Spatial Patterns of Range Management and Fodder Resources: How Important Is Local Reserve Biomass?

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Spatial patterns of range management and fodder resources : how important is local reserve biomass ?

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Introduction A sustainable range management has to cope with the temporal variability of natural resources ,but also to spatial variability both on local and a landscape level (Linstädter and Bolten ,2007) .As regards the natural resource fodder" ,range management has to ensure fodder reserves as an ecological buffer against temporal variability ,and it has to be adapted to spatial differences in vegetation productivity and recovery potential of plants (Müller *et al* . ,2007) .Fodder reserves are crucial for two key situations : firstly for scarce times within the annual grazing cycle ,and secondly for drought times .Different user groups may have alternative strategies ensuring the availability of fodder reserves on local and regional levels . They may either be ensured on a local level as reserve biomass of perennial species ,and/or as protected reserves for drought .It may also be obtained on landscape level through external (non-local) resources ,either by moving livestock to external pastures ,or by fodder supply .

In our study we hypothesize that the proportion of fodder used on a local level and on a regional level may differ between user groups ,reflecting mobility patterns and the recovery potential of vegetation .Vegetation patches with a comparably high recovery potential after disturbances such as drought or heavy grazing ,will be used more intensely and more regularly than others .

Material & Methods We compare spatial patterns of range management in two key situations : (i) regular scarce times within a year ,and (ii) during and after a drought period .We take the range management of Namibian and Moroccan user groups ,in particular pastoral-nomads and profit-oriented farmers ,as an example .Data on vegetation structure ,productivity and recovery potential on different pastures are matched with data on grazing frequency and intensity on these pastures .

Results & Discussion Spatial patterns differ significantly between user groups .Whereas Namibian farmers tend to rely on internal reserve biomass built up by perennial grasses ,Namibian and Moroccan pastoral nomads make more use of external reserve biomass ,particularly in drought situations .These differences have already been described as the horizontally flexible strategy of mobile pastoralists .In all cases ,vegetation structure and recovery potential of plants on local and regional pastures is a good predictor for grazing intensity and frequency .

Conclusions Spatial patterns of a sustainable range management have not only be adapted to pasture productivity ,but also to their ability to build up reserve biomass .On a landscape level ,spatial flexibility is not the only strategy to cope with temporal variability of resources ,but it is crucial in cases where fodder shortages in key situations may not be buffered by local reserve biomass .

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