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Climate and Disaster Risk Assessment Using High-Resolution Hydro-Meteorological Hazard Maps

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The Philippines, due to its geography and location, is exposed to typhoons, earthquakes, and volcanic eruption which inflict loss of lives and damage to properties. Identification and understanding of impacts imposed by climate change is the first step in risk reduction and management. Hence, it is important to determine the locations of threatened localities, as well as its vulnerability to recognize the gaps in the communities' abilities to prepare, mitigate, and recover from the impacts of hazards.
This study aims to present the climate change vulnerability and disaster risk assessment using climate change adjusted high-resolution hydro-meteorological hazard maps of the municipality of Zarraga, Iloilo. The Housing and Land Use Regulatory Board (HLURB) of the Philippines, expressed vulnerability as the function of the degree of impact, derived using exposure, sensitivity, and adaptive capacity. This, together with the definition of Intergovernmental Panel on Climate Change of vulnerability assessment as a systematic examination of impacts of climate change and disasters on natural and socio-economic systems, was used as one of the main reference in conducting the vulnerability assessment. The vulnerability assessment was divided into 3 main processes namely, exposure database development, scoring, and assessment. The database is further divided into five units namely population, natural resource-based production areas, urban use, critical facilities, and lifeline utilities with unique indicators for exposure, sensitivity, adaptive capacity. These indicators were completed using data triangulation method. The scoring system was established to normalize the data collected for exposure and sensitivity indicators. This allowed the researchers to quantify the degree of impact of hazards. The adaptive capacity was subjectively scored using the standards set by HLURB. The vulnerability level for each barangay for every exposure unit was then acquired using the product of the degree of impact score and adaptive capacity.
In addition the HLURB defined risk as the function of the likelihood of occurrence and severity of consequence. The likelihood of occurrence was derived using 5 year, 25 year, and 100 year return period for climate change induced flood, rain-induced landslide and storm surge hazards. The severity of consequence was computed using the extent and magnitude of hazard, and sensitivity of elements being assessed.
The output of this study can be used in developing comprehensive land use and development plans including appropriate mitigating measures and adaptive strategies.