

## *Proposal*

# **ESAPP priority action project**

## **PROJECT SUMMARY**

**1. Project Name:** Assessment of land-use patterns and vegetation changes in Miombo woodlands and savanna landscapes of Tanzania

**2. Lead agency:**

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**3. Executing agency:** Research partnership between WSL / SUA

**4. Requesting agency:** WSL / SUA

**5. Person of contact at CDE:** Prof. Dr. Urs Wiesmann

**6. Project mission statement:** The project mission is to identify and understand past and present-day land-use patterns at different geomorphic locations and their impact on the vegetation what will allow to better anticipate future events and to design management strategies to ensure sustained productivity and minimise the likelihood of undesirable shifts in vegetation structure of Miombo woodlands and savanna landscapes in Tanzania.

**7. Region, country or countries:** Kagera, Morogoro, Shinyanga and Tanga Region, Tanzania

**8. Estimated project duration:** July 06 – December 07

## 9. Overall budget:

	In North:	In South:	Total:
ESAPP:	17'000 CHF	22'580 CHF	39'580 CHF
Other funds:	40'000 CHF	20'000 CHF	60'000 CHF
Total:	57'000 CHF	42'580 CHF	99'580 CHF

1 US\$ ~ 1.30 CHF.

Source of other funds: The Government of Tanzania is taking in charge the salaries of the SUA research staff (about 8 men-months) and the infrastructure of the Sokoine University of Agriculture will be made available. CEPF (Critical Ecosystem Partnership Fund) will logistically support the field work in Tanga Region. No remuneration is asked by Dr. Urs Bloesch (self-employed consultant) for the preparation, the monitoring, the data analysis and the elaboration of report(s)/scientific article(s) in Switzerland (about 4 months). WSL will take in charge the laboratory costs for the soil carbon isotope analysis.

## PROJECT DETAILS

**10. Current situation:** Miombo woodland and savanna are the dominant vegetation types in Tanzania. Their resources are vital to the livelihood of millions of rural and urban people living in and around them. Mainly used as pastures and for subsistence farming they also provide a multitude of products including food, energy, shelter, medicines and a number of invaluable environmental and spiritual services. Miombo woodlands and savannas have been occupied and utilised by human beings in East Africa for thousands of years. However, currently type and intensity of land-use are changing due to changes in the socio-economical, political, and technological set-up in this region leading to increased land degradation in many areas. The temporal assessment of vegetation shifts and the underlying changes of land-use pattern, fire regime, browsing/grazing by mammalian herbivores and termites are of primary importance for the sound economical and ecological management of these dominating vegetation types in Tanzania.

Preliminary studies were carried out under a first ESAPP Project entitled „Assessment of Vegetation Shifts and Land-Use Changes in Morogoro and Kagera Regions, Tanzania” and the results were discussed during a two days workshop in Morogoro. Considering the recommendations of this workshop, this new ESAPP joint research project will focus on investigations of observed land-use changes and vegetation shifts at different geomorphic locations along transects through Miombo woodlands and savanna landscapes. Furthermore, the socio-economic aspects will gain in importance with the active participation of the agricultural extension department from SUA. In addition, previous to the start, the overall strategy of this highly interdisciplinary research project will be discussed with CETRAD (Centre for Training and integrated Research in Arid and Semi-Arid Lands Development) from Kenya.

**11. Objectives:** The overall objective is to assess vegetational shifts and to evaluate patterns of land degradation at different geomorphic locations within Miombo woodlands and savanna landscapes of Tanzania in view of promoting sustainable management of natural resources in benefit of the local communities. Large scale vegetation changes in the Miombo woodlands (including the adjacent savannas) will be studied along decreasing rainfall gradients considering the topographic position. On a smaller scale, vegetation sites of the savanna landscape will be analysed along transects through small dry evergreen forest formations extending into open savanna on either side. The project aims at:

- Enhancing the research partnership amongst the Swiss Federal Institute for Forest, Snow and Landscape Research in Birmensdorf (Switzerland) and the Sokoine University of Agriculture (Tanzania) including the Centre for Development and Environment (CDE), CETRAD (Kenya) and CEPF (Biodiversity Project in Tanga Region). The additional participation of partners from the South (e.g. University of Butare, Rwanda and/or Makerere University, Uganda) will be favoured.
- Strengthening the research capacity of both parties.
- Contributing to the education and training in tropical ecology at the Sokoine University of Agriculture by supporting lectures in related topics and by offering possibilities to carry out diploma and doctoral studies.
- Promoting the diffusion of the research results by a) regular exchange of information with NGOs working in the field of rural development and support of their on-farm research activities in view of contributing to a sustainable rural development and b) joint publications of scientific papers, project reports and articles for newspapers.

