

**1.1 Knowledge, skills and organisational capacity - To strengthen practitioners' skills and knowledge, foster meaningful engagement and enhance cross-sectoral, multidisciplinary and inter-organisational planning and delivery.**

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. <b>Integrated water-related skills</b> and knowledge are <b>rare</b> in water-related organisations in the region. <b>Engineering or technical skills dominate</b> organisational skills. <b>Limited formal training opportunities</b> exist, emphasis on practical skills and experience. Organisational knowledge and capacity is <b>regularly lost</b> due to staff turnover.</p> <p>2. <b>Integrated water-related skills</b> and knowledge are <b>available</b> in the key water-related organisation in the region, but limited to a few individuals. <b>Engineering or technical skills dominate</b> organisational skills. Formal education and training supports professional capacities. Organisational knowledge and capacity is often lost due to staff turnover.</p> <p>3. <b>Integrated water-related skills</b> and knowledge are <b>actively maintained</b> and updated across the key water-related organisation in the region. <b>Engineering skills are complemented by other disciplinary skills</b> (for example, landscape and ecology). Some connection(s)/alliance(s) with knowledge brokering organisation(s) is/are in place.</p> <p>4. <b>Integrated water-related skills</b> and knowledge are <b>influenced by science</b>, actively maintained and updated across the key water-related organisation in the region. Regular connection(s)/alliance(s) with knowledge brokering organisation(s) is/are in place. <b>Multi-disciplinary skills are common</b> (for example, landscape and ecology, social and urban design). This extends to embedding multidisciplinary skills into key decision-making positions/groups.</p> <p>5. <b>Integrated water-related skills</b> and knowledge are <b>influenced by science</b>, actively maintained across the key water-related organisation in the region. A <b>strong learning culture</b> means knowledge and skill needs are regularly reassessed and updated. <b>Multi-disciplinary skills are common</b> (for example, landscape and ecology, social and urban design, architects) <b>and applied</b> to projects and decision-making. <b>Organisations support</b> (e.g. fund) <b>research</b> and knowledge brokering programs (such as, capacity building programs).</p>	<p><b>Science influence</b> Are there contacts and partnerships with research organisations, do organisations invest in research and capacity building programs to fill their gaps?</p> <p><b>Capacity</b> What are the skills and knowledge required for water sensitive management and governance?  What is the level of skill and knowledge available in the various organisations?  How are internal skills assessed and what measures are in place to update knowledge and skills?</p> <p><b>Learning culture</b> How important is keeping skills and knowledge up to date for the organisations relative to other activities (e.g. as can be judged from budget or otherwise resource allocation)?  How do organisations deal with gaps in skills and knowledge - to what degree do they have a learning culture?</p>	<p>Interviews or surveys within organisations</p> <p>Policy documents</p> <p>Programs and activities for skill and knowledge development</p> <p>Annual reports - regarding resources allocated to skill and knowledge development</p> <p>Organisational chart - presence of people with responsibility to organise the maintenance and updating of skills and knowledge</p> <p>Partnerships with universities and other research institutes</p>

## 1.2 Water is key element in city planning and design – To improve urban planning decisions, processes and practices to support water sensitive outcomes.

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. <b>Water policy and management</b> beyond essential services are <b>rarely considered</b> in matters of urban planning and design. Water servicing for informal settlements happens as needed and does not take into account impacts on broader city planning.</p> <p>2. <b>General policy on sustainable urban water management</b> is in place but there is a lack of focus on integrated urban and water system planning. Regulation exists but is not enforced.</p> <p>3. <b>Urban planning policy acknowledges</b> the role of water systems and the services they provide. <b>Urban planning</b> generally involves some <b>coordination with utility service providers</b>. Some <b>individual advocacy of water sensitivity</b> in the physical form and layout of urban development. Preliminary practical guidance is emerging. Urban developments experiment with water sensitive urban design. Regulation enforcement is starting to mature.</p> <p>4. <b>Urban planning policy acknowledges</b> the role of <b>water systems in supporting liveability and sustainability</b>. <b>Formal collaborative processes for integrated urban and water planning are established</b>. <b>Urban planning and design standards and guidelines include some specific water sensitive related incentives and requirements</b>. Urban developments incorporating water sensitive urban design elements are becoming commonplace. <b>Monitoring and evaluation</b> of planning and performance outcomes is in place.</p> <p>5. <b>Water system planning is fully integrated</b> in urban planning and design. Formal collaborative governance structures with clearly defined roles and responsibilities are mandated and embedded in practice. Urban design guidelines address the critical role of water in achieving liveability, sustainability, resilience and productivity goals Comprehensive policy and regulation incorporating clear and specific water-related objectives/performance requirements and incentives is in place. Urban developments incorporating water sensitive urban design are the norm. <b>Monitoring and evaluation</b> of planning and performance outcomes is in place.</p>	<p><b>Water system planning</b> In what ways are the following things taken into account in water system planning processes and approaches?</p> <ul style="list-style-type: none"> <li>• the long term</li> <li>• integration with the built form</li> <li>• planning and building controls</li> </ul> <p><b>Monitoring and evaluation</b> How are the review processes for urban planning decisions and practices undertaken and what evidence exists for improvements in practices as a response to these processes?</p> <p><b>Evaluation frameworks</b> What are the processes and approaches in place to take different sectoral/stakeholder priorities into account?</p> <p><b>Policy and strategy</b> Is there evidence of cross-sectoral commitment to integrate water management in broader urban planning and design? How is liveability, sustainability and resilience planning embedded in water and urban policies and practice?</p> <p><b>Legislation and regulation</b> Do statutory planning requirements mandate water sensitive practices are incorporated into land use planning and urban design?</p>	<p>Strategies that formally acknowledges the role of water.</p> <p>Urban design guidelines and policy documents, project proposals and strategic plans.</p> <p>Statutory and strategic planning and policies.</p> <p>Monitoring and evaluation of projects.</p>

**1.3 Cross-sector institutional arrangements and processes – To ensure institutional processes support robust, effective, transparent and stable cross-sectoral arrangements, with joint accountability between all sectors, organisations and levels on how water sensitive goals should be achieved.**

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. Relevant <b>institutional arrangements</b> and processes are <b>lacking</b>, ad hoc or in continuous flux. <b>Organisations act on their own</b> and no input with other stakeholders is sought at any stage of any project. Organisational <b>responsibilities are unclear</b>, especially in regards to urban water management and environmental regulation.</p> <p>2. <b>Some</b> relevant <b>institutional arrangements</b> and processes are <b>present</b>. <b>Coordination between organisations</b> is <b>sometimes</b> sought if strictly necessary or externally enforced.</p> <p>3. Relevant <b>institutional arrangements</b> and processes are <b>mostly transparent</b> and <b>embedded in policies</b> and strategies. <b>Some collaboration</b> is typically occurring at some stage of most projects. <b>Some structures and processes</b> are in place to <b>promote integrated outcomes across organisations</b>, such as collaboration platforms and work groups.</p> <p>4. Relevant <b>institutional arrangements</b> and processes are <b>fully transparent</b> and thoroughly <b>embedded in policies</b> and strategies. Organisations <b>monitor, evaluate and adapt</b> these processes and arrangements according to changing circumstances and new insights. Agencies are required to share information, and <b>transparency</b> supports platforms for coordination and <b>inter-agency networks</b>. <b>Collaboration</b> with relevant stakeholders in <b>some stages of all projects is sought</b>. <b>Several ongoing partnerships</b> are established to drive particular integrated initiatives.</p> <p>5. Relevant <b>institutional arrangements</b> and processes are <b>mandated</b> in policy and planning frameworks and thoroughly <b>embedded in organisational</b> strategies. Organisations <b>monitor, evaluate and adapt</b> these processes and arrangements according to changing circumstances and new insights. Agencies are required to share information and <b>full transparency</b> ensures coordination across <b>inter-agency networks</b>. <b>Collaboration</b> with relevant stakeholders in <b>all stages of all projects occurs</b>. Collaborative work is undertaken across policy portfolios (e.g. energy, transport, health etc.). <b>Many ongoing partnerships</b> are established <b>with joint accountability</b> common e.g. targets, KPIs, shared investment or maintenance responsibilities.</p>	<p><b>Monitoring and evaluation</b> What is the review and reporting process for institutional coordination and inter-agency arrangements and what evidence exists that demonstrates an improvement in practice as a response to these processes?</p> <p><b>Policy and strategy</b> What policy supports cross sector collaboration? Is work undertaken across policy portfolios? How well are the organisations equipped and organised to deal with matters that go beyond the boundaries of what they are directly responsible for (e.g. jurisdiction or property wise)?</p> <p>How do organisations deal with externalities and responsibilities around boundary-crossing issues, e.g. do they have joint strategies, investment proportional to ultimate beneficiaries etc.?</p> <p>To what degree does policy within the sector address boundary issues (such as, jurisdictional, property, ecological, organisational and disciplines) and externalities (such as joint strategies, shared KPIs and targets, pricing and off sets)?</p> <p><b>Networks</b> Who gets involved and at what stages? What are the interdisciplinary and cross-silo collaborations involved in project planning and execution? Are collaborative arrangements formal or informal? e.g. Managing Directors group once a month, formal - collaborative group, informal interactions between stakeholders e.g. phone calls, emails, meetings, preparing reports etc.</p> <p><b>Monitoring and evaluation</b> What is the review and reporting process for institutional coordination and inter-agency arrangements and what evidence exists that demonstrates an improvement in practice as a response to these processes?</p>	<p>Interviews or surveys within organisations to ascertain the more informal or ad hoc approaches and arrangements</p> <p>Policy documents (for guidelines regarding project planning and collaboration)</p> <p>Project proposals and plans (for overview of the actual stakeholders and experts involved)</p> <p>Policy documents and regulations to assess the level of formal embedding of such approaches and arrangements</p> <p>Formal structures - permanent and indefinite - e.g. project-based collaboration and ultimately funding/investment arrangements</p>

## 1.4 Public engagement, participation and transparency – To actively pursue meaningful involvement and empowerment of citizens in decision-making processes.

