Indigenous Peoples and Climate Change in Africa

Report on Case Studies of Namibia's Topnaar and Hai||om Communities

Land, Environment and Development Project
LEGAL ASSISTANCE CENTRE

March 2013

Acknowledgements

The researchers for this study and the authors of this report were **Ute Dieckmann**, **Willem Odendaal**, **Jacquie Tarr** and **Arja Schreij**.

We thank **Birgitte Feiring**, **Sille Stidsen** and **Jakob Kronik** of **Charapa Consultants** who made it possible for the Land, Environment and Development (LEAD) Project of the Legal Assistance Centre (LAC) to be involved in this project. For LEAD's involvement, Charapa Consultants made funds available from the **World Bank's Trust Fund for Environmentally and Socially Sustainable Development (TFESSD)** which funds the global TFESSD study on *Impacts of Climate Change on Indigenous Peoples and Traditional Knowledge*.

We thank the following for their contributions to the field research and/or the study report:

- the **communities of Soutrivier**, **Tsintsabis and Farm Six** who participated in the study;
- **Sebedeus Swartbooi** of the Topnaar community and **Moses |Khumub** of the Hai||om community, for their guidance and assistance during the fieldwork period;
- the **personnel of the Gobabeb Research and Training Centre**, especially **Mary Seely**, **Vivian Ward** and **Machel Bock**;
- **Sebedeus Swartbooi** for providing photographs to supplement those taken by Ute Dieckmann and Willem Odendaal;
- **Arja Schreij** for providing the original diagrammes and tables for this report;
- **Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)** for making funds available for the editing and layout of this report, and particularly **Nadine Faschina** and **Konrad Uebelhör** of GIZ for facilitating this funding process; and
- **Perri Caplan** for laying out this report and assisting with editing.

We also thank **Evangelischer Entwicklungsdienst (EED)** for its financial support for the LEAD Project over the years, and **Africa Groups of Sweden**, the **Embassy of Finland** and the **Swedish International Development Agency (SIDA)** for their financial support for the LAC.

EMBASSY OF FINLAND
WINDHOEK

Printed by _____ in Windhoek.

ISBN 978-99945-61-49-0

Publisher's contact details:
4 Marien Ngouabi Street (former name Körner St) Windhoek
P.O. Box 604, Windhoek, Namibia
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An electronic version (PDF) of this report is available on the LAC website.

Cover photo: the Kuiseb River (Erongo Region) flooding in 2011

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List of Abbreviations

CBNRM	Community-Based Natural Resource Management
CBO	community-based organisation
CERD	(UN) Convention on the Elimination of all Forms of Racial Discrimination
COPs	Conferences of the Parties
DEA	Directorate of Environmental Affairs
DFID	(UK) Department of International Development
GRN	Government of the Republic of Namibia
ILO	International Labour Organisation
INP	indigenous natural product
IPCC	Intergovernmental Panel on Climate Change
LAC	Legal Assistance Centre
MET	Ministry of Environment and Tourism
MLR	Ministry of Lands and Resettlement
NCCC	Namibian Climate Change Committee
NDC	Namibian Development Corporation
NGO	non-governmental organisation
NPCC	National Policy for Climate Change
NHE	National Housing Enterprise
NamWater	Namibian Water Supply
OPM	Office of the Prime Minister
OVC	orphans and vulnerable children
RCC	Roads Contractor Company
RRC	Regional Resettlement Committee
SWAPO	South West Africa People's Organisation
TA	Traditional Authority
TCF	Topnaar Community Foundation
TFESSD	Trust Fund for Environmentally and Socially Sustainable Development
PPA	Participatory Poverty Assessment
RoN	Republic of Namibia
UNDRIP	United Nations Declaration on the Rights of Indigenous People
UNFCCC	United Nations Framework Convention on Climate Change
UPR	Universal Periodic Review (of the UN)

Summary

1. Introduction

This study examines the impact of climate change on indigenous people and their strategies for adapting to climate change. Such a study is necessary because it has been recognised that more research is needed to better understand the particular challenges and changes that indigenous peoples face in relation to climate change, and to understand the local and traditional knowledge that informs their adaptation strategies.

Case studies in Namibia were undertaken in partnership with Charapa Consultants for the World Bank's Trust Fund for Environmentally and Socially Sustainable Development (TFESSD) study on the *Impacts of Climate Change on Indigenous Peoples and Traditional Knowledge.*

The specific objectives of the case studies are to:

- document how indigenous peoples are affected by climate change through a thorough review of existing data and literature;
- analyse and document in a participatory way how indigenous peoples (a) perceive climate change, (b) adapt to and minimise the adverse impacts of climate change, and (c) leverage opportunities presented by climate change, including through the use of local and traditional knowledge and practices; and
- provide recommendations for strengthening indigenous peoples' engagement and direct participation in the formulation of national and international public policies regarding climate change.

In Namibia, the Topnaar and the Hai||om were selected for the case studies for the overall study on *Impacts of Climate Change on Indigenous Peoples and Traditional Knowledge*.

The Topnaar community lives in small settlements along the Kuiseb River in the Namib Naukluft National Park. This area has been arid or semi-arid for an estimated 80 million years. Over this extensive period the plants and animals have been able to adapt to extremely harsh climatic conditions, as has the Topnaar community for centuries.

The Hai||om are one of the six San groups in Namibia. Two Hai||om settlements were visited for this study: Tsintsabis on the western edge of the Kalahari Basin, and Farm Six located about 50 km north-west of Tsintsabis. These areas were traditional ancestral lands of the Hai||om, but their access to land in these areas became increasingly limited in colonial times, and this trend has continued in post-colonial times.

