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Land use patterns, resource use conflict and community-based conservation in northern Tanzania

By

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Abstract

Since the colonial demarcation of protected areas, clashes over access to widely distributed and unpredictable resources have occurred in northern Tanzania between pastoralism, agriculture and areas set aside for wildlife. The recent move towards community-based conservation reflects a shift of focus on to trying to secure access, rights and a sense of ownership to local people who depend on these resources.

Research was undertaken into how ethnicity, age and other factors influencing the heterogeneity of a community, are affecting land use patterns and resource use conflict between herding, farming and wildlife areas and to determine attitudes towards community conservation benefits generated by a hunting company.

The study focussed on the case study village of Makao. Participatory Rural Appraisal techniques were used to gather qualitative research through observation of village life and key informants and quantitative and attitudinal data through semi-structured interviews. Attitudes towards land and wildlife policy and awareness of the proposed Wildlife Management Areas of Tanzania were also investigated.

Results show that agriculture is the main livelihood activity in the area and is expanding, leading to increased conflict between nomadic pastoralists and areas set aside for wildlife. Many felt the cost of not being able to utilise land and other basic resources for sustenance in the adjacent game reserve. Benefits from hunting tourism were recognised at a community level by the majority of villagers, but only at a household level by those with household members employed in the industry. Attitudes towards conservation varied significantly with ethnicity. More Sukuma were employed by the hunting company that Nyisanzu or Maasai, and tended to have a more positive attitude towards conservation. Most villagers felt that land and wildlife management decisions were made in the village, but the more educated people still believed decisions were state controlled.

This research highlights the need for socioeconomic and attitudinal research in developmental and conservation organisations that are trying to build local people's sense of stewardship over resources they are protecting. The success of community-base conservation hinges on recognising the dynamic extent of a community, so that individual costs and benefits are accommodated in the management of a resource.

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Acronyms

CBC – Community-Based Conservation

GCA – Game Controlled Area

MGR – Maswa Game Reserve

NCA – Ngorongoro Conservation Area

NGO – Non-Governmental Organisation

RHS – Robin Hurt Safaris

RHWF – Robin Hurt Wildlife Foundation

SNP – Serengeti National Park

WMA – Wildlife Management Area

Chapter 1 - Introduction

1.1 Justification

The last ten years have been a period of great change for land use in the semi-arid regions of Tanzania. A weakening of state control followed the liberalisation of the economy in the 1990s and safari hunting and photographic tourism boomed (Lovett *et al, 2001*). Conservation policy excluded people and livestock from protected areas, and demographic growth and expanding agriculture excluded wildlife use (Sachedina, 2006). Immigration of farmers to marginal areas has changed land use and livelihood patterns. Traditional pastoralist systems have diversified and shifted from livestock-based economies to agro-pastoralism. This diversification of livelihoods has led to conflict between land use patterns, reflecting competition over access to resources between pastoralists, agriculturalists and wildlife (Campbell *et al.*, 2003).

These changing livelihood patterns and resulting shifts in land use are thought to be directly affecting the socioeconomics and ecology of the Maswa-Makao region in Northern Tanzania. This region is embedded in a network of protected areas, surrounded by the Ngorongoro Conservation Area, Serengeti National Park and the Maswa Game Reserve, which overlaps with a hunting concession controlled leased to Robin Hurt Safaris (RHS). Robin Hurt Wildlife Foundation (RHWF) provides economic benefits from trophy hunting tourism to local communities surrounding the hunting concession. The project is grounded on the belief that local communities must derive tangible economic benefits to truly develop a sense of stewardship.

70% of wildlife lives outside of protected areas in East Africa on land which is occupied by pastoralism and agriculture (Western & Gichohi, 1993). The revenues from wildlife based-tourism accrue at the national level, but people adjacent to the parks who tolerate wildlife seasonally or year round bear the direct costs from disease, predation, crop damage and personal safety (Norton-Griffiths, 1996). In response to recognition of the failure of top-down regulated protectionist conservation, and the exclusion of local communities' access to resources, the encompassing solution for effective conservation and development has turned to 'the community' through Community-Based Conservation (CBC) (Goldman, 2003). The underlying paradigm of CBC is to create economic incentives for local communities to manage wildlife on their land and enable wildlife to compete as a form of land use (Sachedina, 2006).

However, whilst many conservation initiatives in Africa have claimed the rhetoric of CBC, they may be top-down regulated and externally driven. 'The community" is often viewed as a

homogenous entity and as an essential ally in expanding conservation beyond protected area boundaries and into human-inhabited landscapes (Goldman, 2003).

The ethnic make-up of the Maswa-Makao region has altered dramatically over the last ten years owing to natural increase and rapid human immigration. For a conservation initiative to be community-based it is essential to assess the intricacies of community heterogeneity. Factors such as ethnicity, age, gender, education level, may be affecting attitudes towards what livelihood options are available and actual land use behaviours. Factors such as immigration, urbanisation and education may be affecting people's livelihood patterns and land use. If there is to be a viable future for wildlife within the Maswa-Makao area, the drivers of land use and livelihood patterns need to be determined and management strategies adapted to meet the specific needs of all ages and ethnic backgrounds. CBC can only be effective if the dynamic extent of 'the community' is realised.

This thesis uses a combination of participatory techniques to address the limitations and interactions between participatory development and community-based conservation through local attitudes towards the benefits that accrue from wildlife revenues.

1.2 Aim and Objectives

Aim

The aim of this project is to explore how age and ethnicity affect land use patterns and resource use conflict between herding, farming and wildlife and to determine attitudes towards conservation benefits from wildlife revenues generated by a hunting company.

Objectives

a.) To determine how land use patterns differ between ethnicities and age and how this links with actual land use behaviour though observational studies and quantitative analysis.

b.) To assess, behaviourally and attitudinally, whether any conflict exists between herders, farmers and wildlife, the nature of this conflict and to determine how the community perceives solutions using participatory rural appraisal techniques.

c.) To assess the attitudes towards the benefits which are gained by the community, as generated from the RHS Village Benefit Scheme, and to determine how ethnicity, age and other factors may be affecting this.

d.) To provide a methodological tool for Robin Hurt Wildlife Foundation, which can be replicated and applied across the ecological and anthropogenic range of villages in which they operate.

e.) To make recommendations for RHWF future work, and for other NGO and governmental interventions.

Chapter Two – Background

This section will introduce and discuss the concepts of community-based conservation (CBC); the history, current status and future plans of land policy in Tanzania; interactions and conflicts between different land uses and livelihoods; hunting tourism in Tanzania; and outline the community-benefit scheme of Robin Hurt Safaris (RHS) and the case study village.

2.1 Community-based Conservation

CBC of wildlife in Tanzania is now over 18 years old (Baldus *et al*, 2004). Yet today it has become a popular catchphrase in the conservation and developmental worlds. The theory of CBC makes sense both ethically and practically. Ethically, in that conservation of resources should be in line with the interests of those whose lives are most closely linked to their use. Practically in that conservation initiatives that have disregarded local people are rarely successful (Milner-Gulland & Mace, 1998). However, in reality, CBC is often pervaded with fundamental problems and its trademark status can be dangerously over simplistic.

Projects that have been implemented by outsiders cannot by definition be "community-based" and are unlikely to be self –sustaining without considerable external infrastructure and resources, after the departure of an external organisation (Milner-Gulland & Mace, 1998). Another deep-rooted problem with CBC is how the "community" is perceived. When a community is a small, homogenous unit, it may be possible for natural resource management systems to be implemented and managed. Yet communities are, of course, made up of individuals, whose personal costs and benefits are likely to differ from those of the community as a whole. The idea of a close-knit community is increasingly threatened by population growth, immigration, increased financial incentives and increasing agricultural technology (Milner-Gulland & Mace, 1998). Although CBC processes are expanding geographically across Africa and communities are involved in the politics and policies of conservation, devolution and participation often remain passive in nature (Goldman, 2003).

2.2. Land in Tanzania

2.2.1 The Past

In order to understand current interactions between wildlife and rural people's access to land, the issue has to be framed in context of Tanzania's history of land policy, as much of today's conflict can be traced back to the colonial period. Under British rule in the 1930s areas were set aside for wildlife conservation and local people's land rights were extinguished (Nelson, 2005). This was heightened in the 1950s, when the paradigm of Tanzania's National Park system was established:

exclusive protected areas were to exist without people living in them. In 1959 the Serengeti National Park (SNP) was set up and 10,000 Maasai residents were evicted. The British established a "multiple land use" area, where pastoralists were allowed to live, designated the Ngorongoro Conservation Area (NCA) (Homewood & Rodgers 1991; Poole, 2006). Tanzania has among the highest geographic coverage of protected areas in the world with almost 40% of the total land area under some form of protected status which inhibits human settlement: 5.6% national parks, 13% game reserves, 12% game controlled areas and 9.8% forest reserves (David Erikson, *pers.comm.*). The result of the shift in wildlife, and land laws to central control was the loss of native lands to foreign settlers and impoverishment of indigenous communities as the resources their lives depended upon became increasingly inaccessible (Kallonga *et al.*, 2003).

Much of CBC rhetoric states that tenure and ownership of a resource will create stewardship and incentives to protect it. Land that is owned by a government but not effectively managed by it is frequently treated as an open-access resource, with dire consequences for conservation (Milner Gulland & Mace, 1998). Land in Tanzania is "held in trust" by the government (MLHSD, 1997). The landscape in northern Tanzania is dominated by semi-arid rangeland – where agriculturalists and pastoralists use large, often marginal, areas of land and widely distributed resources in a climatically unpredictable environment (Nelson, 2005). Securing access to the land base, which such livelihoods depend on, has been the most prominent socioeconomic and political issue in northern Tanzania during much of the past 20 years (Kallonga *et al.*, 2003).

2.2.2 The Present

Land in Tanzania is divided into 3 main categories: reserved, general and village land (MLHSD, 1997). Reserved land is any land managed by the central government and includes Game Reserves, National Park, and Game Controlled Areas (GCAs). The boundaries between village and reserved land often overlap, for example, 95% of Monduli District's total land area is contained in GCAs (Nelson, 2005).

2.2.3 The Future: Wildlife Management Areas?

In the mid '90s, as international conservation and donor interest moved towards CBC, the Tanzanian government reviewed its wildlife policies, "to ensure that wildlife conservation competes with other forms of land use" for rural people (Homewood *et al*, 2005; MNRT, 1998). In 2002, the government proposed the creation of a new category of land: Wildlife Management Areas (WMAs). These areas would be established outside of core protected areas, where "local people will have full mandate of managing and benefiting from their conservation efforts,

through community-based programmes" (Goldman, 2003). Since 2002, 16 pilot WMAs have been established with mixed success. The concept created optimism for the future of CBC, but it has prompted much debate and unease. Described in the Wildlife Policy as an "area declared by the Minister to be so, and set aside by Village Government for the purpose of biological natural resource conservation" (MNRT, 1998), the very definition of WMA reflects a colonial conservation mentality (Goldman, 2003). Makao Village land is included in the 17th proposed WMA. This WMA is not on the official pilot list and was allowed to go ahead at the behest of Frankfurt Zoological Society (David Erikson, *pers.comm.*)

2.3 Conflict over Land Use and Changing Livelihoods

There are three important facts that need to be addressed in considering land use conflict in Tanzania. Firstly, Tanzania has a wealth of natural resources. It has been classed as one of the four "mega-diversity" countries in terms of biological richness, topography, large mammal populations and natural habitats (Kallonga *et al.*, 2003). Secondly 70% of the population live in rural areas (David Erikson, *pers.comm.*). Thirdly, much of the population are reliant on basic natural resources for sustenance (Kallonga *et al.*, 2003).

