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Coupled soil and water conservation and rain fed agriculture system to cope with climate change in semiarid Africa and China

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Improving rainwater resource use efficiency and controlling soil and water loss are the two major challenges under climate change in semiarid Africa and China. The two regions confront an increasing ecological crisis of water and soil loss and vegetation degradation, lowering CO₂ sequestration of plant community and field productivity of main crops due to extreme climatic events. It is a critical practical demand to improve food production and soil & water conservation capacity in this region. Our previous work showed that rain fed farming system of northwest China led to significant increase in rainwater use efficiency and crop yield in semiarid Kenya and Ethiopia since 2011 and also made the social-economic investigations on farmers' livelihood and ecosystem conservation as well. Local community is mainly featured by small household farmers, and the reclamation activities at sloping lands resulted in serious soil and water erosion. We designed and implemented a few successful case studies by introducing micro-field rain-harvesting farming system to improve food production level at flat lowlands, and conducting terrace construction programs to retain rainwater and restore vegetation at sloping highlands in the two regions. By this, social-economic-ecological outputs had been improved simultaneously. We therefore attempted developing a theoretical framework to guide the scientists, farmers and decision-makers to work together to adopt and extend the coupled rain fed agriculture and soil & water controlling system. The coupled system can act as a promising solution to increase vegetation cover, decrease soil & water loss, improve carbon sequestration and food production, and ultimately achieve ecosystem sustainability under climate change in semiarid Africa and China.

Biography

You-Cai Xiong has completed his PhD from Lanzhou University, China and Post-doctoral studies from McGill University and ECORC, Agriculture & Agri-Food Canada. He is currently the Deputy Director of MOE (Ministry of Education) Engineering Research Center for Dryland Agriculture and Ecological Conservation, China. He has 20-year research experience in ecosystem sustainability and food security under climate change and has published more than 150 papers in reputed journals. He has been serving as an Editorial Board Member of over 10 international journals.

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