

Tsunami Hazard Mapping and Evacuation Sites; A Case Study in Southern Sri Lanka

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Abstract

A pilot study was conducted in Devinuwara area Southern Sri Lanka which underwent the Tsunami tragedy in December 2004. The objective of the study was to identify the inundated locations and the magnitude of the damage caused by the 2004 Tsunami wave, to project vulnerable areas in case of a future disaster of the same magnitude or more, and to locate safer areas for the establishment of the evacuation sites. A field survey was conducted through a structured questioner to collect the data on Tsunami impact in the area. GPS coordinates were collected to locate them on a digital elevation map. Levels of the submergence due to 2004 tsunami in the inundated areas were demarcated using GIS techniques. In the investigated areas, the flooded area was demarcated as 86,011 sq meters and the average distance covered by the wave inside the land as 90 meters with a maximum of 530m. The appropriate evacuation sites were identified in the outer skirt of the Tsunami hazard zone, considering the factors of road accessibility, availability of common places, such as temples, schools in coordination with the disaster management center and other stake holder institutions.

Accordingly Wawwa temple and Galgane Temple were identified as primary and the Principal evacuation sites respectively. Principle evacuation site was identified after considering the factors such as elevation of the site, accessibility through roads and air, sufficient shelter and space, availability of clean water resources, uninterrupted communication facilities in case of severe damages to the systems etc to meet the needs of a large crowd.

Introduction

World disaster data for the past decade (1997-2006) indicates that the number of reported disasters grew from 4,241 to 6,806, an increase of 60 %.The number of reported deaths due to disasters were doubled, from more than 600,000 in early Nineties to more than 1.2 million at present. Asian Tsunami in 2004 killed more than 225,000 people in eleven countries, inundating coastal zones with waves up to 30 meters (100 feet) high. It was one of the deadliest natural disasters in history. Indonesia, Sri Lanka, India, and Thailand were turned to be the most affected countries. In Sri Lanka, the tsunami claimed over 35,000 lives and left half a million people homeless (World Disasters Report, 2005).

In a disaster situation, a quick rescue and relief mission is inevitable; however, considerable damage can be minimized if adequate preparedness levels are achieved. Indeed, it has been noticed in the past that when attention has been given to adequate preparedness measures, the loss to life and property has considerably



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management cycle, disaster prevention, disaster
ss constitute the pre-disaster planning phase

The main objectives of the present study were to,
Identify and map the tsunami inundation area of 2004
Demarcation of potential Tsunami risk areas
Identify Tsunami evacuation sites using GIS techniques.

In the present paper identification of the potential Tsunami hazard sites based on the 2004 Tsunami experiences, in Devinuwara area and identification of evacuations sites for the area using GIS techniques are described. The available resources in the vicinity have been used for the preparation of evacuation sites and the maps.