Soil Erosion Study on the Chinese Loess Plateau

Yaxian Hu (1), Shengli Guo (1), and Nikolaus Kuhn (2)

(1) Institute of Soil and Water Conservarion, Northwest A&F University, Yangling, China, (2) Physical Geography and Environmental Change, University of Basel, Basel, Switzerland

The Chinese Loess Plateau, because of its highly erodible loess soils and hilly topography, has been extensively studied by soil scientists and geomorphologists. As a research hotspot, there are five national-level field stations across the Loess Plateau, with hundreds of erosion plots set up with various sizes, lengths, slope angles and vegetation covers. In addition, huge indoor rain simulation facilities exist in in different institutes which can provide rainfall simulations under a wide range of controlled conditions. Consequently, national-level restoration projects have achieved tremendous improvements in curbing soil erosion and improving regional agro-ecosystem, mostly by afforestation and soil rehabilitation. However, when implementing the advanced techniques and models that have been widely applied in the rest of the world, there are often regional considerations, which demand new approaches to overcome. One example are the unintentional impacts of restoration efforts, such as the establishment of apple orchards. Over 20 years, they have caused an increase in soil erodibility and lowered local ground water levels. Neither before the introduction of this landscape rehabilitation technique, nor now, has the impact of intensive fruit production been systematically studied, despite lending itself to systematic experiments. The lack of research is attributed to the general idea that trees protect soils and improve environmental services. This presentation identifies several such specific regional environmental issues associated with soil erosion on the Loess Plateau and discusses strategies to avoid missing important research questions.