

**Socio-economic and livelihood strategies of the Ehirovipuka
Conservancy, Namibia**

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Table of Contents

List of Tables	ii
List of Figures	iii
Acknowledgments.....	iv
List of Acronyms	v
Executive Summary	vi
1. Introduction	1
2. Conceptual Framework.....	2
2.1. Sustainable livelihoods.....	2
2.2. Conservation and development	3
2.3. The history of the communal Conservancy programme in Namibia	5
3. Methodology.....	8
3.1. Description of the study area.....	8
3.2. Study design and data collection procedures	Error! Bookmark not defined.
3.3. Data analysis	11
4. Results and Discussion	11
4.1. The Socio-economic situation of the area	11
4.1.1. Household Demographic data	11
4.1.2 Dependence Ratio.....	13
4.1.3. Levels of household income	14
4.1.4 Involvement on the Conservancy Activities.....	15
4.2. Livelihood Strategies.....	16
4.2.1. Ranking of livelihood activities.....	16
4.2.2. Livestock farming: The most important livelihood activity.....	17
4.2.3. The effects of predation on livestock	22
4.3. Main sources of cash income: Employment and Pension grants	24

4.4.	Linking livelihoods and natural resources	25
4.4.1	Fuel wood	25
4.4.2	Poles for construction	27
4.4.3	Mopane Worms	27
4.5.	Community perceptions on changes in the livelihoods and natural resources.....	29
4.6.	Community perceptions on the management of natural resources	30
5.	Conclusion	31
6.	Recommendations	33
1.	References	33

List of Tables

Table 1	Number of households surveyed in the Conservancy	10
Table 2	Proportion of each level of education per gender	12
Table 3	Proportion of each level of education per age group of persons.....	12
Table 4	Proportion (%) of Persons per age group in the Conservancy.....	14
Table 5	Household income	15
Table 6	Involvement in conservancy activities based on gender	15
Table 7	Involvement in conservancy activities based age groups	16
Table 8	Ranking of livelihood activities	16
Table 9	Mean number of livestock per household in the community	18
Table 10	Mean±SD amount of livestock kept at Home and cattle post per household	18
Table 11	Livestock predation as compared to own consumption.....	22
Table 12	Type of animals causing damages in the Conservancy (2003-2005).....	23
Table 13.	Types of damages caused by problem animals.....	23
Table 14	Economic activities of household members.....	25
Table 15.	Distance travelled to collect fuel wood.....	26

Table 16 Time period fuel wood is collected per year.....	26
Table 17 Distance travelled to collect Mopane worms.....	28
Table 18 Community perceptions on the changes in livelihoods activities and products.....	30

List of Figures

Figure 1 Conservation strategy model that directly links livelihoods and conservation	5
Figure 2. The Map of Ehirovipuka Conservancy.....	9
Figure 3. The proportion of livestock owned by Conservancy communities.	18
Figure 4 The distribution of livestock in female and male headed households. (a) shows the total livestock owned, (b) shows number of livestock that are kept at home, while(c) shows the number of livestock that are kept at the post.	19
Figure 5 The distribution of livestock per household based on age groups. (a)total number of livestock owned, (b) number of livestock kept at home, (c) number of livestock kept at the post.	21
Figure 6.. The employment status of the household members.....	24
Figure 7 Towns where Mopani worms are sold.....	28

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List of Acronyms

CBD	Convention of Biological Diversity
CBNRM	Community Based Natural Resources Management
CAMPFIRE	Communal Areas Management Programme for Indigenous Resources
DFID	(UK) Department of International development
FGD	Focus Group Discussion
ICEMA	Integrated Community-Based Ecosystems Management
IRDNC	Integrated Rural Development and Nature Conservation
MET	Ministry of Environment and Tourism
NACSO	Namibian Association of Community Based Natural Resource Management Support Organizations
NBSAP	Namibia Biodiversity Strategy and Action Plan
NGO	Non-Governmental Organization
WWF	World Wildlife Fund

Executive Summary

The Conservancy, a Community-Based Natural Resources Management (CBNRM) approach, implemented in the rural areas in Namibia was identified as the focus of this study. A Conservancy is an organised group of farmers living within a common boundary area and related cultural background, as well as sharing the same resources for their livelihoods (Sullivan, 2002). Namibian rural areas have undergone changes in terms of social structures and the use of the environment. The livelihood strategies of people have been changing over time due to changes in the resources base and accessibility. This case study focuses on the Ehirovipuka communal Conservancy, which is located in the north-western part of the Namibia and directly bordering Etosha National Park. The north-western part is regarded as the richest region for wildlife species in the country. The objective of this study was to examine changes in livelihoods in order to enhance understanding the perception of the community on the linkages between the natural resources base and the livelihood strategies in the area.

This study employed both the household questionnaire survey and focused group discussions. A total of 111 households from 10 villages were randomly interviewed for the survey. In addition, six focus group discussions (FGD) were conducted in the two main settlements of the Conservancy, namely, Otjokavare and Onguta.

The findings of the study showed that the Conservancy is characterised by a high dependency ratio 100% or 1:1. This ratio is high because the number of the dependent age (50.3%) is almost equal the number of independent age group (49.7%). In addition to this, the Conservancy is dominated by low level of education and a high unemployment rate. Most members of the independent age group (economically active) (60%) also indicated to be neither working nor looking for employment. Also, the majority of the household members have either not attended

any formal education (44%) or have not completed primary education (48%). The households from this conservancy are engaged in various livelihood activities. These livelihood activities have been maintained over the years, although some have changed in order of importance. Livestock farming, mainly for own use purposes, emerged as the most important livelihood activity, followed by formal employment and old age pension grants. Most of the income generating livelihood strategies only became important during the 1980s, which suggests the shifting of the rural community to respond to the national cash economy lifestyle. Three factors that maintained the livelihoods activities in the Ehirovipuka Conservancy emerged as access through strong social relations, diversification of livelihood activities and the emergence of the community level support institutions such as the Conservancy. In conclusion, the Conservancy is perceived as community level support that contributes to the improvement of natural resources which most livelihood activities depend on, hence, leading to the resilience of most livelihood activities.

The study recommended the following: (i) Although owning large herds of cattle is a cultural practice, there is a need to find ways to address this practice because it may lead to subsequent land degradation in the area, hence affecting the main livelihood activity of the area; (ii) Development of monitoring mechanisms for vegetation resources and landscapes is required to allow community leaders to make informed decisions; (iii) Community members need to practise mechanisms that are important in reducing human wildlife conflict such as herding, kraaling the livestock at night and others known to them as wildlife in their communities will continue to increase due to good management practices put in place by the conservancy; (iv) Social cohesion among conservancy members should be promoted as this could be crucial to reduce vulnerability among poor households; (v) Employment creation through tourism initiatives in the conservancy could help in tackle the need for employment among those economically active members of the

community; and (vi) There is a need for further research to understand the implementation of the conservancy activities and its contribution to sustainable development.

1. Introduction

The use of natural resources is an integral part of the livelihoods of many African societies (Scoones, 1998). According to Turner (2004), the natural resources base in a specific area is the foundation for rural livelihoods, and livelihood strategies depend on this resource base for subsistence and commercial resource harvesting. The concept of livelihood is about individuals, households or groups making a living, attempting to meet their consumption and economic necessities, coping with uncertainties, and responding to new opportunities (Marschke and Berkes, 2006). A livelihood is said to be resilient when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resources base (Scoones, 1998; Hussein and Nelson, 1998; Butler and Mazur, 2007). The outcomes of resilient livelihoods are increased income and the well-being of the community, reduced vulnerability among community members, improved food security and increased sustainable use of the natural resources base in the area (Campbell and Luckert, 2002).

Establishment of community-based natural resources management institutions such as conservancies is directly linked to the maintenance and resilience of livelihoods. The Namibian communal conservancy programme is hailed as one of the most successful initiatives for devolving natural resources management to the local people as well as combating poverty. A Conservancy is an organised group of farmers living within a common boundary area and related cultural background, as well as sharing the same resources for their livelihoods (Sullivan, 2002). The establishment of conservancies was mainly stimulated by great losses of wildlife experienced during the 1970s and 1980s in this area. The causes of these losses were complex and beyond the control of local communities. During the late 1970s and early 1980s, a devastating drought caused further wildlife losses. This stimulated local poaching in attempts to counter erosion of local pastoralist livelihoods.

