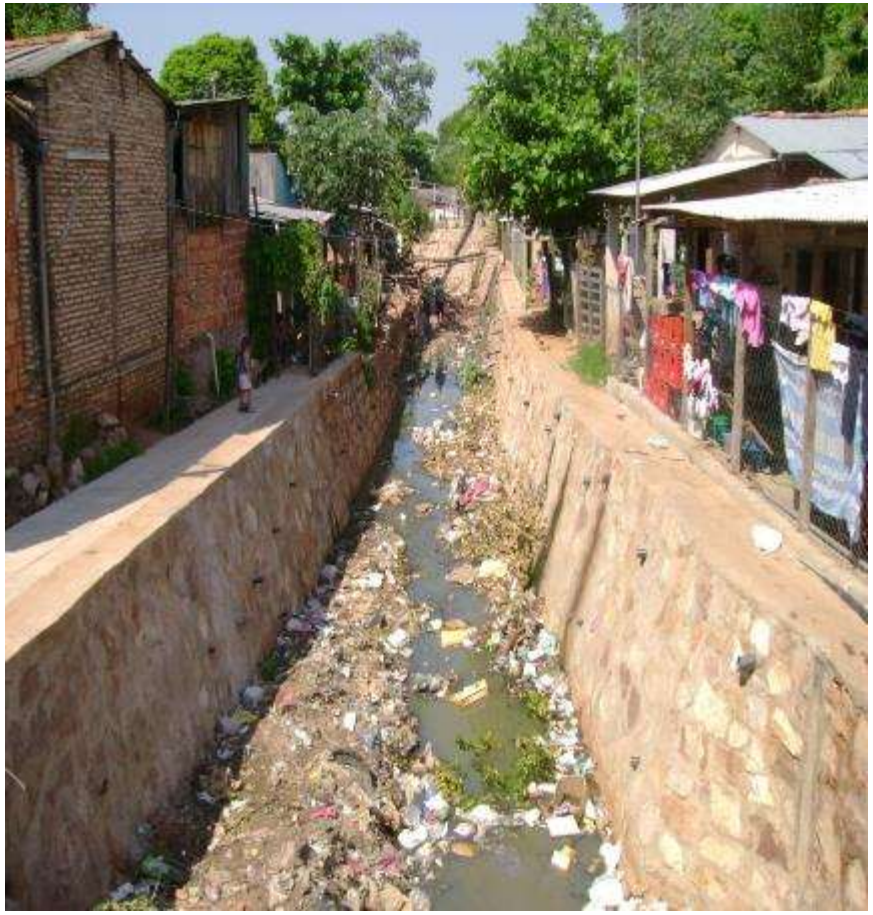
Flood increase due to urbanization

Degraded area by increase on flow velocity

Flow obstruction from solids

Floods due urbanization increase, river reduction capacity (solids and sediments), and occupation of the valley

Bad practice of closing channels



Integrated impacts: lack of water supply, sewage, drainage, solids and illegal occupation

Causes

- Fast urbanization in most developing countries without control of land use
- Lack of sanitation and solid waste management and loss of water sources;
- Increase of impervious areas (land use) and unsustainable drainage (channels and conduits)- *erosion, contamination and floods*
- Fragmented institutional approach- *lack of capacity, information's and cost recovery*

In 2050 world population will be 70% urban. Most of the increase will be in developing countries

Proportion of sewage treated in developing countries is still low; bad investment decisions and lack of cost recovery

