

Soil erosion is a process of physical degradation (including, for example, scouring, gouging, and/or weathering) of soils. When the mechanical agent is water, we speak of water erosion of soils. The process of erosion has a detrimental effect on the state of the natural environment and on living and agricultural conditions for humans. The protection of soils from this harmful process is the subject of many scientific programmes and is one of the priorities of soil science.

From an agricultural perspective, water erosion is an unfavourable process that causes, among other things, leaching of the most fertile top layer of the soil as well as deposition of the transferred material at the foot of the slope, which can result in the sealing of the soil surface and, consequently, also hinder plant germination. In addition, soil and sediments from erosion processes are transported to rivers and water bodies, causing their gradual siltation and/or eutrophication. It is estimated that annual soil losses caused by water erosion in Poland amount to 14 Mt. Moreover, 16% of the country's territory are areas particularly threatened by erosion processes. On the scale of European soils, up to 24% of all land and 32% of agricultural land is eroded. It is also worth noting the danger that may be posed by heavy rainfall, namely the triggering of mudslides. This phenomenon can cause a great deal of damage to farmland, houses, and road infrastructure. Although the main area of its occurrence to date has been the monsoon rain region, it is increasingly occurring in other zones as well, often in the basins of small mountain rivers, ravines and gullies.

Water erosion consists of several stages. The first of these is splash erosion, the course of which is the subject of this project. This stage is related to the direct contact of raindrops with the soil surface and, depending on, among other things, the intensity of the rain or the terrain, can initiate further erosion forms on a different scale. Despite the importance of the issue, there is a lack of information in the literature on the natural susceptibility of soils to splash erosion. Filling this gap in the knowledge will be the main objective of the proposed project.

The main objective of the project is to determine the parameter that characterise soils in terms of susceptibility to splash erosion and to relate this parameter to the physical and chemical properties of soils. The study material will include soils typical of Central Europe.

The project will be possible to the use of the unique research equipment available at the Institute of Agrophysics of the Polish Academy of Sciences in Lublin, including a set of synchronized high-speed cameras with specialised software allowing the tracking of soil particles that have been splashed.

The results of the project will provide an important contribution to broader basic knowledge of soil water erosion, which in the longer term may find practical application, e.g. extending the possibilities for modelling this phenomenon in the context of improving erosion prevention measures, among other things. The project will result in a multifaceted picture (characterisation and classification) of the potential of soils to trigger surface degradation under the influence of rainwater.