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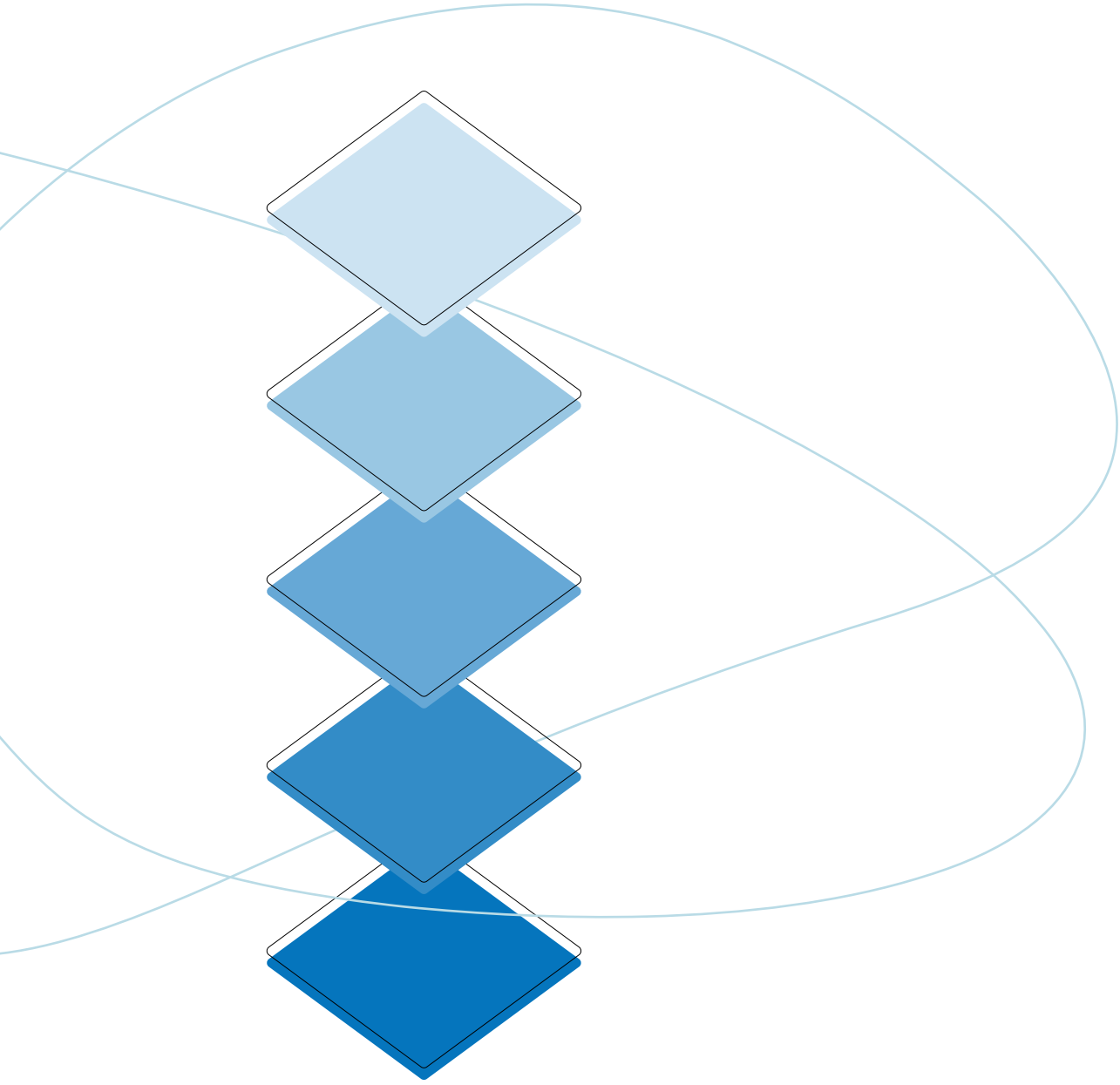

CITY WATER RESILIENCE ASSESSMENT

METHODOLOGY

ACKNOWLEDGEMENTS

On behalf of the project team, I would like to thank The Rockefeller Foundation and the Resilience Shift for supporting this project.

The CWRA is a joint effort developed in collaboration with our project partners, the Stockholm International Water Institute (SIWI), along with city partners in Amman, Cape Town, Greater Miami and the Beaches, Mexico City, Kingston upon Hull, Greater Manchester, Rotterdam and Thessaloniki, and with contributions from 100 Resilient Cities and the Organisation for Economic Co-operation and Development (OECD).

This project would not have been possible without the valued guidance and support of the **CWRA Steering Group.** Our thanks to the following: Fred Boltz (Global Commission on Adaptation / The Resilience Shift / Resolute Development Solutions), Casey Brown & Sarah Freeman (University of Massachusetts, Amherst), Katrin Bruebach & Andrew Salkin (100 Resilient Cities), Jo da Silva (Arup), Nancy Kete & Juliet Mian (The Resilience Shift), Diego Rodriguez & Maria Angelica Sotomayor (World Bank).

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FOREWORD

The global urban population is estimated to nearly double by 2050. This has serious implications for urban water demand, which is likely to increase from the current 15-20 percent of global consumption to 30 percent of the world's entire water demand. Such a rise in water use will also lead to an increase in wastewater generation and, consequently, water pollution. Climate change further exacerbates pre-existing water stresses and is already having a measurable effect on the urban water cycle, altering the amount, distribution, timing and quality of available water.

To address these challenges, we must mainstream resilience in the planning and implementation of water systems, within the context of the larger metropolitan landscape and the watersheds that supply cities with water. We need tools that enable cities to diagnose and design for resilience to anticipate water variability and uncertainty from climate and non-climatic stressors. The City Water Resilience Approach (CWRA) responds to this need. This novel approach allows cities to comprehensively assess and plan for urban water resilience across sectors and stakeholders, as well as across city boundaries. The CWRA was developed and tested, with a number of strategic partners, in cities across both the developed and developing world. The CWRA is fully aligned with the World Bank's strategic approach to water: sustaining water resources, delivering services and building resilience. The Bank stands ready, in collaboration with our partners, to scale up CWRA globally.

JENNIFER J. SARA
Global Director, Water Global Practice
The World Bank

THE WORLD BANK

The safety and well-being of millions, if not billions of people globally depends on the provision of safe, inclusive and resilient infrastructure systems. In the face of increasing urbanisation, population growth and uncertainty around climate and other natural and man-made hazards, those working across urban water systems need to recognise the three inherent parts of their complex systems: the technical (the physical and cyber components), the ecological (both naturally occurring and designed-in nature-based components) and the social (those who depend upon the system, as well as those who own, operate and maintain them). Furthermore, in cities, the interdependencies between different systems, different organisations, and public and private sectors are inescapable.

Within and between critical infrastructure sectors, there is a need to equip organisations and individuals across the entire value chain, with the tools and approaches they need to introduce resilience into their decision-making. People need to know what to do differently, and the City Water Resilience Approach fills that gap, taking city water stakeholders through the key stages from system mapping, resilience assessment to option identification and prioritisation, whilst recognising all of the complexities referred to above. The rigour and collaboration that sit behind it significantly enhance its value in practice.

The Resilience Shift believes that this approach has the potential to create genuine and lasting impact in cities globally, and is delighted to have supported this work.

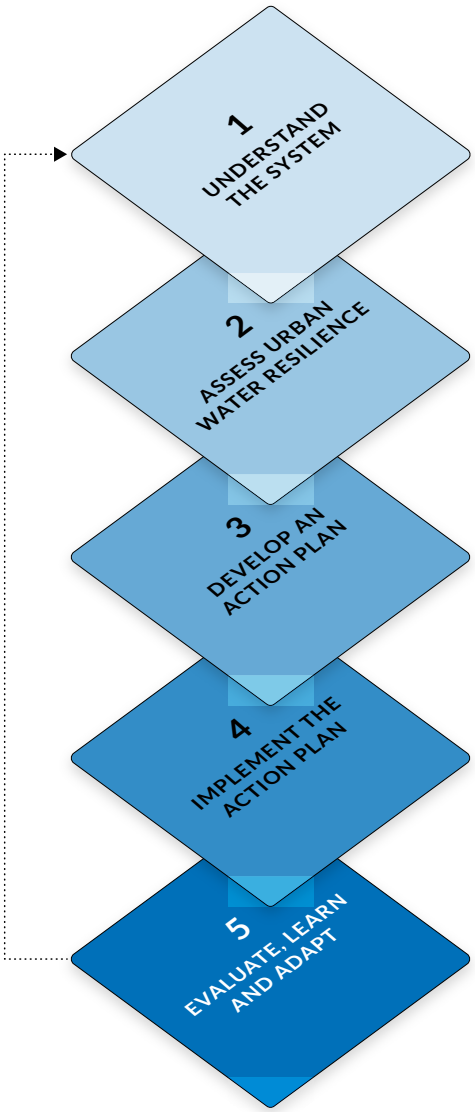
JULIET MIAN
Technical Director
The Resilience Shift

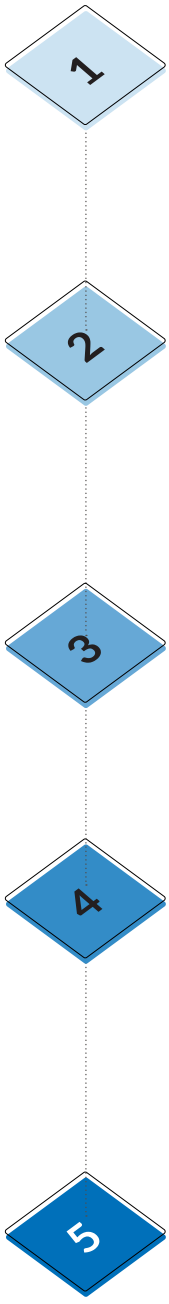
THE RESILIENCE SHIFT

EXECUTIVE SUMMARY

With cities worldwide expected to grow an estimated 2 billion residents by 2050, there is an urgent need for urban water management that ensures consistent, adequate and high-quality water services for all and protects citizens from water-related disasters. However, the scale and complexity of this need presents new challenges to decision-makers in government, civil society and the private sector.

The City Water Resilience Approach (CWRA) responds to a demand for innovative approaches and tools that help cities build water resilience at the urban scale. The CWRA was developed to help cities grow their capacity to provide high quality water resources for all residents, to protect them from water-related hazards, and to connect them through water-based transportation networks ("provide, protect, connect"). It provides a robust, evidence-based approach to resilience assessment and development of an action plan.





The City Water Resilience Approach (CWRA) comprises of a five-step process, namely:

Step 1. Understand the system - in which the city's unique context is appraised to understand shocks and stresses, map key manmade and natural assets and governance processes. identify important system interdependencies, understand existing resilience plans and programmes and convene key local stakeholders.

Step 2. Assess urban water resilience - in which the city's current practices are assessed according to the City Water Resilience Framework (CWRF) to provide a water resilience profile, which identifies areas of existing resilience strength and weaknesses and establishes a baseline against which progress is measured.

Step 3. Develop an action plan – in which, based on the water resilience profile, an action plan is developed with interventions that build water resilience. The action plan is based on holistic evaluation of anticipated resilience value and costs and prioritization and optimisation of key interventions.

Step 4. Implement the action plan - in which actions agreed upon during the previous step are implemented by relevant city actors. In this step, actions are developed, implemented and monitored according to best practices and international experience. In this step, the CWRA provides best practice guidance on monitoring ongoing actions to ensure objectives are met, and resources are used efficiently.

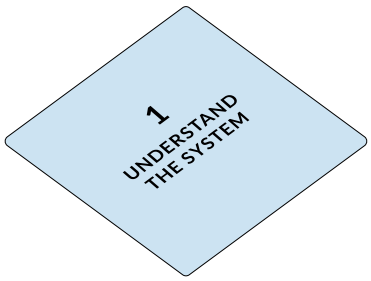
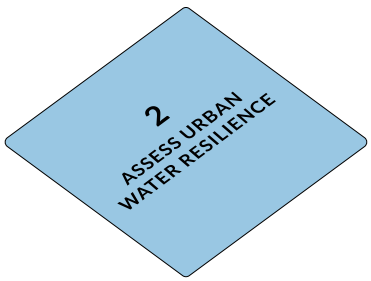
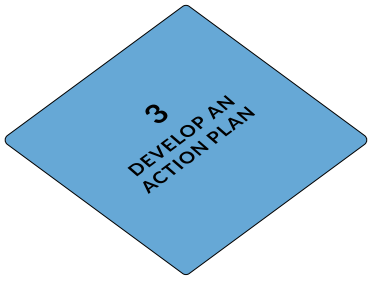
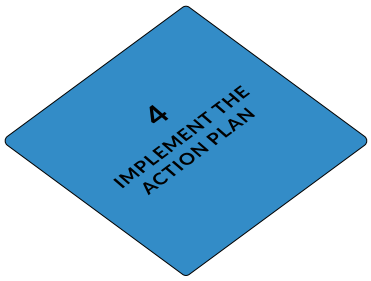
Step 5. Evaluate, learn and adapt - in which the implementation of resilience measures is evaluated to ensure that the resilience value has been achieved. Changes in context and stakeholder involvement are analysed to reassess objectives for the next period.

This report is a guide for users to prepare for and undertake the City Water Resilience Approach in a city. This guidance focuses on the first three steps of the CWRA from "understanding the system" through "resilience assessment" to the "action plan development". The outputs of the Step One, Step Two and the action development in Step Three of the CWRA form the input to the City Characterisation Report, which describes the context of the water system and its governance, and the Resilience Profile and Vision for a city, which sets out the resilience baseline assessment for the city and highlights initiatives that address water resilience vulnerabilities. The approach was tested in the City of Cape Town in June 2019 and Greater Miami and the Beaches in July 2019. The facilitation guidance that was developed for Miami is included in the appendices as an example.

The testing of the CWRA in City of Cape Town and Greater Miami and the Beaches has led to several refinements that will be adopted for future city water resilience assessments.

INTRODUCTION

The City Water Resilience Approach is a multi-step process that moves from understanding the system, through urban water resilience assessment, to the creation and implementation of an action plan, and the monitoring the results of interventions. It has been developed with the goal of helping cities achieve safer and more secure water resources, and protecting citizens and property from water-related shocks and stresses ("Provide and Protect").

CWRA FIVE STEP PROCESS	DESCRIPTION	KEY RESOURCES
	› **Establish a city champion** › **Understand stakeholders, infrastructure and existing plans** › **Develop City Characterisation Report**	› OurWater digital tool
	› **Assessment workshop** › **Resilience analysis** › **Key insights**	› City Water Resilience Framework (CWRF) › Assessment Workshops
	› **Co-create action plan** › **Prioritize according to social, economic and environmental impacts**	› **VIsion Workshop** › **Action planning toolbox (for high level project prioritisation and detailed feasibility studies)**
	› **Implement action plan through partners coalition led by the city champion** › **Develop and implement a monitoring mechanism**	› **Implementation Guide**
	› **Monitoring, evaluation and learning** › **Co-learning through community of practice for water resilience**	› **Monitoring and Evaluation Framework** › **Community of Practice**

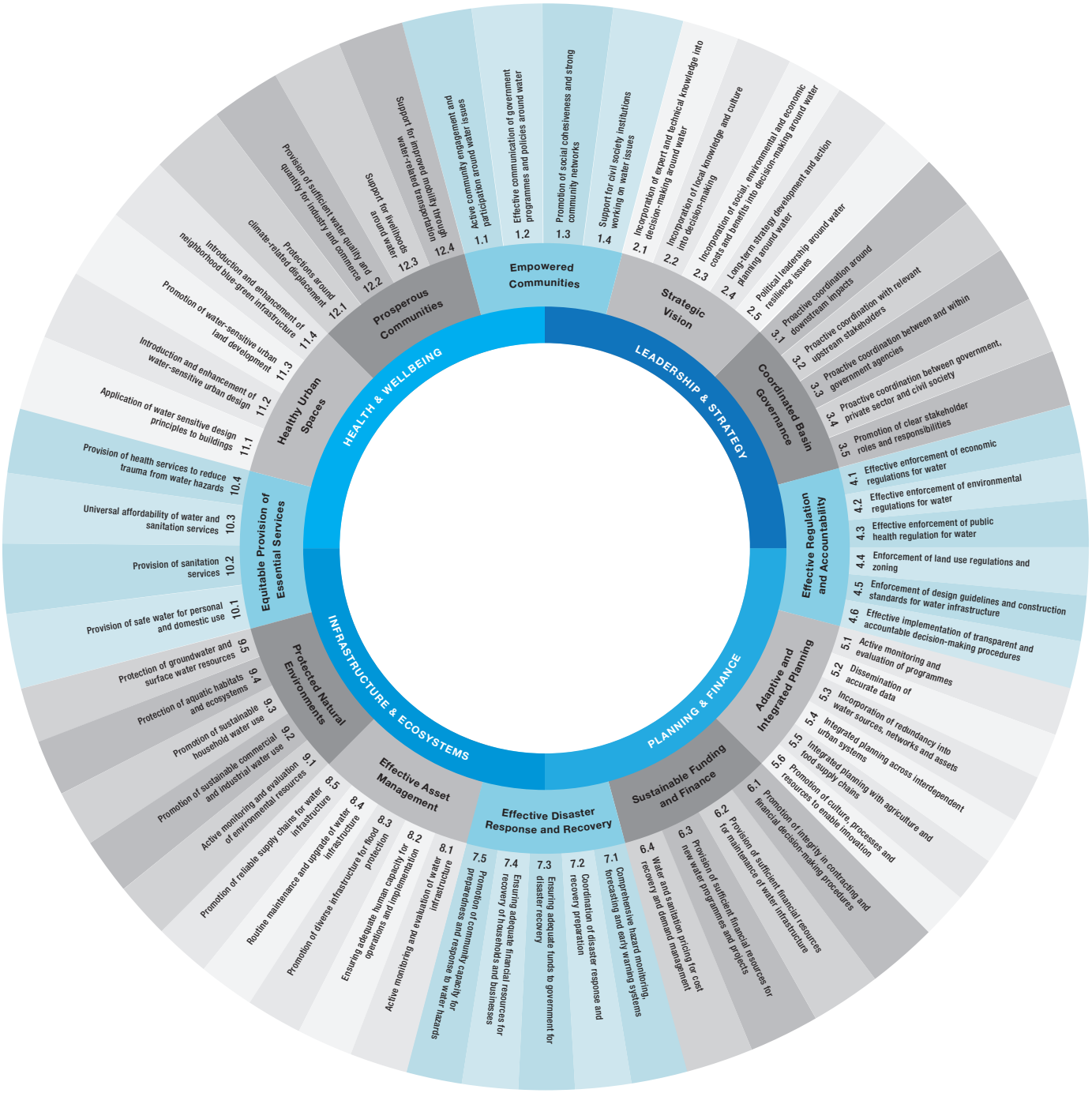
To help cities enact the multi-step CWRA process, a suite of resources has been developed, including digital and analogue tools, frameworks and workshop methodologies, with additional resources planned for the following steps of the approach.

