IWRM Action Hub

CASE STUDY

Thailand: The 2011 Floods in The Lower Chao Phraya River Basin in Bangkok Metropolis

Summary

For the past century, Thailand had been experiencing constant severe floods which typically occurred in between August and December. Yet, the worst flood ever experienced in more than a half century in Thailand was the mega 2011 flood – indicating tremendous loss of lives and properties across socio-economic sectors.

Background

Floods is a common natural phenomenon in the Chao Phraya River and has occured 13 times in the past. The Chao Phraya River basin is the largest artery for land and water resources development in Thailand. It stretches from the elevated northern plains to the low alluvial plains of the central regions, draining an area of 160,000 km^2 and covers 30% of the country's total land area. The expanse of the Chao Phraya River covers 4 major tributaries of the Ping, Wang, Yom and Nan located in the northern elevated plain where it originates.

The confluence of the Ping and Nan tributaries at Pak Nam Pho in Nakorn Sawan is where the Chao Phraya watershed is being divided into an upper and lower watershed. The junction forms the beginning of the main Chao Phraya River channel of the lower basin which then flows south for 372 kilometers. From the central plain through Bangkok's delta, the capital of Thailand's political, commercial and industrial and cultural center the Chao Phraya drains out into the Gulf of Thailand.

The 2011 flood in Thailand was ranked as the world's fourth costliest disaster over the period 1995 to 2011. The maximum ever recorded flood of 2011 was accounted by the total amount of 1,439 mm rainfall which was 143% higher than the average rainy season between two decades from 1982 -2002. The total water volume surpassed the 10 billion m^3 storage capacity of the Bhumipol and the Sirikit Dams in Chao Phraya River, reaching 15 billion m^3 in early October of 2011. The extreme incidents combined generated large water volume that breached the reservoirs capacities and caused overtopping of the dams – consequently releasing tremendous floodwater downstream and amplified the inundation area lying below including Bangkok Metropolitan Area (BMA).

Actions taken

The actions taken have been categorized into 3 i.e. Before, During and After the flood.

Different interventions were carried before the occurrence of the flood, during and even after the floods. Department of Drainage and Sewerage (DDS) had the main responsibility in flood regulation of the BMA. Underlined with the perception to protect and drain floodwater out of the city as fast as possible, the agency emphasized the structural means of dykes, levees and floodwalls as the main prevention measures. After extensive flood damage in 1995 under the king's advice, several authorities convened for flood mitigation measures including the assistance from the Chaipattana Foundation, a NGO established in 1988 to develop projects of national and social benefit.

To prevent floodwater to spread to East of Bangkok, the DDS build flood defense dikes beside the Rangsit Canal located in Lak Hok Sub District (beside the Hok Wa Canal and along the royal initiative water ridge). In addition, sandbags were erected along the Phaholyothin Road starting from the Rangsit Bridge to the Prapa Canal. The temporary dike (8.2 km long and 3 m above MSL) later failed in its operation to protect Bang Khen Bueng Kum, Lad Phroa and Khlong Sam Wa districts from being flooded.

The Strategic Committee for Water Resource Management SCWRM collaborated with the Japan International Cooperation Agency (JICA) assigned to conduct the comprehensive flood management plan for the Chao Phraya River Basin under the supervisory panels consisted of the representatives from the Royal Irrigation Department (RID) and the Department of Water Resources (DWR).

Outcomes

After the 2011 flood damage, the SCWRM and the NESDB published an outline to the national Master Plan for Water Resource Management with the strategy to adopt the King's initiatives and the Philosophy of Sufficiency Economy as guiding principles in the drafting. There is a progress on the installation of the early warning system in the Chao Phraya River Basin with the initiation from the BMA and HAII in partnership with DHI in August 2016. The Prime Minister Yingluck Shinawat proposed to consolidate the water governance under the "Water Ministry after 2011 flood event. However, the reformation did not take place once 2011 flood issue died down. The Kaem Ling project was initiated by King Bhumiphol Adulyadej (King Rama IX) of Thailand as the flood control measure.

Lessons Learned

Flooding is frequent in lower Chao Phraya River, yet, the urban population became increasingly less accustomed to its occurrence due to the detachment from natural water cycle and development of urban settings.

Bureaucratic political process needs to be overcome with cross-cutting horizontal governance and management such as the capacity building in the residents, public and private sectors as well as across the government departmental agencies.

Ad-hoc and transition measures are often evoked after crisis than before. The existing NWRC were less prepared for flood management. The establishment of a new body, SCWRM which is headed by the Prime Minister duplicate roles and responsibilities.

Numerous structural measures were emphasized in several sub-projects following the initiation of the plan to prevent and mitigate the floods in the Chao Phraya River Basin with insufficient considerations of the impacts to the surrounding areas.

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