

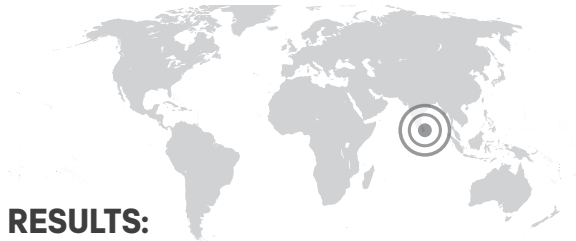
Stories of Impact

A series highlighting achievements in disaster risk management

Urban Wetlands – A New Model for Urban Resilience in Colombo



REGION: SOUTH ASIA
FOCUS: RISK REDUCTION
COUNTRY: SRI LANKA



RESULTS:

- 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 Group.
- Colombo has developed a comprehensive urban wetlands management strategy, one of the first of its kind in the world, which will enable municipal decision makers and urban planners to incorporate Colombo's wetlands into its flood reduction system and city master plan.
- 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** and enhanced climate and disaster resilience.

In 2010, two major rainfall events in May and November flooded Colombo, Sri Lanka's capital city, shutting down the Colombo Metropolitan Region (CMR) for almost a week. Approximately 50% of the private sector in the CMR was affected, with losses initially estimated at \$50 million for the May flooding – although actual losses may have reached \$100 million.

In response to the May 2010 flood, the government of Sri Lanka sought technical and financial assistance from the Global Facility for Disaster Reduction and Recovery (GFDRR) and the World Bank Group to address the flood risk in the metropolitan capital with a population of more than two million. GFDRR support has helped leverage a \$213 million World Bank loan for prioritized flood mitigation works, flood management systems, and building urban resilience.



CONTEXT:

Flood risk in Colombo is increasing due to rapid economic growth and investments from the public and private sectors, changes in land use, and new proposals for building development in flood retention areas, including the region's unique natural urban wetlands.

The May 2010 flooding, with losses as high as \$100 million, demonstrated the realities of high flood risk in Colombo Metropolitan Area. Hydrological scenario analyses conclude that, if all of the CMA's urban wetlands were lost, the flooding observed in 2010, once considered a 50-year event, may now occur every 25 years. If climate change is taken into account, the severity of these extreme events is expected to be even higher. Substantial flooding occurred again in 2016.

APPROACH:

In response to the flooding and high level of flood risk, GFDRR supported a Post-Disaster Needs Assessment (PDNA), the update of the hydraulic models for Macro and Micro drainage systems, the update of the rainfall patterns and related revised flood return periods for the past 25 years, as well as the pilot application of the Robust Decision Making methodology.

GFDRR's support of a hydraulic model and updated rainfall pattern analysis of the Colombo Water Basin highlighted the criticality of the role of urban wetlands in reducing flood risk. Colombo has used this information and developed a comprehensive strategy, which has recommended that all of the wetlands in the CRM region be preserved.

In the Colombo Megapolis Development Plan, which is currently being finalized, Colombo's urban wetlands have been strategically mapped as green areas, preserving the wetlands' natural character and co-benefits to the city. This will limit encroaching development. Legal protection for the wetland complex as a 'conservation zone' has been proposed via a draft cabinet paper and is currently being reviewed and processed.



A heavy monsoon day in Colombo

LESSONS LEARNED:

Clearly Identifying and Measuring the co-benefits of wetlands can present a strong case for disaster risk 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. Wetlands also treat waste water, bring freshwater and food such as fish and rice to local communities, store carbon, regulate erosion, help pollination, and can bring recreational benefits if well managed.

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 and with technical support from SLRDC to assess the economic value of wetlands in a context of deep uncertainties about future urban development and climate change in the Colombo Metro Area, as well as identify solutions to boost flood resilience. In this context, protected and managed urban wetlands were identified as a "no regret" option to building urban resilience.

NEXT STEPS:

The government officials and urban planners are now 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 CMA could lose 1% of GDP on average every year due to floods.

By leveraging public-private partnerships, the government will also develop market incentives for communities and private enterprises to participate in wetland management, restoration, public awareness campaigns, and tourism development.

The Government is in the process of creating an urban wetlands system that will act as natural retention areas as well as provide recreational and open space areas to residents.

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*ALL MONETARY VALUES IN USD