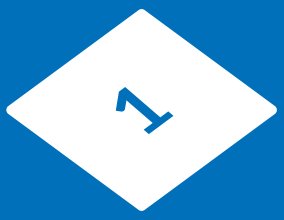
To assist with Step One, OurWater, a digital tool, has been developed to help cities better understand their local water context. It helps cities to understand the natural and manmade assets and systems that make up their water basin; the types of shocks and stresses they face, their impact on natural and man-made water systems, and the interaction between key stakeholders involved in urban water management.

To assist with Step Two, the City Water Resilience Framework (CWRF) has been developed. The CWRF is a framework that helps cities to assess their resilience baseline so that they can evaluate the current areas of resilience strength and weakness in their urban water systems. The CWRF helps guide cities to assess their resilience across four dimensions - leadership and strategy, planning and finance, infrastructure and ecosystems, and health and well-being. These dimensions are broken down into eight goals and detailed further in 53 sub-goals. 63 qualitative and 40 quantitative indicators for each sub-goal allow cities to measure performance and assess the overall resilience of their current water system.
The City of Cape Town, South Africa and Greater Miami and the Beaches, USA were the first to complete the CWRA from Step One, Understanding the system to Step 3 Develop an action plan.

This user guide has been written to guide a city's resilience champion and the water stakeholders through the five-step process of the City Water Resilience Approach as well as using the supporting tools, OurWater and the City Water Resilience Framework.

The City Water Resilience Framework 2019





UNDERSTAND THE SYSTEM

ASSESS URBAN WATER RESILIENCE

DEVELOP AN ACTION PLAN

IMPLEMENT AN ACTION PLAN

EVALUATE, LEARN AND ADAPT

Activities and milestones for CWRA Steps 1-5

MILESTONE		ACTIVITY	CWRA STEP
Project Kick-off	1	**DESK RESEARCH** Initial analysis of existing conditions, defining key shocks and stresses, and identifying relevant stakeholders.	STEP 1
	2	**OURWATER** Populate OurWater with stakeholders and existing programmes.	
City Characterisation Report	3	**PRE-WORKSHOP PLANNING** Workshop planning and pre-engagement with City Champion and local stakeholders	STEP2
Assessment Workshops *Vision Workshop* *OurWater Workshop*	4	**RESILIENCE ASSESSMENT** Engagement with stakeholders (in-city) and resilience assessment using the City Water Resilience Framework	
	5		
Water Resilience Profile	6	**ANALYSIS** Analysis of assessment results and development of Water Resilience Profile	
Action Planning Meeting	7	**PROJECT PRIORITISATION** Prioritisation of interventions identified in Water Resilience Profile, including high-level assessment from city stakeholders around which actions to pursue	STEP 3
Stakeholder Check-In (public re-engagement)	8		
	9	**FEASIBILITY STUDY** Detailed assessment of selected projects according to financial, social and ecological costs and benefits	
	10		
Action Plan Public Presentation	11	**IMPLEMENTATION** Implementation of selected actions begins according to Action Plan	STEP 4
	12	**MONITORING & EVALUATION (ONGOING)** Monitoring and evaluation begins for ongoing projects	STEP 5

ESTABLISH A CITY CHAMPION

This activity identifies a City Champion that is motivated and has the leadership, convening power and responsibilities to progress the CWRA. The resilience champion can be a representative from a single organization or representatives from a team of organizations working together. The City Champion is identified at the onset of the CWRA process, and leads the approach through all five steps, with ongoing advice and support provided by the advisory team as needed. The City Champion has the following responsibilities:

- Identifying and securing stakeholder involvement for carrying out the five-step process. This will include organising a series of multi-stakeholder workshops including venue and rapporteurs;
- Leading the City Water Resilience Approach in a transparent, inclusive and accountable way;
- Developing a clear understanding among the stakeholders of the City Water Resilience Approach; and
- Coordination of data collection through the OurWater webtool and CWRF quantitative indicators.

A fieldwork preparation checklist and example timeline of the CWRA process are provided to the City Champion to set out the expectations and guide their preparation.

ANALYSE THE WATER BASIN

The City Champion collects background information through a preliminary desktop review, interviews and focus groups with stakeholders. The focus of this stage is:

- Defining the water system: a geospatial map and schematic drawing of key elements of the water system, including natural and manmade elements.
- Characterisation of shocks and stresses: understanding the key shocks and stresses, their cascading impacts and interdependencies with other systems.
- Mapping of the institutional landscape governing water: a schematic map of the stakeholders, their responsibilities in the water system and the relationships between the stakeholders.
- Mapping of existing water plans, programmes and policies against the CWRF wheel to ensure that ongoing programmes and projects are taken into account and built upon rather than recreated.

This step is supported by OurWater, a digital tool that allows cities to understand their local water system; this includes the types of shocks and stresses confronted, the impact of various hazards, and the interaction between key stakeholders involved in urban water management. OurWater allows users to input information about the water system and governance processes they participate in, and to map relationships between stakeholders throughout the entire water system. By answering key questions about the number, type and interaction between assets and actors that make up the water system, the tool addresses a fundamental challenge in many cities, where water governance functions are often siloed, and limited coordination, collaboration and knowledge sharing exists between actors working in the water system. In crowd-sourcing these tasks, OurWater creates a platform for city-wide information supplied by users across multiple sectors and levels of government.

CITY CHARACTERISATION REPORT

The City Characterisation Report provides a summary of the water basin. It includes:

- Spatial maps and system flow charts of natura and man-made water assets for the water basin;
- Stakeholders who are responsible for the different assets and systems of the urban water system and the relationships between each other;
- Key shocks and stresses encountered in the city;
- Ongoing programmes, projects and policies and their contribution towards city water resilience.

Example reports from Mexico City and Greater Manchester. Reports are available at: https://www.resilienceshift.org

UNDERSTAND
THE SYSTEM

ASSESS URBAN WATER RESILIENCE

DEVELOP AN
ACTION PLAN

IMPLEMENT AN
ACTION PLAN

EVALUATE, LEARN
AND ADAPT

In Step Two, the assessment of the city water resilience will be undertaken using the City Water Resilience Framework (CWRF) assessment tool. The CWRF supports cities and governments to gather information in a structured way and assess current practices, providing cities with a comprehensive, credible, and technically robust means to assess and monitor their water resilience to inform decision-making. The CWRF operationalizes resilience by providing a means for measuring cities' progress through 62 qualitative and 40 quantitative indicators. This framework will help structure cities' thinking around water resilience, including what elements are hindering and what is required in building resilience. Step Two results in a Water Resilience Profile report that summarizes analysis from the water resilience assessment.

PREPARATION FOR CWRA STAKEHOLDER WORKSHOPS

Water resilience assessments are carried out 'in-city' in close cooperation with the City Champion and local stakeholders. This step consists of three workshops that are implemented over the course of one week. There are five key steps to prepare for the engagement in city.

1. CITY CHAMPION ACTIONS

The City Champion provides overall coordination for the 'in-city' mission, as below:

- Preparation of a list of multi-stakeholder actors / organisations to invite to the workshops and send invitation,
- Organising logistics such as workshop venues, additional facilitators and rapporteurs.

2. PRE-MISSION WORK

The quantitative indicators for the CWRF should be completed before the mission to inform the CWRF assessment and the Water Resilience Visioning workshop. Due to the wide range of quantitative indicators it is important to provide sufficient time to the City Champion to compile the information. Based on the pilot cities, it is recommended that a month is allowed for the collation of the responses to the quantitative indicators.

3. WORKSHOP SCHEDULE AND STAKEHOLDERS

(A proposed workshop schedule is shown on next page)

The City Champion sends invitations to the workshops. Participants in the workshops should represent a range of organisations including civil society, government, private sector and academia. – who can provide different perspectives and insights on the same topic. They should be invited to the CWRF assessment workshops based on their knowledge and expertise within dimensions and goals.

These included the following types of stakeholders per dimension:

Dimension 1: *Leadership and Strategy* – stakeholders related to government, strategy, planning, creation and enforcement of regulation including senior leadership in national and regional and city government as well as community leaders.

Dimension 2: *Planning and Finance* – stakeholders related to city planning, land use and zoning considerations, interdependent systems such as energy and agriculture, finance and funding for projects/programmes, insurance and asset strategy and planning.

Dimension 3: *Infrastructure and Ecosystems* – stakeholders related to the natural environment, green and grey water infrastructure, asset management, disaster response and hazards.

Dimension 4: *Health and Wellbeing* – stakeholders related to the provision of basic services (water, sanitation), urban design and water landscapes, livelihoods and water-based transportation. Also includes engagement with communities around water use.

4. DEVELOP / COLLATE WORKSHOP MATERIALS

The following materials are required for the workshops:

- Facilitator's guide
- Participants' guide
- Presentations for each workshop type
- Large format materials for group exercises

Examples of these materials from Miami are included in Annex A.

Typical workshop schedule

	MORNING	AFTERNOON	EVENING
DAY 1	Facilitators briefing in the city	PM: CWRF assessment workshop for 2 dimensions	Water Resilience Visioning workshop
DAY 2	CWRF assessment workshop for 2 dimensions	Analysis (no workshops)	CWRF assessment workshop for community representatives (if unable to attend daytime workshop
DAY 3	OurWater workshop	Analysis (no workshops)	
DAY 4	Water Resilience Visioning workshop		Water Resilience Visioning workshop for community representatives (if unable to attend daytime workshop)
DAY 5	Debrief with City Champion and key stakeholders		

CWRA WORKSHOPS

Three types of workshops are held in the city:

OURWATER GOVERNANCE WORKSHOP

The objective of the OurWater governance workshop is to share with stakeholders the mapping of the water system and agree the roles and responsibilities of the stakeholders with respect to the water system. This workshop is ideally held the day before the Water Resilience Visioning Workshop, but it may be included at the start of the Water Resilience Visioning Workshop.

CWRF ASSESSMENT WORKSHOPS

The objective of the CWRF workshop is to collect a multi-stakeholder score for the qualitative indicators of the CWRF to inform the baseline assessment. In addition, the consensus during the focus group discussion to score the qualitative indicators is measured (consensus score). Where it is not possible for representatives of the community to attend the daytime CWRF assessment workshop, an additional evening CWRF assessment workshop can be held. Representatives from community groups should be invited to attend this workshop alongside city/utility water representatives. This workshop should focus primarily on the health and wellbeing dimension of the CWRF.

WATER RESILIENCE VISIONING WORKSHOP

The objective of the water resilience visioning workshops is to develop water resilience initiatives that have multi-stakeholder buy-in based on the resilience strengths and weakness identified in the CWRF baseline assessment. Where it is not possible for representatives of the community to attend the daytime water resilience visioning workshop, an evening water visioning workshop should be held with a focus on issues relating to water in the community. The following following table shows the general methodological approach for implementing CWRA from Step One to Step Three.

CWRA STEP	WORKSHOP TYPE	ACTIVITIES	OUTPUTS
1. UNDERSTANDING THE SYSTEM	**Preparation for fieldwork (no workshop) and compilation of secondary data and information**	Use of OurWater to: identify key shocks and stresses; map the physical water system; stakeholder roles and responsibilities; and map the existing plans and programmes against the CWRF. Compilation of secondary information and data including preparation of a map of the urban water system including natural and physical assets. Compilation of quantitative indicators for city resilience assessment.	The context of the city is summarised in the City Characterisation Report (excluding quantitative indicators).
2. ASSESS URBAN WATER RESILIENCE	**CWRF assessment workshopsStep**	CWRF assessment workshop for community representatives (if unable to attend daytime workshop.	The results of the CWRF assessment including the resilience strengths and weaknesses are set out in the City Water Resilience Profile. Problem statements are developed with the Resilience Champion for the water resilience visioning workshop based on the results of the assessment workshops.
	OurWater workshop	Share with stakeholders the mapping of the water system and agree the roles of the stakeholder organisations with respect to the water system.	The governance of the water system is summarised in OurWater.
3. DEVELOP AN ACTION PLAN	**Water resilience visioning workshop**	In multi-stakeholder groups: - Explore the root causes of the problem statements; - Develop vision statements that address prioritised problems; - Develop design briefs / needs statements; and - Develop resilience actions with owners, timescales, cost estimates, alignment with existing programmes and barriers to development and implementation.	The actions are summarised in the City Water Resilience Vision.

Process of developing inputs to a City's Resilience Profile

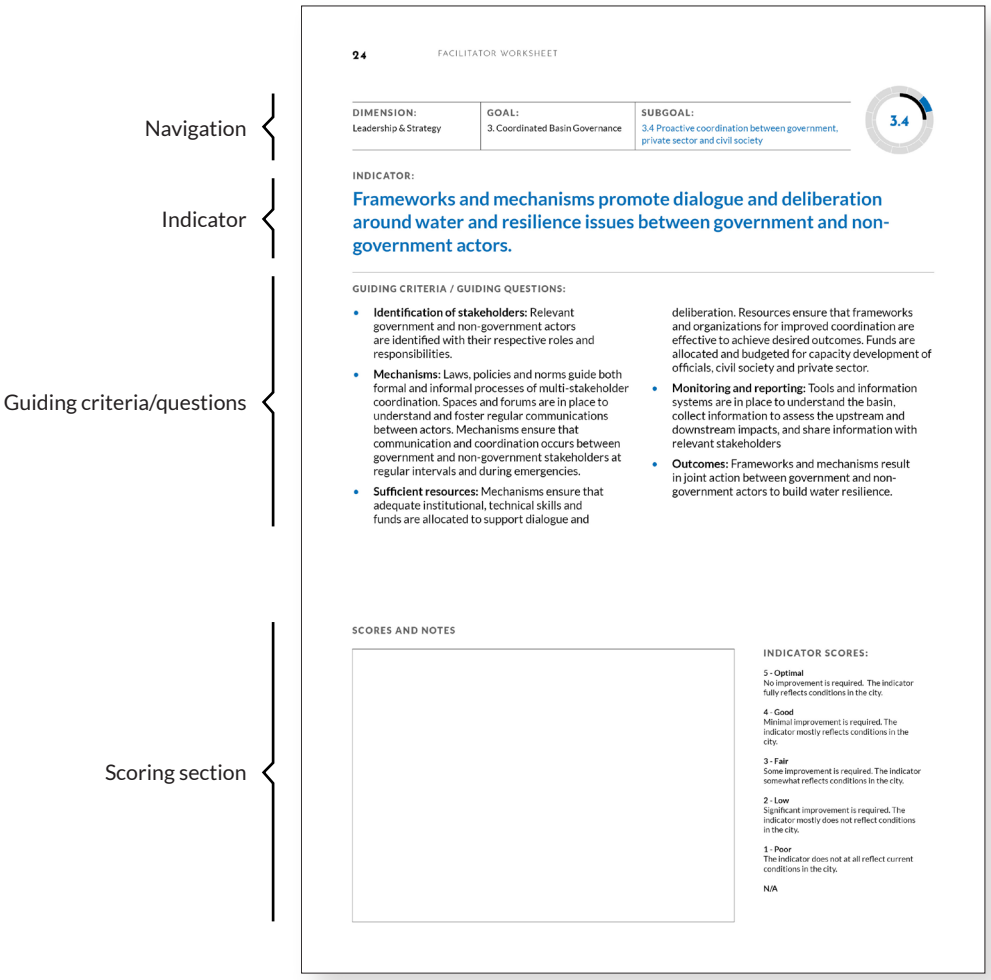
WORKSHOP METHODOLOGY

CWRF ASSESSMENT WORKSHOP

Workshop activities

At least two CWRF assessment workshops are held, each one should cover two different resilience 'Dimensions' from the CWRF, with a different selected group of stakeholders. The images below depict an assessment workshop held in Cape Town in June 2019:

In the workshop, stakeholders assess the city's water resilience performance against qualitative indicators to determine their current performance. Each qualitative indicator has guiding criteria, which describe a resilient water system and participants are asked to score their city on a scale of 1 to 6 against the indicator and guiding criteria. An example indicator and the scoring scale are shown in Figure 1. Annex A gives an overview of each indicator broken down into dimension, goal and sub-goal.



Example of qualitative indicator from Attendee Workbook

The qualitative indicator assessment should be carried out in moderated groups of 4-6 participants. The groups should ideally comprise of stakeholders that relate to the goal but from different perspectives, for example, an engineer, planner, decision-maker and community representative. Ideally each goal is reviewed by two groups to ensure robustness.
The indicator assessment should begin by giving participants 2 minutes to read the indicator and guiding criteria. Each participant should then be asked to write down their initial score in their participant pack. The participants should then spend 12-14 minutes discussing the justification for their scores and sharing their perspectives. The participants should then be asked for their final score individually and their justification, which should be recorded. It is useful to assign a rapporteur to each group to record the scoring, discussions and justifications in a common template. From the testing in Cape Town, it is recommended that 18-20 minutes is provided for each indicator.

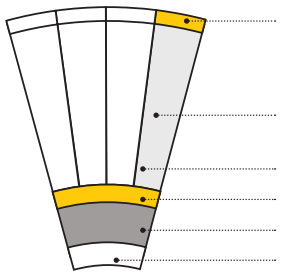
WORKSHOP ANALYSIS

The City Water Resilience Framework qualitative indicators should be analysed following the workshops as per the following:

1. Participants qualitative indicators scores should be collated and the median score for individual indicators calculated.
2. A consensus score should be recorded to understand the level of agreement on individual indicators between participants (1 – low consensus and 3 – high consensus).
3. Map the median qualitative scores across the CWRF – red indicates low scores and green high scores. In addition, it is useful to plot the scores against indicator number.
4. Identify gaps (areas of red, low scores) and compare them to existing plans and programmes to check whether these gaps are already being addressed or whether they warrant the development of further action.
5. A local expert group should be convened to examine resilience vulnerabilities in the CWRF wheel considering existing resilience programmes and initiatives.
6. Problem Statements should then be developed to address multiple resilience vulnerabilities. Problem Statements are simple descriptions of the issue(s) that contribute to the resilience vulnerabilities that are highlighted by the CWRF wheel. Problem Statements are the input to the Water Resilience Visioning Workshop. Each problem statement should make reference to the indicators they are addressing and any plans and programmes that are already being progressed to improve the performance against the indicator.
7. The assessment should be recorded in a water resilience profile. This will be referred to throughout future steps as well as in circa five years when the assessment should be completed again to check for progress.

Examples of the completed CWRF Indicator Assessment 'the wheel' for Greater Miami and the Beaches and the City of Cape Town is shown in figure on next pages. Resilience vulnerabilities are shown by low scoring indicators, typically scores of 1 or 2.

