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Comparison of Infiltrability Measurements in the Thornbush Savanna, Namibia

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Large proportions of Namibian Savannas are affected by strong bush encroachment leading to a reduction in grazing capacity. Especially woody plant encroachment is expected to have an impact on hydrology by increasing plant transpiration, bare soil evaporation and reducing soil water availability (HUXMAN et al. 2005). Although the processes are not fully understood, the role of soil water balance is highlighted by many studies. Especially the small-scale interactions of vegetation and soil are of high relevance.

To characterize the water balance of different sites in the Namibian thornbush savanna long-term studies were conducted. In addition we applied three methods to quantify the infiltration rate (IR) at four central Namibian thornbush savanna sites differing in soil texture and vegetation type: a single ring (own construction, 14 cm inner diameter), a disc-infiltrometer (Eijkelkamp Agrisearch Equipment BV) and a hood infiltrometer (UGT Umwelt-Geräte-Technik GmbH). At each site, the measurements we conducted along short transect lines (15 m) in positions with differing plant influence (canopy of Acacia trees and shrubs, grass and dwarf-shrub tussocks, bare soil, termitaria).

All three methods resulted in different mean IR as well as spatial distribution patterns. Using statistical analysis by ANOVA, dominant controlling variables were elaborated. The poster will demonstrate which of the methods is defensible with respect to the research question.

References : HUXMAN, T. E., B. P. WILCOX, et al. (2005): Ecohydrological implications of woody plant encroachment. Ecology 86(2): 308-319.

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