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Rain drop size distribution (RSD) associated with precipitation types in the middle zone of the Santa River catchment, Peru

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At present, climate change is modifying rainfall regimes at a global level with effects on local activities as well as changes in the variability of perceptible rainfall at a very short time scale. This phenomenon places in a scenario of high vulnerability to all activities that depend on rainfall for its development. In this sense, the detailed knowledge of the patterns and microphysical characteristics of the precipitations that occurred in the middle zone of the Santa River catchment (Western Andes of Peru) is of high importance mainly for dryland agricultural activity.

On the one hand, there is the presence of intense precipitation that causes erosion and, on the other hand, precipitation of less intensity beneficial for the improvement of the soil structure. In this regard one of the main parameters that define the characteristics of precipitation and are directly related to the origin of its formation (convective and stratiform) and intensity is the distribution of the size of raindrops (RSD). Through RSD the type of precipitation occurred in the catchment can be defined and classified.

In such context, the main objective of the study is to characterize the distribution of the size of raindrops and associate them with a type of precipitation. For this we use the Micro Radar of Precipitation (MRR-2) installed in the city of Huaraz (between the Cordillera Blanca and Cordillera Negra), with data from March 2017 to December 2019 (34 months). A frequency analysis with the distribution data of RSD is carried out as well as an analysis of main components to relate it to a type of rain. The results reveal the different types of rainfall that occurred in the area during the analysis period, and also identify the periods and frequencies of these rains due to the current weather patterns.