Changes in Annual Rainfall patterns in the Democratic Republic of Congo: Congo river basin

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This study focuses on the change detection in annual rainfall in the Democratic Republic of Congo (DRC) in the Congo river basin. High resolution gridded rainfall provided by Climate Research Unit (CRU) is used in this study. Trends in the annual rainfall patterns are calculated and the significance of the trends are found out using non-parametric Mann-Kendal test at 10% significance level. It is found that high negative trends are prevailing in Northern and Southern parts and high positive trends are in the Eastern and Western parts of the Congo river basin. Almost all of these locations show a significant trend. Central wetlands don't show a significant change in annual rainfall pattern. Change detection studies are carried out to detect year of change when annual rainfall starts showing deviation from its natural state. Mann-Whitney-Pettit method is used to detect year of change at 5% significance level in this study. Change is detected for almost all of the locations where the trend of annual rainfall is significant. Much earlier change is detected in the Eastern regions of the basin, i.e., the change year 1941-1960, while most of the Northern, Southern and Westerns shows change detection year from 1981-1995.
It is evident from this study that rainfall patterns in the Congo river basin are changing and the changes are non-uniform. There is no change detected in the central regions, while Northern and Southern areas show a significant decrease in rainfall and Eastern and Western regions are showing an increase in total annual rainfall. Change detection year also have non-uniform spatial patterns and Eastern regions are found to be affected much earlier by climate change.
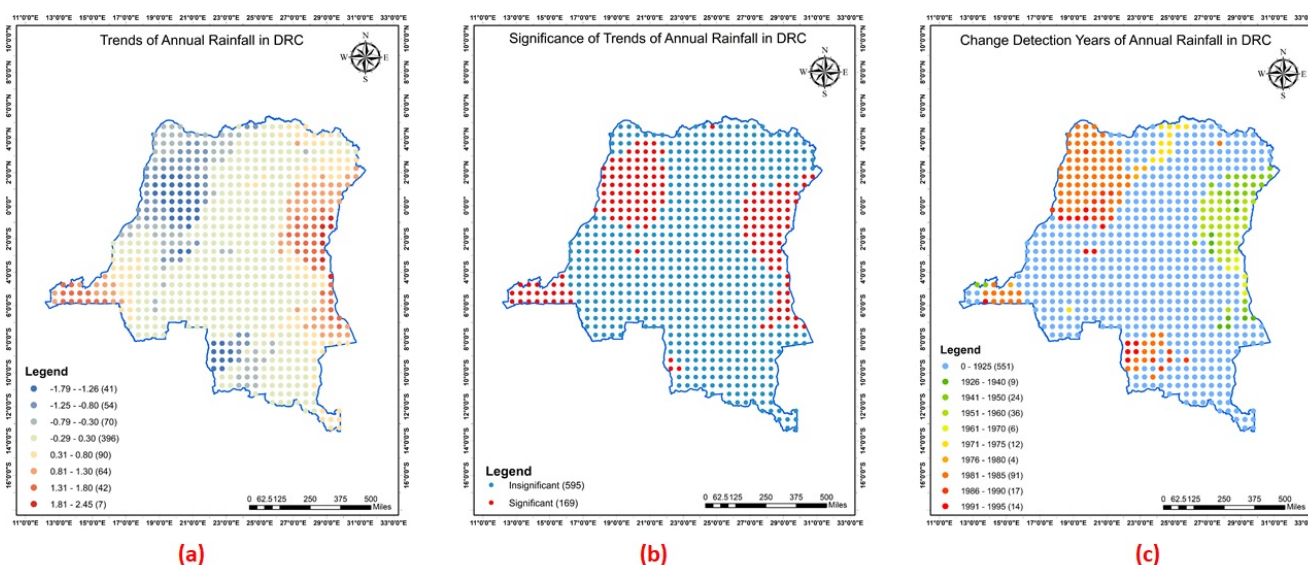
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Fig-1. Annual Rainfall Patterns and Changes in Democratic Republic of Congo (DRC): Congo River basin (a) Trends (b) Significance of rends (c) Change Detection Year