At the moment, the majority of conservancies are formed in the north-western parts of the country as the area consists of vast communal rangelands which are a home to a range of wildlife species. Communal land in the north-west is occupied by pastoralists. Traditionally, pastoralists have over time evolved survival strategies like high herd mobility, mixed herds and keeping large numbers of livestock (Harring, 2001; Niboye, 2010). High mobility is practised to optimise the utilisation of the available range of resources (Niboye, 2010). Grazing rights, which are normally traditionally allocated by the chief, are among the most valuable assets of a household or family (Harring, 2001). The recent strategy adopted by these communities was to involve themselves in community level management of natural resources through the establishment of conservancies.

This study focuses on the livelihood strategies of the Ehirovipuka Conservancy inhabited by a community of pastoralist background. The conservancy establishment in this community can be regarded as an essential route for contributing to the resilience of the traditional livelihood activities. Although there is a perception that pastoralists with their large herds might cause degradation to the rangeland resources, the modern land management approaches of the conservancy could help to promote sustainable utilisation of the rangeland resources. Therefore, the objective of this study was to examine changes in livelihoods in order to understand the perception of the community on the linkages between the natural resources base and the livelihood strategies in the Ehirovipuk Conservancy.

2. Conceptual Framework

2.1.Sustainable livelihoods

One of the most influential approaches to understanding livelihoods is the sustainable livelihoods framework developed by the United Kingdom Department for International Development (DFID). The framework identifies livelihood assets in terms of five types of capital: i) human capital, ii) social capital, iii) physical capital, iv) financial capital and v) natural capital (Campbell and Luckert, 2002; Turner, 2004). In the CBNRM set up, natural

resources are the natural capital. For these resources to be managed, human and social capital must be available and appropriately deployed. In simple terms, the outcomes of sustainable livelihoods are increased income and the well-being of the community, reduced vulnerability among community members, improved food security and increased sustainable use of the natural resource base in the area (Campbell and Luckert, 2002).

Conserving biodiversity is crucial for the livelihoods of many communities in the developing world. The use of natural resources is an integral part of the livelihoods of many African societies. Ramakrishnan (2003) emphasised that biodiversity conservation should include people's participation so that biodiversity can contribute to societal welfare. In addition, any discussion on sustainability issues, when dealing with conservation of biodiversity, should take into account the sustainable livelihood concerns of the societies.

2.2. Conservation and development

The "neo-traditional" approach to conservation has been for authorities to impose restrictions such as preventing farming, grazing, hunting, timber extraction or access, often with little consideration of social and economic consequences. Until the 1970s, most conservation laws dealing with protected areas were on designating areas as national parks or wildlife sanctuaries in developing countries. This type of approach advocated for centralised regulatory control and exclusion of local people and their subsistence on natural resource-based activities to protect biodiversity (Sutherland, 2000). Furthermore, Salafsky and Wollenberg (2000) indicated that conservationists began to develop new approaches to meet economic well-being and conservation needs. These approaches were based on making livelihood activities dependent on and hence directly linked to biodiversity.

According to Shackleton et al. (2002), there has been a paradigm shift over the two past decades in conservation and natural resources management from the costly state-centred control towards approaches in which local people play a much more active role. Community-

based conservation is regarded as a practical approach to stem biodiversity loss in developing countries (Mehta and Kellert, 1998). Throughout sub-Saharan Africa, governments are devolving natural resources management to local communities. This reflects a trend within international donor and government circles towards participatory development and decentralisation of resources control (Gray, 2001). Wilshusen et al. (2003) indicates that there have been critics arguing that while communities have received economic benefits from community-based initiatives, the approach has not strengthened protection of biodiversity. Many of these initiatives have been hampered by a combination of poor design, inefficient implementation, weak local participation, institutional changes and political dynamics. However, most community-based projects have emerged as qualified successes in terms of strengthening local institutions and reducing destructive land-use (Wilshusen et al., 2003).

Salafsky and Wollenberg (2000) introduced a strategy model that assumes that if local communities receive sufficient benefits from community-based conservation, then they will act to counter internal threats such as overexploitation of resources, caused by those living in the area and external threats such as bad advice from outside organisations. The community-based conservation approach must:

- depend on *in-situ* biological resources of the area;
- generate benefits (financial, social and environmental) for the community members;
- involve the members of the community and enhance their capacity to counter threats¹;
and
- use a conservancy strategy model that directly links livelihoods with conservation.

¹ Internal threats could be over-harvesting resources or harmful livelihood activities, while external threats are threats caused by outsiders, this could be pollution from tourism activities.

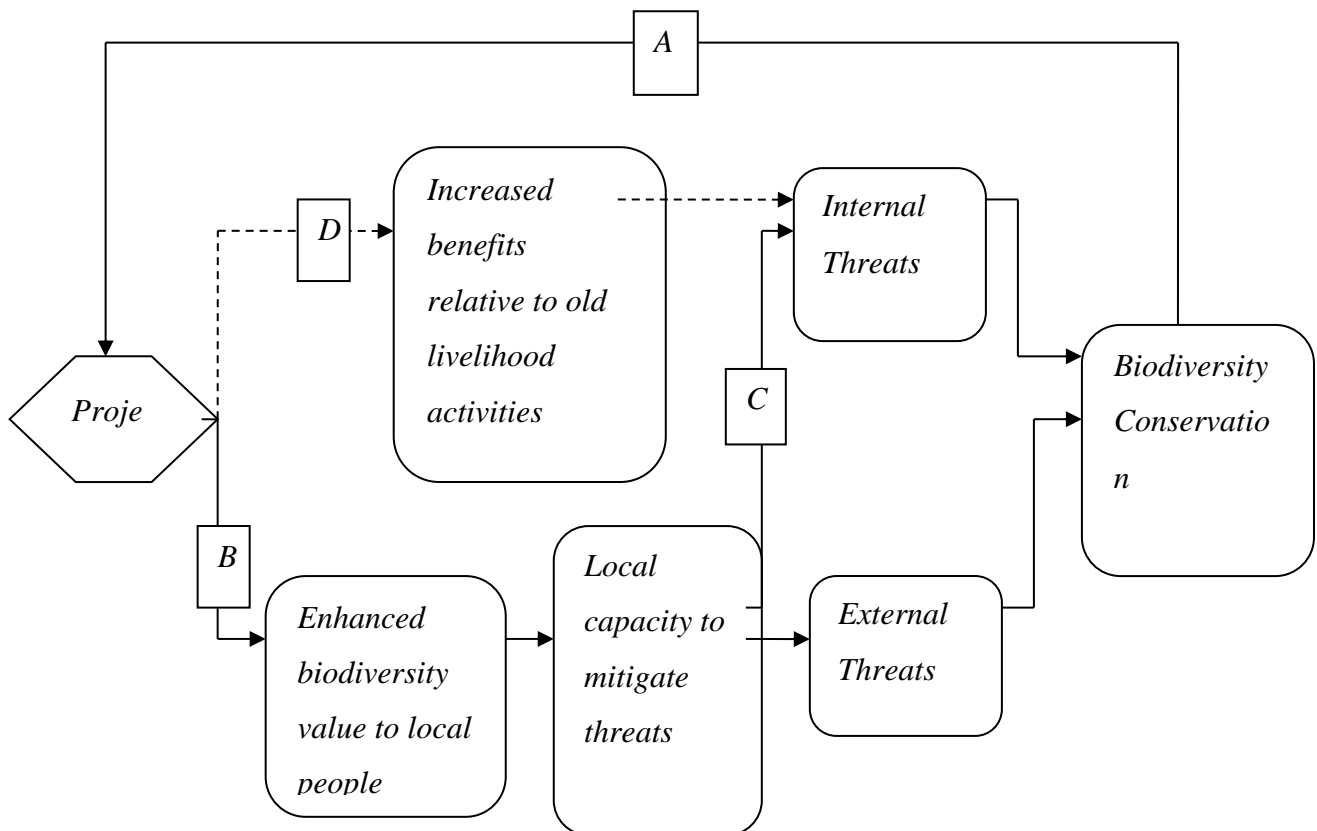


Figure 1. Conservation strategy model that directly links livelihoods and conservation

(A) Linking incentives to biodiversity conservation through CBNRM projects, (B) generation of short-term and long-term benefits, (C) Local community involvement in mitigating internal and external threats, (D) an alternative pathway (---) where CBNRM will help mitigate internal threats (Modified from Salafsky and Wollenberg, 2000)

2.3. The history of the communal Conservancy programme in Namibia

During the colonial era, conservation in Namibia between 1947 and 1976 mainly focused on managing protected areas, game reserves and dealing with wildlife on commercial farms. However, the Nature Conservation Ordinance of 1967 enabled freehold farmers to hunt, sell, capture and relocate wildlife according to their own economic interests. By 1968, freehold farmers had legal rights to consumptively and otherwise utilize wildlife on their farms. According to Sullivan (2002), the ‘Conservancy’ concept evolved in the 1970s in an apartheid-structured South Africa as a means of consolidating exclusive rights over wildlife by white farmers in commercial areas. This was done largely through the employment of game guards to militate against poaching by black “African neighbours” (Sullivan, 2002).