Conflicts over natural resources are frequent in northern Tanzania; these are often centred over contested access to land and the resource base because of clashes between wildlife conservation interests and rural livelihoods (Homewood, 2004). The demarcation of protected areas in northern Tanzania impinged on the territories of nomadic pastoralists such as the Maasai and the Mang'ati. Traditionally transhumant ethnic groups have adopted small-scale agriculture as a means of ensuring food security (Homewood, 2004).

2.4 Hunting Tourism

2.4.1 The Industry

In 2001, Tanzania's tourism industry was the second highest export earner after agriculture, generating an estimated $725 million (Nelson, 2004). Annual income to the Division of Wildlife from hunting concessions is approximately US$10 million. Tourist hunting is the most economically viable form of wildlife utilization, in terms of money generated from area used (Lindsey *et al*, 2007), and plays an important part in the economic development of many remote areas that are unsuitable for other forms of tourism (Baldus & Cauldwell, 2004). Hunting concessions are distributed throughout the country in Game Reserves, GCAs or as Open Areas on village land. The scale of Tanzania's hunting industry can be realized in the fact that there are over 130 hunting concessions covering an area in excess of 250,000km^2 that are leased to

outfitters to conduct tourist hunting (Baldus & Cauldwell, 2004). This means that 31% of Tanzania is in hunting concessions (David Erikson, *pers.comm.)*

The Director of Wildlife can refuse renewal of or application to a hunting concession if a hunting company is not contributing to i.) The implementation of community development projects within and adjacent to the area of operation; ii.) The improvement of infrastructure and protecting the environment within his hunting block and iii.) Anti-poaching operations against poachers (URT, 2002). The breakdown of hunting fees to the company, the community, and the Government is complex (Fig. 1).

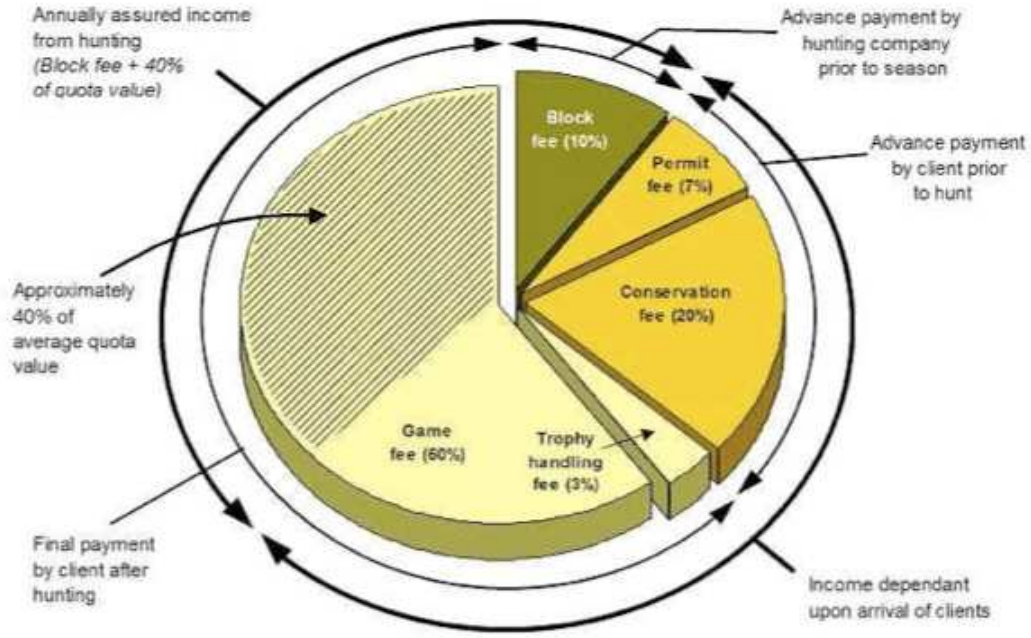

Fig. 1. Breakdown of hunting income in the Sealous Game Reserve paid to the Wildlife Division averaged from 1996-2001 (Source: Baldus & Cauldwell, 2004)

2.4.2 Robin Hurt Safaris (RHS)

RHS has a Village Benefit Scheme, in which the 20% sur-charge applied to each trophy animal taken in a concession goes directly to the appropriate village accounts. Funds are to be spent at the discretion of the village (RHWF, 2006).

2.5 Case study village – Makao

The Maswa-Makao hunting block is located in the Meatu District, Shinyanga region in northern Tanzania (Fig.2). Makao village is embedded in a network of protected land. A third of the hunting block lies inside the Maswa Game Reserve (MGR) and two-thirds on village land. The reserve was established in 1981 as part of the Serengeti ecosystem. Makao village is situated on

the Southern border of MGR. The Ngorongoro Conservation Area (NCA) lies 10km to the east of the village, and Serengeti National Park (SNP) 40km to the north (Fig. 2).

2.5.1 RHS in Makao

RHS has been operating for over 17 years in Makao. It was the first village to be part of the Village Benefit Scheme. Benefits from the Maswa-Makao block are distributed to seven villages in the area.

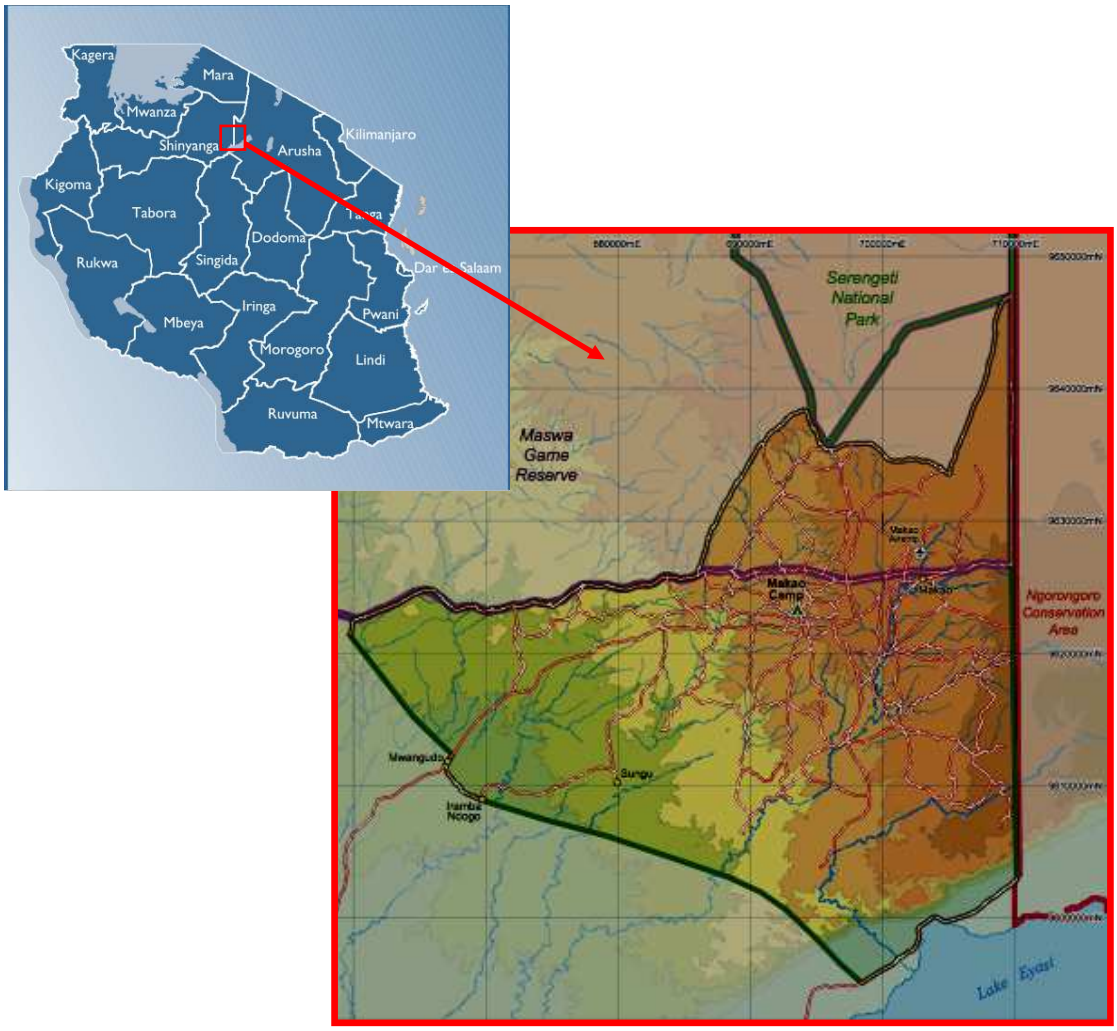

Fig.2 The Maswa-Makao hunting concession and its position in Tanzania (Source RHWF & Household Budget Survey, 2002)

2.5.2 Natural Environment

Rainfall is typically unimodal in the area, with heavy rains in March-May. The semi-arid rangeland environment is characterised by a patchwork of savannah grassland and scrub, thick with Tsetse fly. Makao is at an altitude of 5380 feet at the top of a gradual decline into the Lake

Eyasi escarpment. Three rivers (Makao, Seki and Lorigumi river) convene inside village land. The soil is a mixture of loam, clay and sand.

Makao consists of five sub-villages: Makao Centre, Hebabu, Komesha, Lorigumi and Matiko, and the whole village covers an approximate area of 38, 104 Ha.

2.5.3 People

Makao is ethnically very diverse due to a history of immigration. There are 11 ethnic groups in total, in order of presence: Sukuma, Maasai, Nyisanzu, Iramba, Hadzabe, Mang'ati, Taturu, Nyamwezi, Iraqw, Kikuyu and Chaga. However the last few groups consist of one or two households. Shinyanga region has been identified as one of the three most disadvantaged regions of Tanzania (Household Budget Survey, 2002).

As RHS' first village to be included in their Village Benefit Scheme, Makao is an ideal study site for analysing the attitudes towards hunting tourism within a local community. Makao has the potential for land use conflict between herding, farming and wildlife conservation since it is surrounded by protected areas and has a recent history of immigration of nomadic pastoralists and agriculturalists coming to settle for small-scale subsistence cultivation. This movement of people makes Makao an interesting case study to determine how ethnicity and age can affect land use patterns.