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. <b>Public not</b> or hardly <b>informed</b> of sector activities due to citizen antipathy, lack of opportunity or lack of institutions that support participating in water governance.</p> <p>2. <b>Public is informed</b> around certain sector activities but <b>limited</b> opportunity for <b>participation and influence</b>. Some sections of the community are managed to minimize risk rather than foster participation. <b>No formal citizen engagement</b> nor transparency policy in place.</p> <p>3. <b>Public participate in some areas</b> of water governance, for example, through participation in public meetings, surveys and consultations undertaken on key issues or areas of interest.</p> <p>4. <b>Formal citizen engagement</b> and <b>transparency policies</b> are in place. <b>Citizens participate actively</b> in water governance, for example through reference groups, committees and collaborative initiatives. The <b>public</b> is routinely involved and <b>engaged in collaboration</b> and there is ongoing dialogue with the public about issues of interest.</p> <p>5. Ongoing and <b>frequent citizen engagement</b> activities, reaching in principle all people in the relevant area. These communication and <b>engagement activities</b> are part of <b>formal policy</b>. <b>Citizens participate actively</b> in water governance, for example through reference groups, committees and collaborative initiatives. Active liaisons between community organisations and formal water governance organisations (utilities, councils) exist and <b>citizens play important leadership roles</b> in water governance. The public is <b>routinely engaged in collaborations</b> and <b>empowered</b> to shape decisions in the water sector. There is ongoing dialogue with the public about the water sector priorities and activities.</p>	<p>What organisational policies and programs are in place for public engagement?</p> <p>How is the public informed about sector activities? What are the strategies, methods etc. in place to advise the public about sector activities?</p> <p>Are the engagement activities reaching the groups of people in the relevant areas? What IAP2 levels are engagement activities aimed at?</p> <p>Are ongoing communication networks and platforms between the water sector and the public established?</p>	<p>Review council policy and record details about transparency, and communication and public engagement activities.</p> <p>Examples of ongoing communication hubs, networks and platforms, established to support communication between the water sector and the public e.g. online forums, smartphone apps, regular public meetings, water events, community discussion groups etc. Refer to the IAP2 participation spectrum - <a href="https://www.iap2.org.au/resources/iap2s-public-participation-spectrum">https://www.iap2.org.au/resources/iap2s-public-participation-spectrum</a></p> <p>Reports on effectiveness of public engagement</p>

**1.5 Leadership, long-term vision and commitment – To articulate a water sensitive vision and narrative linked to broader city aspirations that drives innovation and water sensitive practices across all sectors and government levels.**

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. Leadership principles are based on fundamental water issues and <b>basic service provision</b> (water security and human health). <b>No recognition</b> of the broader value of water (e.g. <b>water sensitive principles and practices</b>). <b>Leadership of organisations does not support</b> such an agenda.</p> <p>2. <b>Individual champions</b> advocate individual elements of water sensitive principles and practices but <b>lack senior support</b> and therefore have <b>limited opportunity</b> to initiate change.</p> <p>3. Champions advocate water sensitive principles and practices. They have some influence organisationally, with <b>several leaders</b> supporting the water sensitive agenda and endorsing investment in <b>initiatives</b> to drive change.</p> <p>4. Several <b>senior leaders advocate</b> for water sensitive principles and practices. Organisations <b>commit to a water sensitive vision in policy and strategy</b>, embedding long-term broad aspirations for water's role in delivering liveability, sustainability, resilience and productivity outcomes. <b>Ongoing funding</b> is made available to deliver programs and initiatives that will support achievement of the water sensitive vision. <b>Incentives</b> exist to promote water sensitive practice.</p> <p>5. Several <b>senior leaders advocate</b> for water sensitive principles and practices. Organisations <b>commit to a water sensitive vision in policy and strategy</b>, embedding long-term broad aspirations for water's role in delivering liveability, sustainability, resilience and productivity outcomes. <b>Ongoing funding</b> is made available to deliver programs and initiatives that will support achievement of the water sensitive vision. <b>Incentives</b> exist to promote water sensitive practice. Organisations provide <b>sector-wide leadership</b> to drive and support other organisations to implement changes that will <b>help the city at large achieve a water sensitive vision</b>.</p>	<p><b>Vision and narrative</b> Does a water sensitive vision and/or narrative exist? Is it widely recognised and embedded across other sectors?</p> <p>What is the level of endorsement and commitment to liveability, sustainability and resilience?</p> <p><b>Policy and strategy</b> Is a water sensitive vision aligned with liveability, sustainability and resilience present in official policy documents?</p> <p><b>Incentives</b> What awards or other signs of recognition exist for water leadership?</p> <p><b>Revenue, funding &amp; investment</b> Is reliable and dedicated funding available to support a water sensitive vision?</p> <p>Leadership and capacity Who can be considered leaders or champions of the water-sensitive cause?</p> <p>What leadership and power positions do these people hold? How well are they represented and how much influence can they exert onto key projects and initiatives?</p>	<p>Interviews or surveys, within the organisations and in the sector and community</p> <p>Organisational charts</p> <p>Supporting policies (leadership commitment) for supporting structures for water leadership- Dept. of Planning, formal and informal structures to support leadership</p> <p>Policy documents</p> <p>Annual reports</p>



**1.6 Water resourcing and funding to deliver broad societal value – To create revenue, funding and investment models to drive dedicated investments in water sensitive practices, including non-market values**

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. Water-related resourcing and funding based on <b>no business case</b> or little analysis (e.g. purely political influence).</p> <p>2. Water-related resourcing and funding, including external grants, are subject to <b>simple cost reasoning</b> (cheapest option).</p> <p>3. Water-related resourcing and funding, including external grants, are subject to <b>financial analysis</b> with <b>some consideration</b> given to <b>broader societal or environmental outcomes</b>. <b>Budget is allocated on an ad hoc basis</b> to support water sensitive practices.</p> <p>4. Water-related resourcing and funding, including <b>external grants</b>, are integral part of a <b>broader societal cost-benefit analysis (consideration is consistently given to broader societal or environmental outcomes)</b>. <b>Budget is allocated consistently</b> to support water sensitive practices.</p> <p>5. Water-related resourcing and funding, including <b>external grants</b>, are integral part of a <b>broader societal cost-benefit analysis (consideration is consistently given to broader societal or environmental outcomes, as well as more abstract benefits</b> (e.g. inter-generational equity). <b>Considerable budget is consistently allocated</b> to supporting water sensitive practices. <b>In-house innovation funds</b> support ongoing learning and innovation.</p>	<p><b>Cost-benefit analyses</b> Are considerations of broad societal values made explicit in planning and investment decision-making (based on economic analysis - total community benefit/cost rather than solely on a financial analysis basis)? What evidence exists?</p> <p>How well are water-related resourcing and funding portfolios geared towards delivering broad societal value, e.g. through social value business cases and funding allocation mechanisms for water practices supporting liveability, sustainability and resilience?</p> <p><b>Revenue, funding and investment</b> What are the resourcing and funding allocations that testify of an intent to deliver broad societal value (e.g. liveability, sustainability and resilience considerations rather than cost efficiency reasoning for example)?</p> <p>What proportion of the total budget and resourcing do these resourcing and funding allocations amount to? How well-embedded are these funding and resourcing allocations?</p>	<p>Interviews or surveys within organisations</p> <p>Policy documents and project documentation to assess how broad societal value (e.g. liveability, sustainability and resilience considerations) are taken into account when making resourcing and funding allocation decisions</p> <p>Annual reports to assess this resourcing and funding relative to total budget and resourcing</p> <p>Policy documents (for guidelines regarding project planning and funding)</p> <p>Project proposals and plans (to assess how structural and embedded this resourcing and funding is)</p>



**1.7 Equitable representation of perspectives – To ensure inclusiveness and representation of relevant different perspectives in the governance arrangements and decision-making in the water sector (including, gender, race, age, mental or physical disability, groups who are minorities/disadvantaged/marginalised etc.).**

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. <b>No representation</b> by groups who experience marginalisation or disadvantage. Opposition to any change in status quo regarding equitable representation.</p> <p>2. <b>Low degree of representation, no policy</b> for improvement. Representatives have <b>little power</b>.</p> <p>3. <b>Some positions of power</b> held by representatives who experience marginalisation or disadvantage. <b>Equity policy</b> in place and <b>maintained</b>.</p> <p>4. <b>Reasonable level of representation</b> of relevant different perspectives (i.e. reflecting societal averages) in <b>positions of power</b>. <b>Equity policy</b> is in place, <b>maintained</b> and <b>considered an important asset</b>.</p> <p>5. <b>High level of representation</b> of relevant different perspectives (i.e. reflecting societal averages) including <b>across power positions</b>. <b>Equity policy</b> is in place, <b>maintained</b> and <b>considered an important asset</b>. <b>Organisation(s)</b> take(s) <b>pride</b> in being <b>equitably represented</b> and is recognised as such.</p>	<p>How well are the different perspectives (e.g. regarding gender, ethnicity, indigenous people, age, mental or physical disability etc.) included in the governance arrangements and decision-making?</p> <p>How does this translate in representation and positions held within the organisations?</p> <p>How much is this part of official policy and the identity of the organisations?</p>	<p>Interviews or surveys within organisations</p> <p>Policy documents</p> <p>Organisational chart</p>



**2.1 Water literacy – To improve citizens’ knowledge of the water cycle, the water sector and the current state of water affairs so they can actively participate in decision making.**

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. Generally little or <b>no understanding</b> of the water cycle and no interest either.</p> <p>2. <b>Some interest</b> in the water cycle but <b>limited understanding</b></p> <p>3. People have some interest and a <b>general understanding</b> of most parts of the water cycle. People have some understanding of the water sector, sufficient to know what they are paying for and where key responsibilities sit organisationally</p> <p>4. People have <b>general interest in and a thorough understanding of the water cycle</b>. People have a <b>general understanding of the water sector</b> to know what they are paying for, where key responsibilities sit organisationally and the current water situation broadly. People are aware of the existence of <b>water sensitive solutions</b>. <b>Reasonable participation rates</b> for the <b>outreach programmes</b> the water sector provides.</p> <p>5. People have a <b>deep interest in and thorough understanding of the water cycle and the water sector</b>. People know what they are paying for, where key responsibilities sit organisationally and details of the current water situation politically, technically and environmentally. People have strong interest in the potential of <b>water sensitive solutions</b>. <b>Outreach programmes</b> are <b>developed</b> by, or in <b>close collaboration</b> with, the <b>community</b> and yield <b>high participation rates</b>.</p>	<p><b>Citizen engagement</b> Do people have a general understanding about the water sector and know what they are paying rates for?</p> <p>How knowledgeable are people about the water cycle?</p> <p>What proportion of people are aware of the current state of water aware affairs at a local, state, national and international level?</p> <p>What opportunities are available for people to acquire knowledge about the water sector, the water cycle and the current state of water affairs?</p> <ul style="list-style-type: none"> <li>- Water education included in school curriculum</li> <li>- The number and frequency of events about water (e.g. water festivals)</li> <li>- The number of community group presentations about water</li> <li>- The number of outreach programs organised developed in collaboration with community and run by the water sector and the number of attendees.</li> </ul>	<p>Check websites of water authorities, Councils and Board of Education</p> <p>Existing surveys and market research about people’s knowledge of water</p>





## 2.2 Connection with water – To foster pride and connectedness of people with water through improved understanding of water's role in landscape.

