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How we the can measure impact of artificial protection on slopes of linear structures to the connection with surroundings

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The embankments along the roads, railroads, watercourses and other linear structures are very often not constructed the way that they would be protected against soil erosion and rills development during the construction works and also operation phase. Usually, for the case of Central Europe, the period of sudden heavy convective rainstorms with high erosivity potential overlapwith the stage of the intensive earthworks. This causes mobilization of large amounts of soil from the construction sites to the surrounding environment. The sediment, often enriched with bounded pollutants, causes siltation and pollution of the nearby watercourses and reservoirs.
We present preliminaty results of the ongoing research project that investigates the affordable and simple technical measures that have a potential to protect the slopes against the splash erosion, rills development and the topsoil sliding. The specific goal is the experimental testing of various mechanical and technical surface protection measures and evaluation if it's effectivity.
In the first stage of the research, we test covering of the slopes with different permeable materials. The experiments are done on five 6 m long inclined plots with different slopes. The soil profile, that mimics the typical soil stratification of the embankments, is encapsulated in large steel containers. All plots are equipped with sediment and runoff collection system and with soil water regime and temperature regime monitoring network. It is also possible to simulate the rainfall with a nozzle rainfall simulator, the simulator is installed on three plots with different slopes.
We compare and evaluate the runoff, soil loss and surface topography changes (sliding, soil compaction and rills development) on the protected and untreated plots. The research is funded by the Technological Agency of the Czech Republic (research project TH02030428) and an internal student CTU grant (SGS17/173/OHK1.)