



## Developing nature-based solutions together with citizens

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According to European Union's research guidelines, Nature-Based Solutions (NBSs) are intended to provide means for tackling societal and environmental challenges through green infrastructures inspired and supported by nature. Green infrastructures instead of grey are often cost-effective, health-supporting and so far have been considered as feasible solution to tackle environmental problems especially on urban areas. In this study we develop approaches for planning NBS together with stakeholders on rural areas to confront challenges caused by intensive bioeconomy.

A Horizon 2020 research project OPERANDUM (Open-air laboratories for nature based solutions to manage hydro-meteorological risks) examines and delivers NBS's in seven European and two non-European countries through open-air laboratories (OALs). Each OAL focuses on a specific local hydro-meteorological challenge, such as flooding, landslides and excessive nutrient loading, and develops and tests natural methods for reducing their exposure. In all OAL's, the solutions have to be developed together with various stakeholders because the region in question and the ecological challenges to be solved involve players from the social system (land or water owners, citizens, decision makers, industry, regional authorities etc).

In OPERANDUM, the Finnish OAL is the Lake Puruvesi in the Eastern-Finland. Due to nutrient loading, especially during peak flows after heavy rainfall and snow melt, excellent water quality of the lake has begun to deteriorate (eutrophication). In the project, NBSs developed and tested are aimed for slowing down the water flow in order to allow water-borne nutrients and sediments to descend into the water passage or recesses created next to it. That will be done by constructing sedimentation ponds and pits, buffer zones, wetlands and peak runoff control structures in the catchment areas. Also, recommendations for forest management practices is considered. One of the most important stakeholder is an active civil organisation, ProPuruvesi. The group, consisting of local citizens, have not only for several years activated discussion about the situation of the lake, but also measured and monitored the lake conditions (e.g. visibility changes) as voluntary work. ProPuruvesi has developed co-operation with the local business (fishermen and recreation) and people (local citizens and out-of-town land owners).

In this presentation we show practical examples of how the co-development in planning and implementing NBS is being conducted together with scientists and stakeholders and what possibilities it offers to foster citizen science.