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. People <b>lack connection</b> with water-related assets. Water is <b>not recognised</b> as contributing to <b>sense of place</b>.</p> <p>2. People feel <b>some connection</b> with water-related assets. Water is <b>recognised</b> as contributing to <b>sense of place</b> in <b>some parts</b> of the city, <b>but water's support of green infrastructure is not appreciated</b>. Connection to water can be <b>positive or negative</b>.</p> <p>3. People feel a <b>reasonable connection</b> with water-related assets. Water is <b>recognised</b> as contributing to <b>sense of place</b> and <b>neighbourhood character</b> in <b>many parts</b> of the city. Water's support of green infrastructure in the neighbourhood is <b>appreciated for its role in gardens</b> (public or private) only.</p> <p>4. People feel a <b>strong connection</b> with water-related assets. Water assets in their neighbourhood makes people <b>feel proud</b>. Water is <b>recognised</b> as <b>contributing</b> to <b>sense of place</b> and <b>neighbourhood character</b> in <b>most parts</b> of the city. Water's importance for supporting <b>green infrastructure and</b> delivering broader liveability in the neighbourhood is <b>appreciated by many</b> people.</p> <p>5. People feel a <b>strong connection</b> with water-related assets. Water assets in their neighbourhood makes people <b>feel proud</b>. Water is <b>recognised</b> as being a <b>major determinant</b> in <b>sense of place</b> and <b>neighbourhood character</b> in all parts of the city. Water's importance for supporting green infrastructure and delivering broader liveability is <b>recognised and celebrated</b> by everyone.</p>	<p><b>Community connection</b></p> <p>Is water recognised as part of the neighbourhood and is water appreciated?</p> <p>Do people feel connected to water?</p> <p>How proud are people of natural and constructed water assets? Do people feel proud of their neighbourhood due largely in part to water?</p> <p>How much is water celebrated?</p> <p>Is water considered to be an asset to the neighbourhood?</p> <p>Consider religious or cultural connections to water.</p>	<p>Conduct a (sample) survey of residents to gather information about dot point 1 and 2 and/or use local survey results about perceptions of water</p> <p>Park visitation numbers (visitation information about parks where water is a main feature)</p> <p>Conduct a (sample) survey of various parks (where water is a main feature) and note the number of visitors.</p> <p>Refer to urban planning documents, note the number of water-related artworks e.g. water features, fountains etc.</p> <p>Contact Council Events Manager (or similar) and community groups about festivals where water is the major theme</p>

## 2.3 Shared ownership, management and responsibility of water assets – To increase the extent to which the community is an active participant in creating, operating and maintaining the water system and its infrastructures.

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. <b>No shared ownership and management by households or communities.</b> Responsibility of water assets is with formal water governance organisations. No desire, or even opposition, to changing this situation.</p> <p>2. <b>Ownership, management and responsibility of water assets is with formal water governance organisations, except for local ad hoc water management solutions</b> implemented by households. These local water management solutions are <b>not monitored by a designated authority.</b></p> <p>3. <b>Households and communities</b> drive a <b>small role</b> in the ownership and management of <b>local water management solutions.</b> These local water management solutions are <b>monitored by designated authorities</b> to inform formal planning and management systems.</p> <p>4. Formal water governance organisations <b>encourage households and communities</b> to have a <b>role</b> in the ownership and management of local water management solutions. These local water management solutions are <b>coordinated and monitored by designated authorities</b> to inform formal planning and management systems. The design and implementation of the neighbourhood's water servicing has been <b>informed by the community.</b></p> <p>5. Formal water governance organisations <b>encourage and enable households and communities</b> to play a <b>significant role</b> in the ownership and management of local water management solutions. These local water management solutions are <b>coordinated and monitored by designated authorities</b> to inform formal planning and management systems and ensure they <b>connect with other local water networks as part of an integrated system.</b> The design and implementation of the neighbourhood's water servicing has been done in <b>close collaboration with the community.</b></p>	<p><b>Operation and maintenance</b> What is the proportion of local assets? What kind of assets are they e.g. rainwater tanks, raingardens, wetlands, waterways?</p> <p>To what degree does community own, operate and maintain water assets?</p> <p>What is the level of interaction between governance organisations and community? Are there meetings run by formal water governance organisations (utilities, councils), about water assets with community representatives/members present?</p> <p>Do the local solutions inform part of broader regional water strategy and planning?</p>	<p>Evidence used to decide that there are community owned and managed water asset. E.g. asset data base on private properties, planning applications, bureau of statistics, etc.</p> <p>Gather data from water utility community surveys and meetings?</p>

## 2.4 Community preparedness and response to extreme events – To empower citizens to cope with impacts associated with an extreme water-related event and minimise the severity and duration of its impact.

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. <b>No formal</b> or community <b>response plans</b> are in place to respond to a water-related extreme event, and the community is not prepared.</p> <p>2. Communities have <b>some capacity</b> to respond to extreme events due to either social opportunities and connections or formal emergency services. <b>Regional response plans exist</b> but the public is poorly informed about them. The public is <b>generally not well prepared</b> at the household scale for an extreme event.</p> <p>3. Communities have <b>capacity to respond</b> to extreme events and are generally prepared, either through social opportunities and connections or formal emergency services. Either the informal or formal system is <b>more dominant</b> than the other, creating a locked-in and at-risk system. <b>Regional response plans exist</b> and the <b>public is generally informed</b> about them. <b>Some</b> of the public <b>prepared</b> at the <b>household scale</b>.</p> <p>4. Communities <b>have capacity to respond</b> to extreme events and are well prepared. Both social opportunities and connections exist as well as formal emergency response measures, and each function well but separately. <b>Regional response plans exist</b> and the public is <b>well informed</b> about them. <b>Household plans complement</b> these <b>regional response plans</b>. Efficient emergency services provide <b>regular community engagement</b> to facilitate <b>preparedness to cope</b> at the <b>household scale</b>.</p> <p>5. Communities have a <b>strong capacity to respond</b> to extreme events and are well prepared. Both social opportunities and connections exist as well as formal emergency response measures, and they function well together to support a robust emergency response system. <b>Strong relationships</b> between emergency services and citizens create <b>resilience networks</b> capable of <b>mobilising action</b> before, during and after an extreme event. <b>Regional response plans exist</b> and the <b>public has contributed</b> to their development. <b>Household plans complement</b> these <b>regional response plans</b>. Efficient emergency services <b>regularly engage with the community</b> to facilitate <b>preparedness to cope</b> at the <b>household scale</b>.</p>	<p><b>Citizen engagement</b></p> <p>How aware is the community of the risks associated with extreme events?</p> <p>How prepared are the community to respond to an extreme event?</p> <p>What information and education campaigns are provided to the community?</p> <p>What formal emergency services plans are in place?</p> <p>What resources are committed to community engagement and support?</p> <p>What response plans do households have in place?</p> <p>What communication channels are established for community to access before, during and after an extreme events?</p>	<p>Refer to disaster management plans, emergency plans, etc., to provide evidence that emergency services cater to both regional plans and household scale plans</p> <p>Regulation and policy documents</p> <p>Education and engagement programs</p> <p>The measures in place e.g. designated areas specifically designed to accommodate citizens in the event of a disaster</p>

## 2.5 Indigenous involvement in water planning – To ensure indigenous economic, cultural and/or spiritual interests are considered in the planning and management of water systems

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. <b>Little</b>, or no <b>recognition</b> of indigenous interests and knowledge in the planning and management of water systems.</p> <p>2. <b>Informal recognition</b> by water policy makers, planners and/or managers of indigenous interests and knowledge in water system planning and management.</p> <p>3. <b>Broad policy</b> and frameworks in place to recognise indigenous interests and knowledge in water system planning and management. <b>Some attempt to involve</b> indigenous people and cultures in the planning and management of water systems.</p> <p>4. <b>Detailed policy</b> and frameworks ensure that indigenous economic, cultural and/or spiritual interests and knowledge are considered in water system planning and management. <b>Indigenous people and cultural involvement</b> in water planning and management is <b>common, driven and supported by formal requirements</b>. It is <b>common</b> practice to <b>protect</b> and <b>enhance</b> the <b>cultural associations</b> with water systems.</p> <p>5. <b>Comprehensive policy</b> and frameworks ensure that indigenous economic, cultural and/or spiritual interests and knowledge are considered in water system planning and management. <b>Legislative requirements</b> mandate indigenous representatives are included in governance activities and are effective in giving <b>a voice to indigenous interests and knowledge</b>. <b>Legislation requires</b> that <b>cultural associations</b> with water systems are <b>protected</b> and <b>enhanced</b>. <b>Indigenous knowledge is actively sought and valued</b> as a part of water system planning.</p>	<p><b>Water system planning</b> How well are the different perspectives by indigenous people included in water planning and management?</p> <p>What examples exist that demonstrate indigenous economic, cultural and/or spiritual interests are considered in planning and management of water systems?</p> <p><b>Legislation and regulation</b> Does legislation exist that mandates indigenous representatives are included in governance activities?</p> <p>How does this translate in representation and positions held within organisations?</p> <p><b>Policy and strategy</b> How much is this part of official policy and the identity of the organisations?</p>	<p>Interviews or surveys within organisations</p> <p>Legislative documents</p> <p>Policy documents</p> <p>Identify formal roles for indigenous people</p>



**3.1 Equitable access to safe and secure potable water supply – To provide safe, secure and affordable water supply services that are accessible to all households, educational institutions, health institutions and businesses.**

