Landscape change dynamics in a semi-arid part of Baringo District, Kenya, based on Landsat-TM-Data and GIS analysis
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SUMMARY

The study area, a semi-arid area in the Baringo district of Kenya, is inhabited by communities that mostly derive their livelihood directly from the environment, through subsistence agriculture and pastoralism. Consequently, the landscape in this area is managed with two major goals. The primary, and most compelling, goal being maximisation of the production function of the landscape. The second goal, which is often seen as secondary, is related to landscape’s information carrier function, where conservation of both biotic and abiotic resources for future use is considered to be important. Ideally, these objectives should be complementary for sustainability. However, in practice they tend to be competitive at best, otherwise conflicting. With proper planning and management it is possible to approach this ideal situation. This study investigated the possibilities of reducing conflicts between these objectives by increasing the understanding of the landscape change dynamics related to human exploitation of the natural resource base.

The study recognises the fact that landscape changes as a result of human utilisation of natural resources is inevitable. However, land degradation or continuous lowering of landscape quality, can be avoided through planning and management of landscape changes. Effective management requires, among other things, a) knowledge of the spatial distribution of resources, b) ability to monitor changes in quantity and quality of these resources, c) knowledge of the factors causing or controlling these changes and, d) an understanding of how these factors interact to cause such changes. Satellite remote sensing and image processing software are capable of providing accurate and up-to-date information relevant for locating and monitoring the quality of resources. By combining temporally distributed land resource data with similar spatially referenced socio-economic data in a geographic information system, the relationship between the two is explored. This relationship is analysed further using multivariate statistics to identify the most important drives of land cover changes. Armed with this knowledge and appropriate spatial dynamic models the process of landscape change is modelled. The resultant information can enable planners to predict future change patterns and also provide managers and policy makers a means for directing or controlling land cover changes through deliberate introduction or elimination of specific change drivers.

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