URBAN WETLANDS MANAGEMENT IN COLOMBO

A new model for urban resilience

AT A GLANCE

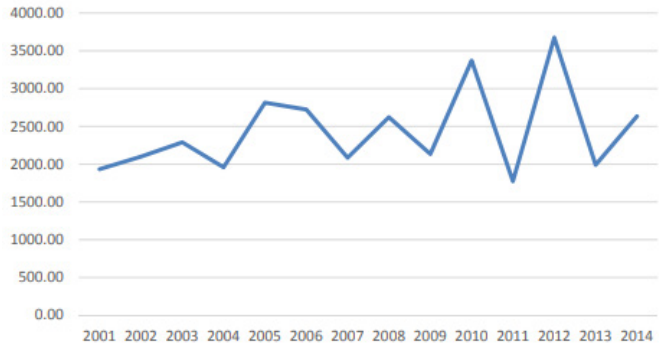
Country Sri Lanka

Risks Climate change exacerbating extreme weather events

Area of Engagement Scaling up the resilience of cities

In response to devastating floods, the government of Sri Lanka has prioritized urban wetlands management in the Sri Lankan capital Colombo as a key pillar of its climate and disaster resilience strategy.

Colombo's increasing annual average rainfall (mm)



Source: Department of Meteorology, Sri Lanka

FLOOD RISK ON THE RISE

Built on a low-lying river estuary overlooking the sea, Colombo is highly vulnerable to flooding. Flood risk in the Sri Lankan capital is being exacerbated by rapid economic growth and investments from the public and private sectors that have led to rapid and haphazard land use and reclamation of the city's unique natural urban wetlands which function as flood retention areas.

In 2010, two major rainfall events flooded Colombo, demonstrating the realities of high flood risk in the Colombo Metropolitan Region (CMR). The massive flooding shut down the CMR for almost a week, affecting approximately 50% of the private sector in the CMR. Losses due to the May flooding were initially estimated at $50 million – although actual losses may have reached $100 million.

Over the past three decades, Colombo has seen a marked increase in its annual average rainfall, which may indicate that floods of this scale will happen with increasing frequency in the future. If climate change is taken into account, the severity of extreme events is expected to be even higher. Substantial flooding most recently occurred in 2017.

COMPREHENSIVE URBAN WETLANDS MANAGEMENT

In order to address these challenges, the Sri Lankan government carried out a Post-Disaster Needs Assessment (PDNA) supported by GFDRR, set up a state of the art hydraulic model for the Colombo drainage catchment, piloted the Robust Decision Making methodology, and carried out a comprehensive analysis of rainfall and flood patterns for the past 25 years. The hydraulic model findings have demonstrated the critical role wetlands play in flood regulation within Colombo, providing refuge for 39% of the flood waters during a storm event. By highlighting the criticality of the role of urban wetlands in reducing flood risk, these initiatives helped create the impetus for the Sri Lankan government's development of a comprehensive strategy to urban wetlands management. Leveraging nature-based solutions for flood risk management, this strategy includes:

- Protecting and managing the existing retention capacity of the basin that comes from a network of natural and man-made wetlands. As part of the Colombo Megapolis

Development Plan, there are preparatory efforts underway to strategically map Colombo's urban wetlands as green areas, preserving the wetlands' natural character and co-benefits to the city.

- Tapping the recreation potential of the wetlands through the establishment of two urban wetland parks with information centers and nature viewing facilities. A third center for wetland discovery for children is being planned. If their recreation potential was maximized, the wetlands could generate about $13 million in revenue for Colombo, a further impetus for their long-term preservation.

- Formulating legal protection and inter-agency coordination for the urban wetland complex to ensure its preservation, ultimately avoiding high flood risk scenarios in which the CMR could lose 1% of GDP on average every year due to floods. Legal protection for the wetland complex as a 'conservation zone' has been proposed via a draft cabinet paper.

LESSONS LEARNED

Clearly identifying and measuring co-benefits can present a strong case for urban wetlands management.

In addition to mitigating floods, the wetland system of the Colombo basin also provides co-benefits. For example, wetlands and surrounding areas are an average of 10 degrees Celsius cooler than impervious areas (e.g. parking lots) at the hottest time of the day, resulting in energy savings from artificial cooling systems. Further, wetlands also treat waste water, bring fresh water and food to local communities, store carbon, regulate erosion, and help pollination. If well-managed, wetlands can also have revenue-generating, recreational benefits. Increasing awareness of these co-benefits has undoubtedly helped build broad-based support for comprehensive urban wetlands management in Colombo.

Robust decision-making methodologies can handle uncertainty and support decision-making.

The cutting-edge Robust Decision Making (RDM) methodology was used by the World Bank Climate Change team, with technical support from the Sri Lanka Land Reclamation and Development Corporation, to not only assess the economic value of wetlands in a context of deep uncertainties about urban development and climate change in the Colombo Metro Area, but also to identify solutions to boost flood resilience. Through the use of the RDM methodology, protected and managed urban wetlands were identified as a "no regret" option to building resilience.

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232,000 RESIDENTS

with greater flood protection

DISASTER RISKS IDENTIFIED

A GFDRR-supported Post-Disaster Needs Assessment and subsequent risk reduction efforts are informing a $213 million Metro Colombo Urban Development Project supported by the World Bank. Once the project is completed, 232,000 residents will have greater direct protection from flooding.

COMPREHENSIVE STRATEGY DEVELOPED

The Sri Lankan government has developed a comprehensive urban wetlands management strategy for Colombo. One of the first of its kind in the world, this strategy will enable municipal decision makers and urban planners to incorporate the city's wetlands into its flood reduction system and city master plan.

DECISION MAKING TOOLS

A state-of-the-art Robust Decision Making methodology was piloted to examine the economic value and co-benefits of wetland conservation, such as waste water treatment and recreational activities. This guided the Sri Lanka Land Reclamation and Development Corporation and high level decision makers to look at the urban wetlands as a resource for enhanced climate and disaster resilience.