Chapter 3 – Methodology

The methodologies used in this thesis took a case study village approach as time was limited to a month's fieldwork and an inter-village comparison would be brief and superficial. A combination of Participatory Rural Appraisal (PRA) techniques was used. The key aspect of PRA is the empowerment of people being researched, so that research is driven by the concerns of local people as opposed to the researcher's agenda (Milner-Gulland & Rowcliffe, 2007). Techniques employed qualitative research through key informants and quantitative and attitudinal data through semi-structured interviews. This approach was chosen because agriculture and livelihood based questions have traditionally relied on questionnaire surveys (Pretty & Vodouhe, 1997). However questionnaire surveys have to be prepared in advance and the designer cannot pre-empt what issues are of importance to local people. This often results in lengthy surveys collecting a lot of redundant information (Pretty & Vodouhe, 1997). Through inclusion of PRA techniques, an in-depth understanding can be achieved in this study, rather than a broad, superficial view of the community (De Vaus, 2002).

The fieldwork for this research was carried out over four weeks in June 2007 in Makao village. The research team consisted of the author, a male Kiswahili translator and a female Kiswahili and Maa translator.

The first week was an initial familiarisation period comprising the pilot study and participatory exercises to gather seasonal, historical, economical and social information through PRA exercises and focus groups. This was followed by an intensive three weeks of semi-structured, household based interviews.

3.1 Preliminary Research

The aims of the preliminary research were to:

- Develop a timeline of recent culturally and environmentally significant events from local knowledge
- Understand the geographical layout and land use of the area surrounding the village using participatory mapping techniques
- Create a village map of households, key village resources and utilities
- Form a wealth rank index of locally relevant assets
- Understand seasonal patterns of livelihood activities
- Refine and develop the semi-structured interviews through a pilot study

Upon arrival, the Village Chairman, Secretary and Executive Officer introduced the research team to the village. Much of the preliminary week was spent informally gathering general information of village life, which helped to assess the validity of answers given in the household interviews. The Village Secretary was asked to gather a representative group of ten village members from each of the five sub-villages. The resulting group, although of mixed gender (three men, two women) and varied livelihoods, was not entirely representative as there was no one from the more marginal sub-villages of Matiko and Lorigumi. The research team discussed each exercise with the Village Secretary beforehand to help us initiate and guide the process on the day. Emphasis was placed on the open nature of discussion to allow the flow of ideas and reduce researcher bias.

3.1.1 Participatory Mapping

Participants were asked to draw two maps (Fig.3):

i. A map of the area, identifying key features that impinge on their life. Features included the boundaries of the Maswa Game Reserve and village land; the three rivers that converge in Makao; roads; water pumps; school; dispensary; and village office (Appendix 1).

ii. A map of each sub-village locating each household. In larger sub-villages a *Balozi* indicated a settlement of ten households.

The mapping exercise took place in the school, so a large blackboard provided an ideal work surface for maps to be drawn and altered if necessary. The Village Doctor volunteered to be cartographer and copied the maps on to A3 paper. Maps of the two remaining sub-villages had to be drawn with smaller focus groups later during the fieldwork.

Fig. 3. The participatory mapping exercise

3.1.2 Wealth-Ranking Index

Relative wealth was assessed using participatory wealth-ranking, with a similar procedure to de Merode *et al* (2004). This qualitative approach aims to describe the social and economic dimensions of wealth using key informants, familiar with the community to assist in defining appropriate wealth-rank criteria. We had planned to ask informants to rank a selection of households in terms of relative wealth, however the focus group advised us that the subject was too sensitive for such an approach. Instead, three main indicators were identified:

i.) Possessions - An asset index was developed based on a broad range of assets: some a few of the wealthiest people in the village have, some that 90% of people have and some that a middling number of people have (Holmes, 2003). Assets identified were: Bicycle, radio, cart, mobile phone, electricity and car. A monetary value was attained for these items from the key informants and triangulated with informal questions asked at the interviews. A total monetary score could therefore be calculated from the asset index.

ii.) Housing type – There was a clear progression in roof and wall type from poorer to more wealthy.

Roof: woven branches, to *tembe* (branches and grass), to corrugated iron

Wall: Mud, to earth brick, to cement. Because of the clear progression of roof an wall type, each category was assigned a number 1-3, poor-rich, and totalled to give a score out of 6 to represent wealth.

iii.) Acreage – the amount of land cultivated by each household.

The possessions score strongly correlated with the roof/wall score (Spearman's rank: r=0.432, S=20439.69, p<0.000) and with acreage (Spearman's rank: r=0.312, S=15189.12, p=0.025) supporting the use of these ranks as a measure of household wealth.

3.1.3 Focus Groups

a) **Farmers –**We carried out a farming systems analysis with a group of seven farmers (Howlett *et al*, 2000) to understand the basic annual rhythms of the production system in terms of planting, growth and harvesting, inputs and outputs and discussed how farming techniques had changed over the past 40 years. It was reported that there was a variety in farming techniques used in the village, with a range of more traditional to modern practices. Farmers were asked to identify what the key indicators of "modern techniques" were, so that a farming score, that represented the degree of modernity, could be developed through questions asked (See Appendix 2).

b.) **School children –** As age is one of the key variables being examined in this project, we arranged two focus groups after school, of seven girls and seven boys aged 14.

c.) **Hadzabe –** The Hadzabe are a hunter-gatherer ethnic group that have a settlement in Lorigumi sub-village. We arranged focus groups of five men and five women to discuss their land use and traditional way of life.

d.) **Mang'ati -** Few Mang'ati are resident in Makao but come during the dry season to graze their cattle on land in and around the village. The study period was just after harvest so many Mang'ati were coming into the village centre to grind, buy or sell maize. We arranged a day that was convenient and met two groups of five men and five women to discuss their annual movements and land use around the area.

3.1.4 Historical timeline

The Village Chairman was asked to get together a representative group of five village elders to discuss the social, cultural and environmental background of the Maswa-Makao area, to develop a historical timeline.

3.2 Semi-Structured Interview

The semi-structured questionnaire was constructed using social survey design methods outlined in De Vaus (2002) to obtain qualitative and quantitative answers. Questions were ordered in a clear progression, from initial descriptive questions regarding household/livelihood information to later attitude-based questions, once the interviewee had relaxed into the process. Methods were used to reduce bias, these included:

- Randomisation in sampling (see below)
- Triangulating answers from focus groups and informal time spent in the village.
- So that people's attitudes towards benefits from hunting could be reported as openly as possible, we explained we were an independent research team and we did not use the RHWF car to move from village to village.

A pilot of the semi-structured household interviews was carried out with five households. The questionnaire asked too much detail and the delivery was too long, although it decreased in length even after the third pilot as the research team became more familiar with the process. Subsequent interviews were much shorter (mean ± S.D. =29.73 minutes ± 10.32, range= 14-57 minutes). Lessons learnt from this and the PRA exercises led to adjustments being made to the provisional questionnaire (the final questionnaire is attached in Appendix 3):

- Asking what each person did in a household and how they were related to one another proved to be too lengthy, so picture cards of possible livelihood options were laid out and informants listed the number of people in their household who performed these activities.
- Asking whether members of the household living elsewhere sent money home was a sensitive subject that people were reluctant to answer, so it was omitted from the questionnaire.
- Questions regarding shifting agriculture were omitted, as all agriculture was permanent.
- Extensive details of livestock keeping (disease, treatment) were omitted as it became clear that few owned livestock in the village.

The three largest ethnic groups in Makao were sampled: Maasai, Nyisanzu and Sukuma.
The village was geographically stratified by sub-village, as each sub-village was situated in a clear ecological zone. Due to time limitation we aimed to interview ten households from each sub-village. A co-ordinate grid was drawn over the household maps and ten households were randomly selected by generating ten sets of co-ordinates from a random number generator. The household closest to that co-ordinate was then selected for interview. The research team was accompanied at all times by the Village Secretary, who assisted in recognizing the randomly sampled households identified in the mapping exercises and had prior knowledge of whether the household members were of the three relevant ethnic groups. When *Balozis* were mapped and randomly selected, we randomly selected a number 1-10 once at the site. The households were consulted in advance, to explain our purpose and methods and arrange an appropriate time.

All interviews took place in the respondent's home. From the pilot study, it was clear that interviewees seemed more relaxed with just one translator of the same sex and the author. Where possible, questions were made interactive. For questions about proportions, for example of what is sold and eaten from a seasons harvest, interviewees were asked to show their answer dividing a pile of beans into relative amounts. Living in a family home in the village centre helped us to become a familiar part of village life, as we walked to and from each sub-village. Although time-consuming this proved valuable in developing relationships within the community.

3.3 Problems Encountered

During the first participatory mapping exercise, many people had heard about it and came to watch, lining up outside the classroom. When discussions were taking place, there were angry complaints at the lack of payment to the people who had come to see the meeting. Many

reported that previous interventions by external organisations in the village had been paid 30,000 Tsh for an hour's meeting (equivalent to the Tanzanian minimum wage in the private sector; University of Dar es Salaam, 2007) and they were yet to see any results. The same issue was raised in a few incidents during interviews, after we had explained why we were doing the work and whom we were collaborating with. RHWF believe that meetings with the communities they work with should be unpaid, since those benefits would be biased in distribution and alter the dynamics of community empowerment. The relationship between respondent and researcher would be altered by payment. Usually, once we had explained that this work was going to be used by RHWF and other collaborators, and that negative opinions were as important as any other questions, participants talked freely.

3.4 Statistical Analysis

Quantitative data was coded and analysed with Statistical programme R (R Development Core Team) with the level of significance for General linear Models, Chi-squared tests and Spearman correlations at $p < 005$.

In analysis regarding attitude, and perceived problems, individual responses were analysed. Household level responses were used in livelihood analysis. One of two respondents from the same household was selected randomly (with a random number generator).

Chapter 4 – Results

To understand current trends and interactions in land use and attitudes towards benefits received from tourist hunting, it is necessary to be put in the context of the recent social and environmental history of the village. This section will therefore begin with a brief history of the village; the inhabitants; their livelihood activities and land use; interactions between land uses; attitudes towards conservation; awareness of and attitudes towards wildlife and land policy and problems facing the village.

4.1 History of Makao

Makao was registered as a village in 1974 under President Julius Nyere's 1970s villagisation programme. However, the Maasai inhabited the area since 1945. The mean length of residency of individuals interviewed was 28 years (mean± SD = 28.10 ±14.8; median = 27.5; range = 1 – 57 years). The abundance of rivers and available land attracted the Sukuma to settle in the area from 1947. The two tribes coexisted uneasily. When the resident Maasai were evicted from the newly established Serengeti National Park in 1959, many did not move into the designated Ngorongoro Conservation Area, but moved further south to what is now Makao. Conflict over livestock grew as the populations of Maasai and Sukuma increased, resulting in a long period of cattle theft between the two tribes. Consequently those with large herds of cattle moved into the interior.

The availability of low-lying land and network of river valleys attracted many to the area for small-scale cultivation. This was the reason given by 31% of individuals as to why they had moved to the area. 16% who cited conflict as a reason for moving to Makao said it was after the government had reclaimed land for protected areas (see Fig. 4). More ethnic groups continued to settle in Makao. From 2000, the neighbouring Mang'ati nomadic pastoralists began to use the land in and around Makao to graze their cattle in the dry seasons. In 2001 there was mass immigration of Sukuma from Bariadi, a neighbouring District in Shinyanga region. There had been severe droughts and pressure on land because of lack of water available. The population from 2001-2006 increased dramatically. Sukuma came with lorries and tractors, equipped to cultivate and claimed large sections of land. This immigration placed huge pressure on natural resources. Poaching and deforestation increased dramatically. The government evicted these Sukuma in 2006. As a result there are many abandoned farms scattered on the outskirts of Makao.