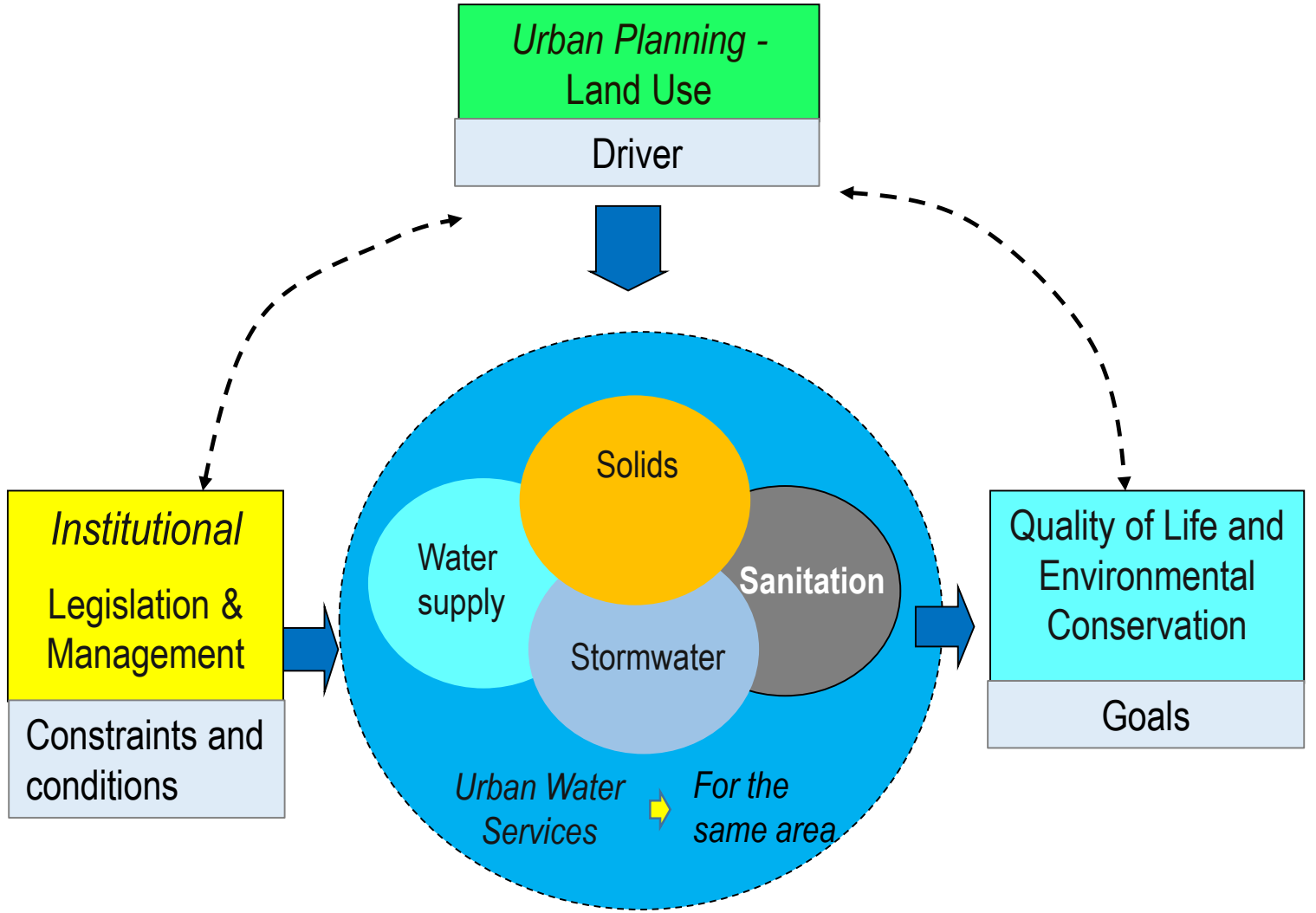
Impervious areas increase flood frequency; channels and conduits cost six times sustainable solutions and increase negative impact

Bad services, no goals and indicators, lack of capacity building, cost recovery and enforcement

IUWM Framework

- The main driver of IUWM is land use and its Planning
- The society needs basic Institutional construction
- Urban water services should be integrated in the space solution
- Urban water services should take account of land use aspects and institutional constraints…

...in order to improve quality of life and the urban environment



Integration means: *provide all service to the same planned* ***space***

Sustainable Solutions for IUWM

- ***Land use:*** reduction of irregular occupations; avoid occupation of areas of risk; regulations and incentives for sustainable occupation, efficient transport;
- ***Water Supply & Sanitation***: protection of river basin to preserve the quality of water sources; efficiency in WSS services; high coverage of sanitation and water quality goals for the river and Treatment plants;
- ***Flood management and Stormwater***: regulation of flood spaces, incentives and regulations for source measures to increase on-site infiltration; detention facilities; integrated amenities
- ***Solid waste***: collection and treatment (sanitary landfills); avoid proliferation of degraded areas; preserve functionality of hydraulic infrastructure; reduce-reuse-recycle
- ***Integrated solutions*** Develop all the services for the same area. Usually the best division are the creek basin inside of the city in order to comply with the impacts from upstream to downstream.

