

# **Habitat Fragmentation, Livelihoods and Conservation: Implications for Tarangire National Park**

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## ABSTRACT

This study set out to investigate habitat fragmentation and its implications for wildlife conservation. It focused on Emboreet Ward in the Arusha region of Tanzania, which is in close proximity to the Tarangire National Park. This area, traditionally occupied by the Maasai pastoralists, has undergone several changes, not least of which are changes in the local livelihoods in response to a need for cash and deterioration of state support for animal health care. Dominating these changes is a shift in livelihood strategies from pastoralism to a mix of pastoralism and cropping.

Increasingly, land is being cultivated and agricultural opportunities are changing lifestyles, livelihoods and habitat integrity for wildlife. Fragmentation of habitats outside the national park has serious implications for the future of pastoralism and conservation, especially since some species of wildlife migrate seasonally between this park and the adjoining plains. It also has significance for the Maasai whose approach to domestic livestock management is deeply rooted in a culture that does not comfortably accord with the market economy.

The study adopted a case study approach, was mainly qualitative, and relied on both primary and secondary data sources. Interviews played a critical part in sourcing primary data from the respondents. Documentary analysis was critical to gathering secondary data.

The study shows the future of Tarangire National Park to be intricately woven into the complex and dynamic interaction between the changing economy, the responses of the Maasai whose culture separates them from the market economy, migrants into the area, and the government agencies whose intentions appear to be neither clearly expressed nor interpreted. The study concludes that empowerment lies at the heart of the envisaged change. This is shown to be a necessity for all stakeholders operating within a proposed integrating structure.

DECLARATION

I, Jacob Thomas Porokwa do hereby declare to the Faculty of Science and Agriculture, University of Natal, that this thesis is my own original work except where acknowledged, and has never been submitted for a degree award at any other University.

Signature: Jacob T Porokwa 21 August 2003  
Jacob T. Porokwa Date

Signature: [Signature] 20 August 2003  
Prof Charles Breen (Supervisor) Date

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## **DEDICATION**

I dedicate this thesis to my parents Thomas and Monique for their love and eagerness to take me to school when I was a child, and their wisdom that makes me proud of them.

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## CHAPTER 1

### INTRODUCTION

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#### 1.1 Introduction

East Africa is internationally famous for its wildlife and wide-open spaces. At the same time, it is well known that its human population is growing at a very high rate, up to 4% annually (Scoones, 1995). A large number of National Parks have been set aside for the purpose of nature conservation and for public enjoyment. Efforts are also made to safeguard these areas. Growing human populations will necessarily lead to ever increasing pressure on the land in general, and hence, on National Parks. In this research attention is drawn to the problem of conflict in land use, between on the one hand nature protection, and on the other agriculture and pastoralism, using Emboreet Ward in northern Tanzania as a case study (Figure 3.1).

In Tanzania, the protection status of an area can range from National Park, which has a near-absolute protection apart from mining and national security, to reserves where many economic activities are banned and where land use has to be compatible with protection of natural resources, to game controlled areas in which hunting is allowed but regulated. It is unquestionable that protecting nature has not only non material or ethical aspects to it but at the same time, it has economic consequences related to foreign currency earnings that require an integrated land use plan within the boundaries of the area (Hulme and Murphree, 1999). It is also obvious that people who live near the wildlife areas bear burdens of the impacts of wildlife. In this sense conflicting needs and land uses are explored by the study as well as the needs of the people as conditions force them to opt for alternative land uses as a coping strategy. It is also becoming apparent that at present, the future of the Tarangire National Park is at stake due to the increase in these coping strategies outside of the Park.

## 1.2 Research questions

- Why and how has agropastoralism grown in Emboreet Ward?
- What have been the implications for wildlife management of this growth in agropastoralism?
- What actions can be taken to reconcile agropastoralism with wildlife management?

## 1.3 Aim and objectives

### *Study Aim*

The aim of this study is to find out if the current park-neighbour interface is contributing to the disruption of wildlife integrity in the Tarangire-Emboreet area. It also aims at studying the presence, effectiveness and implications of various controls, policies and mechanisms for promoting the integrity of the area.

### *Objectives:*

- To assess the causes and manner of growth in agropastoralism in the Emboreet Ward.
- To assess the implications for wildlife management of this growth in agropastoralism.
- To assess the impact of Tanzania National Parks' (TANAPA) Benefit Sharing Scheme in resolving habitat fragmentation in the area.
- To recommend actions that could be taken to reconcile agropastoralism with wildlife management.

## 1.4 Assumptions

The following assumptions are tested in study:

- Agropastoralism is increasingly changing land use patterns in the Emboreet Ward.
- This change in the land use has resulted in habitat fragmentation, leading to a change in the relationship between wildlife and livestock. As a result of this change there is a conflicting relationship between people and wildlife, hence conflict between the Park and local people.

- Interventions such as TANAPA's Benefit Sharing Scheme may not be enough in themselves to produce a positive impact in this relationship.
- Wildlife, land and agricultural policies are also fragmented and need to be integrated.

### **1.5 Structure of the dissertation**

This study is divided into seven chapters. The first chapter introduces the study by stating the problem to be explored. It also outlines the structure of the study. The second chapter considers National Parks, neighbours and the changing conservation paradigm in Africa, by exploring processes that sustain the existence of both people and wildlife. This chapter contends that the paradigm shift calls for a recognition of the requirements for ecosystem concerns and steps towards achieving them. The chapter raises the issue of the need for sustainability of conservation as reflected in maintenance of protected areas and the process that supports them which are not secure in many parts of Africa. The call here is for conservation to become more sustainable. It concludes that conservation should be regarded as a way of thinking that influences the behaviour of people. The third chapter presents a framework for the analysis of the research problem. It presents a mental model that explores various elements that need to be considered in studying and understanding issues regarding fragmentation of habitat in the Emboreet Ward.

Chapter four introduces the study area by exploring specific relevant characteristics. While this chapter gives a description of these characteristics, they are not all addressed in the later chapters. The aim is to provide the reader with contextual information so that whatever emerges at any stage can be more clearly understood. The chapter therefore, covers issues such as the location of the study area, population and settlement, climate, wildlife, livestock, socio-economic features, major land uses and some concluding remarks. Limitations of various methods that are used in this research work are considered.

The fifth chapter presents the findings of this research work. It presents the findings in specific themes. The tables and maps that are used in the chapter do not only summarize specific findings, but also act as important elements in representing what was gathered in

the field. Chapter six presents the discussion of specific issues that emerged from the previous chapter. The aim of this chapter is to discuss the findings and interpret them in the context of achieving the intentions of conservation. Guided by the conceptual framework that was developed in Chapter three, the discussion explores the way in which the conceptual framework, related to the findings, can be useful in understanding problems and issues that commonly underpin the relations between people, park officers and wildlife in general. The chapter concludes with policy implications that emerge from the findings. The last chapter (Chapter seven) draws conclusions and makes recommendations regarding this study. The findings show that habitat fragmentation is a complex issue with many interrelated causal processes and emergent properties. Actions that can be useful in establishing an integrated biosphere area as a possible solution to the problems of habitat fragmentation in the Emboreet Ward are identified.

## CHAPTER 2

### NATIONAL PARKS, NEIGHBOURS AND THE CHANGING CONSERVATION PARADIGM IN AFRICA

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#### 2.1 Conservation in pre-colonial Africa

Prior to colonialism in Africa, substantial portions of wildlife resources were under communal management regimes. Most of Africa's natural resources were managed under a wide and creative range of common property and communal tenure arrangements (ART, 1999). These tenure arrangements suited low population densities and allowed for migration of people and wildlife and other responses whenever natural resources became degraded (Matowanyika, 1998; Murombedzi, 1995). Natural resource-based land uses such as hunting and gathering, constituted the primary livelihood strategy of the local people. These were supplemented by subsistence agriculture as well as nomadic pastoralism. Together, local people occupied communally owned tracts of land as part of their survival strategy. Local traditional systems of authority and responsibility effectively regulated the use of wildlife resources (Kiss, 1990). The institutional arrangements favoured sustainable use of natural resources. These arrangements provided for a system of traditional governance that regulated the use and conservation of resources. Both locally and in a larger area, the same traditional systems also regulated social relations among people, as well as the way they related to natural resources, particularly wildlife (*ibid.*). Conflict with regard to the overlap in the use and management of wildlife resources was resolved within the traditional institutional arrangement. This system promoted sustainability in the manner in which natural resources were managed and used (Kiss, 1990; Child, 1995).

#### 2.2 Conservation in the colonial era

Traditional land use systems existed for centuries prior to the coming of the European settlers to Africa. The dawn of colonialism saw the beginning of a new direction in the management and use of wildlife resources (Murphree, 1996). Colonialism introduced new power relations between the colonialists and the local indigenous people. The new

power relations also affected the traditional authority system. This change did not only affect the political and social arrangement of local governance, but it also promoted a new trend in the management of wildlife and natural resources in general. Specifically, the colonial period saw the alienation of land by the state to establish national parks and game reserves (ART, 1999). The new colonial system introduced the concept of 'protected areas' in the form of national parks and game reserves, from which local people were excluded. The establishment of national parks meant setting aside certain natural resources from people. In many African countries, the establishment of national parks was not so much the acceptance that the principle of national parks was morally correct, but rather it was the attempt by the colonial state to implement its economic and social interests (Carruthers, 1989).

Although many issues were intertwined in the creation of national parks, there is no doubt that conflicts arose. Not only did conflict arise because of the establishment of these parks, but also because people were excluded from accessing this 'new' form of land use. Local people, who resided in the areas that were designated as parks, were forcibly removed and neighbouring people were barred from access to wildlife resources. Local people were regarded as 'poachers' and intruders. They began to consider parks as 'enemies'. Referring to this, Hulme and Murphree (1999) observe that wildlife was no longer regarded as a resource but only as a liability - someone else's property to either be tolerated with resignation, or destroyed, covertly if possible. Resistance offered by these local people to being excluded and controlled by national park authorities, and to the withholding of game and pastures was almost continuous throughout the colonial period (*ibid.*).

### **2.3 Conservation in post-colonial Africa**

The post-colonial era saw the independence of African countries from colonial rule. While the new nation states could now rule themselves politically, conservation policies and practices were still dominated by the colonial legacy. The management of national parks continued the way it used to be during the colonial period (Gibson, 1999). The lack of effective participation by local people in the decision-making and benefit distribution



processes from wildlife resources continued to dominate this period (*ibid.*). Much of what was contained in the colonial conservation legislations was carried forward by the independent states. Governments, for instance, implemented policies, legislative and institutional frameworks for wildlife management without effective local people's participation (Barrow and Murphree, 1999). This has often resulted in conflicts between government structures and local people, leading to further uncontrolled and unsustainable utilization of wildlife resources (*ibid.*).

While many African countries continued to claim parks as their national heritage, neighbouring rural people had traditionally seen wildlife as a gift of nature (Abrahamson, 1985). Due to the continued policies and laws that alienated parks from people, the latter have frequently viewed national parks and wildlife not as a valuable commodity but as a threat and nuisance. This attitude has fomented acrimony between national parks and neighbours. In the simplest terms, neighbouring communities have continued to bear the significant costs of living with wildlife, but have progressively been excluded from obtaining meaningful benefits from it. Not surprisingly, the relationship between people and national parks has continued to deteriorate and neighbouring people have continued to express the feeling of dispossession of their land (Kangwana, 1993).

While it may be acceptable that national parks have been increasing in numbers throughout Africa, this has been insufficient to protect wildlife migration routes. The wildlife that migrates outside these protected areas continues to face survival problems. Regardless of the protectionist approach that the national parks have inherited from the colonial period, wildlife corridors and migration routes have continuously shrunk. In some areas decline and extinction of species through poaching, human settlement and habitat disintegration has alarmed the management of these parks (Ngure, 1995).

## **2.4 Governments' response**

The response of African governments to the alarming depletion of wildlife and wildlife habitat outside protected areas is not unanimous. Two types of responses can be discerned. The first was for the governments to revisit their legislations in order to allow

local participation in wildlife management. This response manifested itself with minor changes in conservation legislation (Rondinelli *et al.*, 1984). The second response, which was more common, was the intensification of law enforcement operations to combat poaching and other ‘illegal’ activities. This involved human and resource intensive techniques such as the employment of law enforcement personnel, purchase of more patrolling vehicles and ammunition.

But neither the changes in legislation nor the intensification of law enforcement operations have altered the reality that the livelihood patterns of the local communities have been disturbed. The inability of the state to protect wildlife was constrained by the financial crises that engulfed most African countries in the 1980s. The structural adjustment programmes that were introduced by the International Monetary Fund (IMF) and the World Bank (WB) forced national governments to reduce the services they rendered to people, and hence the capacity to safeguard natural resources (Wunsch, 1984). This crisis occurred amidst other pressing social, economic and political needs of the time. Moreover, the increase in human population intensified the need for neighbouring people to utilize wildlife resources. These problems fueled the historical conflicts that existed between national parks and their neighbours. While the state and national parks in particular, tried to protect their land, loss of unprotected habitat has severely limited the range for wildlife (Barnes and Lahm, 1997). These realities could not help the envisaged reduction in poaching nor secure habitat integrity as hoped for earlier on by the national parks and conservation agencies.

## **2.5 ‘Parks and neighbours’ as a conservation strategy**

While conservation in Africa deteriorated in the 1980s, a new conservation approach was emerging. “ Conservation policies and agencies in Africa came under heavy fire in the 1980s. The charges against them were both empirical and conceptual. Evidence from many countries indicated that conservation goals were not being achieved. Increasing rates of illegal off take on many mammals (most obviously elephant, rhinoceros and gorilla but also many less charismatic species) were interpreted as bringing many species to ‘the edge of extinction’” (Hulme and Murphree, 1999:1). It is also evident that the

impact of the advance of agriculture and livestock grazing frontiers into wilderness areas is resulting in irreversible loss of habitat (*ibid.*). Traditionally, conservation focused on the preservation of flora, fauna and scenic landscapes at the expense of some people. But major changes have occurred in the past two decades. There is a shift in approach from 'parks without people' or 'fences and fines' or 'island parks', to a more embracing 'parks and people' approach (Bergin, 1996).

There is a growing recognition that national parks are becoming islands surrounded by an ever-expanding human population. It has been proven to the authorities that there is a need for a change in their conservation strategies. National parks management has to trade between their initial strategies of being reactive to their neighbours, to their being more proactive. They have realized that protected areas will only continue to exist if their management strategies are changed. They have also developed a growing realization that in many instances, they are dealing with a resource (game) that migrates out of their judicial mandates.

It has become evident to the national parks and conservation agencies that "...saving Africa's wildlife and wilderness requires action on a grander scale. Wildlife needs more space to find food and shelter and to reproduce than parks can provide. When wild animals roam beyond protected areas onto populated land, people have a greater incentive to protect them if they benefit from their presence."<sup>1</sup> Parks in Africa are forced to pursue this new conservation paradigm. It is the matter of their continued survival that drives them to do so rather than mere interest.

Beyond the level of the national parks, there are other strong forces driving a move away from the conventional style of strictly protected areas to one of community-based solutions. This conservation approach is fostered by many conservation agencies worldwide, as well as in Africa. In the six categories of protected area management, the World Conservation Union (IUCN) has identified category six as a type of protected area that is envisaged to be of great importance in the future (IUCN, 1994a). According to the

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<sup>1</sup> <http://www.awf.org/news/8>

IUCN, category six is called Managed Resource Protected Area. This is defined as, an “Area containing predominantly unmodified natural systems, managed to ensure long term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs” (*Ibid.* 1994a: 24). In the light of this, the IUCN draws the attention to the global significance of ecosystems as networks that are connected by areas of natural and semi-natural habitat, in which protected areas, corridors, rehabilitation zones and sustainable land practices can be reconciled (*ibid.*).

The United Nations Environment and Social Council’s (UNESCO) programme on Man and Biosphere (MAB) is another input in the changing conservation paradigm. The MAB programme is one of establishing a sustainable balance between the goals of conserving biological diversity, promoting development and maintaining associated cultural diversity.<sup>2</sup> Biosphere reserves are locations of marine or land areas or both, which are internationally recognized within the UNESCO’s MAB programme. Like in the IUCN’s definition of category six, the MAB approach to conservation aims at promoting the concept of sustainable development on a local scale. The MAB programme contends that national parks and other categories of strict protection of biodiversity are not self-sustaining (*ibid.*). That is, they cannot ensure the continued survival of biodiversity by themselves. Instead, they should act as cores, while the establishment of extensive areas of multiple land use and cultures should be enhanced. It is fair to say that the MAB programme areas have important roles as refuges for culture, and fulfill a liaison function between conservation and development. This is a critical function in places such as national parks, where the pressure of economic policies can contribute to loss of genetic biodiversity and ecosystems (Wangari, 1997).

The African Wildlife Foundation’s (AWF) heartlands programme is another significant move in the changing conservation paradigm. “Heartlands are large African landscapes of exceptional wildlife and natural value extending across state, private and communal

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<sup>2</sup> <http://www.unesco.org/mab/docs/stry-1.htm>

lands.”<sup>3</sup> Like the other approaches to conservation, the AWF’s heartlands initiative states that wildlife and wilderness areas require action on a larger scale rather than a smaller scale. Wildlife needs much space to fulfil its natural processes. The AWF holds that it is only through the inclusion of the socio-economic needs of the local people that these people gain a greater incentive to protect wildlife (*ibid.*).

The Peace Parks Foundation is a further example of the recognition of the need to change the conservation approach. The Peace Parks Foundation is a joint sub-regional initiative in southern Africa. It has re-introduced the concept of trans-frontier conservation areas, which was introduced for the first time by IUCN (1994a). The trans-frontier conservation areas, or Peace Parks, are defined as “...relatively large protected areas, which straddle international frontiers between two or more countries and cover large-scale natural systems encompassing one or more protected areas.”<sup>4</sup> The philosophy underlying Peace Parks is that through the amalgamation of adjacent trans-frontier parks, large tracts of African wilderness areas will be conserved for the good of wildlife and for sustainable livelihood options. Thus, saving wildlife habitat and improving the livelihood of the local people will act as incentives for more conservation (*ibid.*).

## **2.6 Decentralization as a response to park-neighbours tensions**

In their effort to become more proactive to the tensions that the park-people interface has generated over time, various African countries have adopted a decentralized approach to natural resource management. Decentralization could be defined as “...the devolution of central state assets and powers to local or private decision-making bodies: representatives, local government, local administrative branches of central government, non-state organizations (NGOs, cooperatives, associations etc.), or private individuals and corporations” (Ribot, 1999: 27). Randinelli (1984) concurs with this definition. He goes further to explore four dimensions of decentralization. The four dimensions are: deconcentration, delegation, privatization, and devolution. Further description of the four dimensions is given below according to Randinelli (*ibid.*):

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<sup>3</sup> <http://www.awf.org/heartlands/>

<sup>4</sup> [http://www.peaceparks.org/content/assist\\_us/story.php?type=profile](http://www.peaceparks.org/content/assist_us/story.php?type=profile)

- Deconcentration is the handing over of some amount of administrative authority to lower levels of central government.
- Delegation is that dimension of decentralization that relates to the transfer of managerial responsibilities for specifically defined functions to organizations that are not in the regular bureaucratic structure and that are not controlled by the central government.
- Privatization could briefly be described as the transfer of certain central government functions to private individuals or privately owned organizations.
- Devolution on the other hand, could be defined as the institutionalizing of sub-national units of the government through the creation of financial and legal frameworks.

