



The Indian catastrophic tsunami of 26 December 2004: Field observations and eyewitnesses accounts from Sri Lanka, Maldives islands and Thailand

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The big Sumatra earthquake ($M_w = 9.0$) of 26 December 2004 generated a catastrophic tsunami that attacked a long number of coastal zones of the Indian Ocean. To study the tsunami impact our team organized post-event field surveys as well as a collection of eyewitnesses accounts. Post-event field surveys were performed in Sri Lanka from 8 to 14 January 2005 and in Maldives islands from 14 to 16 January 2005. Eyewitnesses accounts were collected from individuals who happened to experience the tsunami attack in Thailand. In the west, south and east coastal zones of Sri Lanka and in Maldives islands the horizontal and vertical runups of the tsunami waves were measured from characteristic traces left behind by the tsunami and the wave heights at the coast were estimated for several tenths of spots located by hand GPS devices. Wave heights ranging from 3m to 11m a.m.s.l. were estimated with the highest values being observed in the south part and in the east coastal segment south of 9°N . The tsunami penetration inland ranged from about 200m up to 2km. The results were cross-checked with observations made by local people. Interviews with local people supplied also other pieces of information including the number of main wave arrivals and the respective arrival times. In Sri Lanka three main waves were described with arrival times separated by intervals of about 5 to 15 min. However, in the west coastal zone a remarkable delay was reported for the arrival of the third main wave. It seems that as a rule the second wave was the most powerful and destructive one. Heavy destruction in the population, the built environment and the infrastructure (railway

system, bridges) was caused mainly in the southwest (e.g. Kalutara, Paralia, Galle), south (e.g. Hambantota) and east (Pottuvil, Batticaloa, Trincomalle) coastal zones of Sri Lanka, the death toll going up to at least 15,000. The heavy destruction is attributed not only to the significant wave heights but also to the increased vulnerability of the coastal communities. As an instance, rural buildings without concrete frame proved extremely vulnerable to the tsunami attack while buildings with concrete frame suffered much less. It seems that the inundation parameters were very sensitive to the coastal geomorphology papa meters. In Maldives islands the wave heights did not exceeded about 3m which is mainly explained by the presence of the coral reef to the east of the island complex as well as to that the tsunami arrived at low tide time. As regards the eyewitnesses accounts in Thailand, a standard questionnaire was organized and individual interviews were taken from about 25 Greek persons who happened to experience the tsunami attack in Padong and Blue Lagoon Port of Phuket island as well as in Phi-Phi islands. Information regarding the number of waves, their arrival times and runups were collected and cross-checked. The tsunami impact was documented in a large number of photographs taken by the individuals. The information collected from Sri Lanka, Maldives islands and Thailand seems to be of great value for not only to understand the factors that controlled the tsunami impact but also to model the tsunami generation, propagation and inundation.