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Human migration , squatters and land cover change in the Chyulu Hills , Kenya

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Introduction Access to land remains critical to the survival and livelihoods for many rural people in Kenya . Migration is a response of the rural poor to acquire land , and when they occupy land for which they have no legal right to , they become squatters . The Chyulu Hills are recognised as a key site harbouring significant ecosystems and threatened biodiversity (GEF 1999) but despite this , continues to attract many spontaneous settlers , which have sometimes triggered forceful evictions when squatter encroach on protected lands . By focusing on the factors that encourage squatter settlements in the hills , the trajectories of land cover change , and the factors considered crucial in driving change , we aim to contribute insights on plausible future changes under different assumptions and how different planning and policy scenarios may be important in averting negative change .

Materials and methods A migration study is done using quantitative methods and the life history matrix and modelling the "pull" factors for the destination location . The study further applies a combination of social surveys using PRA tools , and community mapping to establish settlement patterns and relationships with the land . Black and white photographs taken in 1967 and 1978 at scales between 1 : 20 ,000 and 1 : 50 ,000 are analysed in Landscape Mapper[®] and ArcGIS 9 . 2[®] . Landsat Imagery from 1987 (TM) , 1999 and 2007 (ETM+) are analysed in ERDAS Imagine and ArcGIS . Generalised Linear Models and Regression Trees are used to model the drivers and role of factors responsible for land cover change (Veldkamp and Verburg 2004) .

Results and discussion The work is ongoing , and preliminary findings indicate that the abundance of natural resources including relatively fertile soils and wetter climate than the surrounding rangelands are among the important pull factors for spontaneous settlements . The population growth rates are high due to the influence of migration . A multiplicity of land statutes and weak enforcement of land tenure regulations are part of a system of factors responsible for the consequent trajectories of change . Our a priori predictions are that between 1967 and 2007 (a) squatter presence (b) distance to roads (c) distance to parks and (d) agricultural suitability of land are major causes of land cover change . Policy acts as a bouncing pad on which land use decisions are made , which consequently influence land cover change .

Conclusions Knowledge on the forces responsible for the long-term dynamics in land resources use is limited in Kenya . This research integrates biophysical information with socio-economic and policy issues to examine the trajectories of land cover . Spontaneous settlements may act as an accelerator in land cover change , exacerbated by a multiplicity of tenure arrangements and weak enforcement . Policy options to avert the spiral of need created in the Chyulu Hills , currently necessitating allocation of land set aside for other uses to settle squatters are seen as a feasible option . Provision of alternative non-agricultural-based livelihood strategies for those squatters who are being settled could provide some reprieve for the ecosystem .

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