Toolkit on Digital Transformation of People-Oriented Cities and Communities

8

Module 8:
Smart Water Management

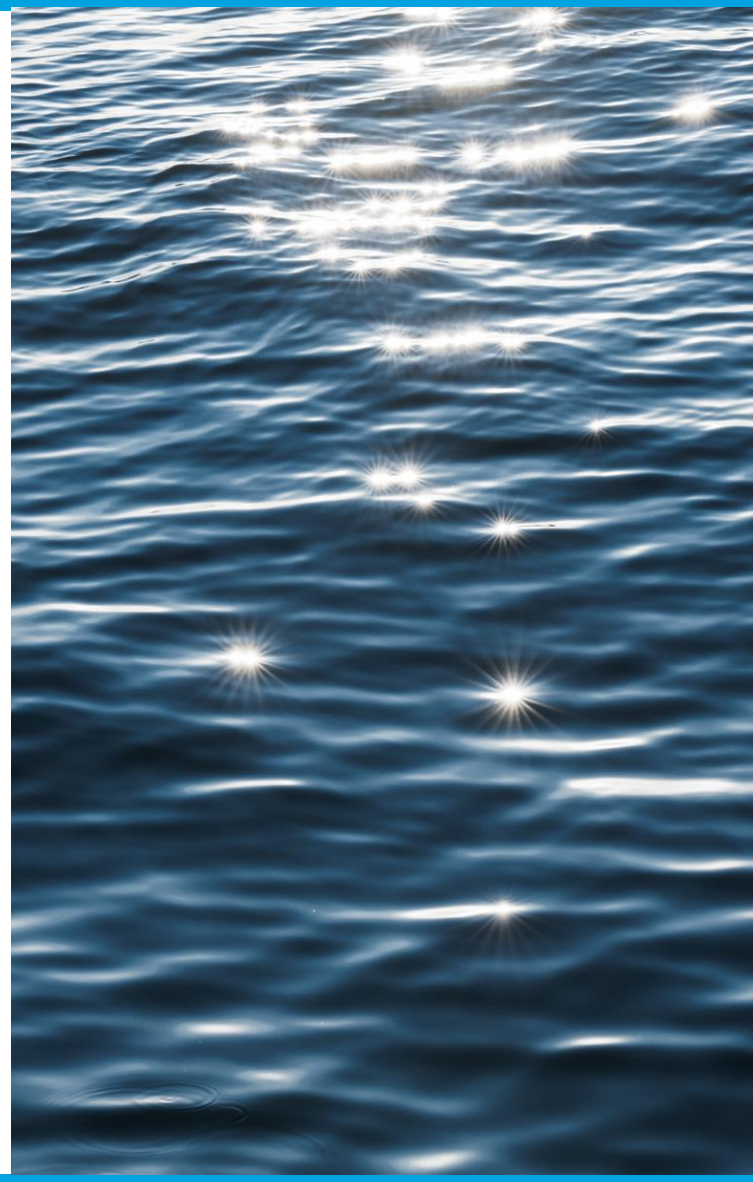
Jointly developed by: ITU, UN-Habitat, UNDESA, IWRA, UNECE, UNEP DTU, UNDP

Module 8 – Smart Water Management

This Module of the Toolkit on Digital Transformation for People-Oriented Cities and Communities focuses on setting up and maintaining smart utilities, particularly smart water management.

Cities and communities that are starting on their digital transformation journey will find the resources highlighted within this Module useful toward planning, developing and sustaining smart water management practices.

This Module is also useful for cities and communities that have already made some headway into their digital transformation process but would like to validate the extent to which their water management is truly smart.



Module 8 – Smart Water Management

This Module will cover the following topics:

1. Water Management Challenges
2. Water Management Solutions
3. Key Smart Water Management Tools
    1. Tool #1: Smart water management technologies and tools
    2. Tool #2: Smart metering and sensing
    3. Tool #3: Climate proofing

1. Water Management Challenges

Water Challenges in Cities and Communities

Urbanization

Leadership and governance

Water utilities and infrastructure

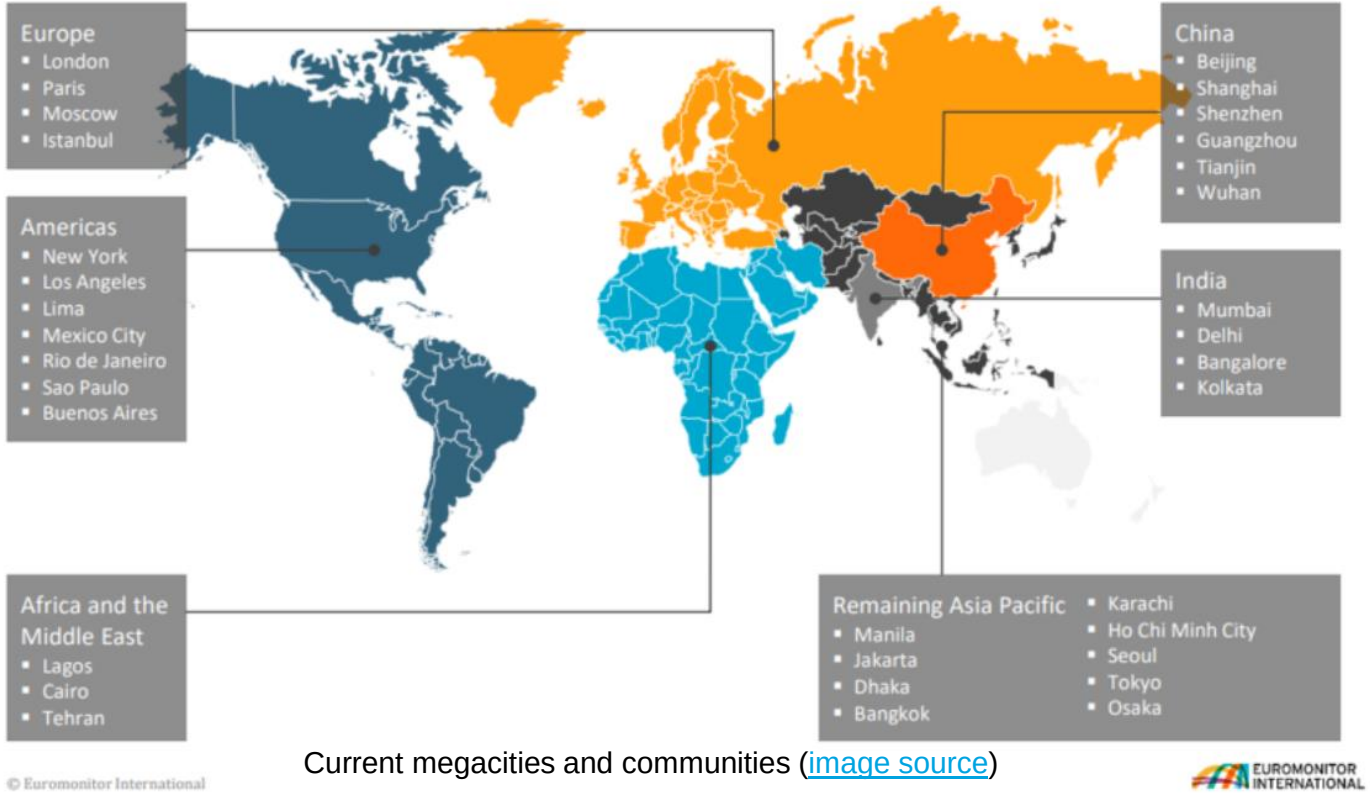
Investment

Water availability and quality

Climate change

Rapid Urbanization

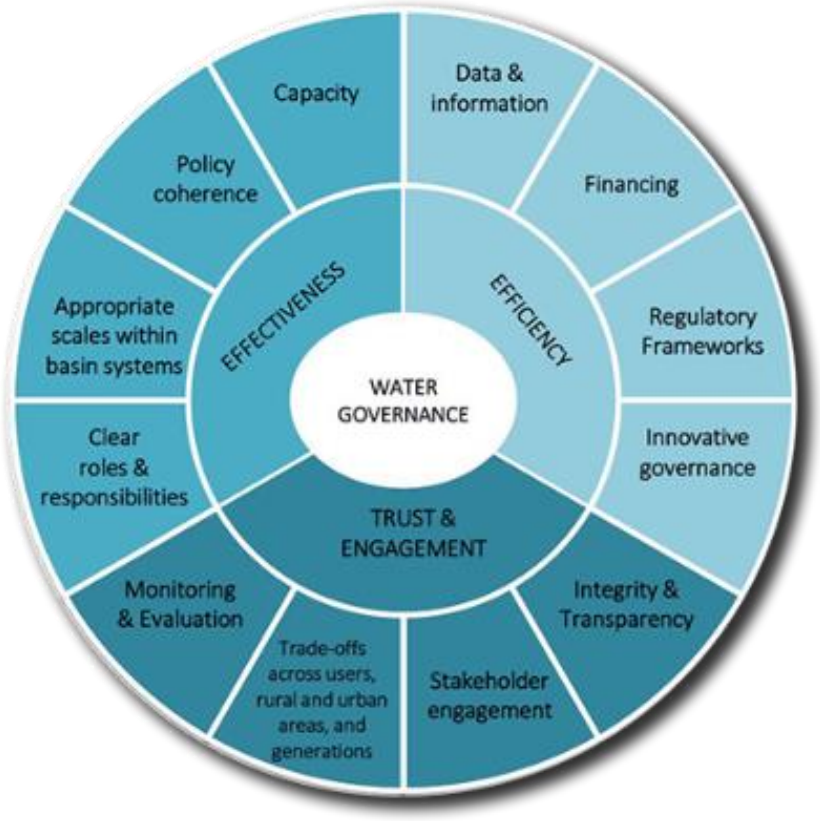
These highly concentrated populations and the increasing size of cities and communities have posed severe strains on local water resources, as cities and communities are confronted by the need to meet an increasing demand for water resources.



