



## Technical Deep Dive on Integrated Urban Water Management (IUWM) Sep 25 to 29, 2017

World Bank Tokyo Development Learning Center (TDLC)  
Integrated Urban Water Management Community of Practice  
(IUWM CoP)

### Executive Summary

Rapid urbanization and increasing climate variability are causing a significant surge in competition for scarce water resources and for urban space across different users and sectors. The increased frequency and magnitude of natural disasters, from droughts to floods, threaten the inhabitants and economies of urban areas. Complicating matters further, raw water sources are at risk of becoming more contaminated through changes in land use patterns, poor solid waste and wastewater management and aging infrastructure. At the same time, urban planning is often more re-active than pro-active as cities cannot cope with the speed of unplanned urbanization.

As a consequence, the quantity and quality of water, and the space available to cities for agriculture, energy, industry and human development needs, are and will remain in constant flux. With many sectors relying on the same river basin, groundwater, and urban environment, the competitive dynamics at play require an integrated approach to urban water management and a holistic mode of strategic planning and investment design. The IUWM approach takes a landscape view of the challenges by looking at competing users in a given catchment or river basin and the urban area therein, including economic and financial analyses of alternatives for water-related infrastructure and services.

Through coordinated and flexible planning among interconnected water and urban sectors and stakeholders, IUWM allows for adequate sequencing of traditional and new infrastructure with appropriate management scenarios that leverage efficiencies and promote conservation. This IUWM Technical Deep Dive (TDD) will be organized and financed jointly by the World Bank's Social, Urban, Rural & Resilience (SURR) Global Practice and the Water Global Practice and will provide an opportunity for participants to develop a deeper understanding on the different elements of the IUWM approach, and its applicability in specific contexts.

### Context and challenges

Urbanization increases the competition for the same natural resources (air, land and water) that humans depend on for living, for productive activities and for amenities. The environment that results from a city's natural resources and its population can be considered as a living and dynamic entity that generates a set of interconnected effects which, if not controlled, can lead a city into a state of development chaos including significant negative externalities: large population concentrations in congested areas with inadequate urban planning, transportation, water supply, sanitation, solid waste and storm water services commonly lead to unsustainable urban dynamics which in turn will impact the population's health and quality of life and ultimately the city's competitiveness. These negative social, environmental and economic impacts can compound to become major limitations for sustainable development in a city.

Integrating urban and water considerations through a holistic planning approach allows cities to prioritize investments in pursuit of a liveable, greener, competitive and more resilient city. This can be realized at the investment or project level by involving stakeholders of linked or affected sectors, as well as at a programmatic level by developing a holistic masterplan or framework with different stakeholders. Through these holistic frameworks, economic analyses can be developed which take account of the often positive medium- to long-term impacts of

integrated solutions, and financial analyses can be used to identify different options for securing additional funds, such as through private sector involvement and revenue increases.

IUWM is not a new concept; its principles have been outlined elsewhere before and are referred to in a variety of ways (e.g. Cities of the Future (IWA), Water Sensitive Cities (Wong, 2009)) and with different acronyms (e.g. Sustainable Drainage Systems (SUDS), in the UK, or Water Sensitive Urban Design (WSUD), in Australia). Two figures from the IUWM Guidance Note<sup>1</sup> (World Bank, 2016) describe the IUWM approach holistically: Figure 1 shows the multiple layers of integration along administrative boundaries, users in a basin, and interdependent sectors, while Figure 2 illustrates the three different segments of an IUWM strategy: engagement, diagnostic and planning.

It is important to note that IUWM is not a framework or methodology that can or should be applied to all cities indiscriminately. For a city to benefit from an IUWM approach, two factors are critical: First, the level of integration across urban sectors and spatial scales, while involving all relevant stakeholders, needs to be determined based on the city's institutional capacity – with higher capacity, more integration could be feasible. Second, serious water-related challenges, such as water scarcity, flooding, or water pollution issues, provide a unique entry point or a “driver” for IUWM approaches to be considered by urban decision makers.

There are number of different challenges faced by urban actors in client countries. In general, these can be described along three scenarios: water-abundant and flooding cities, water-scarce cities, and grid vs. on-site sanitation situations. Although any given city can be challenged by having too much or too little water at different times throughout the year, or in different areas, and at the same time can also face varying sanitation challenges, this distinction facilitates the conceptualization of the IUWM approach. These three scenarios are 1) Water-abundant, resource polluted and flooding cities, Water scarcity and lack of Integrated sanitation approaches

## Organizer and Partners

The conference will be organized under the auspices of the TDLC program, a partnership of the Government of Japan and the World Bank. TDLC supports and facilitates strategic WBG and client country collaboration with select Japanese cities, agencies and partners for joint research, knowledge exchange, capacity building and other activities that develop opportunities to link Japanese and global expertise with specific project-level engagements in developing countries to maximize development impact. The program is global in reach and thematically focused on urban planning, urban service provision, urban management, social development, land and territorial policy and municipal finance. In delivery of the TDD, TDLC expects to collaborate with and draw on expertise of many of the following development agencies, think tanks and organizations including the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), Water and Water Resource Bureau, Government of Japan, Yokohama City.

