ABSTRACT

EXTREME VALUE ANALYSIS OF RAINFALL IN MYANMAR (1970-2008)

Thet Htar Su Hlaing
University of the Philippines, 2010

Adviser: Dr. Josefina Argete
Reader: Dr. Raquel Francisco

Extreme values of rainfall in Myanmar were analyzed using the daily observations from 1970 to 2008 (39 years) of 35 synoptic weather stations. For each station and each year, the maximum 1-day, 2-day and 3-day rainfall were selected. When the maximum 1-day rainfall for each year was used, results show that extreme events most often occur during the southwest monsoon months of May to September and contribute 95 % to the annual frequency of extreme rainfall and more extreme rainfall events happen after 2000 that the previous years. The return values were estimated according to the Generalized Extreme Value (GEV) distribution function. Only 5 stations observed rainfall with return period more than 200 years. The highest return period is 310 years at Kengtung, its rainfall is 270 mm in 2003. The highest daily rainfall observed at Sittwe is 563 mm in 2002, and has return period of 229 years. Stations with return period more than 200 years are considered rare events and impressive flooding most likely occur. The amounts of rainfall with a return period of 2-, 5-, 10-, 20-, 50- and 100-years were also derived using GEV and mapped to show the spatial variation of expected rainfall. The western part of Northern Myanmar, Rakhine Coast and South of the country receive heavier rainfall than the other areas of the country. The trend of 100-year return period rainfall was investigated. This was accomplished by overlapping 30-year intervals of the entire dataset and the 100-years return period rainfall estimated. Using 95% confidence interval of the slope, only five areas showed significant increasing trends. Another 5 stations exhibited significant decreasing trends. The rest of the stations displayed increasing trend but not significantly. Since 4 of the 5 stations showing significant increasing trends are located either on the mountain or mountain slope, rainfall over these areas may funnel its way towards the river system flowing from north to south implying increase in flood risk downstream.