Apart from granting rights over land and wildlife to commercial farmers, the future of wildlife populations within the communal areas remained a great concern to conservationists. Great losses of wildlife were experienced during the 1970s and 1980s. The causes of these losses were complex and beyond the control of local communities. During the late 1970s and early 1980s, a devastating drought caused further wildlife losses and stimulated local poaching in attempts to counter the erosion of local pastoralist livelihoods. In addition, regional warfare during the 1980s (including countries such as Namibia, South Africa and Angola) resulted in illegal trafficking of ivory and rhino horn, which affected the desert elephant (*Loxodonta africana*) and black rhino (*Diceros bicornis bicornis*) of north-west Namibia severely (Sullivan 2002; Long 2004, NACSO, 2004).

Following independence in 1990, the Constitution of Namibia dedicated itself to environmental management in Article 95. The then Ministry of Wildlife, Conservation and Tourism (now the Ministry of Environment and Tourism) started exploring the potential to involve local people from communal rural areas in the management of wildlife and benefiting by managing these resources. This thinking was mainly influenced by the Communal Area Management Programme for Indigenous Resources (CAMPFIRE) approach in Zimbabwe. This approach led to the birth of the Wildlife Management, Utilization and Tourism policy of 1995, which was also based on evidence from the freehold farms which demonstrated that some rights over wildlife and opportunity to benefit from its use could promote better management (Long, 2004).

The main aim of the Wildlife Management, Utilization and Tourism policy of 1995 was to amend the Nature Conservation Ordinance of 1967 so that residents of communal rural areas living on state land could gain some rights over wildlife and tourism as in the case of commercial farmers. This policy also aimed to redress the past discriminatory policies and practices that were introduced by the colonial laws. It also explored the possibilities of rural

communities to enter into business arrangements in their areas to improve their living conditions. Conservancies are currently involved in the management and utilization of a wide range of flora and fauna resources in their communities.

The people-centred conservation approach adopted in Namibia was also driven by international agendas. In 1985, the World Wildlife Fund (WWF) established a wildlife and human needs programme that attempted to combine conservation and development in developing countries (Fabricius et al., 2004). The Convention on Biological Diversity (CBD) also moved towards international conservation policies of people-centred conservation. Namibia ratified the Convention in 1997. As a condition for all parties to the convention, Namibia developed its plan of action which is known as Namibia Biodiversity Strategy and Action Plan 2001 – 2010 (NBSAP). The NBSAP is a policy document that provides the overall guidance for the implementation of Article 95(l) of the Namibian Constitution. Article 95 of the constitution addresses the need to put up measures that will promote and maintain the welfare of the people. Among these are measures aimed at *“the maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future...”* (GRN, 1990).

By 2010, the Nature Conservation Amendment Act of 1996 had promoted the establishment of 59 communal conservancies. The 59 conservancies cover a total area of 138,482 km² which is about 16.8% of the land area of Namibia². These conservancies are gazetted and registered with the Ministry of Environment and Tourism (MET). The bulk of these conservancies are situated in the north-western and north-eastern parts of the country, which are the richest regions for wildlife species in the country.

² Extracted from the 2010 statistics of the Natural Resources Management (NRM) Working Group of the Namibia Associations of CBNRM Support Organizations (NACSO).

3. Methodology

3.1. Description of the study area

The Ehirovipuka Conservancy is located within the communal areas in the north-western part of Namibia, Kunene region, extending between 18° 49' 53" S to 19° 39' 58" S and 14° 10' 07" E to 14° 30' 09" E. The Conservancy shares borders with Etosha National Park on the east (Figure 2). This Conservancy covers an area of 1,975 km², with approximately 2,500 inhabitants most of whom are Otjiherero speaking people mainly of the Ovahimba origin. Ovahimba are indigenous pastoralists located in the North-western part of Namibia (Bolling and Schulte, 1999). Land use practice in this Conservancy mainly focuses on traditional livestock husbandry with limited cropping crop farming.

The vegetation in Ehirovipuka Conservancy forms part of the western Kalahari woodlands. The area is dominated by Mopane (*Colophospermum mopane*) shrubs and trees. The Conservancy also maintains a large wildlife population, notably elephants, leopards, lions, cheetah, elands, kudus, duikers, warthogs, steenbok, oryx, giraffes, springboks, ostriches and mountain zebra. The soils are composed of Kalahari sands and sandstones (Marsh and Seely, 1992). The climate is classified as semi-arid with rain falling mainly in the summer months (December – March) when temperature is the highest. Rainfall is highly variable, which means that activities dependent on water such as farming are very risky. The rainfall ranges from 250mm (in the west) to 300mm (in the east) (Marsh and Seely, 1992; Mendelsohn et al., 2000).

The Ehirovipuka Conservancy is run by a Management Committee of twelve members who are democratically elected by the members of the Conservancy every third year. These Management Committee members represent different areas within the Conservancy to ensure equal representation of all members. The Conservancy has seven employees- five community game guards, one field officer and a community mobiliser. The Conservancy income is mainly generated from trophy hunting, craft production and life sales of wildlife. In addition,

grants were obtained from Integrated Rural Development and Nature Conservation (IRDNC) and the ICEMA programme of the Ministry of Environment and Tourism (MET) to assist with the operations of the Conservancy as well as for infrastructural development (NACSO, 2004).

