



## **Catchments Classification: Multivariate Statistical Analysis for Physiographic Similarity in the Niger Basin**

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The objective of this study was to determine physiographic similarity, as indicator of hydrologic similarity between catchments located in the Bani basin, and to derive the dominant factors controlling each group singularity. We utilized a dataset of 28 catchments described by 16 physical and climatic properties distributed across a wide region with strong environmental gradients. Catchments attributes were first standardized before they underwent an integrated exploratory data analysis composed by Principal Component Analysis (PCA) followed by Hierarchical Clustering. Results showed a clear distribution into 3 major clusters. Two of them were well separated and partitioned into northerly flat and semi-arid catchments, and southerly hilly and humid catchments. This nomenclature came from the interpretation of the main factors, topography, precipitation and latitude, which seem to control the most important variability inside these clusters. Moreover, the group of northerly catchments was designated to be dominated by agricultural land use and ferric luvisols soil type, two additional drivers of similarity. The third cluster was located in the center of the study basin, inside which, none of the descriptors seems to exert a strong control on the similarity. The outcome of this study can help understanding catchment functioning and provide a support for a regionalization of hydrological information.