Current megacities and communities (image source)

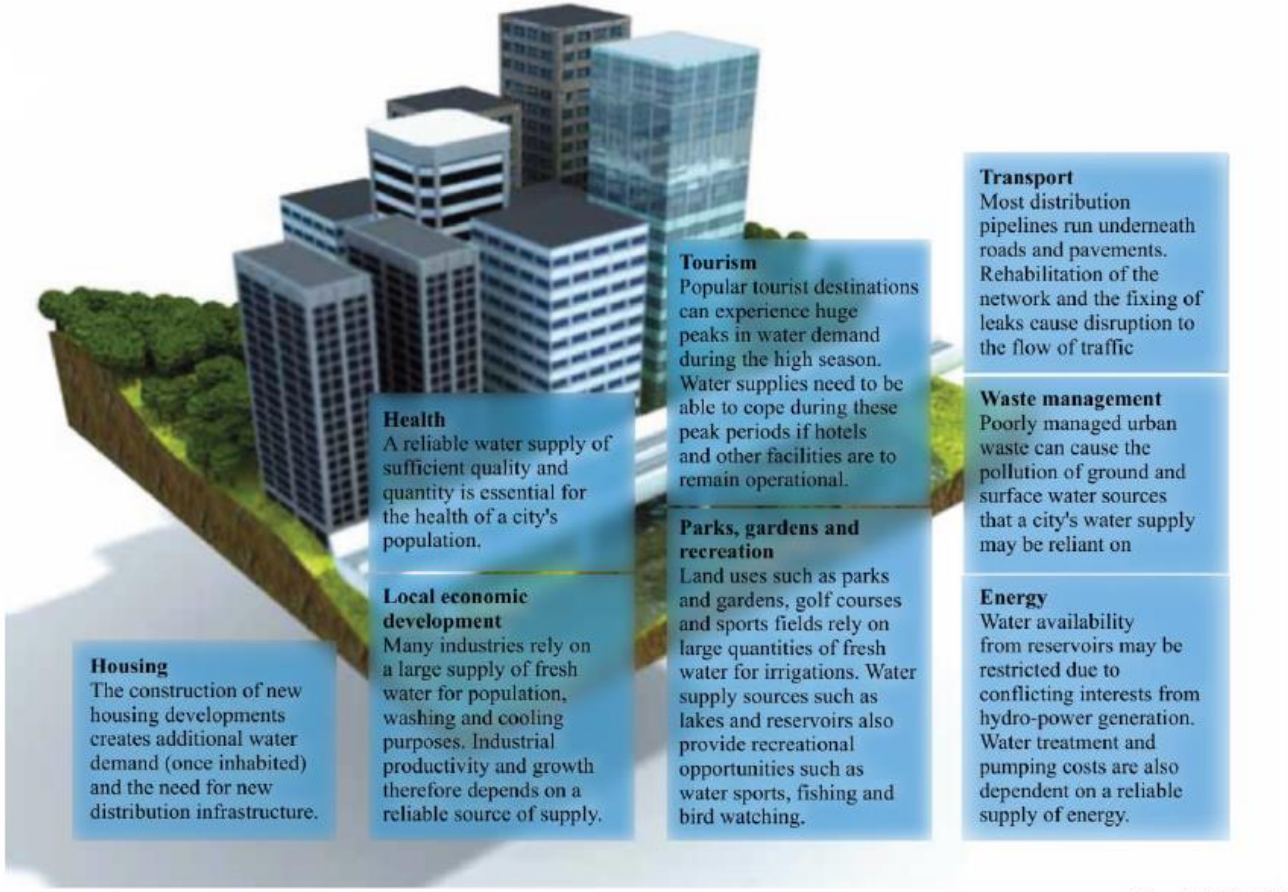
Leadership and Governance

Weak regulatory water and sanitation frameworks, along with overlapping functions within governmental agencies and institutions, have led to an unclear division of responsibilities and to uncoordinated efforts in urban water management



Principles on water governance (image source)

Water Utilities, Infrastructure and Investment



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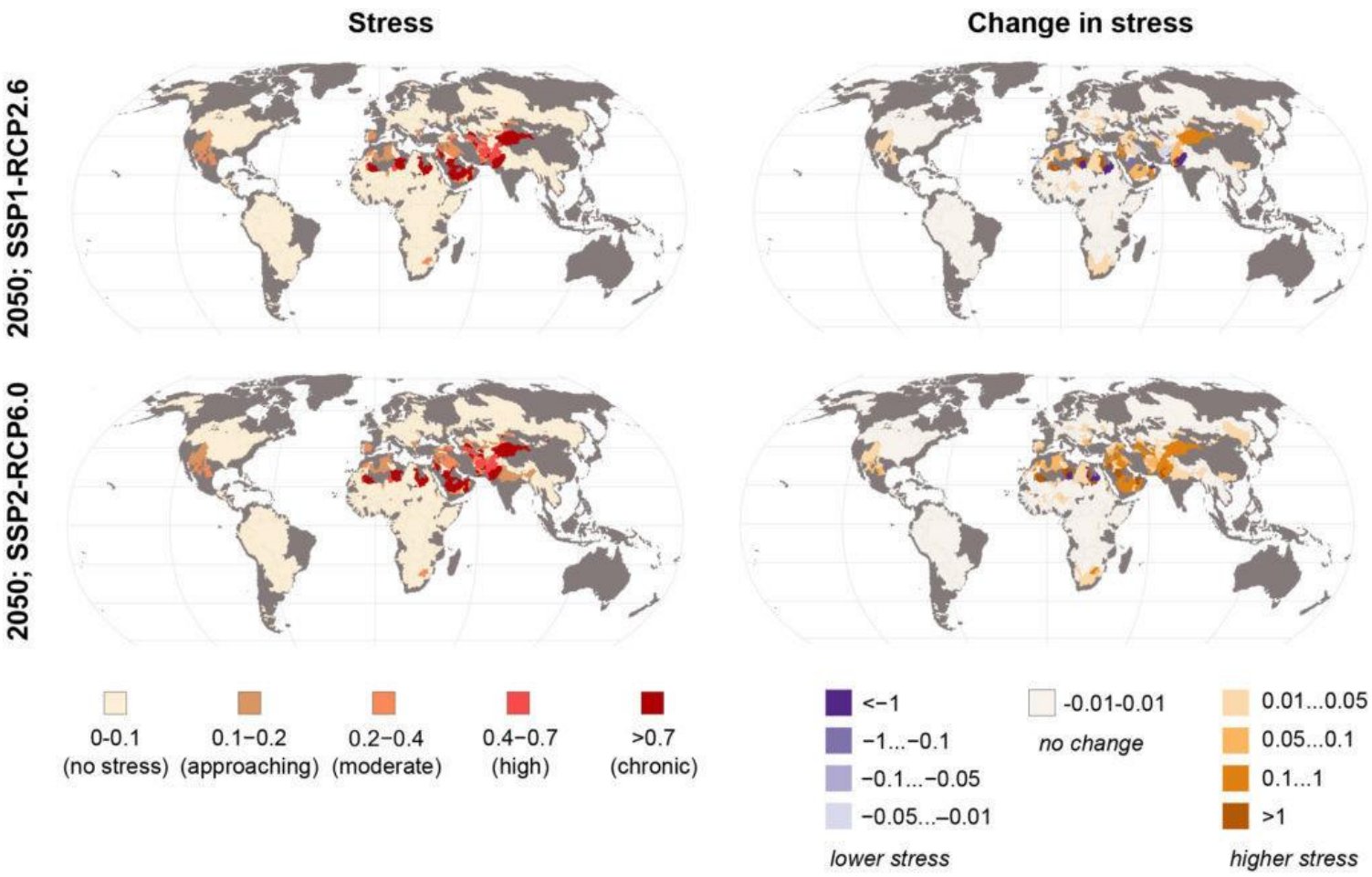
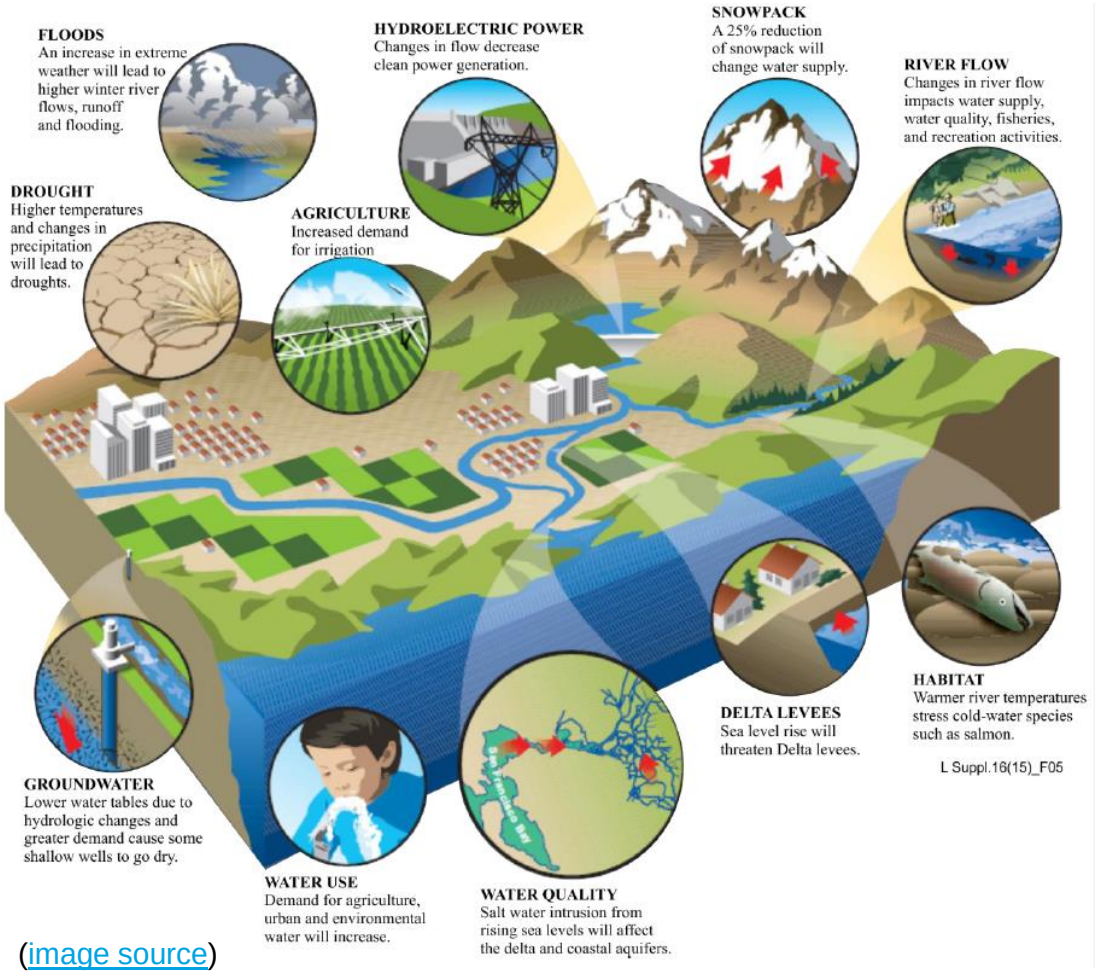
Water Availability and Quality



Projecting water stress (image source)