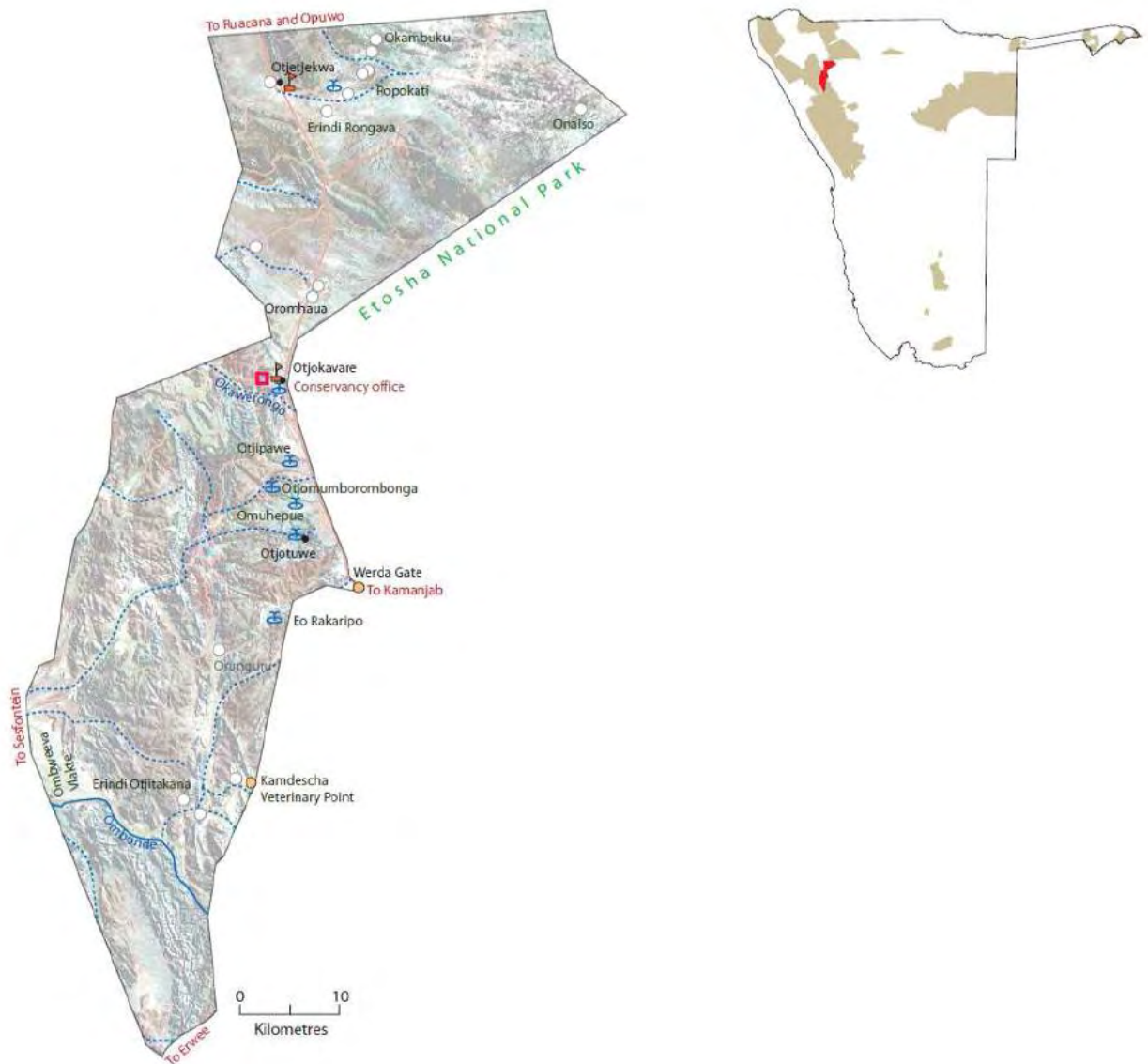


Figure 2. The Map of Ehrovipuka Conservancy

3.2. Data Collection Methods

A household questionnaire and group discussions were used to gather data for this study. A semi-structured questionnaire was administered to a sample of 111 households from 9 villages in the central and northern part of the area which constitutes around 30% sample of the households. Over 90% of the population of this Conservancy is located in central and northern parts while the southern part is dominated by cattle posts and wildlife areas, with very few households. Households that were interviewed were selected on a random basis per community. However, due to the unequal distributions of households per community, the number of samples was shared proportionally based on the population size of each community (

Table 1).

Three enumerators were recruited and trained to administer the questionnaire to the local people. The collection of data was done during April 2006.

Table 1. Number of households surveyed in the Conservancy

<i>Villages</i>	<i>Total households (provided by Conservancy office)</i>	<i>No of households interviewed</i>
<i>Werda</i>	<i>44</i>	<i>10</i>
<i>Otjivero</i>	<i>61</i>	<i>8</i>
<i>Okatjangee</i>	<i>53</i>	<i>8</i>
<i>Ohanjuna</i>	<i>24</i>	<i>3</i>
<i>Orozotjize</i>	<i>8</i>	<i>3</i>
<i>Missing (Villages not indicated)</i>	<i>-</i>	<i>6</i>
<i>Total</i>	<i>963</i>	<i>111</i>

A total of six Focus Group discussions (FGD) were conducted in Otjokavare and Onguta which are the two large villages in the Conservancy. In each village information was collected from the following groups: 1 group of elderly men (≥ 45 years old), 1 group of elderly women (≥ 45 years old) and 1 mixed group of younger men and woman (≤ 45 years). These groups consisted of five to ten members of the Conservancy. The main discussion points in these groups focused on the changes in natural resources base and livelihood activities.

3.3. Data analysis

The data were analysed using Excel and SPSS 17. The data were summarised and presented using descriptive statistics in tables and charts. The livestock data were analysed in R (R Development Core Team, 2009). Kolmogorov-smirnof test was used to test for normal distribution in the data. The data did not fit the normal distribution; as a result non-parametric Wilconxon test and Kruskal Wallies test were used to compare livestock ownership with gender and age of household heads, respectively. The Chi square test was also used to test for association between gender, age and involvement in conservancy activities.

4. Results and Discussion

4.1. The Socio-economic situation of the area

4.1.1. Household Demographic data

A total number of 585 people were counted during this survey from the 111 households interviewed. The results show that the proportion of male and female household members is 51% and 49%, respectively and the average household size in the Ehirovipuka Conservancy is five persons per household. These scenarios of gender proportion and average household sizes are similar to the Census data of the Kunene Region where the Conservancy is located

(NPC, 2001). However, the average household sizes of the main villages such Otjokavare and Onguta slightly exceeds the overall average.

Members of the Ehirovipuka Conservancy have low levels of education, especially those above 16 years old. The majority of the household members have either not attended any formal education (44%) or have not completed primary education (48%). The level of education between men and women in the Conservancy does not differ (Table 2).

Table 2. Proportion of each level of education per gender

Gender of persons	Not formal (%)	Some primary (%)	Primary Completed (%)	Some secondary (%)
Female	22	23	2	1
Male	23	24	3	1
Total	44	48	5	1

Although many household members start primary education, the results seem to suggest that most of such members do not complete their primary education to proceed with secondary education. This is illustrated by the age group of 16 to 30 years who did not indicate to have attended either secondary or tertiary education institutions (Table 3). Various factors may have contributed to the gap in the levels of education in this area. These factors may include school drop-out, mobility, among the educated members of the community, cultural beliefs or lack of understanding on the importance of education among community members. However, there appears to be an increase in the attendance of community members in the primary education phase.

Table 3. Proportion of each level of education per age group of persons

Age group	No formal (%)	Some primary (%)	Primary completed (%)	Secondary (%)	Post-secondary (%)	Tertiary ed completed (%)
0-6	10	11	0	0	0	0
7-15	9	12	1	0	0	0
16-30	12	15	1	0	0	0
31-46	7	6	3	0	0	0

47-60	2	2	0	1	0	0
61+	4	2	1	0	0	1
Total	44	48	6	1	0	1

According to Chambers and Conway (1991), the effects of education on the rural livelihoods can be two-fold, either enhancing or diminishing capabilities of local people (Chambers and Conway, 1991). For example, young boys and unmarried Himba men (ranging between twelve and twenty-five years old) herd cattle from homes to cattle posts within the traditional grazing areas. Cattle wealth is regarded more valuable than conventional activities such as schooling, and that is why most Himba children never attended school (Harring, 2001). However, the “education for all” slogan adopted by the Namibia government at independence aimed at including children from marginalised and minority groups into the formal education system country-wide. This was because education is recognised as among the best long-term investment any country can make. Through education, marginalised people are empowered to participate broadly, both at local level by making better decisions for their livelihoods and also at national level by influencing political processes in exercising their civil rights. The education for the Himba children, in particular, was done through the introduction of mobile educational programmes geared toward economic, social and cultural development of that community (Champagne, 2009). Education is likely to influence the socio-cultural livelihood strategies of a community

4.1.2 Age Structure

The dependence ratio was used to understand the age structure of the Ehirovipuka Conservancy. Dependence ratio is a good indicator of economic and social wealth of a community (Heskett, 2006). In order to determine the dependency ratio, the following equation was used:

$$\text{Dependence ratio} = \frac{(\% \text{ under } 16 \text{ years}) + (\% \text{ over } 61 \text{ years})}{(\% \text{ } 15 - 60 \text{ years})} \times 100$$

Therefore, the Conservancy's dependence ratio is 100% or 1:1. The value suggests that there are less economically active people compared to the economically inactive people. The Ehirovipuka Conservancy is mainly dominated by children under 15 years of age (42%, Table 4). In addition to this, there is a higher proportion of people between the ages of 16 to 46 years (44%), which is part of the economically active age group, but the majority (60%) are neither working nor looking for employment.

Table 4. Proportion (%) of Persons per age group in the Conservancy

Gender/Age group	0-6(%)	7-15(%)	16-30(%)	31-46(%)	47-60(%)	≥60(%)	Total
<i>Female</i>	9.29	9.65	13.84	8.93	3.46	3.64	48.82
<i>Male</i>	11.66	11.84	14.75	6.74	2	4.19	51.18
Total	20.95	21.49	28.59	15.67	5.46	7.83	100

This in line with the findings in the UNEP report (UNEP, 2010) that many African societies are experiencing changes in demography particularly age structure of the population. Over the last 20 years, Africa's population has become younger mainly due HIV/AIDS and other social factors. The UNEP report continue citing that by 2003, more than 40% of the Sub-Saharan region's population was below the age of 15 years.

4.1.3. Levels of household income

Half of the Conservancy households depend on a monthly income lower than N\$ 300-00 (Table 5). This could be explained by the high number of non-working community members, which seems to be high given the low level of education and employment opportunities in the Conservancy. Meanwhile, 17% of the households indicated to depend on an income between N\$ 301 and 750 per month, while only 10% of the households earn income of more than N\$ 3000-00 per month. Those depending on more than N\$3000-00 per month income probably belong to those people who are engaged in professional employment. As discussed in the earlier sections, only a small proportion of community members are employed, while some depend on elderly pension fund from the Government.