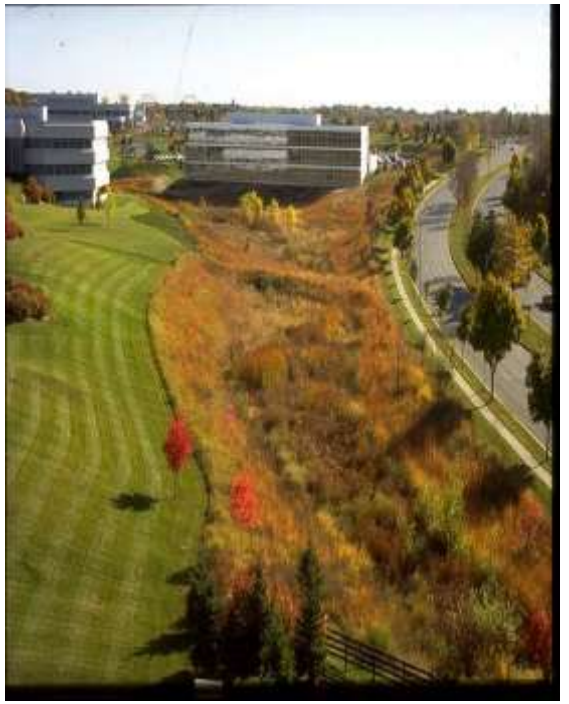
IMPROVING ON SITE MEASURES AND LAND SCAPE

Infiltration decreases the overland flow and recharge the groundwater, recovering the natural hydrologic cycle

