Pyrenees, Spain/France – Demonstrator site

CTP I. Arauzo ; J. Terrádez Mas
BRGM S. Bernardie ; R. Vandromme ; C. Levy, Y. Thiery, I. Bouroullec, G. Grandjean

BRGM, Risks and Prevention Divisions, France, e-mail s.bernardie@brgm.fr
CTP Consorcio de la Comunidad de Trabajo de los Pirineos, email : i.arauzo@ctp.org

1. Objectives

Extreme precipitation has led to increased risk of flooding, rockfalls, landslides and debris flows along different landscapes in more than 10,000 km² in different hydrological basins. This has resulted in damage to agricultural land, infrastructures and in urban areas. The objectives within this case study is to propose, test, set up and monitor NBS to reduce these hazards.

For that purpose, it is proposed to set up an appropriate Land Use and Climate Change (LUCC) model based on Houet (2015) between 20th and 21st century in order to identify the places where hazard and risk have increased/decreased, and to propose adapted strategies. In particular, vegetation types that have decreased the risk level related to landslides, rockfalls or floods will be proposed as new NBS.

Within this case study, specifically analyses will be performed in Cauterets municipality (France), and in Navarra region (Spain).

NBS development to fill knowledge gaps

- Computing hazard susceptibility maps from past and current LUCC data over the area for risk identification
- Selection of NBS and locations: tree species and density, facies drainage, agropastoral practices, regeneration of lost plant cover, natural material for protection works, horizontal wood and rock dikes, wood steps...
- Selection of monitoring method (UAV, remote sensing, In situ sensors ...) for controlling sediment retention, landslide evolution, rockfalls occurrence and propagation;
- Impact/Risk maps taking into account the reduction of risks offered by the selected NBS
- Develop with stakeholder the conditions of a plan that should implement the identified NBS, positive/negative aspects, funding schemes, monitoring systems, services and policies related to various NBS

Reproducibility and upscaling potential

- NBS analysis will identify change in hazard (landslide, flash floods) susceptibility affecting the whole Pyrenees mountain domain conditioned by agropastoral and additional NBS changes
- Other service/workflow development that is transferable to other mountainous regions like the Alps, Massif Central, or other mountainous areas located within Europe

The identified NBS will be specified and described to be implemented by SME’s. This should boost the market of risk reduction in mountain areas. This knowledge transfer will allow: i) appropriateness of technical aspects, ii) development of operational tools for risk assessment, and monitoring related impacts of the NBS, iii) collaboration between private-public actors to operate the NBS

References