## **2.7 Decentralization in the framework of CBNRM**

In Africa, and more precisely in southern Africa, decentralization of natural resource management has been applied within the framework of Community-Based Natural Resource Management (CBNRM). The term 'community-based' distinguishes CBNRM from the conventional understanding of community natural resource management (CNRM). CNRM refers to a community having full-scale control and autonomy over the management of natural resources. It assumes that indigenous knowledge, norms and institutions have evolved over a long period of time to the extent that local people are capable of managing their natural resources (Clay, 1988 and Berkes, 1989). CBNRM makes for a dedicated commitment to the conservation of natural resources by the community amongst others. Two key issues emerge in CBNRM. Firstly, it is not always true that all changes in resource status are primarily the result of human action or intervention (Leach *et al.*, 1999). In recent advances in ecological theory it is suggested that time span limits the ability of man to realize other key factors that determine changes in trends of natural resources (*ibid.*). Secondly, the conditions and circumstances that favour community autonomy on natural resource management are becoming more and more restricted. Unlike the past few decades where the human population was low, today

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it has increased. This has imposed much pressure on the use of natural resource (Hulme and Murphree, 1999). The need to make a commitment to the conservation of these resources seems to be the only option for the future.

It is along this line that the CBNRM philosophy argues in social and policy terms that species, organisms and ecosystems are dependent on each other. They all need to be maintained, nurtured and improved to make them continue to exist. Without the ecosystem, organisms and species would not exist, and vice versa (Rihoy *et al.*, 1999). Steiner and Rihoy (1995) define five principles that form the basis for CBNRM:

1. Giving a resource a focused value leads to effective management of natural resources. This principle entails the fact that a resource must have a measurable value for the community to perceive it to be worth managing.
2. Differential benefits must stem from differential inputs - those communities living in close proximity to the resource and thus bearing higher costs should receive higher benefits than those living away and who do not bear the costs.
3. Both the quality of management and the magnitude of derived benefits must be positively correlated.
4. The unit of proprietorship (i.e. who decides) should be the same, as should the unit of production management and benefits. The community that manages the resources should form the management institution.
5. The proprietorship unit should be as small as practicable, within ecological and socio-political constraints. This means that small and organized social groups are better at managing themselves than large disorganized and anonymous groups.

Among the key mechanisms that have been developed to implement CBNRM in Africa is Community Conservation. Community Conservation is a strategy for the attainment of conservation objectives that is based on the inclusion, rather than exclusion of local people's needs and aspirations (Bergin, 1996; Western *et al.* 1994; Hales, 1994;). Hulme and Murphree (1999) identify three major types of Community Conservation approaches as follows:

1. Community-Based Conservation (CBC): this is a process of devolving control over natural resources to a community for sustainability as its main objective. This model has become dominant in the southern African region. The Zimbabwe Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) is a vivid example of CBC as a form of CBNRM. The Living In Finite Environment programme (LIFE) in Namibia also develops along these lines (*ibid.*). These, along with other CBNRM programmes are explained in more detail later in this chapter.
  
2. Collaborative Management: this is a form of Community Conservation that seeks to create agreements between local communities or groups of resource users and conservation authorities for negotiated access to natural resources, which are usually under some form of statutory authority. In Uganda, for instance, some sections of Uganda Wildlife Authority's conservation programmes take this form (*ibid.*).
  
3. Protected Area Outreach: this is a type of community Conservation that attempts to facilitate the integrity of biodiversity at Parks and Reserves level, by working to educate and benefit local communities and by incorporating protected areas in local plans. Community Conservation Services (CCS) in Tanzania National Parks Authority falls within this category (TANAPA, 1994).

## **2.8 Selected models of CBNRM programmes in southern Africa**

The previous discussion has shown that the search for solutions to the depletion of Africa's natural resources has been driven by tensions that are deeply rooted in the interactions between socio-economic, political and cultural changes on one hand, and natural resource management on the other (ART, 1999). This has prompted African countries (particularly in southern Africa), in the past two decades to focus on the establishment of community-based solutions. They are commonly referred to as Community Based Natural Resource Management systems (CBNRM) (Steiner and Rihoy, 1995; Dimbi, 1998; Maughan-Brown, 1998; ART, 1999; Namanha, 1999; Abacar,



2000). The approaches to CBNRM in the southern Africa region have been viewed in a manner of ‘adaptive management’, meaning that they are context specific. They are based upon specific context-related issues.

In southern Africa, several countries have adopted various management approaches within the framework of CBNRM. The following examples from Zimbabwe, Zambia and Namibia substantiate this support for CBNRM. In Zimbabwe, the CBNRM process involved the establishment of the CAMPFIRE programme. This aimed at decentralizing the wildlife sector. The CAMPFIRE programme is a shift in the perspective of wildlife management in Zimbabwe. It strives to involve rural communities in conservation and development by returning to them the stewardship of their natural resources and by harmonizing their needs with those of wildlife. CAMPFIRE operates in communal lands around national parks and other wildlife areas. Although CAMPFIRE creates buffer zones around national parks, its aim is two-fold; one is to prevent national parks from becoming islands in the sea of human development by making wildlife valuable to people. The other is to facilitate a debate between local people and the conservation authorities on the management of national parks and other protected areas, by joint planning for co-management of these areas (Rihoy, 1999; Johnson, 1998).

Zambia is another example of a country that has established CBNRM programmes. This has taken the form of an Administrative Management Design Programme for Game Management Areas (ADMADE). This system has evolved within the wildlife sector and it is still focused largely on wildlife. The ADMADE programme is the primary mechanism for the decentralization of wildlife management functions in Zambia (*ibid.*). While it relies heavily on traditional structures, ADMADE was first introduced in 1979, to involve local people in reducing poaching, particularly that of elephant and rhinoceros, in national parks and Game Management Areas (GMAs). It was only in 1993 that the government endorsed ADMADE as a CBNRM approach in Zambia. ADMADE devolves limited rights to traditional authorities to manage wildlife in GMAs through a community-based wildlife management area. The wildlife management area brings together local traditional leaders (chiefs), national parks and wildlife service personnel

and government technical staff and commercial businesses. Their task is limited to the adoption of wildlife management programmes proposed by unit leaders. They are also responsible for budget approval to support ADMADE and local community development projects (*ibid.*).

Namibia has also developed a CBNRM programme called, Living in a Finite Environment (LIFE). This programme was established in 1993 as a partnership between the government of Namibia and that of the United States of America, the World Wide Fund for nature (WWF) and other conservation NGOs in Namibia. LIFE's objective is to support the institutional strengthening of Namibia's organizations for common property resources management. Particular attention is given to wildlife and tourism resource management. The philosophy behind this approach is that when people are given the rights and responsibilities to manage their resources, they in turn develop a sense of ownership and responsibility. Furthermore, when they are empowered through their institutions and through economic incentives, they manage the use of the resources sustainably (Ashley, 1998; Hagen *et al.*, 1998a; Hagen *et al.*, 1998b; Rihoy *et al.*, 1999; Johnson, 1998).

It has been shown through literature that CBNRM philosophy originates from decentralization processes. CBNRM is linked to decentralization in that the former is decentralization of natural resources management to the community level that can vary from household to village level. The CBNRM principles of benefit sharing, participation, and empowerment of local people are at the core of decentralization. Nevertheless, while various CBNRM initiatives and programmes promise to empower local communities, true community-based natural resource management is rare. Little and Murphree (1994) indicate that of the case studies they reviewed very few actually constituted true community based natural resources management.

## **2.9 The changing conservation paradigm**

To this end one would ask oneself: how does what has been said so far lead to the changing conservation paradigm? Among the important issues that emerged from the foregoing discussion, the following need to be emphasised:

- The classical approach of parks as ‘islands’ cannot help to secure the integrity of protected areas. An alternative approach must be sought to complement the classical approach (Bergin, 1996).
- Governments cannot conserve alone without appealing to people.
- However, the emerging CBNRM approaches do not seem to fill the gap that the classical approach created (that of disjoining the natural connectivity of ecosystems, people, wildlife and land). Partnering communities does not necessarily lead to conservation.
- An appeal to the core values of society as well as the needs of wildlife must be engaged in the conservation agenda. It should focus on a changed behaviour in the way people live (Breen, pers. comm. 2002).

A set of ideas and initiatives of local and international prominence were introduced in the past to the conservation agenda. According to Hulme and Murphree (1999: 1), “...first is that conservation should involve the community rather than being purely state-centric. Secondly, the concept of ‘sustainable development’ has promoted the notion that the things to be conserved (species, habitats or biodiversity) should be viewed as exploitable natural resources that can be managed to achieve both development and conservation goals...Thirdly and in keeping with neo-liberal thinking that dominated the late 20<sup>th</sup> century, are ideas that markets should play a greater role in shaping the structures of incentives for conservation.” Whilst Hulme may have rightly summarized the evolution in the thinking on conservation that we have been discussing, one critical issue is still unresolved. That is, there is much more to the way one should perceive conservation than linking it with ‘community’, ‘sustainability’ and ‘incentives for conservation’.

The approach of conservation has to be defined differently from how it was defined in the past, namely “species survival” approach. The new paradigm has more to do than merely concern itself with the things, places and locations that MAB, category six of the IUCN and the Peace Parks Foundation seem to advocate. The new paradigm is more than looking at the parks-people interface, as has been the case with CBNRM in southern Africa to date. There is no doubt that CBNRM has progressed beyond the paradigm of

‘parks as islands’ (this has been considered earlier). There is nothing wrong with these CBNRM approaches. They are brave attempts to pave a way forward for conservation. Nevertheless, although admirable, they will never be sustainable as long as they are suited to the old style of conservation. These approaches contain only a few of the many valuable ingredients of the new paradigm of interconnectedness of natural systems (a mosaic of life). The new paradigm moves towards protecting this ‘interconnectedness’ of natural systems and livelihoods, and there is a growing realization that we are failing to achieve this (Breen, pers.comm. 2002). There is a need to achieve this mosaic of life through a myriad of approaches, apart from managing the protected areas and the parks-people interface alone.

Conservation is heading towards a new philosophy. This is a philosophy, not of the things we do (such as conserving through protected, disjointed areas like national parks to preserving species), but rather of the way we live. It is more concerned with the way in which we do the things we do. It is a philosophy that really guides our behaviour and the processes that influence this behaviour (*ibid.*). The new paradigm is concerned with sustaining the processes that lead to the interconnectedness of natural systems. It poses an important question on how we sustain the processes that underpin the very conservation we are trying to advocate (*ibid.*).

In summary, the new paradigm strives to explore processes that sustain the existence of both people and wildlife. This paradigm shift calls for a recognition of the requirements for ecosystem concerns and steps needed to achieve it. It raises the need for sustainability, not of single units such as protected areas, but of life as a whole (*ibid.*). An example of the need to revisit our thinking could make this point clear. Speaking of the need to reconsider the consumptive behaviour of people as a barrier to ecological sustainability, McClerry (2000) says that the flaw in ecological sustainability is that, in the face of stable or increasing resource consumption the effect is to shift the burden and impacts of that consumption to ecosystems elsewhere. Although McClerry refers to the American context, there is no doubt that what he says is also relevant to Africa. It is this flaw in the thinking on ecological sustainability that the new paradigm strives to avoid.

Conservation should be regarded as a way of thinking that influences the behaviour of people.

## **2.10 A framework for the analysis of the problem**

### *2.10.1 Setting the context*

The majority of the Emboreet Ward inhabitants are considered to be pastoralists (Ecosystems, 1980; Muir, 1994; Ndagala, 1990). They depend on their livestock for subsistence needs, without having to practise agriculture. In times of hardship and drought, they have sold stock to purchase grain to supplement their diet. However, many have begun to cultivate maize for their use as well as for obtaining cash. This transformation from livestock keeping only to both livestock and agriculture (agro-pastoralism) can be attributed to various reasons. A steady population increase in the area may be one of them (Muir, 1994; TCP, 1998). In recent times, population growth in the area has tended to outstrip the economic base (cattle), to the extent that dependence on cattle alone as a source of livelihood cannot sustain the growing population (Muir, 1994).

Closely related to the above is a rapid decline in livestock numbers in the area. This factor is probably a key factor in the recent transformation of the community economy towards agro-pastoralism. During the early 1970s to the 1990s, periodic droughts in the area caused massive livestock mortality due to shortages of forage and water. Frequent outbreaks of livestock diseases, including tick-borne infections and Foot and Mouth Disease (FMD), contributed to the decline in livestock populations (Peterson 1978; Muir 1994). The central government's decision to reduce veterinary services for pastoralists speeded the increased incidence of such diseases after the 1970s (Homewood, 1992; Moris, 1981; Muir, 1994). Local governments could not afford to fill the veterinary services gap that was created by the central government. Likewise, individual pastoralists could not afford to purchase drugs to treat their livestock.

Together, these factors have reduced considerably the dependence of people on livestock and forced them to look to alternative livelihoods. Given the cheap rural return of this area, small holding agriculture became the only available alternative at hand. As they

shifted towards this new 'way of life' the pastoralists gradually started to transform their lifestyle to agriculture, hence towards a market-oriented activity, driven by the demand for cash (Muir, 1994; Ndagala, 1990). Related to this is the valuation of land as a resource, capable of being traded with other people. With the market for land and growth in cultivation, the Tarangire-Simanjiro area has become a destination for the more experienced agricultural communities from the Arusha highlands and elsewhere (TCP, 1998; Muir, 1994). This has also intensified the already high population growth in the area, leading to land appropriation from areas adjacent to the Tarangire National Park (Newmark, 1996; TCP, 1998). All these issues have contributed to a curtailing of the traditional interaction between people and wildlife and the emergence of new attitudes and behaviour. Disruption of wildlife emerges in a number of ways, including fragmentation of wildlife movement corridors and an increased desire for livestock grazing in the park, poaching, incidence of wildfires through the clearing of bushes for cultivation and increased human settlements (Borner, 1985; Kahurananga and Silkilwasha, 1997; TCP, 1998). Thus, emerging from these socio-economic changes in the lifestyle from pastoralism to agro-pastoralism, is a whole set of new interactions between wildlife and people. The tendency to view wild animals as enemies is a growing attitude among people. This is due to the fact that these animals, out of their nature tend to follow their 'traditional corridors' and dispersal areas and in so doing they come into contact with crop fields and settlements. This results in relationship of conflict with people. As a result, the park officers view this new interaction as a threat to both wildlife outside the park and the integrity of the park itself (Mwalyosi, 1991; Bergin 1996). The park officers regard agro-pastoralism as a new challenge to wildlife in the area. On the other hand, people view the park as unused land, potentially suitable for both agriculture and pastoralism (Mwalyosi, 1991; Kangwana, 1997).

The Tarangire National Park has implemented an outreach programme called Community Conservation Services (CCS). This is a field programme supported by a department in Tanzania National Parks Authority (TANAPA). The programme seeks to promote the integrity of the park by reducing conflicts between wildlife and communities. One of the major mechanisms that this programme uses is the Benefit Sharing Scheme (TANAPA:

2000). This scheme has been in place for the past twelve years. It seems, however, that although considerable sums of money have been invested in various projects in varied areas of concern, the actual goal of promoting conservation and reducing park-neighbour conflicts has not yet been achieved (Kangwana, 1993; LEAT, 1998).

The struggle among local people themselves, and between local people and the park in terms of resource use, particularly in areas adjacent to the park, has not been stabilized through benefit sharing (Kangwana, 1993). While the Benefit Sharing Scheme is a positive attempt towards reconciling people and wildlife, it is not powerful enough to generate the desired outcomes (*ibid.*). It needs to be backed up by other policies and actions such as the wildlife, lands and agriculture policies, in order to fully address issues that underpin the interplay between people with wildlife. These policies and actions can only succeed if they lead to support for the integrity of the park and the areas outside it (Bergin, 1996; LEAT, 1998).

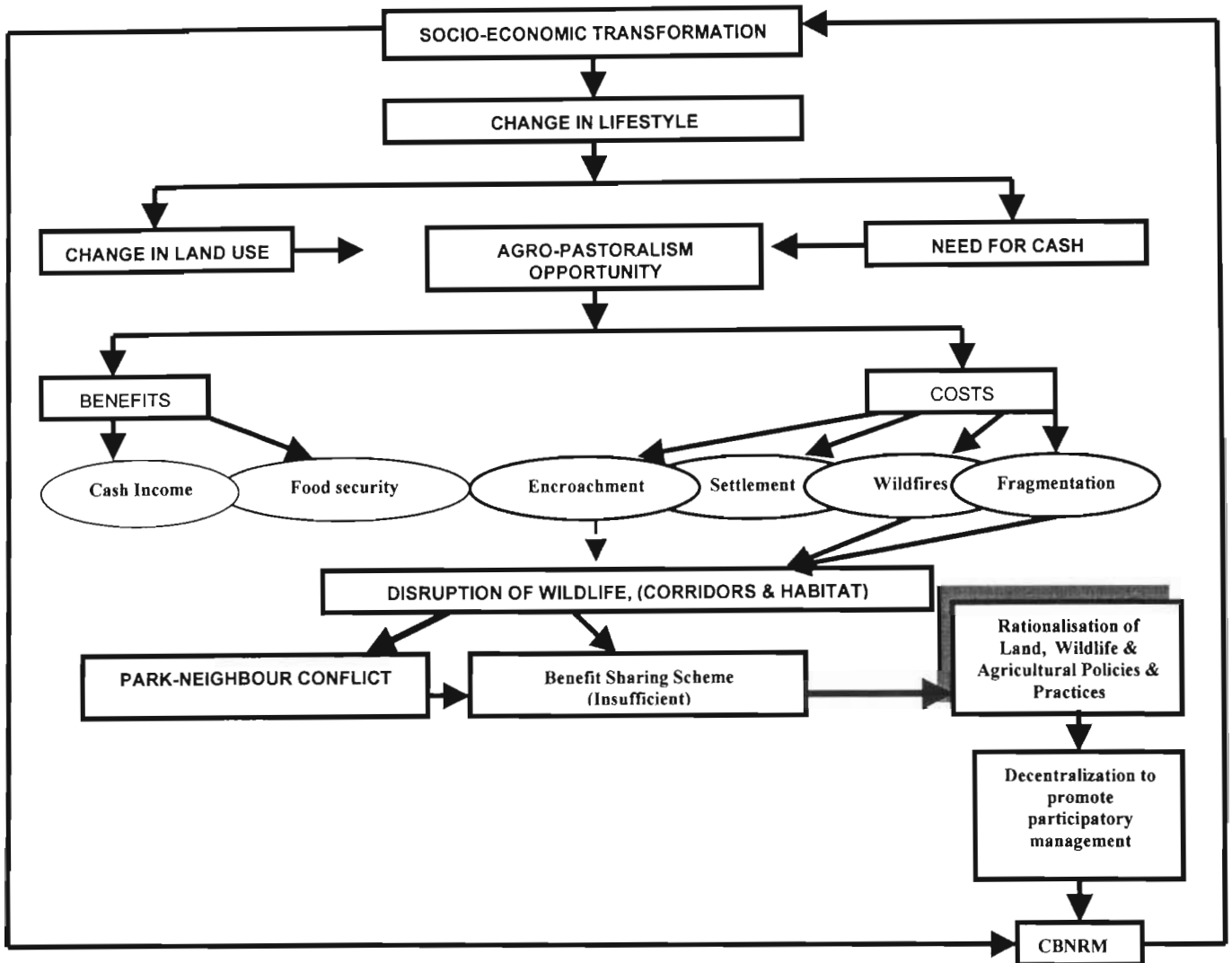
#### 2.10.2 Mental model

The interactions outlined above have been used to construct a mental model (Senge, 1990) that was used to design this study. According to Senge (*ibid.*), one can construct a mental model about how various issues are interlinked. He believes that mental models have a significant influence on how one perceives problems and opportunities, identifies courses of action and makes decisions. Consequently, in this study a framework is developed along the path that Senge advocates. In this framework (Figure 2.1) socio-economic transformation, driven in the first instance by population growth and declining livestock numbers, has forced a shift to agropastoralism that in turn acts as a magnet for people with skills and experience from elsewhere. The consequence is a change in livelihoods, one form of which is a changed attitude to wildlife and the park.

