

THE IWA “PRINCIPLES FOR WATER WISE CITIES”

PRINCIPLES FOR URBAN STAKEHOLDERS TO DEVELOP A SHARED VISION AND ACT TOWARDS SUSTAINABLE URBAN WATER IN RESILIENT AND LIVEABLE CITIES



Prologue

The IWA Principles for Water Wise Cities aim to provide the necessary frameworks and principles to assist urban leaders to develop and implement their vision for sustainable urban water, and resilient planning and design in their cities. The ultimate goal of these Principles is to encourage collaborative action, underpinned by a shared vision, so that local governments, urban professionals, and individuals actively engage in addressing and finding solutions on urban water management challenges, driven by three paradigm shifts:

1. Resources are limited: We need to do more with less
With increasing numbers of people living in metropolitan areas, resources can no longer be used without due consideration for their renewal. Water, energy and materials need to be used carefully, reused and renewed.
2. City densification is both an opportunity for economic growth and a threat to liveability
By 2030, over 6 billion people are expected to live in cities. Cities are becoming denser and are required to host more people and provide more efficient services. Water is a tremendous tool to provide well-being to citizens in this denser population context, and can contribute to making cities safer and more inclusive.
3. An uncertain future underlies the planning of our cities
Historical development pathways may no longer be appropriate reference points to plan our water infrastructure as climate change is bringing unpredictable future climatic events. Population growth is another component of uncertainty. Planning secure cities in the context of an uncertain future means increasing modularity and reducing dependencies for a better reactivity to unforeseen trends and events.

This is a huge task; however, as water professionals, we know that a new vision for resilient, inclusive and livable cities is possible. The recently approved Sustainable Development Goals (SDG), and in particular SDG6¹ and SDG11², are a bold call for the promotion of sustainable urban water management for safer, more inclusive and resilient cities. We are determined to play a decisive role in making it possible, inspiring a shared vision of sustainable urban water. To achieve this we need to harness the power of collaboration: a new paradigm for water management infrastructures and policies, enabled by new governance that spurs broader collaboration, motivates stakeholder engagement and active citizenship involvement.

The following principles are a framework for cities to transition their water related planning to address the above paradigm shifts. Where existing assets are in place, the principles are to be applied at the pace of asset renewal, as dictated by wise asset management strategies. Where assets are to be built, applying the principles opens opportunities to develop systems which best address these paradigm shifts.

The Principles are structured along four levels of action, each enabled by the next level and five building blocks through which the urban stakeholders – becoming a water wise community – can deliver sustainable urban water, see Figure 1.

The Five Building Blocks to Deliver Sustainable Urban Water

Vision

- A shared vision moves stakeholders from defending solutions for their own specialties, to defining a set of common drivers for the greater benefit of the urban community.
- A shared vision is an essential precondition for ensuring the eventual implementation of new policies and strategies.
- A **sustainable urban water vision**, as part of a resilient city vision, enables people to work together at different scales and across disciplines. It enables the political will needed to invest in long term measures. It provides consistency beyond political cycles.

Governance

- Governance and institutions provide the framework for urban stakeholders to work together on solutions and strategies at the building, neighbourhood, metro and catchment scales, integrating water in the city's services and design.
- Policies and governance provide incentives for urban stakeholders to unlock the synergies across sectors, maximising the benefits of water to cities.

¹ SDG6 “Ensure availability and sustainable management of water and sanitation for all” – More details on <https://sustainabledevelopment.un.org/sdg6>

² SDG11 “Make cities and human settlements inclusive, safe, resilient and sustainable” – More details on <https://sustainabledevelopment.un.org/sdg11>

