IDESSA: An Integrative Decision Support System for Sustainable Rangeland Management in Southern African Savannas

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Bush encroachment is a syndrome of land degradation that occurs in many savannas including those of southern Africa. The increase in density, cover or biomass of woody vegetation often has negative effects on a range of ecosystem functions and services, which are hardly reversible. However, despite its importance, neither the causes of bush encroachment, nor the consequences of different resource management strategies to combat or mitigate related shifts in savanna states are fully understood.

The project "IDESSA" (An Integrative Decision Support System for Sustainable Rangeland Management in Southern African Savannas) aims to improve the understanding of the complex interplays between land use, climate patterns and vegetation dynamics and to implement an integrative monitoring and decision-support system for the sustainable management of different savanna types. For this purpose, IDESSA follows an innovative approach that integrates local knowledge, botanical surveys, remote-sensing and machine-learning based time-series of atmospheric and land-cover dynamics, spatially explicit simulation modeling and analytical database management. The integration of the heterogeneous data will be implemented in a user oriented database infrastructure and scientific workflow system. Accessible via web-based interfaces, this database and analysis system will allow scientists to manage and analyze monitoring data and scenario computations, as well as allow stakeholders (e. g. land users, policy makers) to retrieve current ecosystem information and seasonal outlooks.

We present the concept of the project and show preliminary results of the realization steps towards the integrative savanna management and decision-support system.