CENTRE for LiveableCities SINGAPORE

REPORT

Changing Tides:
Building Community Resilience to Tackle Climate Change

Participants from the recent Connecting Delta Cities Network shared how engineering-based real time reporting can build up community resilience. Source: Centre for Liveable Cities

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Infrastructure alone is not enough for coastal cities to manage the flood risks brought about by our changing climate. They are costly and require a long planning period as seen in the case of MOSE, Venice's billion-dollar mobile flood protection barriers that have been in construction since 2003.[1] It is against this backdrop that representatives from nine cities gathered in Venice from 24th to 26th October, 2018 for the 7th Connecting Delta Cities (CDC) workshop.

What emerged from this discussion on the challenges and solutions faced by coastal cities from climate change — including rising sea levels, intensified storms and stronger storm surge events — is the need for more holistic flood risk management. Many cities have complemented engineering-based solutions with projects that build up community resilience in surviving and coping with floods and handling problems post-flood. This helps reduces the risk beyond what flood protection design standards provide.

1. https://www.mosevenezia.eu/mose/?lang=enpublic/topical_report


CDC workshop participants brainstorm solutions for climate change.
Source: Centre for Liveable Cities

Getting the Community Involved

New York City has proposed various flood adaptation strategies for the low-lying waterfront neighbourhood of Edgemere after it experienced significant damage from Hurricane Sandy. Between 2015 and 2017, the city's Department of Housing Preservation and Development (HPD) facilitated a neighbourhood planning process involving the community of some 6,600 residents located on the barrier island of Rockaways.[2] The resulting policies include "Build it Back", a programme where the government acquires vulnerable and damaged homes to develop future coastal protection measures while relocating eligible homeowners further inland where feasible.[3]

The New York City Mayor's Office of Recovery and Resiliency (ORR) is also engaging at-risk coastal communities at Arvene Rockaway (Edgemere) and Hamilton Beach by partnering with Jamaica Bay Science and Resilience Institute, Stevens Institute of Technology and the city's Emergency Management to empower people in reporting flood events in their neighbourhood. This will improve flood models and help planners better understand and visualise flood risk.[4] ORR is also working to connect the city's emergency notification office, NotifyNYC, with Waze, the world's largest community-based navigation app. This enables real-time reporting of emergencies, which is useful in helping agencies organise evacuations, managing road data, predicting road closures and direct people to the nearest shelters.[5,6]

"Living with Water"

The Netherlands has been traditionally protected by its renowned dike system, and more recently become a living showcase for climate adaption with its floating infrastructure, water squares and permeable pavements. However, the low-lying country has also been encouraging its people to reduce their reliance on flood infrastructure and to take actions in flood preparedness too. A multi-layer safety approach has made "living with water" a mantra in Rotterdam, where 85% of the city lies as much as 7-metre below sea level.

One recent project is BlueLabel, a digital service that models rainfall data to come up identify and classify properties at risk to flooding. This system started by Achmea (Netherlands's largest insurance company), Royal HaskoningDHV and Nelen & Schuurmans is made available on a website for people to take

2. https://www1.nyc.gov/site/hpd/about/press-releases/2017/03/03-20-17.page
3. https://www1.nyc.gov/assets/hpd/downloads/pdf/community/resilient-edgemere-report.pdf
4. Jamaica Bay Community Flood Watch Project (2017) Collaborating with communities, scientists, and agencies to address flooding in New York City coastal communities.
5. https://www.accuweather.com/en/weather-news/esri-mapping-waze-partner-to-aid-emergency-responders-residents-navigate-amid-hurricane-florence/70006063
6. https://www.citylab.com/transportation/2018/09/after-the-storm-a-flood-of-data/570640/

