TSUNAMI HAZARDS – ASSESSMENT OF EXPOSURE OF SRI LANKA

By

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for the Degree in Master of Science

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ABSTRACT

The coastal belts of several Indian Ocean countries including Indonesia, Sri Lanka, India and Thailand suffered massive loss of life and damage to property due to the tsunami unleashed by the great earthquake in the Sunda trench on 26 December 2004 which is now called as Indian Ocean Tsunami. In the context of Sri Lanka the extent of inundation and the associated damage varied significantly with the local near shore wave height, topography and the resistance offered to the overland flow and due to the lack of preparedness and unawareness about tsunamis, death toll and the damage was quite high around two third of the coastal zone of the country.

As indicated by the Indian Ocean Tsunami and subsequent tsunami alerts in 2005 and 2007, it will be important to assess the risk of tsunamis for Sri Lanka from possible undersea earthquake zones around the country to mitigate the adverse effects of a future tsunami. That kind of study should assess the exposure of the country in terms of tsunami arrival time, nearshore wave height and extent of inundation for possible tsunami scenarios which could affect the country. Also according to the geographical location of the country, Sri Lanka is threatened by far field tsunamis with tsunami travel time of hours. So the ideal tsunami impact mitigation measure is an early warning and evacuation system. Therefore this study was focussed on assessing the exposure of Sri Lanka to potential tsunami events from Sunda trench and arranging the information from such assessment to be effectively utilized by an early warning system and evacuation system.

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P. K. C. De Silva

DECLARATION

This thesis is a report of research carried out in the Department of Civil Engineering, University of Moratuwa, between July 2008 and August 2010. Except where references are made to other work, the contents of this thesis are original and have been carried out by the undersigned. The work has not been submitted in part or whole to any other university. This thesis contains 100 pages.

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CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

Abbreviation	Description
ASCII	American Standard Code for Information Interchange
BPR package	Seafloor Bottom Pressure Recording package
CFL condition	Courant–Friedrichs–Lewy condition
ComMIT	Community Model Interface for Tsunami
DART	Deep-ocean Assessment and Reporting of Tsunamis
DEMs	Digital Elevation Models
IOT	Indian Ocean Tsunami
ITWS	International Tsunami Warning System
MOST	Method of Splitting Tsunamis
NCTR	NOAA Centre for Tsunami Research
NetCDF	Network Common Data Form
NGA	National Geospatial-Intelligence Agency
NOAA	National Oceanic and Atmospheric Administration
PTWC	Pacific Tsunami Warning Centre
SIMs	Standby Inundation Models
SRTM	Shuttle Radar Topography Mission
SWE	Shallow Water Equations
TWS	Tsunami Warning System
USA	United States of America