Improve the urban landscape, infiltration and heat

Allow infiltration in the vegetation and side walk

Improve the local environment and decrease the heat



Storm water detention, environment landscape and amenities

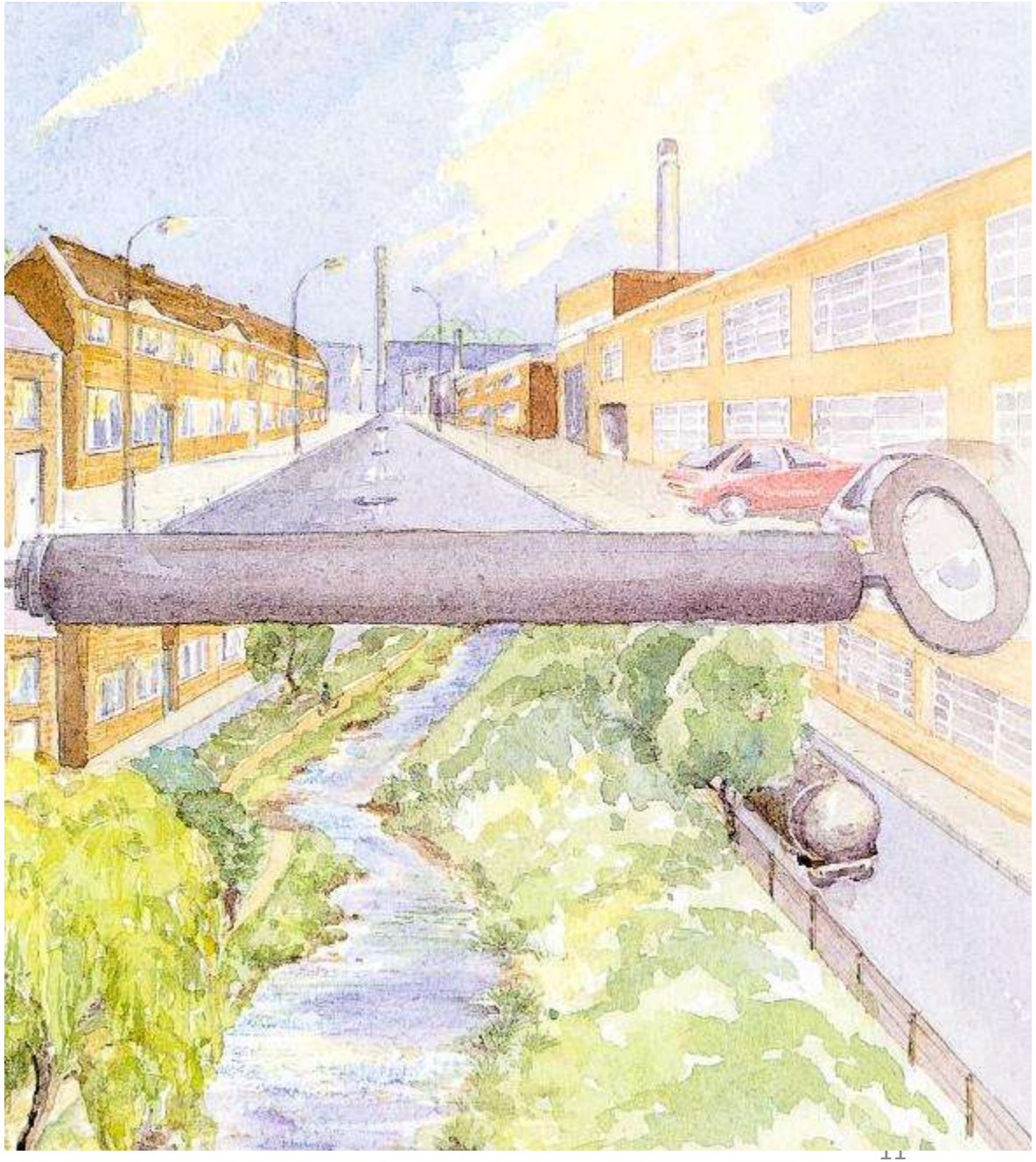
Level of actions

- *At the private level – at source*

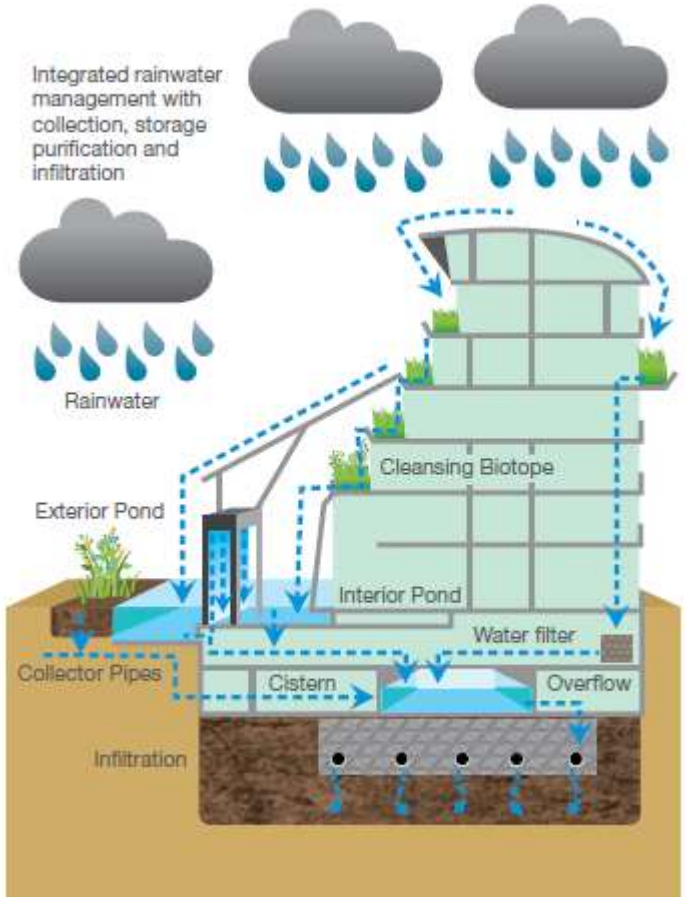
  …encouraging environmental certification such as Green Building, LEED, among others, bringing value to the investment. This area actions at source: *building, plot development*

- *At the public level – urban area*

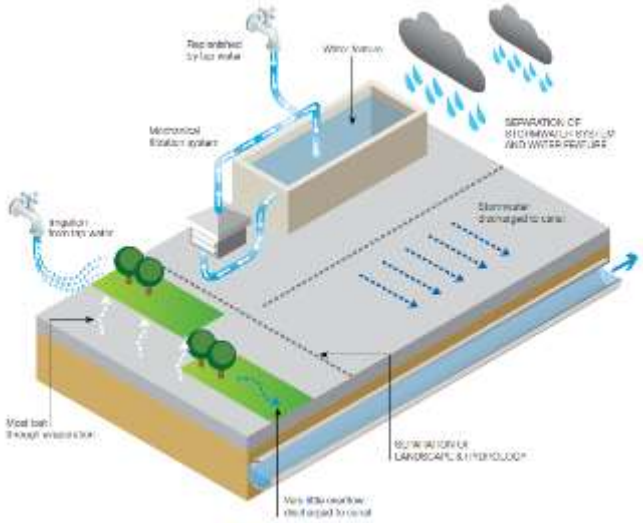
  …undertaking new developments with sustainable standards for urban recovery which represents an opportunity to change the city. *It represents an area of the city*



