

Deforestation and biodiversity-loss due to cultivation? An interdisciplinary analysis in North-East Namibia

Thomas Falk, Alexander Gröngröft

A. Eschenbach, T. Fox, M. Hinz, F. Kangombe, M. Keil, E. Namwoonde, A. Petersen, M. Pröpper, B. Strohbach, U. Wisch

Faculty of Law, University of Namibia, Windhoek; German Aerospace Center (DLR); Institute for Co-operation in Developing Countries, University of Marburg; Institute of Social Anthropology, University of Hamburg; Institute of Soil Science, University of Hamburg; National Botanical Research Institute, Windhoek



"Biodiversity of Africa - Observation and Sustainable Management for our Future!" International Congress, 29 September – 3 October 2008, at Spier, RSA



Hypothesis

"Valuable Biodiversity in the Kavango region is under threat due to cultivation activities as the result of poverty and institutional weaknesses!"









Research area



- 500 mm a⁻¹
 summer rainfall
- aeolian sands of Kalahari basin







Landscape development









Landscape development



Open woodland

Pterocarpus angolensis



- Characterized by numerous timber species
- Moderately high phytodiversity (ø 45 species per 1000 m²)

The Acacia bushlands and thickets



Acacītā filizēki i aspect Bauhinia petersiani

Onon ocn

 Home to a number of rare and/or endemic geophytes

Acacia erioloba

 Comparable species diversity (ø 52 species per 1000 m²)

Natural soil resources



- Nutrient supply in the ferralic Arenosols is very low.
- The topsoils in the interdunes are 4 to 6 fold enriched with K and Mg
- Regarding the depth distribution the differences increase up to 20 fold



Projektträger im DLR

BIOLOG

Human impact









Deforestation history



Deforestation primarily follows the interdunes with higher nutrient supply

(Data base: Landsat TM / Landsat ETM+)









Inland migration caused by population growth

- \rightarrow Traditionally high fertility
- \rightarrow War in Angola
- \rightarrow Overutilization of riverside
- \rightarrow Building of infrastructure

Today population growth in research area: 1.5%

Federal Ministry of Education and Research

Projektträger im DLR



Migration to the Mutompo/Epingiro area





Subsistence agriculture: Dependence on natural resources Average fieldsizes 10 ha High manual labour input & very low capital input decreasing soil fertility = exhaustion of fields after 3-5 years (P and Mg deficiency) Productivity for mixed. cropping is very low with

...insufficient yields are one reason for further expansion of fields

yields of Ø 95 kg/ha

Institutional and legislative background

- Clearing of forest and distribution of land for cultivation de facto regulated by traditional authorities;
- Despite absence of land titles → perceived high security of tenure rights;
- Distrust between government and traditional authorities:

a) inefficiency of overburdened state extension and control authorities;

b) accusations of corrupt and abusive land allocation by traditional authorities;







Institutional and legislative background

Complete Social Network Analysis of all Household heads in Epingiro (N=21): Whom would you contact in cases of detrimental resource uses (logging, fire)?



Strong local reliance on traditional authorities in natural resource management









General conclusions









Outlook

The presentation highlights the necessity for the intensive cooperation between natural as well as social sciences.

Developed suggestions for the management of sustainable landuse in the study area will be discussed and further developed with stakeholders in 2009.

For the upscaling to other dryland cropping regions, the study has to be brought to a broader data base







Thank you for your attention





