

Transforming Colombo into a Flood Resilient Middle Income Country Capital

The Metro-Colombo Urban Development Project (MCUDP) Sustainable Flood Risk Management for the Colombo Metropolitan Area

Floods in Colombo

The Colombo metropolitan area is Sri Lanka's commercial hub and accounts for almost 50 percent of the country's GDP. However, Colombo is highly vulnerable to flooding, and has experienced regular floods for the past 30 years, affecting over 1.2 million people annually. In 2010, the city was inundated by two major floods in the months of May and November. These floods cost Colombo millions of dollars in economic losses due to business interruption, in addition to severe damages afflicted on public and private property. Also, these events result in many hardships to city's residents.

Photo above: Colombo's transformation under the Metro Colombo Urban Development Project (MCUDP).

The recurrent floods in the Colombo metropolitan area are due to a combination of factors including unauthorized constructions that obstruct water flow, dumping waste in the drainage canals, backwater build-up in the main canal system, lack of regular maintenance of the drainage system, and commercial development in wetland reservations. These activities have reduced Colombo's capacity to cope with high intensity rainfall that has become more frequent and intense due to the impact of climate change.

Investing in Colombo's Future

In a bid to transform Colombo and its metropolitan area into a modern, world-class Middle Income Country capital, the Government of Sri Lanka (GoSL) has launched an ambitious economic and physical regeneration program for the Metro Colombo area. This process includes a sustainable, long term, flood risk management program for Colombo. At the request of the GoSL, the World Bank is supporting Colombo's transformation under the Metro Colombo Urban Development Project (MCUDP). The World Bank has

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Top and bottom: Secondary canals.

committed a financial assistance package of US\$213 million and will provide technical assistance to design and implement the project.

The MCUDP will consist of two main components:

- Component 1 invests in urgent flood mitigation infrastructure and supports drainage improvement activities
- Component 2 builds the institutional capacity of the government agencies to enhance long term flood risk management

Component 1: Flood & Drainage Management

Component 1 addresses the urgent problem of urban flooding, which regularly economic activities of Colombo and the entire country.

As an immediate intervention, primary and secondary canals and lakes will be targeted to increase water conveyance and retention capacity. Also, the micro-drainage system in the Metro Colombo area will be improved to solve the problem of urban flooding in 15 critical locations.

To ensure the sustainability of drainage system maintenance, the project will finance the purchase of maintenance machinery. A water-based transport system will be introduced, on a pilot basis, as a possible source of sustainable funding for water system maintenance.

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An Integrated Flood Management System for the greater Colombo basin will also be developed and will include a detailed drainage study and a real-time monitoring system.

To encourage proper maintenance of Colombo’s waterfront areas, the project will develop the Beira Lake waterfront and the Beddegana Wetland located in the metro Colombo area. Beira Lake’s embankment system will be improved and a promenade will be constructed to provide recreational space within the core area of the city. A wetland park will be constructed in the Beddegana Wetland and will include bird watching facilities, play areas, jogging tracks, etc. This will prevent encroachment on the wetlands by unauthorized commercial development.

Component 2: Institutional Capacity

Component 2 aims to support local authorities in the Colombo metropolitan area to rehabilitate and manage their drainage infrastructure and improve the systematic collection of





Colombo's transformation under the Metro Colombo Urban Development Project (MCUDP).

solid waste, which often clogs drainage system and leads to flooding. The key interventions under this component include the rehabilitation of drainage infrastructure; the landscaping of flood-retention areas; the rehabilitation of streets; the rehabilitation of maintenance facilities; the acquisition of equipment for solid waste collection; and drainage maintenance works.

Assistance from GFDRR

The Global Facility for Disaster Reduction and Recovery (GFDRR) of the World Bank assisted in the initial technical studies including the development of hydraulic and hydrological model of the macro- and micro- drainage systems of the Colombo basin. This included a LiDAR survey of the metro Colombo area that provided a high resolution Digital Terrain Model, which significantly contributed in developing a model with a very high accuracy. In addition, bathymetric and hydrographic surveys of the canal network and retention areas, update of the land use maps, short interval rainfall analysis for the basin to derive the recent trends were also carried out to enhance the model accuracy. The model was used to evaluate different flood mitigation interventions and the most effective interventions were selected to be implemented under the MCUDP component 1. The model will also allow generate high resolution flood inundation maps that can be used in comprehensive flood risk assessments. The Policy and Human Resources Development Fund of Japan has joined GFDRR in supporting to carry out a detailed flood risk assessment and a flood risk mitigation strategy for metro Colombo, further strengthening the MCUDP.

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Benefits of Flood Mitigation Efforts in Colombo

Reducing the occurrence of floods in Colombo would generate multiple economic and social benefits for residents of Colombo and the entire country. Nearly 1.6 million people will benefit from flood mitigation measures, including about 220,000 people living in the Municipal Council areas of



CAPRA Training, Colombo, May 2012.

Colombo, Dehiwela-Mt Lavinia, Sri Jayawardenapura-Kotte, and Kolonnawa. The main economic benefits include reduced damages to residential properties and public infrastructure, avoidance of economic losses from disruption of business activities, reduced emergency management and relief costs, and reduced post-disaster health services costs. In addition, fewer flood events will increase Colombo’s development potential and improve the city’s image. The intangible benefits of the project include a healthier, more beautiful city that offers better protection for its bio-diversity and greater recreational opportunities for residents and tourists.

Sri Lanka’s First Post Disaster Needs Assessment (PDNA)

As part of the World Bank’s Disaster Risk Management initiatives in Sri Lanka, the World Bank and the UNDP supported the Government of Sri Lanka in conducting the country’s first integrated Post Disaster Needs Assessment (PDNA). The assessment evaluated the impacts of the May 2010 floods on the five worst affected districts; Colombo, Gampaha, Kalutara, Galle, and Matara. The Damage and Loss Assessment (DaLA) methodology, developed by the Economic Commission for Latin America and Caribbean

(ECLAC), was used to evaluate flood impacts. The assessment was coordinated by the Disaster Management Centre of the Ministry of Disaster Management and more than 20 national agencies were involved. In addition, a number of non governmental and private sector agencies were also involved.

Approximately 693,035 people, or 161,181 families, were affected in varying degrees by the floods and the total value of damages to physical property and economic losses suffered in the five districts was estimated at US\$ 50.6 million. The districts of Colombo and Gampaha suffered the most, experiencing the highest number of flood victims (Gampaha District 221,808; Colombo District 200,633). In both cases, the assessment noted that the impact of the floods could have been lower if drainage networks were functioning better. The Government of Sri Lanka spent approximately US\$815,145 on relief operations.

Considering the comprehensive nature of the assessment, the National Council for Disaster Management, Chaired by the President of Sri Lanka, decided that PDNAs will be conducted for any future disasters affecting over 50,000 people in Sri Lanka. Such PDNAs are expected to support sustainable recovery efforts and strengthen national disaster risk reduction strategies.

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