Municipal Corporation of Greater Mumbai (MCGM)

IMD, BMC to bring in flood warning system

Richa Pinto | TNN | Updated: Dec 15, 2019, 11:30 IST, TIMES OF INDIA

....We needed local data for it, like topography, drainage system, water bodies in the city, tide levels and data from various rain gauges in the area. This was received from BMC. The system will forecast how much inundation can happen in different pockets. This will be very useful, especially if people need to be evacuated from low-lying areas as we will be able to forecast 12 hours in advance that a particular spot may get flooded"....

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i FLOWS-MUMBAI

INTEGRATED FLOOD WARNING SYSTEM FOR MUMBAI

A G2G Initiative Towards A Disaster Resilient India

Mumbai, the capital of the state of Maharashtra, a megapolis and the financial capital of India has been experiencing floods with increased periodicity and recent torrential rain on 29 August 2017 flooded the city to a standstill in spite of its natural and storm water drainage systems. The Mumbai flood during 26th July 2005, is probably etched in the memory of every Mumbai citizen, when the city received a rainfall of 94cm, a 100 year high in a span of 24 hours paralyzing the city completely. Anticipating floods before they occur, facilitates precautions to be taken so as to protect property and save lives.

In a bid to aid in the mitigation activities of the flood prone city, Disaster Management Department of Municipal Corporation of Greater Mumbai (MCGM), Govt. of Maharastra approached the Ministry of Earth Sciences (MoES) to develop an Integrated Flood Warning System for Mumbai referred to as iFLOWS-Mumbai, as similar system was already developed by MoES and put into operation in Chennai. MoES initiated the development of flood warning system in July 2019 using the in-house expertise available within the MoES (India Meteorological Department (IMD), National Centre for Medium Range Weather Forecasting (NCMRWF), Indian Institute of Tropical Meteorology (IITM) and National Centre for Coastal Research (NCCR)), in close coordination with Disaster Management Department of MCGM. iFLOWS-Mumbai is developed by NCCR as a state of art system to enhance the resilience of Mumbai city by providing early warning for flooding specially during high rainfall events and cyclones.

iFLOWS-Mumbai is built on a modular structure and comprises of the following modules.
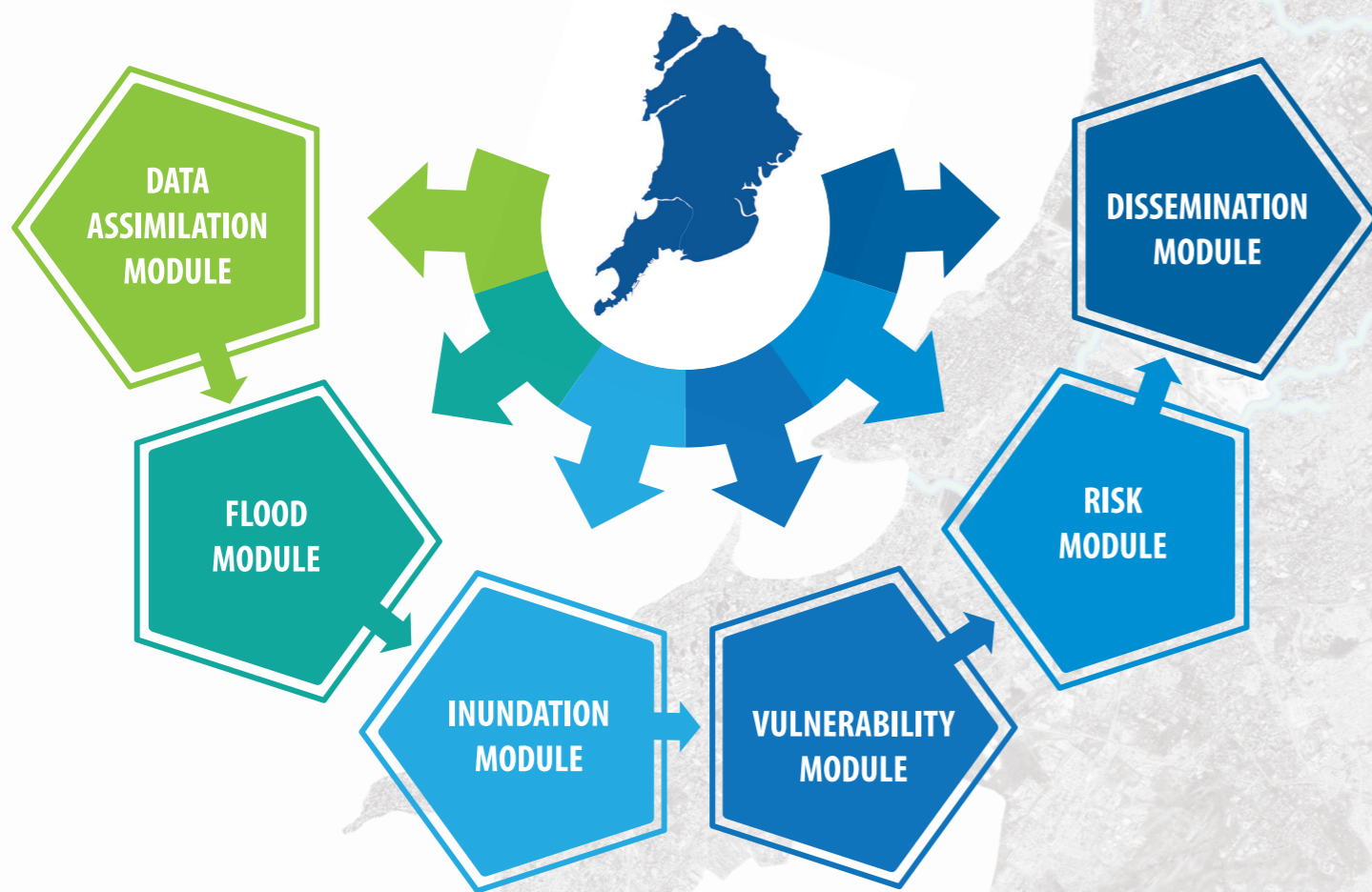

