SP 04: Carbon stocks, turnover and nutrient budgets in soil along land-use and climate gradients

Simone Hoffmann, Jens Boy, Georg Guggenberger

Rationale

Soil organic matter represents the most important terrestrial carbon sink. Therefore, understanding of the driving mechanisms controlling SOM stabilization is crucial for predicting effects of land-use and climate change on carbon sequestration as well as potential nutrient status. These are prerequisites for a sustainable and carbon friendly land management.

Objective

(1) Determine native stocks of C, N, P, Mg, Ca, and S

(2) Decipher temporal change in C and nutrient stocks using space for time substitution

(3) Analyze the quantity and quality of stored C

(4) Quantify the C turnover rates affected by landuse management

(5) Evaluate the influence of climate change on C turnover rates

(6) Parameterize a C and N turnover model

Methods

(1) Carbon and nutrients stocks and spatial distribution, including deep soil
(elemental analyser and bulk density)

(2) SOM fractions and composition
(density fractionation, biomarker)

(2) C turnover rates
(^{14}C and ^{13}C isotopes)

Workplan and collaboration

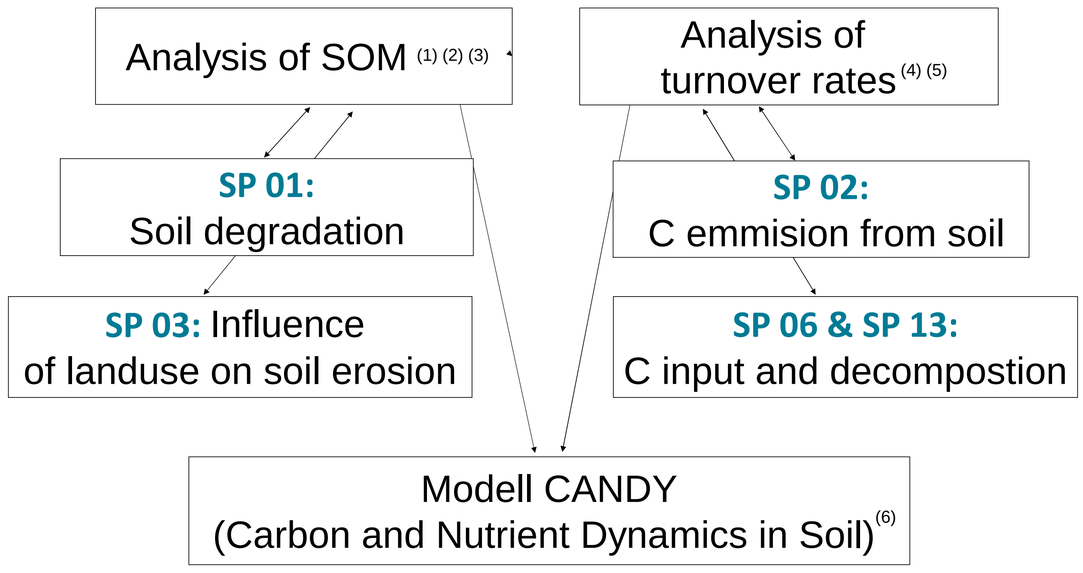

Fig. 1: Scientific aims and networking of the subproject 04

Expected Results

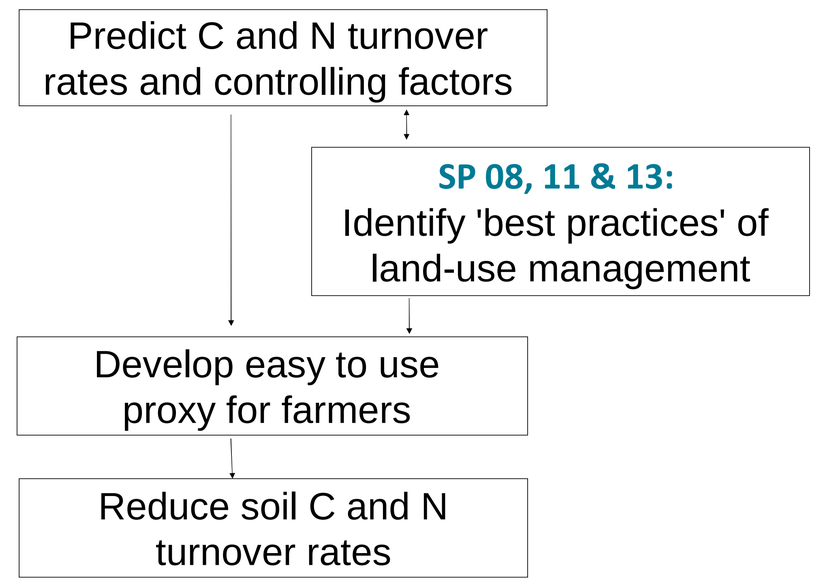

Fig. 2: Expected results and networking of subproject

Benefits

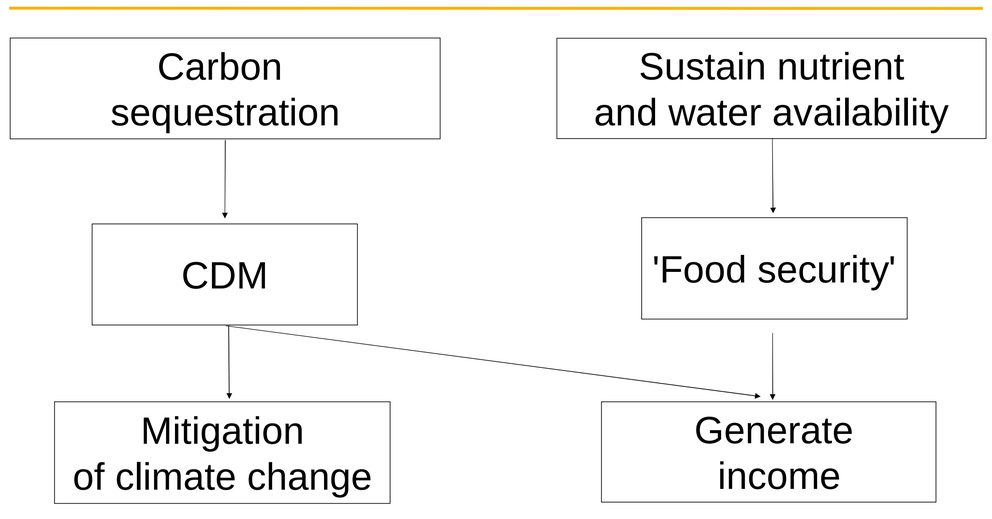

Fig. 3: Soil organic matter management as a tool to assure sustainable food production and optimize carbon storage in soil

SPONSORED BY THE

FONA Research for Sustainable Development BMBF

Federal Ministry of Education and Research

Institute of Soil Science, Herrenhäuser Straße 2, 30419 Hannover, Germany
Georg Guggenberger: guggenberger@ifbk.uni-hannover.de
Jens Boy: boy@ifbk.uni-hannover.de
Simone Hoffmann: hoffmann@ifbk.uni-hannover.de