New land laws have been created since 2004 because of the Makao's inclusion in the 17th proposed WMA. Even though Makao was registered as a village in 1974, it does not have a

formal village title deed. Because land is held in trust by the government in Tanzania, a village can be "relocated" at any point under government orders. The village is currently in the process of official registration as part of the WMA application process. The village government is now legally able to lease village land into three categories: for farming, grazing; and settlement, to improve the distribution of land for different uses.

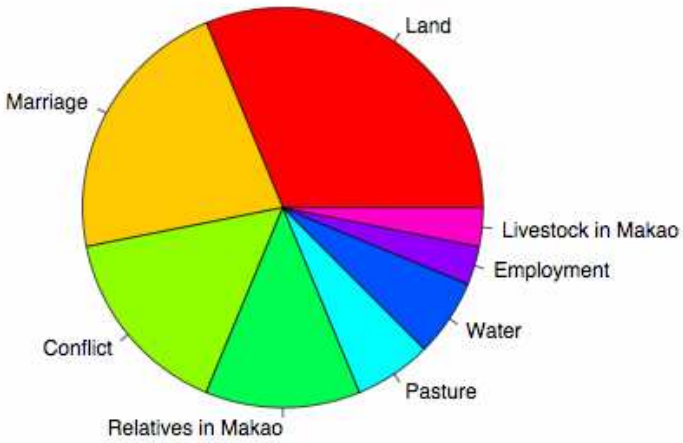

Fig. 4. Reasons for moving to Makao (all respondents who cited marriage as a reason for moving were female)

4.2 Inhabitants of Makao

The 50 households that were interviewed accounted for 358 individuals. There was difficulty in ascertaining an exact population number as the 2002 census, stating 2000 individuals, included all recent immigrants who settled to farm at that time. However the participatory mapping exercise indicated 200 households. The Village Chairman supported this figure. Therefore, 25% of all households were interviewed. An estimate of current population size in Makao is 1400, however there was large variation in the size of household (mean ± SD = 7.00 ± 2.77; median = 7; range = 2-14).

60 individuals were interviewed, 30% of which were Sukuma, 32% Maasai and 33% Nyisanzu (Table 1). An equal proportion of households were sampled from each ethnic group. The samples were fairly even from four of the five sub-villages of Makao, however only two people were interviewed in Lorigumi as the majority of households are Hadzabe and Mang'ati there (Table 1). The age range of people interviewed was from 16-80 years old, with a mean age of 37 years (mean± SD = 15.04 ±; median = 35). Ages were divided into three classes: young (16-29

years), middle-aged (30-46 years) and old (46+). 33% of the sample was young, 37% middle aged, and 30% were old. 53% of interviewees were female.

Sub-Village	Ethnic Group	Sample size		Mean Length of Residency	Mean Age
		Households	Individuals		
Centre	Sukuma	5	7(4)	35.29±12.93	42±21.75
	Maasai	0	0	0	0
	Nyisanzu	5	5(3)	33.2±12.40	42±9.62
Hebabu	Sukuma	9	11(2)	19.72±19.45	34.55±12.97
	Maasai	0	0	0	0
	Nyisanzu	2	2(1)	34±11.31	46.5±2.12
Komesha	Sukuma	2	2(2)	26±12.73	26±12.73
	Maasai	3	3(2)	22.33±5.51	24.33±1.15
	Nyisanzu	9	12(7)	29.08±14.02	40.91±14.15
Matiko	Sukuma	0	0	0	0
	Maasai	14	16(10)	31.13±13.44	35.25±16.53
	Nyisanzu	0	0	0	0
Lorigumi	Sukuma	1	1	4	48
	Maasai	0	0	0	0
	Nyisanzu	1	1(1)	18	18

Table 1. Background information to the sub-villages of Makao. The number of female individuals interviewed is given in brackets. The mean and standard deviations for length of residency and age are for individuals in the sample.

There is a marked difference in ethnicity within each village (Table 1). The ethnic groups varied significantly in wealth .The Maasai had the highest proportion of poor households and Sukuma the highest proportion of rich households (Fig.5).

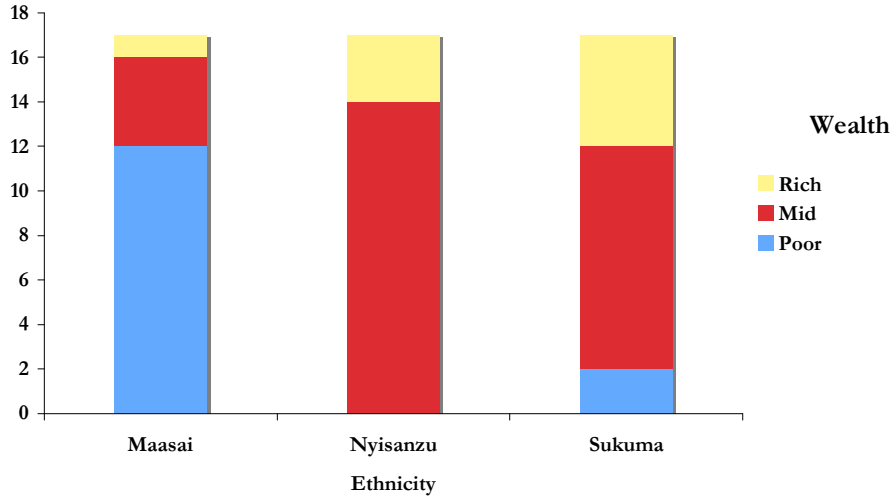

Fig. 5. Wealth levels of households of three ethnicities in Makao (X^2 = 25.8095, d.f = 4, p < 0.000).

4.3 Livelihoods

All households interviewed practised small-scale subsistence agriculture. This was cited by 61% of households as their main livelihood activity (Fig. 6). 11 households had a father or son who was employed by RHS. 9 were employed year round in anti-poaching or tracking, 2 were employed as casual labourers during camp-building for 3 months before the hunting season reopens in July.

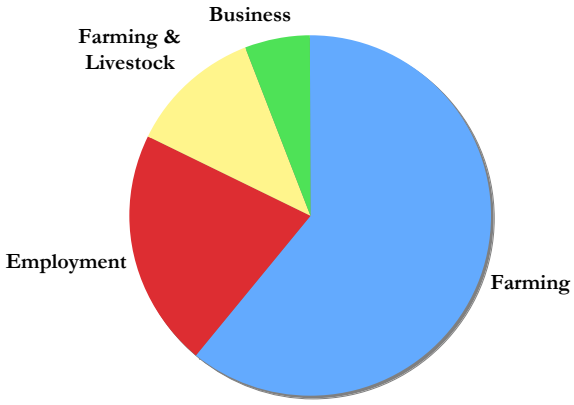

Fig. 6. The main livelihood activities in terms of economic benefits carried out by households in Makao. Farming & livestock refers to both being equally as important economically.

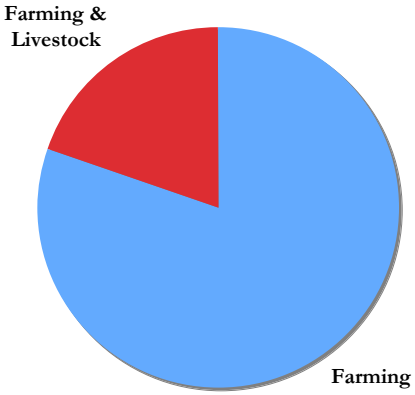

Fig. 7. The main livelihood activities in terms of time carried out by households in Makao. Farming & livestock refers to both being equally as important in terms of time.

There was not marked division of labour between sexes in all ethnic groups in Makao, as agriculture was the most carried out economic and time activity and both men and women cultivated (Fig. 6 & 7).

4.3.1 Children

Children have the opportunity to go to a primary school in Hebabu sub-village from age 5. Only 4 households had children at Paji secondary school, these were among the wealthiest households

in the village who's household head had been employed, long-term, by RHS. Ethnicity had no significant effect on whether an individual had been to school or not. 73% of children between the age of 5-14 went to school out of the households interviewed.

4.3.2 Agriculture

Every household that was interviewed cultivated maize. 96% of households farmed as a family, 27 % hired extra labour to assist in weeding. The two wealthiest households only used employed labour throughout to cultivate, never farming themselves. People who cultivated with more modern agricultural techniques had higher relative wealth ($S=19261.51$, $rho=0.537$, $p=0.0005$,) and cultivated a larger area of land ($S = 16180.68$, $rho = 0.2678$, $p = 0.0574$). Using a General Linear Model (GLM) of degree of modern farming technique as a function of education and ethnicity it was found that ethnicity significantly affects the degree of modern farming techniques used in cultivation. Whether individuals were educated or not had no significant affect on techniques used. The Maasai used more traditional techniques for cultivation. The Nyisanzu used techniques with a middling degree of modernity. The Sukuma had the most modern farming technique score.

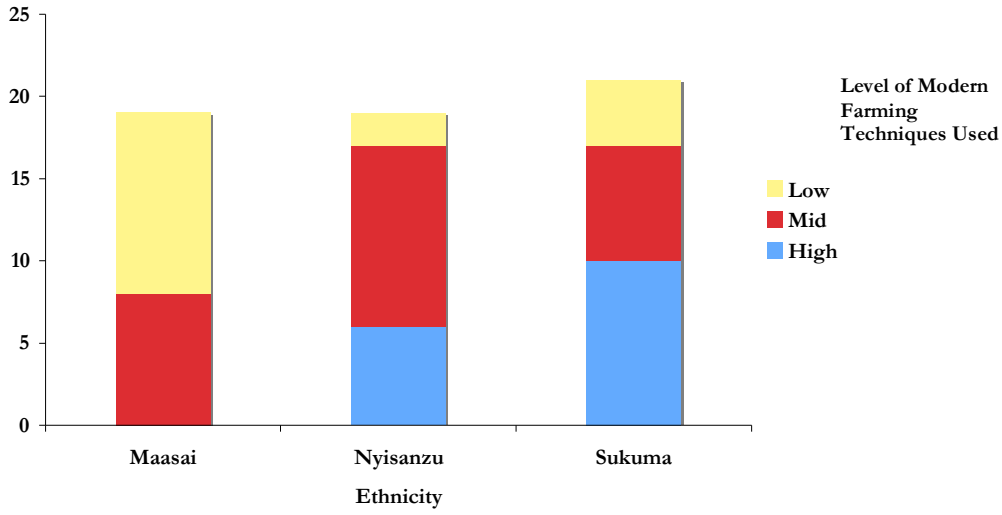

Fig. 8. The levels of modern farming technique used within each ethnicity ($\chi^2=5.236$, d.f.=4, $p=0.0005$)

4.3.3 Livestock Keeping

37% of households kept livestock. A GLM of livestock keeping as a function of ethnicity and wealth showed that ethnicity (Fig. 9) and wealth ($\chi^2 = 16.8986$, d.f.=6, $p=0.0097$) both significantly affected whether households kept livestock although there was no interaction between ethnicity, wealth and livestock keeping. The Maasai kept significantly more livestock than Sukuma and Nyisanzu households (Fig. 9). 78% of Maasai were livestock keepers.