## Format

Technical Deep Dives (TDDs) integrate workshops, site visits, peer-peer knowledge sharing and action planning to support World Bank clients in specific topics. TDDs facilitate knowledge sharing and provide ongoing support to connect clients with technical experts and best practices in close collaboration with the World Bank's Communities of Practice (COP)/Knowledge Silo-Breaker (KSB)

Delegates to the Technical Deep Dives benefit from:

- Cutting-edge policy thinking and technical knowledge delivered through engaging learning sessions;
- Increased capacity to assess policy and regulatory frameworks across several sectors;
- Peer learning and networking through experience exchange sessions;
- Experimental knowledge exchanges through site visits;
- Opportunity to engage directly with Japanese municipalities, ministries, transit agencies, private sector and academia, to learn innovative solutions and to identify areas of further collaboration and knowledge exchange;
- Access to follow-up operational support to assist in the successful application of knowledge gained through the TDD, provided through TDLC's operational support component.

<sup>1</sup> <https://openknowledge.worldbank.org/handle/10986/24430>

DAY 1 MONDAY, SEPTEMBER 25 <sup>th</sup>	
SCHEDULE	
8:30-9:00	Breakfast and Registration at TDLC
9:00-9:30 (30 min)	<p><b><u>Welcome and Technical Deep Dive Objectives</u></b></p> <p><b>Agenda Setting</b></p> <p>Opening: Dan Levine, Senior Officer, TDLC, WBG</p> <p>Welcome Remarks</p> <ul style="list-style-type: none"> <li>▪ Maria Angelica Sotomayor, Practice Manager, Water GP, WBG</li> <li>▪ Catalina Marulanda, Practice Manager, GP-SURR, WBG</li> </ul> <p><b>Icebreakers</b></p> <p>Cultural bingo</p> <ul style="list-style-type: none"> <li>▪ Haruka Imoto, KM Analyst, TDLC, WBG</li> </ul>
9:30-11:30 (120 min)	<p><b>Framing IUWM</b></p> <p>The session provides an overview of IUWM (background, process, levels, etc.) and several technical primers to be selected based on alignment with clients' focusing on range of issues along with wet cities, dry cities, sanitation; urban planning; urban flooding, drainage and green infrastructure; water supply and sanitation, water resource diversification and demand management; solid waste management; etc.</p> <ul style="list-style-type: none"> <li>▪ Maria Angelica Sotomayor, Practice Manager, Water GP, WBG</li> <li>▪ Catalina Marulanda, Practice Manager, GP-SURR, WBG</li> <li>▪ Dr. Carlos Tucci, Professor, Federal University of Rio Grande do Sul; Director, Rhama Consultoria Ambiental Ltda; consultant, WBG</li> <li>▪ Manuel Marino, Consultant, WBG (Senior expert on IUWM, previously Lead WSS Specialist, WBG)</li> </ul>
11:30-12:50 (80 min)	<p><b>Addressing the challenges</b></p> <p>Interviews on how Japan has been addressing IUWM challenges at national, state and local level</p> <ul style="list-style-type: none"> <li>▪ Yoshihisa Iwasaki, Director, Integrated Water Resources Management Strategy Office, Water Resource Planning Division, Water Resources Department, Ministry of Land, Infrastructure, Transport and Tourism (MLIT), and Counselor for Policy Planning Coordination, Secretariat, Water Cycle Policy Headquarters, Cabinet Secretariat</li> <li>▪ Facilitator: Diego Rodriguez, Senior WRM Specialist, WBG</li> </ul>
12:50-14:00	Lunch
14:00-17:00 (180 min)	<p><b>Shift and Share 1</b></p> <p>The challenges, opportunities and lessons learned on IUWM by client countries</p> <ul style="list-style-type: none"> <li>▪ Representatives from first half of client countries</li> <li>▪ Overall facilitation guidance from Shobha Kumar, Senior Knowledge Management Officer, WBG and TDLC</li> </ul> <p>Coffee available (15:00)</p>
17:00-17:45 (45 min)	<p><b>Quick Reflection and Comments from Practice Managers, Task Team Leaders and Participants</b></p> <p><b>Introduction to action plan exercise</b></p> <ul style="list-style-type: none"> <li>▪ Facilitator: Shobha Kumar, Senior Knowledge and Learning Officer, WBG</li> </ul>
18:00-19:30 (90 min)	<p><b>Networking event dinner at "Za Watami"</b></p> <p>1F, 1-3-10, Shimbashi, Minato-ku, Tokyo</p>