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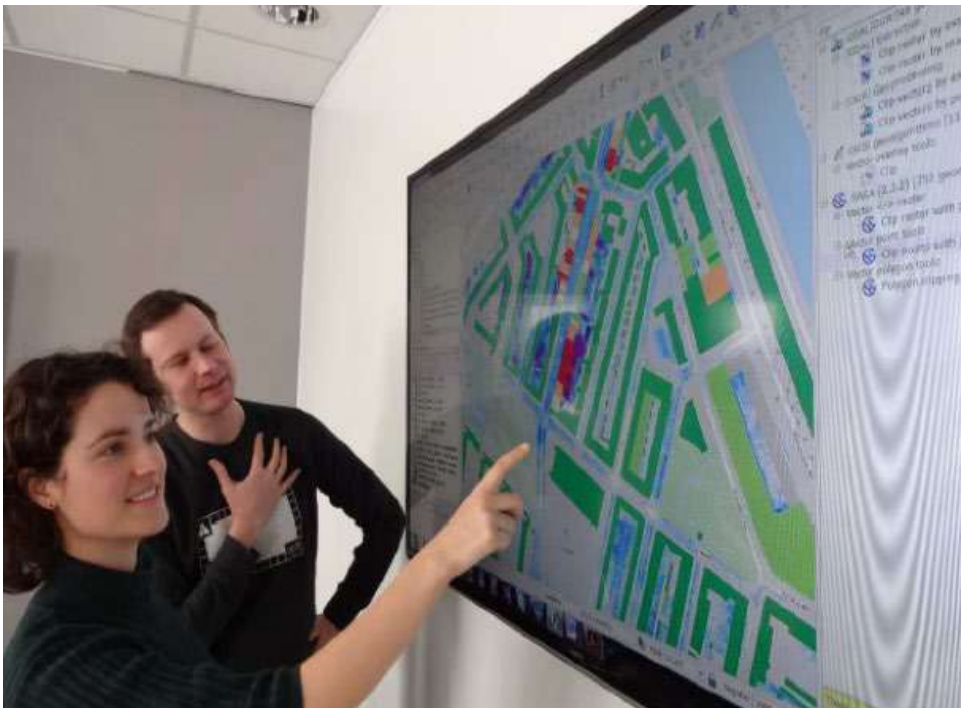
action and there is a dashboard for policy makers to monitor their goals. Rotterdam is the first Dutch city government in the Community of Practice on Climate Resilience to invest in the dashboard and provide pilot sites to test the labels and provide houses at-risk with financial assistance to implement more risk mitigation measures.



BlueLabel is used in spatial planning scenarios by policy makers and provides citizens with relevant information to mitigate flood risks. Source: Royal HaskoningDHV

Staying Prepared Together

Following floods in 2008 and 2009, early coastal flood warning systems were installed in the low-lying island of Tai O in Hong Kong. To further enhance emergency preparedness, annual drills to evacuate residents during flood hazards are also carried out with the city's Fire Services, Police Force, Home Affairs Bureau, Drainage Services Department and HK Observatory.[7]

Nevertheless, a small number of residents, usually the elderly, choose to remain even when the storm situation worsens due to superstitions and beliefs. During the recent 2018 Typhoon Mangkhut, which was raised the highest warning level of signal No. 10, the Home Affairs Department operated

7. Chan et al (2013). Coastal flood-risk management practice in Tai O, a town in Hong Kong. *Environmental Practice.*

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a 24-hours hotline for the public and an emergency coordination centre when conditions worsened. These efforts were supported by voluntary groups such as the HK Red Cross. They sent disaster relief materials and also helped the elderly to move electronic appliances and home furniture to higher ground to prevent damage. After the typhoon, these first responders also helped the elderly to clean up their houses and offer emotional support.[8]

Reducing Risks, Raising Resilience

While each coastal city has a unique context of growth, development pressures and socio-economic factors, a common thread to tackling the impact of climate change surfaces from these examples. By involving the community more, whether it is through training or crowdsourcing data, both the people and planners can get access to information more readily. This helps reduce flood risks, but also builds communities that can mobilise themselves as the first line of defence in a crisis. Building climate resilience is a strategic, city-wide effort by the authorities that must be complemented by the ground-up action of its communities. In this way, cities can become truly resilient in the face of climate change and related crises, and be able to bounce back faster and stronger in the aftermath.

8. https://www.redcross.org.hk/en/latestnews_events/latest_news_detail.html?id=3355

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About the CLC

The Centre for Liveable Cities was set up in 2008 by the Ministry of National Development and the Ministry of the Environment and Water Resources, based on a strategic blueprint developed by Singapore's Inter-Ministerial Committee on Sustainable Development. Guided by its mission to distil, create and share knowledge on liveable and sustainable cities, the Centre's work spans four main areas - Research, Capability Development, Knowledge Platforms and Advisory. For more information, please visit us at http://www.clc.gov.sg