Emerging from this changed life style is a subsequent change in land use and an increased demand for cash to cater for the needs of agropastoralism. Apparently, agropastoralism brings with it benefits to the people on one hand, and costs to the park on the other. The benefits to people of agropastoralism are cash incomes to cater for their livelihood needs, and food security in the form of grain, particularly in times of severe

drought. The costs to the park and wildlife include among others, encroachment on wildlife habitat near and in the park by cultivation, grazing and settlements, a rise in population due to in-migration of people from outside and due to birth, an increase in wildfire incidences from human activities such as bush clearing for cultivation, and lastly fragmentation of wildlife habitats due to the expansion of agriculture and other related anthropogenic activities. The consequence of these costs is disruption of wildlife habitat, corridors and a subsequent loss of habitat integrity. From the disruption of wildlife habitat, conflict arises between the park and people. This conflict emerges from pressure that the park receives from the peoples' persistent expansion into wildlife habitat. Attempting to minimize these pressures and conflicts between people and the park, the park initiated a benefit-sharing scheme through an outreach programme called Community Conservation Service (CCS). The benefit-sharing scheme, which offered to provide public services such as water, and health buildings, is not sufficient to reduce pressure or conflict between people and the park. Although the benefit-sharing scheme has provided people with water, health and education facilities in the hope of reducing pressures and conflicts with people, external forces such as land, wildlife and agriculture policies do not seem to promote this effort (LEAT, 1998). There is a need to explore other natural resource management policies such as land, wildlife and agriculture policies to see if they can be harmonized in order to manage the entangled problems of the integrity of the park and wildlife habitat. Decentralised Community-based Natural Resource Management processes, including Community Conservation Service (CCS), may not necessarily promote the integrity of the park as has been evidenced by the experiences of the benefit-sharing scheme. The integrity of the park is only possible if it is harmonized with the integrity of the people.





**Figure 2.1:** The conceptual framework of the social-ecological system illustrating the components and their interrelationships. Refer to text for explanation of Community Based Natural Resources Management (CBNRM).

### 2.11 Focus of the study

Given the magnitude and complexity of the issues that exacerbate conflict between people and wildlife, it was necessary to develop a focus for this research. This study focuses on habitat fragmentation as contributing to the disruption of wildlife integrity in the Emboreet Ward and the Tarangire area.

## 2.12 Rationale for the study

The issues and problems of the land categories bordering protected areas are increasingly receiving special attention (Ngure, 1993; Western and Wright, 1991; IUCN, 1994a). There are considerable pressures generated by the anthropogenic activities outside the protected areas. Because of these pressures, many protected areas are increasingly facing risks of becoming ecological islands that may not be able to sustain biological diversity.

The Tarangire National Park is not immune to pressures generated from adjacent lands. Its survival rests on habitat continuity and the integrity of the corridors that link it with other protected areas (Mwalyosi, 1991). However, the past few years have seen the Tarangire National Park being threatened by human activities such as cultivation, charcoal burning and settlement (TCP, 1997). Although these activities are taking place outside the park, they are jeopardizing the future of the park's viability and integrity. Most large mammals in the park depend for more than six months a year on the resources available in the areas outside the park (*ibid.*).

The threats generated by anthropogenic land uses in areas bordering the Tarangire National Park substantiate the reality that no protected area can function as a self-contained ecological unit (Bergin, 1996). This justifies the need to invest in efforts to protect the lands bordering protected areas so that they can continue benefiting the wildlife of the park. The current efforts undertaken by the management of Tarangire National Park in pursuit of safeguarding the integrity and viability of the park through CCS, need to be broadened to sustain both people and wildlife outside the proclaimed park. With this in mind, the research focused on the following objectives:

- To assess the causes and manner of growth in agropastoralism in the Emboreet Ward.
- To assess the implications for wildlife management of this growth in agropastoralism.
- To assess the impact of the Tanzania National Parks' (TANAPA) Benefit Sharing Scheme in resolving habitat fragmentation in the area.
- To recommend actions that could be taken to reconcile agropastoralism and wildlife management.

## CHAPTER 3

### THE STUDY AREA AND MENTAL MODEL

#### 3.1 Introduction

This chapter introduces the study area. The aim of the chapter is to provide the reader with important contextual information to promote an understanding of the various issues that are addressed by the research.

#### 3.2 Location

The Emboreet Ward is located approximately 75 kilometres south west of Arusha in northern Tanzania (Figure 3.1.). With an area of about 36,468 km<sup>2</sup>, the Ward is situated within the famous Maasai Steppe, east of the Tarangire National Park in Simanjiro district. The ecosystem encompasses approximately 20,500km<sup>2</sup> of the Maasai Steppe (TCP, 1997).

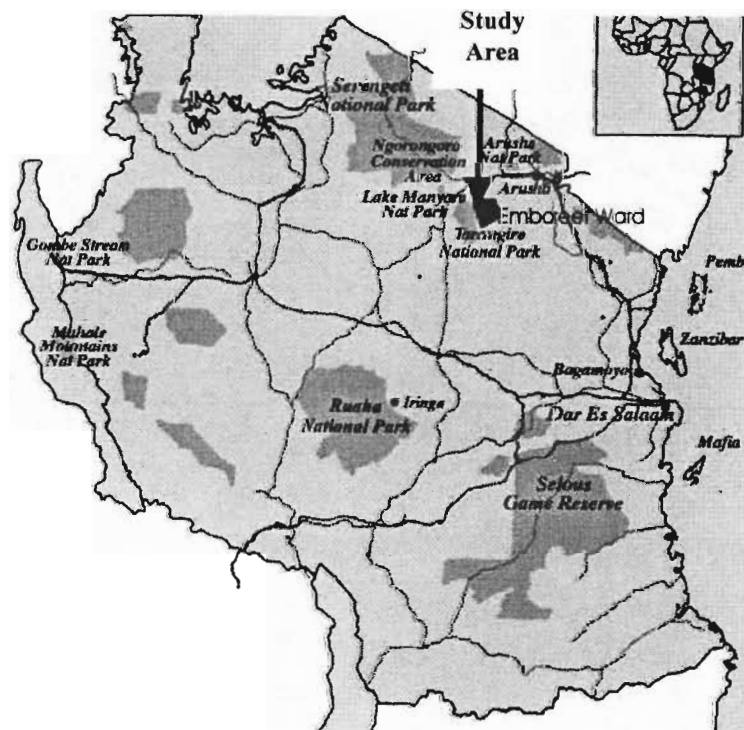


Figure 3.1: Map showing the location of the study area.

### 3.3 Population

To understand the population dynamics of the Emboreet Ward, one must place the ward within the national context. The reason for doing this is that national issues have a bearing on what happens at the local level, including the Emboreet Ward. There are approximately 30 million people in Tanzania, who are dispersed over an area of 924, 578 km<sup>2</sup>. Eighty nine percent of the population live in rural areas as small farmers and pastoralists. The annual population growth rate is about 2.8% (URT, 1989). It is estimated that 250, 000 people are pastoralists, approximately 0.5% of the population, some of whom are of Maasai origin (NOPA, 1992). The Tanzanian Maasai population is approximately 100, 000, a third of the total Maasai population in East Africa. The other 200, 000 live in Kenya. Of the 100, 000 Maasai, two thirds live in Arusha region, part of which is Simanjiro district where the Emboreet Ward is situated. Table 3.1 shows population figures for Wards and villages in Simanjiro district in 1988 when the last census took place in Tanzania. The total district population was 5 2,897 (URT, 1989). Using the national population growth rate of 2.8%, would translate into a population of approximately 72, 152 in the year 2001. The actual figure is likely to be somewhat higher, given the trend of in-migration for farmland (Table 3.1). In the case of the Emboreet Ward, the total population was 2, 654 in 1988. Using the same annual population growth rate of 2.8%, this represents a population of approximately 3,620 in 2001. Like in the case of the District, actual figures are also likely to be higher given the trend of in-migration of people searching for farmland.

### 3.4 Climate

Meteorological records are fragmentary and recording stations are sparsely distributed. The Emboreet Ward and the whole Tarangire ecosystem, are located in a semi-arid area, characterized by a prolonged dry season lasting up to seven months (Peterson, 1979). The annual rainfall pattern consists of short rains between November and December, followed by a dry spell in January; long rains can occur any time between February and March, to May and June. The short rains are erratic, unreliable and variable in distribution. The average annual rainfall is about 650mm. Temperatures are highest from December to February and lowest in June and July. The average maximum temperature is 27 °C while average minimum is 16° (TCP, 1997).

**Table 3.1:** Simanjiro District Population By Village (Source: Muir, 1994)

| <b>Ward</b>                 | <b>Village</b>    | <b>Population</b> |
|-----------------------------|-------------------|-------------------|
| Orkesumet                   | Orkesumet         | 2,438             |
|                             | Kitwai B          | 549               |
|                             | Kitwai A          | 688               |
|                             | <b>Ward Total</b> | <b>3,675</b>      |
| Naberera                    | Naberera          | 3,830             |
|                             | Lendanai          | 1,242             |
|                             | <b>Ward Total</b> | <b>5,072</b>      |
| <b>Emboreet<sup>5</sup></b> | Emboreet          | 1,262             |
|                             | Loibor Soit       | 1,392             |
|                             | <b>Ward Total</b> | <b>2,654</b>      |
| Loibor Siret                | Loibor Siret      | 2,693             |
|                             | Narakauo          | 1,811             |
|                             | <b>Ward Total</b> | <b>4,504</b>      |
| Terat                       | Terat             | 1,798             |
|                             | Sukuro            | 2,057             |
|                             | Loswaki           | 2,113             |
|                             | Komolo            | 2,950             |
|                             | <b>Ward Total</b> | <b>9,118</b>      |
| Shambarai                   | Kilombero         | 1,022             |
|                             | Olbili            | 1,179             |
|                             | Shambarai         | 1,238             |
|                             | Mererani          | 4,228             |
|                             | Naisinyai         | 1,961             |
|                             | Kambi ya Chokaa   | 1,272             |
|                             | <b>Ward Total</b> | <b>10,900</b>     |
| Msitu wa Tembo              | Msitu wa Tembo    | 2,043             |
|                             | Kiruani           | 1,080             |
|                             | Magadini          | 2,367             |
|                             | Ngorika           | 1,418             |
|                             | Lemkuna           | 1,743             |
|                             | <b>Ward Total</b> | <b>8,651</b>      |
| Ruvu Remiti                 | Ngage             | 951               |
|                             | Oloiborsoit       | 785               |
|                             | Ruvu Remiti       | 1,460             |
|                             | <b>Ward Total</b> | <b>3,196</b>      |
| Oljoro No.5                 | Oiborkishu        | 2,846             |
|                             | Oljoro No.5       | 1,044             |
|                             | Losinyai          | 1,237             |
|                             | <b>Ward Total</b> | <b>5,127</b>      |
| <b>District Total</b>       |                   | <b>52,897</b>     |

<sup>5</sup> The Emboreet Ward is the case study for this research work.

### 3.5 Wildlife

The Emboreet Ward (and the Simanjiro Plains in particular), is an ecologically important area. It supports the largest population of zebra and wildebeest in southern Maasailand during the rains (Kahurananga, 1981). The ward is known to be a wet season dispersal area for the majority of the migratory wildlife that moves east of the Tarangire National Park. The ward is part of a larger wildlife ecosystem called the Tarangire-Manyara Complex (TMCP, 2000). The Emboreet Ward is rich in mammals, particularly zebra and wildebeest (*ibid.*). These two types of animals are of much interest owing to their migration pattern from the Tarangire National Park during the rainy season and back at the beginning of the dry season (Kidegesho *et al.* 1999). The area is also rich in bird life. Among the famous wild game that moves to the ward during the wet season are zebra, wildebeest, buffalo, lion, hyena and elephants (TWCM, 1990; TCP, 1997; Kahurananga, 1981; Peterson, 1978; Mwalyosi, 1991).

### 3.6 Socio-economic conditions

Quantitative information on per capita income, household consumption and nutritional status to measure trends in economic status, is not readily available for the study area. Nevertheless, it is clear that pastoralism alone is unable to sustain the majority of people in the study area. “In the absence of alternative sources of income to supplement the livestock economy and to re-invest in cattle, poverty is increasing. In a worsening cycle, the number of livestock per capita is declining and poor households have to sell a greater proportion of their cattle to buy grain. An increasing dependence on grain is pushing households into cultivation to reduce the need to sell livestock to purchase grain” (Muir, 1994: 60).

### 3.7 Major land uses in the area

#### 3.7.1 Pastoralism

Although there is no recent census on the livestock population in the area, it is estimated that the Emboreet Ward has a population of about 65,235 livestock, including cattle, sheep, goats and donkeys (Groundwater Survey, 1993). Kahurananga (1981) estimates

that the Simanjiro Plains, where the Emboreet Ward is situated, have a high cattle population, as more cattle are moved in the dry season. He concludes that the grassland is therefore intensively used throughout the year (*ibid.* 1981). Pastoralists are considered to be under constant pressure from agricultural expansion, the impacts of which have been forage degradation and acceleration of soil erosion (Peterson, 1978; Simanjiro District Council, 2001). Competition for water in the dry season, as well as disease exchange among different domestic herds and wild animals are evident and could intensify with time.

### 3.7.2 Agriculture

Cultivation is gaining ground in the Simanjiro District, particularly in the study area. This ranges from smallholder growing of maize in all locations of the ward, to medium scale cultivation for both maize and beans in the area adjoining the Tarangire National Park. Agriculture provides food and a cash income not only to the farmers, but also to the Maasai pastoralists who seem to be being drawn rapidly towards it (TCP, 1997; Simanjiro District Council, 2001). Agriculture is replacing pastoralism because of a higher density of human population which is far less amenable to wildlife conservation (TCP, 1997).

### 3.7.3 Hunting

The Emboreet Ward is also used for commercial hunting purposes. It is designated for seasonal hunting by the Wildlife Department (WD) and permission to hunt is granted to private companies. Hunting generates substantial revenue for the central government (URT, 1998). From hunting concessions, 25% of the revenue is allocated to the districts. This revenue is not currently shared in any systematic manner with local communities which evidently exacerbates conflict between the community and wildlife authorities (Otto *et al.*, 1998).

### 3.7.4 Safari camping and walking safaris

Private Safari camps are also found in the Emboreet Ward. The owners of these camps establish for a fee agreements with village councils. The revenue that is thus generated is

used for various socio-economic activities in the ward ranging from construction of school buildings to improvement of water facilities. These operations tend to be a source of conflict at times when the camp owner and a few village leaders reach an agreement for these concessions without the consent of the public.

### **3. 8 Concluding remarks**

It is postulated from this description of the study area, and the analysis presented in Chapter 2, that:

- the spatial designation of the Tarangire National Park has not taken into account the seasonal requirements wildlife has for grazing on the Simanjiro plains outside the park;
- if wildlife is not able to sustain itself during the dry season by grazing of the plains, the whole justification of the park will be questioned;
- if the justification for the park is questioned, there will be increasing pressure for it to be made available for other uses; and
- that there has been a failure to adopt an integrated approach to developing the rural economy.

On this understanding, the research set out to examine the evidence that wildlife is being adversely affected by the pattern and extent of agricultural development, and to suggest an approach to promote integrated planning and management.



## CHAPTER 4

### METHODOLOGY

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This chapter describes the methods adopted for this study. There are five sections: selection of study area, data collection, data analysis, limitations and concluding remarks.

#### 4.1 Selection of study area

Criteria were established for the selection of the study area. The area had to meet the following requirements:

- an area thought to be of critical importance for the wildlife which migrates from Tarangire National Park;
- an area where there is apparent interaction between livestock and wildlife;
- an area considered to be of critical importance (historically) for the Maasai pastoral community;
- an area where agricultural and other land uses have grown rapidly over time.
- an area where the TANAPA Community Conservation Service (CCS) has been active for at least the past ten years; and
- an area where people are willing to participate in the study.

Using these criteria, a decision was reached to conduct the study in the Emboreet Ward, east of the Tarangire National Park, in the Arusha region.

One of the possible difficulties that a researcher may face is inability to gain access to the intended study area, its organizations and people (Neuman, 1997). Fortunately, access to the study area was made easy by the fact that organisations in the district and the ward, were welcoming, and the researcher was encouraged to engage the study as an employee of the Tanzania National Parks Authority.

## 4.2 Data collection

Bailey (1982) defines methods as the research techniques or tools used to gather data. Data refers to “... facts or information used in deciding or discussing something” (Crowther *et al.* 1997: 294). Following these definitions, the methods used to collect data in this study were literature review, open-ended interviews, close-ended interviews (direct questionnaire of up to 30 minutes each), content analysis and direct observation.

### 4.2.1 *The case study approach*

The case study approach formed the research design for this study. For the purpose of this work, ‘case study’ is defined as an investigation of a particular subject, or problem area of research about a specified location with the intention of solving certain research questions (Yin, 1984). The case study approach was used because, as Yin (1984:1) writes, “...case studies are preferred strategy when ‘how’ and ‘why’ questions are being posed, when the investigator has little control over events and when focus is on a contemporary phenomenon with some real life context.” Given the context of this study, as explained in chapters 2 and 3, a case study approach was appropriate. This is partly due to the qualitative nature of the study on the one hand, and on the other hand the need to investigate the contemporary change in the way of life of the pastoralists in relation to land fragmentation.

### 4.2.2 *Literature review*

Neuman (1997: 89) stresses that, “A literature review is based on the assumption that we learn from and build on what others have done.” In line with the above statement, this study undertook a review of relevant literature to permit the researcher to understand the subject area and by making this explicit, to develop a conceptual framework. According to Crowther, (1997), a conceptual framework is a set of principles or ideas used as a basis for one’s judgments or decisions.

#### 4.2.3 Open-ended interviews

Semi-structured interviews were organized and held with wildlife managers, (both at TANAPA and Park levels), Livestock Development Officers and Land Management Officers. The reason for using open-ended interviews was to allow spontaneity and flow of discussion between the researcher and the respondents. At times the researcher probed into specific issues to learn more. In some cases, the interviews were recorded (by agreement with the interviewee) as this enabled the researcher to keep pace with the respondents, who sometimes spoke fast. The second reason was to enable the researcher to later go back to the recorded interviews to understand better points made during the interview.

