Entropy of Stable Seasonal Rainfall Distribution in Kelantan

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Abstract
Investigating the rainfall variability is vital for any planning and management in many fields related to water resources. Climate change can gives an impact of water availability and may aggravate water scarcity in the future. Two statistics measurements which have been used by many researchers to measure the rainfall variability are variance and coefficient of variation. However, these two measurements are insufficient since rainfall distribution in Malaysia especially in the East Coast of Peninsular Malaysia is not symmetric instead it is positively skewed. In this study, the entropy concept is used as a tool to measure the seasonal rainfall variability in Kelantan and ten rainfall stations were selected. In previous studies, entropy of stable rainfall (ESR) and apportionment entropy (AE) were used to describe the rainfall amount variability during years for Australian rainfall data. In this study, the entropy of stable seasonal rainfall (ESSR) is suggested to model rainfall amount variability during northeast monsoon (NEM) and southwest monsoon (SWM) seasons in Kelantan. The ESSR is defined to measure the long-term average seasonal rainfall amount variability within a given year (1960-2012). On the other hand, the AE measures the rainfall amounts variability across the months. The results of ESSR and AE values show that stations in east coastline are more variable as compared to other stations inland for Kelantan rainfall. The contour maps of ESSR for Kelantan rainfall stations are also presented.

Keywords: entropy; apportionment entropy; entropy of stable rainfall; entropy of stable seasonal rainfall