Climate Change Effects on Urban Water Resources



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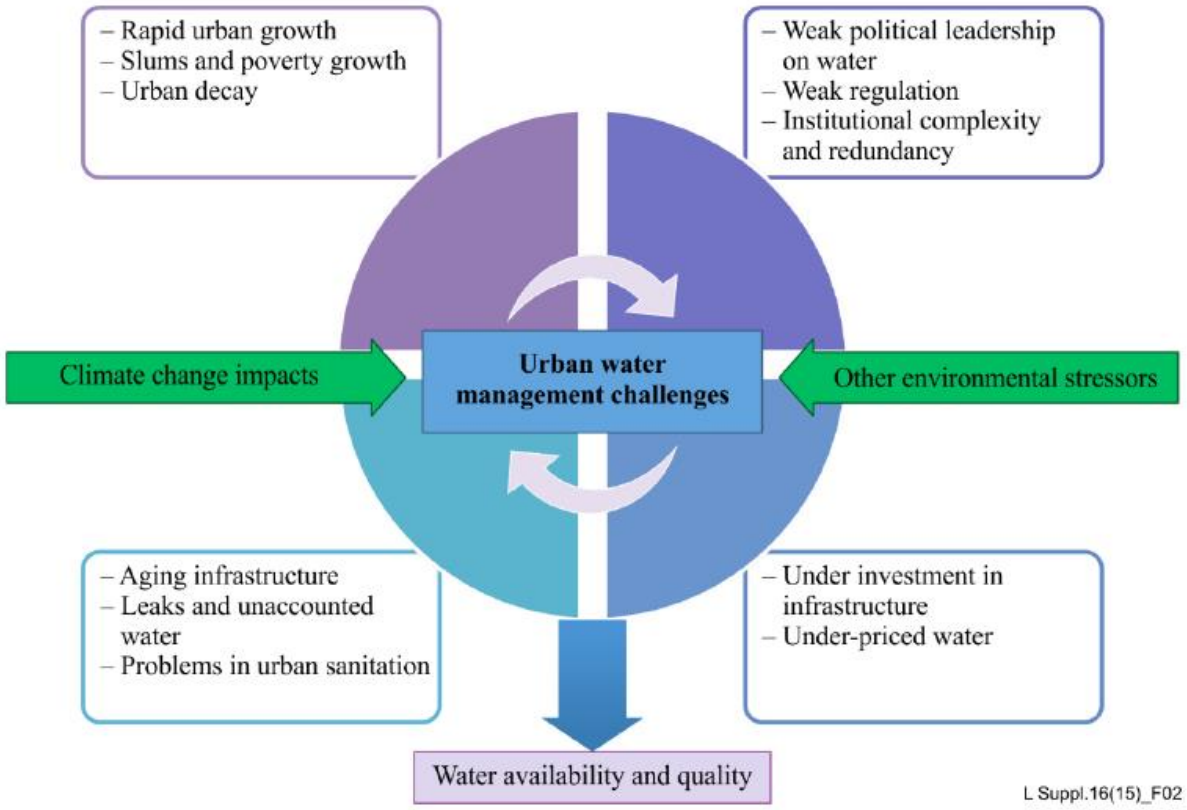
Influencing Factors on Urban Water Management Challenges



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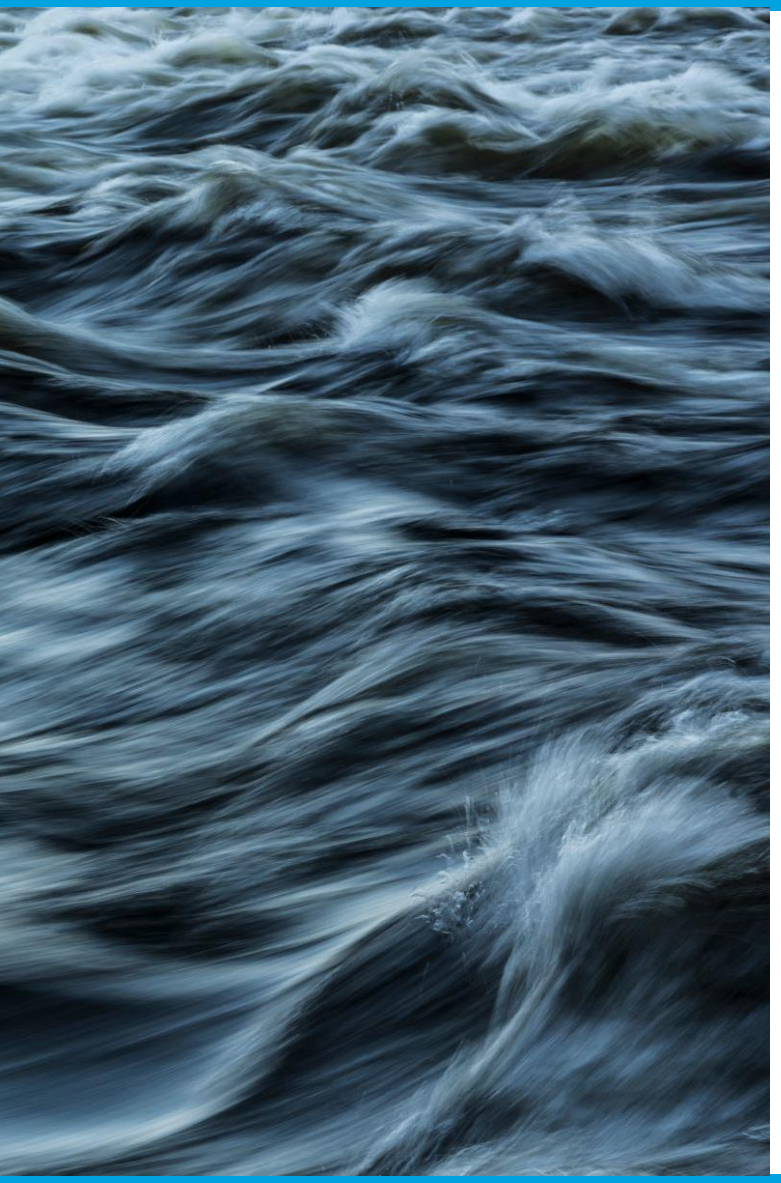
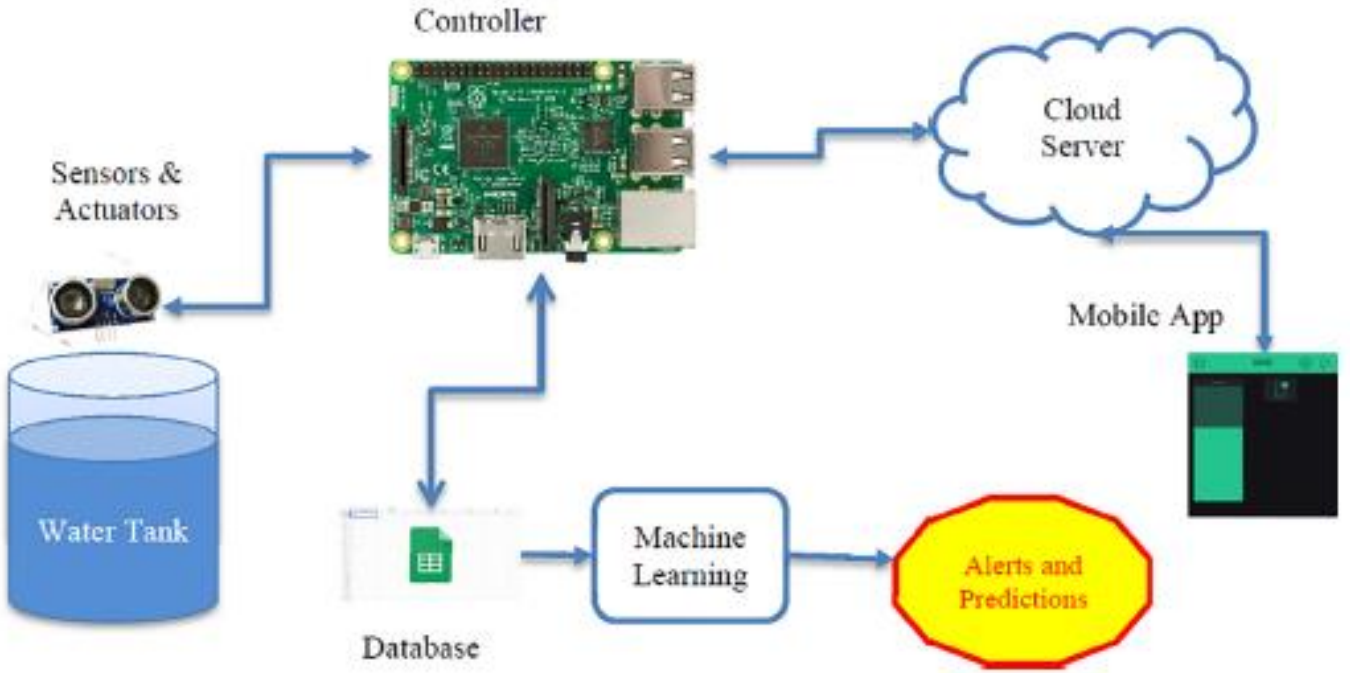
2. Water Management Opportunities and Solutions