Table 5. Household income

<i>Income(N\$)</i>	<i>Proportion %(N=110)</i>
< 300	50.9
301- 750	17.3
751- 1000	10.9
1001- 3000	10
> 3000	10.9
Total	100

4.1.4 Involvement in the Conservancy Activities

Community members above 18 years old are required to be registered members of the conservancy. Moreover, to test whether involvement in the Conservancy is significantly independent of gender, a chi square test was also computed (Table 6). The test found that involvement in the conservancy was independent on the gender of the respondent $X^2(N=317) = 0.82$, $df = 1$, $p = 0.66$). In the case of age groups, the Chi-square test revealed that there is significant association $X^2(N=286) = 14.56$, $df = 3$, $p = 0.002$) between age groups and involvement in the Conservancy. The respondents between 18 and 45 years are more involved in Conservancy activities as compared those above the age of 45 years old (Table 7).

Table 6. Involvement in Conservancy activities based on gender

Gender(N=317)	No	Yes	Total
Female	17.03	36.28	53.31
Male	15.77	30.91	46.69
Total	32.81	67.19	100

Table 7. Involvement in conservancy activities based age groups

Age groups(N=286)	No	Yes	Total
18-30	17.83	26.57	44.41
31-45	4.9	25.52	30.42
46-60	3.85	6.29	10.14
>60	4.9	10.14	15.03
Total	31.47	68.53	100

4.2. Livelihood Strategies

4.2.1. Ranking of livelihood activities

Households in the Ehirovipuka Conservancy are engaged in various livelihood activities (Table 8). Livestock keeping, formal employment and pension (old age social grant) were ranked as the first most important livelihood activities for most households. Livestock sales, harvesting of wood resources for construction and fuel wood, gardening and harvesting of medicinal plants were among the second and third most important livelihood activities. Gardening is mainly practiced at small-scale gardens due to low rainfall in the areas.

Table 8. Ranking of livelihood activities

Livelihood activities	MI (%) (N=96)	SMI(%) (N=94)	TMI(%) (N=86)
Livestock (Consumptive use)	33.3	29.8	12.8
Government grant (pensions)	20.8	5.3	9.3
Formal employment	18.8	2.1	2.3
Livestock sales	13.5	16	10.5
Gardening	7.3	9.6	11.6
Remittances	4.2	1.1	0
Conservancy support	2.1	1.1	1.2
Informal employment	0	3.2	1.2
Harvesting of medicinal plants	0	4.3	11.6
Harvesting wood resources	0	22.3	38.4
Wild Animal Resources	0	5.3	1.2
Total	100	100	100.0

FMI=First Most important, SMI= Second Most important and TMI= Third Most important

Most households depended on an average of two income and four non-income livelihood activities. This is livelihood diversification which is defined as “the process by which rural families construct a diverse portfolio of activities and social support capabilities in their struggle for survival and in order to improve their standards of living” (Hussein and Nelson, 1998). Diversification of livelihood activities is crucial for contributing to household security. Livelihood diversification may include both on- and off-farm activities.

4.2.2. Livestock farming: The most important livelihood activity

One-third of the Conservancy members have indicated to be engaged in livestock keeping. Livestock is mainly kept for households’ consumption uses rather than commercial purposes. Cattle dominate the livestock kept by households in the Conservancy, followed by goats as shown in Figure 3.. An average of 40 cattle is kept per household and few families owned up to 900 cattle (Table 9). There were some households that indicated they did not own a single head of cattle. Keeping large herds of livestock, particularly cattle, is an indication of wealth in most pastoral societies. It emerged during group discussions that households without cattle also have access to the livestock products, particularly meat and milk for nutrition, hides for clothing and bedding and cow dung for plastering homes. Such products are accessed from neighbours or extended families without having to pay for them.

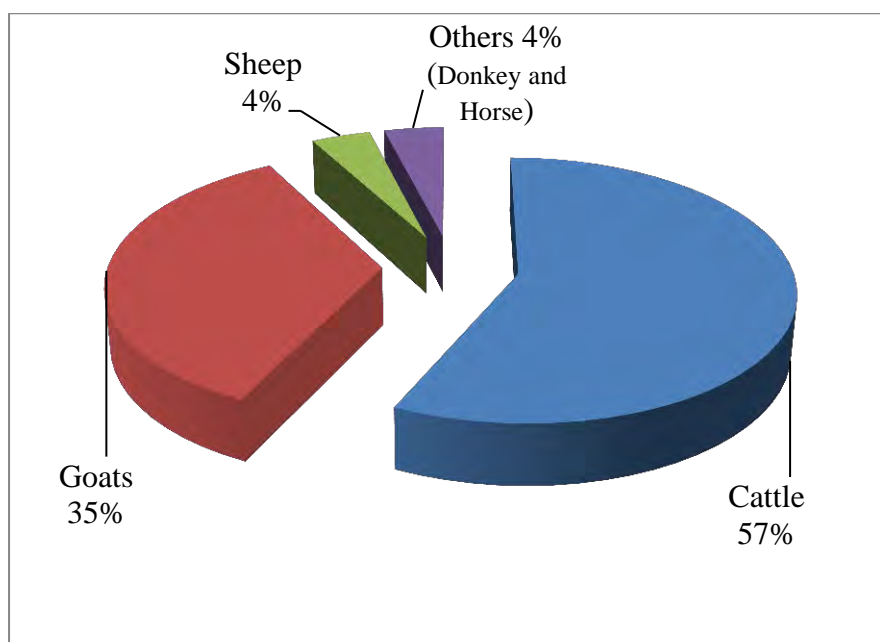


Figure 3. The proportion of livestock owned by Conservancy communities

Table 9 Mean number of livestock per household in the community

Livestock types	Mean	Min	Max	N (Households)
Number of cattle	40	0	900	111
Number of goats	24	0	300	111
Number of sheep	3	0	79	111

In order to ensure sustainable farming and survival of livestock during drought periods, farmers distribute their livestock between home and the cattle post. Cattle posts are grazing areas away from residential areas where livestock is kept temporally or seasonally. Moving livestock to cattle posts is a common practice whereby livestock is kept away from the residence of the owners for a certain period in search of better grazing area (Table 10).

Table 10. Mean \pm SD amount of livestock kept at home and cattle post per household

Livestock	Cattle	Goats	Sheep	Others
Home	24.61 \pm 34	15.63 \pm 32	2.39 \pm 09	1.98 \pm 0.9
Post	19.16 \pm 88	5.39 \pm 28	0.33 \pm 02	0.35 \pm 0.8

Gender and livestock farming

Livestock ownership by gender is presented in Figure 4. There was no significant difference between male- and female-headed households in term of total number of livestock owned or those kept at cattle posts. The outcome of the different categories tested is as follows: total number of livestock owned ($W = 1528$, $p = 0.988$); total number of goats ($W = 1536$, $p = 0.94$); total number of sheep ($W = 1517.5$, $p = 0.956$); number of cattle kept at home ($W = 1412.5$, $p = 0.49$); number of goats kept at home ($W = 1397$, $p = 0.43$); number of sheep kept at home ($W = 1507$, $p = 0.88$); number of cattle kept at cattle post ($W = 1614.5$, $p = 0.44$); number of goats kept at post ($W = 1476$, $p = 0.57$) and number of sheep kept at post ($W = 1486$, $p = 0.56$).

