



Subsurface information for risk-sensitive urban spatial planning in Dhaka Metropolitan City, Bangladesh

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Dhaka Metropolitan City (including Dhaka and five adjacent municipal areas) is one of the fastest developing urban regions in the world. Densely build-up areas in the developed metropolitan area of Dhaka City are subject to extensive restructuring as common six- or lower storied buildings are replaced by higher and heavier constructions. Additional stories are built on existing houses, frequently exceeding the allowable bearing pressure on the subsoil as supported by the foundations. In turn, newly developing city areas are projected in marshy terrains modified by extensive, largely unengineered landfills. In most areas, these terrains bear unfavorable building ground conditions within 30 meters.

Within a collaborative technical cooperation project between Bangladesh and Germany, BGR supports GSB in the provision of geo-information for the Capital Development Authority (RAJUK). For general urban planning, RAJUK successively develops a detailed area plan (DAP) at scale 1 : 50000 for the whole Dhaka Metropolitan City area (approx. 1700 km²). Geo-information have not been considered in the present DAP. Within the project, geospatial information in form of a geomorphic map, a digital terrain model and a 3-D subsurface model covering the whole city area have been generated at a scale of 1 : 50000. An extensive engineering geological data base consisting of more than 2200 borehole data with associated Standard Penetration Testing (SPT) and lab data has been compiled.

With the field testing (SPT) and engineering geological lab data, the 3-D subsurface model can be parameterized to derive important spatial subsurface information for urban planning like bearing capacity evaluations for different foundation designs or soil liquefaction potential assessments for specific earthquake scenarios. In conjunction with inundation potential evaluations for different flooding scenarios, comprehensive building ground suitability information can be derived to support risk-sensitive urban planning in Dhaka Metropolitan City area at the DAP scale