

Contextualizing land use and land cover change with local knowledge: a case study from Pokot Central, Kenya

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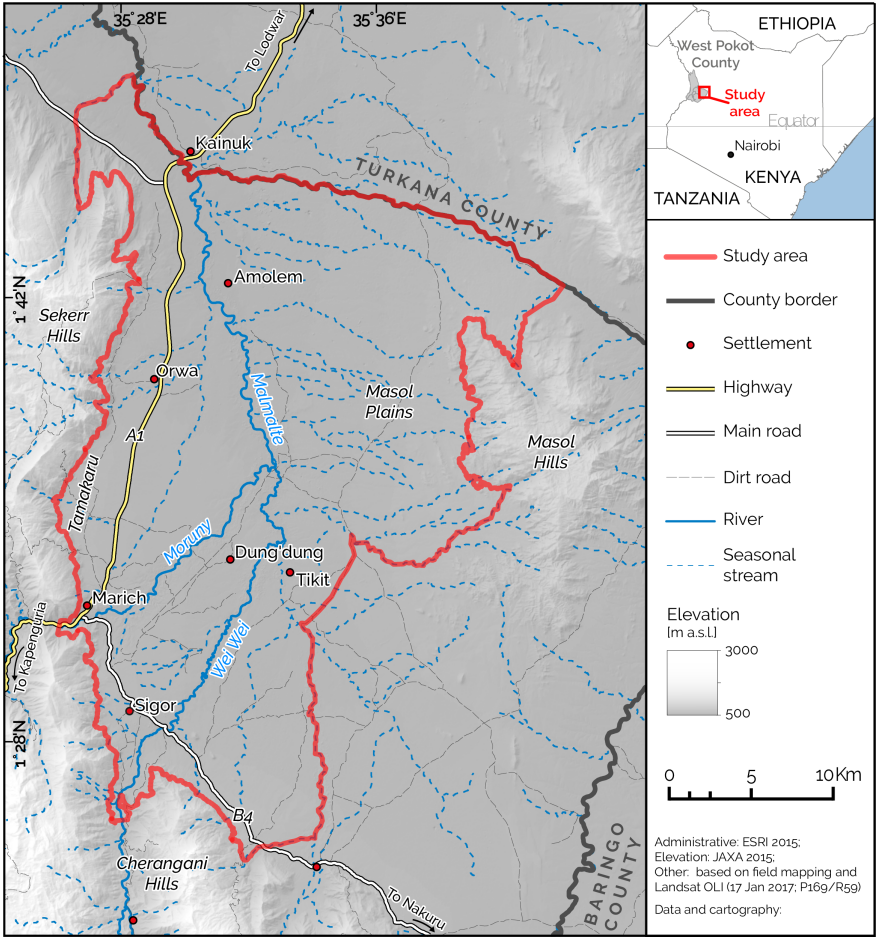
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Abstract

Rural communities in the drylands of Sub-Saharan Africa (SSA) derive their livelihoods primarily from their natural resource base. Unprecedented changes in these environments over the past few decades are likely to intensify in the future and land users need to develop sustainable adaptation strategies. This study aims to identify land use and land cover (LULC) changes and their drivers in a Sub-Saharan dryland, between 1986 and 2017, by integrating local knowledge and remote sensing analysis. Local knowledge and environmental perception are used as the basis for defining LULC classes and for training and validation of change detection. This study identifies bush encroachment into former pastures as the dominant LULC change with an increase of woodland by 39 % and a decrease of grassland by 74%. This process is perceived as severe degradation by local respondents and is linked to changing management regimes and unreliable rainfall patterns. Deforestation and woodland thinning can be traced back to increased habitation and farming, though the local community also identifies charcoal production as a driving factor. The integration of remote sensing and local knowledge provides a holistic view on LULC change in Pokot Central, Kenya, and offers a solid base for site specific and actor-centred management approaches necessary for sustainable pathways of drylands.

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LULC class	Characteristics	Local name	Local explanation	Photo
Gallery forest	Height > 10 m; Canopy cover > 70 %; dominantly single stemmed trees; with/without subcanopy layer; impenetrable in some parts (<i>Vachellia tortilis</i> (Forsk.) Galasso & Banfi.)	<i>Wuw po latwa</i>	Larger communities of mostly higher trees along the rivers	
Thicket	Height <10 m; canopy cover >70 %; impenetrable; with dense subcanopy layer; evergreen (<i>Euphorbia</i> spp.)	<i>Stwūr</i>	Impenetrable mix of short trees and shrubs, "one cannot see through"	
Woodland (continuum from open to closed)	Height <10 m; canopy cover 15-70 %; with scattered larger trees; single- but mostly multi-stemmed trees; with subcanopy layer; deciduous (<i>Vachellia</i> spp.; <i>Sorisevieria ehrenbergii</i> Schweinf. ex Baker) (Where dominated by multi-stemmed, deciduous <i>Vachellia reficiens</i> (Wawra) Kyal. & Boatwr. usually no subcanopy layer)	<i>Wuw nyo anger</i>	Dense mix of short trees and shrubs, with few larger trees in between, where you can hardly walk through and where people would not settle	
		<i>Wuw nyo tartar (also: Sarsar)</i>	A bushy area where you can easily walk through and where people settle; often a mixture of tall and short trees with foot trails in between	
		<i>Wuw nyo kieghe</i>	The trees are all the same height, and nothing grows below	
Sparsely vegetated	<15 % cover, very scattered trees/ bushes; no grass layer	<i>Nameywa</i>	Vegetation is very scattered and appears in small "islands" of an individual tree and some shrubs; no grass appears after the rains	
Grassland	Cover of woody plants <15 %; annual grassland	<i>Korosus</i>	An area where you find plenty of grass	
Farmland	Cultivated fields	<i>Paren</i>	Farmed land, no differentiation between irrigated and rainfed	
Bare areas	Land with limited vegetation, such as sandy or rocky riverbeds, wasteland, land recently cleared for future farming or recently harvested farmland	<i>Korran</i>	Bare ground, nothing grows, no grass appears after the rains	