#### 4.2.4 Structured interviews

These were used to collect information from individuals in the households as well as from ward officials. This method was used to develop an understanding of the issues that determine the contemporary interaction between people and wildlife, as well as the impact that land fragmentation poses to the relationship between people and wildlife.

#### 4.2.5 Documentary review

For the purpose of this study, document review means the process of examining specific subject areas of various reports and documents in order to record relevant findings that inform a new study (Haralambos and Holborn, 1995). It is distinguished from the review of literature by the nature of the material reviewed. Literature has its emphasis on concepts and principles whereas documents are more oriented to data and information. Documentary review was a major source of data for this research.

*Random* as well as *purposive* sampling methods were used in the documentary review. The former allowed the analysis of documents as they were encountered, while for the latter, the researcher decided on the relevance of the material to the study and documents were sought. Documents were obtained from the Tarangire National Park, the Tanzania National Parks (TANAPA) headquarters, Simanjiro District headquarters, Veterinary

Investigation Centre (VIC) in Arusha, Tarangire-Manyara Conservation Project Office (OIKOS), African Wildlife Foundation (AWF), Institute of Resource Assessment (University of Dar es Salaam), Conservation Information Centre in Arusha (CIC), Emboreet Ward office and Pastoralist Non-governmental Organizations based in Arusha.

#### *4.2.6 Direct observation*

According to Mikkelsen (1997: 74-5), “observation of physical structures, social differences, behavior, action and symbols, in solitude or with others with whom observations are discussed, provides important information for posing central questions. Observations during all phases of a study contribute information on persistence and change.” In line with Mikkelsen’s understanding, observations were made of various land uses, settlements, actions and behaviours that might have a bearing on the dynamics of the interaction of people with wildlife.

### **4.3 Data analysis**

Mikkelsen (1997: 115-6) observes that “Collection of data is linked to the analysis, interpretation and presentation of findings...there is typically no precise point at which data collection ends and analysis begins, either. In the course of gathering data, ideas emerge about analysis, and interpretation appears.” In this study, data analysis reflected the methods of obtaining data and the nature of the data. This being the case, a brief outline of the procedure followed for data analysis for open-ended surveys, close-ended interviews, and direct observation is set out below.

#### *4.3.1 Open-ended interviews*

Open-ended surveys generated qualitative information. General statements were noted in data using words and phrases that kept on recurring in each interview and across interviews. The categories were expanded as issues arose in the interview. Microsoft excel was used to express the findings as tables and graphs.

#### *4.3.2 Close-ended interviews*

Thirty eight respondents who were identified using a structured sampling approach, were asked to respond to a prepared set of questions.

#### *4.3.3 Direct observations*

Direct observations were categorized into issues that kept on recurring. These were clustered depending on their similarity, using tables and short phrases. Categories included socio-economic, spatial and land use. Data derived from observation were in most cases, incorporated into the discussion of related findings.

### **4.4 Limitations**

One would anticipate that remote sensing would be used in a study of habitat fragmentation, extension of agriculture and settlements and even wildlife distribution. However, remotely sensed information could not be utilized due to both unavailability and the inaccessibility of images from the relevant authority. Alternative approaches had, therefore, to be developed and applied. The principal sources of information was documentation, including maps and reports, and local knowledge.

In some instances the researcher could not corroborate important information using more than one source, and sometimes the researcher would receive conflicting data that could not be reconciled. Surrounding the issue of the relationship between people and wildlife, there are important data gaps. For instance, crucial data like population in the study area could only be deduced by extrapolating the growth rate, as there were no recent censuses, the last one in Tanzania took place in 1988. Other data collected suggest that significant changes have occurred during the period.

### **4.5 Concluding remarks**

It must be appreciated that the intention of this study was to conduct a study that would expose the issues rather than necessarily develop a deep understanding of the issues. The following factors contribute to this: a sense of urgency to develop insight that would inform policy revision, and constraints imposed by available data and the understanding that this research was expected to be completed during five months of full study.

## CHAPTER 5

### PRESENTATION OF FINDINGS

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#### 5.1 Introduction

The conceptual framework that was developed in chapter two guides the presentation of findings for this study. This chapter is divided into two sections. The first section examines evidence of the fragmentation of wildlife habitat as contributing to the loss of integrity of the park and the adjacent wildlife habitat as it relates to the conflictual relations between the Tarangire National Park and its neighbours in the Emboreet Ward. The second section considers the relationship between fragmentation of wildlife habitat and people. It presents perspectives of people in the Emboreet Ward and those of park wardens. The intention was to construct an understanding of the interaction between fragmentation of habitat and people's perceptions thereof, with an approach to resource use that balances wildlife conservation, agriculture and pastoralism.

#### 5.2 Fragmentation

The main concern underpinning this research is the fragmentation of wildlife habitat because it is believed to be a growing source of conflict. Fragmentation in the context of this study is defined as a break up of a continuous landscape containing extensive habitat patches, into smaller, usually more numerous and less connected patches (Theobald, 1998; Forman and Godron, 1986). Fragmentation disrupts wildlife movement so that conservationists have difficulties achieving their objectives; and as settlements and associated activities fragment habitat, so animals become problems for people. Eventually, when habitat patches are too small, the very survival of wildlife is threatened. This section draws upon previous research findings, particularly from Tarangire Conservation Project (TCP), now called the Tarangire-Manyara Conservation Project (TMCP), and others (Ecosystems, 1988; and TMCP, 2001). It also presents the findings from interviews that were conducted for this study. Various scholars have used different kinds of variables to study fragmentation as a human induced phenomenon. These variables include, among others, habitat and wildlife, agriculture and the impact of pastoralism (TCP, 1998). Three variables were the focus of this study in the Emboreet

Ward: the distribution of zebra and wildebeest as reference because these are the major migratory species from the Tarangire National Park through the Emboreet Ward to the Simanjoro Plains (Ecosystems, 1988; TCP, 1998); cultivation (agriculture) and grazing (pastoralism).

### 5.2.1 Habitat and wildlife

Seasonal distribution of wildlife is a complex phenomenon (Borner, 1985). There are two seasons, the wet and the dry seasons that mark the distribution of zebra and wildebeest between the Tarangire National Park and the Emboreet Ward (Lamprey, 1964). The wet season is the rainy period between November and June, while the period between July and October marks the dry season in the area (TCP, 1998). The dry season does not result in a marked interaction between wildlife and people outside the park (Lamprey, 1964; TCP, 1998). During this period most zebra and wildebeest are concentrated in the park where water is permanently available in the Tarangire River<sup>6</sup>. On the other hand, during the wet season most zebra and wildebeest move outside the park (figure 5.1). It is in this period that competition between people and wildlife is more conspicuous (*ibid.*). The driving forces postulated for this seasonal movement of zebra and wildebeest are:

- a decline in forage mineral content in wet season in Tarangire (McNaughton, 1990);
- the presence of high quality pastures in the eastern side of the park (Simanjoro plains) (Kahurananga, 1979);
- a reduction of predation risks outside the park (Fryxell and Sinclair, 1998); and
- the avoidance of sticky soils in the park (Anderson and Talbot, 1965).

While a continuous distribution pattern of wildlife may be an indicator of a healthy habitat (Fryxell and Sinclair, 1998), this is not the case in the study area because of the seasonal migration of zebra and wildebeest. In this study, the distribution patterns of zebra and wildebeest were acquired from TCP research findings (1998). This research revealed that the numbers of the two species outside the park fluctuate between the dry and wet seasons. Although there are no specific data about the number of zebra and

wildebeest that migrate to the Emboreet Ward, TCP (1998) estimated that about 55,000 zebra and wildebeest move east of the Tarangire National Park during the wet season (TCP, 1998). The Emboreet Ward forms part of this area in the east (*ibid.*). Data were available to enable comparison of patterns of distribution (1988, 1994 and 1996). Distribution was delineated to examine change in the distribution patterns of zebra and wildebeest in the Emboreet Ward.

Distribution is depicted for three groupings (population classes 1-5; 6-50 and above 50) in four broad subjective classes of stretched, widely stretched, clustered, and highly clustered patterns of population classes. These reflect the extent to which animals were 'clumped.' The four classes are arranged in scores from 1- 4, where (1) corresponds with 'widely stretched' class, (2) relates to 'stretched' class, (3) relates to 'clustered' class and (4) corresponds with the 'highly clustered' class. The 'ideal' situation for a 'healthy distribution' is postulated as a widely stretched class because this reflects the dispersal of animals when habitat was considered to be approximating most closely natural conditions (Ecosystems, 1988). In contrast, a highly clustered class indicates the opposite (TWCM, 1995).

**Table 5.1:** Estimated wet season zebra and wildebeest distribution patterns in Emboreet<sup>7</sup>

| Population Class  | May-1988         | Score | March-1994 | Score | June-1996        | Score |
|-------------------|------------------|-------|------------|-------|------------------|-------|
| <b>Zebra</b>      |                  |       |            |       |                  |       |
| 1-5               | Widely stretched | 1     | Clustered  | 3     | Clustered        | 3     |
| 6-50              | Stretched        | 2     | Stretched  | 2     | Clustered        | 3     |
| >50               | Stretched        | 2     | Stretched  | 2     | Highly clustered | 4     |
| <b>Wildebeest</b> |                  |       |            |       |                  |       |
| 1-10              | Widely stretched | 1     | Clustered  | 3     | Clustered        | 3     |
| 11-100            | Widely Stretched | 1     | Clustered  | 3     | Clustered        | 3     |
| >100              | Clustered        | 3     | Stretched  | 2     | Highly clustered | 4     |

(1=Widely Stretched; 2=Stretched; 3= Clustered; and 4=Highly Clustered)

One might anticipate that the higher population classes might be correlated with degree of clustering. This, however, is not so as low population classes also show clustering (Table 5.1); and the high population class of wildebeest, for example, even stretched in

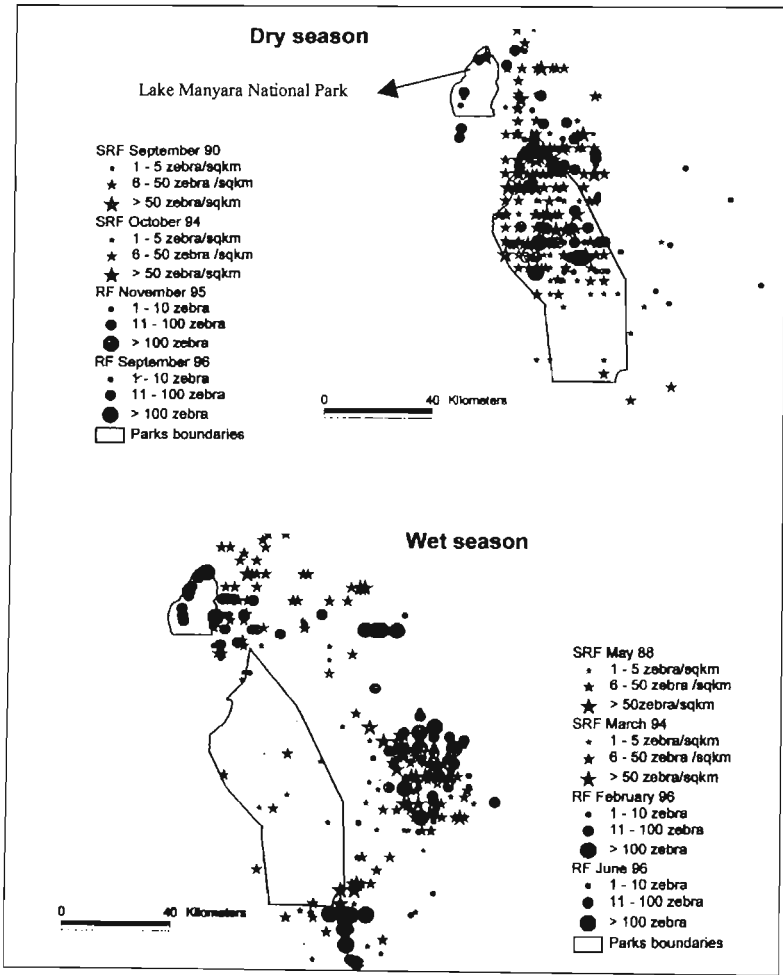
<sup>6</sup> Tarangire River is the source of water for wildlife in Tarangire National Park (see chapter four for further explanation).

<sup>7</sup> See Figure 5.1 and 5.2. Dry and wet seasons distribution of zebra and wildebeest in and around the Tarangire National Park.



1994, and was highly clustered in 1996. The inter-annual climate variation would clearly be one factor that could contribute to clustering, even in the absence of habitat fragmentation. It is unfortunate that continuous data are not available. Under these conditions of data scarcity interpretation must of necessity be cautious.

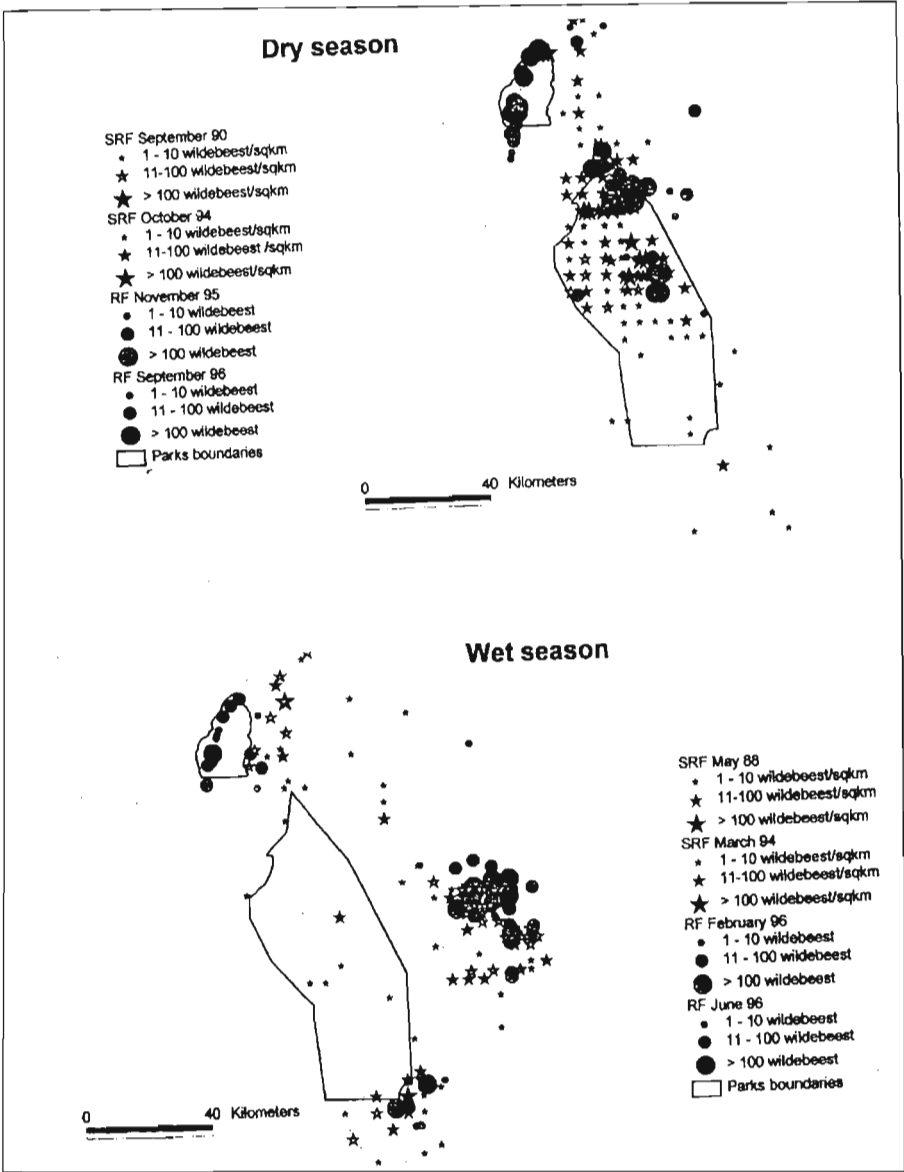
Notwithstanding the limitations, the findings in table 5.1 suggest an increasing confinement of zebra and wildebeest over the period. One way of corroborating this would be to follow the advance of agriculture over the same period. Advance of agriculture and distribution of fields would provide a ‘confining force’ causing wildlife to be more clumped than in the past.



(Source: TCP, 1997)

SRF: Systematic Reconnaissance Flight; RF: Reconnaissance Flight

Figure 5.1: Map showing distribution of zebra around Tarangire National Park



(Source: TCP, 1997).

SRF: Systematic Reconnaissance Flight; RF: Reconnaissance Flight

**Figure 5.2:** Map showing distribution of wildebeest around Tarangire National Park.  
See also **Figure 5.1**

5.2.2 Agriculture and fragmentation

Knowledge of when people started to cultivate in the Emboreet Ward provides insight into the advances of agriculture during the period when it is considered that increased clustering of zebra and wildebeest has occurred. Interviews with local inhabitants showed

that while some respondents (11%) think agriculture started in 1980, most respondents (45%) believed that agricultural activities started in 1981 (Table 5.2).

**Table 5.2:** Respondents’ perceptions of the year when agriculture started

| Year | n=38 | %  |
|------|------|----|
| 1980 | 4    | 11 |
| 1981 | 17   | 45 |
| 1982 | 10   | 26 |
| 1983 | 5    | 13 |
| 1984 | 2    | 5  |

It is not surprising that a range of years is reflected in the responses because people arrived in the area at different times. Also, perceptions reflect the personal realization of both the benefits or costs from agriculture. As these benefits and costs build up, so too does awareness of agriculture. At best, the results provide a general indication that the level of awareness of agricultural development is a significant factor in the lives of the residents.

The frequency of responses was implicit for 1981 and 1982 and dropped for the years thereafter, indicating the possibility that agriculture was from that time a well founded and recognized activity in the study area. This suggests new farms may have continued to be established, but as part of the process that became clearly evident in 1980/81. This is some years earlier than the first data for distribution of zebra and wildebeest. Perhaps, even by 1988 agricultural expansion was already having an effect on wildlife distribution, which might account for the clustered distribution of the higher population class of wildebeest (Table 5.1).

Distribution pattern of cultivation in the Emboreet Ward

To facilitate comparison between habitat fragmentation and cultivation, the criteria of size and degree of clustering were used. The findings are presented in Table 5.3. The clustering patterns of five sizes of cultivated fields that characterize the study area are

shown (TMCP, 2001). The results show that large fields are clustered in the same geographical locations (Table 5.3 and Figure 5.3). The medium sized fields display stretched distribution (Q2). There is also evidence that some small fields are clustered together (Q3), but there are others of the same size that are isolated from one another, displaying a pattern of small fields with stretched distribution (Q5). The area in the middle of the Emboreet Ward is developed mostly as small isolated fields (Q7) (Table 5.3). Extension of agriculture may be linked to both water availability and population distribution in the study area. The clustering of fields results in an agricultural land use form that attempts to exclude wildlife, and in which wildlife would be exposed to danger. These forces contribute to clustering of animals in areas of less danger where fields are widely separated.

