



keep your models up-to-date: connecting community mapping data to complex urban flood modelling

Hessel Winsemius (1,2), Ivan Gayton (3), Elia Dominic (3), Andres Diaz Loaiza (2), Eskedar Gebremedhin (1), Mark Hegnauer (1), Dirk Eilander (2,1), Philip Ward (2,1)

(1) Deltares, Inland Water Systems, Delft, Netherlands (hessel.winsemius@deltares.nl), (2) Vrije Universiteit Amsterdam, Institute for Environmental Studies, Amsterdam, Netherlands, (3) Humanitarian OpenStreetMap Team, Washington D.C., United States

The world is urbanizing rapidly. According to the United Nation's World Urbanization Prospect, 50% of the global population already lives in urban areas today. This number is expected to grow to 66% by 2050. The rapid changes in these urban environments go hand in hand with rapid changes in natural hazard risks, in particular in informal unplanned neighbourhoods. In Dar es Salaam – Tanzania, flood risk dominates and given the rapid changes in the city, continuous updates of detailed street level hazard and risk mapping are needed to adequately support decision making for urban planning, infrastructure design and disaster response. The Ramani Huria 2.0 (Swahili for "Open Map") project is mapping the most flood prone neighbourhoods, including roads, buildings, land use and drainage. All data is contributed to the open-source OpenStreetMap database.

In this presentation, we will demonstrate what is required to mobilize these data to establish dynamic flood models for Dar es Salaam and keep these up-to-date by making a direct link between the data, and model schematization. Three essential components are presented: a) data model development; data quality assurance; and c) automated model schematization. For component a), an online wiki page is developed (http://wiki.openstreetmap.org/wiki/Dar_es_Salaam/Ramani_Huria#Drainage), which can be re-used in other community mapping project. For component b) and c), we are developing software for automated quality assurance and conversion to flood models (<https://github.com/openearth/hydro-osm/>). The tools automatically establish a sound 1D drainage network which is translated fully automatically into the inputs required for the open-source D-HYDRO modeling suite. Our tools are built such that community and stakeholder knowledge can be included in the model details through workshops with the tools so that missing essential information about the city's details can be augmented on-the-fly. This process creates a continuous dialogue between members of the community that collect data, and stakeholders requiring data for flood models. Moreover, used taxonomy and data filtering can be configured to conditions in other cities, making the tools generic and scalable. All tools are made available open-source.