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Urban Flood Damage Mitigation Measures in Bangkok Metropolitan Area, Thailand

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Bangkok is Thailand's capital that opens onto the banks of the Lower Basin of the Chao Phraya River, and it is a major city representative of Asia. Bangkok is a city that developed on the delta of the Chao Phraya River Basin, and topographically, it is the delta of the River. In the Bangkok Metropolitan Area, an increase in damage potential due to progressive urbanization in areas where naturally were suffered from flood was the basic cause of increase of flood damage. In addition, since the city water necessary as a result of urbanization was covered by groundwater pumping, there was severe subsidence, making the damage worse. In the 1980's, the rates of land-subsidence are up to 10cm/year, but the Thailand government stop the ground-water pumping since 1986, so the rates have been reduced to 1-3cm/year.

The Chaopraya River delivers retonly about 50 m3/sec in the dry season but the peak flow in October may reach 4,000 m3/sec. Bangkok has "Too little water" problem, water shortage in dry season and has "Too much water" problem in rainy season. The elevation ranges from 0-2.5 m of the mean-sea level has made the city vulnerable to flood. And flow in sewerage system is stagnant so floodwater cannot be flown away sufficiently. Japan International Cooperation Agency (JICA, 1985) proposed the need of comprehensive flood damage mitigation measures, combination of structural measures and non-structural measures, in Bangkok Metropolitan Area first. As structural measures, flood wall on river banks had been built in a continuing program and they are extending to practically all the waterfront areas, and pumping system with deep tunnels have been constructed to provide adequate capacity for drainage from inland to the Chao Phraya River. On the other hand, it cannot be said that non-structural measures like retarding basin had progressed as planned; still, some non-structural measures have been sincerely progressed by some institution, for example, Bangkok Metropolitan Administration. For example, production of flood risk map, establishment of permanent flood marks, conservation of run-off retardation area, providing a storage capacity, and public relation program for flood-risk information, etc.

The implementation of flood control in Bangkok Metropolitan Area is progressing. JICA originally proposed the need of combination between structural measures and non-structural measures. Although it cannot be said that non-structural measures have been progressed as planned, the flood damage mitigation measures in the Bangkok Metropolitan Area can be esteemed as the comprehensive flood damage mitigation measures.