Chapter 1 of this case study report conveys the study background and methodology. Chapter 2 provides background on Namibia's indigenous peoples. Chapter 3 focuses on the vulnerability and opportunity context in Namibia, with environment, climate change,

governance, socio-economic status and access to land and natural resources considered. Chapters 4 and 5 present the two community case studies, focusing on the Topnaar and Hai||om livelihoods, perceptions of climate change and possible adaptation strategies. Finally, Chapter 6 presents recommendations based on the findings of the two case studies, and lessons learned from these studies.

1.2 Conceptual framework

The overall methodological approach to these case studies entailed:

- collaborative research between indigenous peoples and scientists with the aim of combining the knowledge of these indigenous peoples;
- using scientific knowledge in assessing issues relating to the impacts of climate change on indigenous peoples;
- recommending measures to minimise the impacts of climate change; and
- improving local indigenous peoples' adaptation strategies.

The impacts of climate change (with reference to scale, intensity, predictability, etc.) on indigenous peoples are related to their adaptive capacity and vulnerability. Indigenous peoples' adaptive capacity and vulnerability depend on the nature and types of assets that they possess, including human capital (e.g. skills and knowledge), social capital (e.g. relationships and institutional access), cultural capital, political capital, natural capital, financial capital and physical capital. The fieldwork assessed the vulnerability and adaptive capacity of local indigenous communities, including the factors that facilitate or hinder successful adaptation, using the vulnerability concept developed by the Intergovernmental Panel on Climate Change (IPCC) and the framework used for the World Bank study on Indigenous Peoples and Climate Change in Latin America and the Caribbean Region, which was adapted from the UK Department of International Development (DFID) Sustainable Livelihood Framework as a tool to assess the vulnerability of different socio-economic groups and their adaptive capacity.

The following are the elements of the adapted Sustainable Livelihood Framework used for the World Bank study:

- *vulnerability context* – relates to the external environment (trends, shocks, seasonality, climatic variability, etc.);
- *livelihood assets* – refers to human, natural, financial, social, cultural and physical capital;
- *transforming structures and processes* – relates to formal and informal institutions either facilitating or hindering individuals' and communities' adaptive capacity;
- *livelihood strategies* – influenced by the first three elements; and
- *livelihood outcomes*.

The case studies focus on the relationship between the impacts of climate change on indigenous people' livelihoods (including the social implications of climate change and variability) and indigenous peoples' knowledge and adaptive strategies.

In the Namibian case studies it proved problematic to separate climate change impacts from other factors impacting on indigenous peoples' lives. It is our opinion that climate

change and factors such as governance, access to land and socio-economic status are interrelated, and therefore, whether studied separately or in combination, they all impact on indigenous peoples' livelihoods and adaptive strategies.

1.3 Methodology

The research methods used in these case studies were:

- a literature review;
- data collection through a household questionnaire, focus group discussions, semi-structured interviews with experts and other individuals, and participatory methods; and
- data analysis with a focus on identifying cases of indigenous peoples knowledge having resulted in successful management of, or adaptation to, the social implications of climate change.

In addition, the following post-study activities are planned:

- workshops and discussions with other experts and relevant stakeholders (e.g. local, national and international indigenous peoples' organisations) on the preliminary findings of the fieldwork;
- capacity-building activities; and
- dissemination of the case study results.

1.3.1 Fieldwork

The Namibian research team visited each community selected for participation in this study to introduce the Legal Assistance Centre (LAC) and explain the purpose of the study and the research meetings.

The first meeting with the Topnaar community took place at the Gobabeb Research and Training Centre in the Namib-Naukluft Park in February 2012. Personnel at the station facilitated the meeting at the nearby settlement of Soutrivier. During this initial-contact session we explained the purpose of the study, obtained the community's free prior consent to their participation in the study, and reached agreement on the organisation of the fieldwork. A second visit for the first round of fieldwork took place in March 2012. The second round of fieldwork was done in June. Thereafter, the team returned to the community twice to conduct key informant interviews and record life histories.

In March the team visited the Hai||om community of Tsintsabis. As with the Topnaar community, this initial-contact session with the Hai||om community entailed explaining the purpose of the study, obtaining the community's free prior consent to their participation and reaching agreement on the organisation of the fieldwork. The first round of fieldwork was done in April and the second round towards the end of June.

1.3.2 Methodological considerations

We needed to modify the methodology in order to obtain the most reliable and valid data from the research. We faced the following challenges during the whole study:

CHALLENGES	REMEDIAL MEASURES
People lacked understanding of the concept of 'climate change'.	Asking for adaptation strategies for climate change is difficult if the community does not completely understand 'climate change'. Therefore, we had to merge the scenario outline and the discussion on adaptation strategies. In this way the community understood what the research team meant. We also talked about environmental changes rather than climate change.
Potential interviewees refused the extensive original questionnaire.	We developed a briefer version of the questionnaire.
Separating the climate change factor from other factors (e.g. political and socio-economic) which endanger indigenous peoples' livelihoods. In our case studies, the increasingly limited access to land due to political factors and favouritism within the Traditional Authority system seemed to be perceived as much more threatening to livelihoods than environmental factors. At both sites, the participants depended on government aid to a considerable (though varying) degree. Due to the limitations of access to natural resources, the direct impacts of climate change seem to be minimal in comparison to other hazards.	We focused first on livelihood factors and potential hazards rather than impacts of climate change (see next row).
People were more eager to talk about their current problems (e.g. extreme poverty) than about climate change.	We found a compromise between the schedule and the participants' needs.
The methodology as agreed by Charapa and the partners in the meeting in Nairobi was not feasible for the circumstances and the budget.	We modified the methodology (see document feedback on methodology and progress reports).
Trendlines were too time-consuming and sometimes difficult for the participants to relate to. Furthermore, sometimes it was difficult for them to remember specific events or livelihood activities over the given time line (e.g. 1990-2012).	The research team considered the timelines on livelihood activities and climate change to be the most important, so these two were done in the way suggested in the methodology manual. However, with the Topnaar, the other two timelines were done in a different way: in the discussion on the importance of traditional institutions, we asked whether this has changed over time, and likewise for formal institutions. Also, the team conducted key informant interviews with the relevant institutions to fill possible gaps.
Using different participatory methods for the discussion on the importance of institutions.	During the second round of fieldwork in Gobabeb, the research team noticed that participatory methods worked well, but the Venn diagram was not used. Rather, we drew circles on the board that represented the different institutions and their importance – the larger the circle, the more important the institution.
It was difficult to use qualitative data for quantitative data sheets, for example in copying community responses into individual rows. The trendlines, for example, were discussed at community level whereas the sheets ask for individual responses (the same applies for wellbeing ranking).	In accordance with Charapa's requirements, the team provided the household *and* community data for every individual.