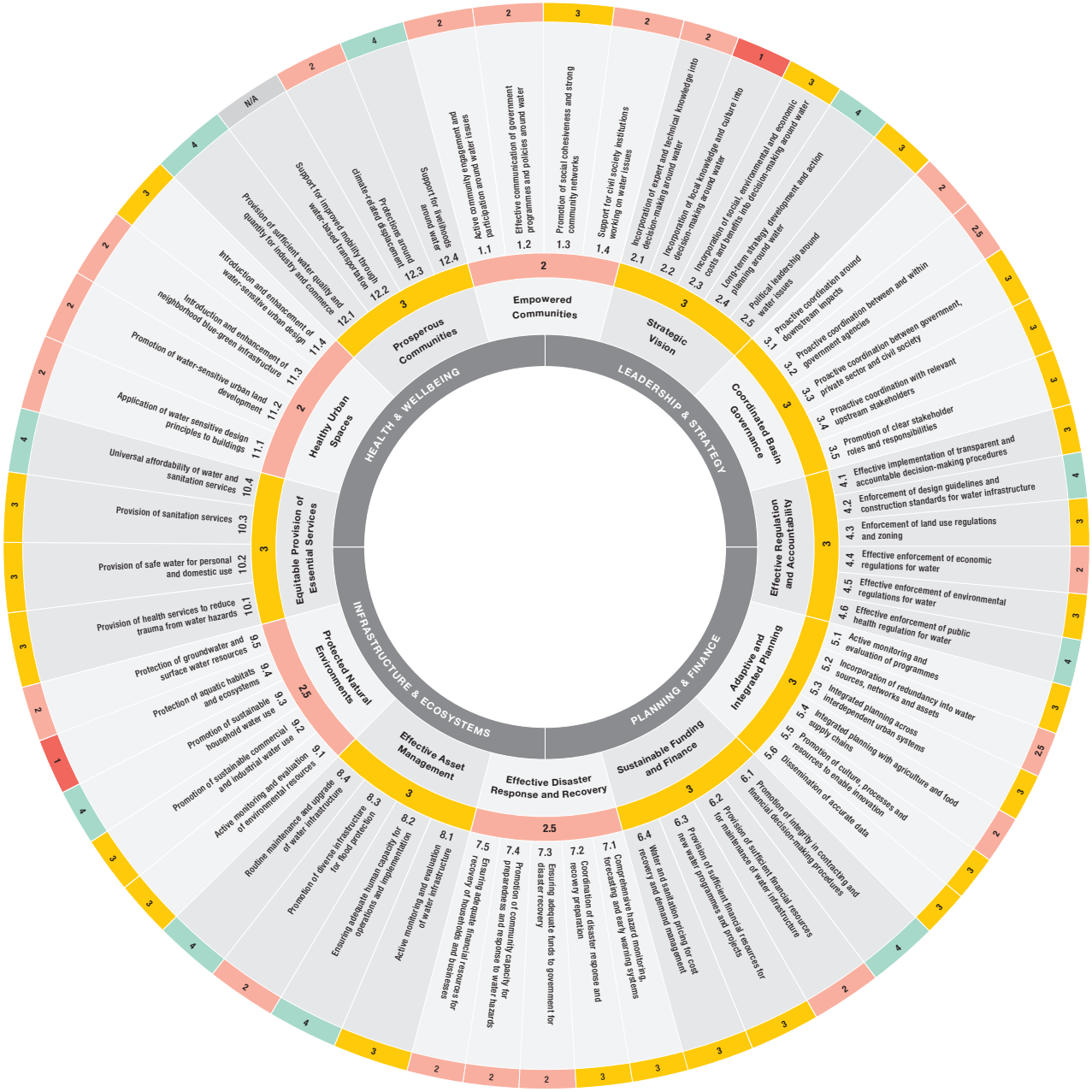
How to interpret results of the assessment



5	Optimal
4	Good
3	Fair
2	Low
1	Poor

*Results from the **Greater Miami and the Beaches** Water Resilience Assessment, **qualitative scoring***

*Results from the **Cape Town** Water Resilience Assessment, **qualitative scoring***



For example, the ten Problem Statements developed for the Greater Miami and the Beaches are given below:

1	**Engaged water communities**	How can Greater Miami and the Beaches (GM&B) engage a broader range of communities in decision-making around water programs and infrastructure?
2	**Institutionalizing Resilience**	How can GM&B further institutionalize and ensure continuity of this approach to withstand changes in electoral processes and leadership?
3	**Coordinated planning for disaster management**	How can GM&B improve planning across sectors and agencies to improve disaster preparedness, response, and recovery?
4	**Build back smarter: Long-term planning for disaster recovery**	How can GM&B ensure that post-disaster planning takes a comprehensive long-term approach to disaster recovery that improves resilience and ensures safe and prosperous communities?
5	**Evidence-based decisions: Water and environmental data for decision-making**	How can GM&B ensure that data informs policy-making?
6	**Silicon Valley? Everglades Alley: Greater Miami and the Beaches as a technology hub**	How can GM&B encourage new technologies and innovation that addresses the shocks and stresses facing the region?
7	**Look up(stream)! Improving coordination with upstream water users**	How can coordination be improved to bring us closer to a One Water approach?
8	**Understanding water infrastructure: Data and monitoring**	How can GM&B ensure data is current, accurate, and shared between relevant users?
9	**Going green**	What can be done by the government to develop a coordinated approach to green infrastructure and encourage its adoption by communities and businesses?

1 UNDERSTAND THE SYSTEM

2 ASSESS URBAN WATER RESILIENCE

3 DEVELOP AN ACTION PLAN

4 IMPLEMENT AN ACTION PLAN

5 EVALUATE, LEARN AND ADAPT

In Step Three, the city turns the diagnostics and assessments conducted in previous steps into actionable initiatives and projects. Exploring the results, the city can evaluate its challenges and opportunities, and initiate closer study of priority areas. The Water Resilience Action Plan will identify new projects based on the objectives defined in Step Two. Potential projects will be prioritized by all stakeholders involved in the assessment process in order to identify the most important actions to be taken. The plan should build off existing actions that are already being undertaken or are planned over the short, medium and long-term, respecting and supporting plans already undertaken by the city, which may be described in city master plans or sector planning for urban water strategy, disaster management plans, etc.

WORKSHOP METHODOLOGY

WATER RESILIENCE VISIONING WORKSHOP

Workshop activities

The Water Resilience Visioning Workshop is designed to:

1. Facilitate dialogue and deeper understanding of the Water Resilience Assessment and its preliminary results;
2. Facilitate the collaborative development of water resilience initiatives by city officials, sector experts, and local/national stakeholders to collectively improve the resilience of the city's water systems.

The workshop methodology is as follows:

- It begins with a presentation of the CWRF assessment workshop results. The participants are then taken through the problem statements that have been developed based on the CWRF assessment.
- The participants are given the opportunity to individually select two problem statements that they think are a priority and the voting is aggregated to prioritise the problem statements to address in the workshop.
- Working in tables of 6-8, delegates should be asked to use a 'fish diagram' to identify the root causes of the problem statements against the themes of social, economic, technical, governance and legal, environmental, and other.
- A design sprint exercise is undertaken by delegates working in table groups. The design sprint asks to develop several interventions to achieve the vision and select a priority intervention for further development. For the priority intervention, the delegates identify the short, medium and long term steps in order to achieve the vision and estimate the costs and the benefits or resilience value of the intervention. Alongside the costs and benefits, they identified any barriers and enablers to the progression of the intervention and the stakeholders that need to be engaged in the action.
- Each group is matched to a group working on a similar themed problem statement. The groups present to each other with the opportunity for constructive feedback and improvement of the interventions.
- Each group summarises their intervention into three bullet points, which they report back to the workshop participants in plenary. Participants are then invited to vote to prioritise the interventions using sticky dots.
- The outputs should be fed into the City Water Resilience Profile and Action Plan.

LESSONS IDENTIFIED

Each workshop should conclude with a feedback session in which participants have the opportunity to provide their comments on the workshop methodology and CWRA content.

A table of the feedback following the workshops in the City of Cape Town and Greater Miami and the Beaches and the integration into the CWRA are summarised on following pages.

CAPE TOWN

WORKSHOP	FEEDBACK	INTEGRATION INTO CWRA
CWRF Assessment workshops	The qualitative indicator methodology went well, and guiding criteria were found to be helpful and not overly technical to the audience. Suggestions were made around language used for some indicators.	The CWRF indicators were updated in preparation for fieldwork in both cities.
CWRF Assessment workshops	There should be a rapporteur and separate facilitator for each table as it is challenging for a single facilitator to perform both roles.	The need for a rapporteur and facilitator for each group has been incorporated into the CWRA user guide. A rapporteur was provided for each facilitator/group in Greater Miami and the Beaches.
CWRF Assessment workshops	Notes for assessment workshops should be taken on a computer, according to a consist to format, to make it easier to translate observations from Assessment Workshops into the Resilience Profile.	A template for rapporteurs to document scores and discussion was developed following the Cape Town fieldwork and used to good effect in Greater Miami and the Beaches.
Visioning workshop	The Arup / 100RC team felt there needs to be a prescribed process for developing the "problem statements" that participants respond to as the problem statements for Cape Town were developed based on discussions on CWRF assessment workshop results which was not a robust method.	A structured methodology for developing the "problem statements" has been developed for Miami.
Visioning workshop	A full day is needed for the visioning workshop; the city wanted to make it a half-day, but ultimately this didn't allow sufficient time to develop fully detailed actions.	This guidance has been added to the CWRA user guide and adopted in Greater Miami and the Beaches.
Visioning workshop	The root causes of problem statements should be explored as a step in the visioning workshop to ensure that participants direct the focus of their actions effectively.	The visioning workshop approach has been updated to include root cause analysis of the problem statement as the first step of the development of interventions.
OurWater presentation	The OurWater workshop has an overwhelmingly positive response. Cape Town's Economic Development Partnership (EDP) has asked to be the guardian / champion for the tool.	A separate memo outlining the proposed changes to OurWater is being developed. Arup is continuing to work with EDP to deploy OurWater on ongoing EDP projects.

GREATER MIAMI AND THE BEACHES

WORKSHOP	FEEDBACK	INTEGRATION INTO CWRA
Workshop preparation	Develop a checklist and timeline for cities to set the expectation for the City Champion and give them an overview of the approach and timescale.	This has been developed and incorporated into the CWRA User Guide. The timeline, and milestones identified for the city, will be discussed with new city champions as part of the project kick-off meeting.
Assessment workshop	Participants opinion was divided on the use of an initial score in the assessment workshop. Some participants felt that the initial score was a good entrance into the conversation. Others felt that sharing initial scores prejudiced discussions.	Participant guides have been updated to include space for participants to write their initial and final scores in their participants pack.
Assessment workshop	Participants tended not to use the full scoring range and defaulted to score 3.	The scoring range has been updated to an even scoring range 1-6. Changes to normative label associated with each score (“fair”, “good”, etc.) are under consideration. In the presentation at the start of the assessment workshop, the facilitator should reinforce that the purpose of the assessment is to draw out the weaknesses to focus actions.
Community workshops	Comparatively few community representatives attend CWRA workshops because they are held during working hours at government/utility buildings.	A range of options to improve turnout can be considered depending on local context. Additional meetings can be hosted in locations more convenient to community leaders. Alternatively, community meetings can be held in evenings in community buildings, where appropriate. Community workshops have been included in the CWRA User Guide.
Visioning workshop	Workshop participants requested more opportunity to constructively challenge and improve other interventions.	A review section has been added into the Visioning workshop. Each group is matched to a second group working on a similar problem statement. The groups present to each other with the opportunity for constructive feedback and improvement of the interventions.
Visioning workshop	The plenary presentations of each group’s proposed action/intervention were long, which decreased energy levels in the room.	A summary box has been added to the workshop materials for participants to develop three summary bullet points to present in plenary.
OurWater	OurWater was received positively with additional opportunities identified to use OurWater. During fieldwork, and based on feedback from workshop participants, added features and changes to the graphic interface have been identified. These will help extend use of the tool into Step 2 – Resilience Assessment of the CWRA.	A separate memo outlining the proposed changes to OurWater is being developed.

ANNEX A: FACILITATION GUIDE

THE RESILIENCE SHIFT

100 RESILIENT CITIES

SIWI

305 RESILIENT

ARUP

CITY WATER RESILIENCE ASSESSMENT

GREATER MIAMI & THE BEACHES

FACILITATION GUIDE

MIAMIBEACH RISING ABOVE

THE CITY OF MIAMI INCORPORATED 1896 FLORIDA

MIAMI-DADE COUNTY

OVERVIEW

The CWRA team will host a series of workshops in Greater Miami and the Beaches (GMB) as part of the CWRA assessment. These include:

- Two half day Assessment Workshops
- One full day Visioning Workshop
- Focus Session

SCHEDULE

The workshops will be conducted per the following schedule:

	VENUE	MORNING	BREAK	AFTERNOON
Mon July 22nd	tbd	Assessment Workshop 1	-	Team Meeting
Tue July 23rd	tbd	Assessment Workshop 2	-	Team Meeting
Wed July 24th	-	Desk Results Analysis	-	Desk Results Analysis
Thu July 25th	tbd	Visioning Workshop	Lunch presentation	Visioning Workshop
Fri July 26th	WASD	Focus Session	Team Lunch	-

1. ASSESSMENT WORKSHOP

WORKSHOP DESCRIPTION

SUMMARY

Two Assessment Workshops will generally cover different resilience 'dimensions' from the City Water Resilience Framework, with a different pool of stakeholders, though there is a potential for overlapping dimensions and participants attending both days. The workshops will evaluate city water resilience against CWRF goals and sub-goals using qualitative indicators. The workshop also provides feedback to the team that can be used to refine the CWRF indicators and workshop methodology.

Specifically, the objectives are to:

1. Conduct a baseline assessment using qualitative indicators to highlight areas where resilience improvements will be required as well as existing strengths that can be utilized to build resilience in the water system;
2. Solicit feedback on CWRF assessment process to improve future workshops and refine indicators as needed.

Depending on responses, the first assessment workshop one will cover the following two dimensions:

- **Planning and Finance**
- **Leadership and Strategy**

The second assessment workshop will cover the remaining two dimensions:

- **Health and Wellbeing**
- **Infrastructure and Ecosystems**

For each workshop, we expect between 20 to 30 participants (refer to separate invitation list). Participants have been identified and invited based on their knowledge of the particular "dimension of resilience". These include stakeholders representing a range of organisations —civil society, government, private sector, academia, etc.—who can provide different perspectives and insights on the same topic.

- **Dimension 1:** Leadership and strategy – stakeholders related to government, strategy, planning, creation and enforcement of regulation including senior leadership in government as well as community groups. National and regional government representatives.
- **Dimension 2:** Planning and finance – stakeholders related to city planning, finance, funding for projects/programmes, land use and zoning considerations, related sectors (energy, food production, etc.)
- **Dimension 3:** Infrastructure and ecosystems – stakeholders working on natural environment, green and grey infrastructure, protection of water sources / environmental health, disaster response and hazards.
- **Dimension 4:** Health and wellbeing – provision of basic services (water, sanitation), urban design and water landscapes, livelihoods, transport around water, grassroots community empowerment.

FACILITATION PLAN

PREPARATION

- Participants will receive the indicator packs in advance (ideally by or before the morning of **Friday, July 19**);
- Facilitators are told which indicators/ sub-goals they are expected to facilitate to ensure that they are familiar with the indicators and corresponding guiding criteria they will facilitate at their table;
- Facilitators should arrive at the venue by 08:00 to set-up room, registration desk, and prepare tables;
- Registration will start 15 minutes before the start of the Workshop. One team member of the facilitation team will ensure that arriving participants will sign in, will receive an indicator booklet and will be directed to the correct table. N.B. Participants keep their booklets.
- Tables should consist of 4-6 people.
- Each table will complete 4 indicators per session.
- A minimum of 4 tables are needed to complete 32 indicators each day. Groups change after the mid-morning coffee break.
- Each table should have: a stack of relevant A5 CWRF indicator cards, one large copy of the CWRF wheel in the middle of the table, pens, and facilitator/participant booklets.

OUTPUT

- Participants / contact register;
- Completed score sheet for each table (see Annex 1) as recorded by each facilitator (containing the scoring of each individual indicator by each participant
- Notes on discussions around indicators
- Notes on ways to improve indicators and workshop

ANALYSIS OF RESULTS

Results from the two Assessment Workshops inform the Visioning Workshop. The analysis of results should be done by facilitators following each workshop. This entails:

- Recording results from each session into an Excel spreadsheet. The spreadsheet will generate a "consensus score" for each indicator.
- Discussing strengths, weaknesses and challenges encountered during the process. Difficulties understanding or responding to indicators.
- General trends in responses

The team will compile all results into a "scored CWRF" that summarizes results from both workshops to present back to participants.

PROBLEM STATEMENTS

The team will generate 5-10 Problem Statements from the completed assessment. Problem statements are developed by:

- Identifying low scores
- Graphing clusters of scores according to resilience "goal"
- Identifying common underlying causes for low scores
- Considering results in context based on notes and discussion

Problem Statements should follow a standard format that makes them easy to read and understand quickly during workshops. Each Problem Statement should consist of 1) short (punchy) title, 2) a two-sentence description, 3) a short "context statement" paragraph describing why the statement was chosen (this will be used in developing the Profile, but not given to participants) and 3) a list of sub-goals which the statement refers to. Problem statements should be numbered.