DAY 2 TUESDAY, SEPTEMBER 26 <sup>th</sup>	
SCHEDULE	
8:30-9:00	Coffee at TDLC
9:00-9:10 (10 min)	<b>Introducing D2</b> <ul style="list-style-type: none"> <li>Facilitator: Haruka Imoto, Knowledge Management Analyst, TDLC, WBG</li> </ul>
9:10-9:40	<b>Issue around the Solid Waste Management</b> <ul style="list-style-type: none"> <li>John Morton, Senior Urban Environment Specialist, WBG</li> </ul>
9:40-10:25 (45 min)	<b>Lessons learned from previous IUWM Experiences and Operations</b> Presentation and discussion on lessons learned from previous IUWM experiences and operations, including importance of stakeholder engagement & institutional arrangements, quick wins <ul style="list-style-type: none"> <li>Lizmara Kirchner, Senior Water &amp; Sanitation Specialist, WBG</li> </ul>
10:25-12:55 (150 min)	<b>Shift and Share 2</b> The challenges, opportunities and lessons learned on IUWM by client countries <ul style="list-style-type: none"> <li>Representatives from second half of client countries</li> <li>Overall facilitation guidance from Shobha Kumar, Senior Knowledge and Learning Officer, WBG and TDLC</li> </ul>
12:55-14:00	Lunch
14:00-14:45 (45 min)	<b>Economic and finance aspects of IUWM</b> Presentation on economic cost-benefit analysis and diversification of financing options under the IUWM approach <ul style="list-style-type: none"> <li>Diego Rodriguez, Senior WRM Specialist, WBG</li> </ul>
14:45-16:45 (120 min)	<b>Economic and finance game</b> Simulation game on economic cost-benefit analysis and diversification of financing options under the IUWM approach in the fictional Bay City <ul style="list-style-type: none"> <li>Facilitators: Diego Rodriguez, Senior WRM Specialist, WBG and Matthijs Schuring, Operations Officer, WBG</li> </ul>
16:45-17:15 (30 min)	<b>Wrap-up and reflection</b> Comments from participants/Practice Mangers/Experts/Task Team Leaders <ul style="list-style-type: none"> <li>Facilitator: Yuko Okazawa, Urban Specialist, WBG</li> </ul>
17:15-	Free time

DAY 3 WEDNESDAY, SEPTEMBER 27 <sup>th</sup>	
SCHEDULE	
8:30-9:00	Coffee and pastry at TDLC
9:00-9:15 (15 min)	<b>Introducing D3</b> <ul style="list-style-type: none"> <li>Facilitator: Dan Levine, Senior Officer, TDLC, WBG</li> </ul>
9:15-10:15 (60 min)	<b>Citywide Inclusive Sanitation</b> Presentation and discussion on Citywide Inclusive Sanitation (including treatment and re-use examples from Durban, South Africa) <ul style="list-style-type: none"> <li>Martin Gambrill, Lead Water &amp; Sanitation Specialist, WBG</li> </ul>
10:15-11:00 (45 min)	<b>Country Table Discussion &amp; Planning for Peer Assist Session</b> <ul style="list-style-type: none"> <li>Facilitator: Shobha Kumar, Senior Knowledge and Learning Officer, WBG</li> </ul>
11:00-11:15 (15 min)	<b>Briefing session on site visits</b> <ul style="list-style-type: none"> <li>Facilitator: Haruka Imoto, Knowledge Management Analyst, TDLC, WBG and Shobha Kumar, Senior Knowledge and Learning Officer, WBG</li> </ul>
11:15-11:45 (30 min)	Lunch in TDLC
11:45-13:00 (90 min)	Bus ride
13:15-17:15 (240 min)	<b>Site Visits in Yokohama Area</b>  <b>13:15-14:45 Site Visit (1) Tsurumi River Multipurpose Retarding Basin</b> project, constructed at the intersection of the Tsurumi River and the Toriyama River in the Kozukue and Toriyama areas of Kohoku-Ward, Yokohama City, as example of a multi-purpose park and flood retention area.  <b>14:45-15:30</b> Bus ride  <b>15:30-17:15 Site Visit (2) Yokohama Hokubu Water Recycling Center</b> , to learn about city's effort in recycling water including sludge treatment
17:30-	Free Time - <u>Explore Yokohama and come back by public transportation OR come back to Tokyo directly by our chartered bus</u>