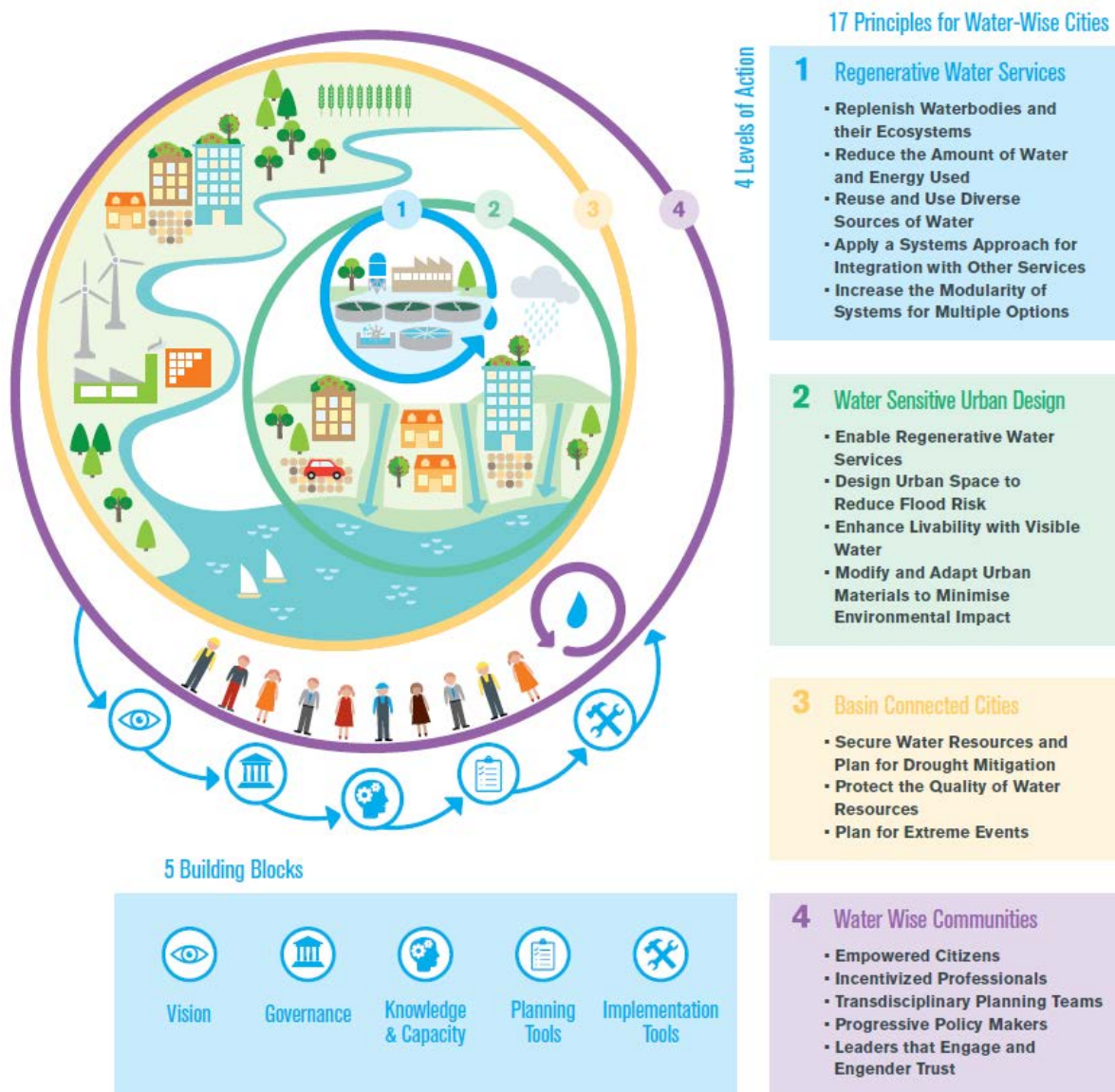


Figure 1: The “Principles for Water Wise Cities” Framework: four *Levels of Action* and five *Building Blocks* for urban stakeholders to deliver “Sustainable Urban Water” in their cities

Knowledge and Capacities

- Urban stakeholders have knowledge and capacities which are the basis for their actions at different scales within the city.
- Through a sustainable water “vision” and a governance structure that enables collaboration; urban stakeholders may further develop their knowledge and capacities, learning from each other, from other cities’ sustainable urban water successes, but also learning to work differently with new tools and other sectors.
- The ability to pool resources, share tools and experiences openly across urban stakeholder groups and geographies creates a sound learning environment.

Planning Tools

- Asset management, master plans or decision support systems are the means for urban stakeholders to initiate action.
- These tools, developed and used by cross sectoral urban planning teams, allow for assessing risks, identifying benefits and co- benefits of projects, defining levels of service, and ensuring ownership by stakeholders.