2. Indigenous peoples of the sub-region

The category of indigenous peoples is not specifically defined by either the UNDRIP or the ILO Convention 169 on Indigenous and Tribal Peoples – the two main international documents specifically addressing indigenous peoples. These documents and others do outline certain characteristics, however, including: self-identification; descent from original inhabitants of the territory; close relationship with the land and land-use strategies that differ from those of the majority; cultural distinctiveness; and an experience of marginalisation within the State. In the context of Namibia, the San, the Himba and the Nama have generally been regarded as meeting these criteria, and thus as falling within the category of indigenous peoples.

2.1 History, culture and ethnicity, institutions, social organisation and demographics

The extent of San marginalisation is clearly evident in the United Nations Development Programme's socio-economic indicators of human development, with the situation of the San being consistently worse than that of other groups in Namibia.

Another indigenous group is the Nama, a Khoe-speaking group numbering some 70 000. The Nama include the Topnaar communities of the Kuiseb River valley and the Walvis Bay area in west-central Namibia, numbering some 1 800 people in total.

2.2 Livelihood and traditional knowledge

The indigenous groups in Namibia are living on privately owned commercial land and in urban areas, as well as on communal land. The livelihoods in commercial and communal areas differ significantly. The majority of San living on commercial land have no right to any land and have to make a living as farm labourers, domestic workers or urban squatters, whereas San, Himba and Nama living on communal land have access (albeit limited) to land and its resources. On communal land, rural communities have the option to establish conservancies and community forests. Most of the Topnaar live in the Namib-Naukluft National Park. They reside in more than a dozen small settlements and depend on small-scale livestock production, use of *!nara* melons, and tourism. Some of them live in the nearby town of Walvis Bay.

2.3 Non-climatic drivers of change

The indigenous group currently facing the most challenges are the San, especially with regard to access to resources and opportunities to secure basic livelihoods. One of the primary factors creating dependency and marginalisation among the San of Namibia is their widespread loss of land and consequent lack of access to natural resources, especially during the past century of colonial rule. Under the apartheid administration of South West Africa, while most other ethnic groups in the country were granted "homelands" (inadequate as they were), most San found their land subsumed into commercial farming areas, the "homelands" of other ethnic groups, game reserves or national parks. As their

options diminished, San in many areas became progressively more dependent on others for survival, primarily white farmers, military employment and salaries, and later the patronage of communal-area farmers.

For San communities residing on commercial farms, the problem of landlessness has worsened since Namibia became an independent state in 1990. Without access to land, livelihood options depend on access to wage employment. However, low educational levels, stigmatisation by other groups, residence in "remote" areas and a range of other factors combine to create conditions of high unemployment.

3. The vulnerability and opportunity context in Namibia

3.1 Environment, climate hazards and impacts

Namibia is the most arid country in Africa south of the Sahara. Rainfall ranges from about 600 mm in the extreme north-east to less than 50 mm in the extreme south and along the entire coast. Central- to north-western Namibia experiences one of the steepest rainfall gradients anywhere in the world, ranging from about 400 mm to less than 50 mm over a distance of just 230 km. Rainfall is highly variable and unpredictable with an inter-annual variation coefficient that ranges from about 30% in the north-east to over 100% in the driest areas.

For most of Namibia, rain falls in the summer months of November to March, but the Succulent Karroo in the south-west receives a significant amount of its meagre rainfall in the winter months of June to August.

About 22% of Namibia's land is classified as hyper-arid desert, 70% is classified as arid to semi-arid savannah, and the remaining 8% (in the north-east) is classed as dry sub-humid savannah.

High temperatures and low humidity over most of the country for most of the year result in high rates of evaporation.

3.2 Scale, intensity and predictability of identified key climatic phenomena

The 1980s and 1990s were the hottest decades of the 20th century, and together with global trends, several records were broken in Namibia for maximum temperatures during the summer of 1997/98. Since then, numerous new record temperature highs and lows were recorded over South Africa for 2003, 2004 and 2005.

Besides the changes in temperature and rainfall, a sea-level rise (SLR) was noticed. Tide gauge records taken from Namibia (Lüderitz) between 1960 and 1992 displayed increasing sea levels. The rate of rise on average was 27 mm per decade (Hughes et al. 1992). The IPCC's (2007(a)) predictions for global SLR (a best-estimate rise of less than 2 mm per year) were lower than the actual rise (3.3 mm/yr) which occurred between 1993 and 2006.