DAY 4 THURSDAY, SEPTEMBER 28 <sup>th</sup>	
SCHEDULE	
8:30-9:00	Coffee at TDLC
9:00-10:00	<p><b>Reflection from D3 – specially from the Field Visits</b>– Facilitator, Dan Levine</p> <ul style="list-style-type: none"> <li>Experts including Maria Angelica Sotomayor, Practice Manager, Water GP, WBG, Catalina Marulanda, Practice Manager, GP-SURR, WBG, Martin Gambrell, Lead Water &amp; Sanitation Specialist, WBG</li> </ul>
10:00-13:00 (180 min)	<p><b>Master Class: Optimizing land use planning through a water lens</b></p> <p>Practical experiences of bringing together WSS, WRM, drainage, DRM, housing, urban planning, environment, etc. using hydrological models and other tools - based on Teresina, Brazil and other cases</p> <ul style="list-style-type: none"> <li>Dr. Carlos Tucci, Professor, Federal University of Rio Grande do Sul; director, Rhama Consultoria Ambiental Ltda; consultant, WBG</li> <li>Manuel Marino, Consultant, WBG (Senior expert on IUWM, previously Lead WSS Specialist, WBG)</li> </ul>
13:00-14:00	Lunch
14:00-15:30 (90 min)	<p><b>Peer Assist</b></p> <ul style="list-style-type: none"> <li>Shobha Kumar, Senior Knowledge Management Officer, WBG</li> </ul>
15:30-15:45	Coffee
15:45-17:45 (120 min)	<p><b>Explanation about action plan</b></p> <ul style="list-style-type: none"> <li>Facilitator: Dan Levine, Senior Officer, TDLC, WBG</li> </ul> <p><b>Presentation of TDLC operational support</b></p> <ul style="list-style-type: none"> <li>Yuko Okazawa, Urban Specialist, TDLC, WBG</li> </ul> <p><b>Action Plan Preparation</b></p> <p>Each country team works on action planning preparation</p>
	Free time

DAY 5 FRIDAY, SEPTEMBER 29 <sup>th</sup>	
SCHEDULE	
8:30-9:00	Coffee at TDLC
9:00-10:00 (60 min)	<p><b>The IUWM Process</b></p> <p>Presentation on the IUWM approach through (1) stakeholder engagement, (2) diagnostic &amp; institutions, (3) planning &amp; prioritization</p> <ul style="list-style-type: none"> <li>▪ Martin Gambrill, Lead Water &amp; Sanitation Specialist, WBG</li> <li>▪ Lizmara Kirchner, Senior Water &amp; Sanitation Specialist, WBG</li> </ul>
10:00-11:00 (60 min)	<b>Preparation of action plans</b>
11:00-12:30 (90 min)	<p><b>Action Plan Presentations (1) – 6 countries</b></p> <p>Each delegation presents their action plan; comments from expert panel</p> <ul style="list-style-type: none"> <li>▪ Facilitator: Dan Levine, Senior Officer, TDLC, WBG</li> <li>▪ Expert Panel– Maria Angelica Sotomayor, Catalina Marulanda, Carlos Tucci, Manuel Marino, Yoshihisa Iwasaki</li> </ul>
12:30-13:30	Lunch (Bento Box)
13:30-14:30 (60 min)	<p><b>Action Plan Presentations (2) – 4 countries</b></p> <p>Each delegation present their action plan based on the presentations, peer to peer learning, site visits and modules.</p> <ul style="list-style-type: none"> <li>▪ Facilitator: Dan Levine, Senior Officer, TDLC, WBG</li> <li>▪ Expert Panel– Maria Angelica Sotomayor, Catalina Marulanda, Carlos Tucci, Manuel Marino, Yoshihisa Iwasaki</li> </ul>
14:30-15:00	Coffee Break
15:00-16:00 (60 min)	<p><b>Action Plan Presentations (3) – 4 countries</b></p> <p>Each delegation present their action plan based on the presentations, peer to peer learning, site visits and modules.</p> <ul style="list-style-type: none"> <li>▪ Facilitator: Dan Levine, Senior Officer, TDLC, WBG</li> <li>▪ Expert Panel– Maria Angelica Sotomayor, Catalina Marulanda, Carlos Tucci, Manuel Marino, Yoshihisa Iwasaki</li> </ul>
16:00-16:30 (30 min)	<p><b>Feedback on the workshop (survey)</b></p> <p><b>Wrap up</b></p>
17:30-20:00	<p><b>17:30</b> Move to the reception venue on foot or by taxi</p> <p><b>18:00</b> Closing reception at Gonpachi Ginza 1-2-3, Ginza, Chuo-ku, Tokyo</p>

# TECHNICAL DEEP DIVE ON INTEGRATED URBAN WATER MANAGEMENT (IUWM) SEP 25 TO 29, 2017: TOKYO, JAPAN

## SPEAKERS AND COLLABORATORS



Team Lead of TDLC  
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## SPEAKERS AND COLLABORATORS



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## PARTICIPANTS



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## PARTICIPANTS



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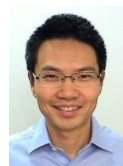
Indonesia  
Arfiansyah  
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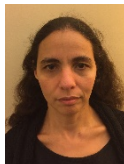
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# TECHNICAL DEEP DIVE ON INTEGRATED URBAN WATER MANAGEMENT (IUWM) SEP 25 TO 29, 2017: TOKYO, JAPAN

## PARTICIPANTS



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Philippines

Danilo Delapuz Lim  
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Office of the Chairman  
Metropolitan Manila Development Authority



# TECHNICAL DEEP DIVE ON INTEGRATED URBAN WATER MANAGEMENT (IUWM) SEP 25 TO 29, 2017: TOKYO, JAPAN

## PARTICIPANTS



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# TECHNICAL DEEP DIVE ON INTEGRATED URBAN WATER MANAGEMENT (IUWM) SEP 25 TO 29, 2017: TOKYO, JAPAN

## PARTICIPANTS



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## What is Shift and Share?

