

On the Estimation of a Scaled Weibull Distribution of Rainfall Data of South West Nigeria.

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Many probability distributions have been proposed to explain the distribution of rainfall pattern but scanty of these distributions were known to have been applied to real life data. This work was carried out to evaluate the utility of weibull probability distribution in the estimation of the distribution of rainfall data of South western Nigeria. The study was executed using the rainfall data of 4 (Ibadan, Ikenne, Ilora and Orin Ekiti) stations of the Institute of Agricultural Research and Training, Ibadan. The data obtained from the data base were subjected to weibull distribution analysis using “Peak Fit” program and the parameters were estimated using maximum likelihood estimation (*MLE*). The results showed that the parameter, alpha (α), estimates ranged between 0.32907 for the Ibadan rainfall and 0.37024 for the Ilora rainfall. β on the other hand ranged from 0.8712 for rainfall at Ibadan to 0.9913 for rainfall at Ikenne. For the upper domain of x, the range of the parameter α and β followed the same trend. The parameter estimates obtained from the rainfall data of the different station and the mean rainfall ranged from 5.2272 for Ibadan to 5.9478 for Ikenne rainfall. The statistical properties of this distribution are that the estimated mode of the rainfall is zero because α and $\beta < 1$ and the mean ranged between 5.2272 (Ibadan) and 5.9478 (Ikenne) while the estimated mean for Ilora is 5.8975 and Orin Ekiti is 5.8411. These were not closely related to the actual mean annual rainfall which ranged between 3.3778 (Ibadan) and 3.8534 (Ikenne). Both the estimated and actual mean follow the same trend, indicating the plausibility of the distribution function. The graph of the reliability test as well as that of the *pdf* showed that $f(t) \rightarrow 0$ as $t \rightarrow \infty$.

Key word. Weibull distribution, cumulative density function