Research suggests that maximum temperature increases (2-6°C) will occur in Namibia by the 2050 decade. Due to the influence of the cold Benguela Current, warming in Namibia is likely to be considerably less near to the coast than along the escarpment and inland regions of the country. Namibia's Oshikoto Region lies in an area where extreme increases in annual temperature are expected (possibly in excess of 4°C).

By 2080 the northern regions of Namibia (including Oshikoto Region where the Hai||om reside) are expected to experience a 10% decline in rainfall while the central regions (including the inland Erongo Region) could experience a 20% decline. These figures are predicted to worsen to 20% and 30% respectively by 2080.

For every degree of temperature rise in Namibia, potential evaporation (already extremely high) will increases by 5%. Thus, soil moisture levels are projected to decline dramatically with the cumulative impacts of higher temperature, lower rainfall, lower humidity and higher rates of evaporation. This will have severe implications for plant growth and carrying capacity of rangelands throughout Namibia.

Rainfall variability is likely to increase over southern Africa, and extreme events such as droughts and floods are likely to become more frequent and intense.

Coastal areas are likely to see increased incidence of flooding and inundation, affecting low-lying areas (IPCC 2007(a)). Saltwater intrusion into underground aquifers is also predicted, and this could influence the survival of certain desert plants (eg. the *!nara* plant – an important seasonal staple of the Topnaar living in the Kuiseb River valley).

3.3 Governance: legislation, policies, institutions, recognition of indigenous peoples' rights, political participation/constituent and conflicts

Namibia is still in the process of redressing past historical and legal inequalities that were premised on racial discrimination. In its post-colonial era, the Government of Namibia established itself as a sovereign, secular, democratic and unitary State founded on the principles of democracy, the rule of law and justice for all. It ratified most regional and international human rights instruments. It continues to position itself politically, and possibly legislatively, as a government accommodating its indigenous communities in line with international expectations.

The Constitution of Namibia provides for the devolution of limited powers and an advisory role to Namibia's Traditional Authorities. However, there is no specific recognition of the rights of indigenous peoples or minorities in the Constitution.

3.3.1 Recognition of indigenous peoples' rights in Namibia

Namibia signed the UNDRIP in 2007. Although the UNDRIP is technically not binding, the standards it contains are based on existing human rights, or declarations about existing human rights which have been formulated in the context of indigenous peoples and have been signed by Namibia. Namibia has not yet ratified the only binding international

document dealing specifically with indigenous peoples rights, i.e. the International Labour Organisation (ILO) Convention 169. However, the ILO is working closely with the Office of the Prime Minister's San Development Programme to promote the signing of the document and the rights of San peoples in Namibia.

Namibian legislation includes a number of interconnected Acts that provide opportunities to implement indigenous rights as outlined in the international declarations – in particular in the areas of land, leadership, natural resource management and education. Traditional leadership in Namibia is closely connected with land and resource rights. Government structures responsible for overseeing various acts related to traditional leadership, land and resource rights are spread across several different ministries. There are also various responsible leadership positions and boards, and a number of different supporting organisations.

Namibian policy provides options for indigenous peoples to enjoy land rights through an innovative approach of integrating conservation and development, known as community-based natural resource management (CBNRM). An integral component of Namibia's CBNRM programme is conservancies, these being areas of communal land in which conservancy members are granted wildlife resource rights under Namibia's Nature Conservation Amendment Act of 1996. With wildlife as a main focus, conservancies provide management units that cover geographically defined areas, and these organisational systems can be extended to encompass other resources including water points and woodlands/forests, and to address social and economic issues.

Namibia's educational policy also provides options for indigenous peoples to gain access to education. The Ministry of Education's policy document entitled *National Policy Options for Educationally Marginalized Children* (2000) identified the three major "educationally marginalized" groups in the country: the San, the Ovahimba and the children of farm workers (a great many of whom are San). According to this document, in addition to an overall lack of schooling that recognises and validates their language, culture and background, these minorities experience barriers to formal education stemming from poverty, low socio-economic status, stigma surrounding their culture, and "remoteness".

3.3.2 Recognition of traditional authorities in Namibia

The Traditional Authorities Act 25 of 2000 establishes the legal framework for the recognition of Traditional Authorities. It allows for a community to designate one person to be their Traditional Authority (in accordance with customary law), who must then be approved by the Minister responsible for Regional and Local Government.

However, appropriate training and monitoring of the performances and accountability of the Traditional Authorities is almost non-existent in Namibia, and the Government is not providing any support to the Traditional Authorities to fulfil their duties with some degree of competency. It is an important fact that Traditional Authorities receive a monthly remuneration, as well as a car and other provisions from the Government.

Traditional Authorities run the risk of becoming the agents of government instead of being real community representatives. The system, as it currently operates, has some similarities with the colonial strategy of divide-and-rule.

3.3.3 National climate change policies and consultation

Namibia ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1995. Parties to the UNFCCC are obliged to make periodic submissions including Initial National Communications to Conferences of the Parties (COPs). The *Namibia Second National Communication to the UNFCCC* was officially launched in November 2011. In addition, Namibia established the Namibia Climate Change Committee (NCCC) in 2001, and also has the following instruments in place to meet its obligations under the UNFCCC:

- Legislation and policies related to global challenges and environmental management and protection, such as Article 95(l) of the Namibian Constitution, the Environmental Management Act 7 of 2007, Vision 2030, National Development Plan 4, and various policies and Cabinet directives. Of special significance in this regard is the National Policy on Climate Change for Namibia (NPCC), which focuses mainly on adaptation, coping strategies and disaster management.
- Reports on the greenhouse gas inventory based on 1994 and 2000 data were completed in 1998 and 2009 respectively.
- An assessment of capacity needs required to implement Article 6 of the UNFCCC was completed in 2005. Article 6 requires parties to develop and implement educational and public awareness programmes on climate change and its effects.
- A Directorate of Disaster Risk Management is operational in the Office of the Prime Minster.
- A National Drought Policy was developed in 1997.
- A Technology Needs Assessment was conducted in 2005 to identify financial and research needs.