**Shift & Share** replaces long large-group presentations with several concise presentations made simultaneously to multiple small groups.

### How does the Shift and Share session work?

A few individuals set up “stations” where they share in **under ten minutes** the essence of their work/project, challenges they are trying to solve, and lessons learned that may be of value to others. Participants move to another station after the presentation and brief question and feedback period. As small groups move from one station to another, their size makes it easy for people to connect with the presenters. They can quickly learn from the lessons shared by the presenters, and the informal small-group setting also encourages the participants to ask questions and share their ideas/suggestions on the challenges. Presenters learn from the repetition, and groups can easily spot opportunities for creative solutions and shared interests.

### How to prepare for a Shift and Share session?

Each delegation prepares a brief presentation/informal storytelling session (to be delivered in **under 10 minutes** without power-point slides) to address the following questions:

- What are the key challenges the country is trying to solve?
- What is current status of progress towards a solution?
- What will change once the challenge is addressed.?
- What are the key lessons learned?
- It is important to note that this is your opportunity to share with your peers the lessons you have learned in the process of solving challenges so that others can learn from your experience. Please also make a point to share at least **one** thing that is working well or holds promise in your country in this sector.

### Additional session details

Presenters are welcome to use any handouts, visuals to support their presentation or show brief video clips or project websites to participants.

The facilitator for this session will meet with the presenters ahead of the session to answer any questions on the presentation and process.

### When do you share your story?

Day 1 Sep 25 PM		Day 2 Sep 26 PM	
Pakistan	Bangladesh	Ethiopia	Philippines
Central America	Ghana	Senegal	Lebanon
Indonesia	Kenya	Argentina	India
Brazil		Turkey	



## What is Action Plan?

An **action plan** identifies key challenges or issues the delegation plans to tackle as a follow-up to the TDD and their strategy/roadmap for addressing them. It should identify specific action steps that need to be taken to achieve a single or multiple objectives. The action plan will also identify follow-up support that may be required to implement the action steps.

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The presentation should be no more than **10 min in total and up to 8 slides**. Each client delegation prepares and presents an action plan to an expert panel composed of technical experts from the World Bank and resource cities. **You will have enough time to prepare the action plan during the week.**

### What to Cover?

- COVER PAGE: **Some photos** from your city (hopefully from your project)
- SLIDE 1: **Key takeaways** from the Technical Deep Dive
- SLIDE 2: **What needs to be accomplished** (List up to 3 things) to address the priority challenges you are facing in your context.
- SLIDE 3: **What approaches** that were presented during the TDD are most applicable to addressing your challenges
- SLIDE 4: **What are some of the action steps** you can take in the next six months to apply/adapt this in your city/organizational context.
- SLIDE 5: **Who are the key stakeholders** you need to reach/ work with to implement the action steps?
- SLIDE 6: **What is the timeline** to achieve 3-4 key milestones in the next six months?
- SLIDE 7: **What are 2-3 opportunities/barriers** that you see in implementing the action plan?
- SLIDE 8: **What concrete support/assistance will you need from TDLC to implement your action steps successfully?** you would help you make those steps successful?

## Participant Questions for a Field Visit

### **Questions**

*What did I expect from this visit?*

*What struck me most? Why?*

*What are the questions that came up from the visit?*

*What do I consider to have been the success factors of the initiative we observed?*

*What obstacles and challenges came up in the process of developing this initiative?*

*What new challenges are there today and how are they being addressed?*

*Is this experience replicable in my city/country? Yes / No.*

**Questions**

*What aspect/part would or would not be? Why?*

*How I can put what I learned into practice in my city/country?*

*What lessons can I take from this experience?*

## What is Peer Assist?

A Peer Assist is a tool that supports "learning before doing" processes. It is a transfer of tacit knowledge from one group of peers to another, allowing valuable lessons from past projects to inform future projects. The team seeking knowledge and insights from others are called "Host Team," while the group of peers who have had similar experiences and share their knowledge and insights is called "Resource Team."

### Benefits of a Peer Assist for the Host Team

- Target an adaptive results **challenge** they are currently facing in their project
- Gain new perspectives from people outside the team based on their knowledge and insights
- Promote collective learning and develop networks with peers
- Identify possible new approaches, action items, and new lines of inquiry

### Benefits of a Peer Assist for the Resource Team

- Share knowledge and insights about adaptive challenges with peers, based on past experience and lessons
- Promote collective learning and develop networks with peers

## Peer Assist: Conditions for Success

Peer Assist is not a typical meeting, but a session that is specifically structured for learning. To make it a success, the Host Team needs to keep the following in mind.

