



Tsunami hazard assessment along the western coast of Thailand

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The 26 December 2004 tsunami caused of the order 220,000 casualties and devastated large areas along the coastlines of Indonesia, Thailand, Myanmar, Sri Lanka, India, the Maldives and even some parts of the east African coast. The study was initiated to assist the authorities in Thailand with development of plans for how to deal with the future tsunami risk in a short term as well as in a long term perspective.

Along the most affected part of the west coast of Thailand, the tsunami wave caused an inundation or flooding level from about +5.0 m to + 10-12 m above mean sea level. These inundation levels including the spatial distribution have been confirmed by numerical simulations with focus on source representation.

The Sunda arc is quite an active fault zone with frequent earthquakes. Based on a detailed study of available earthquake statistics as well as plate tectonics, the following main conclusions are drawn:

- i) The 26 December 2004 earthquake has released a lot of the energy accumulated along the northern part of the Sunda arc subduction zone as a result of the steadily ongoing plate movements. It will therefore take considerable time before stresses will build up to the same level and again cause an earthquake of similar magnitude as in 2004.
- ii) The largest credible earthquake to be prepared for along the part of the Sunda arc that could cause tsunamis hitting the coasts of Thailand, is in the short to medium term (within the next 50-100 years) found to be an earthquake of magnitude 8.5. The return

period of an M 8.5 earthquake event is presently about 200 years. Such earthquakes can cause tsunamis which give an inundation or flooding level up to 1.5 to 2.0 m above sea level along the west coast of Thailand. For an M 8.5 earthquake and tsunami scenario, the potential consequences to human life and property will be so small that no immediate risk reduction measures are strictly required.

iii) In a longer time perspective (more than 50-100 years ahead) , the likelihood of earthquakes of similar magnitude and consequences as the 2004 event will become gradually larger and giving an unacceptable risk to human life.

It was part of the scope of this project that the results should be of general use to other countries around the Indian Ocean that may be exposed to future tsunamis. Although no other site specific studies have been carried out, it is fair to assume that a similar earthquake and tsunami hazard study as done for the west coast of Thailand would conclude that the short to medium term design event for the west coast of Sumatra would be much more severe. It may also be significantly worse for the Andaman and Nicobar Islands, Sri Lanka and parts of the Indian coastline.