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. <b>Few people (less than 30%</b> of urban population) have access to safe and secure water for basic needs. The source of supply (communal stand pipe, well, roof tank or metered supply) is <b>within 1000 m</b> of the home and collection time <b>does not exceed 30 minutes</b>. River, creek or other represent inadequate access.</p> <p>2. <b>Some people (30-60%</b> of urban population) have access to safe and secure water for basic needs. The source of supply (communal stand pipe, well, roof tank or metered supply) is <b>within 1000 m</b> of the home and collection time <b>does not exceed 30 minutes</b>. River creek or other represent inadequate access.</p> <p>3. <b>Many people (60-95%</b> of the urban population) have access to safe and secure water for drinking and other consumptive purposes. The source of supply (communal stand pipe, well, roof tank or metered supply) is <b>within 1000 m</b> of the home and collection time <b>does not exceed 30 minutes</b>. River, creek or other represent inadequate access. Water is affordable at less than 3% of household income.</p> <p>4. Safe and secure water is available to <b>almost all people (more than 95%</b> of the urban population) all of the time for drinking and other consumptive purposes. Water is available as metered tap water (or tank water) in houses and affordable at <b>less than 3% of annual household income</b>.</p> <p>5. Safe and secure water is <b>available to everyone</b> for drinking and other consumptive purposes. Water is available as metered tap water (or tank water) in houses and affordable at <b>less than 3% of annual household income. Measures are in place (such as discounted bills etc.) to address affordability and access for disadvantaged</b> and low-income groups as well as future community needs. Future threats to water security are taken into account in planning and a long-term water strategy is in place.</p>	<p><b>Water system design</b> Is a safe water supply capable of supplying between 50 and 100 litres of water per person per day available to everyone?</p> <p>What proportion of households, educational institutions, health institutions and businesses are connected or have access to potable water?</p> <p><b>Monitoring and evaluation</b> Is safe water supply available to everyone? If not, what percentage of the urban population has access?</p> <p>What are the international standards for quality and how does the quality of supply compare?</p> <p><b>Legislation and regulation</b> Does national and/or local standards for drinking-water quality reflect the measures and requirements defined by the World Health Organization (WHO) Guidelines for drinking-water quality?</p> <p><b>Revenue, funding and investment</b> What is the cost of water?</p> <p>Are mechanisms available for lower income households to be subsidised?</p> <p>Are mechanisms available for to provide access to homeless people?</p>	<p>Policy, legislation and regulation Existence of national and/or local standards for drinking-water quality that are based on measures of drinking-water safety defined by the World Health Organization (WHO) Guidelines for drinking-water quality</p> <p>Contact water utilities to determine the proportion of households connected to mains water system and or alterative supplies (such as, recycled water supplied via separate supply network). Also include households with independent supply e.g. rainwater tanks</p> <p>WHO international standards Monitoring data for micro-organisms, chemical substances colour, odour and taste for domestic use.</p> <p>Calculate the cost of water relative to household incomes. (Water charges as a percentage of various household income groups. i.e. the relative cost of water to household incomes) - collect household income data from ABS - contact water retailers/utilities for water costs and standards</p> <p>Compare and contrast household income to cost of water</p> <p>Identify mechanisms to subsidise costs for lower income households</p>





**3.2 Equitable access to safe and reliable sanitation – To provide reliable sanitation services that is affordable and accessible to all households, educational institutions, health institutions and businesses.**

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. <b>Few</b> people (<b>less than 30%</b> of urban population) have access to and use safe and reliable sanitation (pit latrine with slab/ventilated, sealed privies).</p> <p>2. <b>Some</b> people (<b>30-60%</b> of urban population) have access to and use safe and reliable sanitation (pit latrine with slab/ventilated, sealed privies), not shared by too many and of sufficient capacity.</p> <p>3. <b>Many</b> people (<b>60-95%</b> of the urban population) have access to and use safe and reliable sanitation (pit latrine with slab/ventilated, sealed privies), not shared by too many and of sufficient capacity.</p> <p>4. Safe and reliable sanitation is available to and used by <b>almost all people (more than 95%</b> of the urban population). Most households are connected to a sewer system or otherwise have a <b>hygienic toilet facility in house</b> (flush/pour flush to sewer, septic tank or pit latrine, or composting toilet). <b>Most discharge to the environment that causes public health risk is prevented</b> (including leaks) or treated at wastewater treatment plant to at <b>least secondary standards</b> prior to release. The system takes planning for growth into account along with other shocks and stresses.</p> <p>5. Safe and reliable sanitation is available to and used by everyone. <b>All households are connected</b> to a sewer system or otherwise have a <b>hygienic toilet facility in house</b> (flush/pour flush to sewer, septic tank or pit latrine, or composting toilet). <b>Discharge to environment that causes public health risk is prevented</b> (including leaks) or treated at wastewater treatment plant to at <b>least secondary standards</b> prior to release. Measures are in place (such as discounted bills etc.) to address affordability for disadvantaged and low-income groups.</p>	<p><b>Water system design</b> Is safe sanitation available to everyone at affordable prices?</p> <p>What proportion of households have access to safe and reliable sanitation?</p> <p><b>Monitoring and evaluation</b> What are the international standards?</p> <p>What are the monitored or reported results for water supply quality?</p> <p><b>Legislation and regulation</b> Does national and/or local standards for sanitation services reflect the measures and requirements defined by the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP)?</p> <p><b>Revenue, funding and investment</b> What is the cost of water supply compared to household income? Are mechanisms available for lower income households to be subsidised?</p>	<p>Contact water utilities to determine the proportion of households connected to a sewerage system. Also include households with access to an alternative hygienic domestic toilet facility e.g. septic tanks, pit latrine, sealed privies, etc.)</p> <p>WHO international standards</p> <p>Legislation and regulation</p> <p>Policy documents</p> <p>Calculate the cost of sanitation relative to household incomes. (Sanitation charges as a percentage of various household income groups. i.e. the relative cost of safe sanitation to household incomes) - collect household income data from ABS - contact water retailers/utilities for sanitation costs and standards</p> <p>Compare and contrast household income to cost of sanitation</p> <p>Identify mechanisms to subsidise costs for lower income households</p>

### 3.3 Equitable access to flood protection – To reduce nuisance flooding to protect citizens and infrastructure and to deliver affordable protection against flood risk to everyone.

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. Rainfall events lead to minor flooding that <b>always disrupt</b> everyday activities. <b>Substantial proportion</b> of the urban population (<b>more than 10%</b>) are <b>at risk</b> of severe consequences to life associated with flooding. Almost <b>no action</b> is undertaken to address the issue.</p> <p>2. Rainfall events lead to minor flooding that <b>regularly disrupt</b> everyday activities. <b>Significant proportion</b> of the urban population (<b>2-10%</b>) are <b>at risk</b> of severe consequences to life associated with flooding (including health and welfare). Actions are taken in some areas to reduce flood risk.</p> <p>3. Rainfall events lead to minor flooding that <b>sometimes disrupt</b> everyday activities. <b>Some</b> of urban population (<b>less than 2%</b>) are <b>at risk</b> of severe consequences to life associated with flooding (including health and welfare). Measures are undertaken to reduce the impact on infrastructure and property. A <b>coordinated response</b> is undertaken to address these risks <b>across some areas</b>. A number of different actions are undertaken in some areas to reduce flood risk. <b>Detention measures</b> located in catchments reduces downstream impacts associated with peak flood events.</p> <p>4. Rainfall events <b>generally do not disrupt</b> everyday activities. <b>Almost everyone's lives</b> is <b>well protected</b> against flood risks, although extreme events may <b>affect some property</b> in some areas in a negative manner and the <b>risks</b> are <b>understood</b>. Measures are undertaken to reduce the impact on infrastructure and property. A <b>coordinated and integrated response</b> is undertaken with urban planning, infrastructure planning and housing typology (raised or floating dwellings) <b>explicitly taking flood risks into account</b>. <b>Harvesting</b> and <b>detention measures</b> throughout catchments reduces flooding impacts associated with peak flood events.</p> <p>5. Rainfall events <b>do not disrupt</b> everyday activities. <b>Human safety</b> is <b>virtually guaranteed</b>, and infrastructure and <b>property damage</b> are <b>infrequent</b>; <b>risks</b> are <b>well understood</b>. A <b>coordinated and integrated response</b> is undertaken with urban planning, infrastructure planning and housing typology <b>explicitly taking flood risks into account</b>. Urban areas are designed to provide a flood mitigation function as part of <b>multifunctional landscapes</b>.</p>	<p><b>Water system design</b> Do rainfall events disrupt normal day-to-day activities?</p> <p>What level of flood protection is in place? Are people and properties protected and if so how?</p> <p>What is the probability of flooding events with human lives lost, significant economic damage and social disruption?</p> <p>What urban design initiatives and infrastructure have been implemented to protect against flooding?</p> <p>What planning and preparedness measures are in place?</p> <p>What town planning controls on urban development are in place?</p>	<p>Calculate the cost of flood risk protection to household incomes. (Flood risk protection costs as a percentage of various household income groups. i.e. the relative cost of flood risk protection to household incomes)</p> <ul style="list-style-type: none"> <li>- collect household income data from ABS</li> <li>- contact water retailers/utilities water costs</li> </ul> <p>Refer to disaster management plans, emergency plans, building codes, policy etc., to provide evidence that urban planning and design specifically takes into account fluvial flood protection</p> <p>The measures in place in flood-prone areas e.g. designated areas specifically designed to accommodate flooding, elevated homes, retarding basins, floodways, overland flow paths etc.</p> <p>Refer to flood modelling and mapping for data about the probability and effects of flooding</p>

**3.4 Equitable and affordable access to amenity and cultural values of water-related assets – To enhance amenity values associated with urban landscapes and provide affordable access to water related assets with high amenity values to everyone.**

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. Water-related assets <b>do not provide amenity and cultural benefits</b> in most areas of the city. Enjoyment of available amenity benefits of assets comes at a <b>relatively high cost</b> for some households.</p> <p>2. Water-related assets <b>provide amenity and cultural values in some areas of the city</b>. These areas are <b>not easily accessible</b> and enjoyment of these benefits comes at a <b>relatively high cost</b> for <b>some</b> households.</p> <p>3. Water-related assets <b>provide amenity and cultural values in large areas of the city</b>. These areas are <b>mostly accessible</b> and come at a <b>moderate cost</b> for some households.</p> <p>4. Water-related assets <b>provide amenity and cultural values in most areas of the city</b>. These areas are <b>highly accessible</b> and enjoyment of these benefits comes at <b>low cost</b>.</p> <p>5. Water-related assets <b>provide amenity and cultural values in all areas of the city</b> and are implemented to <b>improve lower socio-economic areas</b>. These areas are <b>highly accessible</b> and enjoyment of these benefits <b>comes at no cost</b>.</p>	<p><b>Urban landscape design</b> What amenity values are associated with water-related assets? Where are they located? Are they easily accessible?</p> <p>Are the amenity values of most water-related assets accessible to different income groups? Are there admission costs?</p> <p><b>Revenue, funding and investment</b> How are the relative costs to enjoy such amenities distributed between different income groups?</p>	<p>Review policy documents</p> <p>Use GIS to map the distribution of water assets with high amenity values</p>



