



## **Low cost hydrometeorological monitoring for small mountain basins in semi-arid regions**

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Currently, basins monitoring is carried out extensively principally in large basins with low spatial sensors distribution. The low distribution is lower in developing countries due mainly to the monitoring process' cost, not just the acquisition cost of the equipment but also the data transmission and equipment maintenance.

Basins and water resources management depend on the acquisition of reliable hydrometeorological data, even more in small mountain basins in semi-arid areas. These basins are vulnerable to drastic changes, in relief, elevation, vegetation and soils, which generates high hydrometeorological variability in short distances, causing high floods and fast floods events.

This framework highlights that the necessity to increase sensors density in catchments would be possible if their monitoring is efficient at low cost, especially in small mountain basins. This work proposes a hydrometeorological monitoring for small catchments which is based on low cost sensors, electronics and programming on free software and hardware Arduino. It could be an alternative to traditional monitoring with commercial instruments and software.

The proposal is based on three sensorisation units that allows to measure climatic variables such as precipitation, relative humidity and temperature; edaphological variables such soil moisture content and hydrological variables such as surface runoff from the water depth measurement. In addition, the proposal includes data transmission units, data logging and equipment powered unit. To allow and almost real time data acquisition, data protection and autonomy in the operation of the system.

The selected equipment for this proposal has been evaluated and validated preliminarily in the laboratory condition, obtaining satisfactory results, that promises, is possibility of hydrometeorological variables measurement and monitoring, spatially in small mountain basins with a good accuracy and at a cheapest way. Next step is to try it in field conditions.