

The B-SaFFeR project – sensor network implementation

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Abstract— In this paper the B-SaFFeR project is presented, with its goals, ambitions and results.

The Rwenzori Mountains in Uganda are increasingly affected by flash floods, resulting in severe human and socio-economic losses. The B-SaFFeR project, funded by VLIRUOS, seeks to strengthen local capacities for disaster risk reduction through a combination of low-cost technology, hydrological modelling, and community engagement.

A sensor network integrating rainfall gauges, radar river level measurements, and CCTV-based computer vision has been deployed to collect real-time meteorological and hydrological data. Data are transferred via low-power 4G connections to the APTERRA cloud platform, enabling open access for researchers

and supporting the development of a spatially explicit hydrological model.

Preliminary results demonstrate successful installation and validation of monitoring stations, alongside capacity building with local partners to ensure knowledge transfer and system sustainability. Future work will integrate AI-based flood prediction, citizen-driven data collection, and watershed modelling to design a proof-of-concept flood early warning system. By coupling technological innovation with socio-economic resilience mechanisms and stakeholder co-steering, B-SaFFeR aims to deliver long-term academic, community, and policy impacts in the Rwenzori region.

Keywords—Flash Floods; Internet of Things; East-Africa; cloud platform; VLIRUOS