



Tropentag, September 19-21, 2012, Göttingen -
Kassel/Witzenhausen

“Resilience of agricultural systems against crises”

Rangelands Ecosystems of the Tibetan Plateau: their Current Status and Sustainable Development Strategies

SHANG ZHANHUAN, R.J. LONG, L.M. DING, X.S. GUO

Lanzhou University, China

Abstract

Rangelands on the Tibetan plateau support a unique society and culture on the roof of world. Climate change is predicted to worsen the already harsh environmental conditions on the Tibetan plateau. Kobresia meadow is the dominant vegetation on Tibetan plateau, and yak is the key livestock species. Already today, degradation of rangelands and deterioration of livelihoods lead to herders out-migration. Livestock numbers have increased over the last 60 years, though stagnated during the last 10 years; especially yak numbers decreased due to warming and degradation effects. Rangeland degradation is expected to increase with global warming effects, especially in winter. Spots of barren land provoke heavy carbon losses from top-soil: the conversion of 1 ha alpine meadow to barren land result in a loss of 10 cm top soil and about 20–46 tons of soil organic carbon (SOC). It is estimated that close to 5 Mio hectares barren land exist in the headwater region of the Yangtze and Yellow river on the Tibetan plateau, which are estimated to have lost around 247 Mio tons SOC. In consequence of the above, ecological restoration is of first importance to improve Tibetan livelihood. Seed banks for rangeland species and active re-sowing of barren land is important to restore degraded areas. In addition, the pastoral value chain must be integrated, and large, privately managed areas should be dedicated to forage production. Supplying enough and nutritious feed and enhancing the value of livestock products is expected to enable a reduction of livestock numbers and increase herders' income. In addition, fostering the development of biological control of rangeland pests (e.g., grasshoppers) and keeping the ecosystem in balance is needed as well. Overall, the philosophy of sustainable development needs to be incorporated into the regional policy and become as important as economic development. In particular, more 'bottom-up' programs and approaches need to be applied for the improvement of livestock and rangeland management, to ensure the effectiveness of government investments in maintaining the productivity of the Tibetan rangelands.

Keywords: Alpine meadow, degradation, restoration, sustainable development, tibetan plateau