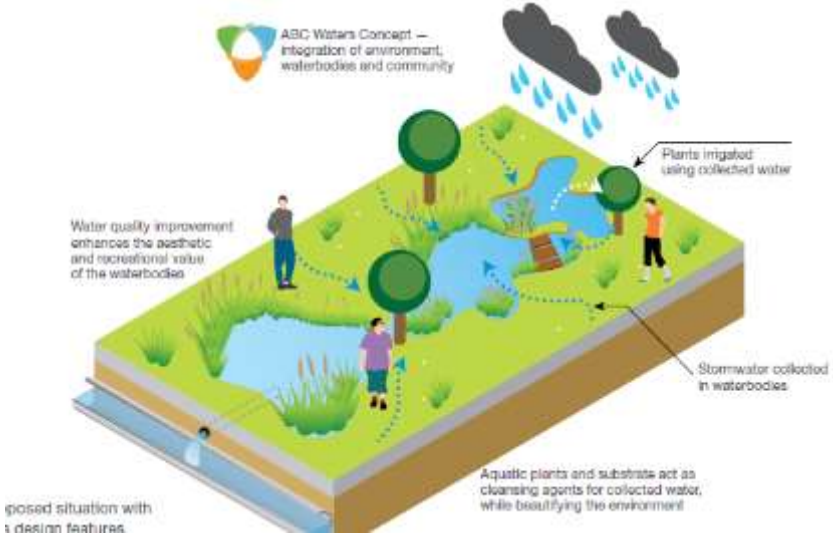
Local or Source Level



conventional



Green development



At public level - Integrated solutions

- *For an urban area – develop all services for the same area an improve the urban development*
- *There are three levels of action*

I – *infrastructure* – develop sanitation, solids management, storm water; transport, resettlement, etc

II – *Amenities, prevention, education an cultural*: parks, recreational equipment's, schools, museum, etc

III – *New Investments – Urban Structured Operation*: Housing, Shopping, Hospital, Universities, Economic Mechanisms in the Urban Structure Operation, etc.

Seul, South Coreia

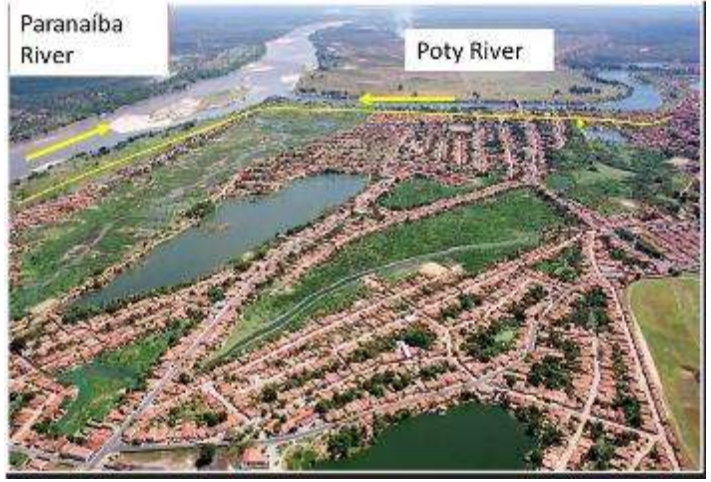
Sewage treatment, storm water, urban recovery, solids, transport, etc

Integration at Public Level

- Area of 13 km2 inside of river dikes which is often flooded by Storm water in of Teresina, Brazil;
- Poor population without overall infra structure;
- Interventions developed was on:

✓ Sanitation: collection and sewage treatment;
✓ Solid Management: improve the services;
✓ Storm water and flood control;
✓ Integrated lagoon to park with recreational facilities, school, museum, among other
✓ Resettlement of population in risk area;
✓ Urbanization of the area in parks, streets for transport ways
✓ Alternative job opportunities

TERESINA, BRAZIL



Conclusions

- IUWM is a process with a long term vision
- IUWM should be developed in stages and requires continuous actions
- Institutional strengthening and capacity building are conditions to move from planning to actions
- A holistic approach that integrates actions and measures in the urban space is more efficient to achieve economic, social and environmental goals