

Statistical approach to flood disaster management and risks reduction - in IBU River Basin

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Abstract

In the past four decades, economic losses due to flood have increased tremendously and resulted in major loss of human lives and livelihoods, the destruction of economic and social infrastructure, as well as environmental damage. This study focuses on flood disaster management through the establishment of a flood prediction model for Ibu River, a major tributary of the Ona River using the statistical approach. The Hazen plotting position was used to calculate the flood return periods while the floods were fitted into log-Pearson Type III distribution to obtain extreme flood estimate. Estimates showed that extreme floods are expected to occur between the months of June and October when rainfall is prominent within the basin area. In addition, flood magnitudes were found to increase with an increase in return periods in the Hazen plotting position. The model $Q = 27.89Tr^{0.548}$ ($R^2 = 0.97$) generated from fitting the extreme values (peaks) of the River Ibu into the log-Pearson type III distribution, can reduce flood risks within the River Ibu basin, particularly in Sagamu, and this information is highly helpful to hydrologists and engineers in planning for flood regulation and protection measures.

Keywords: Ibu River, Hazen Plotting Position, Log-Pearson Type III Distribution, Peaks, Flood Regulation

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Received: 2015/07/13

Accepted: 2015/11/25

DOI: <http://dx.doi.org/10.4314/njtr.v10i2.4>