Namibia's National Development Plan 4 of 2013-2017 deals briefly with climate change under Chapter 8 which covers the topic of "extreme poverty". It states that, "... since subsistence farmers are more affected by extreme poverty than the population in general are, Government will supplement cash transfers with interventions such as the promotion of Conservation Agriculture in order to increase subsistence farmers' productivity and reduce their vulnerability to climatic conditions."

3.4 Socio-economic conditions

Namibia has an estimated 2.1 million inhabitants spread over an area of approximately 824 000 km^2 with an urbanised population of 31.3%.

Poverty in Namibia is linked to unemployment. In 2004 about two-thirds of Namibia's unemployed fell into the most productive age group of 16-45 years. Unemployment continues to rise in Namibia, and a recent labour survey states that by 2008 it had reached 51.2%. Namibia is often reported as having the most unequal distribution of income in the world.

The first few years following Namibia's Independence in 1990 saw a rise in the share of the budget allocated to Health Affairs and Services, but, although a share of 10% or more was sustained for seven years, the allocation has since declined. The allocation has consistently fallen short of the 15% recommendation contained in the 2001 Abuja Declaration. This has come at a time when the country has started to face the full costs associated with the HIV/

AIDS crisis which is considered to be one of the major drivers of falling life expectancy and poverty in the country.

Since Independence, Education Affairs and Services has consistently received the highest share of resources from the national budget. Huge improvements for previously disadvantaged people in Namibia have occurred since Independence. But, despite the high budgetary allocation for education, and despite the improvements in school attendance and facilities, this sector is constantly under criticism. One of the main issues is that a high percentage of teachers are not deemed proficient in the language of tuition (English), with the result that education standards remain low.

3.5 Access to land and natural resources

A resolution was taken at the 1991 Land Conference that the land rights of disadvantaged communities should receive special protection. The San and disabled communities are specifically mentioned. The National Resettlement Policy identifies the San as a specific target group for resettlement. It states that "Members of the San Community have endured exploitation and discrimination at the hands of their citizens throughout history … [they] have suffered tremendously as a result of historical changes caused by the political constellations and ecological constraints … they need to be helped in realizing a new living by developing existing skills and acquiring new ones to be able to secure their sustenance."

Apart from that, Namibia does not have any national legislation that deals directly with indigenous peoples, and the Namibian Constitution does not mention indigenous peoples.

Conservancies and national parks

The conservancy movement, CBNRM and other plans offer much promise for San development in particular. These programmes have to be supported, but also carefully researched and monitored to ensure that San choices are respected and that these institutions truly benefit the San.

4. Case studies

For the purpose of this study, two communities were selected: the Topnaar and the Hai||om communities. The selection was based on the differing environmental conditions in which they live.

The climate at Gobabeb (Topnaar area) is hyper-arid. The average annual rainfall is only 27 mm, and the average annual precipitation derived from fog (which reaches the study site on an average of 37 days per year) is 31 mm. In 2010/11 an extreme rainfall of about 165 mm was measured at the study site during the rainy season.

By contrast, Tsintsabis (Hai||om area) has a sub-tropical climate, with very hot summers and mild winters. The mean maximum temperature is 29.7° C and the mean minimum is 14.4° C. Occasional thunderstorms occur during the summer rainfall months (October to March). The average annual rainfall is 555 mm.

4.1 Case Study One: the Topnaar

The Topnaar community lives in small settlements along the banks of the Kuiseb River in the hyper-arid western part of the central Namib Desert (Erongo Region), in the Namib Naukluft National Park. The number of Topnaar living in the Kuiseb valley has fluctuated over the years, but records suggest that it has never been a very large number.

For this study, 174 Topnaar community members were interviewed. These interviewees are residents of Swartbank, Armstraat, Homeb, Klipneus, Natab 1, Natab 2, Os-Water and Soutrivier. This is not the total number of Topnaar in the area: there were difficulties with tracking people down due to migration and because some community members are not permanent residents.

4.1.1 Vulnerability and opportunity context for the case study

4.1.1.1 Environment, climate hazards and impacts

The area in which the Topnaar live has been arid or semi-arid for an estimated 80 million years. Over this extensive period, the plants and animals found here have been able to adapt to extremely harsh climatic conditions, with the result that many are now endemic to the area.

Under expected climate change conditions, the Kuiseb River will be subject to decreasing rainfall, increasing temperatures and increasing rates of evaporation. Less frequent and lower-magnitude flooding is predicted for these 'linear oases', but due to higher rainfall variability, the years with excessively high rainfall (as experienced in 2011) will cause high rates of runoff and excessive flooding.

Regarding water availability, the vegetation structure along the river will be seriously threatened. The implications for biodiversity and Topnaar survival along the Kuiseb River could be severe as large trees in riverbeds provide essential shade, fodder and habitat to many species of wildlife, as well as fodder for the small herds of goats kept by the Topnaar.

Reductions in vegetation cover and declining surface water are likely to affect the wildlife presence. Due to the possible lower availability of water, there may be a drive to increase the number of boreholes, which will increase overgrazing and the rates of land degradation. It was estimated that already at least 1 290 boreholes exist in the Kuiseb Basin. An increasing number of boreholes and dams throughout the Kuiseb Basin is impacting negatively on aquifer recharge, amounting to a reduction in flow to the lower reaches of the Kuiseb River by an estimated 21%. This effect is exacerbated in drier years and could be further exacerbated under climate change conditions.

