

A PROPOSAL FOR THE UPGRADE OF AGROHYDROLOGICAL TECHNIQUES

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Abstract. Based on the proposal of Parodi and Damiano (1989) on the Agrohydrological Systematization of flat micro-basins for the control of recurrent flooding through the application of concepts from agronomic and civil engineering, this work proposes the upgrade of that technique through the incorporation of digital elevation models, complemented with high-resolution photogrammetry and the two-dimensional computational simulation of shallow water equations to determine the natural drainage paths and feasible storage ponds. The principle of Agrohydrological Systematization is to divert excess water to the least productive areas, retain it there as long as possible, and then allow for its controlled and channeled evacuation towards the next downstream sector. The design includes a first functional phase with evaluation of extreme events, and a second structural phase to design an optimal drainage and storage network with minimal earth movements. During the preliminary phase, the Copernicus GLO-30 digital model with a resolution of 30x30 meters, the Intensity-Duration-Frequency curves of precipitation, calculated by IHLLA around Azul region, and the HEC-RAS hydrodynamic software have been used. In a pilot area in the Rauch district, with a surface of 2000 hectares, where there is support for hydrometeorological monitoring at the basin level, it has been confirmed that it is feasible to channel the drainage and retain part of the surface runoff, while working with precipitation events with a recurrence of less than 25 years, and in conditions of saturated soil and high water table. In the future, it is expected that a high-resolution DEM will be available, using drone altimetry with RTK support, which will allow centimetric precision in the vertical and be able to provide exact figures of drainage volumes and feasible retention schemes for each precipitation scenario, also a simple subsurface soil retention model that complements the HEC-RAS surface model will be evaluated. Given the regional magnitude of the problem, the advantages of joint action between stakeholders are being analyzed to achieve greater resilience and reduce the impact based on damage curves.