### Be in a problem-solving mode

- You are facing a problem that others have faced in the past, and you can learn from their experiences.
- Focus on an adaptive results **challenge** for which there is more than one solution.

### Look beyond your department and sectoral colleagues for inputs

- Expand the perspectives by reaching outside your familiar networks – seek inputs from the "unusual suspects" – go beyond your department and sectoral colleagues.

### Limit the size of the group and break it up as needed

- Encourage everyone's participation by limiting the size of the group (no more than 15-18) while keeping the group diverse in experience and skills. As necessary, break it up so that everyone provides inputs.

### Promote collective learning and develop networks with peers

- While the Peer Assist is driven by the Host Team's needs, Resource Team participants also benefit from the participatory learning experience and developing a network of peers.

### Identify new approaches and action items, and new lines of inquiry

- Seeking perspectives from outside the team can sometimes lead to breakthroughs in the way you understand and address challenges in your project.

### **Balance telling and listening**

- The Host Team must help the Resource Team participants clearly understand the context of the challenges, spend time explaining past efforts to address them, and absorb the Resource Team's recommendations without interrupting or defending past efforts and decisions.

### **Prioritize and commit to action**

- While taking note of all the ideas and recommendations that came out of the session, identify, and note a few action items for follow up.

### **Preparing Materials for Peer Assist**

Depending on the purpose and needs of your session, the host team may use:

- Flipchart pads and stands
- Writing pads and pens

### **Role of Facilitator**

#### **Before the session**

- Learn about the challenges that the Host Team has, and if necessary help them clarify and prioritize the issues
- Clarify the respective roles that you and the Host Team will play during and after the session
- Ensure that the meeting space is set up in a manner conducive to dialogue

#### **During the Session**

- Welcome participants.
- Review process: Familiarize all participants with the respective roles of the Host Team, Resource Team, and Facilitator.
- Clarify up-front the key challenges and questions. To keep the session focused and outcome-based, ensure that participants have a clear understanding of the challenges that the Host Team is looking to solve.
- Manage Timing: Encourage participants to stay on the agenda. Keep Host Team's context-presentations short. Ensure that the process and flow of the session is managed in such a way that the objectives of the Peer Assist can be achieved.
- Traffic control: Ensure that everyone on the Resource Team has a chance to contribute either verbally or by putting down ideas/comments in writing/post it notes. Ensure that any disagreement is focused on the issue rather than the person, and encourage people to consider alternative ways of thinking and taking action.
- Have Host and Resource Teams summarize what they learned: In addition to having the Host Team summarizing what they learned, invite Resource Team participants to reflect and share what they have learned from the session.
- Conclude the session.



## Peer Assist Session Running Order

Total time: 90 minutes

5 mins	<p><b>Facilitator</b> opens the session. Explain purpose, format and ground rules. A <b>Reporter</b> from among the Responding Participants is identified to present a summary of the key recommendations. Participants are seated comfortably with a view of everyone.</p>
15 -20 mins	<p>A pre-assigned <b>Host Team member</b> describes the problem, and briefly explains key questions for peer assist (already listed on a flip chart). Other host team members can join in (as needed) to explain the problem. Some questions for clarification permitted.</p>
45 mins	<p>Discussion is launched on the key questions, and <b>Responding Participants</b> brainstorm among themselves on possible solutions to the problem. The <b>Host Team</b> is in listening/note taking mode (and does not intervene in these discussions).</p>
20mins	<p><b>Reporter</b> reports back to the <b>Host Team</b> with key recommended action items. The requesting team asks clarifying questions, and may request participants to elaborate on points of discussion which were of special interest to them. <b>A pre-assigned host Team member</b> is making note of the recommended action items</p>
5 mins	<p><b>Host team member/s</b> report on a few ideas that they can prioritize for follow up. Invite <b>all Participants</b> to share a Reflection/Insight.</p>

## CASE DESCRIPTION ROUND 1

Bay City is located in a delta area. The natural water system of Bay City consists of one main river with some lakes and ponds, which discharge into a bay that is linked with the wider ocean. A wastewater treatment plant is located downstream along the river at the bay which collects sewage from the city and conducts primary treatment of sewage before discharging it directly into the bay.



The discharged wastewater increasingly causes water quality degradation and ecosystem damages in the bay. This has significant negative effects on recreation and tourism activities and surrounding property values.

With increasing urbanization and population growth in the city, the capacity of the wastewater treatment plant is no longer sufficient. Therefore, enhancing the capacity of the plant is necessary.

The city is expecting to have an annual revenue stream of \$1,000,000 in water treatment fees available for the investments in capacity expansion over the coming 30 years.

You are the Bay City task force responsible for the water management investment program.