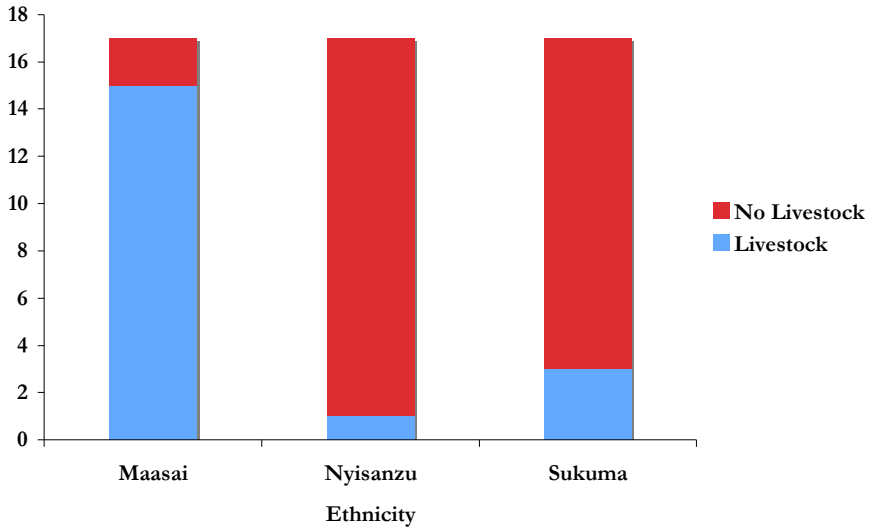

Fig. 9. Livestock keeping with the ethnic groups
(χ^2 =15.113, d.f=6, p=0.0194)

4.4 Interactions Between Land Uses

4.4.1 Other People's Livestock and Crop Production

53% of people reported interactions between other people's crop growing and livestock production and their own crop growing and livestock production this year. Damage caused by Mang'ati livestock was reported most frequently (Table 2, Fig.10).

Interaction	Frequency response was reported
No interaction	28
Crop destruction by Mang'ati livestock (pre-harvest)	16
Soil destruction by Mang'ati livestock (post-harvest)	7
Mutual protection from crop damage by livestock and wildlife from surrounding farms	4
Encroachment onto land by other's farms expanding	3
Livestock herds mixed with other owners	2
Fined when own livestock goes onto other's farms	2
Water sources for own livestock ruined by Mang'ati cattle eroding river banks	2

Table 2. Interactions between others crop production and livestock keeping and own crop production and livestock keeping.

Fig. 10. Erosion of a river bank by Mang'ati watering cattle

4.42 Wildlife Areas

53% stated a cost of the MGR (Table 3).

Cost	Frequency of response	Analysis Category
No cost	23	**None**
Restricted access to charcoal/firewood/honey	17	**Restricted Access to Resources**
Misuse of funds by Village Government	5	**Financial**
Hunting wildlife illegal	5	**Restricted Access to Resources**
Increased human-wildlife conflict	6	**Human-wildlife Conflict**
Restricted access to land for grazing livestock	3	**Restricted Access to Resources**
Restricted access to land for agriculture	3	**Restricted Access to Resources**

Table 3. Costs of the MGR perceived by villagers in Makao

51% saw benefits from the Game Reserve (results summarised in Table 4). Whether people said there were no benefits from the MGR was significantly affected by ethnicity (Fig.11). More Maasai and Nyisanzu respondents felt there were no benefits from the reserve compared to Sukuma. Significantly more Sukuma mentioned the financial benefits from MGR than for the other two ethnic groups ($\chi^2 = 15.831$, d.f.=2, $p<0.001$). Significantly more young respondents mentioned the reserve as a provider of resources ($\chi^2 = 7.020$, d.f. = 2, $p = 0.030$).

Benefits	Frequency of Response	Analysis Category
No benefits	24	**None**
Social services to the community	13	**Financial Benefits**
% to Village Government	5	**Financial Benefits**
Protects forest	3	**Environmental Protection**
Protects wildlife	2	**Environmental Protection**
Provides firewood and honey	2	**Provides Resources**
Hiding place during conflict	1	**Provides Resources**

Table 4. Benefits of the MGR perceived by villagers of Makao

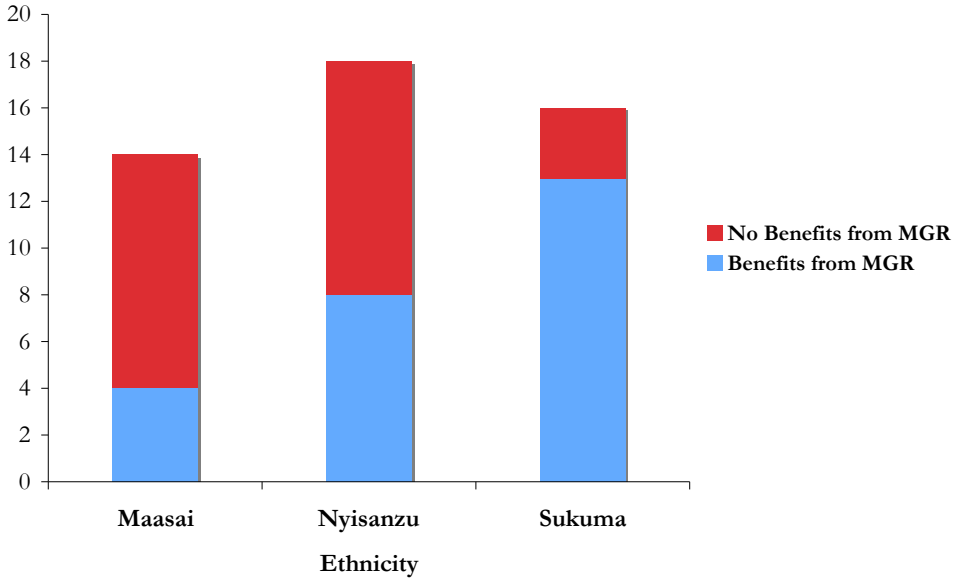

Fig.11 Proportion of respondents who recognised benefits from the MGR (χ^2 =8.980, d.f=2, p=0.011)

4.5 Attitudes Towards Hunting Tourism

41% of respondents felt they benefited from hunting tourism at a household level. 4 respondents felt they individually benefited through infrastructure provided to the community. 2 said they benefited when a hunting client donated corrugated iron sheets for roofing to households in the central sub-villages. Significantly more Sukuma were employed by RHS or Tanzania Game Trackers (a hunting outfit with a concession in Meatu District) in the region (Fig.12). Perhaps as a result of this, there was a significant difference in the ethnicity of respondents who felt that they received independent benefits from hunting tourism (χ^2 =14.237, d.f=2, p<0.001).

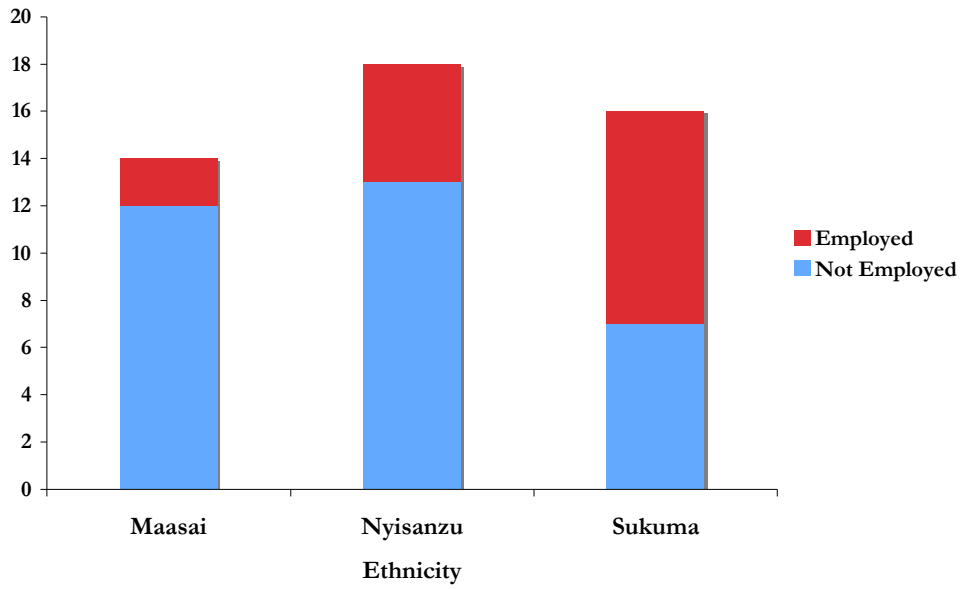

Fig.12. The number of individuals in each ethnic group who have a household member employed in hunting tourism

(χ^2 =6.317, d.f=2, p=0.042).

73% felt they benefited at a community level. All mentioned at least two of five infrastructure or social services provided by RHS: primary school, tractor, dispensary, water pumps and maize grinding machines (one in Komesha, one in Makao Centre). 76% felt that certain individuals benefited in the village. 26 mentioned employees of RHS and other hunting companies, and 2 mentioned that Village Government members benefited "and built large houses".

55% felt there was a cost of hunting tourism in the area, their responses are summarised in Table 5. I explored each response univariately with age, and then ethnicity, using Chi-squared tests and found no significant interactions. A GLM of whether people felt there were any costs of hunting tourism today showed no significant effect of response as a function of ethnicity or age.

Cost	Frequency of Response
No Costs	23
Restricted access to charcoal/honey/firewood	8
Community not benefiting enough relative to RHS's revenue	7
Misuse of funds by Village Government	7
Employees and central villages benefit more than others	5
Human-wildlife conflict (elephants) increased through anti-poaching	4
Unfinished Village Benefit projects	3

Table 5. Costs of hunting tourism perceived by villagers in Makao

4.6 Policy

50% had heard of WMA yet only 11 people knew the details of WMA policy. These included village officials, and the secretary of the WMA committee. Significantly more Nyisanzu said they had heard of WMA (χ^2 =12.799, d.f.= 2, p=0.002) and knew the proposed policy details (χ^2 =8.942, d.f.=2, p=0.011) than Maasai and Sukuma respondents.

42% respondents felt that land and wildlife management decisions were made within the village; 35% felt decisions were made externally by the State; 3% said it was a balance between external and internal control and 17% said they did not know. The middle age group felt that decisions were made within the village significantly more than older or younger respondents. There was a close to significant affect of education on people thinking that decisions were made outside of the village (χ^2 =3.683, d.f=1, p=0.055).

4.7 Development Priorities of the Village

The results are summarised in Table 6. The development area placed as first priority (χ^2=46.571, d.f=6,p<0.001), in the top three positions of priority (Fig. 13.) and as last priority (χ^2=90.489, d.f.=6, p<0.001) was not random. Road improvement from Meatu (the nearest town to Makao) was ranked in first position most frequently; health care was most frequently ranked in second; improved water supply was most frequently ranked in third; forestry initiatives were most frequently ranked in last position, followed by loans for starting businesses. The 11 people who placed loans in last position did so because they felt a loan system, that was not corrupt, could not exist in Makao.

