

The perspectives and adaptation to soil conservation
with the stress of climate change in Asia

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Many climatic variables related to soil erosion in Asia has changed significantly under the background of global climate change, and in turn greatly influenced the soil erosion. With the greatest population in the world, the changes in soil erosion will result in a series of problems such as food security; therefore, the connection between climate and soil erosion should be clarified, and further adaptation should be discussed to reduce the adverse impacts of climate change.

Changes in driving factors of soil erosion has been detected over the past century. Warming trends and increasing temperature extremes have been observed across most of the Asian region over the past century, which has absolutely accelerated hydrological cycle. Increases of heavy rainfall events and floods have been observed in most areas of Asia. The reported climate changes will directly or indirectly influence on soil erosion through altering the rainfall intensity or vegetation coverage. Though no long-term and large-scale observation can be used to evaluate the attributes of soil erosion to climate change, some simulation results showed that soil erosion have increased in the past century, and the contribution of climate change was up to 30%.

Some comprehensive measures have been taken successfully to reduce the impacts of climate change on soil erosion. Since climate change may be slowed down through reducing green house gas emission, these measures focused on altering surface conditions. Take China as an example, the Grain for Green Project (GGP) has been launched as one of the most important projects for soil and water conservation since 1999. Till the end of 2013, more than 9.3 million ha of slope farmland has been converted into forest or grassland and about 17.5 million ha of barren mountains and hills were re-vegetated. Results of a case study showed that the GGP has many

obvious ecological impacts, such as water conservation, soil loss reducing, carbon fixing and oxygen releasing. Comparing with 1998-2002, the runoff and sediment load in 2003-2007 decreased by 18% and 45.4% respectively.

The challenge of soil and water conservation due to climate change should be widely recognized. And the adaption measures should be reconstructed systematically from farmer to governments.

Keywords: Soil erosion, ecological restoration, Asia, climate change