AGENDA

ASSESSMENT WORKSHOP - MONDAY JULY 22ND & TUESDAY JULY 23RD

TIME	ACTIVITY AND DESCRIPTION	LEAD	MATERIALS
8:00	Facilitators and rapporteurs arrive	-	
08:30	Arrival, registration & coffee/ tea	-	Registration desk, sign-in sheet, name tags, markers Projector, screen, AV equipment
08:40	Introduction Introduction from Greater Miami and the Beaches / Arup / SIWI team: • Welcome • Workshop objectives & agenda	WASD (DG)	PPT
08:55	City Water Resilience Framework Brief introduction to the City Water Resilience Framework (CWRF): • What is the CWRF? • Why do we need the CWRF? • How have we developed it? What has been done so far?	Arup (LE)	PPT
09:05	CWRF Assessment 1 • Introduction to assessment activities and using the CWRF • Small group work session	Arup (GB) Facilitators	Large printed CWRF "wheel" for each table Participant Booklets Facilitator Booklets Indicator Cards (optional) Pens
10:35	Break	-	-
10:45	CWRF Assessment 2 • Small group work session	Facilitators	
12:05	Reflections Open discussion reflecting on assessment process and CWRF • Reflections on the assessment process • Reflections on the exercise results	Arup / SIWI	-
12:25	Concluding Remarks Concluding remarks, invitation to attend Visioning Workshop	WASD (DG)	-

	NOTES
	- Facilitators set up room - Rapporteurs will be provided with a template for note taking
	- Distribute one indicator pack to each participant on arrival and direct them to correct table. A list showing participant allocation to tables should be projected on a screen. - Facilitators will be told which indicators they are responsible for during the two morning sessions.
	- Introductory presentation
	- CWRF presentation highlighting how we have developed the framework, and detailing research and fieldwork behind the water resilience goals, sub-goals, indicators - Ground rules: please do not check phones, computers during session, etc. Feedback on indicators is welcome to help us make improvements. Participants are free to keep their notebooks and encouraged to make notes in them.
	- Introduction to exercises presentation. - At tables, the facilitator begins by asking all participants to introduce themselves Each table is given a specific subset of indicators to focus on. The facilitator: 1. Introduces each new indicator by reading the name of the indicator out loud, then allowing time for participants to read guiding criteria and take notes in their workbooks. 2. The facilitator asks each participant to provide an initial score with minimal explanation for why they assigned that score. 3. Once all participants have reported, the facilitator encourages people to explain their score. 4. If a participant does not feel qualified to answer, they can say so and their score will not be recorded 5. After an additional 15 minutes the facilitator then asks participants to provide a final score and, if the first and second score differed, to reflect on the reason for updated score. 6. Discussion of each indicator last a maximum of 20 minutes, though some groups concluded their discussions in less time. If completed in less time, the group can move on to new indicator. - Facilitator is encouraged to change the order of who reports initial scores to make sure no one participant is overly influencing others - If the group finishes all assigned indicators, they can choose to move on to additional, or finish early. - Facilitators are responsible for timing. - At least three participants are required to score an indicator. If we don't have three scores, flag the indicator and we will attempt to find additional scorers (incl. scoring remotely)
	During break, facilitators identify new tables for participants. Participants are re-assigned to new tables for second CWRF session
	-
	Facilitators will ask the participants at each table to reflect on the following: 1. On the assessment process: What worked, what did not work? Was it easy to understand or were there any difficulties encountered? 2. On the exercise results: Were there any surprises? Did participants find general consensus or are there significant disagreements? What general areas of strengths and/or weaknesses were identified through the process? What "areas of opportunity" have been identified? The facilitator/rapporteur will record comments made.

2. VISIONING WORKSHOP

WORKSHOP DESCRIPTION

SUMMARY

The Visioning Workshop will reconvene participants that attended the two Assessment Workshops earlier in the week as well as new participants. The Visioning Workshop validates the findings of the week and identifies opportunities to address weaknesses and utilise strengths identified.

The objectives of the Visioning Workshop are to:

- Based on initial findings of the resilience assessment, identify and discuss areas that need to be addressed and prioritized for resilience actions;
- Facilitate dialogue and deeper understanding of the Water Resilience Assessment and its preliminary results;
- Develop a long list of proposed interventions and outline resilience qualities, challenges and co-benefits (resilience value) for each intervention;
- Match identified actions with the City Water Resilience Framework (Dimension and Goals). Establish partnerships and initiative to move identified interventions forward towards implementation;

We anticipate ~60 people (to be distributed at 8-10 tables of 6-8 people each).

FACILITATION PLAN

PREPARATION

- Finalise participant groupings and have group assignments projected on a screen so as people arrive they can get to their correct tables;
- Facilitators should arrive at the venue by 08:00 to set-up room, registration desk and prepare tables;
- Staff is needed to sign people in and ensure we have contact details and direct participants to their tables;
- Facilitators are responsible for collecting all completed worksheets from their tables;

Each table should have:

- Worksheets A, B, C, D, E
- Sticky dots
- Pens

OUTPUTS

- Register of participants
- Completed worksheets A-E
- A typed long-list of actions compiled in a single document. Each identified action will include a general description plus a rough outline of next activities if possible.
- Other notes taken to improve process with feedback and recommendations (if any).

AGENDA

VISIONING WORKSHOP - THURSDAY, JULY 25TH

TIME	ACTIVITY AND DESCRIPTION	LEAD	MATERIALS
8:00	Facilitators arrive	All	
08:30	Arrival and registration		Registration desk, sign-in sheet Name tags, markers Projector, screen, AV equipment
08:45	Welcome Workshop objectives	WASD	PPT
09:00	Presentation of CWRA	Arup (LE)	PPT
09:15	Key findings from Assessment Workshops Introduction to Problem Statements	Arup (GB)	PPT
09:25	Problem Statements Select and review Problem Statements	Arup / SIWI	PPT Large printed A0 Problem Statements
09:35	Root Cause Analysis Split into working groups to identify root causes using Worksheet A	Facilitators	Worksheet A Pens
10:20	Coffee Break	-	-
10:35	Design Brief Develop design brief using Worksheet B	Facilitators	Worksheet B
11:20	Proposed Interventions Develop proposed intervention using Worksheet C	Facilitators	Worksheet C
12:30	Lunch (provided) OurWater Presentation	Arup	PPT / video
13:15	Lightning Presentations Presentations from each group summarizing vision /interventions	Participants	Stickers
14:20	Marketplace & Discussion 1. Prioritise action proposals (10 mins) 2. Discuss action proposals in plenary. Key challenges and potential obstacles (40 mins)	Plenary	Stickers
15:25	Reflections Reflections on workshops using Worksheet E. What worked and what didn't? What did you find valuable about the two sessions?	Facilitators	Worksheet E
15:45	Concluding Remarks **Concluding remarks and next steps in CWRA process**	Arup / WASD	-

	NOTES
	- Throughout the day, facilitators are responsible for collecting all worksheets. Worksheets must be turned in by participants as they will be used to develop the Resilience Profile.
	- Welcome, housekeeping and ground rules, exits and bathrooms - Reflection on work done so far - Alignment with the City Resilience Strategy - Purpose of engaging with the City Water Resilience Approach
	- How does assessment and visioning workshop fit into larger CWRA approach and Miami water resilience mission?
	- Problem statements are displayed prominently on A0 sheets and/or on projected screen. Suitable wall space is needed to hang 10 A0 posters. These should be distributed to avoid overcrowding. - Attendees are given four stickers and asked to mark their preferred Problem Statements (5 minutes) - Facilitators identify five preferred Problem Statements and place one at each table (5 minutes) - Attendees go to their preferred table - If some problem statements have no attendees they can be discarded. Tables with many attendees can be split. Ideally 6 people per table.
	- Group exercise at tables using worksheet. Objective is to identify underlying causes of problems identified. - Participants work together as a table
	- Group exercise at tables. - Participants work in teams of two - Design briefs should address root causes identified in Worksheet A. They establish the challenge that will be responded to in Worksheet C - This is NOT to do business as usual but a) to think out of the box, b) to be creative and c) to identify opportunities that respond to root causes and encourage multiple co-benefits. “Opportunities” describe areas for action. They are one step removed from actions/interventions. - Facilitator should read time every 20 minutes and make sure participants provide at notes for every box in the worksheet. - During last fifteen minutes of session, teams will report back to table
	- Group exercise at tables. - Participants select any Design Brief to work on in teams of 3-4 people. They can choose their own design brief or another brief. - Facilitator is encouraged to read time every 20 minutes and make sure participants provide at least notes for every box in the worksheet.
	- Plenary presentation. - Short video and description of OurWater during lunch
	- Plenary. Each group selects one person to present results back to the full group. - Presentations are 2-3 minutes each (and timed)! - Depending on how many presentations/groups, short (1-2 minute) questions follow each presentation
	- Following presentations, all interventions are posted on wall - Each attendee is given 4 stickers to “vote” for interventions they believe should be prioritised. - Facilitators count votes for all interventions and present results on screen - Plenary. Open discussion around the value of proposed interventions. Speakers are encouraged to identify critical obstacles and challenges that should be addressed in realizing each intervention. - Rapporteurs are requested to note the discussion.
	- Group exercise at tables. - The objective is to improve the CWRA and assessment workshop process for future work, and to identify general needs from participants.
	- Description of next steps in CWRA process and how this week’s activities fit in to this process. - Miami Water Resilience Profile will be written and distributed to all participants in ~8-10 weeks.

WATER RESILIENCE **INDICATORS**

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy; Health & Wellbeing	1. Empowered Communities	1.1 Active community engagement and participation around water issues

INDICATOR:

Legal and institutional frameworks and mechanisms promote active, free and meaningful participation around issues related to water supply, sanitation, drainage and flooding.

GUIDING CRITERIA / GUIDING QUESTIONS:

Active, free and meaningful participation is promoted through elements that create an enabling environment for participation[1]:

- **Free and safe participation:** Institutions encourage bottom-up initiatives and guarantee free and safe participation. Participation is voluntary and free from conditions or threats, while people who engage should are protected from reprisals or discrimination.
- **Inclusiveness:** Organizational structures, frameworks and policies exist to promote inclusiveness by ensuring that all relevant stakeholders are engaged in decision-making, and that barriers to participation are removed. Inclusiveness can be promoted through efforts to identify and reach out to all relevant groups.
- **Access to information:** Information is shared with all stakeholders. Information is complete, timely, relevant and free of cost. It is widely to reach target groups, and shared in a variety of formats and multiple languages if needed.
- **Opportunity to influence:** Legal frameworks engage stakeholders in the design and implementation of water-related decisions, policies and projects. Community stakeholders have the opportunity to influence the design of the participatory procedures. Authorities are willing to engage, listen, and eventually change proposals through the participatory process.
- **Accountability:** Mechanisms diagnose and review stakeholder engagement challenges, processes and outcomes. Authorities should be accountable, letting people know how their inputs were considered, what decisions were made, and on what grounds.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

5 - Optimal
No improvement is required. The indicator fully reflects conditions in the city.

4 - Good
Minimal improvement is required. The indicator mostly reflects conditions in the city.

3 - Fair
Some improvement is required. The indicator somewhat reflects conditions in the city.

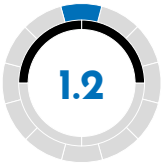
2 - Low
Significant improvement is required. The indicator mostly does not reflect conditions in the city.

1 - Poor
The indicator does not at all reflect current conditions in the city.

N/A

[1] *Jiménez, A., LeDeunff, H., Giné, R., Sjödin, J., Cronk, R., Murad, S., ... & Bartram, J. (2019). The Enabling Environment for Participation in Water and Sanitation: A Conceptual Framework. Water, 11(2), 308.*

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy; Health & Wellbeing	1. Empowered Communities	1.2 Effective communication of government programmes and policies around water



INDICATOR:

Mechanisms ensure that comprehensive information on government programmes and policies are disseminated to all stakeholders.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Roles and responsibilities:** Dedicated institutions produce or collate information from relevant sources and official information about policies, strategies, existing and planned programmes and projects around water.
- **Sufficient resources:** Sufficient financial resources, technical capacity and skill, information and technological tools exist in order to support the organizations responsible for collecting, collating and sharing information.
- **Identification of stakeholders:** Mechanisms identify target audiences, their communication needs and potential barriers to effective communication.
- **Dissemination:** Government shares credible, complete and updated information of their programmes and policies around water in a timely manner with all stakeholders and at no cost, maintaining a consistent and clear information flow through reliable channels and platforms. Information is clear and understandable. Where appropriate, information should be disseminated in different formats, in more than one language if necessary, avoiding overly technical language.
- **Monitoring and evaluation:** Monitoring and evaluation occurs to ensure the correct information is disseminated to audiences that need it.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

5 - Optimal
No improvement is required. The indicator fully reflects conditions in the city.

4 - Good
Minimal improvement is required. The indicator mostly reflects conditions in the city.

3 - Fair
Some improvement is required. The indicator somewhat reflects conditions in the city.

2 - Low
Significant improvement is required. The indicator mostly does not reflect conditions in the city.

1 - Poor
The indicator does not at all reflect current conditions in the city.

N/A

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy; Health & Wellbeing	1. Empowered Communities	1.3 Promotion of social cohesiveness and strong community networks

INDICATOR:

Inclusive and participatory social networks (formal and informal) enable communities to learn from each other, self-organize and act collectively in times of need.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Identification of stakeholders:** Mechanisms identify important community networks and groups, their relative capacities and social assets, and potential challenges to self-organization and collective action.
- **Communication:** Effective and meaningful communication exists among communities, and between communities and the authorities. Communication occurs through participatory processes and platforms, including through outreach from authorities to local organizations and community groups, using diverse forms of community outreach.
- **Sufficient resources:** Adequate technical, institutional skills and financial resources are allocated by government to help assess local capacity, provide training and generally support communities to ensure they are equipped to cope, adapt, self-organize and collectively act in times of need. For instance, this could include awareness raising campaigns, participatory exercises and training to mobilize community anticipate and respond to shocks and stresses.
- **Community Leadership:** Mechanisms exist to ensure that community leadership is representative of the full community (all groups and individuals) in an inclusive manner. Leadership is informed and well-trained, and consults with government at regular intervals. Roles and responsibilities of local leadership are clearly defined and well-known.
- **Community-based emergency preparedness planning:** Community-based preparedness and contingency planning address water-related shocks. For instance, planning and implementation of local-level adaptation and mitigation measures for water related shocks engage with community networks.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

5 - Optimal
No improvement is required. The indicator fully reflects conditions in the city.

4 - Good
Minimal improvement is required. The indicator mostly reflects conditions in the city.

3 - Fair
Some improvement is required. The indicator somewhat reflects conditions in the city.

2 - Low
Significant improvement is required. The indicator mostly does not reflect conditions in the city.

1 - Poor
The indicator does not at all reflect current conditions in the city.

N/A

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy; Health & Wellbeing	1. Empowered Communities	1.4 Support for civil society institutions working on water issues

INDICATOR:

Mechanisms ensure that financial, institutional and technical support is provided to civil society institutions working on water issues

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Civil society institutions are actively engaged in developing urban strategies around water and wastewater services, protection from flooding or droughts, protection of aquatic ecosystems, support for water-related mobility, and related water issues. Civil society includes community groups, academia, charities, religious organizations and non-governmental organizations outside of the private sector.
- **Instruments:** Policies, strategies, programmes and other mechanisms support civil society efforts to engage in decisions related to water policies and projects. Support can come from government, private sector or other civil society organizations. It can be provided in the form of funds, technical knowledge, or institutional support - for example, spaces, forums or platforms where stakeholders can engage with other stakeholders to share knowledge, discuss and deliberate around water-related initiatives.
- **Spaces for participation:** There is adequate institutional, technical and funding capacity to identify and support civil society institutions working on water issues, identify strengths and capacity gaps, and enhance their capacity to participate in decision making, generate debate, inform policies, along with designing and implementing programme on managing local water challenges in general and during shocks and stresses.
- **Dissemination:** Mechanisms ensure that government shares credible, complete and updated information with civil society organizations in a timely manner, maintaining a consistent and clear information flow through accessible, reliable channels and media. Information pertains to water policies and programmes.
- **Outcomes:** Opportunities exist for civil society organizations to influence decisions. Authorities engage with civil society and make revisions of existing water programmes and polices based on inputs received from civil society.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

5 - Optimal
No improvement is required. The indicator fully reflects conditions in the city.

4 - Good
Minimal improvement is required. The indicator mostly reflects conditions in the city.

3 - Fair
Some improvement is required. The indicator somewhat reflects conditions in the city.

2 - Low
Significant improvement is required. The indicator mostly does not reflect conditions in the city.

1 - Poor
The indicator does not at all reflect current conditions in the city.

N/A

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy	2. Strategic Vision	2.4 Incorporation of expert and technical knowledge into decision-making around water issues

INDICATOR:

Technical knowledge is available, understood and continuously incorporated by government into decision-making around water issues.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Technical knowledge exists that can inform resilience planning and implementation. Technical knowledge is accurate and current. It includes information related to natural and social sciences drawing upon inputs from specialists and subject matter experts.
- **Scope:** Technical knowledge covers all relevant aspects related to the decision being made. The available knowledge is understood by decision-makers and technical staff, who know how the knowledge has been produced and are capable of questioning and assessing its validity and relevance.
- **Clarity:** Information is clearly formulated and easily understood by the target audience.
- **Dissemination:** Opportunities exist for knowledge transfer occur at regular intervals, ensuring that knowledge reaches appropriate decision-makers and technical staff involved in water-related decision-making. Information and technical knowledge is updated regularly. Opportunities may include regular meetings or platforms, advisory groups, committees and task-forces that engage and consult subject matter experts.
- **Impact:** Technical knowledge is incorporated into short term and long term decision-making. Existing plans and strategies are revised as needed to include new or updated technical knowledge.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

5 - Optimal
No improvement is required. The indicator fully reflects conditions in the city.

4 - Good
Minimal improvement is required. The indicator mostly reflects conditions in the city.

3 - Fair
Some improvement is required. The indicator somewhat reflects conditions in the city.

2 - Low
Significant improvement is required. The indicator mostly does not reflect conditions in the city.

1 - Poor
The indicator does not at all reflect current conditions in the city.

N/A

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy	2. Strategic Vision	2.1 Incorporation of local knowledge and culture into decision-making

INDICATOR:

Local knowledge and cultural values of all population groups are referred to in government decision-making around water issues.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Community engagement:** Community engagement efforts adequately capture the full diversity of local knowledge, cultural values, and practices around water issues for all local populations.
- **Participation:** Participatory processes exist that engage all groups in decision-making around water issues, and reconcile different or conflicting group interests within the local population .
- **Clarity:** All population groups understand and accept the decision-making procedures, outputs and expected outcomes from decisions.
- **Representation:** Mechanisms ensure that local knowledge, cultural values and traditions are well-represented within governance structures and decision-making procedures. For instance, decision-making bodies reflect the diversity of the local population, and policies specifically recognize the needs and inputs from indigenous communities.
- **Outcomes:** Policies, strategies and programmes are fully informed, effective and appropriate to local context and that reflect local knowledge and experience.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy	2. Strategic Vision	2.5 Incorporation of social, environmental and economic costs and benefits into decision-making around water

INDICATOR:

The social, environmental and economic impacts of increased water resilience are understood and incorporated into short, medium and long-term decision-making around water issues.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Baseline information:** Efforts are taken to assess the potential costs and benefits of increased water resilience. Evaluation of ongoing and completed projects measure their impacts (good and bad).
- **Social impacts:** Existing processes evaluate the social impact of water programmes or projects on local communities, including marginalized or disadvantaged groups. New projects seek to identify and leverage existing social assets or build upon social resources already present in the community.
- **Environmental impacts:** Existing processes evaluate the environmental impact of water programmes or projects. New projects seek to identify and leverage existing environmental assets or build upon natural resources already present in the community.
- **Economic impacts:** Existing processes evaluate economic impacts, including the economic cost-benefits and economic sustainability of new and ongoing projects. New projects seek to identify and leverage existing economic assets or build upon social resources already present in the community.
- **Dissemination:** Information is disseminated to increase awareness among decision-makers. Information relates to social, environmental and economic costs and benefits from increased water resilience. Information should compare anticipated impacts against business-as-usual scenarios.
- **Impact:** Information is continuously incorporated into both short and long-term decision-making around water issues.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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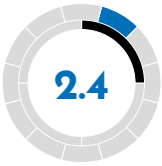
N/A

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy	2. Strategic Vision	2.2 Long-term strategy development and action planning around water



INDICATOR:

A long-term strategy is in place to guide projects and programmes that build water resilience over time.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** A long-term strategy that promotes resilience around water issues exists. The strategy includes long-term goals and priorities.
- **Scope:** The strategy addresses all relevant key challenges confronted by the city, under different climate shocks and stresses. In addition to long-term goals and priorities, the strategy outlines short and mid-term milestones, allowing for some flexibility to adapt to variety of potential scenarios. It defines interim targets in sequential way to meet the long term goals and priorities. An implementation strategy exists to outline actions to be taken and responsible actors for realizing strategy goals.
- **Clarity:** The strategy is clearly formulated and easily understood by the target audience.
- **Sufficient resources:** There is a realistic financing plan and adequate human and technical resources in place to implement the strategy.
- **Outcomes:** The strategy, and related financing and implementation plans, are referred back to for future projects and programmes, which align with the goals and priorities set in the strategy.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy	2. Strategic Vision	2.3 Political leadership around water resilience issues

INDICATOR:

Political leadership promotes resilience as a priority issue in government decision-making.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Political leadership recognizes the need for strategies and policies that build urban water resilience.
- **Political commitment:** Political leaders prioritize, champion and implement a water resilience agenda. Political support helps prioritize water resilience in policy implementation, assigns responsibilities and allocates sufficient funds. Leadership builds consensus on common goals.
- **Public outreach:** Government promotes water resilience through public campaigns, statements and media briefings, social media and other avenues.
- **Government processes:** Political leadership promotes resilience priorities through government agencies. Where necessary, new agencies, committees or special representative are created to help realise resilience priorities. Leadership ensures that efforts to support resilience within government are recognized and celebrated to encourage resilience and create an environment that promotes resilience.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy	3. Coordinated Basin Governance	3.1 Proactive coordination around downstream impacts

INDICATOR:

Coordination between city stakeholders and relevant downstream stakeholders minimize downstream impacts.