**4.1 Broad community benefits from water-related services – To stimulate beneficial outcomes for the public beyond those attained through water-related essential services.**

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. No, or virtually no, <b>benefits</b> for the community are delivered through water-related services (beyond benefits associated with essential services).</p> <p>2. <b>Few benefits</b> for the community are delivered through water-related services (beyond benefits associated with essential services), <b>those identified</b> remain <b>difficult to quantify</b> and are generally not included as part of a business case.</p> <p>3. <b>Minor benefits</b> for the community are delivered through water-related services (beyond benefits associated with essential services) and <b>most identified are described but remain difficult to quantify</b> and incorporate into business cases. There is active planning and intent to deliver these benefits.</p> <p>4. <b>Some benefits</b> for the community are delivered through water-related services (beyond benefits associated with essential services) and <b>some can be quantified</b> and are considered in a business case. There is active planning and intent to deliver these benefits.</p> <p>5. <b>Many benefits</b> for the community are delivered through water-related services (beyond benefits associated with essential services) and are <b>readily quantified</b> and are <b>consistently incorporated into a business case</b>. There is active planning and intent to deliver these benefits and the practices are mainstreamed.</p>	<p>What other sectors (e.g. Health, Transport, Energy, etc.) benefits from water related activities (beyond essential services which include supply, sanitation and drainage)?</p> <p>What efforts have been made at quantification?</p> <p>Do business cases for water system investments include quantification of benefits to other sectors such as health or energy?</p> <p>What examples are there of novel water infrastructure that have saved money with respect to augmenting conventional infrastructure?</p>	<p>Water authorities and Government reports, strategic plans</p> <p>Business cases that take into account externalities</p>

**4.2 Low GHG emission in water sector – To reduce the levels of GHG emissions and maximise the use of alternatives to high carbon emitting energy sources to supply water infrastructure.**

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. <b>High</b> levels of GHG emissions (high energy usage from high carbon emitting sources) in the water sector relative to international and national standards, targets or averages (<b>e.g. &gt; 300 net tonnes of CO<sub>2</sub> equivalents per 1,000 connected properties</b>). Alternative energy sources are <b>not considered</b>.</p> <p>2. <b>Fairly high</b> levels of GHG emissions (high energy usage from high carbon emitting sources) in the water sector relative to international and national standards, targets or averages (<b>e.g. 200-300 net tonnes of CO<sub>2</sub> equivalents per 1,000 connected properties</b>). Alternative energy sources are <b>considered but rarely used</b>.</p> <p>3. <b>Fair levels</b> of GHG emissions (using alternatives to high carbon emitting energy sources) in the water sector relative to international and national standards, targets or averages (<b>e.g. 100-200 net tonnes of CO<sub>2</sub> equivalents per 1,000 connected properties</b>). Alternative energy sources <b>typically supply some new infrastructure</b>.</p> <p>4. <b>Low levels</b> of GHG emissions (using alternatives to high carbon emitting energy sources) in the water sector relative to international and national standards, targets or averages (<b>e.g. &lt; 100 net tonnes of CO<sub>2</sub> equivalents per 1,000 connected properties</b>). Alternative energy sources <b>typically supply new infrastructure</b> and demonstration projects used to provide proof-of-concept for novel ideas and innovation in technology.</p> <p>5. <b>Very low levels</b> of GHG emissions (using alternatives to high carbon emitting energy sources) in the water sector relative to international and national standards, targets or averages (<b>e.g. Zero net tonnes of CO<sub>2</sub> equivalents per 1,000 connected properties</b>). Alternative energy sources are <b>common across all new infrastructure</b>, and progressive upgrade of existing infrastructure occurs.</p>	<p><b>Water system design</b></p> <p>What is the source of energy used to supply major infrastructure within the water sector?</p> <p>What are the levels of emissions compared to the international and national standards, targets and averages?</p>	<p>Reporting by water authorities on GHG emissions</p> <p>Council energy targets and KPI reporting on energy use (from a water perspective)</p>

### 4.3 Low end-user potable water demand – To support the valuing of water as a scarce resource.

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. <b>High</b> end-user potable water demand relative to the local scarcity or abundance of water. No consideration given to water efficient practices across residential, industrial and commercial sectors. <b>Demands (total residential, industrial and commercial) on drinking water supplies are greater than 350 litres/person/day.</b></p> <p>2. <b>Fairly high</b> end-user potable water demand relative to the local scarcity or abundance of water. Little consideration given to water efficient practices across residential, industrial and commercial sectors. <b>Demands (total residential, industrial and commercial) on drinking water supplies are between 300 litres/person/day and 350 litres/person/day.</b></p> <p>3. <b>Fair</b> end-user potable water demand relative to the local scarcity or abundance of water. Some water efficient practices (water efficient fittings, fixtures and appliances) across residential, industrial and commercial sectors. <b>Demands (total residential, industrial and commercial) on drinking water supplies are between 250 litres/person/day and 300 litres/person/day.</b></p> <p>4. <b>Low</b> end-user potable water demand relative to the local scarcity or abundance of water. Reasonably consistent water efficient practices (water efficient fittings, fixtures and appliances) across residential, industrial and commercial sectors. Water efficiency programs targeting households and business are widespread and effective. <b>Demands (total residential, industrial and commercial) on drinking water supplies are between 200 litres/person/day and 250 litres/person/day.</b></p> <p>5. <b>Very low</b> end-user potable water demand relative to the local scarcity or abundance of water. Very consistent water efficient practices (water efficient fittings, fixtures and appliances) across residential, industrial and commercial sectors. Water efficiency programs targeting households and business are widespread and effective. Water efficient behaviours are embedded in community and business. <b>Demands (total residential, industrial and commercial) on drinking water supplies are less than 200 litres/person/day.</b></p>	<p><b>Water system planning</b> What is the potable water demand?</p> <p>What is the population?</p> <p>What regulation and/or policy exist for water efficient practices?</p> <p>What regulation and/or policies exist for alternate water supplies for non-potable demands?</p> <p>What research data exists about the attitudes and behaviours related to water use?</p> <p>Is water considered a valuable and scarce resource?</p> <p>Do people build water efficient houses and gardens?</p>	<p>Total annual potable water supply for, and population of the, geographic region being benchmarked.</p>

**4.4 Water-related economic and commercial opportunities – To stimulate investment in new business opportunities through innovation in the water sector.**

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. Water management creates no, or virtually <b>no business opportunities</b>.</p> <p>2. <b>Some business opportunity</b> is created by water system services but is largely incidental to business as usual.</p> <p>3. <b>A noticeable amount of business opportunity</b> is created by water system services. While it is mostly driven by the need to improve efficiency and service standards for business as usual activities, there is some exploration of ways to enhance commercial opportunities for water businesses and their commercial partners.</p> <p>4. <b>A noticeable amount of business opportunity</b> is created by water system services and there is significant investment and collaboration between government and business to enhance commercial opportunities.</p> <p>5. <b>A significant amount of business opportunity</b> is created by water system services and the city is recognized as a leading source of innovation and advanced service provision to other cities.</p>	<p><b>Revenue, funding &amp; investment</b> What sort of business opportunities are there? E.g. opportunities for green infrastructure entrepreneurs, technology providers, peri-urban agriculture, employment or profits from resource recovery.</p> <p>What businesses have been established to provide water related green infrastructure, technologies and services? E.g. consulting, tech providers, maintenance, contractors, professionals</p> <p>What is the scale and number of these businesses, the size of the workforce and the money made?</p>	<p>Expenditure on opportunities for green infrastructure entrepreneurs, technology providers, peri-urban agriculture, employment or profits from resource recovery</p> <p>Business directories, Chamber of Commerce, etc. for listed companies, business type and their financial reporting</p>



**4.5 Maximised resource recovery – To maximise resource recovery through innovative water system design.**

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. <b>No</b> resource recovery occurs. All recoverable <b>resources are wasted</b>.</p> <p>2. <b>Low levels</b> of resource recovery. Resource <b>recovery is considered</b> but remains <b>incidental</b> and <b>limited</b> to specific recoverable resources, such as recycled water.</p> <p>3. <b>Fair levels</b> of recovery of <b>one or two recoverable resources</b>, usually wastewater recycling or biogas, occurs.</p> <p>4. <b>Fairly high levels</b> of resource recovery of a <b>number of recoverable resources</b> occurs. <b>New infrastructure</b> and <b>demonstration projects</b> used to provide proof-of-concept for novel ideas and innovation in technology.</p> <p>5. <b>High levels</b> of resource recovery across <b>most recoverable resources</b>. Practices are common across all <b>new infrastructure</b>, and <b>progressive upgrade of existing</b> infrastructure occurs.</p>	<p><b>Water system design</b></p> <p>What resources can (potentially) be recovered?</p> <p>How much is recovered and at which facilities?</p>	<p>Websites of water authorities, statutory bodies</p> <p>Water authorities annual reports</p> <p>Operational documentation to know what and how much is being recovered</p>





**5.1 Healthy and biodiverse habitat – To ensure water system services help to protect, restore and create well-functioning ecosystems that contribute to ecological resilience.**

