Laboratory and numerical study of woody and stony debris flow

Summary

Debris flows can be defined as fast flowing mixtures of water, fine sediment and granular material originated from landslides or rockslides. Debris flows are among the most frequent and destructive off all geomorphic processes, they affect mountainous areas and the damage created is often devastating, as seen in the events of Madeira Island "aluviões" in 2020. The main objective of the thesis is the development of conceptual model for check dam self-cleaning based on laboratory observations and interpretation of numerical data.

The thesis should meet the following specific objectives: i) to investigate the structure of granular arrangements in hydraulically and mechanically controlled deposits; ii) to investigate the patterns of erosion of both kinds of deposits and iii) to evaluate the influence of the structure of the deposits on the patterns of erosion.

Keywords

Check-dam, granular flow, hydraulic deposition, mechanical deposition, clogging.

Open type check dam: concrete slit barrier of St. Luzia River in Madeira, Portugal.

PhD student
Solange Valente Mendes

PhD program
Civil Engineering (IST, University of Lisbon)

Supervisor
Rui Ferreira (CERIS, IST, University of Lisbon)

Co-supervisor
Maria Teresa Viseu (LNEC)

Period
2020-2024

Funding
-