GUIDING CRITERIA / GUIDING QUESTIONS:

'Downstream stakeholders' refers to actors relying on water sources that have already passed through or been diverted to the urban area and/or stakeholders that receive urban wastewater from domestic, industrial or commercial activities, or stormwater runoff.

- **Baseline information:** Efforts are taken to assess the potential impacts of urban water use on downstream stakeholders.
- **Identification of stakeholders:** Relevant downstream government and non-government actors are identified, and their respective roles and responsibilities are broadly known.
- **Mechanisms:** Laws, policies and norms guide both formal and informal processes of multi-stakeholder coordination. Spaces and forums are in place to foster regular communications between actors. Mechanisms ensure that communication and coordination occurs between city stakeholders and relevant downstream stakeholders at regular intervals.
- **Sufficient resources:** Adequate institutional resources, technical skills and funds are allocated to support coordination. Resources ensure that frameworks and organizations for improved coordination are effective and achieve desired outcomes.
- **Monitoring and reporting:** Tools and information systems are in place to understand the basin, collect information to assess the upstream and downstream impacts, and share information with relevant stakeholders
- **Outcomes:** Frameworks and mechanisms result in joint action planning between downstream actors and city stakeholders to build water resilience.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy	3. Coordinated Basin Governance	3.2 Proactive coordination with relevant upstream stakeholders

INDICATOR:

Frameworks and mechanisms promote coordination between city stakeholders and relevant upstream stakeholders on water issues.

GUIDING CRITERIA / GUIDING QUESTIONS:

'Upstream stakeholders' refer to actors that influence the quality or quantity of water before it reaches the urban area. These may include other cities, towns or individual users.

- **Baseline information:** Efforts are taken to assess the potential impacts of upstream water use on the city.
- **Identification of stakeholders:** Relevant downstream government and non-government actors are identified, and their respective roles and responsibilities are broadly known.
- **Mechanisms:** Laws, policies and norms guide both formal and informal processes of multi-stakeholder coordination. Spaces and forums are in place to understand and foster regular communications between actors. Mechanisms ensure that communication and coordination occurs between city stakeholders and relevant upstream stakeholders at regular intervals and during emergencies.
- **Sufficient resources:** Mechanisms ensure there is adequate institutional, technical skills and funds allocated to support coordination. Resources ensure that frameworks and organizations for improved coordination are effective achieve desired outcomes. Funds are allocated and budgeted for capacity development of officials, civil society and private sector.
- **Monitoring and reporting:** Tools and information systems are in place to understand the basin, collect information to assess the upstream and downstream impacts, and share information with relevant stakeholders.
- **Outcomes:** Frameworks and mechanisms result in joint action between upstream actors and city stakeholders to build water resilience.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy	3. Coordinated Basin Governance	3.3 Proactive coordination between and within government agencies

INDICATOR:

Coordination exists between different government agencies operating at various administrative levels to define and implement water priorities.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Mechanisms are in place to encourage collaboration and resource sharing in pursuit of an agreed strategy or vision. Organizational structures encourage coordination between agencies including between managerial and technical staff. Standard operation procedures and lines of communication between agencies exist to ensure information is shared with government agencies working on programmes related to water, sanitation and related areas.
- **Identification of stakeholders:** Mechanisms exist to identify actors with whom better coordination is needed, and to outline their relative roles and responsibilities.
- **Consensus:** Actors share common objectives related to water resilience, integrating evidence and incorporating inputs from all relevant government agencies to building a shared vision and common priorities.
- **Sufficient resources:** Adequate financial and human resources, institutions, and expertise exists to carry out coordinated actions that support water resilience.
- **Outcomes:** Coordination between government agencies results in joint action to carry out agreed strategies.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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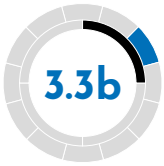
N/A

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy	3. Coordinated Basin Governance	3.3 Proactive coordination between and within government agencies



INDICATOR:

Coordination exists within government agencies to define and implement water priorities.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Mechanisms are in place to encourage collaboration and resource sharing in pursuit of an agreed strategy or vision. Organizational structures encourage coordination within agencies including between managerial and technical staff. Standard operation procedures and lines of communication within agencies exist to ensure information is shared within government agencies working on programmes related to water, sanitation and related areas.
- **Identification of stakeholders:** Mechanisms exist to identify actors with whom better coordination is needed, and to outline their relative roles and responsibilities.
- **Consensus:** Actors share common objectives related to water resilience, integrating evidence and incorporating inputs from all relevant government agencies to building a shared vision and common priorities.
- **Sufficient resources:** Financial and human resources, institutions and expertise are in place to carry out coordinated actions that support water resilience.
- **Outcomes:** Coordination within government agencies results in joint action to carry out agreed strategies.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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1 - Poor
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N/A

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy	3. Coordinated Basin Governance	3.4 Proactive coordination between government, private sector and civil society

INDICATOR:

Frameworks and mechanisms promote dialogue and deliberation around water and resilience issues between government and non-government actors.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Identification of stakeholders:** Relevant government and non-government actors are identified with their respective roles and responsibilities.
- **Mechanisms:** Laws, policies and norms guide both formal and informal processes of multi-stakeholder coordination. Spaces and forums are in place to understand and foster regular communications between actors. Mechanisms ensure that communication and coordination occurs between government and non-government stakeholders at regular intervals and during emergencies.
- **Sufficient resources:** Mechanisms ensure that adequate institutional, technical skills and funds are allocated to support dialogue and deliberation. Resources ensure that frameworks and organizations for improved coordination are effective to achieve desired outcomes. Funds are allocated and budgeted for capacity development of officials, civil society and private sector.
- **Monitoring and reporting:** Tools and information systems are in place to understand the basin, collect information to assess the upstream and downstream impacts, and share information with relevant stakeholders
- **Outcomes:** Frameworks and mechanisms result in joint action between government and non-government actors to build water resilience.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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1 - Poor
The indicator does not at all reflect current conditions in the city.

N/A

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy	3. Coordinated Basin Governance	3.5 Promotion of clear stakeholder roles and responsibilities

INDICATOR:

Frameworks and mechanisms clearly define the roles and responsibilities of water stakeholders.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Laws, policies, contracts and norms define the roles and responsibilities of all stakeholders in the urban water system. Rules define how government and regulators at different levels of local, municipal and national government interact. Where appropriate, guidance is provided for how stakeholders working in different sectors relate to one another.
- **Monitoring:** Monitoring mechanisms ensure roles and responsibilities are implemented.
- **Compliance:** Sanctions and penalties are imposed on officials and institutions for non-compliance and non-enforcement related to service quality, consumers protection, environment and health issues.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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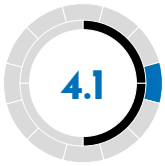
N/A

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy; Planning & Finance	4. Effective Regulation and Accountability	4.1 Effective enforcement of economic regulations for water



INDICATOR:

Economic regulation of water and sanitation services and water resources is performed effectively, resulting in adequate provision of key services, and high customer satisfaction.

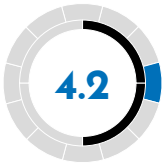
GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Rules, norms, standards and organisations exist that set, change, monitor, and enforce allowed tariffs and minimum service standards for water and sanitation services. Higher cost will be incurred for higher service standards. The regulatory system ensures both that providers recover their costs (ensuring financial sustainability of service provision) and that customers receive the services they are able to pay for (affordability). Service standards and rules for cost recovery through tariffs are clear and unlikely to change unpredictably. Regulatory processes and outcomes are understood and generally accepted by consumers who bear the ultimate impact of tariff and service standard decisions. Water pricing encourages efficient water use and recognises the economic and other values of water services.
- **Institutional autonomy:** Clear roles and responsibilities have been defined for organizations responsible for carrying out these activities. The regulator is free from political interference. It has a scope of regulation to define roles and responsibilities, review the service standards and norms, and adapt existing rules to needs. It has a sufficient degree of institutional independence to organise the agency's structure and to decide upon human resources strategies and appointments.
- **Financial autonomy:** The regulatory function has sufficient financial autonomy to decide salary scales, budget structure and capacity. It can approve decisions and enforce them. It receives sufficient and predictable sources of funding which do not interfere with the regulatory function.
- **Monitoring and evaluation:** Mechanisms are in place to collect information, monitor and evaluate on the regulated scope. Information about the activities of the regulator is available to the public. Procedures are fair, accessible and open.
- **Enforcement:** Sanctions and penalties are imposed on officials and institutions to enforce compliance. The consequences of non-compliance is disclosed and well-understood. An efficient appeal system exists to review and change official decisions where appropriate.
- **Outcome:** Economic regulation ensures that service providers charge appropriately without making excessive profits at the expense of consumers, and that service providers operate efficiently, with high labour productivity, low non-revenue water and without corruption. Regulation prevents tariffs from increasing above the level required to recover reasonable costs and make the service provider bear costs that are considered excessive. It promotes water conservation and ensures affordability of services .

P1	P2	P3	P4	P5	P6	P7	P8

SCORES AND NOTES

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy; Planning & Finance	4. Effective Regulation and Accountability	4.2 Effective enforcement of environmental regulations for water



INDICATOR:

Environmental regulation is performed effectively, resulting in high quality, protected water environments.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Rules, norms, standards and organisations exist that set, change, monitor, and enforce the protection, conservation and enhancement of natural resources to reduce environmental degradation. This includes services such as permitting and licensing of abstraction and discharge, environmental flows and quality, and groundwater protection. Clear roles and responsibilities have been defined for organizations responsible for carrying out these activities.
- **Institutional autonomy:** Clear roles and responsibilities have been defined for organizations responsible for carrying out these activities. The regulator is free from political interference. It has a scope of regulation to define roles and responsibilities, review the service standards and norms, and adapt existing rules to needs. It has a sufficient degree of institutional independence to organise the agency structure and to decide upon human resources strategies and appointments.
- Financial autonomy: The regulatory function has sufficient financial autonomy to decide salary scales, budget structure and capacity. It has enough power to approve decisions and enforce them. It receives sufficient and predictable sources of funding which do not interfere with the regulatory function.
- **Monitoring and evaluation:** Mechanisms are in place to collect information, monitor and evaluate on the regulated scope. Information about the activities of the regulator is available to the public. Procedures are fair, accessible and open.
- **Enforcement:** Sanctions and penalties are imposed on officials and institutions to enforce compliance. The consequences of non-compliance is disclosed and well-understood. An efficient appeal system exists to review and change official decisions where appropriate.
- **Outcome:** Environmental regulation ensures that water resources are protected and enhanced.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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1 - Poor
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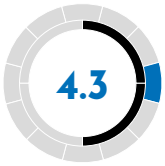
N/A

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy; Planning & Finance	4. Effective Regulation and Accountability	4.3 Effective enforcement of public health regulation for water



INDICATOR:

Public health regulation for water is performed effectively, resulting in water that is safe to consume and wastewater that can be returned to the water cycle with minimal environmental impact.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Rules, norms, standards and organisations exist that set, change, monitor, and enforce water quality to ensure the availability and adequate supply of water for drinking, food preparation and personal hygiene, the safe reuse of wastewater (water recycling) to ensure public health risks are considered and managed and to ensure that lakes, rivers, oceans, etc. may be used safely for recreational purposes. Clear roles and responsibilities have been defined for organizations responsible for carrying out these activities.
- **Institutional autonomy:** Clear roles and responsibilities have been defined for organizations responsible for carrying out these activities. The regulator is free from political interference. It has a scope of regulation to define roles and responsibilities, review the service standards and norms, and adapt existing rules to needs. It has a sufficient degree of institutional independence to organise the agency structure and to decide upon human resources strategies and appointments.
- **Financial autonomy:** The regulatory function has sufficient financial autonomy to decide salary scales, budget structure and capacity. It can approve decisions and enforce them. It receives sufficient and predictable sources of funding which do not interfere with the regulatory function.
- **Monitoring and evaluation:** Mechanisms are in place to collect information, monitor and evaluate on the regulated scope. Information about the activities of the regulator is available to the public. Procedures are fair, accessible and open.
- **Enforcement:** Sanctions and penalties are imposed on officials and institutions to enforce compliance. The consequences of non-compliance is disclosed and well-understood. An efficient appeal system exists to review and change official decisions where appropriate.
- **Outcome:** Regulations ensure that water is safe and fit for purpose, minimizing or eliminating public health risks related to water.

SCORES AND NOTES

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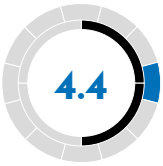
N/A

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy; Planning & Finance	4. Effective Regulation and Accountability	4.4 Enforcement of land use regulations and zoning



INDICATOR:

A sound regulatory framework controls land use and urban expansion and reduces growth in high-risk and water-poor areas.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Regulations exist related to land use and urban expansion, imposing limits on how and where urban development occurs.
- **Quality:** Land use regulations are developed with relevant subject matter experts based on accepted best practice. They include consideration of where development should be prohibited based on best available information. They reflect current circumstances and have been developed based on accurate and timely information.
- **Scope:** Land use address all areas of the city. Regulations apply to all relevant types of settlement, including formal and informal settlement on public and private lands. Different types of regulatory instruments exist to address various types of land use.
- **Regulator autonomy:** Regulators are politically, institutionally and financially independent with the power to design, approve and enforce decisions. They have broad scope to define different roles and responsibilities, review the service standards and norms, and adapt existing rules to needs. They are able to delegate powers to organize the agency structure and to decide upon human resources strategies and appointments. They have sufficient financial autonomy to decide upon salary scales, budget structure and capacity.
- **Monitoring and evaluation:** There are mechanisms in place to monitor and collect information on the regulated scope. The information on the activities of regulator are readily available to the public and procedures fair, accessible and open.
- **Enforcement:** Mechanisms exist to impose sanctions and penalties on individuals, officials and institutions for non-compliance and non-enforcement. The consequences of non-compliance must be disclosed and well understood.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

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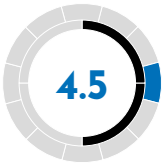
N/A

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy; Planning & Finance	4. Effective Regulation and Accountability	4.5 Enforcement of design guidelines and construction standards for water infrastructure



INDICATOR:

Technical standards and design guidelines define best practice for critical infrastructure.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Technical standards and design guidelines exist and are available to all relevant users. Standards define best practices for performance, efficiency and safety for critical infrastructure.
- **Stakeholder input:** Standards and guidelines have been developed with input from technical experts and reflect accepted best practice as defined by relevant professional societies.
- **Scope:** Standards and guidelines address all relevant topics including infrastructure performance, efficiency and increase safety in the event of shocks and stresses.
- **Clarity:** Standards and guidelines are clearly formulated and easily understood by the target audience.
- **Impact:** Standards and guidelines are continuously used in practice by all relevant stakeholders.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

5 - Optimal
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4 - Good
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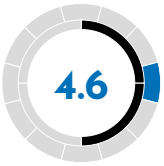
N/A

DIMENSION:	GOAL:	SUBGOAL:
Leadership & Strategy; Planning & Finance	4. Effective Regulation and Accountability	4.6 Effective implementation of transparent and accountable decision-making procedures



INDICATOR:

Decision-making procedures around water resources management, water and wastewater services are made clear and open to all stakeholders.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Roles and responsibilities:** Roles and responsibilities are defined for all relevant stakeholders in the sector that are involved throughout the decision-making process. Relevant stakeholders include all organizations involved in water governance, including in policy-making, regulation and enforcement. It is clear who makes and implements decisions, why decisions have been taken and what actions will be implemented as a result.
- **Participation:** Formal spaces for participation exist for decision-making. All stakeholders have the right to participate.
- **Dissemination:** Official information is easily accessible, open, understandable, sufficient and accurate. Information is regularly updated to all relevant stakeholders, including citizens. Sufficient guidelines and explanation on the use of the resources is available.
- **Accountability:** Stakeholders can monitor decision-making procedures. They can seek feedback or raise complaints on the decisions and actions taken. Authorities duly address stakeholder concerns and provide reasoned explanation and responses.
- **Compliance:** Sanctions and penalties are imposed on officials and institutions for non-compliance. The consequences of non-compliance should be disclosed and well-understood. An efficient appeal system exists to review and change official decisions where appropriate.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Planning & Finance	5. Adaptive and Integrated Planning	5.1 Active monitoring and evaluation of programmes

INDICATOR:

Monitoring and evaluation mechanisms and frameworks measure how programmes have achieved intended outcomes and disseminate lessons learned.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Monitoring and evaluation:** Monitoring and evaluation frameworks, mechanisms and implementing bodies exist.
- **Scope:** All relevant dimensions of programme management are included in the monitoring and evaluation framework (e.g., economic, financial, technical, institutional, etc.).
- **Sufficient resources:** Organizations charged with implementing monitoring and evaluation programmes are capable of collecting and assessing results, and translating data into prioritized action plans. They have access to adequate financial, technical and human resources to carry out their mandate.
- **Dissemination:** Information is disseminated to relevant decision-makers in a timely fashion. Information products are clear and easy to understand. Data is formatted according to industry standards.
- **Outcomes:** Data and lessons learned are incorporated into stakeholder decisions and policy-making.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Planning & Finance	5. Adaptive and Integrated Planning	5.2 Dissemination of accurate data

INDICATOR:

Accurate data is used by key decision-makers in government, private sector and civil society to promote urban water resilience.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Roles and responsibilities:** Organizations are responsible for monitoring programmes in data collection, including data producing and collection, analysis and processing. Organizational responsibilities are clearly defined. A dedicated institution and structure helps ensure that data and information is produced and collected from relevant sources and is disseminated according to a consistent and official standard. The responsible organization(s) are responsible for any pre-processing of data.
- **Data quality:** Data is accurate and current. It is collected and updated regularly. It is provided at a geographic scale or resolution to meet user needs to user needs.
- **Adequate capacity and resources:** Institutions responsible for data collection and management are provided with adequate funding, staff and other resources necessary to carry out their mission
- **Open data dissemination:** Information is shared with target audiences including key decision-makers and the general public. Information provided is complete, primary, timely, accessible, machine processable, non-discriminatory, open-source and license free. It is made available through common formats. To reach target groups information may need to be presented in different formats, in more than one language using different dissemination tools.
- **Clarity:** Target audiences receive and understand the data shared, and are provided with guidelines on the use of the data. Accurate and complete metadata is provided. Standard naming conventions and schema standards have been agreed upon and are followed.