**Table 5.3:** Distribution pattern of cultivated fields in the Emboreet Ward<sup>8</sup>

| <b>Types of cultivated fields</b> | <b>Map code</b> | <b>Current distribution pattern (2001)</b> |
|-----------------------------------|-----------------|--|
| Large Fields                      | (Q1)            | Clustered                                  |
| Medium Fields                     | (Q2)            | Stretched                                  |
| Small Fields                      | (Q3)            | Clustered                                  |
| Small Fields                      | (Q5)            | Stretched                                  |
| Small Fields                      | (Q7)            | Isolated                                   |

#### Conversion of wildlife habitat into crop fields in the Emboreet Ward

This part of the study presents the findings about wildlife habitat transformation in the Ward. The reason for choosing the factor of wildlife habitat transformation is that vegetation structure characterizes zebra and wildebeest habitat preferences and constitutes the forage source for both species (Kahurananga, 1979; Newmark, 1996). Change in the natural cover (vegetation) is likely to affect habitat for zebra and

<sup>8</sup> Source, TMCP, 2001

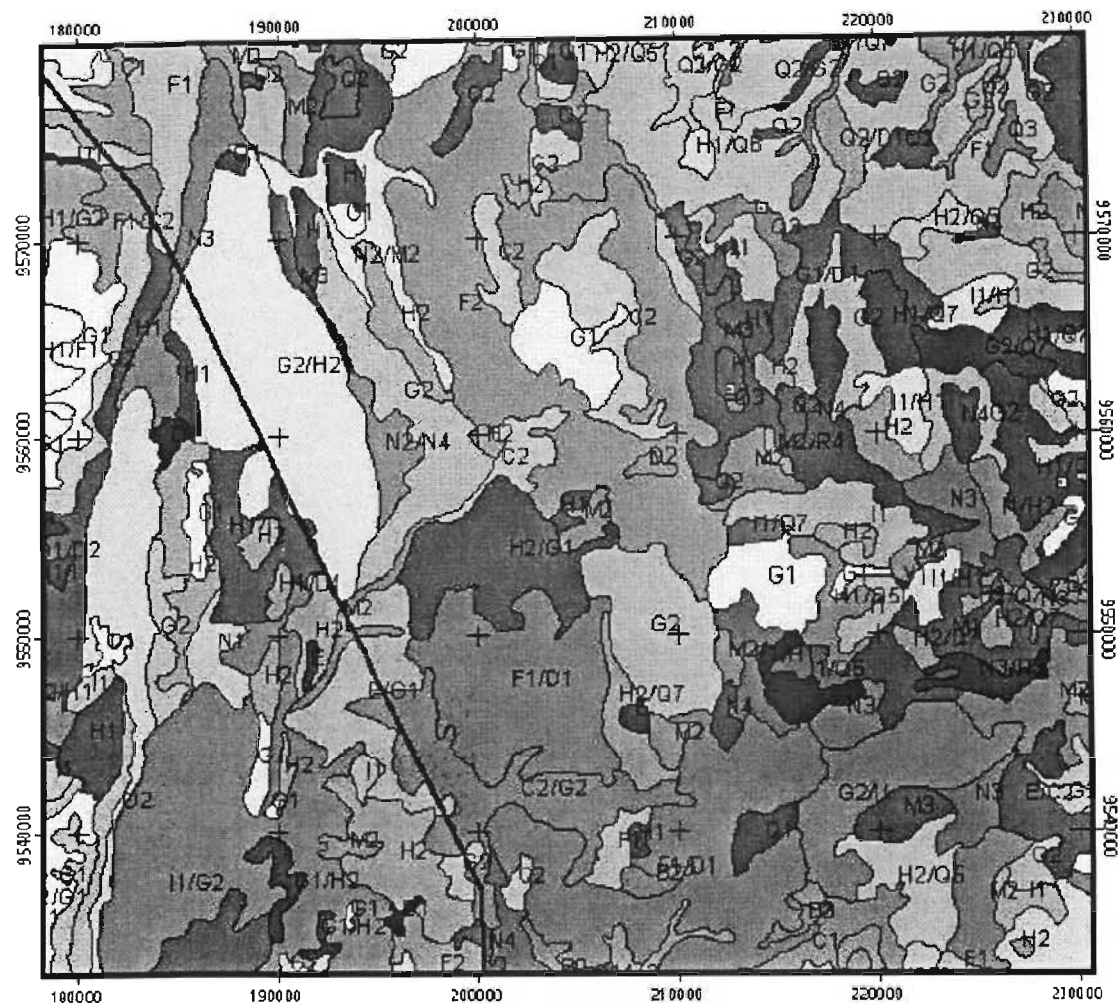
wildebeest (*ibid.*). Table 5.4 shows various habitat types that have been altered to establish crop fields in the study area since 1988. Habitat types and their status are depicted by use of the land cover map (Figure 5.3).

**Table 5.4:** Presence of agriculture in wildlife habitat types in the Emboreet Ward <sup>9</sup>

| Habitat type before 1988                  | Map code | Presence of crop fields in 1998 |
|---|----------|---------------------------------|
| Open low trees with herbaceous and shrubs | (C2)     | Present                         |
| Very open trees with shrubs               | (D1)     | Present                         |
| Very open shrubs with herbaceous          | (G2)     | Present                         |
| Closed herbaceous with shrubs             | (H2)     | Present                         |
| Closed herbaceous                         | (I1)     | Present                         |

Transformation of habitat types has taken place in all of the five vegetation formations that characterize the Ward (Table 5.4). These were transformed from grazing areas for wildlife and livestock to crop fields. Since rain-fed cropping occurs in the wet season when zebra and wildebeest migrate out of the park (Table 5.1), this is when conflict between animals and farmers, and between farmers and park wardens is likely to arise. While people have lived with wildlife for generations (Kiss, 1990), it is the increasing scarcity of grazing for zebra and wildebeest caused by the expansion of cultivation, that is likely to increase conflict between farmers and conservationists.

<sup>9</sup> See Land cover map adapted from TMCP, 2001 (Figure 5.3) for a detailed description of classes aggregation. Make reference to Appendix 1.



(Source, TMCP, 2001)

NB: See Appendix 1 for the legend

**Figure 5.3:** Land cover map of the Emboreet Ward and surrounding areas

### 5.2.3 Pastoralism and fragmentation

For centuries, the Maasai have traditionally been pastoralists and cultivation has played a minor role in their livelihood (Muir, 1994). Evidence of clustering of wildlife is a recent phenomenon that reflects increasing cultivation with the result that human activities did not cause clustering of wildlife. The distribution and extent of cultivation shows clearly that agriculture is now an important element of the strategy that the Maasai have for their survival (Table 5.5). From the point of view of what to expect in the future two thoughts

arise. If all present inhabitants have agriculture as their predominant livelihood strategy, then further extension of crop fields will reflect either or both population growth and/or market growth. If however, only some of the present population has adopted agriculture as their predominant livelihood strategy, then it might reasonably be anticipated that extension of fields might occur in the future as members of the present population engage cultivation, even if the population was to remain the same.

**Table 5.5:** Responses on primary sources of livelihood

| Activity    | n=38 | %  |
|-------------|------|----|
| Agriculture | 20   | 53 |
| Livestock   | 18   | 47 |
| Others      | 0    | 0  |

The data in Table 5.5 show that when respondents were asked to indicate their current predominant livelihood strategy there was almost equal division between agriculture (53%) and livestock (47%). This may reflect the presence of poor extension support for pastoralism referred to earlier. However, the implications are that we can anticipate a doubling of fields as pastoralists shift their endeavours to cultivation if the trend is not controlled. The consequences of such a change for conservation are very serious indeed. This causes us to consider the questions of the compatibility of pastoralism and wildlife, and of strengthening of the benefits from pastoralism and wildlife for local people. Most of the respondents (84%), however, indicated that they currently practise both, i.e. they are agro-pastoralists.

#### Causes of a shift from pastoralism to cultivation as a predominant livelihood strategy in the Emboreet Ward

Pastoralism combined with wildlife offers prospects for synergy between conservation and sustaining rural livelihoods. However, if keeping livestock can no longer contribute meaningfully to livelihoods, then the future would be one of cultivation predominantly. Respondents indicated that although they still keep livestock, most of them (53%) depend

on agricultural activities as their main source of income (Table 5.5). Table 5.6 presents the reasons given by local respondents as to why this shift has occurred:

**Table 5.6:** Reasons given by local inhabitants of the Emboreet Ward for shifting from pastoralism to cultivation as their predominant livelihood strategy

| <i>Response</i>                                     | <b>n=38</b> | <b>%</b> |
|---|-------------|----------|
| Loss of livestock due to disease                    | 25          | 66       |
| Easy access to cash from maize and bean cultivation | 7           | 18       |
| Cope with vagaries of weather-drought               | 6           | 16       |

Most respondents (66%) suggested that they opted for cultivation as their primary source of livelihood because of loss of livestock due to disease. Considerably fewer (18%) declared that easy access to a cash income directed their changed endeavours. The remaining 16% said they opted for cultivation with few livestock to cope with vagaries of weather, particularly drought. These responses suggest that if government re-introduced an effective livestock health programme, and if they were able to introduce livestock marketing so that cash flow could improve, then the advance of agriculture might be arrested, which would serve the joint interests of conservation and would sustain rural livelihoods. Indeed, it may even be possible to reorganize cultivation to better accord with conservation by addressing the issue of habitat fragmentation.

### **5.3 Park-neighbour relations**

#### *5.3.1 Local community respondents' profiles*

The significance of respondents' profiles in research should not be underrated. It was necessary to develop a profile to help understand peoples' perceptions about the park and wildlife in general on the one hand, and the park perceptions about people on the other. Respondents were divided into two broad categories: the local inhabitants of the study area (Table 5.7) including local inhabitants at the household level, and the council leaders at the ward level. The second category was that of government officers, including park wardens, district officers and regional officers (Table 5.8).



**Table 5.7:** Profile of households

| Profile variable            | Response   | %  |
|-----------------------------|--|----|
| Marital Status              | 34 married   | 89 |
|                             | 4 unmarried  | 11 |
| Size of household           | 3-10   | 39 |
|                             | 11-40  | 61 |
| Distance from National Park | 5-15km   | 49 |
|                             | 16-45km  | 51 |
| Level of education          | 7 have primary level                                   | 18 |
|                             | 31 have no formal education                            | 82 |
| Household activity          | 32 livestock keeping and cultivation (agropastoralist) | 84 |
|                             | 6 crop cultivation                                     | 16 |

*n*=38

#### Marital status and household size

It was necessary to understand local peoples' marital status for a number of reasons. First, being married or unmarried is likely to be accompanied by varying responsibilities, determining what people do and why they engage in certain activities at the household level (Muir, 1994). In an agropastoralist situation, marital status may at times determine the number of livestock, and the size of land to be cultivated (*ibid.*). Lastly, in a polygamous situation, it may be the case that marriage increases the number of individuals in the population of the area (*ibid.*). This may in turn, increase the risk of expansion of human activities into wildlife habitats leading to further fragmentation.

More than half of the respondents said that the size of their households was between 11-40 individuals. The remaining 39% of respondents mentioned that their households ranged between 3 and 10 individuals. Maasai households are relatively big due to the practice of polygamy and living in extended families.

#### Distance from the park boundary

It is speculated that the closer a household is to the Park the more likely it is that there will be interaction. Conservation requirements provide for a one-kilometer buffer zone between human settlements, their associated activities, and the park (LEAT, 1998). The results show that 49% of respondents reside between 5 and 15 kilometers from the Park. More than half of the respondents (51%) claimed that they live between 16 and 45 kilometers from the park boundary (Table 5.7). These results show that none of the

respondents claim to live within the prohibited distance of 1 kilometer from the park boundary, and since most live a considerable distance from the Park, they are likely to have little, or infrequent direct interaction with it. Clearly though, they have indirect interaction by way of wildlife moving considerable distances beyond park boundaries.

#### Level of education

It has been suggested that achieving a more sustainable conservation system may rest on making pastoralism more attractive. It is envisaged that this requires better veterinary services and the transformation of pastoralism from a cultural and subsistence activity to a commercial activity. Education lies at the heart of achieving this transformation. The results indicated that considerably more than half of the respondents (82%) did not have formal education training, and only 18% had primary level education (Table 5.7). Such a low level of education is likely to limit opportunities for people to engage in activities that are dependent on a modern cash economy. Clearly, this matter has to be addressed urgently if progress is to be made with sustaining conservation beyond the boundary of the park.

#### 5.3.2 *Government officers*

Park neighbour relations are also determined by the perceptions and behaviour of government officials operating within and outside of the park in the Emboreet Ward.

The collection of data for this study was made possible by the contacts that were made by the researcher with different respondents at various levels. These respondents can be categorized as follows: Park Wardens and District Officers.

#### Park wardens

Respondents included the Warden in charge, Park Veterinary Officer, Park Ecologist, Community Conservation Warden, Law-enforcement Warden and Tourism Warden, all from the Tarangire National Park. Their responsibilities are shown in Table 5.8.

**Table 5.8: Park Wardens' Profiles**

| <b>Title</b>                  | <b>Duty</b>   | <b>Location</b>  |
|-------------------------------|---|------------------|
| Park Warden in Charge         | Overall in charge of all park departments                                     | Inside the park  |
| Veterinary officer            | Monitoring wildlife health and control of wildlife diseases                   | Inside the park  |
| Park Ecologist                | Ecological monitoring of activities   | Inside the park  |
| Community Conservation Warden | Promoting park-neighbour relation through conservation education and projects | Outside the park |
| Law-enforcement Warden        | Deputy of the warden in charge. Enforces park regulations and laws            | Inside the park  |
| Tourism Warden                | Oversees tourism activities   | Inside the park  |

Only the Community Conservation Warden works outside the park, which indicates little activity outside the park by the Park wardens. This would limit operations outside the Park by the Park officials to the extent that there would be inadequate communication with neighbours, which could contribute to conflict.

#### District officers

Three district level officers were contacted in the course of this study. These were the Livestock Development Officer who is in charge of managing livestock health and development programmes in the district; the Lands Officer who is in charge of land management and planning in the district; and the Game Officer, in charge of monitoring game hunting and tourism issues within the district. District officers described their roles as necessary in co-ordinating rural development in the Simanjiro District and in the Emboreet Ward, but there was no suggestion that they played a role in reducing conflict between the park and the local people in the study area. This indicates an opportunity that might be utilized in the future.

#### **5.4 Perceptions of the benefits of interaction between the park and neighbours**

In order to assess park-neighbour relations in the context of this study, it was considered necessary to examine the benefits to people accruing from the Park. Moreover, it was necessary to investigate the benefits that the park gains from this relationship. Community Conservation Service (CCS) is the outreach programme set up by the park to interact with its neighbours (TANAPA, 1994).

#### 5.4.1 Benefits accruing to local respondents

A variety of responses were received. 72% of the respondents mentioned a school or classrooms being built; 62% of respondents said that CCS has raised their awareness of park regulations and conservation in general; 36% of respondents mentioned free visits to the park as a benefit from CCS, and 26% of respondents mentioned free transport for the sick (Figure 5.4).

The responses suggest that the efforts of the CCS are acknowledged by local people, and that the interaction has increased awareness of conservation and the park. There is, therefore, a foundation of goodwill on which to build cooperation.

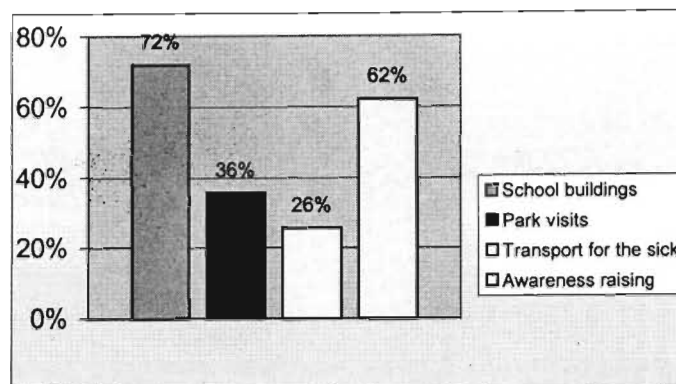


Figure 5.4: CCS benefits as perceived by local people (n=38)

#### 5.4.2 Benefits perceived by park wardens

The responses from park wardens are categorized in Table 5.9. These responses can be divided into two fairly distinct categories. The first theme indicates benefits that wardens believe accrue to conservation. These include a heightened awareness of conservation, a reduction in poaching and the willingness of local people to participate in the collection of information relevant to informing conservation. The last two are clearly considered important by wardens, but they reflect services the wardens provide to local people. The first, support for community projects was mentioned by local people (Figure 5.1) whilst dealing with problem animals was not. It is important to note the wardens clearly feel that the CCS is helping them meet their goals.

**Box 5.1:** Benefits of CCS to the park as perceived by park wardens

- Introduction and expansion of conservation awareness to people
- Gathering of baseline information on people and wildlife interaction
- Reduction of poaching through commissioning law-enforcement support
- Support for community initiated projects through provision of social services through community projects
- Support for people to control problem animals

## 5.5 Costs of the interaction between park and neighbours

Whilst relationships bring benefits, there are commonly costs that have to be borne. It was not the intention here to consider monetary cost, but rather costs such as damage to property and threats to livelihoods. These costs are also determinants of how relationships are perceived and therefore, what the attitudes to collaboration are.

### 5.5.1 Costs perceived by the local people

Responses exposed problems in the study area. These are shown in Table 5.9, and each is considered below.

**Table 5.9:** Costs incurred by local people in interacting with wildlife

| Incidence/cost                          | Response (%) |    |            |
|---|--------------|----|------------|
|   | Yes          | No | Don't Know |
| 1. Crop damage                          | 92           | 8  | -          |
| 2. Competition for water                | 75           | 25 | -          |
| 3. Livestock injured/killed             | 62           | 38 | -          |
| 4. Transmission of disease to livestock | 69           | 27 | 4          |
| 5. Competition for grazing/pasture      | 66           | 34 | -          |
| 6. Damage to buildings                  | 30           | 70 | -          |
| 7. Physical attacks/injuries to people  | 8            | 92 | -          |

#### Crop damage

Almost all of the respondents (92%) reported that their crops were damaged by wildlife. This finding has very important implications for the co-existence of agriculture and conservation. Clearly, the prevalence of crop damage will contribute to negative perceptions; and since the findings suggest growing confinement of zebra and wildebeest,

the pressure on cultivated fields will increase. Interestingly, the respondents did not indicate that a benefit received was assistance with control of damage by wildlife.

#### Competition for water

A majority (84%) of respondents are agropastoralists (Table 5.7), and 75% of respondents consider competition between livestock and wildlife for water as a cost. One can easily anticipate a sense of intense conflict during droughts. The fact that 26% of the respondents did not mention competition for water as a problem may reflect those who may not have livestock (Table 5.9).

#### Livestock killed or injured by wildlife

While 84% of respondents could be categorised as agropastoralists (Table 5.7), only 62% mentioned injuries and attacks on livestock by wild animals as a problem. Nevertheless, it is reasonable to conclude that with more than half of the respondents noting this cost, taken together with crop damage, it is evident that local people's livelihoods are under pressure from wildlife and there is a likelihood of people developing negative attitudes towards wildlife and conservation.

#### Transmission of disease to livestock

Transmission of disease to livestock by wildlife is known to be a common problem in areas adjacent to national parks (Muir, 1994). In this study, the majority of respondents (69%) regarded transmission of disease from wildlife to livestock as a cost they bore (Table 5.9). To better understand this relationship, respondents were requested to rank the importance of these diseases. Tick-borne diseases ranked (79%), the second was Malignant Catarrh Fever, which was mentioned by 74% of the respondents, followed by Trypanosomiasis 69%, Foot-and-Mouth Disease 22%, Worms 20% and Hemorrhagic Septicemia 14% (Figure 5.5).

