

Call for PhD Applications

Assessing the impact of SLM systems on soil erosion and agricultural productivity in the loess hills of Tajikistan using fallout radio nuclides (FRN) techniques and spatial modeling

Framework of the study

The proposed PhD study will be developed within the National Centre of Competence in Research (NCCR) North-South as a component of the Research Project “Land resource potentials-climate change-agricultural productivity” focusing on Tajikistan, Ethiopia and Kenya. The proposed PhD is foreseen to be conducted in Tajikistan.

Description of the study

Large areas in semi-arid environments are affected by land degradation processes, especially soil erosion. Furthermore, rainfed agriculture in semi-arid areas is most vulnerable to climate change (especially changing precipitation patterns and increasing variability and extreme events), impacting on yield and accelerating degradation processes. Examples show that sustainable land management (SLM) systems may have considerable potential for preventing erosion processes and for increasing agricultural productivity.

The objective of the proposed PhD study is to assess the impact of SLM systems on erosion, agricultural production, as well as enhanced resilience to climate extremes (especially heavy rainfalls), and to quantify these effects at the local scale. The project will evaluate land use systems by analysis of comparative case studies and their bio-physical context using the WOCAT standard methodology. For quantifying specific impacts, a combination of methods will be applied. This will include fallout radio nuclide (FRN) techniques and GIS modeling. The project is expected to contribute to decision making and identifying win-win solutions, and thus to contribute to rural development and poverty reduction.

Joint Areas of Case Studies:

**East Africa
Horn of Africa
West Africa
South-East Asia
South Asia
Central Asia
Central America
and Caribbean
South America
Switzerland**

We expect

It is expected that within the PhD study the following tasks are tackled:

- Contribute to the development of sampling designs suitable for impact assessment of SLM systems on-farm and in small watersheds.
- Documented examples of SLM systems using the standardized WOCAT questionnaires
- Calibrate quantitative soil erosion models for representative small watersheds or farmer plots.
- Assess the impact of climate extremes (heavy rainfalls and changed rainfall patterns) on soil erosion
- Quantify the impact of SLM systems on erosion and agricultural productivity at the local level

We offer

- A 3-year scholarship for a PhD thesis within the NCCR North-South Programme. The precise amount will be determined by the country of origin/residence/immatriculation. For resident periods in Switzerland, the standards of the Swiss National Science Foundation will be applied.
- Participation in international training courses, project meetings and conferences
- Collaboration with researchers in the multidisciplinary team of NCCR North-South in Central Asia, with fellow PhD students within the Research Project, as well as the staff of the CDE and its national and international network.
- GIS and remote sensing facilities at the NCCR North-South office in Dushanbe, Tajikistan.

We require

- MSc in geography, agronomy, environmental sciences, geo-sciences or a related field, preferentially with a strong background in soil science
- After pre-selection of the candidate a PhD outline and proposal will have to be submitted to NCCR North-South for final approval.
- Experience in and an affinity to laboratory work and analytical measurements

- Good statistical and analytical skills
- Basics in GIS
- Interest in intercultural collaboration and problems and opportunities of developing countries
- Working knowledge in English

Supervision

Supervision will be conducted jointly between a supervisor from a Tajik national institution and researchers from the Centre for Development and Environment (CDE), University of Bern, Switzerland. Collaboration is foreseen with Tajik and international specialists involved in projects of the Soil and Water Management & Crop Nutrition Joint FAO/IAEA Division of Nuclear Techniques in Food & Agriculture.

Supervision from CDE:

Dr. Bettina Wolfgramm (duty station Dushanbe, Tajikistan)

Dr. Hanspeter Liniger (Berne, Switzerland)

To apply:

Please send the following documents:

- Curriculum vitae
- Motivation letter including relevant research experience
- Study curriculum with rankings
- Pdf of diploma and transcripts
- Names (and email addresses) of 2 referees

Only electronic applications will be accepted.

Application and contact for more information:

Bettina Wolfgramm, bettina.wolfgramm@cde.unibe.ch

Deadline: 25 September 2009