ANALYSIS OF TRENDS AND EVALUATION OF PRECIPITATION BEHAVIOR IN RELATION TO THE OCCURRENCE OF DROUGHTS IN COCHABAMBA-BOLIVIA

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ABSTRACT

During the hydrological year from August 2022 to July 2023, a notable water shortage was observed in the department of Cochabamba and in several regions of the country, which prompted the need to assess the behavior of precipitation and its trend. For this purpose, annual series of total precipitation with the most data possible were used, sourced from measurement points in the department of Cochabamba. The analysis revealed that precipitation is decreasing, primarily in the southern part of the department, in the provinces of Mizque, Campero, and the southern part of Carrasco. This phenomenon was not observed in the northern slope of the Tunari mountain range, where, on the contrary, an increase in the amount of rainfall was recorded. Additionally, it was found that the precipitation for the 2022-2023 hydrological year presents a deficit ranging from 31% to 56% of the long-term annual precipitation. To incorporate the effects of El Niño and La Niña into the study, the analysis of variability, oscillation, and trends in these cycles and their teleconnection with precipitation reveals that El Niño events may become more pronounced in the future, which negatively impacts the availability of rainwater in our region. Furthermore, we are currently in the midst of a drought cycle that could last for several more years. Therefore, it is essential to continue analyzing meteorological data to support decision-making in advance, in order to reduce the impacts of potential precipitation deficits in the future.

Keywords: Droughts in Cochabamba, Climate Variability and Oscillation, Precipitation Trend and Behavior, Precipitation Deficit, Climate Teleconnection.

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