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Flood Risk Assessment as a Part of Integrated Flood and Drought Analysis. Case Study: Southern Thailand

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Flood and drought are two main meteorological catastrophes that have created adverse consequences to more than 80% of total casualties universally, 50% by flood and 31% by drought. Those natural hazards have the tendency of increasing frequency and degree of severity and it is expected that climate change will exacerbate their occurrences and impacts. In addition, growing population and society interference are the other key factors that pressure on and exacerbate the adverse impacts. Consequently, nowadays, the loss from any disasters becomes less and less acceptable bringing about more people's consciousness on mitigation measures and management strategies and policies.

In general, due to the difference in their inherent characteristics and time occurrences flood and drought mitigation and protection have been separately implemented, managed, and supervised by different group of authorities. Therefore, the objective of this research is to develop an integrated mitigation measure or a management policy able to surmount both problems to acceptable levels and is conveniently monitored by the same group of civil servants which will be economical in both short- and long-term.

As aforementioned of the distinction of fundamental peculiarities and occurrence, the assessment processes of floods and droughts are separately performed using their own specific techniques. In the first part of the research flood risk assessment is focused in order to delineate the flood prone area. The study area is a river plain in southern Thailand where flooding is influenced by monsoon and depression. The work is mainly concentrated on physically-based computational modeling and an assortment of tools was applied for: data completion, areal rainfall interpolation, statistical distribution, rainfall-runoff analysis and flow model simulation.

The outcome from the simulation can be concluded that the flood prone areas susceptible to inundation are along the riparian areas, particularly at the estuary downstream. Although the quantity of runoff increases slightly, the flooded areas downstream rises up significantly. After taking vulnerability map into account, the area with high risk of flooding where the decision makers should pay more attention on is at the downstream near the convergence of the river due to high vulnerability exposing to flood hazard. The anomaly of continuous high intensity of rainfall was the main cause of flooding. However, in respect of the information from casualties through the questionnaire, a lack of maintenance of the floodway was another factor exacerbating the impacts. The ambiguities of a sufficiency of drainage capacity and the water releasing from the dam are existent. This testimony affirms that societal interference is playing the major role in the degree of increasing losses from weather-climate extremes.

The findings will be used for further study, especially for the proper land use planning and zoning which is lacking in many developing countries. Therefore, land use planning and adaptation might be part of a flood mitigation plan in conjunction with the structural measures.