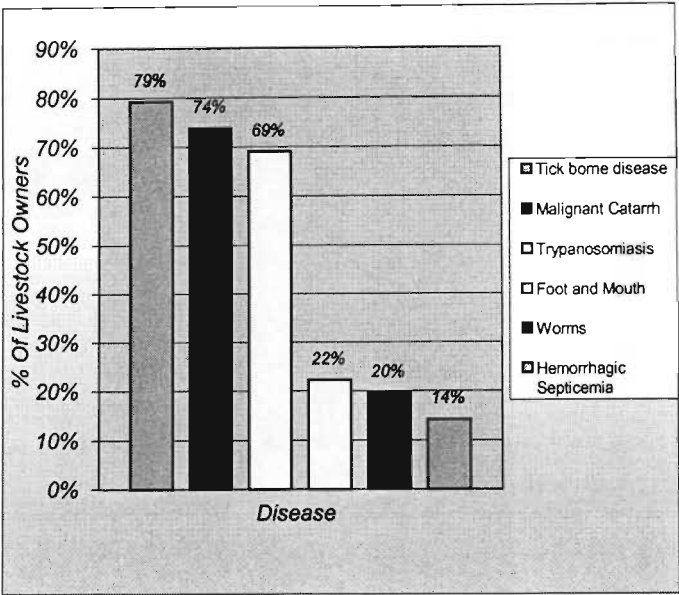


Figure 5.5: Types of diseases reported by livestock owners

Competition for grazing pasture

For those who own livestock, the problem of competition between livestock and wildlife for grazing was mentioned by 66% of livestock owners. This reflects a cost borne by pastoralists through reduced productivity. The fact that 34% of the livestock owners did not perceive competition for grazing as a problem (Table 5.9) may reflect spatial heterogeneity in the distribution of grazing and wildlife, in that some residents experience this more acutely than others. One, can, however, anticipate growing tension if cultivation reduces further the availability of grazing and animals become more and more confined. Since most respondents are agropastoralists (Table 5.7), the balance they strike between pastoralism and agriculture will reflect the relative costs and benefits they experience.

Damage to buildings

According to the respondents, damage to buildings is not a frequent occurrence in the study area, as 70% of the respondents have never faced this problem (Table 5.9). Although the number of household experiences of damage to buildings is low (30%), there is no justification for assuming that it is not a cost that shapes perceptions of wildlife and conservation among those who may have experienced it.

Physical attacks and injuries to people

Physical attacks and injuries to people by wildlife was not a common occurrence and 92% of respondents did not mention it. Nevertheless, 8% said that a member of their family had been attacked or injured (Table 5.9). The low occurrence of physical attacks or injuries caused by wildlife does not necessarily imply an insignificant cost to the household, especially given the labour intensive livelihood strategies of rural people. Households bearing these costs can develop negative attitudes towards wildlife and the park.

5.5.2 Perceptions held by Park Wardens of costs to the park

Just as it is critical to understand how the costs borne by people may affect people in the current interaction between the park and wildlife, it is also necessary to know how costs borne by the park determine relations with people and perceptions of their activities. According to the park officials, problems in the interaction between wildlife and people, and therefore the park and its neighbours relate principally to livestock and agriculture.

Table 5.10: Park wardens’ perceptions of costs incurred by wildlife from livestock outside the park.

| <i><b>Problem</b></i>  | <i><b>%</b></i> | <i><b>Causes</b></i>                    | <i><b>%</b></i> |
|------------------------|-----------------|---|-----------------|
| Competition for forage | 100             | Shortage of land                        | 100             |
| Disease transmission   | 60              | Interaction with livestock              | 100             |
| Competition for water  | 70              | Clustering of livestock at water points | 80              |

n=6

Park wardens were unanimous in the perception that competition for forage, shortage of land and interaction with livestock were causing problems for wildlife and hence could be regarded as a cost borne by the park (Table 5.10). They also mentioned clustering of livestock around water points reducing access by wildlife (80%) and competition for water (90%). Disease transmission was perceived by 60% of respondents as a cost to conservation. The issue of expansion of cultivation was probed further. Park wardens were unanimous in perceiving blocking of migration corridors, deforestation and population increase to be problematic (Table 5.11). Land degradation (70%), fire (76%), poaching (76%) and charcoal production (67%) were also mentioned as problems.



**Table 5.11:** The impact of agriculture on fragmentation of wildlife habitat outside the park as perceived by park wardens

| Impacts                        | %   | Implications  |
|--------------------------------|-----|---|
| Blockage of wildlife corridors | 100 | Loss of wildlife habitat integrity  |
| Land degradation               | 70  | Loss of pasture, floods and loss of wildlife habitat.   |
| Fire eruptions                 | 76  | Loss of forage and wildlife habitat, leading to reactive measures towards culprits.   |
| Poaching                       | 76  | Loss of wildlife species and rise in the costs of law enforcement.  |
| Deforestation                  | 100 | Loss of habitat and change in the dispersal and movement patterns of wildlife.  |
| Population increase            | 100 | Encroachment to park boundary, new land uses such as agriculture and poaching, as well as permanent settlements leading to loss of wildlife habitat on one hand and competition for scarce resources. |
| Extensive charcoal making      | 67  | Destruction of wildlife habitat, changed wildlife distribution patterns and increase in wildfire incidences   |

(n=6)

## 5.6 Evaluating the success of CCS

### 5.6.1 Local people's perceptions about CCS

While it may be appropriate for people to mention the benefits that they acquired from CCS programme, it was also necessary to consider peoples' views on whether CCS were performing to their expectations. The answers generated by this question were critical to understanding the gap between the expectations of the people on one hand, and those of the park on the other. Half of the respondents (50%) said that CCS did not need to be changed in any way, 45% said that some changes needed to be made (Figure 5.6), and only 5% said they did not know if changes should be made.

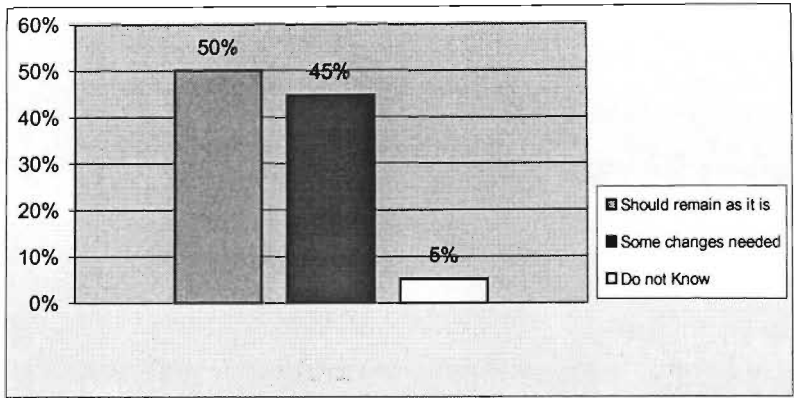


Figure 5.6: Perceptions of local respondents about CCS

People’s perceptions about CCS can be critical as they may generate issues that may not only help the park know what other important considerations should be incorporated in CCS, but the information can form the basis for understanding people’s needs and aspirations. These needs and aspirations can be the starting point in solving potential problems of fragmentation of wildlife habitat. Recommendations made by those who thought some changes were necessary, are shown in Figure 5.7.

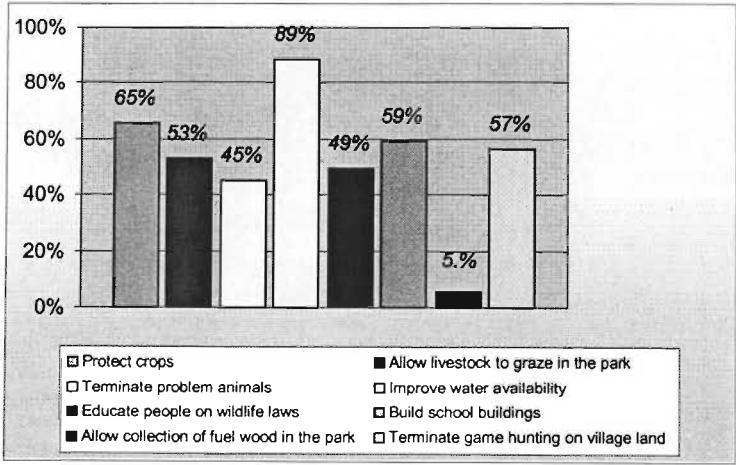


Figure 5.7: What people desire from the park

Most respondents (89%) mentioned improved water availability as the most pertinent issue. Other issues mentioned included allowing livestock to graze in the park (53%), protection of crops outside the park (65%), terminate problem animals outside the park (45%), educate people about wildlife laws (49%), build schools in the Ward (59%), allow collection of fuelwood in the park (5%) and terminate game hunting in the Ward (57%). There is good congruence between these responses and those given in respect of

problems experienced. Here, the problems of access to water, crop production and problem wild animals are raised. The issue of grazing was raised indirectly as the need to permit grazing in the park; and the issues raised by wardens of deforestation and charcoal making by local people are exposed here as a need to prevent fuel wood collection within the park.

The issue of game hunting in the ward was not raised earlier as a cost. The fact that 57% of respondents support this should be terminated may reflect a number of issues, including a perception that local people are not benefiting. The issue has particular relevance to the attempts to promote co-existence with wildlife. Clearly, wildlife needs to be an integral part of the local household economy if it is to gain support from the park neighbours.

*5.6.2 Park wardens’ perceptions on possible deficiencies in CCS*

Park wardens’ perceptions on possible deficiencies in CCS were also examined to determine the the extent of congruence with the perceptions of local people. The findings are shown in Box 5.2. Five deficiencies were noted. Three of these, the inability to address livelihood issues, the participation in decision-making and proper roles are matters central to empowerment of local people. They are the ‘real’ issues that give people a sense of being empowered to determine their own future. Clearly, if these issues are not being addressed appropriately, the CCS is at risk of failure. Two other issues are pertinent: TANAPA being perceived as a donor and not a partner; and contradictory conservation policies. These indicate that TANAPA is inadequately empowered as an agency that is responsible for a park that cannot be separated from the adjoining plains that provide critical water and grazing in the dry season.

**Box 5.2:** Deficiency in CCS as perceived by the park Warden in charge

- |  |
|--|
| <ol style="list-style-type: none"><li>1. Inability to address individual livelihood issues</li><li>2. Lack of clear policy on how people will contribute to the decisions</li><li>3. People’s initiative is not clear in the projects</li><li>4. TANAPA is perceived as a donor and not a partner</li><li>5. Contradictory Conservation Policies</li></ol> |
|--|

According to the park warden in charge (Lenganasa, pers.comm., 10/2001), the five deficiencies in CCS originate from CCS programme's nature as an outreach initiative. This may entail an inability to enforce its functions due to lack of supportive conservation policies.

### **5.7 Concluding remarks**

This chapter explored the issues that relate to the problem of fragmentation in the Emboreet Ward. In the first part three dimensions of fragmentation are revealed. These are habitat and wildlife; agriculture and fragmentation; and pastoralism and fragmentation. The three dimensions demonstrate that the level of integrity of habitat influences the distribution patterns of zebra and wildebeest. A slight change in habitat through external factors, in this case human activities, may cause fragmentation of habitat, leading to a change in the distribution patterns of these animals, and a possible loss of this habitat.

The other part of the chapter indicates various issues that are critical in the relationship between the Tarangire National Park and people in the Emboreet Ward. It highlights specific benefits and non-monetary costs that the interaction between people and wildlife poses. Also, it shows the success, shortfalls and barriers to the implementation of the park-neighbour outreach initiative (CCS). The barrier to the integrity of wildlife habitat in the study area seems to be the continued fragmentation of this habitat, which is likely to lead to conflicts and further loss of what is left of this habitat. Where some issues raised in the findings may not have received a detailed explanation, the following chapter discusses the salient issues raised in the findings. It relates these issues to the conceptual framework that was developed in the earlier chapters in order to come up with a more vivid explanation of the main research problem.

## CHAPTER 6

### DISCUSSION

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#### 6.1 Introduction

The aim of this chapter is to discuss the findings and interpret them in the context of achieving the intentions of conservation. In the previous chapter the findings revealed three important realities: that the Emboreet Ward exhibits fragmentation of wildlife habitat, fragmentation of pastoralism, and the extension and consolidation of agriculture. The results showed that as agriculture extends and consolidates, both wildlife and pastoralism are affected as suitable habitat for these two elements shrinks and becomes disjunct. Guided by the conceptual framework that was developed (Chapter two), the discussion explores the way in which the conceptual framework, related to the findings, can be useful in understanding problems and issues that commonly emerge in the relations between people, park officers and wildlife in general. The chapter concludes with policy implications that emerged from the findings.

#### 6.2 Traditional exclusion of wildlife from livelihood options as a cause of fragmentation in the Emboreet Ward

In developing the framework for this study, chapter three drew attention to the fact that traditionally, the Maasai have always been pastoralists. It was explained that their livelihood strategy<sup>10</sup> was such that all activities, be they economic, social or otherwise, were centred on livestock and had an impact on their development needs. While they may have used wildlife resources for social and cultural purposes, such as killing a lion as an indication of bravery, the Maasai way of life by and large excluded wildlife as a form of consumptive livelihood strategy (Lengisugi, pers. comm. 19/09/2001). Although this was feasible in the context of their past history, there has been a change in their life style in recent times. Not only have they embraced a modern way of living, but they have also adopted agriculture as part of their livelihood activities. There are several explanations given for this changed lifestyle. These were covered in chapter three of this study. In

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<sup>10</sup> A livelihood strategy comprises the means and activities required for living. It includes both material and social resources (Chambers and Conway, 1992).

order not to repeat them here, it suffices to say that the Maasai's clinging to livestock as their sole livelihood strategy places them at high risk during times of severe drought and livestock diseases (Muir, 1994). To diversify the risks, they adopted agriculture to complement livestock keeping. Paradoxically, the same areas were critical habitats for most terrestrial wildlife, particularly the migratory species of zebra and wildebeest (TCP, 1998). The livelihood pressures that grew out of the need to supplement livestock with agriculture, as well as the impact of new life styles, exerted more pressure on wildlife habitats initiating a process of fragmenting them into small and disjointed patches. Livestock habitat also became fragmented, therefore increasing the risk of affecting livelihood strategies as a whole.

### **6.3 Implications of fragmentation to wildlife and local people's livelihood**

The findings suggest that wildlife is still not part of the livelihood strategies of local people in Emboreet Ward. Consequently, it does not appeal to their minds that wildlife should be harvested; neither that there is the need to protect it. While the traditional Maasai life style excluded wildlife, except for some specific purposes, there is evidence that conservation policies also marginalized people from wildlife and excluded them from the benefits of wildlife (URT, 1998). It is contended that this amplified the perceptions people held that wildlife is not part of their livelihood strategy and enhanced a perception that the Maasai co-existed with wildlife but with no livelihood advantage to be gained from this. In this context, it is easy to envisage how threats to wildlife might seem irrelevant. Thus, whilst habitat fragmentation consequent upon the expansion of agriculture might be seen as relevant for the pastoralism component of livelihood strategies, its consequences for wildlife might either be not evident, or if they are evident, they may be considered of little consequence for personal and household well being.

Two forces appear to be shaping the behaviour of the Maasai in the Emboreet Ward. These are the need to diversify livelihoods so as to cope with risks attached to pastoralism; and secondly, the need to embrace the changing economy. As long as wildlife is not perceived to be a livelihood strategy that can contribute to meeting both of

these needs, it will be of little consequence in the way the Maasai plan and implement land use, and in their perceptions of conservation.

The evidence of clustering of wildlife and of fragmentation of habitat suggests that there is urgent need for action. The integrity of the landscape, and not just the integrity of habitat affects the economy associated with wildlife, particularly that associated with the non-consumptive component. If wildlife is to realize its potential in the rural economy and livelihoods of local people, it would be necessary to retain identified natural landscapes. This might be based on a dual economy of wildlife and pastoralism outside the Tarangire National Park and an agricultural and commercial economy in the transformed landscapes. It is clear that for conservation to achieve its intentions and to promote sustainable development it would be wise to incorporate wildlife into the household economies of the Maasai of the Emboreet Ward, thereby establishing a third component to their livelihood strategy. Apart from promoting conservation of wildlife, it would also serve to spread risk across three activities rather than two, as is the present situation.

Although it is not guaranteed that pastoralism and agriculture are the only possible livelihood strategies that wildlife can be integrated into, the realities of the situation in the Emboreet Ward suggest that one cannot ignore them and that wildlife cannot survive as an independent entity. People must be empowered in all three livelihood strategies. The following section discusses this problem by adopting what Cook (1993) calls a 'Development Cube' model. His model is used to analyze the empowerment needs across the range of livelihood strategies, of which wildlife is 'furthest out'.

#### **6.4 Towards an integrated development model for managing livelihoods in the Emboreet Ward**

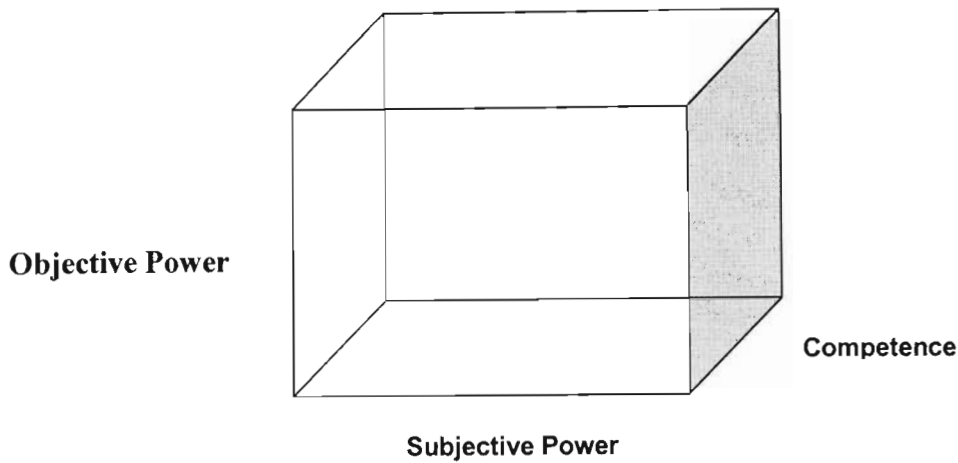
It is believed that managing livelihoods in the Emboreet Ward requires the integrated effort of all stakeholders – conservationists, extension service providers and local people. More specifically, it requires local people's understanding of the potential importance of wildlife habitat for their livelihoods, and the readiness of conservationists to facilitate a

process that is broader than their traditional approach. But there is a risk in this regard as experience shows that unless people understand their responsibilities and authorities, there is not much they can do to change their behaviour. Nor is it possible to change without making wildlife a valuable land use option for them. Consequently, if sustainable livelihoods are to be achieved this risk has to be reduced. Whilst diversifying activities to include wildlife can help, it is insufficient. There has to be increased efficiency and effectiveness in the use of wildlife. Empowerment is central to achieving this. For the purpose of this study, the word is defined thus "...empowerment clearly has to do with power. Power operates at various levels-within a person, between people and between groups" (Fitzgerald, 1999: 282).