SCORES AND NOTES

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DIMENSION:	GOAL:	SUBGOAL:
Planning & Finance	5. Adaptive and Integrated Planning	5.3 Incorporation of redundancy into water sources, networks and assets

INDICATOR:

Redundancy exists in the networks and assets responsible for water supply, treatment and sanitation.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Diversity:** Multiple facilities have capacity to process water and wastewater, and redundancy exists in transmission and sewage networks.
- **Planning:** Integrated water resource planning is carried out to assess and mitigate risk, and ensure that water and wastewater systems to operate under stresses.
- **Redundancy:** The water system can withstand disruption to one part of the network and continue to function. Buffers and back-up including water storage, wastewater storage, chemical storage and power supply are maintained to allow the system to operate in the event of shocks. Redundant infrastructure can be used to compensate for non-functioning public infrastructure.
- **Scope:** All parts of the city receive critical water and sanitation services in the event of a shock or during chronic stresses
- **Outcomes:** The water system can continue to function in the face of shocks and stresses that damage or destroy key infrastructure.

SCORES AND NOTES

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DIMENSION:	GOAL:	SUBGOAL:
Planning & Finance	5. Adaptive and Integrated Planning	5.3 Incorporation of redundancy into water sources, networks and assets

INDICATOR:

Redundancy exists in the sources that supply water to the city.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Diversity:** Multiple water sources supply the city.
- **Planning:** Integrated water resource planning is carried out to assess and mitigate risk of water supply failures under stresses. Contingency planning considers the supply of drinking water through alternative sources in case the public network is down.
- **Redundancy:** Buffers and back-up sources of water supply exist, including from city, neighbourhood or household storage.
- **Outcomes:** The water system can continue to function in the face of shocks and stresses that disrupt supply from key water sources.

SCORES AND NOTES

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Planning & Finance	5. Adaptive and Integrated Planning	5.4 Integrated planning across interdependent urban systems

INDICATOR:

Coordination exists between public sector water agencies, water utilities and organizations working in related domains such as energy, telecommunications, waste management and transportation.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Energy:** Laws, policies or norms exist which guide both formal and informal processes for coordination between water agencies, water utilities and relevant public and non-government stakeholders working in the energy sector. Coordination occurs at regular interval and during emergencies to build consensus for joint action plans and initiatives.
- **Transport:** Laws, policies or norms exist which guide both formal and informal processes for coordination between water agencies, water utilities and relevant public and non-government stakeholders working in the transport sector. Coordination occurs at regular interval and during emergencies to build consensus for joint action plans and initiatives.
- **Waste management:** Laws, policies or norms exist which guide both formal and informal processes for coordination between water agencies, water utilities and relevant public and non-government stakeholders working in the waste management sector. Coordination occurs at regular interval and during emergencies to build consensus for joint action plans and initiatives.
- **Telecommunications:** Laws, policies or norms exist which guide both formal and informal processes for coordination between water agencies, water utilities and relevant public and non-government stakeholders working in the telecommunications sector. Coordination occurs at regular interval and during emergencies to build consensus for joint action plans and initiatives.
- **Other urban systems:** Laws, policies or norms exist which guide both formal and informal processes for coordination between water agencies, water utilities and relevant public and non-government stakeholders working in other relevant sectors. Coordination occurs at regular interval and during emergencies to build consensus for joint action plans and initiatives.

SCORES AND NOTES

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Planning & Finance	5. Adaptive and Integrated Planning	5.5 Integrated planning with agriculture and food supply chains

INDICATOR:

Coordination exists between water agencies and organizations involved in food supply and production.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Action planning and information sharing occurs between water agencies and organizations involved in food production and food logistics, related to consumption and export of food products.
- **Sufficient resources:** Sufficient money, time and attention is dedicated to coordination activities.
- **Stakeholder inputs:** All relevant actors are engaged, including organizations whose mission focuses on agriculture, aquaculture and supply logistics related to receiving, storing and distributing foodstuff. Appropriate representatives from key organizations are engaged in discussions.
- **Timeliness:** Information sharing and coordination activities are conducted regularly and information is current.
- **Outcomes:** Coordination activities result in meaningful joint action between water agencies and organizations involved in food supply and production.

SCORES AND NOTES

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Planning & Finance	5. Adaptive and Integrated Planning	5.6 Promotion of culture, processes and resources to enable innovation

INDICATOR:

Resources and processes reinforce a culture of innovation within the water sector.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Incentives and organizational processes ensure openness to new ideas for organizations operating in the water sector. A culture of learning and innovation is supported by training programmes that build technical capacity of employees, and salary and benefits are competitive with similar sectors.
- **Sufficient resources:** Money, time and expertise is committed to support programmes that foster innovation and promote new research and development.
- **Scope:** A culture of innovation is generally characteristic of the sector and applies to both private and public sector organisations.
- **Cooperation:** Strong relationships between academia, private sector and government encourage sharing of ideas within the industry.
- **Outcomes:** New ideas are explored and tested. Organizations working in the city's water sector help shape national and global best practice by supporting new and evolving initiatives that promote water resilience.

SCORES AND NOTES

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Planning & Finance	6. Sustainable Funding and Finance	6.1 Promotion of integrity in contracting and financial decision-making procedures

INDICATOR:

Financial procedures promote transparency, minimize risk and ensure that procurement processes are implemented fairly and efficiently.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Legal requirements define procedures around how money is disbursed and how contracts are awarded.
- **Transparency:** Transparency fosters confidence in the public procurement institutions and reduces opportunities for corruption. Critical elements of transparency may include sufficient notification and advertising of new opportunities, open competitive bidding, use of standard bidding and contract documents, pre-disclosure of relevant information (including bid evaluation method), public bid opening (and opening immediately following the deadline for bid submission), evaluation of bids in monetary terms (rather than merit point system), qualification of bidders on basis of pass/fail requirements. Opportunities and awards are advertised.
- **Access to information:** Information is available to all interested parties, including contractors, suppliers, service providers and citizens, unless there are valid and legal reasons to keep certain information confidential. Information on the public procurement process includes procurement methods, legislation, evaluation criteria, technical specifications, supplier rights, etc.
- **Evaluation:** Procurement is based on rules guaranteeing fair and non-discriminatory conditions of competition. An essential element is procedures by which aggrieved bidders can challenge procurement decisions and obtain redress if decisions are made that are inconsistent with the established rules. One of the mechanisms used to promote fair procurement is establishing (independent) selection panels to evaluate the proposals.
- **Award:** Awards are made to the lowest evaluated responsive bidder meeting the stated qualification criteria. Any changes to awards based on negotiation are made public. Appeal mechanisms exist to appeal decisions and bidders are provided with debriefing. Award results are publicized. Government departments pro-actively release information including during the life of the contract

SCORES AND NOTES

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Planning & Finance	6. Sustainable Funding and Finance	6.2 Provision of sufficient financial resources for maintenance and upkeep of water infrastructure

INDICATOR:

Adequate funding exists to maintain water and sanitation infrastructure and to support existing programmes.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Financial resources exist to maintain and upkeep existing water infrastructure, including for services related to water, sanitation, hygiene and disaster risk reduction. Plans for corrective and preventative maintenance are in place. Failure prediction models are used to predict probability and consequence of failure. The water utility has conducted a life-cycle cost accounting analysis that incorporates accepted service level risks, asset conditions and values of current and future assets to inform financial and budget management. Formal processes exist to prioritize infrastructure needs, future investments and allocate necessary funding.
- **Sufficient resources:** Financial resources are sufficient to maintain water infrastructure at high performance levels. Financing gaps have been identified and plans exist to cover funding shortfalls.
- **Diversity:** Financing is not overly reliant on single funding sources and is guaranteed for short-term and long-term needs.
- **Efficiency:** Financial resources for maintaining infrastructure are disbursed efficiently.
- **Timeliness:** Resources are provided in a timely fashion, without delay and made available when needed.
- **Accessibility:** Resources are made available to all relevant actors.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Planning & Finance	6. Sustainable Funding and Finance	6.3 Provision of sufficient financial resources for new water programmes and projects

INDICATOR:

Adequate funding exists to finance new capital projects and programmes that support water resilience.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Financial resources for new infrastructure and programmes are available through public or private financing or public-private partnerships. Financial planning ensures that costs and funding are consistent over time.
- **Sufficient resources:** Financial resources are sufficient to develop water infrastructure. Financing gaps have been identified and plans exist to cover funding shortfalls. Investment plans are linked to existing business plans or budgeting procedures.
- **Diversity:** Financing comes from diverse sources, is not overly reliant on single funding sources and reflect short-term and long-term sources.
- **Efficiency:** Resources used towards new infrastructure is disbursed efficiently.
- **Timely:** Funding is disbursed in a timely fashion and made available when needed.
- **Accessibility:** Resources are made available to all relevant actors.

SCORES AND NOTES

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Planning & Finance	6. Sustainable Funding and Finance	6.4 Water and sanitation pricing for cost recovery and demand management

INDICATOR:

Water tariff systems are sustainable and equitable.

GUIDING CRITERIA / GUIDING QUESTIONS:

Setting sustainable and equitable water tariffs requires a balance between various competing objectives and principles, namely (Whittington, 2003)[2]:

- **Cost Recovery:** The revenue from water users is sufficient to pay the operation and maintenance costs of the water utility's operations, repay loans undertaken to replace and expand the capital stock, provide a return on capital at risk and maintain a cash reserve for unforeseen events. Revenue is stable and sufficient to guarantee long-term reproduction of physical assets, compensate the resources that are used as inputs in water-related activities, and ensure cash flow that guarantee the conservation of value of physical assets. Cost efficiency should minimise life-cycle costs of services, i.e. the creation of physical capital and operation and maintenance costs.
- **Economic efficiency:** Economic efficiency ensures prices are set to ensure that consumers face the avoidable costs of their decisions, signalling the true financial and other costs of water use. Pricing is designed to stimulate consumers to use water rationally and environmentally sustainably, and not to threaten the existing capacities by excessive water consumption. Water pricing includes abstraction charges, pollution/effluent charges and potentially other economic instruments – such as tradeable water use permits – to achieve more economically efficient and environmentally sustainable abstraction and allocation among competing uses (besides being affordable).
- **Equity:** Users pay monthly water bills that are proportionate to the costs they impose on the utility by their water use. At the same time, water pricing should consider different water users and different service levels. Domestic consumption should be prioritised over commercial or industrial consumption, for example through the use of decreasing block tariffs, particularly for large users.
- **Affordability:** Tariff policies ensure water is affordable to all, including the poorest, while ensuring the financial sustainability of service providers. Affordable supply of water and sanitation for household use is considered separately in Subgoal 10.4 "Universal affordability of water and sanitation services".
- **Clarity:** Tariff design is easy to explain and understand, and users should know the price they are paying for water. Moreover, it is be acceptable to both the public and political leaders. The tariff system is easy to implement.

P1	P2	P3	P4	P5	P6	P7	P8

[2] *Whittington, D. (2003). Municipal water pricing and tariff design: a reform agenda for South Asia. Water policy, 5(1), 61-76.*

DIMENSION:	GOAL:	SUBGOAL:
Planning & Finance; Infrastructure & Ecosystems	7. Effective Disaster Response and Recovery	7.1 Comprehensive hazard monitoring, forecasting and early warning systems

INDICATOR:

Monitoring, modelling and early warning systems mitigate hazard risks.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Baseline information:** Potential natural hazards have been identified. Hazards include major water-related hazards such as fluvial flooding, coastal flooding, surface water or pluvial flooding, drought, and water pollution as well as non-water shocks such as earthquakes that may effect the city's water system.
- **Hazard monitoring:** Monitoring occurs for all hazards that may impact the city. Reliable data is collected and shared to identify the probability that each hazard may occur.
- **Hazard modelling:** Modelling, including hazard forecasting and risk assessment, predicts the likelihood of hazards occurring, the geographic area they are likely to effect, and their potential impact or consequence. Modelling should evaluate loss of human life as well as economic and environmental resources.
- **Hazard Plans:** A hazard plan or scenario plan exists for each anticipated hazard based on hazard monitoring and modelling. Plans consider a range of scenarios including the most probable and most severe or worst-case scenario. They are detailed and updated regularly. They include the likelihood and anticipated impacts of hazards and identify appropriate responses. As part of hazard planning, efforts are taken to protect critical infrastructure. Roles and responsibilities for agencies involved in implementing actions are clearly defined. Plans consider the cascading impacts of infrastructure and the impact of water hazards on related sectors such as energy.
- **Early warning systems:** Early warning systems provide adequate advanced warning to government, institutions, businesses and residents so they can evacuate or prepare for hazards in-situ. Early warning systems should use multiple media to reach city residents, government, civic institutions, and businesses. Early warning systems are as timely as possible to give enough time for preparation or evacuation.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

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DIMENSION:	GOAL:	SUBGOAL:
Planning & Finance; Infrastructure & Ecosystems	7. Effective Disaster Response and Recovery	7.2 Coordination of disaster response and recovery preparation

INDICATOR:

Disaster response and recovery coordination plans and procedures are current, collaborative, well-rehearsed and properly funded.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Disaster response and recovery plans exist in anticipation of water-related shocks and stresses. Plans describe necessary actions to be taken in the event of a disaster. They incorporate uncertainty and consider various scenarios.
- **Stakeholder input:** Disaster response and recovery plans, programmes, information system are designed, developed, and implemented in consultation with all relevant stakeholders (across sectors and levels), including city residents.
- **Sufficient resources:** There is adequate institutional capacity, funds and skills to develop and implement disaster response and recovery plans in a timely manner.
- **Coordination:** Plans are coordinated between multiple actors, including city agencies responsible for providing key services related to health, electricity, transport, water and sanitation. Clear guidelines are provided to all stakeholders on the procedures of implementation of these plans, with clarity on the roles and responsibilities of actors in the process. Communication channels are established, roles are clearly defined and plans have been rehearsed.
- **Learning:** Disaster recovery plans are updated continuously based on new information. They incorporate learning from past failures and successes in dealing with shocks and stresses.

SCORES AND NOTES

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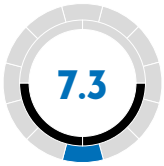
N/A

DIMENSION:	GOAL:	SUBGOAL:
Planning & Finance; Infrastructure & Ecosystems	7. Effective Disaster Response and Recovery	7.3 Ensuring adequate funds to government for disaster recovery



INDICATOR:

Public authorities have access to funds for disaster recovery.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** City government has access to financial resources to support recovery activities following a disaster event. Sources may include city funds, assistance from national government, insurance and other sources.
- **Sufficient resources:** Sufficient funding exists or can be acquired to cover financial needs.
- **Timeliness:** Funds are disbursed to the appropriate recipients in a timely manner following the disaster.
- **Coordination:** Funds are disbursed according to clear procedures outlined by law or described in planning documents.

SCORES AND NOTES

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DIMENSION:	GOAL:	SUBGOAL:
Planning & Finance; Infrastructure & Ecosystems	7. Effective Disaster Response and Recovery	7.4 Ensuring adequate financial resources for recovery of households and businesses

INDICATOR:

Households and businesses have access to sufficient financial resources for recovery and continuity following shock events or persistent stresses.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Residents and business can access financial resources to help them recover from water related shocks and stresses, including household or community savings, insurance or government-provided funds.
- **Sufficient resources:** Financial resources are sufficient to allow households and businesses to recover and continue to function after an event.
- **Availability:** Recovery funds are made widely available. They are not restricted to users based on socio-economic characteristics, geography or land tenure status. Financial resources for households and businesses are advertised widely, can be accessed easily and do not impose onerous bureaucratic or technological requirements.
- **Timeliness:** Funds for disaster relief are disbursed quickly following an event.

SCORES AND NOTES

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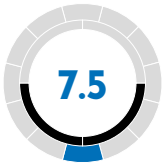
DIMENSION:	GOAL:	SUBGOAL:
Planning & Finance; Infrastructure & Ecosystems	7. Effective Disaster Response and Recovery	7.5 Promotion of community capacity for preparedness and response to water hazards



INDICATOR:

Mechanisms promote community preparedness for water-related shocks and stresses.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Identification of stakeholders:** Responsible authorities identify the groups and individuals vulnerable to different water-related shocks and stresses, to better understand their risks and identify capacity gaps among target groups.
- **Sufficient resources:** Mechanisms ensure there is adequate institutional capacity, technical skills and funds allocated to provide trainings to residents and community based organizations to cope with disasters. Residents and community groups are able to use early warning systems and can receive, analyse, interpret and forecast information.
- **Communication:** Mechanisms ensure that communities and residents are well-informed about training programmes, disaster preparedness plans and early warning systems, through different platforms and channels.
- **Stakeholder input:** Local communities are engaged in the planning, design, implementation and monitoring processes of early warning systems, disaster preparedness and response programmes. Community organizations and local leadership help manage and maintain the systems, collate funding and support for effective implementation. Stakeholder input and improved communication enables quick response to water-related shocks.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

5 - Optimal
No improvement is required. The indicator fully reflects conditions in the city.

4 - Good
Minimal improvement is required. The indicator mostly reflects conditions in the city.

