Study on the effectiveness of coastal forest against tsunami in Indonesia - Field investigation in Pariaman

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The effectiveness of coastal forest against tsunami was indicated by the survey results of tsunami disaster. Especially after 2004 Indian Ocean Tsunami, some researches were reported on the utilization of coastal forest as tsunami countermeasure. The coastal forest is considered as effective countermeasure against tsunami disaster in Indonesia. However the condition of coastal forest is depending on the environment of each site, the research of tsunami mitigation effect by coastal forest is not so much examined in Indonesia. So the field investigation on coastal forest was carried out in Pariaman, Indonesia. The tree conditions (tree age, tree height, trunk diameter, distance of trees) and coastal topography were measured. The tree spices are selected Casuarina (coastal pine tree). Casuarina is popular species in coastal area of tropical and subtropical zone. From the survey result, the relation on tree shape and tree age is modeled. The diameter is increased linearly by tree age, and the tree height is increased logarithmically by tree age. And the numerical simulation including coastal forest effect was conducted. Some numerical simulation studies on coastal forest effect were reported by one-dimensional numerical analysis. However, coastal forest has two dimensional plane structures and limited length along coastal line in actual fields. It is necessary to consider this influences to understand the effect of coastal forest against tsunami run-up. In this study, the coastal forest effect to reduce tsunami was examined by two-dimensional numerical simulation with limited length coastal forest conditions.

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