A Spatial Analysis of the Drivers of Livelihood and Land Use Change in Maasailand, Tanzania

Environmental Technology MSc Thesis

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By

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ABSTRACT

For centuries a pastoralist lifestyle dependent on transhumance was intrinsic to the Maasai. However, it is becoming increasingly apparent that the Maasai pastoralist system is breaking down. Either as a consequence or as a driver of this phenomenon, land use change, in the form of settled agriculture, is rapidly occurring. This thesis produces a time-series map of the change of area under cultivation over the period 1987-2005 using satellite images processing techniques. The vector output is then combined in a Geographical Information System with data collected from a case-study village and resource locations in the area. A comparison is made between the results that the GIS yields and those of People's Problem Perception Mapping (PPPM). This combination of methodological techniques aims to provide an analytical tool for the production of a comprehensive overview of both human and resource related drivers of livelihood and land use change within the Burko hunting area contained within the Monduli District, Tanzania. This report argues that such an integrated overview of the area, in terms of the problem perception of the community, the recent changes in land use and the actual location and availability of resources, is vital for successful future management strategies whose aim is to encourage sustainable development and maintenance of biodiversity within the area.

The results show that five of the six villages show significant net agricultural expansion during this period. The main driving factors identified by the Maasai are drought, hunger, reduction in herd sizes and observation of other tribes. Socio-political driving factors were not mentioned by the participants but are evident in the visible effects of a history of land alienation, of recent forced sedentarisation and also of the socio-political as well as natural climate during the 1980s which is the decade in which the majority of participants started cultivating.

It is recommended that the Maasai first need to work together on solving their common resource issues, as they would plan cattle movement, in their meetings. Once they have decided what action they are prepared to work together on for the area, they then need to approach the appropriate Government agencies and Non Governmental Organisations (NGOs) for assistance. It is recommended that the NGOs working with the Maasai in this area adopt the PPPM as a way of identifying what resource issues need assistance and what the most appropriate assistance would be. If repeated, PPPM can act as a means of measuring the success of the assistance as perceived by the Maasai. Finally, all the stakeholders involved in the southern area of the Burko Hunting Block need to work together and their respective claims/needs should then be incorporated in the land use zoning plans. One possible solution might be to build upon the use of the GIS system in this thesis, adding in a complete dataset of resource locations.

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This project is a collaborative project between Imperial College London (ICL) and Cullman & Hurt Community Wildlife Project (CHCWP). Additional collaborators include the Training Centre for Development Cooperation (MS-TCDC) and the Community Research and Development Services (CORDS). Assistance was also given from the International Livestock Research Institute (ILRI) and the GIS laboratory at the African Wildlife Foundation (AWF) in Nairobi. Several people deserve a special mention for their individual contributions to this thesis:

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FOREWORD

This project and data are a result primarily of a collaboration between Imperial College, London (part of the University of London in the United Kingdom) and Cullman & Hurt Community Wildlife Project (CHCWP), the conservation division of Robin Hurt Safaris (T), Ltd. Students of the MSc in Environmental Technology at Imperial College London have formed what is hoped to be a future long-standing, successful alliance with CHCWP. Students volunteer with CHCWP on specific projects to help improve the efficacy of CHCWP whilst, at the same time, satisfying the educational requirements of their MSc course.

The Cullman & Hurt Project was founded in 1990 on the conviction that wildlife and its habitat can only be conserved by involving local people and from that involvement they must receive tangible and direct benefits from the wildlife among which they live. The Cullman & Hurt Project works with 33 villages throughout Tanzania, all of which are located in and around the hunting areas of Robin Hurt Safaris. Each village which CHCWP participates in has a Benefit programme which delivers funds annually from a 20% surcharge placed on all trophy animals taken by sport hunters who come on safari with Robin Hurt Safaris. CHCWP has been operating for over 13 years in the Burko block (Monduli District) and currently works with 13 villages of which the block is overlapping. While in many ways CHCWP is about wildlife and habitat, it is essentially a "people-focused" organisation which is intimately involved with community development and based on the sustainable utilisation of wildlife.

The idea of this collaboration is to attempt to produce a framework for measuring the effect of the CHCWP benefits as well as to provide a mechanism for village leaders whereby they can consider the resources they need that are critical for their community (taking into account the different requirements of both men and women in Maasai society) but also take into consideration those resources needed by other villages in the immediate area. It is hoped that this new framework will enable village decision makers to incorporate not only the resource requirements at the village level but also those requirements at the wider area level in the decision making process of which projects to spend CHCWP funds on. This will enable the villages within the Burko area to use their funds from CHCWP to more strategically manage their resource requirements.

One of the greatest changes in land use within the area over the past two decades is agricultural expansion. This not only increases conflict between the villages and wildlife (due to crop raiding and also reduced wildlife habitat) but is also causing erosion of roads, silting up of important dams and is undermining the traditional Maasai culture. The driving factors of this land use change were also investigated.

It is hoped that the information contained within this thesis will be disseminated to as many interested organisations as possible and that those organisations will follow the recommendations for the benefit of the Maasai.

The ideas and opinions expressed in this report are those of the author only and do not reflect the views or policies of any of the collaborating or sponsoring agencies involved in this project.

ACRONYMS

ArcGIS	Arc GIS version 9 Desktop software
AWF	African Wildlife Foundation
CHCWP	Cullman & Hurt Community Wildlife Project
CORDS	Community Research and Development Services
ENVI	Environment for Visualising Images version 3.6 software
GIS	Geographical Information System
ICL	Imperial College London
ILRI	International Livestock Research Institute
MS-TCDC	Training Centre for Development Cooperation
PPPM	People's Problem Perception Mapping
PRA	Participatory Rural Appraisal
PVA	Participatory Visual Analysis
ROI	Region of Interest
RPM	Risk perception mapping
RRA	Rapid rural appraisal techniques
SPSS	Statistical Package for the Social Sciences version 13 software

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