Sea level rise will increase the risk of saltwater inundation of coastal aquifers. This could affect the quality of water available to the Topnaar, and to many of the plants on which the community depends – the *!nara* melon in particular with its dependence on deep groundwater. The scale of saltwater intrusion into coastal aquifers will depend on the size of the particular aquifer, geological factors, groundwater withdrawals, surface water recharge and precipitation.

4.1.1.2 Governance

All members of the Topnaar Traditional Authority were recognised by the Government and gazetted accordingly in 1998.

There is a great deal of mistrust among community members and between community members and their leadership. This appears to be fuelled by a lack of transparency on the part of those who are controlling funds on behalf of the community.

4.1.1.3 Socio-economic conditions

The incidence of income poverty varies considerably between the administrative regions and between urban and rural areas. Erongo Region, in which the Topnaar live, is said to be the second wealthiest region due to the towns of Swakopmund and Walvis Bay that provide employment opportunities. However, the Topnaar have been identified as the most marginalised group in this region. In Erongo, high levels of unemployment – due to poor education and low skill levels – is a major cause of poverty. Poor education can be caused by a number of factors, but in the rural areas where the Topnaar live, long distances to schools and limited education opportunities close to the homestead often result in a high incidence of school dropout.

LIVELIHOODS

Livestock and chickens

Livestock is important for the Topnaar community in two ways: food security and income.

When a Topnaar household is in need of food, they slaughter their livestock, and when in need of money, they sell their livestock. However, when they want to sell livestock or meat in Walvis Bay, they need permits for transporting these out of the national park. This limits such sales as it is difficult and expensive for the Topnaar to obtain the permits. Almost all of the participants stated that chickens are very important because of their eggs.

!Nara fields

The *!nara* plant (*Acanthosicyos horridus* – local name "*!nara*") remains the most important plant for the Topnaar. *!Nara* is used as food whereas other plants are used mainly as medicines. Other types of fruit are scarce in this area. Of the 38 households interviewed, only 3 were not involved in harvesting *!nara*. In total, 92 of the 174 individuals interviewed are involved in harvesting wild plants, and only 8 are not involved in harvesting *!nara*. Those harvesting *!nara* have 7 livestock on average. Thus it can be argued that having livestock and harvesting *!nara* are important livelihood strategies for the Topnaar.

The Topnaar community used to have exclusive rights to harvest *!nara* in this area, but today more outsiders are coming to the area to harvest this plant. Community members said that the outsiders are damaging the bushes and harvesting unsustainably.

Pensions

Pensions received by elders are seen as vital for supporting households. Pension money is usually used to buy basic household necessities such as maize-meal, sugar and cooking oil,

and also supports children with school-related costs. Pensions are regarded as the most reliable source of regular income. Cash is important because it pays for food, transport, clothing and telephones. Sometimes money is saved at the bank in Walvis Bay, but savings are small as cash in hand is required on a daily basis to buy necessities. People who have a pension also have more livestock on average compared to people who don't have a pension.

Drought/flood relief

Drought relief has been important for the Topnaar community since Independence (1990), and from 2000 onwards the community received flood relief more often. Drought relief (i.e. three 12,5 kg bags of maize-meal, three bottles of cooking oil and some fish per household) is distributed around three times per year, and flood relief (maize-meal, fish, beans, oil and sugar) is distributed every two months. However, both types of relief are distributed only to people who have a homestead, and only when they are at home.

Employment

The Topnaar community is highly dependent on employment in Walvis Bay, and rural community members who do not work depend on those who do. In turn, rural community members may, for example, look after the animals of a livestock owner who stays in Walvis Bay due to employment there. However, employment is not regarded as a highly important livelihood strategy as job opportunities are rare and educational levels among Topnaar are rather low. Participants also said that they cannot compete with other ethnic groups in terms of employment. Along the Kuiseb River, job opportunities are even more limited.

WELLBEING RANKING

Participants in Soutrivier said that there are three wellbeing categories: poor, medium and better off. After categorising the households of their own community accordingly, the participants were able to do the same for the households of other Topnaar communities. In total there were 8 poor households, 12 medium households and 13 better-off households. It was said that people can move up in life when they get employed. However, people can also move to a lower category due to environmental conditions, e.g. people can lose their livestock due to predators, floods or lightning. Armstraat is by far the poorest community, while Homeb and Swartbank are considered to be financially better-off communities.

Education

A lack of qualifications is the main reason for people not finding employment. It was stated that parents are not particularly interested in investing in education for their children. One reason for children dropping out of school is a lack of money to cover school-related costs. Also the few school hostels are expensive. It was also mentioned that the many distractions that life in town offers is another reason for children dropping out of school.

Health

There are hospitals in the major centres of Erongo Region. People in urban areas do not seem to have a problem with accessing health facilities, although some still say that they are refused access to medicine and services if they cannot pay – which contradicts government policy. In rural areas, communities are served by either static or mobile clinics. Finding

transport to the hospital in Walvis Bay is a big problem. A lack of food is another problem with regard to health: when taking medicines, one must also eat, and people living in poverty do not always have access to food.

4.1.1.4 Access to land and natural resources

Park and conservation regulations mean that the Topnaar are not allowed to hunt inside the Namib-Naukluft Park. Due to the area's aridity, farming is possible only along the Kuiseb River, and livestock never stray too far from water points on the riverbanks. Sometimes during good rainy spells, livestock are allowed to share grazing with game on the plains.

