



Tropentag, September 20-22, 2017, Bonn

“Future Agriculture:
Socio-ecological transitions and bio-cultural shifts”

Soil Fertility and Agricultural Sustainability Strategies in the Desertified Area of Binh Thuan, Vietnam

ALENA RABITZ¹, ALEXANDER HOLLAUS², TIEN DUC PHAM³, BINH MINH TU³, SOPHIE
ZECHMEISTER-BOLTENSTERN¹, AXEL MENTLER¹

¹*University of Natural Resources and Life Sciences (BOKU), Dept. of Forest and Soil Sciences, Austria*

²*University of Vienna, Department of Geography and Regional Research, Austria*

³*VNU University of Science, Faculty of Chemistry, Vietnam*

Abstract

Land degradation caused by human impacts and climatic factors leads to desertification and results in loss of soil fertility, increased salinisation, wind and water erosion as well as a reduction of vegetation cover followed by socioeconomic problems. Furthermore, there is also an effect on the water cycle, the biogeochemical cycle and the climate. Especially land use practices like non-adjusted agricultural methods, overgrazing and degradation of the vegetation cover through deforestation are main driving forces for desertification. The present study examines how different agricultural practices in Binh Thuan province, Vietnam influence soil fertility. The region is characterised by sandy soils as well as hot and dry climate what complicates agricultural production. In order to improve soil fertility and subsequently crop yields and economic development in the coastal area sustainable management practices are needed. To evaluate which sustainability strategies are applied in the area and how peanut and dragon fruit cultivations influence soil properties, soil analyses for different soil parameters were combined with a socio-scientific survey based on quantitative interviews and SWOT analysis. Results show that most farms combine conventional farming with different sustainable agricultural practices but are threatened through local environmental conditions. Furthermore, higher amount of total organic carbon, total nitrogen as well as dissolved organic carbon directly next to the dragon fruit indicate that dragon fruit cultivation contributes more to soil fertility than peanut cultivation. This is especially through the application of mulch around the plant which increases humus content in soil and keeps the nutrients from leaching. To conclude, desertification due to human impacts and climate change is an ongoing local and global problem. For that reason, agricultural practices adapted to environmental conditions become even more important and should be accelerated even in the frame of the SDGs (Sustainable development goals).

Keywords: Agriculture, desertification, drylands, land degradation, soil fertility, sustainability, Vietnam