	Priority Area for Development				
Activity	**First**	**Second**	**Third**	**Top Three**	**Last**
Roads	23 (47%)	8 (17%)	3 (6%)	34 (23%)	0
Health	7 (15%)	18 (37%)	9 (19%)	34 (23%)	0
Water	6 (12%)	6 (13%)	12 (25%)	26 (18%)	1 (2%)
Education	6 (12%)	6 (13%)	9 (19%)	21 (14%)	2 (4%)
Farming Equipment	3 (6%)	4 (8%)	10 (21%)	17 (12%)	4 (9%)
Loans	3 (6%)	5 (10%)	4 (8%)	12 (8%)	11 (25%)
Forestry	1 (2%)	1 (2%)	1 (2%)	3 (2%)	27 (60%)

Table 6. Frequency of response of development area where people would most like benefits from economic revenues from wildlife to be directed.

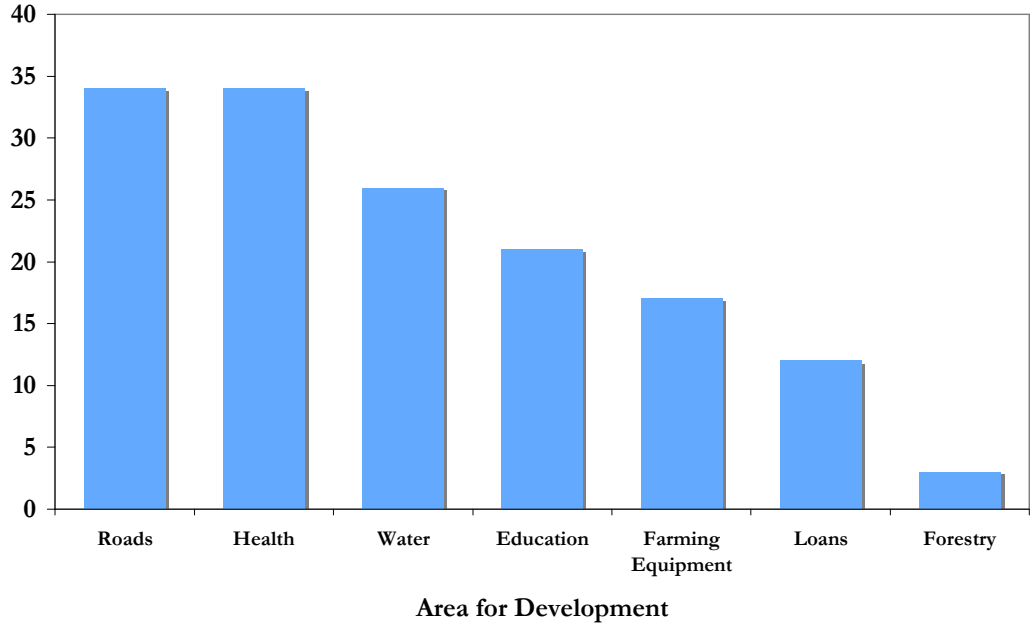

Fig. 13. Development areas placed in the top three positions of priority for where economic revenues from wildlife should be directed. (χ^2=37.333, d.f. = 6, p<0.001)

4.8 Focus Groups

4.8.1 Mang'ati

The Mang'ati are traditionally a nomadic pastoralist ethnic group. Their yearly movements differed from person to person, but all came to the outskirts of Makao to graze their cattle during the dry season, "as their ancestors had done". When asked about conflict with other people's livestock and crop production, all informants said that the increasing number of farms reduced their access to grazing land, and that they often came across conflict with landowners and the village government over access to pasture and water.

The number of cattle owned was a sensitive subject, but reports were of a different magnitude to livestock numbers owned by Maasai in Makao, at 100-500 cattle, goats, sheep and donkeys (compared to the maximum of 30 goats). All informants said Mang'ati were increasingly settling on the outskirts of Makao to cultivate maize. The groups did not know any details of tourism in the area although they knew of its presence of it. Costs of tourism mentioned were restricted access to water and pasture; facing legal action if caught in the MGR; burning of the grassland before the season started by hunting company reduced their access to pasture; increased wildlife killing livestock, particularly lions and leopards. No one reported benefits from tourism.

4.8.2 Hadzabe

The Hadzabe live in temporary grass huts in Lorigumi (Fig. 14). All men in the focus group stated "hunting" as their main livelihood activity. Selling meat and hand-made bows and arrows to other villagers were mentioned as means of income generation. Two half-acre plots of maize had been established by the Hadzabe and were farmed communally, but had both failed this year because of "too much rain". No anti-erosion techniques or inputs were used on the land. The benefits of hunting tourism mentioned included employment from RHS for certain individuals, although they did not feel benefits reached Lorigumi at a community level. Costs reported included fear of getting caught (jailed or fined) by the RHWF anti-poaching unit for hunting wildlife.

Fig. 14. A Hadzabe hut in Lorigumi sub-village

Chapter 5 – Discussion

The discussion draws together the key results of the study in terms of major land uses, conflicts between land uses, problems the village faces, attitudes towards conservation and examines the implications for community-based conservation (CBC) at a local and national scale.

5.1 Land Use

5.1.1 Agriculture

Every household interviewed practised agriculture. In the past, the Maasai have only used cultivation as a temporary livelihood measure when their cattle numbers were severely decreased (Homewood & Rogers, 1991). The degree of modern techniques used in cultivation significantly varied with ethnicity and age. The Maasai living in the marginal village of Matiko were significantly poorer than the other two ethnic groups. Many Maasai felt that their farming was limited by lack of access to farming equipment that is available in the more central sub-villages, and also believed failed crops were caused by the "witchcraft" of the Sukuma. One elder said "if you take something, even a grain of maize, from a Sukuma farm you will not be able to leave the land, the Sukuma will place a spell on you to remain there on their land until the owner comes".

Though land use patterns differed between ethnicities, any intergenerational differences were not significant. This is largely because the majority of young adults, having completed school, assisted their parents on family plots. Many young men interviewed in the central sub-villages mentioned the lack of employment opportunities facing their generation. For those young respondents who had married and established farm plots, any effect of age on the degree of modern cultivation techniques used could have been masked by the significant effect that wealth and ethnicity had on cultivation techniques.

Agricultural expansion is occurring in northern Tanzania as a strategy to increase income and secure a food supply (Angelsen *et al*, 1999). The new land planning laws that give the village government control over land division put a limit on potential expansion, but the threat is there. External pressures from famine, drought and restricted land access may force people to look for agricultural land elsewhere. The visual remnants of the abandoned farms left in Makao by the Sukuma who were evicted last year makes this all the more apparent. All elder Sukuma farmers interviewed claimed that they used to produce a surplus of maize in their youth. This apparent decline in land productivity has been reported in other parts of northern Tanzania (the Iragw in Mbule District, Snyder, 1996). Those who farmed with more traditional techniques gave little

regard to the sustainability of their cultivation. Few inputs were added to the land, with low insecticide and natural fertiliser use (even though the Maasai had significantly more livestock than other ethnic groups). No households practised rotational cropping to restore soil nutrients. This, combined with the threats of Tanzania's increasing human population (Lovett *et al*, 2001), global warming (Homewood, 2004) and the expansion of subsistence agriculture may push land in Makao into a poverty spiral (Fig.15.). As the human population increases, more pressure is placed on the land, increasing vulnerability to crop failure and famine. Access to food was cited as "the main problem facing the village" for poorer households in the Makao.

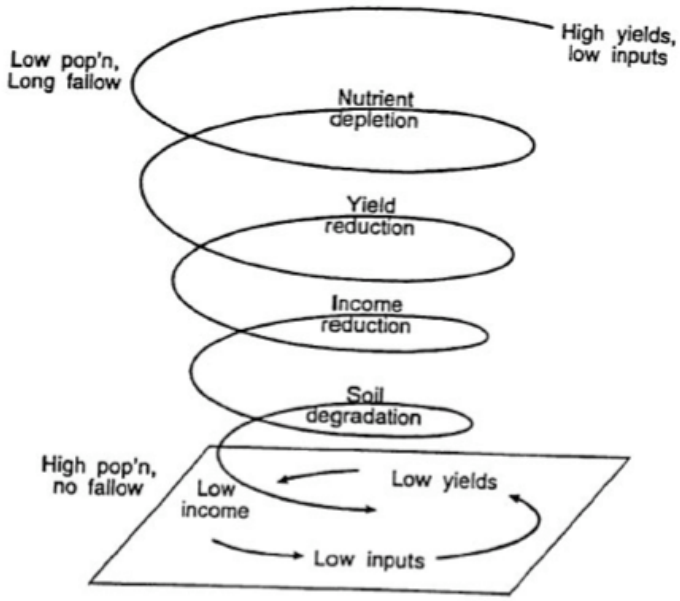

Fig 15. The poverty spiral of environmental degradation (Source: McCown *et al*., 1994)

Rainfall has recently been erratic in Makao, 60% cited too much rain, followed by drought, as the main limiting factor for crop production last year. A "catch 22" situation therefore results: poorer farmers are unwilling to invest much into the land because of the risk of unpredictable rainfall, but are at the same time jeopardising the long-term viability of their land by not using sustainable methods (Turner, 2005).

5.1.2 Pastoralism

Disturbance by the Mang'ati grazing their cattle on Makao farmland was cited as a problem by just below half of all households interviewed. For centuries, pastoralists have coexisted with wildlife throughout Africa (Sachedina, 2006). However the last hundred years have witnessed a dramatic decline in the common property resource lands available for extensive pastoralism (Lane, 1996). The herding system has experienced important changes in semi-arid lands in Kenya, where the population of herders has grown, while critical dry season sources of water and pasture have been lost to increased agricultural expansion and areas set aside for wildlife (Campbell *et al*., 2003). This exclusion from land inevitably results in conflict between land uses. The Mang'ati

in Makao felt the cost of restricted access to essential grazing land for their cattle and reported frequent conflict with local farmers after their cattle had damaged crops, and with local authorities when they were caught on reserve land. Perhaps as a result of this, as is seen in other parts of Africa, many herders have diversified their livelihoods to include agriculture, just as the Mang'ati are doing on the outskirts of Makao.

5.1.3 Wildlife Areas

The benefits from Maswa Game Reserve (MGR) were recognised by 51% of interviewees, with most citing the financial benefits through direct reserve fees that go to the village from RHS's use of MGR as a hunting concession. Although not significantly correlated with the age of interviewees, the response of MGR providing environmental benefits, through protecting wildlife and forests was given by all school children through focus groups. RHS has implemented an environmental education programme at the primary school, and its positive effects could be clearly seen. Children understood the incentives and benefits of conservation, and most, when asked about what they would like to do when they grew up, said they would like to be involved in tourism. However, significantly more young people saw the MGR as a provider of resources such as honey, charcoal and firewood, even though these activities are prohibited in the reserve.