## ALTERNATIVE PROJECT SOLUTIONS

The working group responsible for developing alternative technical investment programs came up with the following three alternatives which all have the main objective to solve the wastewater treatment capacity problem:

### ALTERNATIVE 0

This is the baseline alternative, where the minimal level of investment is made, i.e. augmenting the capacity of the current wastewater treatment plant (WWTP) to meet the growing demand due to population growth, with an estimated investment cost of \$5,000,000 and annual maintenance costs are 3% of the initial investment cost. This alternative is expected to only collect and treat the increased volume of sewage (due to population growth) to the primary level, before discharging it into the bay. Hence, the expanded capacity of the treatment plant will, as a minimal requirement, avoid discharging untreated effluents into the bay as the city grows. However, no improvement of the water quality is expected in the long term as compared to the current situation.

### ALTERNATIVE 1

In addition to expanding the capacity of the current WWTP, this alternative involves investing in treatment upgrades in the plant so that the entire volume of collected sewage from the city will be treated to the secondary level. This will not only reduce pollution and negative impacts on the aquatic ecosystem in the bay, but may help support tourism and recreational activities in the bay while safeguarding public health through these activities. The total investment cost of this alternative is estimated to about \$8,000,000 and annual maintenance costs are 4% of the initial investment cost.

### ALTERNATIVE 2

In this alternative, the capacity of the current WWTP will be expanded to meet the growing demand, without investing in any treatment upgrade. This is achieved by subjecting the wastewater to primary treatment only but moving the discharge point for the primary-treated effluent further into the ocean, outside of the bay through an extended outfall pipe. The total investment cost of this alternative is estimated at about \$7,000,000 and annual maintenance costs are 3% of the initial investment cost. This alternative is based on scientific studies showing the decreased level of pollution impact in the bay that could be achieved with this alternative, obviously leading to increased tourism and recreational activities in the bay. However, the study also showed projections of potential negative environmental impact on the aquatic ecosystem outside the bay, as well as potential negative economic impacts in the long run due to reduced flexibility for future residential, touristic, and recreational development around the bay.

## ECONOMIC IMPACT ASSESSMENT

The working group went ahead and hired an established A&E firm to prepare a high-level assessment of the economic impacts of the two project alternatives, compared to the baseline alternative. The assessment has been overseen by a steering group, in which representatives of the key stakeholders and some well-respected professors in cost-benefit analysis were represented. The following results of the economic assessment are reviewed and approved by the steering group:

<b>Economic benefit</b>	<b>Alternative 1</b>	<b>Alternative 2</b>
<b>Environmental benefits in the river, bay and ocean</b>		
Improvements of aquatic ecosystems in river and bay	\$270,000 / year	\$40,000 / year
Improvements of aquatic ecosystems in ocean	Significant positive effect Not quantified	Positive effect Not quantified
Increase in carbon capture and storage	\$30,000 / year	\$10,000 / year
Avoidance of eutrophication events that can lead to biodiversity loss	Significant positive effect Not quantified	Positive effect Not quantified
<b>Total environmental benefits</b>	<b>\$300,000 / year</b>	<b>\$50,000 / year</b>
<b>Social and economic benefits from development around the bay</b>		
Tourism benefits related to the bay landscape	\$100,000 / year	\$150,000 / year
Reduction in cases of illness and the avoidance of premature mortality arising from water-borne disease	Positive effect Not quantified	Positive effect Not quantified
Eco-efficiency gains from higher fish provision due to healthier ecosystems	\$50,000 / year	\$50,000 / year
Avoided costs of hospitalization and lost days at work from health impacts	Modest positive effect Not quantified	Modest positive effect Not quantified

Development of new industries of the economy	Modest positive effect Not quantified	Modest positive effect Not quantified
Safeguarding of, and access to, natural heritage	N/A	-/- \$50,000 / year
Viability of coastal communities and employment/livelihoods in fisheries	\$50,000 / year	\$100,000 / year
Social cohesion related to employment opportunities	Positive effect Not quantified	Positive effect Not quantified
<b>Total social and economic benefits</b>	<b>\$200,000 / year</b>	<b>\$250,000 / year</b>

## CASE DESCRIPTION ROUND 2

Your city has recently started embracing an integrated approach to urban water management. In this context, your team has been asked to widen your scope and assess other water management challenges in the area. The Water Diagnosis Tool of the Integrated Urban Water Management toolkit has been used. You found out about several additional water challenges that are interrelated:

### Groundwater Depletion & Water Supply Challenges

Population growth and rapid urbanization is causing significant increases in water demand, leading to over-abstraction of groundwater and the lowering of the groundwater table. This depletion of groundwater plus reduced river flows cause salt water intrusion, degrading groundwater quality in the coastal aquifer. The lower groundwater levels and poorer quality increases costs of pumping and treatment for water supply. In addition, land subsidence due to lower groundwater levels causes damages to properties, increases flood damages, thereby reducing property values.

