Identification of Evacuation Routes in Tacloban City using Geographic Information System

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The Philippines is the second most at risk to natural hazards according to the 2014 World Risk Report. On 8 November 2013, category 5 Typhoon Haiyan crossed the central region of the Philippines with maximum sustained wind reaching 315 kph. Considered as one of the strongest typhoons that made landfall in recorded history, Typhoon Haiyan caused USD 8 billion damage to properties, 6,293 deaths, 28,689 injured and 1,061 missing persons. Tacloban City, located in the north-eastern part of the island of Leyte in Eastern Visayas region, is one of the area most devastated by Typhoon Haiyan. The city is susceptible to other natural hazards given its geography, topography and geology. This condition emphasizes the need for preventive measures to avoid further loss of lives and destruction to properties. Evacuation is a mitigating strategy which involves the process of moving people from dangerous places to safer locations. Using Geographic Information System (GIS), a multi-hazard map of Tacloban City was created to determine safe areas for evacuation centers. The optimal route for evacuation was identified using ArcGIS Network Analyst's routing solver based on Dijkstra's algorithm. The medium of transportation used in the analysis is by foot with an average speed of 5.0 kph. Furthermore, the study assumes that all roads are passable and fully functional during the travel period and that there are no structures, trees and other debris that may act as road blockage. The study can be used as a reference in hazard assessment for disaster risk management and evacuation planning. This can be further improved by incorporating behaviour of the affected population and other socio-economic factors, different modes of transportation and detailed analysis of topography.