Traditionally the Topnaar were nomadic hunter-gatherers, entirely dependent on the seasonal harvesting of *!nara* melons, other plants, fishing and hunting wildlife.

Water

As water is a precondition for having livestock, it is important to look at access to water in detail. The development of permanent water points in the late 1970s and early 1980s encouraged settlement and an increase in livestock. Before the permanent water points were drilled, the Topnaar depended on the water from natural pools, springs in the river and hand-dug wells.

In the year 2000, solar pumps were introduced to replace the windmills and diesel engines. In the case of the Topnaar, a number of problems such as management and maintenance of the water points have been experienced.

4.1.2 Impact of climate change and variability on indigenous peoples in the sub-region

4.1.2.1 Local perceptions

The Topnaar could not directly identify any impacts of climate change on their livelihoods, thus the research team decided to develop trendlines to determine their perceptions of the changes in environmental conditions and the impacts of these on their livelihoods. The trendlines (see main report Figure 7, page 68) shows the changes in climate-related factors over time, which had different social, economic, physical and natural impacts. It can be seen that floods increased from 1990 to 2000 and there was a major flood in 2011. The community assumed that the number of floods would decline in the following five years (2012-2017).

4.1.2.2 Key impacts

Due to floods, people had lost livestock, which were swept away by the water or got stuck in the mud. Moreover, access to the *Ana* tree pods (used as animal fodder) declined, because these trees, which occur mainly on the south bank of the river, are accessible only when the water level is low. The Government helped the community with fodder for their livestock. Other impacts of the flood were inaccessible roads and damaged *!nara* fields, especially the fields along the river. However, the *!nara* bushes in the dunes rendered higher-quality fruits, although these were difficult to access. In general the harvest of *!nara* was better in 2011 in comparison to previous years because of the high groundwater level. On the other

hand, it was pointed out that too much water is not good for *!nara* because it causes the plants to rot.

Should floods no longer occur, this will impact on the livelihoods of the Topnaar community. If upstream water abstraction increases and global climate change reduces rainfall, the Kuiseb water levels will decline, with implications for the area's biodiversity as well as the Topnaar survival methods, because the large trees provide shade and fodder for the goats of the Topnaar.

In sum, regular floods which were not as extensive as in 2011, were seen to have a positive impact on the Topnaar livelihoods.

4.1.2.3 Contributing factors

In summary, the most important interrelated contributing factors are:

- the aridity of the land;
- living in a national park –
  - this hampers access to natural resources such as hunting;
- a lack of education;
- Favouritism on the part of the Traditional Authority –
  - this hampers access to other livelihood strategies such as employment and access to further outside support;
- a vulnerable economic position;
- the Ministry of Agriculture, Water and Forestry's lack of capacity to maintain the water points;
- a lack of access to resources needed to invest in education, livestock and alternative livelihood strategies (e.g. gardening);
- the influx of outsiders to the *!nara* fields;
- the conditions of the *!nara* commercial market in Namibia; and
- The increase of *!nara* harvesting.

4.1.3 Traditional knowledge and adaptation to climate change and variability

4.1.3.1 Indigenous peoples' adaptive capacity and resilience

The Topnaar community has lived in a harsh environment for centuries, one result being the development of several livelihood strategies. These can be understood as strategies for adaptation to the environment even before climate change began to have a serious impact.

Farming with small livestock (rather than with large livestock) and harvesting *!nara* are Topnaar strategies for adapting to their harsh environment. Another adaptation strategy in this super-arid environment is the diversification of livelihood strategies – combining livestock, *!nara* harvesting, pensions, food aid, employment and piecework.

Climate change will impact on the Topnaar livelihood strategies. The community identified different wellbeing categories, and said that the strategies of "better-off" households for coping with the changing environmental conditions will differ to those of other categories.

4.1.3.2 Indigenous peoples' adaptation strategies

The following table provides an overview of climate hazards and the community members' potential responses.

CLIMATE HAZARDS AND POTENTIAL RESPONSES: PERCEPTIONS OF THE TOPNAAR COMMUNITY			
Hazard result	**Response 1**	**Response 2**	**Response 3**
Floods			
1. Water pumps washed away	Dig water from river bed and use traditional wells	Buy generator to abstract water from the river	Collect water from other communities
2. Animal diseases	Use natural remedies	Ask Agricultural Extension Officer for advice	
3. Animals washed away or stuck in mud	Better monitoring of own livestock	Better system of communication on floods	
4. Reduction of fodder (pods)	Cooperative to collect pods before flooding starts		
5. *!Nara* fields affected	Allowing *!nara* fields to recover	Small-scale cultivation of *!nara*	Stress the importance of sustainable harvesting methods (without success)
Drop in water level			
1. Changes in vegatation	No response given	No response given	No response given
Drought			
2. Lack of grazing	Focus on adapted livestock such as goats and donkeys	Go to other grazing areas	
Wind			
Solar panels blown away	Wait for NamWater to fix		
Lightning			
Livestock killed	Get livestock out of kraal		
Bush fires			
Trees affected	No response given	No response given	No response given

4.2 Case Study Two: the Hai||om

Two Hai||om communities were selected for this case study: the Tsintsabis and Farm Six communities. The research team decided to visit both communities because there are considerable differences in the arrangement of the two villages and in their poverty levels. For the purpose of this study, several community workshops were held at both sites, and a questionnaire was conducted with a total of 25 households (121 individuals – 45 in Tsintsabis and 76 on Farm Six). The average age of the interviewees was 41.