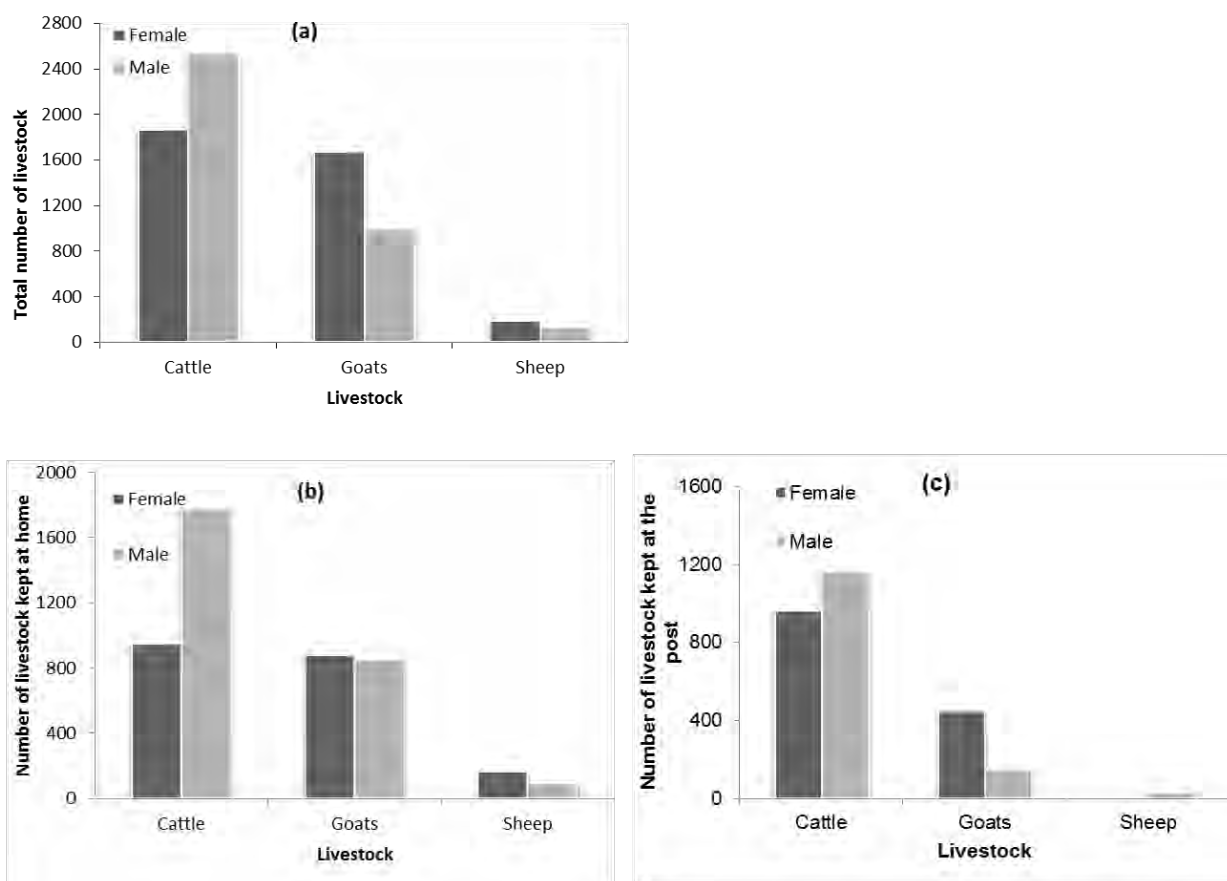


Figure 4. The distribution of livestock in female- and male-headed households. (a) shows the total livestock owned, (b) shows number of livestock that are kept at home, while(c) shows the number of livestock that are kept at the post

Gender relations within households are one of the most recognised aspects of how a household pursues its livelihood strategies (Niehof and Price, 2001). In most cases, the productive and parenting roles are clearly divided along gender lines. The responsibilities of women to handle birthing, caring for newly born animals, milking and processing milk products is fundamental to the pastoral economy (Gritli, 1997). For example, in the life of pastoralists, it is men who take cattle to long distance watering regimes and far-off grazing lands, and deal with predators and raiding (UNEP, 2010). Decisions regarding herd mobility and conflict resolution are also attended by men (Gritli, 1997). This gives men the opportunity to be custodians of some environmental knowledge (UNEP, 2010). It is, therefore, expected that most households headed by women own no or fewer livestock than those headed by men as visible ownership of livestock among pastoralist women has been underestimated. Today, most women exercise substantial and recognised rights over livestock which may vary according to the category of livestock, its sources and the purpose of its disposal (Filtan, 2008) and the results of this study shows as such.

Age and livestock ownership

Total livestock ownership per age group is presented in Figure 4. A non-parametric Kruskal-Wallis test was computed to compare livestock ownership and age of the household heads regardless of their gender. A significant difference was noticed in the categories of total number of cattle owned (K-W=9.8, df = 3, p = 0.02) and number of cattle kept at home (K-W=9.9749, df = 3, p = 0.01). However, there was no significant differences in the other categories of total number of goats owned (K-W= 6.37, df = 3, p = 0.09); total number of sheep owned (K-W =6.50, df = 3, p = 0.08); number of goats kept at home (K-W =4.62, df = 3, p = 0.20); number of sheep kept at home (K-W=7.12, df = 3, p = 0.06); number of cattle kept at the cattle post (K-W=0.5105, df = 3, p-value = 0.9166); number of goats kept at the

cattle post (K-W=1.59, df = 3, p-value = 0.66); and number of sheep kept at the cattle post (K-W=4.49, df = 3, p-value = 0.21).

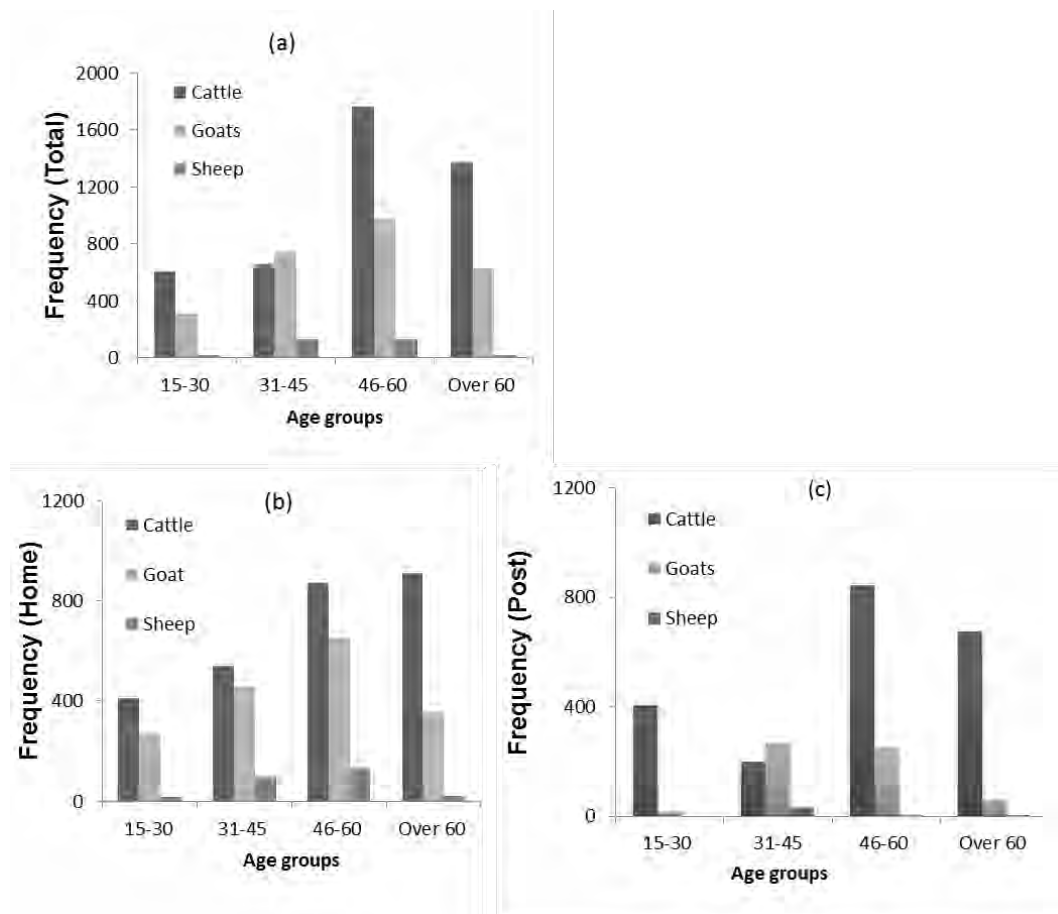


Figure 5. The distribution of livestock per household based on age groups (a) total number of livestock owned, (b) number of livestock kept at home, (c) number of livestock kept at the post

The trend that is visible from the test is that younger household heads (below 45 years of age) had fewer cattle compared to the older household heads (above 45 years). Cattle compared to goats and sheep are the most important type of livestock in the Himba culture or in any pastoral community (Niboye, 2010). Logically, this can be explained by the fact that elderly farmers have been accumulating their livestock over years and are unlikely to sell much of their livestock due to the cultural importance of cattle. On the other hand, younger farmers could have fewer cattle because of the time of farming or they could also be more proactive in modern livestock management where they are likely to only keep manageable stock.

Farmers in the Ehirovipuka Conservancy keep livestock mainly because of the tradition rather than for income purposes. Very few livestock that were slaughtered or sold were recorded. It was indicated that cattle were mainly used as the source of milk for nutrition and dung for plastering of houses, as well as slaughtering at special occasions such as weddings, funerals and other traditional ceremonies. The few households that indicated to sell their livestock do not use a formalised market, but rather trade to those travelling from elsewhere in search of livestock. Table 11 shows the activities which community members identified to reduce livestock numbers and these were mainly predation, slaughtering for consumption and selling and occasions or ceremonies.