3 - Fair
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1 - Poor
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N/A

DIMENSION:	GOAL:	SUBGOAL:
Infrastructure & Ecosystems	8. Effective Asset Management	8.1 Active monitoring and evaluation of water infrastructure

INDICATOR:

Monitoring and evaluation of water infrastructure and networks ensures data is current and accurate.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** A monitoring and evaluation programme plan is in place to assess infrastructure related to provision of water, sanitation and hygiene services, drainage and flood protection, and disaster risk reduction for water hazards.
- **Scope:** All relevant infrastructure assets within the city network are mapped and managed. Assets are monitored as part of their service provision network as opposed to in isolation. A whole asset life-cycle approach is undertaken (managing and updating data through the life-cycle). Condition grades and rate of degradation of asset data is collected over time informing predictions.
- **Quality:** The monitoring and evaluation of assets is undertaken to best practice guided by relevant industry standards. Resulting data is current and accurate.
- **Dissemination:** Information is disseminated to relevant decision-makers in a timely fashion. Information products are clear and easy to understand. Data is formatted according to industry standards.
- **Outcome:** Accurate and current data helps improve infrastructure performance and reduce likelihood of failure.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Infrastructure & Ecosystems	8. Effective Asset Management	8.2 Ensuring adequate human capacity for operations and implementation

INDICATOR:

Technical and managerial staff are trained and knowledgeable in areas related to operation of key infrastructure and project implementation.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Planning:** Human resource plans and strategies look ahead to maintain qualified staff and attract new, qualified staff. Plans identify incentives and encouragement for qualified professionals to assume appropriate professional positions within the field.
- **Implementation:** Human resource strategies are implemented as outlined in planning documents. There are sufficient numbers of trained and knowledgeable staff. There are no significant gaps in knowledge or roles to be filled. Professional development opportunities and training is made available for those in existing roles.
- **Professional qualifications:** Personnel are qualified and certified where necessary and appropriate, including through professional certifications and competencies, higher education and vocational degrees.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Infrastructure & Ecosystems	8. Effective Asset Management	8.3 Promotion of diverse infrastructure for flood protection

INDICATOR:

'Grey' and 'green' infrastructure provide protection from flooding and ensure adequate urban drainage.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Built ("grey") and natural ("green") flood protection infrastructure exist to reduce impacts from fluvial, pluvial, reservoir and coastal flooding.
- **Diversity:** Protective infrastructure is considered at the household, neighbourhood and city scale. Green schemes are routinely considered alongside grey during optioneering. Benefits of both green and grey infrastructure are considered, and trade-offs are identified. Asset value over time of both types of schemes is considered when determining which to build.
- **Integration:** Efforts have been made to integrate green and grey infrastructure where appropriate.
- **Stakeholder input:** Experts are consulted to develop infrastructure according to accepted best practice. Diverse stakeholders, including community organizations, are engaged to identify the appropriate location and design for new interventions.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Infrastructure & Ecosystems	8. Effective Asset Management	8.4 Routine maintenance and upgrade of water infrastructure

INDICATOR:

Existing infrastructure is regularly maintained and upgraded to reduce likelihood of failure.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Maintenance planning:** Routine maintenance and upgrade plans exist. Future planning exists and takes into account long terms trends. If supply is not meeting demand, plans for upgrades, extensions or new builds are developed. Preventative maintenance plans comply with industry standards or best practice. Planning incorporates efforts to protect infrastructure from vandalism.
- **Sufficient resources:** Sufficient time, money and human resources are allocated to maintain and upgrade key infrastructure. Responsible staff have necessary technical knowledge to carry out their responsibilities.
- **Scope:** Maintenance and upgrade is performed for all key infrastructure, including green and grey infrastructure that manages wastewater, water supply and flooding. Maintenance plans exist for infrastructure at the local, neighbourhood and city scales.
- **Implementation:** Maintenance and upgrade plans are carried out for all existing water infrastructure for the integrated water cycle. The backlog of maintenance reporting is in line with industry standards. Assets are inspected and graded.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Infrastructure & Ecosystems	8. Effective Asset Management	8.5 Promotion of reliable supply chains for water infrastructure

INDICATOR:

Supply chains for key water and sanitation infrastructure are reliable during normal conditions and in the face of shocks and stresses.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **System mapping:** Supply chains are well understood for all materials needed to operate and maintain water and sanitation infrastructure, such as mechanical and electronic equipment, building materials, chemical products and fuel.
- **Planning:** Scenario planning has been undertaken to identify alternative supply routes and suppliers if existing chains are disrupted. Backup and emergency supplies exist where appropriate. Supply chain management is featured in operations and disaster planning.
- **Outcomes:** Existing supply chains are coordinated, and goods move efficiently along the supply chain under normal circumstances. Key infrastructure continues to function in the event that large suppliers, supply routes or production of materials is disrupted—as, for instance, in the case of a sudden shock.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Infrastructure & Ecosystems	9. Protected Natural Environments	9.1 Active monitoring and evaluation of environmental resources

INDICATOR:

Environmental monitoring is conducted to assess the quality of water used for human consumption.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Standards exist that define acceptable drinking water quality. Processes and methods exist to monitor water quality.
- **Scope:** Data collected during monitoring covers all relevant topics including biological, chemical and physical qualities of water resources for human consumption.
- **Timely:** Data is current and provided to target audiences in a timely way.
- **Accuracy:** Data is sufficiently accurate.
- **Dissemination:** Information is disseminated to relevant decision-makers. Information products are clear and easy to understand. Data is formatted according to industry standards.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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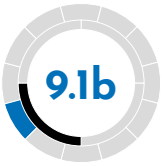
N/A

DIMENSION:	GOAL:	SUBGOAL:
Infrastructure & Ecosystems	9. Protected Natural Environments	9.1 Active monitoring and evaluation of environmental resources



INDICATOR:

Environmental monitoring is conducted to assess the health of environmental systems.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Standards exist to define healthy ecosystems. Processes and methods exist to monitor environmental systems that provide ecosystem services to the city and the impact of human society on the environment.
- **Scope:** Data collected during environmental monitoring covers all relevant topics including biological, chemical and physical qualities of ecosystems. Monitoring applies to the full range of ecosystems that serve the city, including environmental resources that exist beyond city boundaries.
- **Timely:** Data is current and provided to target audiences in a timely way.
- **Accuracy:** Data is sufficiently accurate.
- **Dissemination:** Information is disseminated to relevant decision-makers. Information products are clear and easy to understand. Data is formatted according to industry standards.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Infrastructure & Ecosystems	9. Protected Natural Environments	9.2 Promotion of sustainable commercial and industrial water use

INDICATOR:

Mechanisms promote sustainable water use for commercial and industrial users.

GUIDING CRITERIA / GUIDING QUESTIONS:

Sustainable water use refers to practices that will not adversely impact the overall quality or quantity available to other users in the system.

- **Existence:** Mechanisms exist to promote sustainable water use for commercial and industrial users. Mechanisms may include both "sticks" and "carrots" such as outreach and education programmes to improve water efficiency, financial incentives, promotion of technologies for improved water efficiency and price structures that encourage water conservation through the use of increasing block rates, seasonal rates/restrictions, time-of-day rates, water surcharges, and other tools.
- **Scope:** Programmes are addressed to all relevant commercial users such as agriculture interests, energy suppliers, manufacturers, tourism industries and others.
- **Stakeholder input:** Programmes have been developed with diverse stakeholders and broad stakeholder buy-in.
- **Implementation:** Programmes are implemented and policies are enforced.
- **Outcomes:** Programmes result in meaningful and sustained reductions in water consumption for commercial and industrial users.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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2 - Low
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1 - Poor
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N/A

DIMENSION:	GOAL:	SUBGOAL:
Infrastructure & Ecosystems	9. Protected Natural Environments	9.3 Promotion of sustainable household water use

INDICATOR:

Mechanisms promote sustainable water use for households.

GUIDING CRITERIA / GUIDING QUESTIONS:

Sustainable water use refers to practices that will not adversely impact the overall quality or quantity available to other users in the system.

- **Existence:** Mechanisms exist to promote sustainable water use for households. Mechanisms may include both "sticks" and "carrots" such as outreach and education programmes to improve water efficiency, financial incentives, promotion of technologies for improved water efficiency and price structures that encourage water conservation through the use of increasing block rates, seasonal rates/restrictions, time-of-day rates, water surcharges, and other tools.
- **Scope:** Programmes address all relevant household water users. They consider the needs of different populations within the city, and the degree to which water consumption may by group.
- **Stakeholder input:** Programmes have been developed with diverse stakeholders and broad stakeholder buy-in.
- **Implementation:** Programmes are implemented and policies are enforced.
- **Outcomes:** Programmes result in meaningful and sustained reductions in residential water consumption among target users.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Infrastructure & Ecosystems	9. Protected Natural Environments	9.4 Protection of aquatic habitats and ecosystems

INDICATOR:

Policies and programmes protect aquatic habitats and ecosystems.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Existing laws, policies or programmes protect aquatic wildlife and plant-life by reducing or eliminating the negative impacts of pollution, invasive species, human influence and other potential harmful factors. Policies adhere to accepted standards that define healthy aquatic habitats and ecosystems
- **Stakeholder input:** Experts are consulted to develop policy that protects aquatic habitats and ecosystems according to accepted best practice.
- **Sufficient resources:** Policies and programmes are supported by sufficient money and human resources to achieve defined goals.
- **Scope:** Mechanisms cover all vulnerable aquatic habitats and ecosystems.
- **Enforcement:** Mechanisms are effectively and universally enforced.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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1 - Poor
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N/A

DIMENSION:	GOAL:	SUBGOAL:
Infrastructure & Ecosystems	9. Protected Natural Environments	9.5 Protection of groundwater and surface water resources

INDICATOR:

Protections exist to prevent over-abstraction and eliminate pollution of surface water sources.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Existing laws, policies or programmes protect surface water sources by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, reducing the amount of untreated wastewater and increasing recycling. Policies adhere to accepted standards that define limits on abstraction and pollution.
- **Stakeholder input:** Experts are consulted to develop policy that protects water resources according to accepted best practice.
- **Sufficient resources:** Policies and programmes are supported by sufficient money and human resources to achieve defined goals.
- **Scope:** Mechanisms cover all surface water resources.
- **Enforcement:** Mechanisms are effectively and universally enforced.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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1 - Poor
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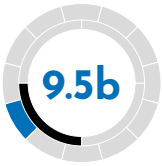
N/A

DIMENSION:	GOAL:	SUBGOAL:
Infrastructure & Ecosystems	9. Protected Natural Environments	9.5 Protection of groundwater and surface water resources



INDICATOR:

Protections exist to prevent over-abstraction and eliminate pollution of groundwater sources.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Existing laws, policies or programmes protect groundwater sources by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, reducing the amount of untreated wastewater and increase recycling. Policies adhere to accepted standards that define limits on groundwater abstraction and pollution.
- **Stakeholder input:** Experts are consulted to develop policy that protects water resources according to accepted best practice.
- **Sufficient resources:** Policies and programmes are supported by sufficient money and human resources to achieve defined goals.
- **Scope:** Mechanisms cover all groundwater resources.
- **Stakeholder input:** Policies have been developed in consultation with experts. They reflect a full understanding of the type and scope of threats to local environment and ecosystems.
- **Enforcement:** Mechanisms are effectively and universally enforced.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Infrastructure & Ecosystems; Health and Wellbeing	10. Equitable Provision of Essential Services	10.1 Provision of safe water for personal and domestic use

INDICATOR:

All people have access to sufficient, safe, accessible and affordable water for personal and domestic use

GUIDING CRITERIA / GUIDING QUESTIONS:

Guiding criteria are based on the Human Right to Water and Sanitation[3]:

- **Availability:** The water supply for each person is be sufficient or personal and domestic uses. Supply is continuous, and of acceptable quantity for all domestic uses.
- **Physical Accessibility:** Water facilities are physically accessible for everyone within, or in the immediate vicinity of households, workplaces and institutions (including health, educational, government, religious, etc.). Adequate number of sources exist for each user. Water points are close to dwellings, with minimum time required to transport water. If travel is required to access water, the path is safe and convenient. If technology is necessary to access water, it is easy-to-use and appropriate for local needs.
- **Quality:** Water is of such a quality that it does not pose a threat to human health. It is be provided according to accepted guidelines for drinking-water quality.
- **Affordability:** Affordability is an essential consideration in provision of safe water for personal and domestic use. It is considered in Subgoal 10.4, "Universal affordability of water and sanitation services".
- **Acceptability:** Water is of an acceptable colour, odour, and taste given local context and users.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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N/A

[3] *Whittington, D. (2003). Municipal water pricing and tariff design: a reform agenda for South Asia. Water policy, 5(1), 61-76.*

DIMENSION:	GOAL:	SUBGOAL:
Infrastructure & Ecosystems; Health and Wellbeing	10. Equitable Provision of Essential Services	10.2 Provision of sanitation services

INDICATOR:

All people have access to sanitation that is safe, hygienic, secure, affordable, and socially and culturally acceptable.

GUIDING CRITERIA / GUIDING QUESTIONS:

Guiding criteria are based on the Human Right to Water and Sanitation[4]:

- **Availability:** There are sufficient number of improved sanitation facilities (with associated services) within, or in the immediate vicinity, of each household and in other high-use settings, including workplaces, schools, health facilities, etc. An "improved" sanitation facility is one that hygienically separates human excreta from human contact.
- **Physical Accessibility:** Sanitation facilities are physically accessible for everyone. They can be accessed at all times of day and night. Waiting times are not unreasonably long. The location of sanitation facilities is critical to ensuring minimal risks to the physical security of users. If travel is required to access sanitation facilities the path is safe and convenient.
- **Quality:** Sanitation facilities are safe to use: the floor and superstructure is stable. They effectively prevent human, animal and insect contact with human excreta, and excreta is safely disposed in-situ or treated off-site. Special attention has been paid to the safety needs of persons with disabilities and children. Sanitation facilities ensure access to water for hand-washing and anal and genital cleansing. The facility has to be equipped for adequate menstrual hygiene management.
- **Affordability:** Affordability is an essential consideration in provision of sanitation services. It is considered in Subgoal 10.4, "Universal affordability of water and sanitation services".
- **Acceptability:** Sanitation facilities and services are culturally acceptable. Facilities are designed to ensure appropriate levels of privacy.
- **Scope:** All services within the sanitation service cycle/market chain—including collection, transport and disposal of waste—are made available, and are safe, affordable and acceptable.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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N/A

[3] *Whittington, D. (2003). Municipal water pricing and tariff design: a reform agenda for South Asia. Water policy, 5(1), 61-76.*

DIMENSION:	GOAL:	SUBGOAL:
Infrastructure & Ecosystems; Health and Wellbeing	10. Equitable Provision of Essential Services	10.3 Universal affordability of water and sanitation services

INDICATOR:

Safe water for consumption is made affordable to all users.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Affordability:** Safe water for consumption is made available for use at a price that is affordable to all people. Affordability describes to the relative ability to pay without suffering undue financial hardship. Whilst there is no universal standard for affordability, 3-5% of household expenditure is often cited as a target for costs related to combined water and sanitation service provision. Price for water should consider the cost of fees related to connections and required infrastructure, as well as regular service provision.
- **Scope:** Affordable services are made available to all people regardless of status or background. Particular consideration has been paid to ensure vulnerable groups are provided with affordable services. Vulnerable groups may include women and children, indigenous peoples, migrants, ethnic minorities, disabled individuals, elderly, urban poor and residents lacking formal property rights.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Infrastructure & Ecosystems; Health and Wellbeing	10. Equitable Provision of Essential Services	10.3 Universal affordability of water and sanitation services

INDICATOR:

Safely managed sanitation services are made affordable to all users.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Affordability:** Access to sanitation facilities and services is available at a price that is affordable for all people. Affordability includes construction, emptying and maintenance of facilities, as well as treatment and disposal of faecal matter. Affordability describes to the relative ability to pay without suffering undue financial hardship. Whilst there is no universal standard for affordability, 3-5% of household expenditure is often cited as a target for costs related to combined water and sanitation service provision. Price for sanitation should consider the cost of fees related to connections and required infrastructure, as well as regular service provision.
- **Scope:** Affordable services are made available to all people regardless of status or background. Particular consideration has been paid to ensure vulnerable groups are provided with affordable services. Vulnerable groups may include women and children, indigenous peoples, migrants, ethnic minorities, disabled individuals, elderly, urban poor and residents lacking formal property rights.

SCORES AND NOTES

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Infrastructure & Ecosystems; Health and Wellbeing	10. Equitable Provision of Essential Services	10.4 Provision of health services to reduce trauma from water hazards

INDICATOR:

High quality health services are made available to residents to reduce impacts from water-related shocks and stresses, including water-borne diseases.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Physical and mental health services exist. These include services provided following a disaster and during recurrent stresses. Health services are provided to reduce the spread of water-borne diseases and illnesses, including illnesses linked to standing water, such as malaria and Dengue fever. Mental health services treat psychological trauma resulting from water-related shocks.
- **Affordability:** Health services are affordable to all residents. Subsidies are provided where needed for poor residents.
- **Access:** Health services are made available to all communities. They are physically accessible and located throughout the city.
- **Timeliness:** Health services are provided immediately following an event to prevent widespread negative public health impacts. Patients are seen by medical professionals with minimal delay.
- **Monitoring and evaluation:** The health system's capacity to respond to mass casualty incidents has been assessed. Evaluation is performed regularly to identify critical resource gaps, including personnel, facilities, equipment, management and communication channels. Assessment results are incorporated into other planning initiatives, such as disaster management and hazard response plans.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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Minimal improvement is required. The indicator mostly reflects conditions in the city.

3 - Fair
Some improvement is required. The indicator somewhat reflects conditions in the city.

2 - Low
Significant improvement is required. The indicator mostly does not reflect conditions in the city.

1 - Poor
The indicator does not at all reflect current conditions in the city.

N/A

DIMENSION:	GOAL:	SUBGOAL:
Health and Wellbeing	11. Healthy Urban Spaces	11.1 Application of water sensitive design principles to buildings

INDICATOR:

Design principles are promoted to improve water performance for buildings.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Strategies, policies and design standards exist for new and existing buildings to guide improved efficiency of water consumption and minimize negative environmental impacts. Based on these principles, water is considered in new and existing buildings as both amenity and a functional design element, integrating benefits such as flood attenuation and water treatment. In water-stressed cities, building design seeks to reduce water use wherever possible, for example through the use of water efficient appliances, rainwater harvesting and drought tolerant plants for exterior landscaping.
- **Quality:** Design principles reflect industry best practices and have been adopted to local context in consultation with experts.
- **Clarity:** Principles are clear and easy to understand by intended users, including building owners, residents and builders.
- **Scope:** Principles are widely applicable and describe a wide range of building types including residential, commercial and institutional buildings at multiple scales.
- **Implementation:** Design principles are broadly adopted by users. If guidelines are stipulated in city building code, they are enforced by relevant agencies.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

5 - Optimal
No improvement is required. The indicator fully reflects conditions in the city.

4 - Good
Minimal improvement is required. The indicator mostly reflects conditions in the city.

3 - Fair
Some improvement is required. The indicator somewhat reflects conditions in the city.

2 - Low
Significant improvement is required. The indicator mostly does not reflect conditions in the city.