Over half felt there is a cost of the reserve. The fact that 10% stated not being able to hunt wildlife within the reserve was a cost could be an indicator of the extent of poaching despite RHS anti-poaching operations in Maswa being one of the most successful (David Erikson, *pers. comm.*) or of an immutable cultural tradition of eating wild meat (Milner-Gulland *et al.*, 2003). The Hadzabe male hunters openly talked about hunting on a daily basis and said that there was a market for bushmeat amongst other ethnic groups. Human-wildlife conflict was stated as a cost by 12%. A much talked about issue within the village was the increase in elephants raiding farms. Harvest time had occurred just before we arrived in Makao and the general village consensus was that more elephants had been crop raiding than during any year previously.

A positive attitude towards the reserve was significantly correlated with ethnicity: more Sukuma saw the benefits of the MGR compared to the Nyisansu and Maasai. The Village Benefit Scheme is based on the belief "that local communities must play an active role in the conservation of wildlife and habitat and that they must derive tangible economic benefits to truly develop a sense of stewardship" (RHWF, 2006). There were significantly more Sukuma men employed by RHS than any other ethnic groups, whose recognition of the benefits of MGR may be because their salaries and active role in conservation does offer them "tangible benefits."

5.2 Attitudes Towards Hunting-Tourism

73% of individuals felt they benefited from hunting tourism as a community through social services and facilities provided to the village. 41% of people felt they benefited as a household. Again, this was significantly related to whether the individual had a household member employed in the hunting industry, and ethnicity.

Although RHS tries to ensure fair employment of Makao villagers and employs many Hadzabe, there was a feeling of resentment that the staff register does not rotate enough. The large disparity in wealth in the village is made more marked by the substantial income of three or four RHS full-time employees, who can even afford a car and electricity. Some complained that these families were favoured, although their long-term employment results from their being a skilled and respected part of the RHS team.

51% felt there was a cost of hunting tourism in the area, there was no difference in perception of cost, or particular costs, with ethnicity, age or whether a household member was employed. The majority of costs addressed the way in which financial benefits were handled in the village with people claiming that funds unequally benefited certain individuals or the village government, that projects were left unfinished and that decisions regarding benefits were not made in the participatory manner they should be. Other financial costs were people feeling exploited by the hunting company. One man said that the 3 million Tsh received in 2006 was "an insult" in comparison to what he knew RHS were making.

This is an inherent problem facing CBC efforts: it is difficult for everyone to benefit equally in a community, especially one as ethnically diverse as Makao. There is a danger in CBC that it is "often primarily expatriate safari operators and a few well-placed local individuals who benefit and in some cases, already poor local groups, are dispossessed" (Homewood, 2004). Many of the poorer members of the community, such as the Maasai, felt marginalised and isolated from the rest of the community. However, adhering to tradition is difficult in an evolving and developing community. The Masaai were the only group who consistently reported not feeling the same sense of kinship to other ethnic groups as they did with their own: thus making their integration and representation in the village more difficult.

The Makao village motto, recited at the start and end of village meetings is "Endeleo Makao," meaning "development for Makao." There is a distinct feeling of community empowerment in

the village. More people in Makao felt that land and wildlife management decisions were made in the village rather than by external, state control. Middle-aged villagers felt decisions were made within the village significantly more than the younger or older ethnic groups. However, the tendency for those who had been educated to think that decisions were made externally to the village, and that decisions should be further devolved to the village level, show a need for improved communication between stakeholders: particularly between RHS, the Village Council and community members. Current CBC policy of Tanzania sees local people as needing "technical advice" and "training" to manage natural resources more effectively (MNRT, 1998). However local knowledge of a resource could be valuable to conservation, through local responsiveness to temporal and spatial heterogeneity combined with an understanding of historical ecological processes (Goldman, 2003). If CBC policy were to incorporate more effectively, the knowledge of local people, perhaps a community such as Makao would begin to feel more stewardship over the land and wildlife they are protecting.

This study shows how individual costs and benefits make up the tapestry of the community in Makao. Ethnic groups differed in wealth, in where they lived, in how they farmed, and in how they perceived costs and benefits of tourism and the game reserve. Although Tanzania is less "tribal" than other African countries, because of Nyere's socialist policies in the 70s, village communities need to embrace the entire extent of the village, so that all needs of the community are represented. As much past conflict in Africa has shown, a democracy with so many ethnic groups with their own needs and beliefs is hard to achieve (Tyson, 1996). Development approaches that adopt simplistic notions of the community will fail to represent the reality of local condition in their considerations of policy (Campbell, 2003).

5.3 Development Priorities of the Village

A better road and transport to Meatu, and towards Arusha, was significantly placed as the first priority for development using funds from economic revenue. When asked why they wanted a road, people said it was to start businesses and seek employment. Other areas ranked as high priority were healthcare, improved water supply and education. These facilities have been provided by RHS' Village Benefit Scheme, however people felt that these areas should be expanded.

5.4 The Study in a Context of National Policy

A frequently cited aim of CBC is to improve communities' sense of stewardship of the resources which they are entitled to protect through receiving benefits directly from the resource (Milner-

Gulland & Mace, 1998). Respondents in Makao recognised the benefits at a community level and those that were employed recognised the benefits at a household level. However the costs of not being able to use a resource and not benefiting enough were frequently reported. The implementation of a WMA that included Makao could potentially give the community "full mandate of managing and benefiting from their conservation efforts" (MNRT, 1998). The overall policy goal of WMAs is to increase direct economic benefits that communities in wildlife-rich areas accrue from the wildlife on village lands (Nelson *et al*, 2006). Some of the key findings of attitudes and awareness to the proposed WMA in Makao highlight the shortcomings of Tanzania's WMA initiative.

50% claimed to have heard of the WMA, but only 21% knew any details of the proposed area. All of these were involved with the WMA community-based organisation (CBO) formed by each village to be involved in the management of the WMA. There is inherent risk in creating any new powerful institution. If the CBO fails to be transparent and accountable to the community, the community may not value the wildlife in the WMA as their resource (Nelson *et al*, 2006). There was a distinct lack of information shared amongst villagers in Makao. Many who had "heard" of the WMA said that only the CBO members had been "taken off and educated." There was no access to reports or literature, apart from the WMA Secretary's crumpled file, which he was reluctant to show us.

Those in the village that knew details of the WMA initiative in Makao, all commented on how long the process had taken, how they have just been "waiting" for the next feedback from the government, having submitted the Resource Management Zone Plan. Fig.16 shows the length and bureaucracy involved in the process of WMA application for a village.

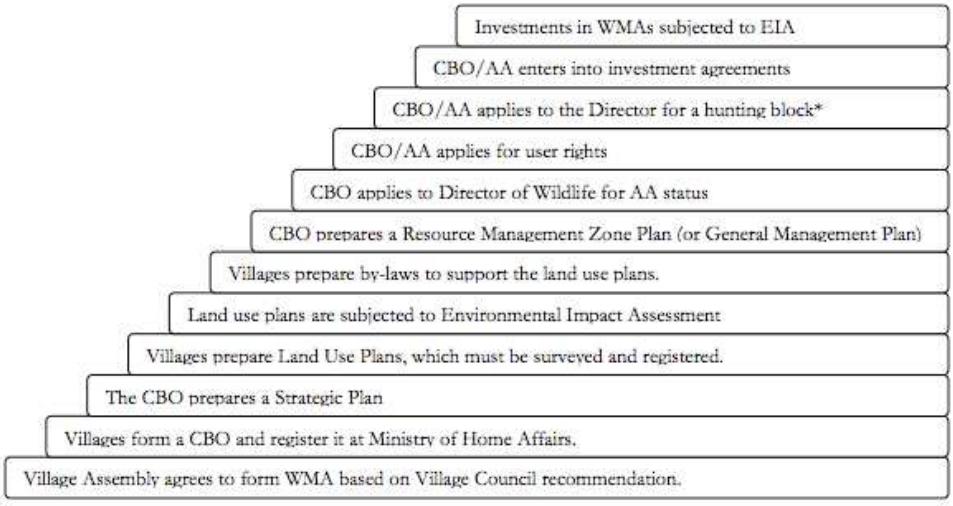

Fig.16. Twelve steps in forming a WMA (Source MNRT, 2002); CBO (Community-based organisation); AA (Authorized Association); EIA (Environmental Impact Assessment).

Ultimately the WMA initiatives are about the transfer of managerial authority over benefit from and capture of valuable wildlife resources. The question the success of WMA implementation hinges on is: will devolution ever truly occur? The CBO does not have authority for granting hunting blocks, which is ironic seeing that the main objective of WMAs has been to promote direct community benefits from hunting (Nelson *et al*, 2006). The WMA council members told us in meetings that the CBO did have the power to choose an investor, emphasising the lack of communication and clarity of policy between stakeholders.

By the middle of 2006, after three years of pilot WMA implementation, only four of 16 pilot areas had been gazetted, one had withdrawn from the process and two others had received very little external facilitative support and had made little progress (Nelson *et al*, 2006). In Nelson *et al's* 2006 interim evaluation of WMAs, three core recommendations are made for WMA policy and process. First, the design needs to be made simpler and more practical for communities, with the issue of benefit sharing made legally clear. Secondly, considerable external facilitation is required to ensure that the broader community is informed about the WMA process and its status, not just the CBO who are directly involved. Community concerns, conflicts and histories need to be openly discussed, and these individual costs and benefits addressed. Finally, WMA stakeholders need to work with the diverse array of public interests in the WMA process to foster the political will for implementation.

The devolution of management authority to the local level is inevitably a complicated and contentious reform issue that surrounds natural resource management in Tanzania, as in much of Africa. The future of conservation rests upon two questions: Will the central government cede control over management of wildlife areas to the community through WMAs? And will CBC conservation become truly "community-based", with hunting companies perceiving communities as advisors and partners, not just willing recipients of external aid?

Chapter 6 – Summary & Conclusions

This study has examined how differences within a community affect land use and attitudes towards conservation and land policy and has identified conflicts between the interacting land uses of herders, farmers and wildlife in a case study village in northern Tanzania. Through living in the community, being able to observe land use patterns, participatory exercises, backed up with more rigorous quantitative and attitudinal data gathered from semi-structured interviews, a thorough investigation into the Makao village was achieved.

However, the constraint of time limited the sampling size and consequent statistical analysis. The affiliation of the research team with the hunting company, and inevitable perception of us as "outsiders," no doubt introduced bias. An ideal analysis would have involved a more thorough investigation of the economics of livelihoods, looking into actual costs of benefits provided. However, to do this would require sampling a much greater number of respondents, especially with Makao's rich ethnic make-up. Age was difficult to investigate as an explanatory variable of attitude as young people, especially women, were apprehensive to voice their opinions freely. A less hurried sampling strategy and more time in the village could have achieved this.

Despite these deficiencies, I believe that the information gathered from this study provides a valuable insight into the benefits which accrue to communities from revenue as generated by a hunting company, and the challenges that face community-based conservation efforts. These findings, can be put in the context of CBC across Tanzania, as many of the insights represent major social and resource-based issues and conflicts that are relevant to most of Tanzania and, indeed, many African countries.

