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Valuing ecosystem services for conservation and development purposes: A case study from Kenya

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ABSTRACT

This paper mapped and valued key inter-related drylands ecosystem services of importance to pastoralists, crop farmers, the tourism industry, conservationists, and policy planners in the Ewaso Ng'iro basin, the largest of the five major basins in Kenya. We used an ecosystem services approach where only final benefits are valued to avoid double counting. The final benefits are ecosystem services or commodities which have an economic value. The supply of ecosystem services depends on the functioning of ecosystems, but rarely ecological and institutional boundaries coincide and often stakeholders in ecosystem services cut across a range of institutional zones and scales. Land use and management influence the system processes, properties and components that are the basis of services provision. Although much has been written about the need to quantify and value ecosystem services, there are fewer spatially explicit studies that delineate the supply and demand areas for ecosystem services and assess the trade-offs between ecosystem services over space and time especially on drylands.

Based on the spatial distribution of resources and the existing competition over these resources, this paper assesses the current values attributed to the selected ecosystem services. Then, by mapping existing supporting infrastructure and drivers of land use change such as demographic pressure, we highlight trade-offs and synergies among alternative uses and opportunities for sustainable development. In particular, the paper identifies services that will be lost if a particular part of landscape is modified: e.g. benefits for livestock and wildlife can be affected by the lack of conservation of corridors and rangelands, while water supply and irrigated crops can be compromised by increased water demand as result of human population pressure mainly at the upstream sub-catchments.

We demonstrate the value of spatial analysis to land use investments and management and highlight how conservation and management of ecosystem services require the understanding of the spatial links between ecosystems and human well-being.

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