### Storm Water Management Challenges

The current combined sewerage system in the city collects and transports untreated storm water to the wastewater treatment plant. In major storm events, the system overflows and discharges into freshwater streams (rivers, lakes) surrounding the city, which eventually reach the bay. Untreated discharging leads to pollution issues in rivers and lakes which have traditionally been used for recreational and tourism activities. Furthermore, the pollution is a public health risk. In addition, the current capacity and design of the drainage system is insufficient to efficiently convey storm water during heavy rainfall events to near-by streams. This causes frequent urban flooding problems and is likely to aggravate in the future due to climate change.

The mayor has asked your team to reach out to the following stakeholders in order to explore opportunities to work together on several of these challenges and to seriously consider any proposals they may bring forward:

- the Bay City water utility,
- ABCD, a major developer in the region, and
- the regional Blue Green Infrastructure Program.

The engagement of stakeholders from different urban water sectors can help to provide a comprehensive understanding of the water cycle and develop strategies that balance the interests of different water users. Additionally, the inclusion of stakeholders fosters ownership of jointly developed solutions and can help reduce barriers to the implementation of innovative IUWM strategies. At the same time, please be aware that working together with stakeholders and exploring alternative and integrated solutions will take time and will therefore result in transactions costs – estimated at roughly \$ 100.000 extra per stakeholder group.





The Honorable Mayor of Bay City

Dear Mayor Smith,

Bay City Water Corp has been facing serious challenges due to significant increases in water demand, leading to over-abstraction of groundwater and the lowering of the groundwater table. We are expecting that these challenges will intensify over the next coming years and will have catastrophic effects in the long run. Therefore, we believe we need to act now to restore the ground water levels. In addition to the project alternatives for the wastewater treatment plant (WWTP) that the Bay City municipal government has developed, Bay City Water Corp has developed an alternative investment alternative, that we refer to as Alternative 3.

#### ALTERNATIVE 3 KEY FACTS

Through this alternative, the capacity of your WWTP will be coupled with additional investments to upgrade treatment to the tertiary level. This advanced treatment will allow a significant reduction in pollution loads discharged to the bay, with high expected benefits in terms of water quality. In addition, the treated effluent can be used to replenish the depleting groundwater aquifer, therefore mitigating the impact of over-abstraction, preventing coastal salt intrusion, and reducing land subsistence – and thereby, closing the urban water cycle. This alternative addresses not only the management of wastewater and groundwater, but also provides a solution for our concerns regarding the increased water demand.

#### ALTERNATIVE 3 COSTS AND FUNDING

We have asked your financial advisor to develop a cost estimate, on the basis of the same methodology as was used for your other cost estimates. The overall (risk adjusted) investment cost would be \$13,000,000, with annual maintenance costs of 6% of the initial investment cost.

Bay City Water Corp is expecting to experience a significant reduction in the cost of supplying water in the long run. In addition, recent research in this area demonstrates that more than 90% of the consumers are willing to pay for better water quality. These two effects allow us to contribute \$750,000 on an annual basis for the next 30 years, which we are pleased to commit in the case of your selection of alternative 3.

#### ALTERNATIVE 3 ECONOMIC IMPACTS

The A&E firm that you hired to assess the economic impacts of your project alternatives, has prepared a high-level assessment of the economic impacts of Alternative 3 in the annex of this letter.

We sincerely hope that you will consider this alternative, that we believe has great benefits for the people of Bay City.

Yours sincerely,

Mr. Jones  
CEO of Bay City Water Corp



ANNEX ALTERNATIVE 3 ECONOMIC IMPACT ANALYSIS

<b>Economic benefit</b>	<b>Alternative 3</b>
<b>Environmental benefits in the river, bay and ocean</b>	
Improvements of aquatic ecosystems in river and bay	\$450,000 / year
Improvements of aquatic ecosystems in river and bay	Significant positive effect Not quantified
Increase in carbon capture and storage	\$50,000 / year
Avoidance of eutrophication events that can lead to biodiversity loss	Significant positive effect Not quantified
<b>Total environmental benefits</b>	<b>\$500,000 / year</b>
<b>Social and economic benefits from development around the bay</b>	
Tourism benefits related to the bay landscape	\$400,000 / year
Reduction in cases of illness and the avoidance of premature mortality arising from water-borne disease	Positive effect Not quantified
Eco-efficiency gains from higher fish provision due to healthier ecosystems	\$100,000 / year
Avoided costs of hospitalization and lost days at work from health impacts	Modest positive effect Not quantified
Development of new industries of the economy	Modest positive effect Not quantified
Safeguarding of, and access to, natural heritage	N/A
Viability of coastal communities and employment/livelihoods in fisheries	\$100,000 / year
Social cohesion related to employment opportunities	Positive effect Not quantified
<b>Total social and economic benefits</b>	<b>\$600,000 / year</b>
Additional benefits	
Avoided groundwater damage	\$350,000 / year
<b>Total additional benefits</b>	<b>\$350,000 / year</b>