IoT and Water Management Opportunities



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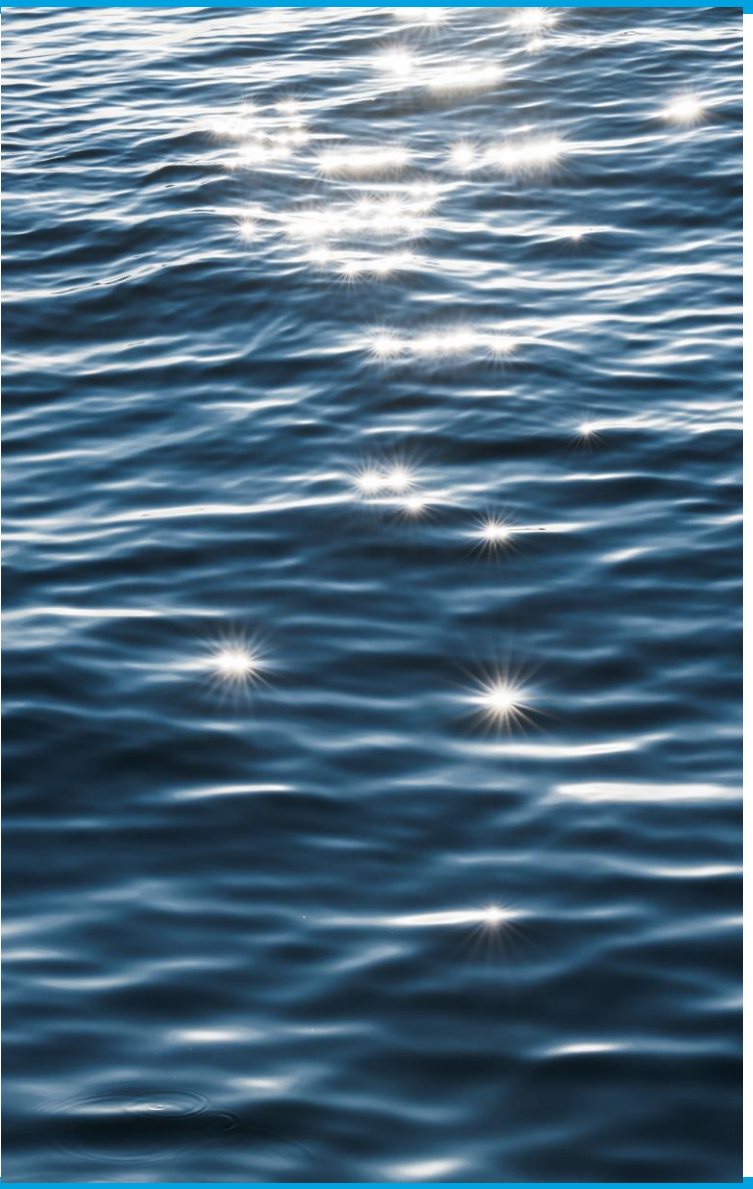
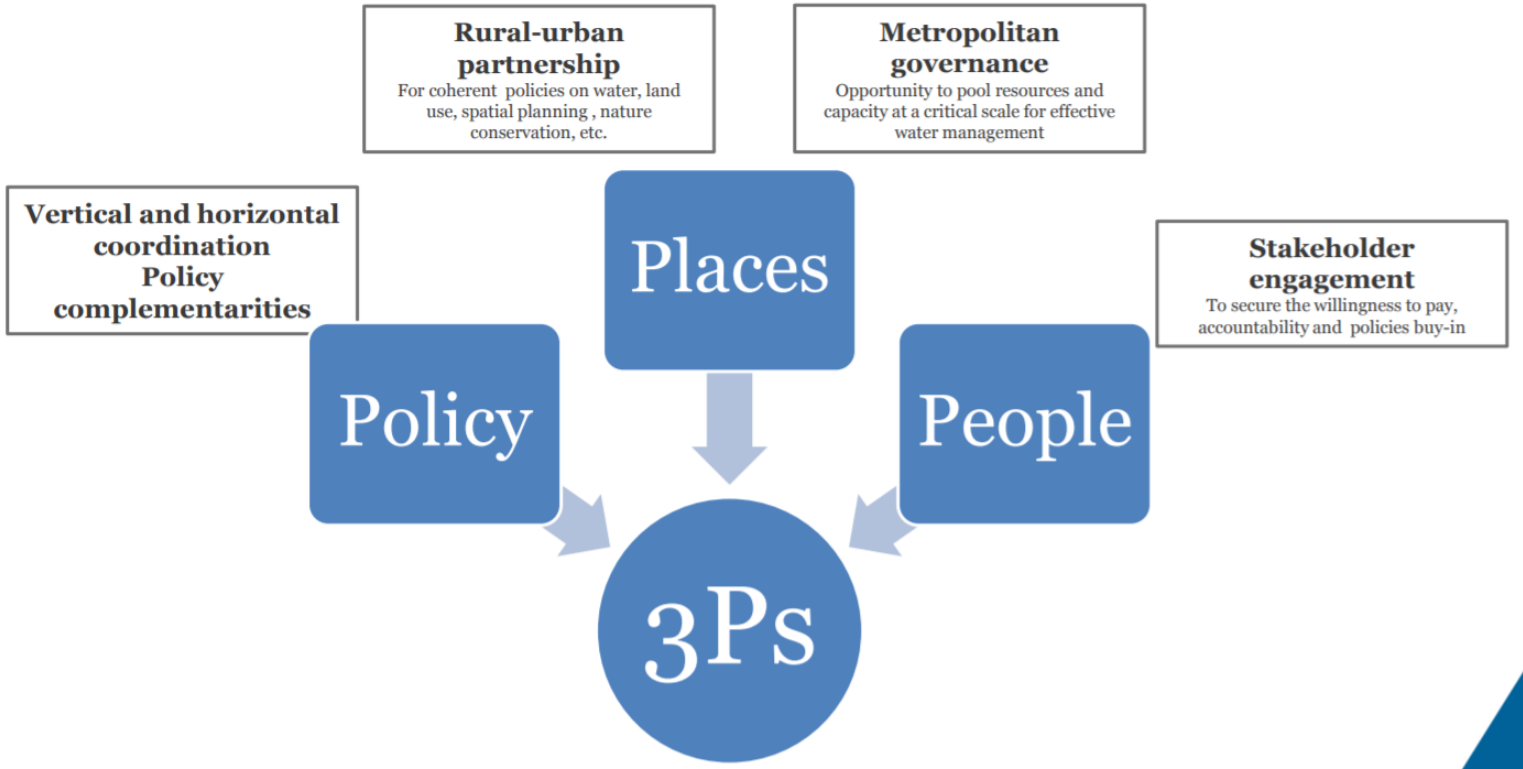


Water Management Opportunities

1. **Sustainability of supply**
2. **Higher water quality**
3. **Lower cost**
4. **Servicing of marginalized communities**

Water Governance for Cities and Communities: Tools to Bridge Gaps and Address the 3 Ps



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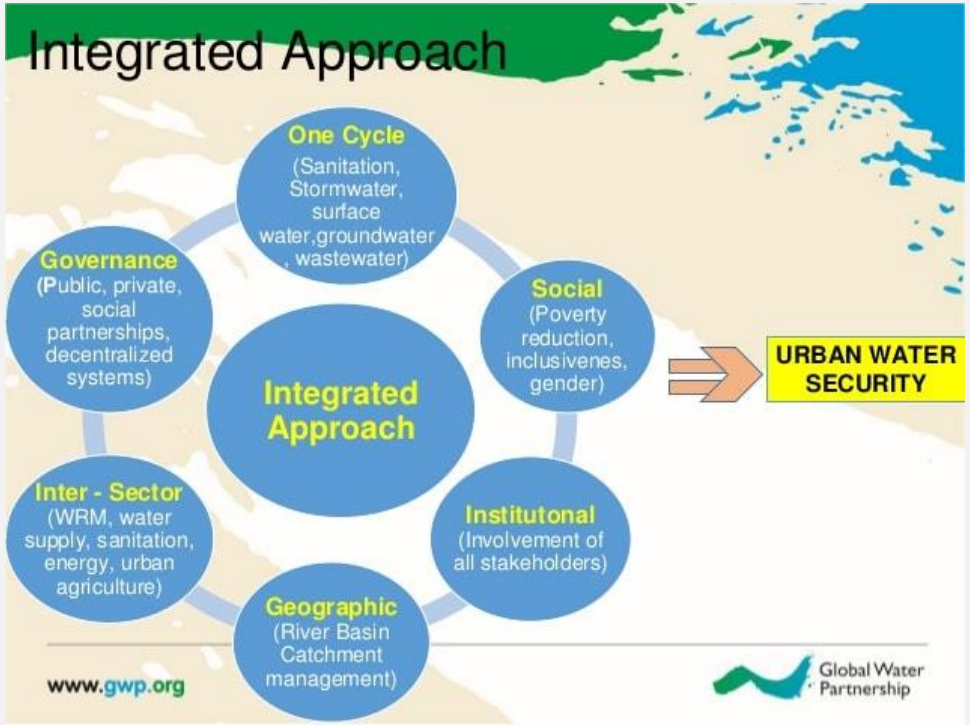
Integrated Urban Water Management

- Urban water as part of full water cycle, within a watershed
- Considers the range of water uses, including ecological ones
- Coordinates horizontally across sectors & vertically across different tiers of authority and spatial scales
- Involves all players and embracing stakeholder participation



Source: http://image.slidesharecdn.com/sustsanworkshop-integratedurbanwatermanagement-140505064514-phpapp01/95/sustsan-workshop-integrated-urban-water-management-by-ankur-gupta-3-638.jpg?cb=1399275034

Sponge Cities

A city planned to absorb water to use as a resource for city water needs through actions such as :

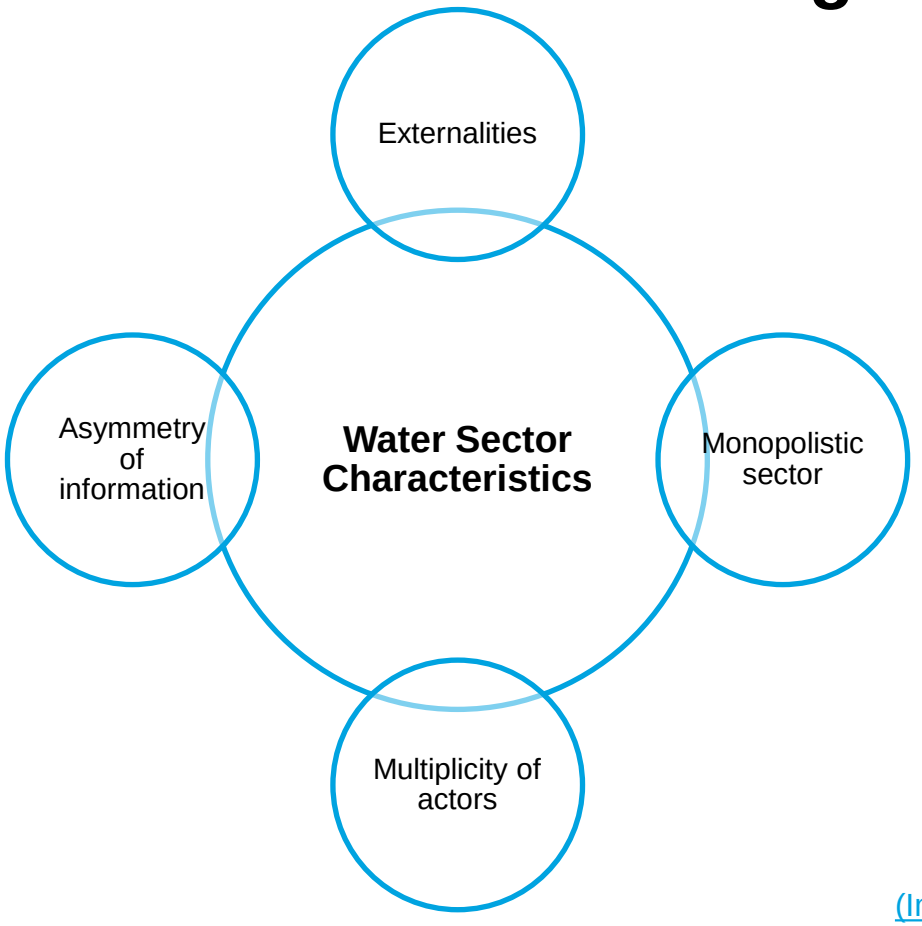
- Porous design
- Contiguous open green spaces
- Water savings and recycling
- Green Roofs

Source: https://www.chapmantaylor.com/insights/what-are-sponge-cities-and-why-are-they-the-future-of-urban-design

Case Example
Sponge Infrastructure – Shenzhen, China

Image Source

Water Governance for Cities and Communities: Regulations



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Regulation measures

- Tariff regulation
- Monitoring of service delivery performance
- Information and data gathering
- Analysing utilities' investment / business plans
- Customer engagement
- Consumer protection and dispute resolution
- Incentives for efficient investment
- Defining technical and service standards
- Etc.

