Drought impact on the vegetation of southern Kalahari: implications and mitigation of future impacts in the face of climatic changes

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Drought is a characteristic feature of southern Africa's climate and a recurring phenomenon in the semi-arid rangelands of the southern Kalahari. The impact of drought on rangelands includes the mortalities of plants, compositional changes of vegetation and a reduction of productivity, which often leads to either poor livestock and game performance or extensive mortalities. Plants from this region have evolved to survive drought and periods of water scarcity, making these rangelands more resilient to drought compared to other vegetation systems. Many climate models, however, predict that droughts in Southern Africa will increase in frequency, duration and intensity due to climate change. It is predicted that the semi-arid southern Kalahari will become more arid, greatly reducing the sustainability of farming practices and threaten the conservation of species. Understanding the impact of drought on the natural resources within this harsh environment is therefore becoming increasingly important. This study set out to determine the broader impact of drought on the rangelands of the southern Kalahari to better understand future impacts. For this, impacts on growth, cover abundance, nutrients and woody plant phenology were studied. It was found that drought affected all aspects of vegetation ecology, but the impact was not uniform across species. Desired perennial species were found to be more resistant to drought conditions compared to annual species, while the degree of post-drought recovery of rangeland was dependent on the composition of species. It was concluded that the resilience and stability of these rangelands in the face of increased drought frequencies will be dependent on the health of the rangelands. It is, therefore essential that management regimes are adapted to promote and sustain healthy rangelands in order to mitigate future impacts of drought.