Table 11. Livestock predation as compared to own consumption

Livestock	Predation (%)	Slaughtering (%)	Occasions /ceremonies (%)
Cattle	28.5	17.1	63.2
Goats	64.9	71.8	31.5
Sheep	6.6	11.1	5.3
Total	100	100	100

4.2.3. The effects of predation on livestock

Increasing losses of livestock due to predation is a great concern for most farmers in the Ehirovipuka Conservancy. Predators such as hyena, leopard, lions and cheetah were identified as the main problem animals in the Conservancy (Table 12). The proximity of the Ehirovipuka Conservancy to Etosha National Park and Hobatere Concession Area was identified among the main contributing factors to the presence of predators in the Conservancy. The Conservancy directly shares borders with the park and the concession area. This poses a threat as there are occasions when the predators escape and prey on the livestock in the Conservancy. Furthermore, the number of game in the area is said to have increased due to better wildlife management practices, which were introduced with the establishment of the Conservancy. While the establishment of the Conservancy was desirable from the

conservation and livelihood diversification perspectives, it has negative impacts on livestock farming in the Conservancy.

Table 12. Type of animals causing damages in the Conservancy (2003-2005)

Predator	Proportion of incidents(N=133)
Baboon	1.2
Caracal	0.8
Cheetah	5
Elephant	1.5
Hyaena	60.9
Jackal	3.1
Leopard	14.3
Lion	12.7
Total	100

Table 13 shows the types of damages caused by problem animals. Of all the recorded incidents caused by problem animals during 2003 to 2005 using the event book records, the majority of such incidents were livestock attacks. As indicated in Table 12 above, goats (65%) are more affected as compared to cattle (29%) and sheep (7%).

Table 13. Types of damages caused by problem animals

Type of damage(2003-5)	Proportion (%) (N=712)
Crop damage	0.14
Human attack	0.14
Livestock attack	98.74
Other damage	0.98
Total	100

4.3. Main sources of cash income: Employment and Pension grants

Employment emerged as one of the most important livelihood activities (Table 8), although only 10% of the household members indicated to be working full-time (figure 6). The same applies to the pension grants which was also ranked high, but only a fraction (3%) (Table 14) of the household depends on this income (Table 14). Among those employed are teachers, office workers, police, military, service workers (cleaners, security personnel, road workers). The pension grant³ is given to every Namibian citizen who is 60 years of age and above.

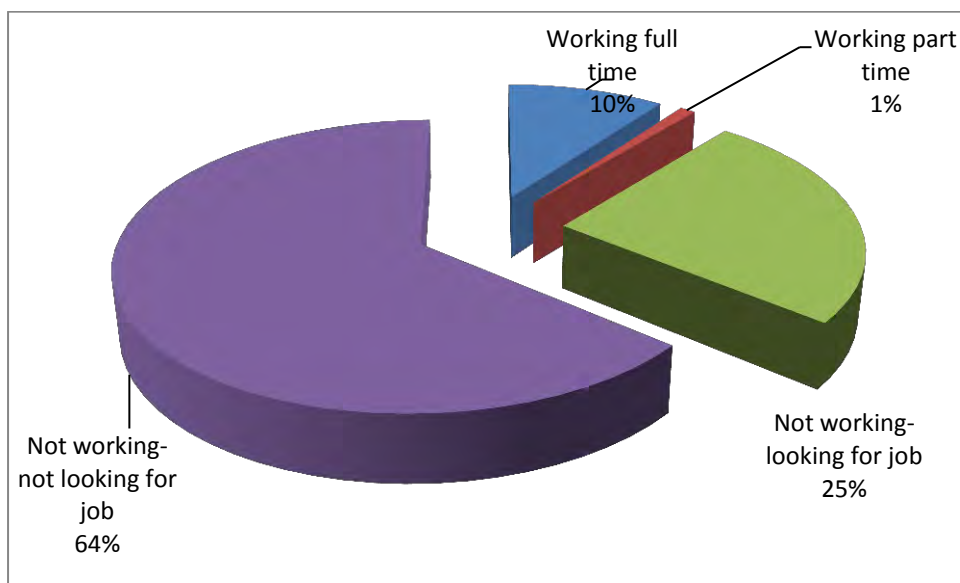


Figure 6. The status of the household members

Ehrovipuka Conservancy is a rural community with very few public services and limited job opportunities. Otjokavare, which is the main settlement of the Conservancy, houses a clinic, a school, Directorate of Rural Water Supply offices and the Conservancy office. There are also small-scale retailers found in a number of villages. During 2006, when the survey was conducted, there was a road construction that was going on in the area, and this provided the residents of the Conservancy with temporary job opportunities. In addition, the Conservancy also recruited 7 people while professional hunters within the Conservancy employed some community members during hunting seasons.

³The pension amount has increased from N\$ 300.00 in 2005 to N\$ 500.00 in 2010.

Table 14. Economic activities of household members

Work status	Proportion of household members (N=584)
Domestic worker	0.9
Farmers	33.2
Office workers	0.7
Pensioners	2.9
Police/Military	1.4
School going learners	25
Self-employed	0.7
Service workers	4.5
Teachers	1.2
Others	0.2
No occupation	29.5
Total	100

As indicated earlier, this Conservancy has a high dependency ratio and this correlates with the data in (Table 14) which shows high percentages for school going children (25%) and no occupation (30%). No occupation mainly refers to the adult community members that are not working and not looking for jobs.

4.4. Linking livelihoods and natural resources

4.4.1 Fuel wood

Fuel wood resources remain the most important sources of energy in most parts of the country. In Ehirovipuka Conservancy fuel wood is harvested all year round, according to over 90% of respondents. Most of the fuel wood is harvested in the areas surrounding the settlements. People mostly go to harvest fuel wood on foot. However, 7% and 11% of the households indicated using own vehicle and donkey carts, respectively. Over 80% of the households members travel less than 5 km to collect fuel wood, while a few indicated to travel more than 7 km to collect such resources. Fuel wood is only harvested for consumption at household level rather than for sale.

Collection of fuel wood in the surrounding area does not require permission and therefore the majority of households (90%) indicated that they did not get permission to harvest fuel wood. Nevertheless, few respondents indicated that the Conservancy Committee and Traditional Authority regulated such resources. It emerged that collection of fuel wood is predominantly done by women, although a few men also indicated to collect it. Community members felt that the condition and availability of fuel wood was still good although some indicated that uncontrolled harvesting of fuel wood resources could lead to a decrease of such resources.

Table 15. Distance travelled to collect fuel wood

Distance(km)	Respondents (%)
0-5	85.9
6-10	7.1
11-15	3
16-20	4
Total	100

Table 16 Time period fuel wood is collected per year.

Months	Respondents (%)
0-3	3
4-6	3
7-9	0
10-12	94
Total	100

4.4.2 Poles for construction

The people from this community live in traditional houses made of poles and such poles are mainly harvested from Mopane trees (*Colophospermum mopane*) in the surrounding areas. Over 73 % of households harvest the poles at least once in a year as most homesteads are renovated annually. Some households (24%) indicated to harvest poles monthly. Unlike fuel wood, construction poles are mainly collected using donkey carts (55%), although some indicated to go on foot (26%). In most cases, no permission was required for the harvesting of poles, but 7% indicated that they had obtained permission from the Conservancy committee. Although 13% of households indicated to go as far as 20 km to harvest poles, most households (57%) travelled a distance of less than or equal to 5 km to harvest poles. All the poles harvested are not sold, but used for household consumption.

Harvesting of poles is predominantly a male activity, although few (15%) households indicated the involvement of women in this activity. Women harvesting poles for construction are probably those from female-headed households.

4.4.3 Mopane Worms

Mopane worm or caterpillar worm (*Imbrasia belina*) is a species commonly found in Southern Africa in Mopane woodland, and it contributes to rural livelihood in countries such as Zimbabwe, Botswana and Northern Central Namibia (Stack, Dorward, & Gondo, 2003). Mopane woodland being the dominant vegetation communities in the area creates a breeding habitat for the moth that produces the worm which plays an important role in the livelihood of Ehirovipuka Conservancy households.

