



## Estimation of seismic ground motions and attendant potential human fatalities from a scenario earthquake on the Sanchiao fault in northern Taiwan

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The purpose of this study is to estimate maximum ground motions in northern Taiwan in the form of ShakeMaps as well as to assess potential human fatalities from a scenario earthquake on the Sanchiao active fault in this area. Analysis of seismic hazard potential becomes necessary in northern Taiwan for the Central Geological Survey (CGS) announced the Sanchiao active fault as Category II. The resultant ShakeMap patterns of maximum ground motion by using ground motion prediction equation (GMPE) method in a case of Mw6.88 show the areas of PGA above 400 gals are located in the regions inside the yellow lines in the corresponding figure. Furthermore, the areas of PGA greater than 637 gal are located in the northern Bali and the border area of Sinjhuang and Shulin. Likewise, the high PGV area greater than 60 cm/s are located in the border area of Sinjhuang, Taishan and Shulin. In addition, seismic hazards in terms of PGA and PGV in the vicinity of the Sanchiao fault are not completely dominated by the Sanchiao fault. The main reason is that some areas located in the vicinity of the Sanchiao fault are marked with low site response amplification values of 0.61 and 0.74 for PGA and PGV, respectively in northwestern Beitou. Finally, from estimation of potential human fatalities from scenario earthquakes on the Sanchiao active fault, it is noted that potential fatalities increase rapidly in people above age 45. Total fatalities reach a high peak in age groups of 55–64. Another to pay special attention by Taipei City Government is the number and percentage of fatalities above age 85 are more in Taipei City with values 419 and 8.54% than New than Taipei City with values of 319 and 5.02%. In addition, it is surprising that the number and percentage of fatalities are 1234 and 9.75%, respectively in Taoyuan City. Finally, the results of this paper will enable both local and central governments in Taiwan to take notice of potential earthquake threat in these areas, as well as to improve decision making with respect to emergency preparedness, response, and recovery activities for earthquakes in northern Taiwan.