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. The urban habitats supported by water system services and/or assets (including streamside habitat) are <b>not or virtually not connected</b> at all and <b>biodiversity is very low</b> even considering the development context (e.g. inner, middle, outer and peri-urban). The quality of the vegetation offers <b>little</b> in regards to <b>functioning ecological systems</b>.</p> <p>2. The urban habitats supported by water system services and/or assets (including streamside habitats) are <b>patchy and some areas connected</b>, and <b>biodiversity is low</b> considering the development context (e.g. inner, middle, outer and peri-urban). The quality of the vegetation provides <b>some functioning ecological systems</b> given the development context (e.g. inner, middle, outer and peri-urban).</p> <p>3. The urban habitats supported by water system services and/or assets (including streamside habitats) are <b>reasonably connected</b> along waterway or infrastructure networks. The biodiversity and quality of the vegetation provides <b>fair functioning ecological systems</b> given the development context (e.g. inner, middle, outer and peri-urban).</p> <p>4. The urban habitats supported by water system services and/or assets (including streamside habitats) are <b>well connected</b> along waterway or infrastructure networks and patches exist across the catchments. The biodiversity and quality of the vegetation provides <b>high functioning ecological systems</b> given the development context (e.g. inner, middle, outer and peri-urban).</p> <p>5. The urban habitats supported by water system services and/or assets (including streamside habitats) are <b>very well connected</b> along waterway or infrastructure networks and extend across the catchments. The biodiversity and quality of the vegetation provides <b>very high functioning ecological systems</b> given the development context (e.g. inner, middle, outer and peri-urban).</p>	<p><b>Urban landscape design</b> To what extent do water system services and assets help to support biodiversity and functioning terrestrial ecosystems?</p> <p>Are patches of vegetation connected or isolated?</p> <p>What is the state and condition of vegetation and habitats? How has it changed over time?</p>	<p>Policy for the protection of biodiversity in urban areas</p> <p>GIS layers of vegetation – areas and average distances between patches</p> <p>Normalised Difference Vegetation Index (NDVI) to assess the extent and quality of vegetation using satellite remote sensing data. Access to website which maps NDVI 'on demand': <a href="http://ivfl-info.boku.ac.at/index.php/eo-data-processing/dataprocess-global">http://ivfl-info.boku.ac.at/index.php/eo-data-processing/dataprocess-global</a></p> <p>Change Matters <a href="http://changematters.esri.com/compare">http://changematters.esri.com/compare</a> to compare Normalised Difference Vegetation Index (NDVI) across different years to show increase/decrease in extent and quality of vegetation.</p> <p>Biological surveys, biodiversity trends, local research reported in scientific papers, biodiversity reports</p>

## 5.2 Surface water quality and flows – To improve and protect the quality of surface waters and marine environments.

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. The quality and flow characteristics of surface and marine waters in the area is <b>detrimental to functioning ecosystems and leads to deterioration over time</b>. <b>Little action</b> is undertaken to prevent or treat point source pollution (such as, domestic and industrial wastewater prior to discharge to the environment) or urban runoff.</p> <p>2. The quality and flow characteristics of surface and marine waters in the area <b>falls short in supporting functioning ecosystems</b>. In some parts of the area it may be better than others, but on the whole it is still deteriorating. <b>Action in some areas</b> is undertaken to prevent or treat <b>wastewater</b> prior to discharge to the environment. Little, if any, action is undertaken to address urban runoff quality prior to discharge.</p> <p>3. The quality and flow characteristics of surface and marine waters in the area <b>supports reasonably healthy ecosystems</b>. Though perhaps not everywhere, mostly the waters are of this quality, and it is not deteriorating. Action addresses almost all point source pollution (such as, appropriate treatment of domestic and industrial wastewater prior to discharge). <b>Some action</b> is undertaken to <b>address urban runoff quality</b> prior to discharge.</p> <p>4. The quality and flow characteristics of surface and marine waters in the area <b>supports healthy ecosystems</b> – this quality is fairly consistently observed throughout the area. <b>Action</b> addresses <b>all point source</b> pollution (such as, appropriate treatment of domestic and industrial wastewater prior to discharge) and <b>urban runoff</b> is <b>treated</b> using green infrastructure (such as, wetlands and rain gardens) in <b>some areas</b>. <b>Some harvesting</b> of urban runoff may occur in some areas.</p> <p>5. The quality and flow characteristics of surface and marine waters in the area <b>supports very healthy ecosystems</b> – this quality is consistently observed throughout the area. <b>Action</b> addresses <b>all point source</b> pollution (such as appropriate treatment of domestic and industrial wastewater prior to discharge) and <b>urban runoff</b> is <b>treated</b> using green infrastructure (such as, wetlands and rain gardens) across <b>many areas</b>. <b>Extensive harvesting</b> of urban runoff reduces flow related impacts on aquatic ecosystems. Actions improve and restore the water quality that flows through the city.</p>	<p><b>Policy and strategy</b> What proportion of domestic and industrial wastewater is treated prior to discharge to receiving waters?</p> <p>Do flow regimes or water quality significantly constrain instream biodiversity?</p> <p>What are the 3 key pollutants of concern to local water bodies?</p> <p>'Healthy' freshwater or marine ecosystems are defined as biodiverse and functioning. Ecosystems may be substantially altered from the pre-urban 'natural' state, but a 'functioning ecosystem', will have basic ecosystem elements in place. Increasing ecosystem health will be characterised by increasing biodiversity and resilience to system shocks.</p>	<p>Policy for protection of surface water quality</p> <p>Data monitoring and exceedance of acceptable water quality thresholds</p> <p>Number and types of WSUD assets (including stormwater harvesting)</p> <p>% of urban runoff treated by WSUD/harvesting schemes</p> <p>Data monitoring of instream biodiversity/ecosystem health</p>

### 5.3 Groundwater quality and replenishment – To improve and protect the quality of groundwater-connected environments.

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. The quality and/or replenishment of groundwater in the area is <b>detrimental to valued ecosystem services</b> (e.g. groundwater dependant ecosystems). <b>No action</b> is undertaken to address domestic and industrial wastewater, and urban runoff, impacting on groundwater.</p> <p>2. The quality and/or replenishment of groundwater in the area <b>falls short in supporting valued ecosystem services</b> (e.g. groundwater dependant ecosystems). In some areas it may be better managed than others, but on the whole it falls short. <b>Little action</b> is undertaken to address domestic and industrial wastewater, or urban runoff, impacting on groundwater.</p> <p>3. The quality and replenishment of groundwater in the area supports <b>reasonably healthy ecosystems and valued ecosystem services</b> (e.g. groundwater dependant ecosystems). Though perhaps not everywhere, mostly the groundwaters are of good quality and not being depleted. <b>Some action</b> is undertaken to address domestic and industrial wastewater, or urban runoff, impacting on groundwater.</p> <p>4. The quality and replenishment of groundwater in the area supports <b>healthy ecosystems and valued ecosystem services</b> (e.g. groundwater dependant ecosystems). Mostly the groundwaters are of good quality and not being depleted – this is fairly consistently observed throughout the area, with hardly any negative exceptions. <b>Significant action</b> is undertaken to address domestic and industrial wastewater, and urban runoff, impacting on groundwater.</p> <p>5. The quality and replenishment of groundwater in the area supports <b>very healthy ecosystems and valued ecosystem services</b> (e.g. groundwater dependant ecosystems). Mostly the groundwaters are of good quality and not being depleted – this is consistently observed throughout the area. <b>Extensive action</b> is undertaken to address domestic and industrial wastewater, and urban runoff, impacting on groundwater.</p>	<p><b>Policy and strategy</b> What are the existing groundwater dependant ecosystems etc.?</p> <p>Does monitoring data indicate a decline in quality or seasonal depth of the groundwater?</p>	<p>Groundwater reporting by relevant government authority</p> <p>Policy for the protection of groundwater</p> <p>Data monitoring and exceedance of acceptable water quality or depth thresholds</p> <p>Number of use of licenced and private bores</p> <p>Active replenishment of groundwater – Aquifer Storage and Recovery schemes</p>



## 5.4 Protect existing areas of high ecological value – To protect existing areas of high ecological value from the impacts of catchment urbanisation.

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. <b>Little</b>, or no, <b>recognition</b> of existing or remnant areas with significant ecological value. <b>No mechanisms</b> exist to <b>ensure the protection</b> of native flora and fauna from urban development and urban water systems.</p> <p>2. <b>Some recognition</b> of the significance of existing or remnant areas with significant ecological value. <b>Policy</b> may be <b>present</b> but <b>not enforced</b>. <b>Limited mapping</b> and records of native flora and fauna are available. The planning and constructions of urban <b>development</b> and urban water systems are <b>only restricted by internationally recognised sites</b> of significance (such as, Ramsar listings).</p> <p>3. <b>Policy</b> is in place to <b>protect</b> and conserve landscapes of existing or remnant areas with significant ecological value. <b>Extensive mapping</b> and records of endangered and protected species are available. Some urban <b>development</b> are <b>excluded</b> in some areas through <b>designated conservation zones</b> (including national and state parks, etc.) and urban water systems that impact on major sites of significance are restricted.</p> <p>4. <b>Legislation and policy</b> are in place to <b>protect</b> and conserve landscapes of ecological significance. <b>Extensive mapping</b> and records of endangered and protected species are available. Urban <b>development</b> is <b>excluded</b> in some areas through <b>designated conservation zones</b> (including national and state parks, etc.) and urban water systems that impact on major sites of significance are restricted. Appropriate development activities are undertaken in other areas given the landscape type and <b>permits</b> are required for <b>vegetation removal</b>. <b>Vegetation offsets</b> are stipulated where vegetation is permitted to be removed.</p> <p>5. <b>Legislation and policy</b> are in place to protect and conserve landscapes of ecological significance. <b>Extensive mapping</b> and records of endangered and protected species are available. Urban <b>development</b> is <b>excluded</b> in some areas through <b>designated conservation zones</b> (including national and state parks, etc.) and urban water systems that impact on major sites of significance are restricted. Appropriate development activities are undertaken in other areas given the <b>landscape type</b> and <b>permits</b> are required for <b>vegetation removal</b>. <b>Vegetation offsets</b> are stipulated where vegetation is permitted to be removed. The <b>community recognises</b> the importance of water systems designed to <b>support ecological significant landscapes</b> and they <b>actively contribute</b> towards <b>protecting</b> and <b>enhancing landscape</b> conservation values in the public and private realm.</p>	<p><b>Policy and strategy</b> What are the existing areas designated as protected land/conservation areas (e.g. national or state forest)?</p> <p>Do areas of international significance exist (e.g. Ramsar listed sites)?</p> <p>Have rare and threatened species been identified and where?</p> <p>What are the measures in place to protect areas of significant ecological value from the impacts of urban development and water systems?</p> <p>What community driven initiatives are in place and how active is the community in protecting and enhancing areas of significant ecological value?</p>	<p>Regulation and legislation</p> <p>Mapping and surveys of rare and threatened species</p> <p>Percentage of protected area from GIS zoning or relevant maps</p> <p>Policy, planning reports and strategic plans to identify solutions in place to protect areas of significance from urban development</p>



