

Urban Drainage Flood Modeling with Limited Data, a Pilot Study

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Cities are often situated along rivers because these locations are very suitable for agricultural, industrial and commercial activities. Unfortunately the low-lying geography of these riverside locations makes them prone to flooding. In Tropical Asia heavy tropical downpours, complex and inadequate drainage and rapid urbanization contribute to the flood problem. Reduction of the flood problem in these cities requires an integrated, city-wide approach but this is often hindered by lack of appropriate data. Naga City in the Philippines is the subject of a pilot study that aimed to build a flood model with limited data that is useful for local decision makers and engineers. It focuses on flooding due to inadequate drainage using a 1D-2D model (SOBEK – developed by WL|Delft Hydraulics, the Netherlands). The required data was gathered from existing sources and updated during field surveys. A small flood event was used to validate the model. Although the model needs refinement and more detailed input information, some general conclusions can already be drawn, like that the capacity of the drains in tandem with water levels in the river are the most important factors in flood generation. Drain roughness (e.g. blockages) appears to be less important and local fixes only serve to relocate the flood problem. It is therefore concluded that such a model, even in a preliminary phase of operation, is a valuable tool for engineers and decision makers. The model can be built and updated locally and can help predict the flood effects of urbanization and infrastructure changes. This allows drainage and other flood mitigation projects to be designed more effectively, thus saving money and reducing flooding.