



Derivation of Population Distribution Using Remote Sensing and Statistical Data as an Input for Tsunami Risk Assessment

R. Khomarudin (1,2,3), G. Strunz (1), J. Post (1), K. Zosseder (1), and R. Ludwig (3)

(1) German Aerospace Center (DLR), Oberpfaffenhofen, Germany, (2) United Nation University Institute for Environment and Human Security (UNU-EHS), Bonn, Germany, (3) Ludwig Maximilian University (LMU), Munich, Germany

Information about people distribution is a crucial component in disaster risk management. Every disaster such as flood, drought, tsunami, volcanic eruption, storm, earthquake etc. implies threats to people with respect to loss of life, injury, and suffer. The number of people affected during 1991 – 2005 is approximately 3.5 billion people (UN ESCAP note), and that means more than 50% of people on the world are affected by disasters. Therefore, the information on people distribution in the disaster or hazard zone is important in order to mitigate the impact of natural disasters. Especially for tsunami, this information will help the government to better manage the evacuation of people and to estimate the number of people affected if there is tsunami event in their area. Normally, the available information on population distribution is based statistical data related to administrative boundaries, e.g. village, municipal, district, province, or national level.

This research focuses on the improvement of the spatial resolution of data on the people distribution covering the area along the west coast Sumatera, South Coast of Java, and Bali. The results are used as an input for tsunami risk assessment in the framework of the GITEWS project. A combination of the number of people at village level with land use maps is under-taken in this research. GIS and remote sensing techniques are used to improve the spatial detail of statistical data on people distribution. The model is based on an analysis of people activities in a certain land use. To assign appropriate weighting factors, census data and potential of village (PODES) data are used.

The results of this research are detailed people distribution maps (day and night time) for the Coast of Sumatera, South Coast of Java, and Coastal of Bali. The spatial improvement can be shown. Moreover, besides the spatial improvement, the results also provide information on the distribution during day and night time. To estimate the accuracy of this approach, sensitivity analyses have been performed, which show the quality of the results.

Keywords: spatial improvement, people distribution, census, land use, risk assessment