Consequently, a model needs to be developed and implemented to show that it is possible to integrate wildlife into the livelihood options of the local people, while at the same time improving the dependability and sustainability of pastoralism and agriculture. A consequence of this integrated approach would be the sustainable use of a mosaic of land uses. It is from this perspective that this study suggests a CBNRM approach as the starting point towards developing this model. In southern Africa CBNRM has been developed as a model for empowering local people in the management of natural resources, including wildlife (Rihoy, 1999). However, it must be understood that as a process, CBNRM depends on co-operation of the state and the local people to cater for both the livelihood needs of the people as well as those of wildlife (*ibid.*). In this case, the focus is on converting fragmentation into a mosaic of integrated land uses for the benefit of people and wildlife.

The Development Cube Model (Cook, 1997) is adopted in this discussion to help to envisage a way forward in the transformation of a fragmented landscape, with fragmented management, into a landscape characterized by an integrated landscape and management incorporating wildlife, pastoralism and agricultural economy and others that may gain relevance in the future. Cook's model proposes three dimensions of empowerment, which are analogous to the three sides of the cube. These dimensions include subjective power, objective power and competence (Figure 6.1).





**Figure 6.1:** The Development Cube Model (after Cook, 1997)

### *Objective power*

Objective power refers to opportunities that lead to a person's self-fulfillment in life. Those who determine the empowerment process i.e. those who already are in power can facilitate the adoption of objective power. Cook (*ibid.*) proposes the way to expose and involve an individual or a group of people in objective power. In summary, he identifies three critical requirements for objective power to occur. They are:

- adopting a participatory approach to management;
- exposing people to various experiences to promote motivation; and
- giving people control over managing their destiny.

Objective empowerment focuses on adopting the experiences and knowledge of an individual or people by incorporating them into management of any sort. The implications of objective power include reduced supervision and increased decision-making levels of the local people. This is critical for the management of wildlife. It implies that wildlife authorities, including the state, have an important role to play in facilitating the adoption of wildlife as a form of livelihood strategy. Moreover, it proposes that the state role is to provide people with an enabling environment and the opportunity to diversify their activities through wildlife management and the accompanying benefits, such as tourism. This includes developing the mechanisms that

provide people with a mandate to manage wildlife. But Cook reveals that subjective and objective powers are not enough to develop an effective empowerment for an individual or a group of people. He then introduces competence development as the third dimension of empowerment.

In the context of the Emboreet Ward, it seems that traditionally people have objective power with livestock in that they realize opportunities for self-fulfillment, but they do not have objective power to integrate livestock into a market-oriented economy. The evidence suggests that since the early 1980s they began to develop objective power in agriculture (Chapter 5) in the sense that it has become the major livelihood strategy for almost half of the local population. However, they have yet to do so in the case of wildlife. One of the deficiencies that prompt exclusion of wildlife from the livelihood options is lack of confidence on the part of the local people that they can do something. Surely, the greatest weakness of objective power as far as wildlife is concerned, relates to not securing opportunities that can promote self-fulfillment in the changed and changing economy. But this may be possibly caused by the traditional exclusion of wildlife and the conservation laws that excluded people from adopting wildlife as a livelihood opportunity.

### *Subjective power*

This refers to a person's development of a sense of confidence that one 'can do' a specific task (Cook, 1997). Self-determination is the key to subjective power. To allow this sense of self-determination to arise, a person must be motivated. The question is however, who motivates this person. Regarding the subjective dimension, Cook (*ibid.*) proposes three characteristics that he considers critical for this process. These are: one's feelings that one can do things that are out of one's reach; an individual's feeling that one is competent to do these things; and when the chances are open through access to information, one is ready to exercise these feelings.

There is a need to develop a sense of confidence on the part of local people to realize that they have the potential to adopt wildlife as a form of livelihood. Moreover, local people

have to cope with a changing economy using a multiple strategy that incorporates agriculture, livestock and wildlife. The development of subjective power would enable people to integrate wildlife into their livelihood strategy.

### *Competence development*

Cook (*ibid.*) proposes that competence development is necessary to carry out functions successfully. The model holds that if people lack interpersonal competence they can be disempowered. The training needs of the people are key to empowering people to perform. These needs must respond to other specific needs that are identified (*ibid.*). Thus, it is not enough for people to see an opportunity and realize that they can do something and that the laws and regulations allow them to do what they want to do. Being able to cope efficiently and sufficiently with the changing economy is critical to their livelihoods. Indeed, it can be said that this is the critical point in empowering local people. They must be able to make decisions and implement them with a clear understanding of the impacts that those decisions may have for them. Training is crucial for any success in adopting wildlife as part of livelihood strategies. But training alone does not induce the required empowerment if there are not other resources, including financial and information related resources.

Cook's model clearly shows that for any successful and meaningful solution to the lack of competence on the part of the local people, empowerment must be at the forefront. Not only is empowerment key to promoting self-confidence and motivation on the part of the local people, but it also helps in developing and implementing policies and programmes that promote the management of livelihoods in the Emboreet Ward. The 'development cube' model emerges as a useful tool in examining the way in which people can be prepared to manage their livelihoods within a fragmented habitat. In a more general sense, one can envisage its value in any situation characterized by diverse patterns of use.

## **6.5 The need for wildlife, pastoralism and agriculture in the Emboreet Ward**

### *6.5.1 The need for wildlife*

Conservation in the context of this study is defined as “The protection, improvement and wise use of natural resources to provide the greatest social and economic value for the present and the future.<sup>12</sup>” Understanding the need for wildlife conservation is critical for any attempt to maintain and promote the survival of wildlife. There is a need for objective empowerment of the state to see the opportunity and necessity for incorporating wildlife into rural livelihoods. Also, there is a need for the objective empowerment of the Maasai to see the opportunity of using wildlife to reduce risk and to increase wealth. It is also important that wildlife conservation is promoted because it acts as a magnet for revenue from tourism activities that are associated with it. Tourism stimulates business and diversity of opportunities for local people in the form of job creation and small-scale businesses. While this is a positive part of conservation, anthropogenic activities such as agriculture and settlement may seriously affect conservation initiatives, particularly when these activities cause fragmentation of wildlife habitat.

There is also the need for subjective empowerment of the state to have confidence and self-determination to let local people plan and utilize wildlife as a source of wealth. The state should see an opportunity and necessity for sharing power with local people in owning and using wildlife resources. On the other hand, people have to develop a sense of confidence that they can do specific tasks that facilitate the sustainable use of wildlife to reduce risk and to increase wealth.

For subjective empowerment to succeed, the state has to build competence at all levels. Being able to perform efficiently and sufficiently is critical to promoting the myriads of opportunities for rural livelihoods. On the other hand, the Maasai should be competent enough to see the opportunity to cope in a changing economy using a multiple strategy that incorporates not only wildlife, but also agriculture and livestock.

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<sup>12</sup> <http://gfgrow.org/popup/poploss.asp?ID=016>

### *6.5.2 The need for pastoralism*

As with wildlife, the significance of pastoralism lies in its role in maintaining livelihood needs of the Maasai in Emboreet Ward. Livestock, particularly cattle, are a source of diet through meat latterly and milk. It is also through livestock that the Maasai identify themselves as a culture and symbol of their well-being (Lengisugi, pers. comm. 12/09/2001). While all these are characteristics of the Maasai identification with livestock, pastoralism has always been practised at a subsistence level. A precondition for the continued meaningful survival of livestock as a livelihood strategy is for it to be integrated into the cash economy, with the improvement of the stock quality rather than quantity, of which the latter seems not to cater for the growing economic needs of the people. More importantly, there is a need to promote the objective empowerment of the state to see the opportunity and necessity for incorporating pastoralism into rural livelihoods. There is also a need to promote the objective empowerment of the Maasai to see the opportunity of using livestock to reduce risk and to increase wealth. There must be an intentional decision by the people to improve the efficiency with which they use land to maintain livestock. Furthermore, if the Maasai continue to support an increasing population, they must also improve their land management practices.<sup>13</sup> It will be increasingly difficult in the future to move livestock from place to place to search for pasture as population increase tends to decrease the possibility of this practice to continue.

### *6.5.3 The need for agriculture*

While agriculture seems to be a new phenomenon relative to pastoralism in the Emboreet Ward, its significance in maintaining people's needs cannot be underestimated. Agriculture is now the predominant livelihood strategy for the local people in the Ward (Muir, 1994). It is understandable that in a situation of limited alternative livelihood options, agriculture has gained ground not only as a coping strategy for a decline in livestock base, but also as a way of catering for new demands that are posed by changes in the Maasai lifestyle (Muir, 1994). However, agriculture, like any other livelihood

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<sup>13</sup> Findings indicated that due to polygamy and extended family practices the Maasai households tend to be relatively large (Chapter five).

strategy, requires proper land use planning through co-ordinated efforts of local people and the government. There is a need to promote objective empowerment of the state to see the opportunity and necessity for incorporating agriculture into rural livelihoods. Moreover, there is a need to develop the objective empowerment of the Maasai to see the opportunity of using agriculture to reduce risk and to increase wealth.

There is also a need to move from a subsistence type of agriculture to a more rigorous economic oriented one. This is a way in which local people can increase benefits from agriculture. Nevertheless, it is not enough that agriculture becomes market oriented. It has to be integrated with pastoralism and wildlife to develop a strong economy that supports not only the livelihood of the people of Emboreet, but also the maintenance of habitat and conservation through managing the fragmented habitat. To be able to manage fragmentation properly the question of empowerment must be clearly articulated and addressed. The 'development cube' model, by exploring various issues related to empowering individual people and groups, provides direction for this.

#### **6.6 A policy for integrated livelihoods in Emboreet Ward**

While habitat fragmentation in the Emboreet Ward may reflect poorly integrated livelihoods, developing policies for empowering local people is critical to promoting integrated rural livelihoods (TCP, 1998; Kahurananga and Silkiluwasha, 1997). For one to appreciate these policies and the shortfalls therein, one needs to examine their impact on promoting habitat integrity. In the context of the Emboreet Ward, the Development Cube model raises many policy-related issues. It touches on the role that policy has in empowering people to utilize wildlife resources. It also calls for conservation policies that take into account the livelihood demands of the people. Furthermore, it entails development of policies that seek to address the management of fragmented habitats as a way of promoting the integrity of protected areas such as national parks, alongside other land areas such as those for agriculture and pastoralism.

### 6.6.1 *The Institutional framework as the basis for promoting integrated livelihoods*

An institutional framework means, an established custom, practice of an organization such as state or company and the associated set of principles or ideas used as a basis for one's judgments and decisions (Crowther *et al.* 1997). The significance of institutional frameworks is recognized to be one of providing direction for the management of wildlife habitat. Nevertheless, one must be cautious in adopting a policy framework without investigating its long-term implications. That is why in investigating the institutional frameworks and conservation policies in southern African countries, Whitman (2000: 281-282) contends that they "...appear inadequate, too fragmented and too divergent to meet the daunting challenges that biodiversity issues are likely to present in the foreseeable future." It is along this line that the institutional arrangement in Tanzania is explored.

The institutional arrangements in Tanzania provide a framework to implement various management objectives, including wildlife conservation (LEAT, 1998). Because of the top-down control by the central government and district councils, it is obvious that ward and village councils have very little measure of power to control, regulate and manage natural resources in the areas under their jurisdiction (*ibid.*). However, the question is whether in a situation where powerful interests are involved in the exploitation of natural resources, local authorities can be allowed to exercise their powers in the long term for the interests of local people and wildlife. This is a major problem in the current interventions in the Emboreet Ward. Nevertheless, there is a need to examine conservation policies and their ability to promote the integrity of wildlife, as well as the extent to which they are able to involve local people in their conservation objectives.

### 6.6.2 *Tanzania National Parks Policy*

Tanzania has a complex and evolving wildlife sector with a number of institutions charged with managing various aspects of the environment and wildlife conservation. While it was not the intention of this study to carry out a detailed analysis of this sector, there are a number of factors that directly impact on the interaction of people and wildlife in the Emboreet Ward. As a National Park, Tarangire falls under the mandate of Tanzania

National Parks (TANAPA), a parastatal organization. A Board of Trustees appointed by the Ministry of Natural Resources and, Tourism directs TANAPA, and the President appoints the Chairman. TANAPA is guided by the National Parks Policy, which is geared towards conservation and non-consumptive use of wildlife, and which includes clear guidelines for Community Conservation Services (TANAPA, 1994). It gives TANAPA the mandate to exercise its conservation efforts within the national parks system only.

Surrounding the Tarangire National Park, the area falls under a mixed regime of management. The Ministry of Natural Resources and Tourism manages the Game Controlled Areas (GCA) at District level. In GCAs the Wildlife Conservation Act of 1974 protects wildlife. Unlike in the National Parks, consumptive use of wildlife resources is allowed in GCAs through licensing. Other human activities such as settlement, cultivation and the like, are not restricted. The Tarangire National Park therefore operates in an institutional landscape that does not give it a strong mandate to work outside its boundaries. Moreover, this park experiences a variety of land uses that in most cases are not compatible with conservation (Boner, 1985). The park holds jurisdiction within its boundaries while its outreach programme, Community Conservation Service (CCS), operates in areas whose jurisdiction lies with other government agencies and some private individuals. Service delivery to neighbouring local communities is a challenge to the Tarangire National Park.

### *6.6.3 The Wildlife Policy*

The newly established Wildlife Policy of Tanzania makes provisions for the management of wildlife in areas outside National Parks (Wildlife Policy, 1998). These areas include wildlife dispersal areas and migration routes, which are critical to the integrity of park ecosystems and the maintenance of wildlife habitats. It also provides for the management of wildlife in these areas in ways that ensure that local communities participate in and benefit from the management of wildlife in their areas. The envisaged creation of Wildlife Management Areas (WMAs) would give a framework for this objective. The policy thus provides a framework, and existing WMA pilot projects in other parts of Tanzania provide precedent and experience for the Emboreet Ward. Currently, the



wildlife sector has not been able to develop to its full potential. It has not convinced the local communities that wildlife conservation can be a livelihood option. People may be aware of loss of wildlife habitat integrity and even the consequences thereof, but the reality of the situation they find themselves in leaves them with little option. Wildlife has failed to compete adequately with other forms of land use, especially for rural communities. This failure has for decades, exacerbated loss of wildlife habitat to settlements, agriculture, grazing and logging due to human population increase and disruption of local people's livelihood.

### **6.7 A proposal to establish an Integrated Biosphere Area (IBA)**

The Emboreet Ward is experiencing fragmented governance apart from a fragmented habitat. Perhaps the former may be the cause of the latter. In order to bring cohesion, it is not enough to integrate and improve livelihood strategies. Bringing governance to the grassroots level and integrating it into these livelihood strategies must be the focus of any proposed initiative. Consequently, a special system of governance ought to be developed. This study proposes the establishment of an integrated biosphere reserve as a way to merging the interests of conservation, pastoralism and agriculture at the national and local level. To do this, co-ordination of all stakeholders is required.

#### *Ministry of Land Affairs*

As it oversees issues related to land management, tenure and planning at the national level, the Ministry of Land Affairs should be a key player in the establishment of IBAs. Its role, among others, would be to facilitate the acquisition of land rights and tenure for the establishment of the biosphere reserve. This is critical because the livelihood strategies in the Emboreet ward are all part of the land use system over which the Ministry of Land affairs has jurisdiction.

#### *Ministry of Water and Livestock Development*

As the name suggests, the elements of water and livestock are inseparable, in the sense that for livestock (pastoralism) to survive, availability of safe drinking water is an imperative. Thus, the Ministry of Water and Livestock Development would be an

important stakeholder in the biosphere reserve. Water and livestock policies developed by this ministry would have a bearing on the performance and success of the proposed biosphere reserve, particularly since it is shown that wildlife migrations are strongly influenced by the availability of water.

#### *Ministry of Agriculture*

While the previously mentioned Ministries would important players in the establishment of the IBA and the subsequent management of the biosphere reserve, the Ministry of Agriculture holds the same significance. It should be an important stakeholder in overseeing agricultural policies and regulations at the national level. Moreover, the input of this ministry to the establishment of the IBA and the biosphere reserve is critical, given the fact that more than half of the local people in the Emboreet Ward practise agriculture as their predominant livelihood strategy (Chapter 5).

#### *Ministry of Natural Resources and Tourism*

This Ministry is responsible for co-ordinating natural resource use and tourism at the national level. In the establishment of the biosphere reserve in the Emboreet Ward, this ministry has a significant role. Its significance would not only lie in the fact that it deals with wildlife and its related habitat, but also that it would be an opportunity for this ministry to mainstream local people's active participation in wildlife conservation. It is an opportunity to develop wildlife management strategies that provide opportunities for local people to integrate wildlife in their livelihood strategies. As a way of integrating wildlife in the livelihood strategies of the local people, the Ministry should ensure that conservation laws and policies are clearly articulated so that they may not be in conflict with the needs of the local people.

#### *The Covenants of Mutual Obligation*<sup>14</sup>

It is proposed that an autonomous management agency should be established to co-ordinate the management of the biosphere reserve. The success of the biosphere reserve will depend on how best the agency performs in coordinating the interests and roles of

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<sup>14</sup> Hooper, 1999

the stakeholders. To do this, covenants of mutual obligation need to be established to guide and bind the stakeholders for the purpose of implementing the requirements of the proposed biosphere reserve. For these covenants to function well there are certain requirements that need to be met. There is a need to:

- build and maintain strong leadership of the engaged community
- ensure that the management of the biosphere reserve is based on skills, rather than on a representative basis
- clarify, strengthen and fund the role of local government;
- develop trust among the stakeholders under the basis of mutual obligations;
- create financial and risk management capabilities for the landowners and local people to adopt; and
- develop a clear definition of property rights in order to avoid, amongst others, land disputes.

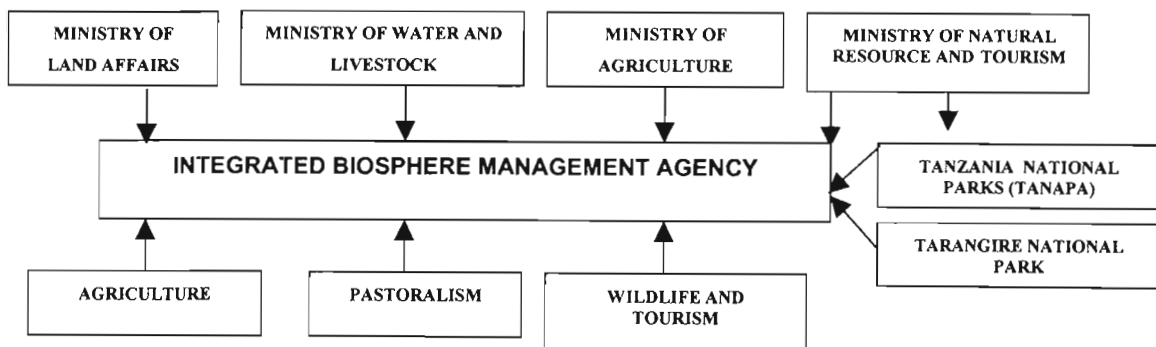
*The tasks of the proposed Emboreet Biosphere Reserve Management Agency*

While the above obligations mention what the covenant of mutual obligations needs to consider, there is also a need to develop specific actions or tasks that the integrated biosphere reserve should undertake. The following tasks should be undertaken in the context of the proposed biosphere reserve:

- making a *social inventory*: this entails describing the demography, social networks and human capital of Emboreet Ward. Analyzing and identifying social change and related indicators can promote this. Furthermore, adoption rates of resource users based on the best management practices needs to be developed. In order to do these tasks, a social impact assessment framework needs to be developed. Its aim is to guide actions related to the management of the biosphere reserve;
- making a *resource inventory*: this includes the description of conditions, trends and the spatial location and variability of natural resources;
- *building the Emboreet Biosphere Reserve information management system*: this

can be done by analyzing and assessing current information management behavior and communication, and delivery mechanisms and by identifying the information management needs of the people;

- *developing policy and programmes for the biosphere reserve*: this can be done by identifying relevant planning, environmental and natural resource legislation; and by developing mechanisms to co-ordinate policy development and action planning;
- *undertaking an economic inventory of the area*: this entails describing and developing economic and performance indicators. This task is important as it would generate information that can be used to plan for other economic activities such as tourism;
- *building a decision support system*: this is the important task of identifying and evaluating resource management options. Stakeholders have to be engaged in developing various scenarios, criteria and variables that can help to predict potential changes that may need specific solutions. This facilitates adaptive management;
- *establishing operations management*: the task of the proposed integrated biosphere management agency in this respect would be to develop and implement a corporate plan and a business plan for the Emboreet Ward. These plans must include the mechanisms for sharing the costs and benefits, best management practices, including a description of the possibilities for each stakeholder.



