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How vegetation analysis can renew soil bioengineering for slope stabilization

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Mountain environments play a crucial role in maintaining biodiversity despite becoming more vulnerable to colluvial processes primarily induced by extreme meteorological events. Soil bioengineering stabilizes mountain slopes and limits impacts on ecosystems and is increasingly used worldwide, yet its effectiveness requires better assessment through post-intervention environmental monitoring. However, such studies are only rarely performed even though they are essential to improve future intervention. This research reports soil and vegetation monitoring data of an area in the Italian Alps in which soil bioengineering work was carried out to restore an area hit by landslides. The monitoring involved an analysis of the floristic-vegetational and ecological features of the plant communities of the area of the soil bioengineering intervention, as well as an analysis of the chemical-physical characteristics of the soils where these communities were established. Vegetation analysis was carried out by applying recent ecological indices developed by Giupponi et al. (Giupponi et al 2015, 2017a, 2017b). The results of the monitoring have highlighted some lines of research and action that should be undertaken by technicians, researchers, and politicians to innovate and to make work aimed at the stabilization of landslides more effective. In particular, it would be extremely useful to study the biotechnical characteristics of herbaceous plants that are still “unknown” in soil bioengineering and to evaluate their possible effects on ecosystems in order to produce seed mixtures that, besides being useful for soil stabilization, can accelerate vegetation dynamics, therefore maximizing the success of such works (Giupponi et al. 2019).

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