**6.1 Activating connected pleasant urban green and blue space – To ensure the presence of many, distributed and well-connected green spaces and water assets.**

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. <b>Very low number of green spaces or waterways</b> with active recreation infrastructures such as bike paths and walking grounds. <b>Many people</b> find the urban landscape <b>oppressive</b>. Green and blue assets are mostly absent, polluted, or otherwise unattractive and unappreciated.</p> <p>2. <b>Low number of green spaces or waterways</b> with active recreation infrastructures such as bike paths and walking grounds. These places are <b>generally not well-connected</b>.</p> <p>3. <b>Fair number of distributed green spaces or waterways</b> with active recreational infrastructures such as bike paths and walking grounds. Most people <b>appreciate</b> the green and blue assets. These places are <b>reasonably well-connected</b>.</p> <p>4. <b>High number of distributed, well-connected green spaces or waterways</b> with active recreational infrastructures such as bike paths and walking grounds. Green and blue assets are <b>highly appreciated</b>. The urban landscape is considered <b>very pleasant to work and live in</b>, and the area is <b>attractive to visitors</b>.</p> <p>5. <b>Very high number of distributed, well-connected green spaces or waterways</b> with active recreational infrastructures such as bike paths and walking grounds. The urban landscape is an <b>important factor</b> in the happiness of the people living and working in the area. The area is <b>frequently visited</b> because of its attractive urban landscape. People attribute the attractiveness to a considerable degree to the presence and accessibility of green and blue assets which are supported by alternative water supplies, and contribute noticeably to the character of the area.</p>	<p>How green spaces and water assets are linked (waterway corridors, walking paths, bike paths, etc.)?</p> <p>What is the condition and quality of the blue-green areas?</p>	<p>GIS mapping of green spaces and water assets, bike paths and walking paths</p> <p>Open space strategy and policy</p>



**6.2 Urban elements functioning as part of the urban water system – To ensure adequate urban space and built form functions as an integral part of the water system**

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. <b>Very low proportion</b> of the <b>urban space and built form</b> functions as an integral part of the water system, for example by means of raingardens, rainwater and stormwater harvesting, flood storage and conveyance, and water sensitive landscaping (pervious surfaces, heat mitigation). <b>Climate impacts are not mitigated at all.</b> The urban environment is not being designed with water outcomes in mind, leading to negative water outcomes.</p> <p>2. <b>Some</b> of the <b>urban space and built form</b> functions as an integral part of the water system, for example by means of raingardens, rainwater and stormwater harvesting, flood storage and conveyance, and water sensitive landscaping (pervious surfaces, heat mitigation). <b>Few urban heat impacts are mitigated locally</b> and mostly with <b>indoor solutions</b> having a high energy footprint such as air conditioning.</p> <p>3. <b>Fair proportion</b> of the <b>urban space and built form</b> functions as an integral part of the water system, for example by means of raingardens, rainwater and stormwater harvesting, flood storage and conveyance, and water sensitive landscaping (pervious surfaces, heat mitigation). <b>Some urban heat impacts are mitigated in various ways</b> including green infrastructure solutions (e.g. irrigated trees).</p> <p>4. <b>Fairly high proportion</b> of the <b>urban space and built form functions</b> as an integral part of the water system, for example by means of green walls and green roof areas, raingardens, rainwater and stormwater harvesting, flood storage and conveyance, and water sensitive landscaping (pervious surfaces, heat mitigation). <b>Urban heat impacts are mitigated by means of passive watering practices and green infrastructure solutions</b> (e.g. irrigated trees) as part of <b>common practice</b>.</p> <p>5. <b>High proportion</b> of the <b>urban space and built form</b> functions as an integral part of the water system, for example by means of green walls, roofs, raingardens, rainwater and stormwater harvesting, flood storage and conveyance, and water sensitive landscaping (pervious surfaces, heat mitigation). <b>Heat impacts are mitigated structurally</b> and as <b>part of the urban design</b>. E.g. blue-green corridors are strategically placed through the urban fabric and hotspots are equipped with additional measures.</p>	<p>What number of assets in the urban space and built form function as an integral part of the water system?</p> <p>What proportion of these spaces are irrigated using recycled water or harvested stormwater?</p> <p>Additional notes: The built form actively responds to and reflects changes in seasons, weather and water abundance scarcity.</p>	<p>Refer to urban planning and design reports/documents or maps to determine the number of assets in the urban space and built form function as an integral part of the water system e.g. green roofs, green walls, living walls, raingardens, wetlands, biofilters etc.</p> <p>Asset register and database, asset audits and maintenance records, etc. Planning and design policies and guidelines for the city may require or encourage incorporation of WSUD into the built form.</p>



### 6.3 Vegetation coverage – To ensure adequate vegetation coverage (e.g. tree canopies)

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. <b>Very low (&gt; 10%) degree of vegetation canopy coverage</b>, e.g. through tree canopies. Coverage defined as the proportion of human accessible area being covered or shaded. Very low meaning <b>hardly any trees around at all</b>. There is <b>no urban tree/shade policy in place</b>.</p> <p>2. <b>Low degree (10-20%) of vegetation canopy coverage</b>, e.g. through tree canopies. Coverage defined as the proportion of human accessible area being covered or shaded. Low meaning <b>some streets have trees but many do not</b>. There is an <b>urban/tree shade policy in place</b>, however there has been <b>little implementation</b>.</p> <p>3. <b>Fair degree (20-30%) of vegetation canopy coverage</b>, e.g. through tree canopies. Coverage defined as the proportion of human accessible area being covered or shaded. Fair meaning for example that a <b>fair proportion of streets have trees</b>. There is an <b>urban/tree shade policy</b> being <b>actively implemented but progress is slow</b>.</p> <p>4. <b>Fairly high degree (30-40%) of vegetation canopy coverage</b>, e.g. through tree canopies. Coverage defined as the proportion of human accessible area being covered or shaded. Fairly high meaning for example that a <b>high proportion of streets have trees</b>. There is a <b>long-standing urban/tree shade policy</b> being <b>actively implemented</b> and <b>significant progress is being made</b>.</p> <p>5. <b>High degree (&gt;40%) of vegetation canopy coverage</b>, e.g. through tree canopies. Coverage defined as the proportion of human accessible area being covered or shaded. High meaning for example that <b>most or all streets have trees</b>. A <b>long-standing urban/tree shade policy</b> has been <b>successfully implemented</b> and <b>established</b>.</p>	<p>What is the percentage of vegetation coverage?</p> <p>What proportion of coverage is represented by tree canopy?</p>	<p>Calculate the percentage of vegetated area to impervious surfaces from GIS zoning or relevant maps</p> <p>Use Normalised Difference Vegetation Index (NDVI) to assess the extent of vegetation using satellite remote sensing data. Access to website which maps NDVI 'on demand': <a href="http://ivfl-info.boku.ac.at/index.php/eo-data-processing/dataprocess-global">http://ivfl-info.boku.ac.at/index.php/eo-data-processing/dataprocess-global</a></p> <p>Review policy, planning reports and strategic plans</p>



**7.1 Diverse fit-for-purpose water supply system – To provide a flexible and adaptive water supply system appropriate to the quality water and demand requirements of the end user.**

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. Water supply system is vulnerable and not backed up by systems and processes that make it secure. It often relies for the most part on a <b>single centralised distribution network</b> supplied by <b>one source</b> for consumers. The system is <b>locked in</b>, and the only change considered to meet increasing demand is augmentation of legacy infrastructure.</p> <p>2. Water supply system relies for the most part on a <b>single centralised distribution network</b> supplied by <b>one source</b> and may be <b>supplemented</b> by a <b>secondary centralised supply network</b> based on a <b>fit-for-purpose water supply in some areas</b>. The <b>system is substantially locked in</b> even though some alternative solutions may be present. Radical system change would be necessary as the alternatives are technically or politically challenging or simply not viable.</p> <p>3. Water supply system relies for the most part on a <b>single centralised distribution network</b> but is supplied by <b>more than one source</b> for consumers. Alternative augmentation options are being considered but yet to be confirmed. There is still a strong commitment to maintaining the existing centralised supply model.</p> <p>4. Water supply system relies on a <b>diversified mode of supply</b> with <b>access to multiple fit-for-purpose water supplies</b> across different areas. The system is reasonably flexible, and a <b>portfolio of alternative options</b> is available and implementation plans are ready for augmentations or responding to supply shortages.</p> <p>5. A <b>diversified water supply system provides fit-for-purpose water</b>. Appropriate source and quality water for different end uses, is available to (almost) <b>all consumers</b>. The system is highly flexible; and local supply and treatment options are designed and managed in an integrated manner. <b>Portfolios of alternative options</b> for augmentation are available and implementation plans are ready. <b>Implementation can be gradual</b> and step wise because a <b>long-term strategy is in place for adaptation of legacy infrastructure</b>. The system is able to rapidly switch between sources.</p>	<p><b>Water system design</b></p> <p>What sources of supply are currently available and at what capacities?</p> <p>How easy is it to switch between them? Are alternative options and contingency plans in place to respond to shortages of supply if required?</p> <p>Are any sources of water dependant on supplies from other countries?</p> <p>What are the city water policies and strategies that take into account fit-for-purpose water supplies?</p> <p>Are there plans that identify alternative options?</p> <p>Does legacy infrastructure lock the system into high cost or high impact (environmental or social) augmentation?</p> <p>Have alternative water supply options with lower cost or impacts been explored?</p> <p>Have alternative water supply options with lower cost or impacts been implemented? To what extent?</p> <p>Are contingency plans in place for alternative water supply options to be implemented when shortages or other supply issues arise?</p> <p>Are there policies and regulations in place to allow for third parties to provide alternative water supply systems?</p>	<p>Proportion of customers (residential and industrial) that have alternative water assets, e.g. recycled water, rainwater tanks, onsite recycled water</p> <p>Existing policies and strategies</p> <p>Inventory of assets (identify sources outside of country borders) and supplies:</p> <ul style="list-style-type: none"> <li>- catchment/river sources</li> <li>- recycled water</li> <li>- rainwater (roof runoff)</li> <li>- groundwater</li> <li>- stormwater</li> <li>- desalination or other</li> </ul> <p>Overview of water supply system</p> <p>Plans and strategies e.g. long-term strategies for the water supply system to accommodate population growth and a changing climate</p> <p>Thresholds and triggers for implementing alternative options</p>