**Figure 6.2:** Proposed Emboreet Integrated Biosphere Management Agency

Figure 6.2 indicates various actors in the formation of the proposed Integrated Biosphere Management Agency (IBA). These actors have to promote and safeguard the interests for which the biosphere reserve is established. At the national level, four ministries are selected on the basis of their relevance to the establishment of the IBA.

### **6.8 Concluding remarks**

The interaction of wildlife and people is a complex reality. It brings with it both costs and benefits. For a conservation authority, fragmentation of wildlife habitat could be viewed the major cost of this interaction. On the other hand, for the people it is not immediately at least a factor of wildlife habitat integrity that matters, but rather their own integrity. To strike a balance between the two is the challenge ahead. To this extent it is not wise to describe wildlife habitat fragmentation as a problem for one will would be biased. In the end, there can be no solution to the degradation of wildlife habitat integrity without a solution to ensuring human integrity. These two visions of integrity have to be merged and a common solution sought. It is in light of this position that apart from summarizing the study, the following chapter attempts to suggest some actions that can be used in reconciling human and wildlife integrity in the Emboreet Ward. It is necessary to recognize that in order to reduce and possibly remove conflict between the park and neighbours on the one hand, and secure wildlife habitat on the other, that the patterns of distribution and expansion of human activities in the Emboreet Ward must be managed. What remains to discuss is how they can be managed. The last chapter concludes this study and proposes some recommendations that are thought to be useful in this process.

## CHAPTER 7

### CONCLUSIONS AND RECOMMENDATIONS

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#### 7.1 Introduction

This chapter draws general conclusions and recommendations from the findings and the discussion. The conclusions that are drawn here reflect the understanding that habitat fragmentation is a complex issue. It is complex because it relates to many interrelated processes that lead to its inception and its continuation. The second part of the chapter recommends various actions that could be useful in establishing an integrated biosphere area as a possible solution to the perceived ‘problems’ of habitat fragmentation in the Emboreet Ward.

#### 7.2 Conclusions

This study shows that:

- the emergence of a cash-based economy and a weakening of the subsistence economy based on livestock is driving a the change from pastoralism to agropastoralism.
- habitat is increasingly being fragmented by the dispersed pattern in agriculture development, and this has serious consequences for wildlife movement outside the park;
- local people are diversifying their livelihood strategies by adopting agriculture as the dominant strategy;
- pastoralism is being replaced by agriculture although the former is still an important livelihood strategy;
- evidence from both the fragmented pattern of agricultural development and the weakening of pastoralism indicate that the Tanzania National Parks Benefit Sharing Scheme is ineffective in resolving habitat fragmentation
- notwithstanding the subsistence nature of pastoralism and agriculture, the two are integrated into the livelihoods of the local people in the Emboreet Ward. For the two strategies to benefit local people in terms of raising their living standards, they need

to change from this subsistence type of livelihood towards a livelihood based more on a market-oriented economy. This will assist people to cater for their socio-economic needs, including raising their level of education, which was shown to be very low (Chapter 5), and improving their household well-being;

- wildlife is still far from being integrated into the livelihood strategies of the local people in the Emboreet Ward. While wildlife offers a potential opportunity for raising the standard of living for local people in the Ward, wildlife is still excluded from the traditional livelihood strategies. It needs to be integrated with agriculture and pastoralism. However, integrating wildlife with other livelihood strategies will not be enough in itself. Wildlife needs to be commercialized so that it produces sustainable benefits to the people. Wildlife activities such as tourism can be introduced and promoted for this purpose by diversifying economic activities;
- while a conflict relationship between people and wildlife in the study area is a consequence of the failure to integrate wildlife conservation into the socio-economy of the local people (Making the ends meet), today a much broader and more comprehensive picture of the situation has to be developed. This bigger picture has to be related to people's developmental needs, and
- the concept of focusing on livelihoods as a cross-cutting and interfacing feature in the land use management is exposed. The study shows this to have generic application but illustrates that contemporary approaches grossly underestimate the dimensions of empowerment needed to meaningfully adopt the concept of integrating livelihoods into economies based on changing patterns of resource use.

### **7.3 Recommendations**

In devising ways to address the complexity and delicacy of interaction between people and wildlife in the Emboreet Ward, it seems that an urgent and radical change is required. The following are some of the recommended actions:

- There is a need to develop an integrated management approach that caters for wildlife, pastoralism and agriculture in the Emboreet ward. The approach plan should be to bring direct and long-lasting tangible benefits to the local community, by

integrating livelihood strategies including those using wildlife. This should be developed through the establishment of the Emboreet Integrated Biosphere Agency. Co-operation of local people, organizations, the central government ministries and related authorities and other stakeholders is necessary for the establishment and implementation of the proposed biosphere area and the managing agency. They must co-operate to find manageable strategies that are ecologically, economically, politically, socially and scientifically sustainable to both wildlife and local people.

- In order to best implement the integrated management plan in the Emboreet Ward, there is a need to pursue policies that promote the empowerment of both local people and government officials at all levels. The empowerment in this case would entail developing three aspects namely: objective power, subjective power and competence that were discussed in the Development Cube model (Chapter 6). The inclusion of local people in policy and decision-making requires direct communication of their perspectives on the problems and solutions with respect to wildlife, pastoralism and agriculture, as well as other potential areas of livelihood such as tourism development. This should involve acknowledgement by the government and conservation authorities, including Tarangire National Park, that the locals have the capacity and right to manage wildlife resources in a sustainable manner.
- If the competition for grazing and water resources and the driving power behind the seasonal migrations of wildlife are to be fully understood a major research programme would be necessary. A detailed understanding of man/wildlife interactions in the Emboreet Ward is an important prerequisite for long term planning. Further studies need to be carried out to determine the nature and the subsequent trend in the interaction between wildlife and people in the Emboreet Ward. These studies are critical in that they would ultimately give the direction to further planning for the conservation and development needs of the study area. At the moment, the limited research findings that have been produced through various researches in the area, have revealed a tremendous potential for integrating wildlife into other livelihood strategies. A detailed and long term socio-economic and wildlife



related research would surely help determine long-term solutions to the ‘problem’ of fragmentation in Emboreet Ward.

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## APPENDIX 1

## Legend for the land cover/habitat types map

| MAIN LAND COVER CLASS   | GENERALISED LEGEND  | MAP CODE | SPECIFIC LAND COVER TYPE  |
|---|---|----------|---|
| NATURAL TO SEMI NATURAL TERRESTRIAL VEGETATION                  | Woody Close Vegetation (group A)                                | A        | Closed Woody Trees  |
|   | Closed Tree (group B)   | B1       | Multilayered Trees  |
|   |   | B2       | Closed Low Trees with Shrubs                                      |
|   |   | B3       | Closed High Trees with Shrubs                                     |
|   | Open Tree (group C)   | C1       | Open Trees with Shrubs  |
|   |   | C2       | Open Low Trees with Shrubs  |
|   | Very Open Tree (group D)  | D1       | Very Open Trees with Shrubs                                       |
|   |   | D2       | Very Open Low Trees with Herbaceous and Shrubs                    |
|   | Closed Shrub (group E)  | E        | Closed Shrubs   |
|   | Open Shrubs with Herbaceous and Trees (group F)                 | F1       | Open Shrub with Herbaceous vegetation and sparse Trees            |
|   |   | F2       | Very Open shrubs with Herbaceous and Trees                        |
|   | Open shrub (group G)  | G1       | Open Shrubs with Herbaceous                                       |
|   |   | G2       | Very Open Shrubs with Herbaceous                                  |
|   | Shrub or Tree Savannah (group H)                                | H1       | Closed Herbaceous with Trees and Shrubs                           |
|   |   | H2       | Closed herbaceous with Shrubs                                     |
| NATURAL TO SEMI NATURAL AQUATIC OR REGULARLY FLOODED VEGETATION | Closed to Open Trees on Temporarily Flooded Area (group L)      | I1       | Closed Herbaceous   |
|   |   | I2       | Open (general) Herbaceous   |
|   |   | L1       | Multilayered Trees (Broad-leaved) on Temporarily Flooded Area     |
|   |   | L2       | Open Trees with Herbaceous on Temporarily Flooded Area            |
|   | Closed to Open Shrub on Temporarily Flooded Area (group M)      | L3       | Closed Trees on Temporarily Flooded Area                          |
|   |   | L4       | Very Open Trees with Herbaceous                                   |
|   |   | M1       | Closed Shrubs on Temporarily Flooded Area                         |
|   |   | M2       | Open Shrubs with Herbaceous on Temporarily Flooded Area           |
|   | Closed to Open Herbaceous on Temporarily Flooded Area (group N) | M3       | Very Open Shrubs with Herbaceous on Temporarily Flooded Area      |
|   |   | N1       | Closed Herbaceous on Temporarily Flooded Area                     |
|   |   | N2       | Closed Herbaceous with Trees on Temporarily Flooded Area          |
|   |   | N3       | Closed Herbaceous with Shrubs on Temporarily Flooded Area         |
|   |   | N4       | Open (general) Herbaceous with Shrubs on Temporarily Flooded Area |
|   | Closed Herbaceous Vegetation on permanent Wet Area (group O)    | O1       | Closed High Herbaceous (Permanent Wet-Fresh Water)                |
|   |   | O2       | Closed Medium Height Herbaceous (Permanent Wet-Fresh Water)       |
| CULTIVATED AND  | Tree Crop (group P)   | P1       | Rainfed Trees-Large Crop Fields                                   |
|   |   | P2       | Rainfed Trees-Medium Crop Fields                                  |
|   |   | P3       | Rainfed Trees-Small Crop Fields                                   |

|   |  |    |   |
|---|--|----|---|
| MANAGED<br>TERRESTRIAL<br>AREAS                       | Rainfed Herbaceous Crop<br>(group Q)                         | P4 | Trees-Clustered Small Crop Fields                       |
|   |  | Q1 | Rainfed herbaceous-Large Crop Fields                    |
|   |  | Q2 | Rainfed herbaceous-Medium Crop Fields                   |
|   |  | Q3 | Rainfed herbaceous-Small Crop Fields                    |
|   |  | Q4 | Rainfed herbaceous-Clustered Medium Crop Fields         |
|   |  | Q5 | Rainfed herbaceous-Clustered Small Crop Fields          |
|   |  | Q6 | Rainfed herbaceous-Isolated Medium Crop Fields          |
|   |  | Q7 | Rainfed herbaceous-Isolated Small Crop Fields           |
|   | Post Flooding Herbaceous Crop<br>(group R)                   | R1 | Post Flooding Herbaceous-Medium Fields                  |
|   |  | R2 | Post Flooding Herbaceous-Small Fields                   |
|   |  | R3 | Post Flooding Herbaceous-Clustered Small Fields         |
|   |  | R4 | Post Flooding Herbaceous-Isolated Small Fields          |
|   | Irrigated Herbaceous Crop<br>(group S)                       | S1 | Irrigated Herbaceous-large Fields                       |
|   |  | S2 | Irregularly Flooded Cereals-Large to Medium Fields      |
|   |  | S3 | Irregularly Flooded Cereals-Medium Fields               |
|   |  | S4 | Irregularly Flooded Cereals-Small Fields                |
| CULTIVATED<br>AQUATIC OR<br>REGULARLY<br>FLOODED AREA | Aquatic or Regularly Flooded<br>Herbaceous Crop<br>(group U) | U1 | Cereals, Rice-Large Fields                              |
|   |  | U2 | Cereals, Rice-Medium Fields                             |
|   |  | U3 | Cereals, Rice-Small Fields                              |
| ARTIFICIAL<br>SURFACES AND<br>ASSOCIATED<br>FEATURES  | Urban Area and Other Associated<br>Feature (group V)         | V1 | Rural Settlements                                       |
|   |  | V2 | Urban Areas   |
| BARE AREAS  | Bare Area-Salt Crust<br>(group W)                            | W1 | Bare Rocks  |
|   |  | W2 | Salt Crusts   |
| ARTIFICIAL AND<br>NATURAL WATER<br>BODIES             | River Bank-Lake Shore<br>(group X)                           | X1 | River Banks   |
|   |  | X2 | Large shore   |
|   | Lake<br>(group Y)  | Y1 | Inland Water Perennial (Artificial Lakes or Reservoirs) |
|   |  | Y2 | Inland Water Perennial (Natural Lakes)                  |

## APPENDIX 2

### INDIVIDUAL-FOCUSED QUESTIONNAIRE

My name is Jacob Thomas Porokwa. Currently I am a student at the University of Natal-Pietermaritzburg, South Africa. The following is a series of questions that I would kindly ask you to answer for me. These questions form part of my study requirements. The aim is purely academic and it has nothing to do with interfering with your privacy. Thank you for your assistance.

---

#### **I. Respondent's Profile**

1. What is your marital Status?
  - a). Married
  - b). Single
2. What is the size of your household?
  - a). Less than three people
  - b). Three to ten people
  - c). Ten to Forty people
3. How long have you in this village
  - a). Less than five years
  - b). Between five and ten years
  - c). Between ten and forty years
  - d). Don't remember
4. How close to the Park boundary do you live?
  - a). Less than five kilometers
  - b). Between five and ten kilometers
  - c). Between ten and fifteen kilometers
5. Do you have formal education?
  - a). No
  - b). Yes
6. If yes, which level of formal education did you attain?
  - a). Primary

b). Secondary

c). College

7. What is your main activity?

a). Agriculture

b). Pastoralism

c). Agriculture and Pastoralism

d). Employed

e). Other (Mention)

## **II. Costs Of Interacting With Wildlife**

8. Do you experience any problems when living near the park?

a). Yes

b). No

9. If yes, mention three most critical problems

a). \_\_\_\_\_

b). \_\_\_\_\_

c). \_\_\_\_\_

10. Mention five most problematic wild animals in your area

## **III. Benefits of Living Near The Park**

11. Do you get any advantage by living near the park

a). Yes

b). No

12. If yes, mention three advantages.

a). \_\_\_\_\_

b). \_\_\_\_\_

c). \_\_\_\_\_

13. Do you know anything about community conservation service?

a). Yes

b). No

14. If yes, mention two benefits that it has brought you

a). \_\_\_\_\_

b). \_\_\_\_\_

#### **IV. Evaluating Community Conservation Service (CCS)**

15. What is your position about CCS in the following statements?

a). CCS should be left to continue the way it is.

b). CCS should be improved to perform much better

c). There is no advantage of having CCS and it should be discarded

**APPENDIX 3**  
**WARD-FOCUSED QUESTIONNAIRE**

My name is Jacob Thomas Porokwa. Currently I am a student at the University of Natal-Pietermaritzburg, South Africa. The following is a series of questions that I would kindly ask you to answer for me. These questions form part of my study requirements. The aim is purely academic and it has nothing to do with interfering with your privacy. Thank you for your assistance.

---

**I. Ward Profile**

- 1. Name of the Ward \_\_\_\_\_
- 2. Location \_\_\_\_\_
- 3. Size of the ward \_\_\_\_\_
- 4. Population \_\_\_\_\_
- 5. Land Uses   a). \_\_\_\_\_  
                      b). \_\_\_\_\_  
                      c). \_\_\_\_\_  
                      d). \_\_\_\_\_

**II. Natural Resources**

- 6. List four main wildlife resources found in the ward
  - a).
  - b).
  - c).
  - d).
- 7. What is the nearest National Park in the ward \_\_\_\_\_

**III. Population Dynamics**

- 8. What type of migration is more common in the area?
  - a). More people are moving into the area than moving out.
  - b). More people moving out than moving in.
  - c). Same number moving in as moving out.

#### IV. Livestock

9. How many livestock does an average person have in the ward?

- a). 5-20      b). 20-50      C). 50-100      d). More than 100

10. What is the approximate land available for livestock keeping in the village?

- a). Less than quarter of village land      d). More than half of village land  
b). Quarter of village land      e). Whole village land  
c). Half of village land

#### V. Agriculture

11. How many acres of farmland does an average person have in the ward?

- a). Less 5      d). 20-50  
b). 5-10      e). More than 50  
c). 10-20

#### VI. Wildlife

12. List four main benefits villagers derive from wildlife

- a). \_\_\_\_\_  
b). \_\_\_\_\_  
c). \_\_\_\_\_  
d). \_\_\_\_\_

13. List four main problems that are caused by wildlife

- a). \_\_\_\_\_  
b). \_\_\_\_\_  
c). \_\_\_\_\_  
d). \_\_\_\_\_

#### VII. Community Conservation Service (Park-People Relations)

14. Which category of people has benefit most from support from Community Conservation Service?

- a). Farmers      b). Livestock keepers      c) Both      d). None

APPENDIX 4

PARK INTERVIEWS

My name is Jacob Thomas Porokwa. Currently I am a student at the University of Natal- Pietermaritzburg, South Africa. The following is a series of questions that I would kindly ask you to answer for me. These questions form part of my study requirements. The aim is purely academic and it has nothing to do with interfering with your privacy. Thank you for your assistance.

---

I. Wildlife and People Interaction

1. What do you think is the state of the relationship between people and wildlife in Tanzania?

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2. What do you think is the state of the relationship between people and wildlife in areas surrounding Tarangire National Park, and specifically Simanjiro? \_\_\_\_\_

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3. What are the main problems associated with livestock and wildlife interaction in Simanjiro district?

- a).
- b).
- c).
- d).

4. What are the main problems associated with agriculture and wildlife interaction in Simanjiro district?

- a).
- b).
- c).



d).

5. Do you think that these problems (3&4) have increased in the past five years? \_\_\_\_\_

If yes, what could be the reasons for the increase? \_\_\_\_\_

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### **III. Community Conservation Services (CCS)**

6. How far has CCS helped to reduce conflict between the Park and people in Simanjiro area? \_\_\_\_\_

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7. If you were to evaluate CCS performance since the beginning of its operations in Simanjiro, what would you mention as its;

a). Strengths

b). Weaknesses