Chapter 7 – Recommendations

For the Community of Makao:

- The wide range of modern farming techniques in the village, especially inter-ethnically and between wealth groups, shows the need for communication between farmers. A farmers' union could be initiated from a truly bottom-up approach, where farmers can share information, resources (reused hybrid seed stocks), techniques and advice to increase agricultural sustainability, productivity and potentially reduce damage to the land.
- A positive shift in local policy is the implementation of village land laws whereby the Village Council control what proportions of village land are to be used for agriculture. However this could be further improved if the Village Council could meet with agricultural experts and learn how to increase yield economically, without increasing the land cultivated, so as to retain the future sustainability of land in Makao.
- Village Benefits should be directed to improving already existing infrastructure: on roads; on more staff and medicine at the dispensary; on improving existing water pumps.

For RHS and Developmental NGOs

- The methodology used in this study could be replicated across RHS', anthropogenic and geographic range of villages (and that of other developmental or conservation NGOs aiming at achieving a community-based approach) to gather basic socioeconomic data to understand the intricacies of the community. This may involve considerable on-the-ground infrastructure. However, a collaborative project such as this thesis, between NGOs and academic institutions, provides a good, non-biased baseline of socioeconomic research. With more extensive socioeconomic data for each village, donations from hunting clients could directly benefit an area of need. During the fieldwork, a client donated 100 pairs of sunglasses and bandanas to the primary school. All the children in the central sub-villages were wearing and enjoying them, however a group of parents suggested they could benefit from more practical gifts "like hybrid seeds or text books".

- There was evidence of miscommunication between stakeholders. Many in the village complained of corrupt local officials. Meetings regarding village benefits are carried out in a participatory way but the more marginalised members of the community need to feel empowered to participate. Many Maasai complained that their local chairman never got

his voice heard. RHS extension officers could facilitate the integration of the more peripheral sub-villages and ethnic groups.

- The environmental education programmes at the primary school were seen to have a positive impact on attitudes towards conservation. These could be expanded to specifically target more marginal sub-villages.

- RHS and other NGOs could utilise local knowledge and insights of natural resources to create their management policies.

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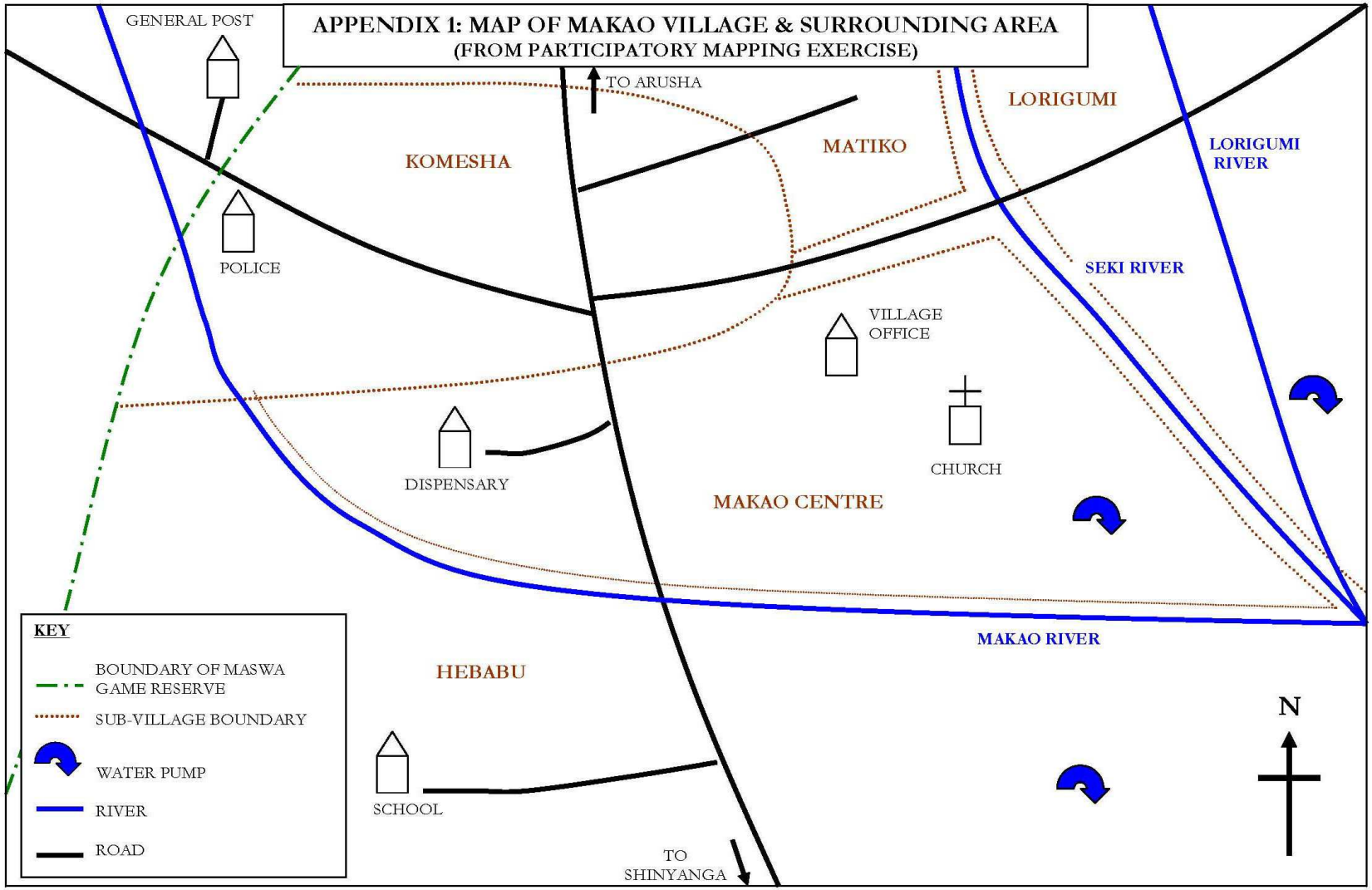
APPENDIX 1: MAP OF MAKAO VILLAGE & SURROUNDING AREA
(FROM PARTICIPATORY MAPPING EXERCISE)
GENERAL POST
TO ARUSHA
LORIGUMI
KOMESHA
MATIKO
LORIGUMI RIVER
POLICE
SEKI RIVER
VILLAGE OFFICE
CHURCH
DISPENSARY
MAKAO CENTRE
MAKAO RIVER
HEBABU
SCHOOL
TO SHINYANGA
N
KEY
BOUNDARY OF MASWA GAME RESERVE
SUB-VILLAGE BOUNDARY
WATER PUMP
RIVER
ROAD

Appendix 2

Modern Farming Score

All questions on agriculture referred to maize, since it was the most predominantly grown crop:

- Type of land preparation: 1= hand; 2 = plough; 3 = tractor
- Measuring out maize: Seed scattered randomly =1; Seed measured out with a rope = 2
- Tree planting: 1 = No; 2 = Because of government suggestion; 3 = anti-erosion.
- Soil added against erosion: 1=No; 2 = Yes.
- Trenches for irrigation: No trenches = 1; trenches for directing water out of farm = 2
- Insecticide use: 1 = no insecticide, 2 = post-harvest insecticide (added to harvested maize); 3 = pre-harvest insecticide (added to growing crop). Post and re harvest insecticide were not used together in any household.

A score was calculated: the higher the more modern the agricultural techniques used. The score was collapsed into factors: high, mid, low for Chi-squared and General Linear Model Analyses.

Appendix 3. Semi-structured Interview

A. Background Information

Informant number:	**Start time**
Household number:	**End time**
Sub village	**Name of head of household**
Gender	

1) How old are you (years if known/age set)?
2) What ethnic group do you belong to?
3) Did you go to school? If so, to what level?
4) Where were you born?
5) Why did you move to Makao?
6) When did you move here?
7) How many people live in Makao as members of your household – what are their ages and sex?
   Household defined as number of people sharing the same cooking and living facilities

B. Livelihood Life History

1) What is your main economic activity?
   A. Crop production
   B. Livestock production
   C. Both equally
   E. Business (state)
   F. Employment (state)

2) What is your main activity livelihood in terms of time?

3) For each person in the house what is his or her main economic and time activity?
   Interactive with cards of each major livelihood activity laid out: business, employment, agriculture, school, livestock, livestock & agriculture equally. Respondents put bean on each card representing number of household members involved in the activity)

C. Wealth

1) Do you or any members of your family own the following?
   Bicycle, radio, kerosene stove, car, electricity, mobile phone

2) Roof type: A. Grass & branch B. Tembe C. Corrugated iron

3) Wall type: A. Mud B. Earth brick C. Cement

D. Agriculture

1) Do you cultivate?
2) What is your reason for cultivating?
   a) Household consumption
   b) To sell
   c) Both equally
3) If you sell, what proportion of food produced from everyone in the HH' work is eaten as opposed to sold? *Indicate with a pile of beans*

4) What do you cultivate in the majority?
   What else do you cultivate?

5) What area do you cultivate? Acres and number of plots:

6) How long have you cultivated this piece of land?
7) What is the status of your land?
   a) Bought (how much and when?)
   b) Inherited
   c) Claimed
   d) Given
8) Do you have a lease?
   a) Village letter of transfer
   b) No lease

9) How do you prepare your land?
10) Do you measure out maize?
11) Do you plant trees? If yes, why?
12) Do you have trenches irrigating your land?
13) Do you use insecticide?
14) What type of seeds do you use?

15) What future plans do you have for changing acreage and plot sizes?
   a) Increase
   b) Decrease
   c) Stay the same
   d) Don't know

16) Do you keep any livestock (If yes state numbers and type)

E. Interactions With Land Use

1) Can you tell me about the factors that have improved and that have limited your production this year, both for crops and for livestock?
   How often? (daily, weekly, occasionally, rarely)

2) How has your livestock keeping or crop growing affected been affected by other people's livestock/crop growing?
   List if positive List if negative

3) Has there been a change in the amount of crop production and livestock production over the last year?

   Since you were a child/first moved to Makao?

F. Hunting Tourism

1) Is there tourism in this area?
2) Do you know any details about the tourism in this area? If yes,

State

4) Do you currently receive any economic benefits from wildlife? *(These might be directly from the wildlife itself or from people or organisations who are involved with wildlife in some way)*
   As a household? *Describe if Yes*

   As a community?

   Certain individuals within the community?
5) Do you see any costs or benefits from tourism in this area?
   Costs Benefits

6) What are the costs and benefits from the presence of Maswa Game Reserve?

G. Perception of Problems

1) Are there any problems facing the village?
2) If Yes, what do you think is the most significant problem?
3) What would you do with the wildlife benefits if you were in charge of them, for the community?
4) Please rank in order of where you would like to see economic revenues from wildlife spent?
   (*Water supply, individual loans, farming equipment, roads, education, health care, forestry)*

H. Policy

1) Have you heard of Wildlife Mangement Areas? (WMA) (Yes or No)
2) Hat do you know about WMAs?
3) Decisions regarding land and wildlife management are made

a.) Within the village:
1= Strongly agree, 2=Agree, 3=Indifferent, 4=Disagree, 5=Strongly disagree
b.) External to the village
1= Strongly agree, 2=Agree, 3=Indifferent, 4=Disagree, 5=Strongly disagree

Any questions or comments?