3. Key Tools for Smart Water Management

Introduction to Tools for Smart Water Management

Tool #1:
Smart water management technologies and tools

Tool #2:
Smart metering and sensing

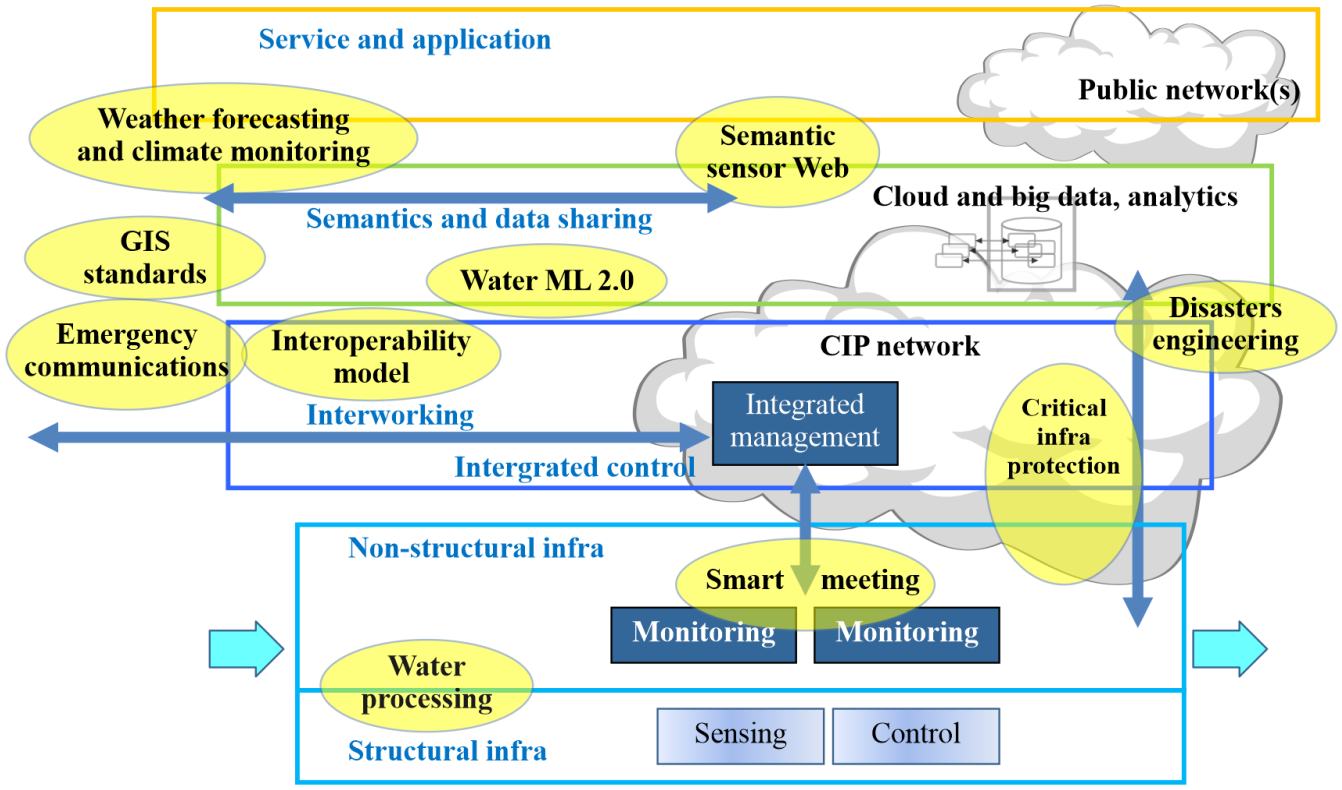
Tool #3:
Climate proofing

Tool #1

Smart Water Management (SWM) Technologies and Tools

Smart Water Management Model

Domains of standardization in SWM model



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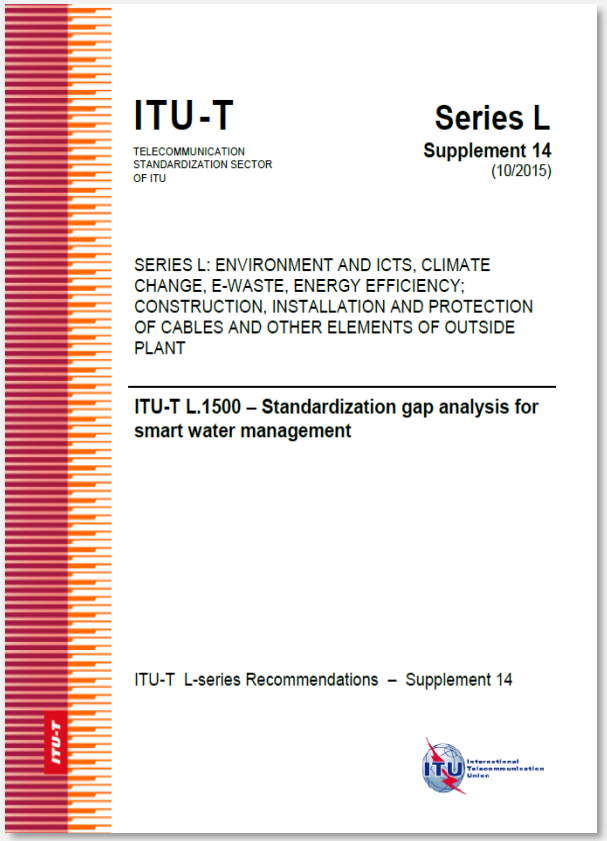
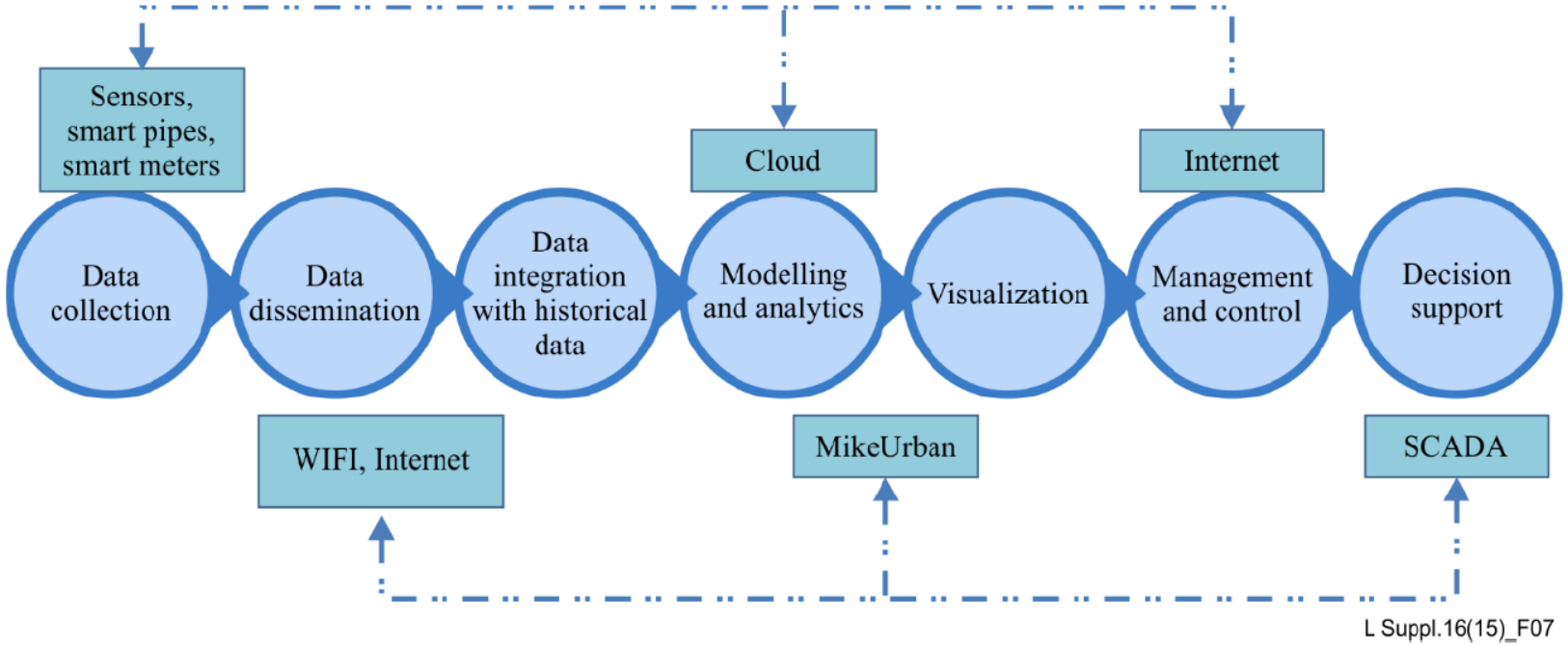
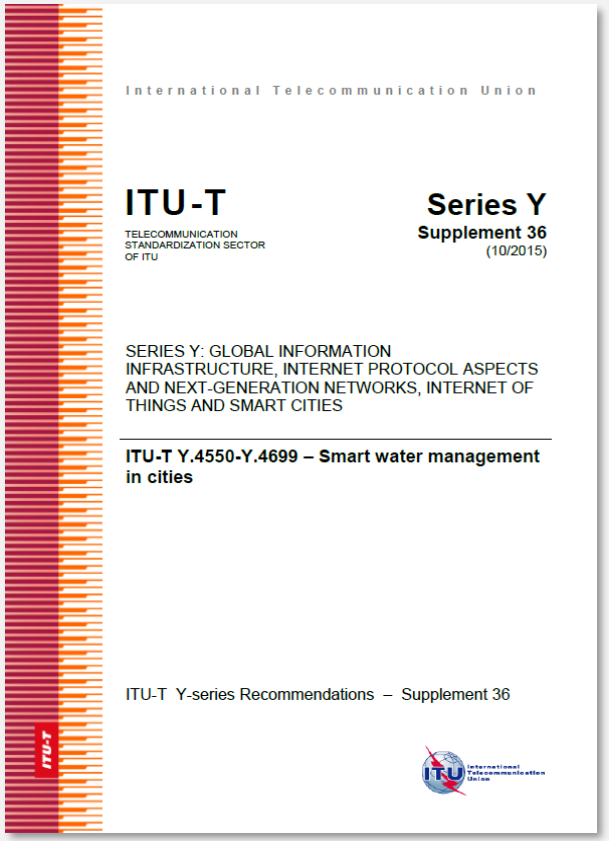