Implementation Tools

- Regulations create incentives. Regulations³ based on quality assurance, equity, transparency, accountability and sound financing provide a solid frame for urban stakeholders to invest in sustainable urban water.
- Financial tools linked to rigorous asset management plans enable long lasting improved service levels with a well maintained infrastructure.
- Financing tools which value the ability of solutions to adapt to changes or recover from disasters might lead cities towards implementing systems requiring smaller, more frequent investments, also allowing cities to adopt more efficient solutions when they arise.
- Integrated services combined with shorter investment cycles, and the valuing of co-benefits may bring new funding opportunities and bridge the lack of financial capacity for cities developing new water systems.
- Augmenting traditional financing and contracting models with innovative instruments involving private and public financing opens new funding opportunities, including circular economy mechanisms, which promote regenerative water services.

The Four Levels of Action:

Level A. Regenerative Water Services for all: the main goal is to deliver public health outcomes while protecting the quality and quantity of water resources for future generations by being efficient in the use and production of water itself but also, energy and materials. Regenerative water services will be underpinned by five principles. Embedding these principles in water and wastewater systems rehabilitation, extension or new development will ensure the resource is protected and not overused, will create value from energy and resource recovery not only from water but also other services, and will facilitate financing by generating revenue, whilst delivering broader economic, social and environmental benefits to the City:

- I.1 **Replenish** waterbodies and their ecosystems within the basin by taking from or discharging to them only what can be given or absorbed by the natural environment: Reduce water intakes to fit quantities that the natural environment is able to renew, and protect the quality of water sources from wastewater and urban run-off so that it is fit for ecosystems and for use with minimal treatment requirements.
- I.2 **Reduce** the amount of water and energy used. Minimise the amount of water used in accordance with storage capacities. Minimise the energy used in moving and treating urban waters, including storm water;
- I.3 **Reuse** and use diverse sources of water with treatment that matches the use applying the “fit for purpose” water quality approach and Integrated Water Resources Management (IWRM⁴); **Recover** energy from water whether through heat, organic energy or hydraulic energy; **Recycle** and recognise the value of “upcycled” materials, such as nutrients or organic matter;
- I.4 Use a **systems approach** integrated with other services. Consider the different parts of a water system and other services such as waste or energy as a whole, to enable solutions which reduce and reuse while improving services costs efficiently.
- I.5 **Increase the modularity** and ensure there are multiple resource, treatment, storage and conveyance options available throughout the system for maintaining service levels and providing resilience to the system in the face of slow changes or disasters.

By applying the principles for regenerative services when adapting to population growth or to the impacts of climate change, water services also contribute to reducing the carbon footprint of cities and to rehabilitating their basins⁵.

Level B. Water Sensitive Urban Design: Seeks the integration of urban planning with the management, protection and conservation of the total urban water cycle to produce urban environments that are 'sensitive' to water sustainability, resilience and liveability co-benefits. This second level of action includes a set of four recommendations and strategies:

- II.1 **Plan and implement urban design enabling regenerative water services.** Design domestic and industrial precincts and buildings in ways that provide the opportunity to enable regenerative water services. This reduces the water, energy and carbon footprint of housing, contributing to its affordability through lower monthly bills. It also leads to cleaner waterways, benefiting ecosystems and people, while also improving social and urban amenities. It implies building green infrastructure to capture and treat stormwater for a range of beneficial outcomes.
- II.2 **Design urban spaces to reduce flood risks.** Increase resilience to flood risks by developing urban drainage solutions integrated with urban infrastructure design so that safe flooding spaces are provided and the city acts as a “sponge”, limiting surges and releasing rain water as a resource. Plan vital infrastructure to enable quick disaster recovery.

³ Refer to the Lisbon Charter

⁴ Integrated water Resources Management is a process which promotes the coordinated development and management of water, land and related resources in order to maximise economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.

