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# An assessment of spatial and temporal rainfall variability and its implications to Molapo farming in the Okavango Delta, Botswana

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This paper assesses the variability of rainfall on the entire Okavango Delta. Due to the effects of climate change as a result of global warming there is a concern of possibility of decline of rainfall over Southren Africa. Rainfall is a very important component driving the hydrological cycle and therefore the understanding of rainfall spatial and temporal variation is crucial for agricultural production and general water resources management. Time series of individual months, continuous month- to month, total rainfall for the early part ofthe rainy season, October-November-December (OND), the mid to end of the rainy season, January-February-March JFM) andannual rainfall, for 16 stations spread on the entire Okavango Delta are analysed and assessed for correlations and any significant trends to proof any changes in rainfall.

A homogeneity test was conducted using four different methods; the Standard Normal Homogeneity, the Buishand Range, the Pettit and the Von Neuman ratio to examine the possible existence of change or break-pointsin the rainfall time series.Spatial rainfall variability was investigated using the spatial correlation function.The Mann-Kendall trend test was used to investigate existence of trends. The results showed a fluctuation from one months to another in existence of trend; e,g October a more negative trend for all stations, then a more positive trend for November and so on and so forth. For a seasonal series half of the stations were showing a negative trend while the other half was positive. The annual series also followed the same order as seasonal. The trends were statistically non-significant.A linear regression and quantile regression were used for further investigation of trends. The spatial rainfall correlation amongst stations and the indication of trends has implications on distribution and yields of molapo farming in the Okavango Delta.