iFLOWS-Mumbai will address the flood inundation due to rainfall, river bank breach, storm surge, obstruction of flow due to road, railway, buildings etc. , high tides and sea level rise. The system will be useful in planning flood mitigation measures such as retaining walls, improvement in storm water drainage system, locations for pumping station and operation of lock gates in the rivers and lakes etc.

Data Assimilation Module

- Downscaled Weather Models for Mumbai from NCMRWF, IMD & IITM
- Weather forecast from IMD
- Rainfall data from a network of Automatic Rain Gauge (120 stations) from IITM, IMD and MCGM
- Digital Elevation Model with a resolution of 20cm, Water level data across rivers, Landuse, Infrastructure and other thematic datasets Disaster Management Department of MCGM
- Bathymetry of rivers and lakes across Mumbai city (NCCR, Disaster Management Department of MCGM and IMD, Mumbai)
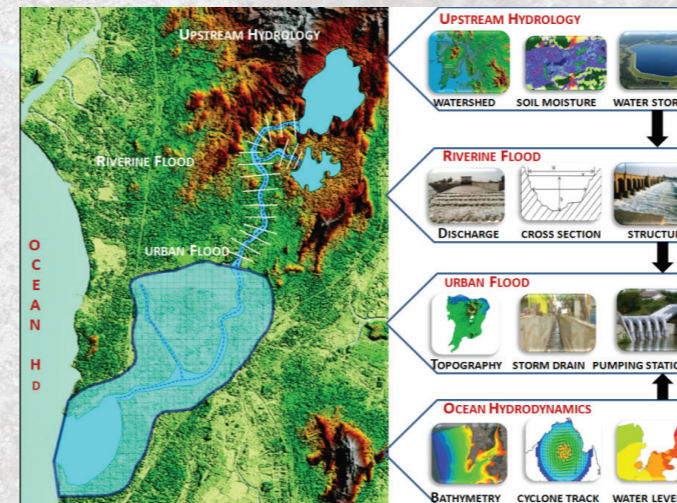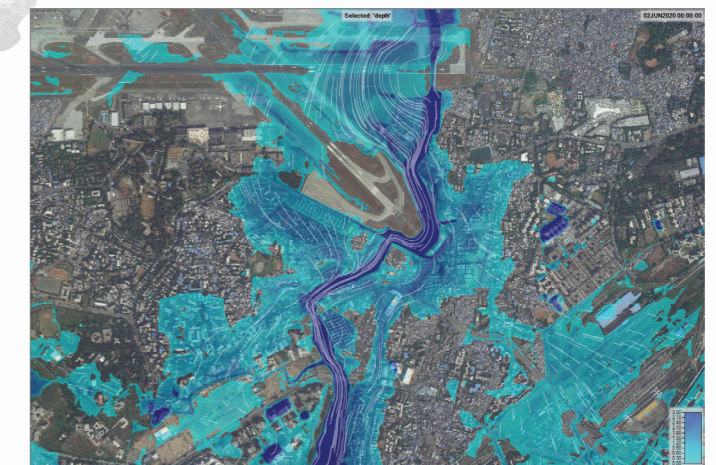

Inundation Module

The system will use forecasted rainfall from the numerical weather models and Flood inundation will be estimated for Mumbai three days in advance. The system will also work in nowcast mode using precipitation data available from the dense network of rain gauges. Ward level inundation maps will be generated as per the requirement of Disaster Management Department of MCGM.
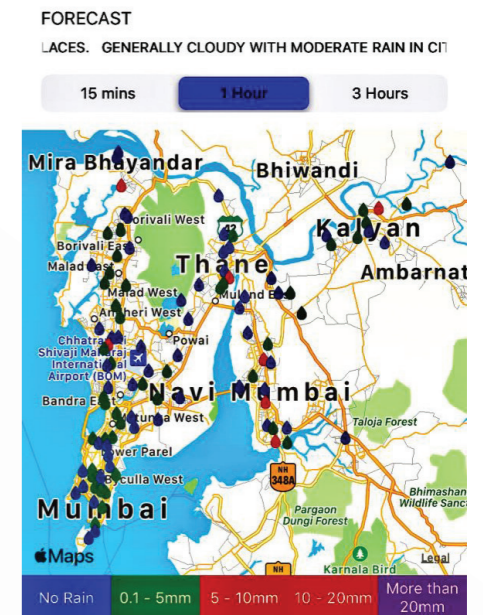
Flood Module

Flood module comprises of Upstream Hydrology, Hydraulic and Hydrodynamic modules. All these models are used to solve equations of fluid motion to replicate the movement of water to assess flooding in the study area. Since, Mumbai is an island city with its connectivity to sea, hydrodynamic models and storm surge model are used to calculate the tide and storm surge impacts on the city.

Decision Support System (Vulnerability and Risk Module)

A web GIS based decision support system will help the decision maker to plan operations based on the vulnerability and risk of elements exposed to flood.

Dissemination Module

The information will be disseminated to the field officials as maps, tables, text etc. through various communication channels .