An American scientist has recently reviewed the different drivers and the effects of soil erosion. This literature survey highlights that soil erosion exerts detrimental effects on food production as well as on the natural environment, and calls for the development of effective conservation methods.

Soil erosion is a serious environmental and public health issue. Each year, about 10 million ha of cropland are lost due to soil erosion, thus reducing the cropland available for food production. This is a serious problem because more than 99% of the world’s food comes from the land. It is therefore of great importance to understand the mechanisms of soil erosion and to be able to predict its effects to preserve human food availability and the natural environment.

An American researcher has recently performed a literature survey to assess soil erosion worldwide. Firstly, the author listed the factors driving soil erosion. Then, he assessed the effects of soil erosion on agriculture productivity, environmental ecosystems, and biodiversity.

Erosion occurs when the soil is left exposed to rain drops and wind which can both easily dislodge surface soil particles. According to the author, the following factors influence soil erosion:

- Soil texture: a fine texture facilitates erosion.
- Vegetative cover: its presence protects the topsoil by dissipation of rain drop and wind energy.
- Land topography: marginal and sloping lands exhibit higher erosion rates.
- Other local factors: the topsoil physical properties are influenced by factors such as human activities, high water energy streams banks, landslides, or earthquakes.

The author highlights that world soil erosion rates are much higher than natural soil renewal, leading to a reduction of agriculture productivity and natural biodiversity. According to the author, the soil erosion notably exerts the following detrimental effects:

- An increased soil water runoff and therefore, decreased water availability for plant and fruit growths.
- The removal of organic matter and essential plant nutrients.
- The reduction of soil depth and thus, of plant root space.

On the whole, the author estimates that 80% of world current agricultural lands suffer moderate to severe erosion and that erosion has been responsible of the loss of 30% of world arable land in the past 40 years. The author underlines that this has led to a reduction of food production but also of the biodiversity of plants, animals, and microbes.

In conclusion, the author calls for the stimulation of research to develop effective soil and water conservation methods, and for their rapid implementation in agricultural and natural ecosystems. This study summarises the key factors and challenges related to soil erosion. Its results are of great help to understand better the mechanisms of soil erosion and to develop more sustainable agricultural techniques limiting its detrimental effects.

Contact: dp18@cornell.edu.
Theme(s): Soil, agriculture, sustainable consumption and production, biodiversity

Additional Information: An example of an innovative technique of using vegetation cover to reduce soil erosion in olive growing can be seen in Andalucia (LIFE00 ENV/E/000547 “Design and Application of a Sustainable Soil Management Model for Orchard Crops in the Doñana National Park Area ”). For more information please see the Project Summary.