

EVENT SNAPSHOT

Part 1 – Resilient City Toolbox for Urban Resilience Planning

Event Details

Date and Time

11 August, 3:00–4:00 p.m.
(Manila time)

Venue

Zoom

Related water subthemes

Water supply, sanitation, and wastewater	x	Flood/drought risk management and disaster resilience
Irrigation and productivity		Water governance and finance
IWRM, storage, water-food-energy nexus		Water and health

The ADB Water Sector Group is collaborating with Deltares, the knowledge partner of the Dutch government, to increase knowledge and improve implementation of water resources management in the region. In five webinars, Deltares will share their expertise and tools on urban resilience, WASH and health, adaptive pathways, hydrological models, and flood forecasting.

For the first part of the series, Deltares focused on the challenges of strengthening urban resilience and implementing adaptation measures. Frans van de Ven, leader of the Urban Land and Water Management team at Deltares, showed how to use their Climate Resilient City Toolbox. This web-based platform encourages collaborative spatial planning of adaptation measures and allows different stakeholders to explore alternatives for a resilient and livable city.

Some cases of using customized versions of the toolbox were also discussed, such as in New Orleans and for an ADB prefeasibility study in Xiangtan (People's Republic of China).

This is the first webinar series that the ADB Water Sector Group has held for public participation. Over 120 participants joined the session.

Key Takeaways

Discussions on urban resilience often focus on ‘too much, too little, too dirty, and not for everyone’. Urban resilience – the capability of society to prevent or cope with the impacts of climate change and sea-level rise, including technical, institutional, economic, and cultural ability – can be looked at through five lenses: (i) flood risk management; (ii) drought; (iii) water quality; (iv) integrated design; and (v) inclusiveness.

Resilience planning is based on analysis (stress test) of the physical, social, and governance vulnerability of the urban system. Spatial adaptation planning builds on the results of an in-depth analysis of vulnerabilities across the urban system. This vulnerability scan is only the first part of a tiered approach, and it also includes having a strategy to reduce vulnerability and set targets, as well as selecting the best set of adaptation measures.

Many experts and stakeholders are unaware of the numerous ecosystem-based adaptation solutions available. Disclosing information on ecosystem-based adaptation measures from a toolbox provides a starting point for reflection and multidisciplinary discussions on effectiveness, applicability, multiple benefits, and feasibility of implementation and maintenance.

The Climate Resilient City Toolbox supports the planning and design process and facilitates the dialogue among stakeholders. The Climate Resilience City toolbox promotes collaborative planning and allows stakeholders to evaluate and estimate the hydrological effectiveness, costs, and co-benefits of solutions. The output of the toolbox is the input for the detailed design of proposed adaptation measures.

There are so many solutions available. The challenge is we have to make a choice – that’s why we need to collaborate and co-design solutions across different disciplines...

— Frans van de Ven

Questions from the Audience

Does the toolbox simulate different scenarios?

The users can produce different alternatives and compare their performance with the help of the performance metrics that the tool provides and other arguments that can play a role in the selection of the preferred option. Climate scenarios are taken into consideration when customizing the toolbox. The effectiveness of the measures and the target storage capacity are both to be based on expected climate. Urbanization scenarios can be used as input by adding the projections as maps of the future situation.

Who are target users of the toolbox? Is it very technical?

The toolbox is developed for both experts and non-experts in the field of urban planning and adaptation as this planning is a multidisciplinary and multi-stakeholder effort. Experts in the field of urban water management, green planning, design, environment, transport, energy, ecology, and the like can work with the tool, as well as local stakeholders such as residents, NGO representatives, etc. The toolbox is developed to support collaborative planning sessions, but can also be used individually to study and explore potential solutions.

The tool is unavoidably a bit technical – take for example the performance indicators – but we hope it is not hindering its applicability in the dialogue to plan better solutions.

How does the toolbox cope with land subsidence?

A land subsidence (projection) map can be added to the background information layers, as with the case of a flood hazard map, a heat stress map, and others.

What are the prerequisite governance frameworks or enabling environment needed to facilitate the use of the toolkit between the initial and design stages of solutions?

The toolbox contains over 40 potential adaptation measures. Their applicability in a specific case not only depends on the physical conditions at the site, but equally critical are the institutional and governance conditions. For these ‘soft’ reasons, some of the solutions might not be a valid choice under the local circumstances.

When customizing the toolbox for local application, a check could be made on the governance feasibility of specific measures. This could be a reason to exclude a measure from the long list of measures in the toolbox.

The toolbox seems to cover surface water and groundwater well. Can you please provide a bit more information on how the interconnectedness to the wastewater and water supply systems are brought in?

Wastewater and water supply systems are not yet part of the urban water balance model that is used for calculating the effectiveness of the measures. Irrigation cannot be included in the effectiveness calculations yet—an extension is under construction. However, rainwater harvesting tanks can be included as a stormwater retention measure.

The resulting costing in the model is in EUR. Could the currency be changed to reflect local currency?

Unit cost prices are used to calculate construction and maintenance costs. These can be given in the local currency; hence, the output is in the local currency too.

How can a river basin perspective be integrated into this tool?

The tool is meant to support planning at the local level. For a river basin perspective, it is important to first set a norm for the maximum discharge capacity (Q_{max}) that the river can handle from the connected urban area. With Storage-Discharge-Frequency curves (see the presentation) we can then decide which combination of storage capacity and discharge capacity Q_{design} ($\leq Q_{max}$) will be used in the design of the urban drainage system—given the design recurrence frequency of once every T years. Q_{design} is the value relevant to the hydraulic design of the river system.

Protection from fluvial floods requires the construction of dikes/levees/berms. To make a spatial reservation for this facility dikes are included in the list of measures.

Can the toolbox optimize costing and outcomes based on feasible solution?

Not in terms of an optimization procedure; but by comparing alternative options and solutions, costs can be minimized. In practice, cost minimization is only a small part of the puzzle. Benefit maximization is often considered more important. By drafting alternative plans and a multi-stakeholder dialogue on ‘the best plan for the future of this area’, consensus can be sought on what should be done.

Is the toolbox available for free? If yes, and if a project needs it, will you be available to train the project team members and stakeholders?

The web-based Climate Resilient City Toolbox is freely available to everyone (<https://crctool.org>). To apply the toolbox in a process that requires the correct calculated results, it needs to be customized for the local climate conditions, performance, and cost figures. If you want to apply the toolbox in planning practice or for training purposes, a less-customized version of the toolbox can be used—depending on the training purposes. Deltares is available to provide on-demand training and customization of the Climate Resilient City Toolbox.

About the Speaker

Frans van de Ven

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Dr. Frans van de Ven is leader of the Urban Land and Water Management team at Deltares and associate professor of Urban Water Management at Delft University of Technology. He holds a PhD in Hydrology and is leading research worldwide on creating sustainable cities, making them climate-resilient, flood- and drought-proof, and subsidence-free. This includes research on improved concepts for urban flood and water management, other ways of urban planning and design and water quality control, blue-green solutions, and energy harvesting from water.

Related Resources

Climate Resilient City Toolbox is available at:

<https://crctool.org/en/>