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Hsu, Tai-Wen; Lan, Yuan-Jyh; Lin, Yue-Chen; Shih, Dong-Sin
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Adaptation of Southwest Coast of Taiwan Due to Climate Change

Tai-Wen Hsu¹, Yuan-Jyh Lan², Yue-Chen Lin³, Dong-Sin Shih⁴

1. Department of Harbor and River Engineering, National Taiwan Ocean University
2. Research Center for Ocean Energy and Strategies, National Taiwan Ocean University
3. Department of Leisure Management, University of Kang Ning
4. Department of Civil Engineering, National Chung Hsing University

ABSTRACT

The adaptation of coastal disasters due to climate change in order to strengthen southwest area of Taiwan against natural calamities in the future was investigated in this paper. In Taiwan, the coastal zone usually suffers from more than four typhoons in one year and the exceptional sea level induced by storm surge always results in coastal disasters and hinders the development in oceanic and coastal environment. The problems of sea level rise as well as more frequent typhoon attack induced by climate change have threatened the Taiwanese coastal environments. The influences because of climate change as well as serious land subsidence upon some assumptive object years were carried out on Chiayi and Tainan Coasts in Taiwan (Fig. 1). The present study includes some major research items such as construction of the disaster warning system characteristics on Chiayi and Tainan Coasts, model establishment for situation analysis of water environmental factors, impact estimation and indefinite analysis on disasters, and vulnerability and risk estimation on coastal disasters.

Fig. 2 illustrates the designation process of vulnerability and risk estimation in this study. The coastal vulnerability analysis consists of exposure, sensitivity and adaptation. The level of risk includes vulnerability and hazard potentiality and formularizes as (UNDRO, 1980). According to UNEP (2005), Doukakis (2005), Kavi Kumar and Tholkappian (2006) and Hong et al. (2006), and considering the specific characteristics of climate and coastal hydrology in Taiwan, three components (total thirteen variables) of Coastal Vulnerability Indicators (CVI) are involved in present assessment. AHP (Analytic Hierarchy Process) evaluation is applied to analyze vulnerability and risk in Chiayi and Tainan Coasts. Fig. 3 shows the risk assessment of coastal disaster due to climate change on Chiayi and Tainan Coasts in Taiwan. The understanding of the marine and meteorological characteristics in coastal zone is conducive to raise the defended efficiency on coastal disasters. These results could provide useful information to set up the adaptation tactic and to implement the benefit analysis of operation program.