Smart Water Management Technologies and Tools





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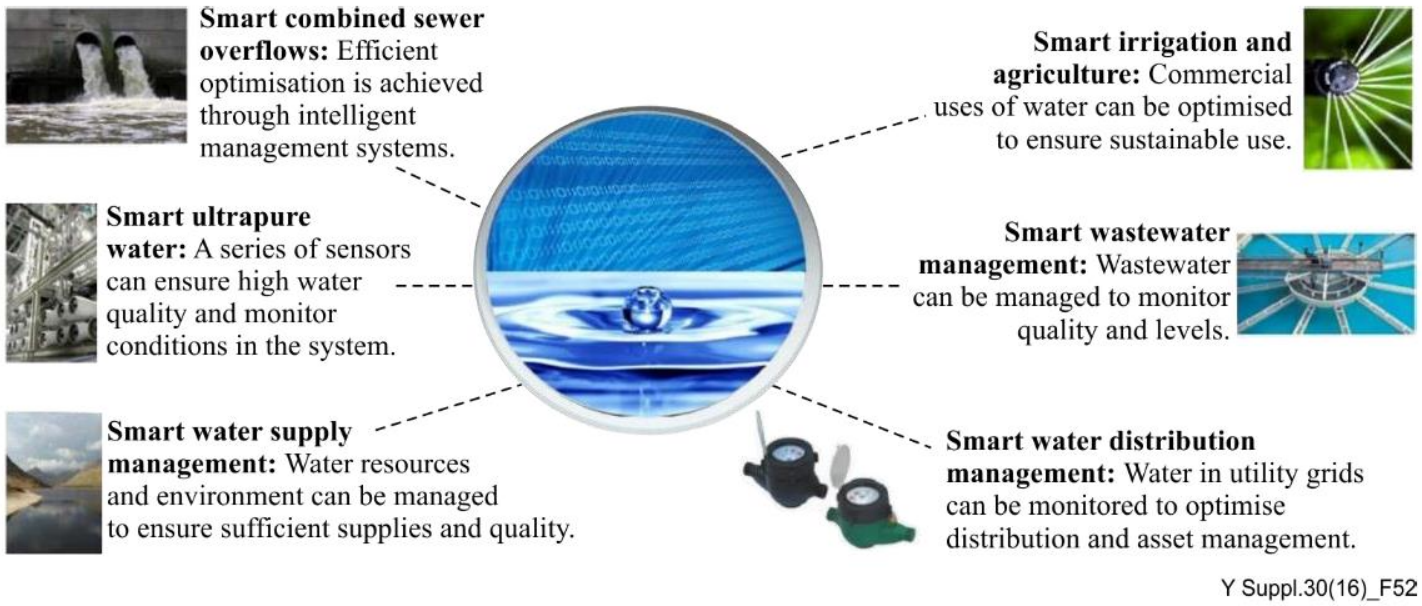
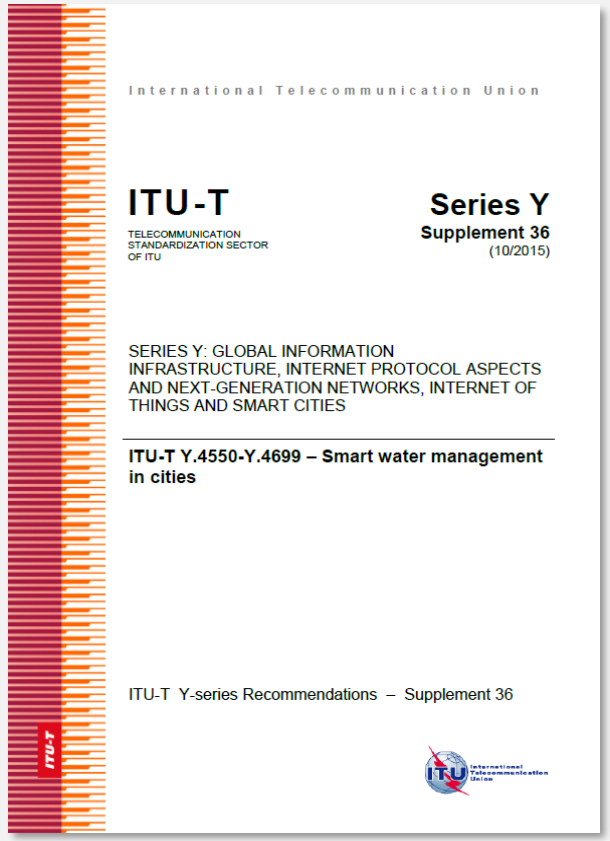
Implementation of Smart Water Management Technologies and Tools





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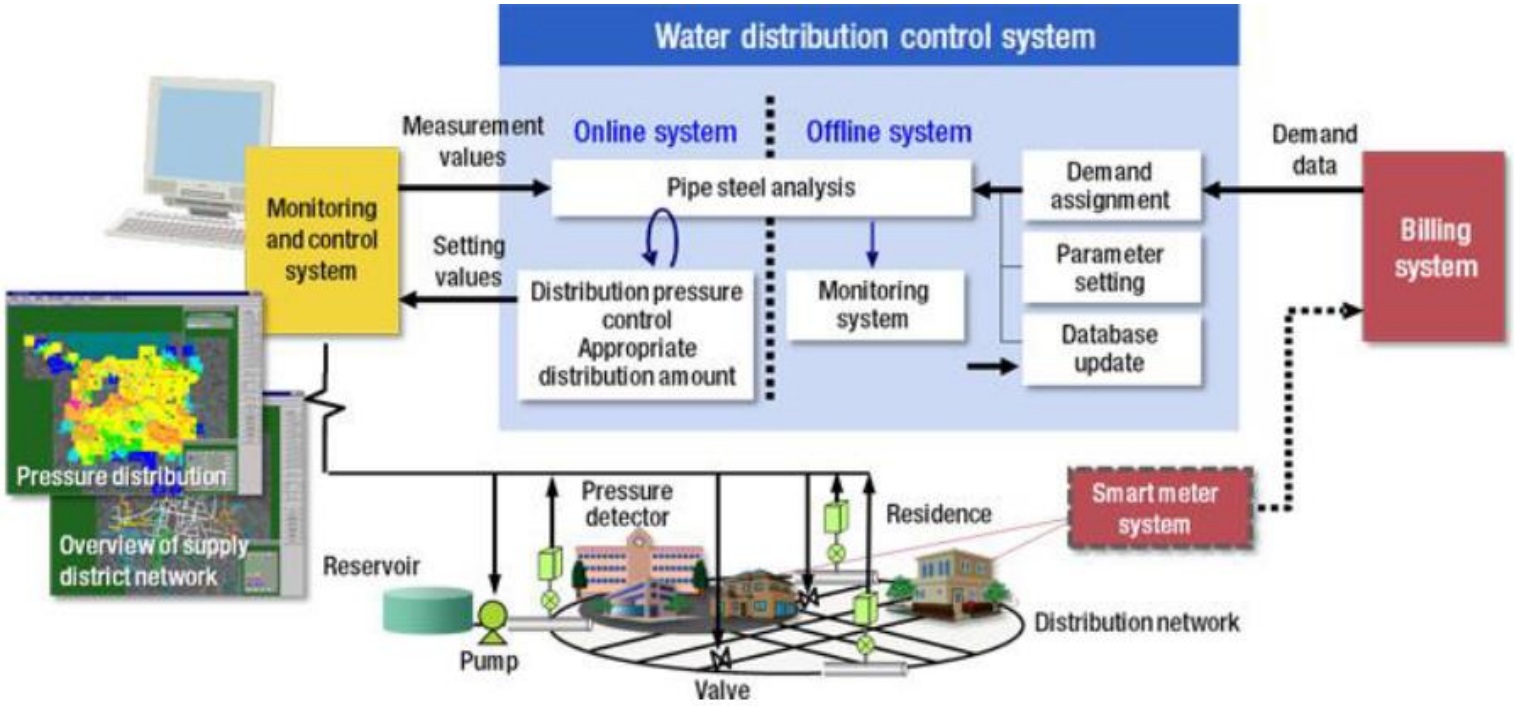
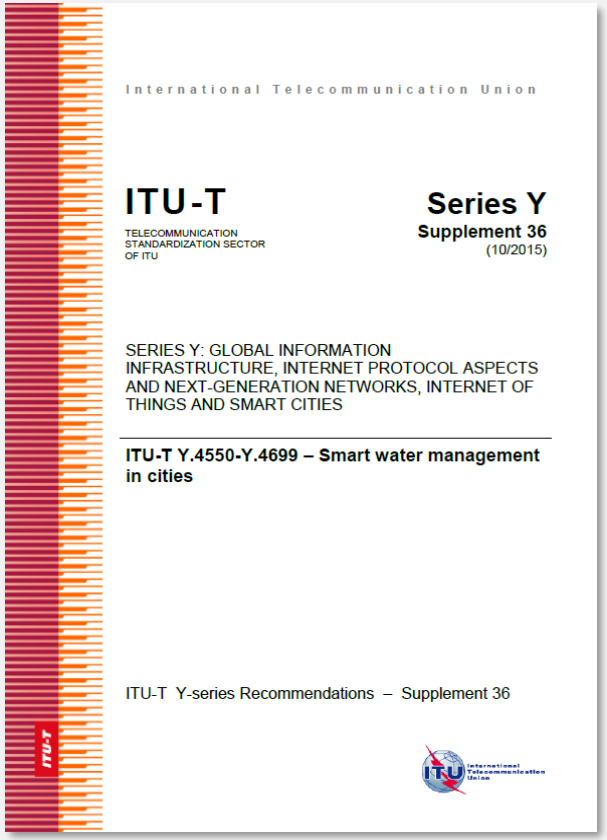
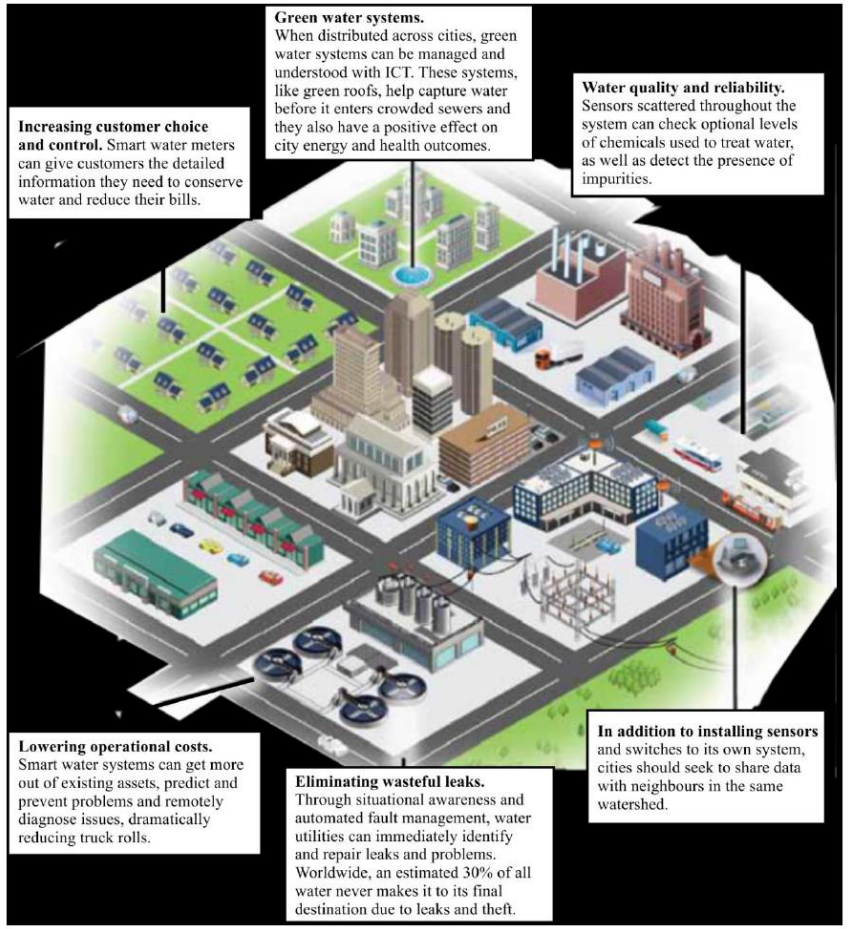
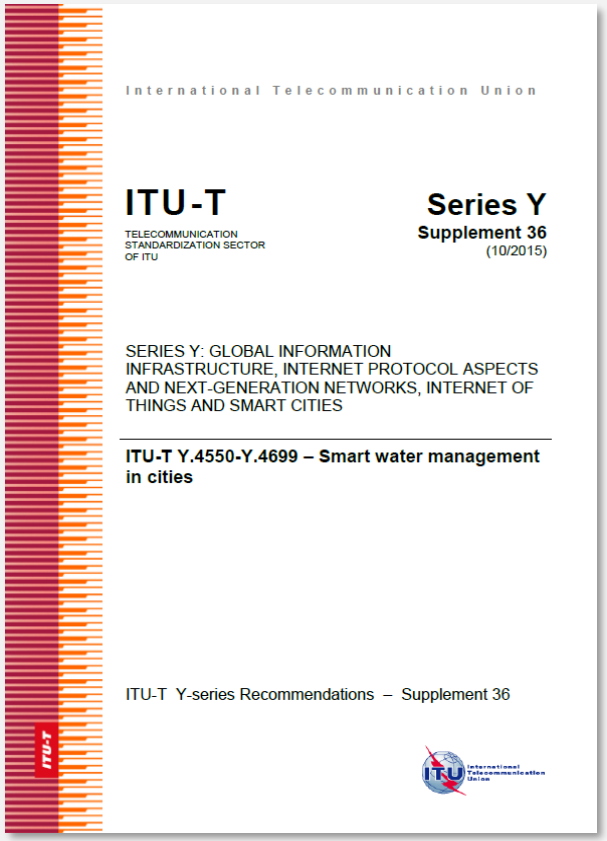
Smart Water Management Networks