**7.2 Multi-functional water system infrastructure – To provide multi-functional water infrastructure seamlessly integrated into the urban landscape.**

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. Water infrastructure assets typically function to serve a <b>single purpose</b>. <b>These assets</b> (including the surrounding land) are <b>generally not available</b> for public access which is seen as conflicting with operational requirements.</p> <p>2. <b>Most</b> water infrastructure assets (function to serve a <b>single purpose</b>. <b>Few</b> assets (including the surrounding land) are <b>available</b> for public access where not seen as conflicting with operational requirements.</p> <p>3. <b>Some</b> water infrastructure assets are <b>multi-functional and co-located</b> with other assets to deliver multiple beneficial outcomes for the community. <b>Some</b> assets (including the surrounding land) are available for <b>public access</b>. Policy recognises public access as a benefit.</p> <p>4. <b>Most</b> water infrastructure assets are <b>multi-functional and co-located</b> with other assets to deliver multiple beneficial outcomes for the community. <b>Most</b> assets (including the surrounding land) are available for <b>public access</b>. <b>Policies</b> are in place which recognise the benefit of multipurpose infrastructure and encourage public access.</p> <p>5. <b>Almost all</b> water infrastructure assets are <b>multi-functional and co-located</b> with other assets to deliver multiple beneficial outcomes for the community. <b>Almost all</b> assets (including the surrounding land) are available for <b>public access</b>. The importance of multipurpose infrastructure and public access is taken for granted.</p>	<p><b>Water system design</b> What is the major infrastructure for supply, wastewater treatment, flood and stormwater management (for example, reservoirs, treatment plants, retarding basins and floodplains)?</p> <p>What services do they provide beyond essential services?</p> <p>Do the site and/or assets have public access? Which assets?</p> <p>Do retarding basins or floodplains include stormwater treatment assets such as wetlands?</p> <p>Do they form part of an open space network?</p> <p>Is land, such as pipe easements, also used for other beneficial purposes?</p> <p>Are there policies in place which recognise the benefit of multipurpose infrastructure and encourage public access?</p>	<p>Water system description. What is the main purpose of the infrastructure? What other services do they provide?</p> <p>Refer to relevant websites - do the assets or surrounding land have public access?</p> <p>Contact water authorities about infrastructure services?</p>



### 7.3 Integration and intelligent control – To optimise water system network performance through the use of a smart city approach.

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. <b>Limited monitoring</b> and automated <b>control systems</b> in place.</p> <p>2. <b>Intelligent control</b> typically limited to the <b>control of systems</b> in <b>isolation</b> (e.g. water supply system only).</p> <p>3. There are some examples of <b>monitoring and control</b> systems that are <b>integrated</b>. <b>Some assets owned by water authorities</b> are equipped with intelligent control systems. Where automated monitoring exists on council owned assets a manual response is typical.</p> <p>4. <b>Intelligent control</b> is used in <b>some parts</b> of the system allowing <b>multifunctional assets</b> to be <b>optimised</b>. Local examples of managing parts of the urban water cycle in an integrated manner exist.</p> <p>5. <b>Integrated intelligent system controls</b> are typical across <b>all scales</b>, and allows operation and performance of multifunctional assets to be <b>optimised</b>. System capacity and resources across all levels can typically be monitored and adjusted in real time.</p>	<p>Water system design Is there planning and management of water systems to achieve integration?</p> <p>Can the available solutions be applied for different benefits if required?</p> <p>What processes and techniques are in place (e.g. IT solutions, real time control systems, etc.)?</p>	<p>Water system description and infrastructure arrangements for managing supply (including alternative water sources), sewerage and drainage/flood control</p>

## 7.4 Robust infrastructures – To create a water system network that is virtually insensitive to stresses through the use of redundancy measures and by-pass systems.

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. The system is <b>highly sensitive</b> to stresses and the number and frequency of <b>failures</b> per capita per year is <b>very high</b>.</p> <p>2. The system is <b>sensitive</b> to stresses though <b>some redundancy</b> measures are in place. The number and frequency of <b>failures</b> per capita per year is <b>moderate</b>.</p> <p>3. The system is <b>fairly robust</b>. There are <b>some redundancy</b> measures and by-pass systems. Infrastructure integrity is <b>checked</b> on an <b>ad hoc basis</b>. The number and frequency of <b>failures</b> per capita per year is <b>low</b>.</p> <p>4. The system is <b>robust</b>. There are <b>redundancy measures</b> and <b>by-pass systems</b>. Infrastructure integrity is <b>checked</b> on a <b>regular basis</b>. The number and frequency of <b>failures</b> per capita per year is <b>very low</b>.</p> <p>5. The system is <b>highly robust</b> and <b>virtually insensitive to stresses and failures</b>. The system has <b>redundancy</b> and <b>by-pass systems</b> and infrastructure integrity is <b>actively monitored</b>. The number and frequency of <b>failures</b> per capita per year is <b>extremely low</b>.</p>	<p><b>Water system design</b> What is the specified performance of key assets and the water system (level of service, design standards)?</p> <p>Is capacity sufficient to meet demand or loads?</p> <p>How often does the system fail? Can the system cope well with occasional failures?</p> <p>Are failures monitored and reported? What system or asset failures have occurred and how often?</p>	<p>Performance standards relative to the stressors of the water system and the operational capacity</p> <p>KPI's and performance data (including failure data)</p> <p>Complaints made by the community</p>



## 7.5 Infrastructure and ownership at multiple scales – To optimise water system performance through the integration of centralised and decentralised infrastructure.

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. Essential services owned and operated by <b>one or a very small number of centralised authorities</b>. <b>Decentralised and onsite water systems</b> such as rainwater tanks, domestic wastewater systems and groundwater bores, are used by property owners to supplement poor or non-existent central services and are often poorly constructed and maintained by property owners.</p> <p>2. Essential services are owned and operated by <b>one or a very small number of centralised authorities</b>. <b>Policy and regulation</b> discourage or are silent on the use of decentralised and on-site systems.</p> <p>3. Essential services are mostly owned and operated by <b>one or a very small number of centralised authorities</b>. <b>Decentralised and onsite systems</b> are <b>encouraged</b> and part of integrated water system planning for the city.</p> <p>4. Essential services are owned and operated by <b>one or more authorities</b>. A <b>combination of centralised/decentralised</b> infrastructure is common and is planned and operated as part of an <b>integrated and well-maintained system</b>. Private companies have opportunities to own and operate water system assets and be part of the integrated service provision.</p> <p>5. Essential services are owned and operated by a <b>combination of property owners, companies and one or more authorities</b>. Diversified and decentralised water system services are <b>planned and operated</b> as part of an integrated system which includes increasing neighbourhood run cooperative facilities such as rainwater harvesting schemes.</p>	<p><b>Water system design</b></p> <p>What are the available water services and what scale do the different services operate? (e.g. bore water in x% households)</p> <p>Who owns and operates the services?</p> <p>Is there integrated oversight and management?</p>	<p>Ownership the water system with respect to supply (including alternative water sources), sewerage and drainage/flood control</p> <p>Policies and strategies related to the planning and operation of the water system</p>

## 7.6 Adequate maintenance - To undertake appropriate maintenance practices ensuring the long term integrity and provide policies for the operation and maintenance of all water infrastructure (including green infrastructure)

Rating Scale	Guiding questions	Suggested data collection sources
<p>1. Evidence of <b>systematic failure</b> of traditional water infrastructure. There are <b>inadequate budgets</b> allocated to maintain the long term water system performance.</p> <p>2. <b>Some</b> evidence of <b>systematic failure</b> of traditional water infrastructure. System <b>maintenance</b> addresses immediate needs of <b>aging infrastructure</b>, although an extensive backlog of activities may exist in some areas resulting in a <b>decline in the standard of service</b> provided.</p> <p>3. Access to adequate <b>funding</b> for maintenance activities is <b>limited</b>. <b>Maintenance guidelines</b> and procedures are <b>widely available</b> for traditional water infrastructure. Long term maintenance needs of traditional water infrastructure are well understood and undertaken to a reasonable standard. Maintenance procedures for <b>green-blue assets</b> are <b>less well understood</b> and often <b>inadequately undertaken</b>. Asset registers for green/blue infrastructure are starting to be developed.</p> <p>4. Access to <b>funding</b> for maintenance activities is <b>available</b>. Long term maintenance needs of traditional water infrastructure and <b>green-blue assets</b> is <b>well understood</b>, planned for and <b>undertaken</b> to a reasonable standard. <b>Maintenance guidelines</b> and procedures are <b>widely available</b> for all water related infrastructure including green-blue assets. <b>Assets</b> are all recorded on a GIS system supported by <b>comprehensive databases</b>.</p> <p>5. Access to <b>adequate funding</b> for maintenance activities is available (perhaps secured through user-based charges). Long term maintenance needs of traditional water infrastructure and <b>green-blue assets</b> is <b>well understood</b>, planned for and <b>undertaken</b> to a reasonable standard. <b>Maintenance guidelines</b> and procedures are <b>widely available</b> for all water related and green-blue infrastructure. <b>Assets</b> are all recorded on a GIS system supported by <b>comprehensive databases</b>. Asset audits and <b>proactive maintenance</b> programs are undertaken. <b>Asset information</b> is used to <b>adapt practices</b> and <b>support innovation</b>. <b>Co-operation</b> between <b>multiple asset owners</b> occurs to ensure all assets at all scales are maintained to enable integrated operation.</p>	<p><b>Operation and maintenance</b></p> <p>What is the specified maintenance of the water related assets (supply, sanitation and stormwater, including blue-green infrastructure)?</p> <p>Do responsible authorities allocate appropriate budgets to maintenance to ensure there is no decline in the condition of the asset? What is the budget allocation for maintenance?</p> <p>Are failures monitored and reported?</p> <p>A formal asset management systems in place? Do they include all asset types e.g. waterways, vegetation?</p> <p><b>Policy and strategy</b></p> <p>What are the existing policies and strategies related to the operation and maintenance of the water system?</p> <p>What maintenance guidelines are available? What asset management systems are used?</p>	<p>WSUD maintenance manuals and audits</p> <p>Budget allocations for maintenance</p> <p>Formal asset management systems</p>