

Flood Risk Assessment and Adapted to the Climate Change by a Trade-Off Process in Land Use Planning

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Abstract : Climate change is an important issue in future, which seriously affects water resources for a long term planning and management. Flood assessment is highly related with climate and land use. Increasing rainfall and urbanization will induce the inundated area in future. For adapting the impacts of climate change, a land use planning is a good strategy for reducing flood damage. The study is to build a trade-off process with different land use types. The Ta-Liao watershed is the study area with three types of land uses that are build-up, farm and forest. The build-up area is concentrated in the downstream of the watershed. Different rainfall amounts are applied for assessing the land use in 1996, 2005 and 2013. The adapted strategies are based on retarding the development of urban and a trade-off process. When a land changes from farm area to built-up area in downstream, this study is to search for a farm area and change it to forest/grass area or building a retention area in the upstream. For assessing the effects of the strategy, the inundation area is simulated by the Flo-2D model with different rainfall conditions and land uses. The results show inundation maps of several cases with land use change planning. The results also show the trade-off strategies and retention areas can decrease the inundated area and divide the inundated area, which are better than retarding urban development. The land use change is usually non-reverse and the planning should be constructed before the climate change.

Keywords : climate change, land use change, flood risk assessment, land use planning

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