



## Making more of vegetation classification results: A livestock farming suitability index as tool for land-use planning in Namibia

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### Abstract

**Aims:** The usefulness of phytosociological descriptions is often not recognised by land use planners and -managers, as these do not provide much information useful for their purpose. With this paper a “Suitability Index” is introduced to illustrate the suitability of natural vegetation types for extensive livestock farming (being one of the main land uses in Namibia), in order to make the vegetation maps and descriptions more user-friendly. **Methods:** Relevé data are compiled on standardised plots throughout the country, with a standardised set of environmental parameters. In addition, a range of additional data are extracted from GIS-based data sources via the plot position. From these data, the Suitability Index is calculated. It consists of three sub-indices, related to habitat, structure and composition. The habitat sub-index determines the plant growth potential, but also some management options and/or constraints. The structure sub-index is based on the cover of perennial vs. annual grasses, shrubs and trees, as an indicator for ecosystem health. The composition sub-index takes the presence of toxic plants and the palatability of grasses into account. From the sum of these sub-indices, a categorical rating is derived to describe the suitability of the vegetation for extensive livestock husbandry. **Results:** The Suitability Index is demonstrated by way of worked examples for four widespread Namibian vegetation associations ranging from sub-humid woodland savannahs to desert grasslands. The results correspond well with a widely used, but outdated grazing capacity map. **Conclusions:** The Suitability Index presents a major value addition to vegetation descriptions. However, it does not replace an accurate determination of grazing capacity, mainly because it is derived from plant cover estimates, and because surveying of the vegetation is generally limited to one season. The composition sub-index can be greatly enhanced once browse availability data for shrub and dwarf shrub species become available.

**Keywords:** GIS data; grazing; land potential; land use planning; livestock husbandry; relevé data.

**Nomenclature:** Klaassen & Kwembeya (2013).

**Abbreviations:** ACACIA = DFG Special Research Project 389 „Kultur- und Landschaftswandel im ariden Afrika“; BECVOL = Biomass Estimates from Canopy Volume; BIOTA = Biodiversity Transect Analysis in Africa; CV = Coefficient of Variation; EIA = Environmental Impact Assessment; EMP = Environmental Management Plan; FAO = Food and Agriculture Organization of the United Nations; GIS = Geographical Information System; GPS = Global Positioning System (with specific reference to hand-held devices to record position in the field); GPZ = Growing Period Zone; GVI = Grazing Value Index; MAR = Mean Annual Rainfall; NARIS = Namibian Agricultural Resources Information System; SASSCAL = Southern African Science Service Centre for Climate Change and Adaptive Land Management; SOTER = Soils and terrain digital databases; SRTM = Shuttle Radar Topography Mission (with specific reference to the digital terrain model data derived from it).

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