⁵ Refer to Basin of the Future Charter (in drafting)

- II.3 **Enhance liveability with visible water** from road-side green infrastructure to major blue-green corridors as opportunities for recreation, inclusive public space, economic development and transportation, creating multi-purpose spaces and infrastructures. Urban water services are essential for ensuring sustainable irrigation of parks and gardens, providing adequate shade, mitigation of heat islands.
- II.4 **Modify and adapt urban materials to minimise their impact on water pollution:** The urban materials of roofs, walls, surfaces, roads, urban furniture ought to be carefully selected to prevent the release of pollutants when exposed to sun and rain.

Level C. Basin Connected Cities: The city is intrinsically connected and dependent on to the basin area it is part of and interacts with neighbouring basin areas. By proactively taking part in basin management, the city secures water, food and energy resources, reduces flood risk and enhances activities contributing to its economic health. This third level of action includes a set of three principles:

- III.1 **Secure the water resource** and plan for drought mitigation strategies by sharing the water resource with other users in the basin, namely agriculture, industry and energy sectors, and other cities who all contribute to the basin's and city's global economy.
- III.2 **Protect the quality** of the water resource together with the other basin stakeholders, to ensure that drinking water quality can be achieved with minimal treatment and energy requirements, and that ecosystems (e.g. forest catchment areas, wetlands) may deliver their services.
- III.3 **Plan for extreme events**, including flooding, by managing flow regimes in rivers and understanding coastal storm risks, by maintaining adequate vegetation in the basin to minimise flash floods, and by investing in flood warning systems.

Level D. Water-Wise Communities: The implementation of the above three sets of Principles requires a holistic approach and strong alliances. This level of action is about people building on their existing capacities to govern and plan; professionals becoming more water wise in their area of expertise, so that they can integrate water across sectors enhancing the co-benefits of solutions to unlock investments. It is also about people becoming water-wise in their behaviours as citizens. This level of action is where the transition starts; it is where each stakeholder realises the role they have to play to make a difference. It's about inspired people instigating five key actors of change into this transition:

- IV.1. **Citizens** involved in the progressive urban water vision. Water wise citizens can drive urban planning and design with their understanding of the risks (flooding, scarcity), and opportunities (resource recovery, reducing dependency on uncertain future resources, increased well-being). Water wise citizens will also adapt their behavior and acceptance to enable regenerative water services. Water wise citizens may develop a willingness to pay for services while mandating their officials to ensure affordability.
- IV.2. **Professionals with various expertise (finance, technical, social)** who understand the co-benefits across urban sectors so that they may plan and implement the best solutions for urban dwellers and businesses. Synergies and dependencies exist between water and urban planning, architecture, landscaping, energy services, waste services and mobility services. Water services require energy but urban water can be used to produce energy locally. Green urban space requires water that can be provided by collecting rainwater or reusing water from treated effluent to recycle nutrients in vegetated areas. The market and non-market value of these co-benefits and outcomes of an integrated urban agenda may enable innovative sustainable solutions.
- IV.3. **Transdisciplinary planning and operation teams** integrating water in city planning. All waters (freshwater supply, rain, rivers, seas and wastewater) are interconnected with each other and other urban systems (parks, roads, energy and waste) so that efficiencies and synergies arise from a coordinated approach. A city planning organisation recognising these inter-relations and bridging over existing individual departments is needed to enable urban professionals to implement sustainable urban water.
- IV.4. **Policy makers** enable the implementation of the Principles for regenerative water services, water sensitive urban design and basin connected cities. Water wise policy makers establish policies and financing mechanisms (tariffs, partnerships, that are responsive and adaptive to future changes) to drive and enable sustainable urban water through incentivising and rewarding innovative solutions. They transition out the existing subsidies and tax advantages that are environmentally harmful. They monitor, evaluate and adjust the policies based on future needs as they change over time.
- IV.5. **Leaders** provide the vision and a sound governance structure to coordinate work at 4 scales (catchment, metro, neighbourhood and building) and across disciplines. The people governing at the national and local levels can enable sustainable urban water through coordination and integration resulting from "effective and efficient governance enhancing trust and engagement"⁶.

Water wise communities will use the building blocks for implementation to put the principles into action. The progressive implementation of the principles at three levels: 1/ regenerative water services for all, 2/ water sensitive cities, and 3/ basin connected cities, will strengthen each of the 5 key actors of change of the city's water wise communities.

⁶ OECD Principles on Water Governance, 2015