Advantages of Smart Water Management





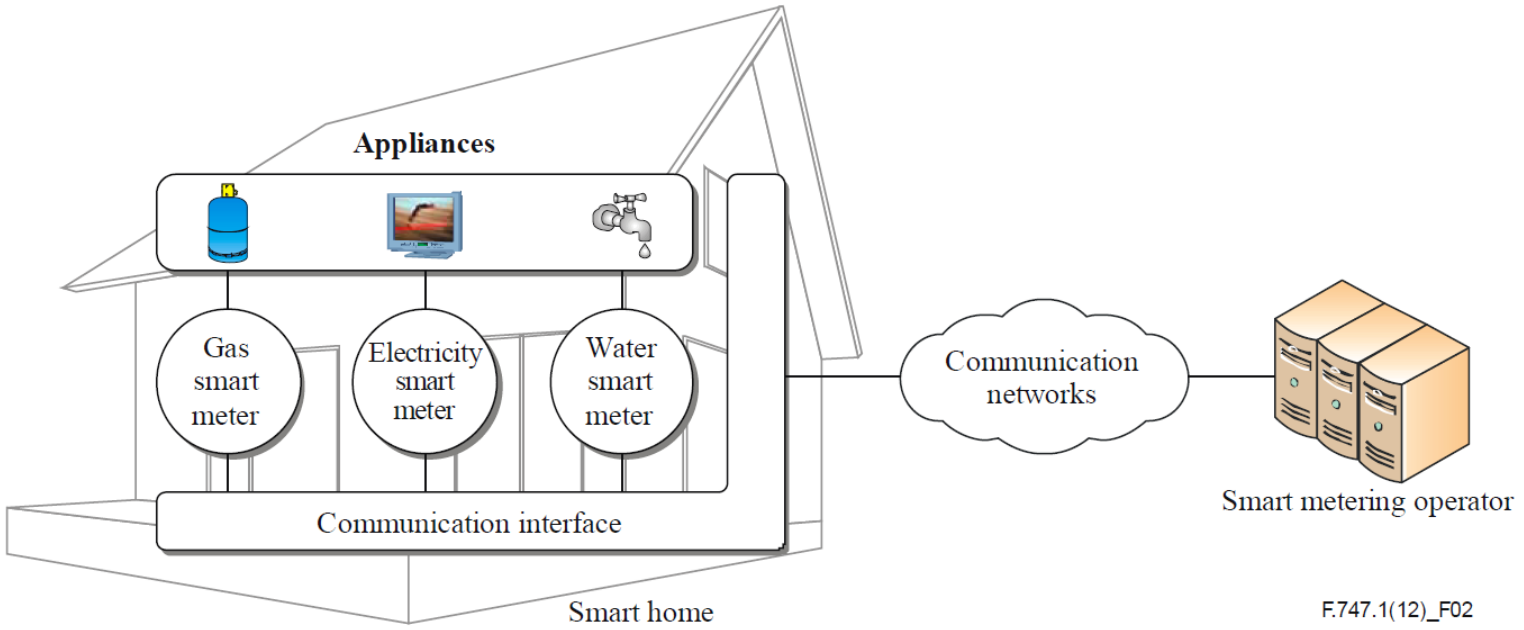
Smart Water Cities Project

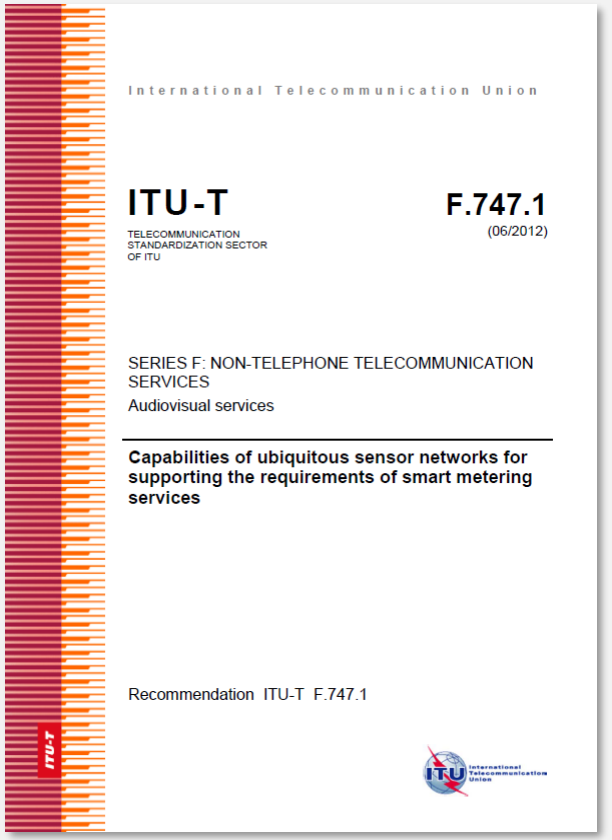
- Identify and examine the technological solutions
- Identify and examine the existing global standards frameworks and the Key Performance Indicators
- Develop a new internationally recognized certification scheme for Smart Water Cities
- Case studies from cities, regions and countries

Tool #2

Smart Metering and Sensing

Smart Metering




International Telecommunication Union

ITU-T
TELECOMMUNICATION STANDARDIZATION SECTOR OF ITU

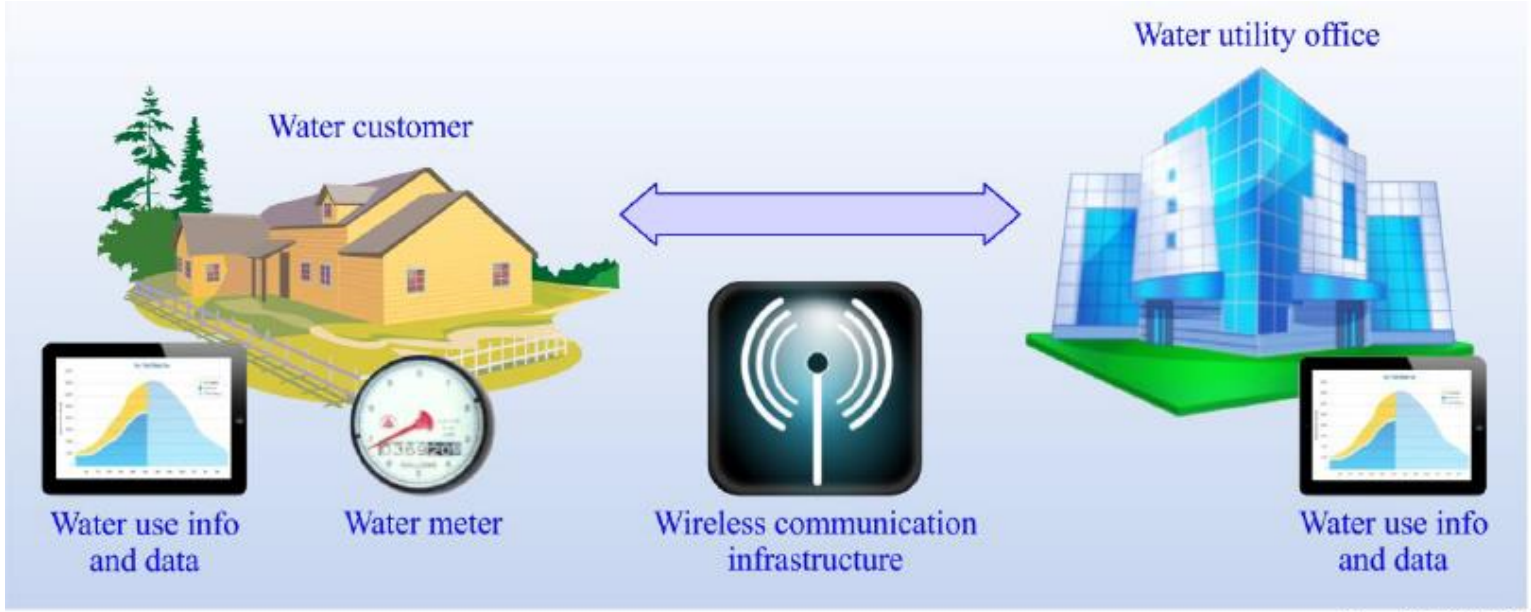
F.747.1
(06/2012)

SERIES F: NON-TELEPHONE TELECOMMUNICATION SERVICES
Audiovisual services

Capabilities of ubiquitous sensor networks for supporting the requirements of smart metering services

Recommendation ITU-T F.747.1

Smart Meter Technologies



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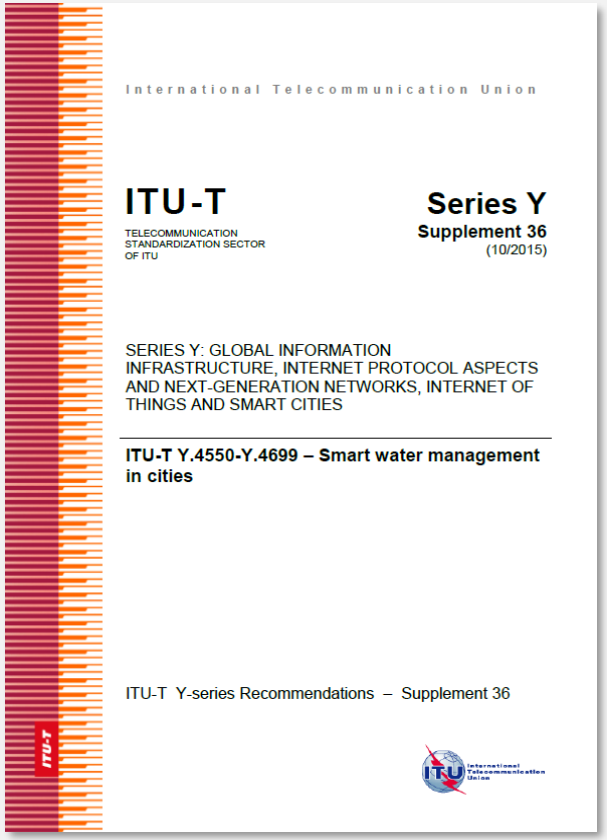
International Telecommunication Union

