Tsunami flood hazard assessment of Aceh And Nias

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To determine the vulnerability of the Aceh and Nias coast for tsunami, which is urgently required to assist the rehabilitation and reconstruction process of the area, comprehensive information on the probability of tsunami occurrences that could affect the coast in Aceh and Nias is essential. This information should be based on tsunami occurrence (studies) for a sufficiently long period of time.

To our knowledge, such information is however not as yet available. Therefore, estimates mentioned in various preliminary studies (Wilkinson, 2005, Stein and Okal, 2005, Thio et.al., 2005, Bellier et al., 1997; Sieh and Natawidjaja, 2000), based either on the rate of convergence of the Indian Burma Plates and the assumption that future events will have similar slip during the tsunami generating earthquake or from preliminary probabilistic simulations of earthquake occurrences along the associated fault line, an assessment of the tsunami flood vulnerability for the Nias and Aceh is carried out.

An estimate is made of a relation between the earthquake magnitudes, Mw, and the earthquake recurrence interval for a stretch of the Sunda Trench between 7^0 S and 16^0 N. Earthquakes that are associated with a return period of approximately 1 to 100, 1 to 150, 1 to 200, 1 to 500 and 1 to 1000 years have been examined.

Using a fault model, the associated initial tsunami field (tsunami excitation) is generated and multitudes of simulations are carried out to compute the propagation of the tsunami wave and flooding in the coastal areas. The flooding simulations are carried out using a special flood solver to produce accurate flood maps with the same recur-

rence interval. The use of this flood solver will be shown to be essential for producing accurate flood hazard maps.