More than two thirds of the households indicated that they harvest Mopane worms. A third of those households who indicated that they harvested Mopane worms sought permission from the Traditional Authority and the Conservancy Committee, while the rest of the households harvested Mopane worms without permission. Most households harvested the

Mopane worms within close proximity of their villages, and hence they walked to collect the worms. The majority of Mopane worms' collectors (67%) indicated to sell most of what they collect. The most important destinations for selling were Oshakati (northern Namibia) (34%) and Windhoek (the Namibian Capital City) (28%) (Fig. 6). These are the urban centres with the highest populations in Namibia. Harvesting is predominantly a women activity, but because of its increasing economic importance, men have started to participate in this activity. More than 70% of the households indicated that Mopane worms resources are still in good condition.

Table 17. Distance travelled to collect Mopane worms

Distance(km)	Respondents (%)
0-4	68.7
5-8	20.2
9-15	7.1
Over 15	4.0
Total	100.0

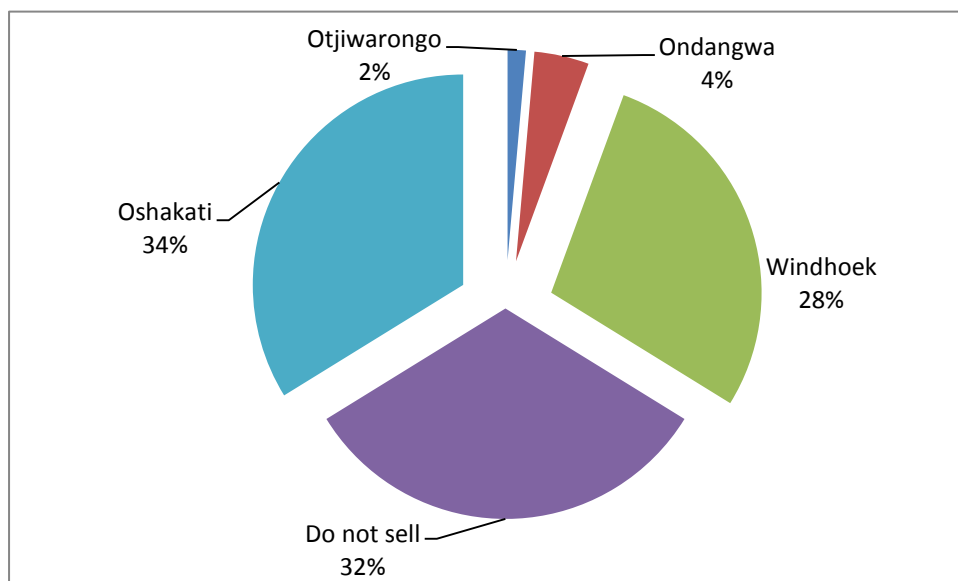


Figure 7. Towns where Mopane worms are sold

Therefore, the Mopane worm is a vital resource that contributes greatly to the livelihoods of these communities. Proper regulation of such resources is required to avoid over-exploitation and the decline of resources.

4.5. Community perceptions on changes in the livelihoods and natural resources

The Conservancy communities depend on diverse livelihood resources. Table 18 shows how the importance of different livelihood activities and products has changed over years. These data were collected during group discussions. Some activities were perceived to be always the most important livelihood activities, for instance, the sale of construction of poles, fuel wood and livestock for own use has been considered as most important as from 1970s up to 2000s. In addition, medicinal plants, edible plants and thatch grass were among the most important livelihood sources during the 1970s, but their importance has decreased in recent years. On the other hand, formal employment and livestock sale has emerged to be among the most important livelihood resources only since the 2000s. The emerging importance for cash income livelihood activities could have been caused by the changing lifestyles and economic demand on the rural populations to pay for services such as school and medical fees and even food.

Table 18. Community perceptions on the changes in livelihoods activities and products

Livelihood activities and products	1970s			1980s			1990s			2000s		
	MI	I	LI	MI	I	LI	MI	I	LI	MI	I	LI
Informal employment			X			X			X			X
Poles for construction	X			X			X			X		
Arable cropping			X		X			X			X	
Conservancy											X	
Edible plants	X			X				X			X	
Formal employment			X		X			X		X		
Fuelwood	X			X			X			X		
Livestock farming–Own use	X			X			X			X		
Livestock farming – Sales		X			X			X		X		
Medicinal plants	X			X				X			X	
Mopane worms		X			X			X		X		
Pensions			X			X	X			X		
Remittance			X			X			X		X	
Thatching grass	X				X				X			X

**MI=Most Important; I=Important; LI=Least Important*

4.6. Community perceptions on the management of natural resources

In order to ensure the sustainable utilisation of natural resources, various management structures are required. The Ehirovipuka Conservancy has management plans such as “Conservancy management plan”, “Community forestry management plan” and “Wildlife protection plan”. About 40% of the respondents indicated that they were satisfied with such management plans. However, other respondents stressed the need for additional educational programmes on sustainable natural resources management and utilisation. This can help address the issue of harvesting resources such as fuel wood and housing poles, which is done with no proper restrictions.

5. Conclusion

The area is characterised by a high dependency ratio as it is dominated by children under the age of 16 years and adults between 16 and 45 years who are not working nor looking for employment. In addition, household members in this Conservancy also displayed low levels of education, although a trend of high enrolment was noticed among the younger members of the community.

The study shows the link between the livelihoods community members depend on the conservation efforts of the natural resources. Ehirovipuka Conservancy members embraced both the cultural and natural management practices that are essential for sustainability of livelihoods and natural resources. Members of this community depend on different livelihood activities. Livestock farming, especially for the purpose of own use (slaughtering for consumption, provision of milk and dung for construction and using for special occasions and ceremonies), emerged as the most important livelihood activity for most households. The other important livelihood activities were mainly the sources of income such as formal employment, old age pension grants and livestock sales.

Community members in this Conservancy were also engaged in the diversification of livelihood activities. The practice of livelihood diversification is a central point in contributing to the security of households in this area. The introduction of the Conservancy in the area emerged as a new source of livelihood; however, other livelihood activities are said to have only changed in order of importance. Most income generating livelihood activities became only important to households recently with the increasing demand for households to use finance to acquire and paying for services such as schools, medical needs and travelling . However, it is important to note that livestock farming for own use, fuel wood and poles for construction have always been very important for the past decades to this community.

Some livelihood activities are heavily dependent on the extraction of natural resources such as fuel wood and construction materials. Despite this, the community does not link heavy reliance of the natural resources to land degradation. The Conservancy establishment in the area has also been associated with the introduction of natural resources management plans that are meant to address the sustainable utilisation of these natural resources.

Three factors have emerged important to maintaining the resilience of livelihood activities in this area. Firstly, strong social relations have emerged in this study to ensure access to resources. The social structure in this area allows extended families to live and farm as a unit. For instance, not all households own livestock but some products such as meat, milk and cow dung are shared readily among community members. The ability for the poorer of the community to rely on fellow community members, families and neighbours for support to have access to important livelihood such as livestock products is crucial to the preservation of culture and traditional practices.

Secondly, the study also revealed that households recently rely on a combination of cash and goods as compared to 20 years ago. Diversification is an important strategy to help cope with temporary adversities such as loss of livestock due to drought, diseases or predation. Diversification may also lead to permanent adaptation when other options are failing to provide livelihood.

The majority of adults in the area are engaged in social and cultural activities that are important for their day to day livelihoods, such as looking after livestock, collection of fuel wood and construction logs, renovate homes and also looking after children. Lack of employment and other livelihood opportunities, as well as setbacks in education, health and other capabilities may mean continued high dependence on natural resources and pose threats to the sustainability of these resources. Thirdly, the Conservancy's establishment has emerged to be more of a livelihood diversification strategy rather than merely an institutional

development. It provides support at community level in terms of livelihood options that are dependent on natural resources and those where demand is very high among community members. The natural resources dependent livelihoods are in high demand as all households have equal access to the resources. The Conservancy brought a common-property regime to the area that allows for proper control over the resources.

6. Recommendations

- Although owning large herds of cattle is a cultural practice, there is a need to find ways to address this practice because it may lead to subsequent land degradation in the area. When this happens, it affects the main livelihood activity of the area.
- Development of monitoring mechanisms for vegetation resources and landscapes is required to allow community leaders to make informed decisions.
- Community members need to practice mechanisms that are important in reducing human wildlife conflict such as herding, kraaling the livestock at night and others known to them as wildlife in their communities will continue to increase due to good management practices put in place by the conservancy.
- Social cohesion among conservancy members should be promoted as this could be crucial to reduce vulnerability among poor households.
- Employment creation through tourism initiatives in the conservancy could help in tackle the need for employment among those economically active members of the community.
- There is a need for further research to understand the implementation of the Conservancy activities and its contribution to sustainable development.

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