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TELECOMMUNICATION STANDARDIZATION SECTOR OF ITU

Series Y
Supplement 36
(10/2015)

SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS AND NEXT-GENERATION NETWORKS, INTERNET OF THINGS AND SMART CITIES

ITU-T Y.4550-Y.4699 – Smart water management in cities

ITU-T Y-series Recommendations – Supplement 36

Smart Metering Benefits

Lower cost

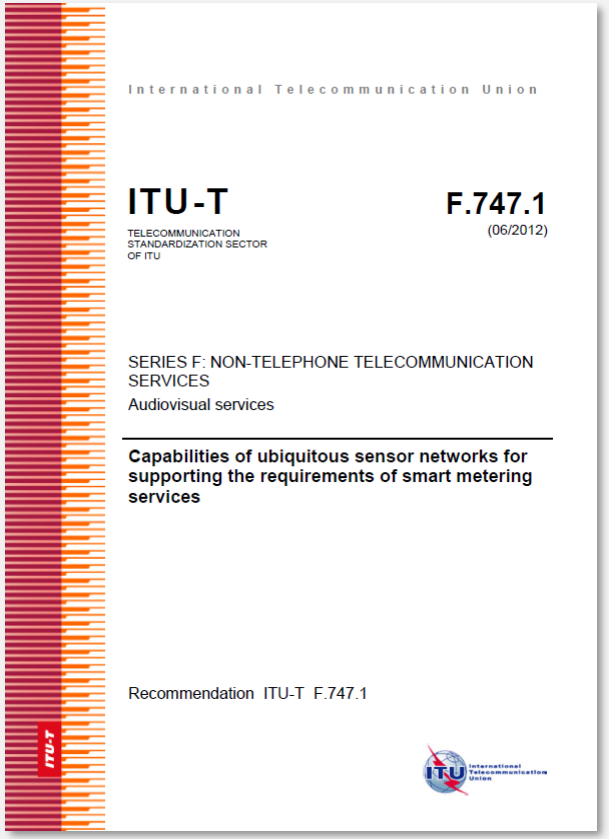
Water savings

Supply reliability

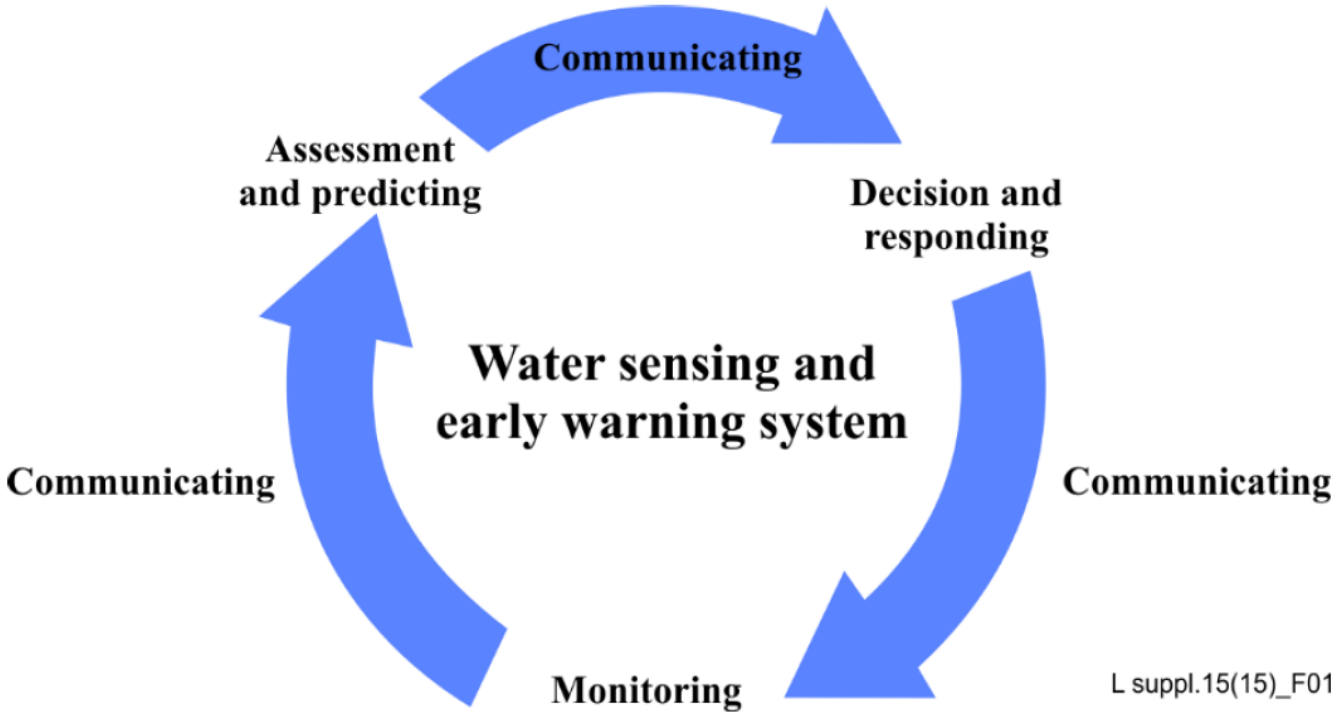
Various pricing schemes

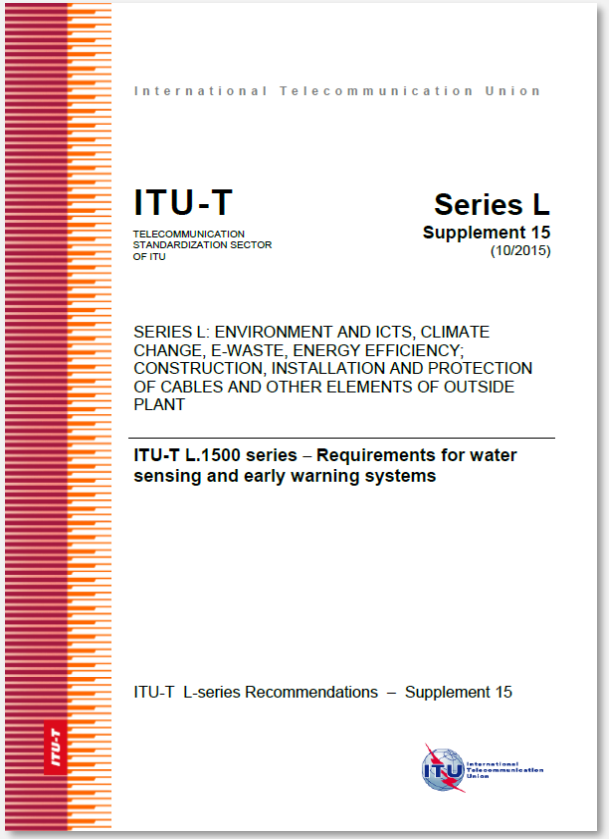
Water loss detection

Automated billing



Water Sensing and Early Warning Systems





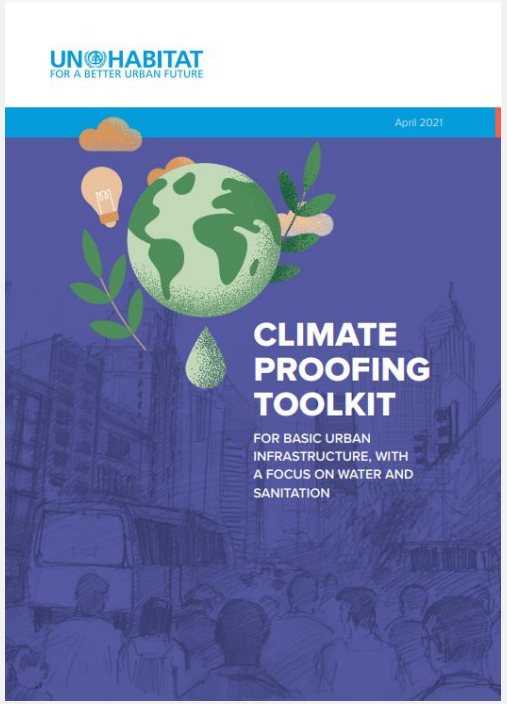
Tool #3

Climate Proofing of Water Infrastructure

Climate Proofing of Water Infrastructure

Taking climate change risks into account when:

- Planning
- Locating
- Designing
- Building
- Operating



Toolkit Structure

TOOLKIT STEPS

STEP 1: Screening, hazard identification and levels of exposure

STEP 2: Sensitivity measures

STEP 3: Adaptive capacity analysis

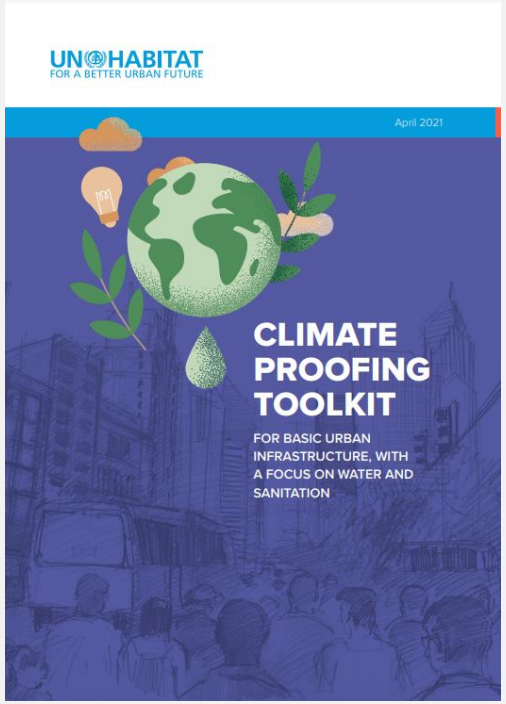
STEP 4: Vulnerability assessment for infrastructure

STEP 5: Options for identification and assessment of climate proofing

STEP 6: Governance, infrastructure, and capacity-building

STEP 7: "Soft" climate proofing options for general infrastructure

STEP 8: Implementation of climate proofing measures



Module 8 –
Smart Water Management

Thank you for completing this Module of the ITU Toolkit on Digital Transformation for People-Oriented Cities and Communities.

We hope that you found the information in this Module useful toward planning and initiating your city or community's digital transformation process.

Please review the resources highlighted within for further details, including valuable real-world use cases, on how to get started on – and optimize from the onset – your city or community's digital transformation journey.

Toolkit on Digital Transformation for People-Oriented Cities and Communities

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