1 - Poor
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N/A

DIMENSION:	GOAL:	SUBGOAL:
Health and Wellbeing	11. Healthy Urban Spaces	11.2 Introduction and enhancement of water-sensitive urban design

INDICATOR:

Water is incorporated as a design element in urban place-making.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** The city features high quality, clean and safe landscapes, amenities and recreational opportunities developed around water, including beaches, wetlands, lake fronts, pools, fountains and other elements that enhance the public domain. In water-stressed geographies, design elements that reduce water use are considered in urban place-making by government and the private sector, for example through the use of drought tolerant plants .
- **Accessibility:** Where they exist, amenities are made available to diverse users, including people from diverse backgrounds and abilities. Amenities are widely distributed or accessible to residents throughout the city.
- **Scope:** Enough water amenities exist to meet demand from city residents and visitors.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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1 - Poor
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N/A

DIMENSION:	GOAL:	SUBGOAL:
Health and Wellbeing	11. Healthy Urban Spaces	11.3 Promotion of water-sensitive urban land development

INDICATOR:

Water is incorporated as a key consideration in land-use planning and development.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Regulations and/or incentives ensure that land development ensures the 'highest and best use' of land near water, resulting in the highest social and economic value of that land. Land-use planning discourages development in areas at risk from flooding. In water-stressed cities, public and private development schemes consider ways to minimize water consumption through land-use planning—for example, by encouraging development in water-rich areas. Where appropriate, efforts are made to catalyse new investment in real estate and land development around rivers, lakes, coastlines and other water features.
- **Equitable:** Land-use planning and responsible land development applies to all populations in the city and benefits all segments of society including historically disadvantaged, urban poor and vulnerable social groups.
- **Monitoring and evaluation:** Data and insight on the value of integrating water into new and existing development is gathered and used to inform policy, design, funding and investment
- **Outcomes:** Urban development concentrates in areas at lowest risk from water shocks and stresses, and high-risk areas are reserved for alternative uses wherever possible (for example, maintained as recreational facilities or parks).

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Health and Wellbeing	11. Healthy Urban Spaces	11.4 Introduction and enhancement of neighbourhood blue-green infrastructure

INDICATOR:

Blue and green infrastructure is adopted in neighbourhoods.

GUIDING CRITERIA / GUIDING QUESTIONS:

Green infrastructure refers to bioswales, permeable paving, planter boxes, rain-gardens, green roofs and other designed interventions that incorporate natural elements to improve drainage and water quality, among other co-benefits. *Blue infrastructure* refers to ponds, constructed wetlands, rivers, blue roofs and other features.

- **Planning:** A city-wide blue or green infrastructure plan or multiple neighbourhood-level plans have been developed. Water utilities and city departments involved in managing urban water have procedures that incorporate blue-green infrastructure into new infrastructure investments where they are suitable to local context and cost-effective. Alternatively, community-led blue-green infrastructure are adopted where appropriate and local support exists for introducing, maintaining and enhancing blue-green infrastructure.
- **Quality:** Standards for new and existing blue-green infrastructure reflect industry best practice and have been adopted to local context.
- **Scope:** Blue-green infrastructure is made available to communities in all areas within the city.
- **Sufficient resources:** Sufficient financial, technical and human resources are made available to develop and implement strategies. Resources are made available to support or incentivize community-led efforts to promote blue and green infrastructure at the household or neighbourhood level.
- **Implementation:** Strategies are implemented according to planning documents. Community blue-green infrastructure is introduced where appropriate, and well maintained.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Health and Wellbeing	12. Prosperous Communities	12.1 Protections around climate-related displacement

INDICATOR:

Policies exist that protect vulnerable populations from displacement as a result of water-related shocks and stresses.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Laws or policies exist to minimize relocation due to water risk, and to guide decisions related to relocation of people as a result of water-related shocks and stresses. Displacement may be the result of direct impacts from hazards such as flooding or indirect impacts from rising property costs or other economic pressures.
- **Equity:** Laws and policies provide guidance on how to minimise impacts on vulnerable communities, including low-income communities, residents of informal settlements, disabled people, women and children. When displacement of communities is necessary to protect lives and property, policies ensure that resettlement is equitable and that residents are adequately compensated. Public policies to reduce displacement are coordinated with other government programmes that provide social services and protections against natural hazards.
- **Stakeholder input:** Policies are developed with inputs from diverse stakeholders and in consultation with affected groups, including those at high risk from climate hazards.
- **Enforcement:** Policies are enforced. At-risk communities and vulnerable populations are protected against displacement from climate impacts where possible. When displacement is necessary, resettlement is fair and adequately compensated.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Health and Wellbeing	12. Prosperous Communities	12.2 Provision of sufficient water quality and quantity for industry and commerce

INDICATOR:

Businesses and industry have access to sufficient water of appropriate quality.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Water is provided to businesses and industry. Examples of water for industrial and commercial applications include manufacturing and industrial processes that use water as a key input, equipment cooling and cleaning, food and beverage preparation and production. Water is also required to support business staff and customers.
- **Planning:** Government or industry plans consider water in strategy development and planning for economic development. Planning accounts for differences in the quantity and timing of water needs for business and industry. Businesses are aware of and plan for water security as a risk.
- **Quantity:** There is sufficient water provided to businesses to function and grow.
- **Quality:** Water is of an appropriate quality for required uses.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Health and Wellbeing	12. Prosperous Communities	12.4 Support for livelihoods around water

INDICATOR:

Jobs and skills are developed, and new opportunities created for developing livelihoods around water.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Baseline assessment:** Efforts have been taken to identify livelihoods dependent on water resources and to understand the people involved. The size and relative importance of economies based on water resources is well understood.
- **Strategy development:** Programmes, policies or initiatives are developed to preserve existing jobs related to water and develop new jobs that use water as a critical asset for local economic growth, including around transport, shipping, fishing and aquaculture, tourism, real estate development or other industries that rely on water resources. Sector-specific training programmes and support for vocational and higher education are outlined. Education and training efforts preserve or create new livelihoods linked to water resources. Plans account for potential socio-economic impacts on local populations.
- **Scope:** A range of livelihoods and industries—related to both formal and informal economies—are considered when developing initiatives.
- **Sufficient resources:** Programmes to support livelihoods are provided with sufficient money and human resources to realize plans. Investment from government or private sector is secured to support economic development around water resources.
- **Implementation:** Programmes, policies or initiatives are implemented, resulting in new jobs based on water resources, and healthy local economies. Workers are adequately protected by safety regulations.

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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N/A

DIMENSION:	GOAL:	SUBGOAL:
Health and Wellbeing	12. Prosperous Communities	12.3 Support for improved mobility through water-related transportation

INDICATOR:

All communities have access to safe and reliable water-related transport where it is feasible to operate.

GUIDING CRITERIA / GUIDING QUESTIONS:

- **Existence:** Opportunities exist for water-related mobility through lakes, rivers, canals, harbours and coastal transport using ferries, water taxies and other forms of water transit.
- **Access:** Transport services are accessible to all communities and are located conveniently throughout the city.
- **Scope:** Services are competitive, providing public transport options and critical links between urban areas. Transport includes a diversity in routes, modes and variation in vessel type to meet passenger demand. Water-related mobility is integrated into public transport network integration through inter-modal transit connections and timetabling alignment, seamless ticketing, and inter-modal infrastructure (including walk and cycle infrastructure)
- **Affordability:** Services are affordable to all.
- **Reliability:** Transport services are frequent and reliable and operate during evenings and weekends. They adhere to accepted and enforced safety standards.
- **Land use integration:** Water-related transport has been employed to unlock potential for new development, provide opportunities for housing, and catalysed urban regeneration and economic vitality

SCORES AND NOTES

P1	P2	P3	P4	P5	P6	P7	P8

INDICATOR SCORES:

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N/A

INDICATOR SCORING

DAY 1 - SESSION 1

Indicators discussed

Participant names

P1

P2

P3

P4

P5

P6

P7

DAY 1 - SESSION 2

Indicators discussed

Participant names

P1

P2

P3

P4

P5

P6

P7

DAY 2 - SESSION 1

Indicators discussed

Participant names

P1

P2

P3

P4

P5

P6

P7

DAY 2 - SESSION 2

Indicators discussed

Participant names

P1

P2

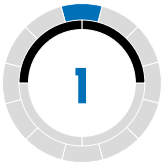
P3

P4

P5

P6

P7



EMPOWERED COMMUNITIES

DIMENSION:
Leadership & Strategy;
Health & Wellbeing

Subgoal Name		Indicator	Ratings							
			P1	P2	P3	P4	P5	P6	P7	
1.1	Active community engagement and participation around water issues	Legal and institutional frameworks and mechanisms promote active, free and meaningful participation around issues related to water supply, sanitation, drainage and flooding.								
1.2	Effective communication of government programmes and policies around water	Mechanisms ensure that comprehensive information on government programmes and policies are disseminated to all stakeholders.								
1.3	Promotion of social cohesiveness and strong community networks	Inclusive and participatory social networks (formal and informal) enable communities to learn from each other, self-organize and act collectively in times of need.								
1.4	Support for civil society institutions working on water issues	Mechanisms ensure that financial, institutional and technical support is provided to civil society institutions working on water issues								

Comments

STRATEGIC VISION

DIMENSION:
Leadership & Strategy

Subgoal Name		Indicator	Ratings							
			P1	P2	P3	P4	P5	P6	P7	
2.1	Incorporation of expert and technical knowledge into decision-making around water issues	Technical knowledge is available, understood and continuously incorporated into decision-making around water issues.								
2.2	Incorporation of local knowledge and culture into decision-making	Local knowledge and cultural values of all population groups are referred to in decision-making around water issues.								
2.3	Incorporation of social, environmental and economic costs and benefits into decision-making around water	The social, environmental and economic impacts of increased water resilience are understood and incorporated into short, medium and long-term decision-making around water issues.								
2.4	Long-term strategy development and action planning around water	A long-term strategy is in place to guide projects and programmes that build water resilience over time.								
2.5	Political leadership around water resilience issues	Political leadership promotes resilience as a priority issue in government decision-making.								

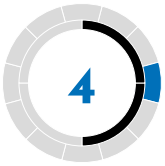
Comments

COORDINATED BASIN GOVERNANCE

DIMENSION:
Leadership & Strategy

Subgoal Name		Indicator	Ratings							
			P1	P2	P3	P4	P5	P6	P7	
3.1	Proactive coordination around downstream impacts	Coordination between city stakeholders and relevant downstream stakeholders minimize downstream impacts.								
3.2	Proactive coordination with relevant upstream stakeholders	Frameworks and mechanisms promote coordination between city stakeholders and relevant upstream stakeholders on water issues.								
3.3	Proactive coordination between and within government agencies	3.3a Coordination exists between different government agencies operating at various administrative levels to define and implement water priorities.								
		3.3b Coordination exists within government agencies to define and implement water priorities.								
3.4	Proactive coordination between government, private sector and civil society	Frameworks and mechanisms promote dialogue and deliberation around water and resilience issues between government and non-government actors.								
3.5	Promotion of clear stakeholder roles and responsibilities	Frameworks and mechanisms clearly define the roles and responsibilities of water stakeholders.								

Comments



EFFECTIVE REGULATION AND ACCOUNTABILITY

DIMENSION:
Leadership & Strategy;
Planning & Finance

Subgoal Name		Indicator	Ratings							
			P1	P2	P3	P4	P5	P6	P7	
4.1	Effective enforcement of economic regulations for water	Economic regulation of water and sanitation services and water resources is performed effectively, resulting in adequate provision of key services, and high customer satisfaction.								
4.2	Effective enforcement of environmental regulations for water	Environmental regulation is performed effectively, resulting in high quality, protected water environments.								
4.3	Effective enforcement of public health regulation for water	Public health regulation for water is performed effectively, resulting in water that is safe to consume and wastewater that can be returned to the water cycle with minimal environmental impact.								
4.4	Enforcement of land use regulations and zoning	A sound regulatory framework controls land use and urban expansion and reduces growth in high-risk and water-poor areas.								
4.5	Enforcement of design guidelines and construction standards for water infrastructure	Technical standards and design guidelines define best practice for critical infrastructure.								
4.6	Effective implementation of transparent and accountable decision-making procedures	Decision-making procedures around water resources management, water and wastewater services are made clear and open to all stakeholders.								

Comments

ADAPTIVE AND INTEGRATED PLANNING

DIMENSION:
Planning & Finance

Subgoal Name		Indicator	Ratings							
			P1	P2	P3	P4	P5	P6	P7	
5.1	Active monitoring and evaluation of programmes	Monitoring and evaluation mechanisms and frameworks measure how programmes have achieved intended outcomes and disseminate lessons learned.								
5.2	Dissemination of accurate data	Accurate data is used by key decision-makers in government, private sector and civil society to promote urban water resilience.								
5.3	Incorporation of redundancy into water sources, networks and assets	5.3a Redundancy exists in the networks and assets responsible for water supply, treatment and sanitation.								
		5.3b Redundancy exists in the sources that supply water to the city.								
5.4	Integrated planning across interdependent urban systems	Coordination exists between public sector water agencies, water utilities and organizations working in related domains such as energy, telecommunications, waste management and transportation.								
5.5	Integrated planning with agriculture and food supply chains	Coordination exists between water agencies and organizations involved in food supply and production.								
5.6	Promotion of culture, processes and resources to enable innovation	Resources and processes reinforce a culture of innovation within the water sector.								

Comments

SUSTAINABLE FUNDING AND FINANCE

DIMENSION:
Planning & Finance

Subgoal Name		Indicator	Ratings							
			P1	P2	P3	P4	P5	P6	P7	
6.1	Promotion of integrity in contracting and financial decision-making procedures	Financial procedures promote transparency, minimize risk and ensure that procurement processes are implemented fairly and efficiently.								
6.2	Provision of sufficient financial resources for maintenance and upkeep of water infrastructure	Adequate funding exists to maintain existing water infrastructure and to support ongoing programmes.								
6.3	Provision of sufficient financial resources for new water programmes and projects	Adequate funding exists to finance new capital projects and programmes that support water resilience.								
6.4	Water and sanitation pricing for cost recovery and demand management	Water tariffs are sustainable and equitable.								

Comments

EFFECTIVE DISASTER RESPONSE AND RECOVERY

DIMENSION:
Planning & Finance;
Infrastructure & Ecosystems

Subgoal Name		Indicator	Ratings							
			P1	P2	P3	P4	P5	P6	P7	
7.1	Comprehensive hazard monitoring, forecasting and early warning systems	Monitoring, modelling and early warning systems mitigate hazard risks.								
7.2	Coordination of disaster response and recovery preparation	Disaster response and recovery coordination plans and procedures are current, collaborative, well-rehearsed and properly funded.								
7.3	Ensuring adequate funds to government for disaster recovery	Public authorities have access to funds for disaster recovery.								
7.4	Ensuring adequate financial resources for recovery of households and businesses	Households and businesses have access to sufficient financial resources for recovery and continuity following shock events or persistent stresses.								
7.5	Promotion of community capacity for preparedness and response to water hazards	Mechanisms promote community preparedness and community-based early warning systems and response to water-related shocks and stresses.								

Comments

EFFECTIVE ASSET MANAGEMENT

DIMENSION:
Infrastructure & Ecosystems

Subgoal Name		Indicator	Ratings							
			P1	P2	P3	P4	P5	P6	P7	
8.1	Active monitoring and evaluation of water infrastructure	Monitoring and evaluation of water infrastructure and networks ensures data is current and accurate.								
8.2	Ensuring adequate human capacity for operations and implementation	Technical and managerial staff are trained and knowledgeable in areas related to operation of key infrastructure and project implementation.								
8.3	Promotion of diverse infrastructure for flood protection	'Grey' and 'green' infrastructure provide protection from flooding and ensure adequate urban drainage.								
8.4	Routine maintenance and upgrade of water infrastructure	Existing infrastructure is regularly maintained and upgraded to reduce likelihood of failure.								
8.5	Promotion of reliable supply chains for water infrastructure	Supply chains for key water and sanitation infrastructure are reliable during normal conditions and in the face of shocks and stresses.								

Comments

PROTECTED NATURAL ENVIRONMENTS

DIMENSION:
Infrastructure & Ecosystems

Subgoal Name		Indicator	Ratings							
			P1	P2	P3	P4	P5	P6	P7	
9.1	Active monitoring and evaluation of environmental resources	9.1a Environmental monitoring is conducted to assess the health of water resources.								
		9.1b Environmental monitoring is conducted to assess the health of environmental systems.								
9.2	Promotion of sustainable commercial and industrial water use	Mechanisms promote sustainable water use for commercial and industrial users.								
9.3	Promotion of sustainable household water use	Mechanisms promote sustainable water use for households.								
9.4	Protection of aquatic habitats and ecosystems	Policies and programmes protect aquatic habitats and ecosystems.								
9.5	Protection of groundwater and surface water resources	9.5a Protections exist to prevent over-abstraction and eliminate pollution of surface water sources.								
		9.5b Protections exist to prevent over-abstraction and eliminate pollution of groundwater sources.								

Comments

EQUITABLE PROVISION OF ESSENTIAL SERVICES

DIMENSION:
Infrastructure & Ecosystems;
Health and Wellbeing

Subgoal Name		Indicator	Ratings							
			P1	P2	P3	P4	P5	P6	P7	
10.1	Provision of safe water for personal and domestic use	All people have access to sufficient, safe, accessible and affordable water for personal and domestic use								
10.2	Provision of sanitation services	All people have access to sanitation that is safe, hygienic, secure, affordable, and socially and culturally acceptable.								
10.3	Universal affordability of water and sanitation services	10.3a Safe water for consumption is made affordable to all users.								
		10.3b Safely managed sanitation services are made affordable to all users.								
10.4	Provision of health services to reduce trauma from water hazards	High quality health services are made available to residents to reduce impacts from water-related shocks and stresses, including water-borne diseases								

Comments

HEALTHY URBAN SPACES

DIMENSION:
Health and Wellbeing

Subgoal Name		Indicator	Ratings							
			P1	P2	P3	P4	P5	P6	P7	
11.1	Application of water sensitive design principles to buildings	Design principles are promoted to improve water performance for buildings								
11.2	Introduction and enhancement of water-sensitive urban design	Water is incorporated as a design element in urban place-making								
11.3	Promotion of water-sensitive urban land development	Water is incorporated as a key consideration in land-use planning and development								
11.4	Introduction and enhancement of neighbourhood blue-green infrastructure	Blue and green infrastructure is adopted in neighbourhoods								

Comments

PROSPEROUS COMMUNITIES

DIMENSION:
Health and Wellbeing

Subgoal Name		Indicator	Ratings							
			P1	P2	P3	P4	P5	P6	P7	
12.1	Protections around climate-related displacement	Policies exist that protect vulnerable populations from displacement as a result of water-related shocks and stresses.								
12.2	Provision of sufficient water quality and quantity for industry and commerce	Businesses and industry have access to sufficient water of appropriate quality.								
12.3	Support for livelihoods around water	Jobs and skills are developed, and new opportunities created for developing livelihoods around water.								
12.4	Support for improved mobility through water-related transportation	All communities have access to safe and reliable water-related transport where it is feasible to operate.								

Comments

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