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## Future Scenarios of Biomass Dynamics under Pastoral Conditions and Regional Water Balance Aspects for the Drâa Catchment in South-eastern Morocco

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### Abstract

The process-oriented and spatial explicit ecosystem model SAVANNA is used to assess biomass dynamics in rangeland landscapes in south-eastern Morocco. This region has been facing continuous droughts during the past 30 years, forcing semi-sedative farmers and nomads to deal with low ground water levels and highly variable patterns of yield and vegetation. Variances of stocking rates and thus economic uncertainty are the results. Model scenario results with a prospective to 2020 are expected to develop useful strategies relying to transhuman decision making.

The model was calibrated for rangeland areas of the Drâa river catchment, located between the High Atlas mountains in the north and the Lac Iriki pan in the south. Measurements of biomass (kg/ha) and plant component parameters (g/m<sup>2</sup> DWT, Dry Weight Matter) of many saharan, iranoturanean and oromediterranean species were collected for calibration purposes. These species are the basic nourishment of trespassing nomadic and sedentary herds. Multiple simulation runs with ‘no grazing’ and ‘grazing’ conditions were carried out. for calibration and sensitivity analysis with three basic SAVANNA vegetation types: herbaceous (e.g. *Stipa ct. parviflora*), shrub (e.g. *Artemisia herba-alba/-mesatlantica*) and woody (e.g. *Juniperus pho.*). Model results were used to determine regional influences of sheep, goat and dromedare herd populations on vegetation cover, species composition and distribution in order to assess their influence on the local/regional water cycle.

**Keywords:** Biomass dynamics, ecosystem modelling, herd dynamics, Morocco, transhumance