## **12. Expected outcomes:**

- 1) Human impact on vegetation changes evaluated and causes of land degradation in function of topographic position identified
- 2) Vegetation history based on radio carbon isotopic signature of soil organic matter reconstructed at the selected sites
- 3) Present plant communities and their population characteristics assessed
- 4) Large and small scale vegetation shift and land-use pattern for the selected sites assessed and presented on topographic maps
- 5) Management recommendations elaborated and discussed with NGO's
- 6) Interdisciplinary method defined
- 7) Students trained and lectures carried out at SUA
- 8) Project results disseminated

## **13. Planned activities to achieve outcomes:**

- 1) Conduct informal discussions and interviews with the local population about land-use and vegetation changes and identify land degradations and its driving forces (including natural factors).
- 2) Evaluate and date carbon isotopic signatures of soil organic matter at selected soil profiles.
- 3) Analyse present plant communities and their population characteristics including age determination of dominant woody species.
- 4) Use of GIS for the spatial analysis of the data and the presentation of the results using also aerial photographs and satellite images as well as historical photographs and records from colonial time.
- 5) Assess current disturbances and threats to these ecosystems in view of elaborating sustainable management strategies together with NGO's and representative of the local communities.
- 6) Elaborate an interdisciplinary methodology for the overall project strategy together with CETRAD.
- 7) Practically train students from SUA in carrying out socio-economic studies (possibly accompanied by a Swiss student), vegetation inventory, tree cambium marking and in the application of GIS (by CETRAD Kenya) and support lectures in relevant topics at SUA.
- 8) Elaborate joint publications of scientific papers in international and national journals and articles for general public in national newspapers (in English and Swahili).

#### 14. Approximate implementation plan:

Activities	Project months								
	2	4	6	8	10	12	14	16	18
1) Socio-economic study				x	x				
2) Soil sampling and laboratory analysis		x	x	x	x	x	x		
3) Present plant community		x	x	x	x		x		
4) GIS					x	x	x	x	
5) Elaboration of management strategies							x	x	
6) Elaboration methodology	x								
7) Workshop									x
8) Elaboration of articles					x	x	x	x	x

#### 15. Budget estimation:

##### a) Salaries and consultancies:

Consultant fee for Dr. Urs Bloesch (6 weeks fieldwork in Tanzania)	11'000 CHF
Backstopping CDE (Centre for Development and Environment)	p.m. CHF
Project Coordination/administration (US\$ 150 per month, Tanzanian staff)	2'340 CHF

##### b) Material costs

Aerial photographs/satellite images	1'000 CHF
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##### c) Travel expenses and daily subsistence

2 air ticket Zurich-Dar es Salaam and 15 days of subsistence/accommodation in Dar es Salaam/Morogoro for consultant (including visa, vaccination)	4'500 CHF
Possibly 1 air ticket Zurich-Dar es Salaam for Swiss student	1'500 CHF
Training SUA student in GIS (Nanyuki, Kenya)	2'000 CHF
Vehicle hire for about 8000 km, 1 km for 0.6 US\$	6'240 CHF
120 men days fieldwork (senior researchers ) x 50 US\$/person per diem	6'000 CHF
100 men days fieldwork (SUA students) x 20 US\$/person per diem	2'000 CHF

##### d) Miscellaneous

Workshop	1'000 CHF
Research permit (Research Associateship)	1'000 CHF
Miscellaneous	1'000 CHF

39'580 CHF

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**16. Project relation to ESAPP's focus within SLM and SRD:** The project will be conducted using transdisciplinary assessment of the ecological and socio-economics context within the project area. The close collaboration with NGOs working in the rural development should ensure the application of the findings.

**17. Project relation to ESAPP's fields of activity:** The project activities are in line with the ESAPP's fields of activity of research partnerships and capacity building and to a lesser degree with the development support.

**18. Stakeholder involvement in project:** Appropriate land-use is of major concern for the local communities since land resources are becoming more and more scarce and signs of land degradation gets more widespread. Our project is done in close collaboration with other ongoing applied research projects of the Sokoine University of Agriculture and with rural development projects of NGOs and international organisations operating in this area.

**19. Beneficiaries:** Final beneficiaries are the participating institutions, the local communities living in these areas and in more general terms the North-South collaboration.

**20. Remarks, further explanations:** The ESAPP project will part of the planed overall project with the University of Wales, Bangor (GB) focussing more on the effects of vegetation changes on carbon sequestration of dry tropical ecosystems in view to contribute to our understanding of global climatic changes.

**21. Annexes:** Letter of interest from WSL and SUA

**22. Date, place and name:**

Biel, 3/5/06

Urs Bloesch (in collaboration with P. Munishi, J. Nduwamungu and F. Hagedorn)