Tsintsabis

After Independence, several Hai||om were resettled at Tsintsabis, located about 60 km north of Tsumeb. Most of them had been farm workers on white-owned farms established before Independence on the Hai||om ancestral land in the areas surrounding Tsintsabis. To the south, Tsintsabis is flanked by commercial farms (historically owned by white settlers but nowadays increasingly owned and managed by emerging black farmers). To the north

and north-east, Tsintsabis is flanked by semi-commercial farms owned by Owambo and Kavango farmers.

Farm Six

Situated 50 km north-west of Tsintsabis is the Mangetti West Block, an area of about 80 000 ha which was originally acquired by the South African Administration for use as a quarantine camp for livestock moving from the northern communal areas into the commercial farmlands to the south. Farm Six is one of eight cattle posts in the Mangetti West Block. Today the Namibian Development Corporation (NDC) leases the Mangetti West Block from the Government of Namibia.

4.2.1 Vulnerability and opportunity context for the case study

4.2.1.1 Environment, climate hazards and impacts

As Hai||om livelihood strategies become more threatened by difficult climatic conditions, their poverty is likely to increase. Overall there is likely to be a decline in the variety and availability of many plants and small animals currently encountered in Oshikoto Region. This will threaten food security, especially for those Hai||om who depend heavily on bushfood for their survival. Declining food security throughout the region will result in increased competition and potential conflict over available grazing, bushfood and potentially valuable indigenous natural products (INPs) which have a high commercial value. Increased incidence of illegal poaching in conservancies and parks is likely to occur. Not only will there be food insecurity, but also there will be less water available due to the reduced groundwater recharge, lower water tables and decline in surface water.

Changes in climate beget several health constraints, particularly those relating to vector-borne diseases. Also the incidence of malaria could increase in Oshikoto during wet years.

4.2.1.2 Governance

San development

In 2005, seeking to "develop" San communities in Namibia, the Office of the Prime Minister (OPM) implemented the San Development Programme, which the Cabinet approved in November 2005. The main objective of the programme is to ensure the integration of the San into the mainstream Namibian economy in line with Vision 2030 (the country's long-term development policy) and specific national development programmes.

The ILO acknowledges the Namibian Government's goodwill with its San support, but has also identified shortcomings in the programme, hence it is trying to bring the Government more in line with ILO principles, and to improve the coordination of San support in Namibia.

Traditional leadership and political representation

Customarily, as with many other hunter-gatherer societies, the social organisation of the various San groups made no provision for a single traditional leader. Instead, headmen of smaller family groups had certain responsibilities, especially in respect of the management of natural resources.

Consequently, today's San Traditional Authorities lack internal role models for their own leadership roles; they have only a vague idea of the roles and duties linked to leadership positions. Also there is often a lack of understanding regarding their role in the overall national governance system, and a lack of awareness that their jurisdiction is limited to their customary laws and practices.

4.2.1.3 Socio-economic conditions

The San are arguably Namibia's poorest people. Most San communities in Oshikoto Region do not participate in an agricultural-based economy, and very few have access to on-farm employment. They consider themselves poor because they depend on government aid, and additionally they depend directly on nature for their livelihoods. They also have very limited opportunities to earn cash, and as their environment degrades due to climatic factors and their own overexploitation of food plants and animals, they have to walk increasingly long distances to look for food. The San feel impoverished because they feel that they are residing on someone else's land. This restricts their sense of freedom of movement.

LIVELIHOODS

Sharing

Sharing was said to be important to the Hai||om, and it relates to other livelihood strategies (e.g. pension, food aid and employment).

Sharing was said to be a reason for Hai||om individuals not being able to 'get rich'. The local research assistant interpreted sharing not as 'a strategy of the poor', but rather as a primary aspect of Hai||om culture. The Hai||om have various methods of sharing among themselves, and the terms of sharing differ for each method. This information is consistent with anthropological literature on (former) hunter-gatherer societies which always points to the importance of sharing.

Pensions

Apart from sharing as the overall framework, pensions are the most important livelihood "strategy", which is a common pattern among San and other poor households in Namibia. Pensioners (aged 60+) usually share their pensions with their family members.

Food aid

Food aid was deemed the second most important Hai||om livelihood strategy. Most of the Tsintsabis community members receive food aid, which usually consists of two 12.5 kg bags of maize-meal and some cooking oil. This aid is provided under the above-mentioned San Development Programme of the Office of the Prime Minister. People on Farm Six are also highly dependent on food aid, but it seems that they experience more irregularities and sometimes have to wait months for the next provision.

Chickens

At both sites, chickens are considered to be an important livelihood strategy, since people can fall back on chickens if there is no other food. Also chickens can be exchanged for maize-meal. Eggs are also considered to be important.

Piecework/employment

Piecework is especially important for the younger people, but it is scarce. Very few members of the two communities are employed – 22 out of ±2 000 in Tsintsabis, and only 8 out of at least 200 and possibly 300 on Farm Six (all 8 are employed by the NDC). According to the participants, there are no young people working in towns and supporting households on Farm Six. This is not surprising given the areas' remoteness and the very low levels of education.

Bushfood

In the past farmers allowed their Hai||om workers to collect bushfood during their free time, but nowadays the lack of access to land hinders their access to bushfood. However, the collection of bushfood is still used as a coping strategy as soon as maize-meal fails to arrive from the Government.

Livestock

The number of livestock owned by Hai||om is low, especially compared to the Topnaar community. The lack of access to land and/or infrastructure (e.g. fences and water points), and the fact that livestock do not feature in the traditional livelihood systems of the Hai||om, mean that livestock are not an important livelihood strategy.

Small business

Some people are engaged in a small business such as selling sugar and chicken. However, the participants agreed that this is not an important livelihood strategy because it is seldom sustainable.

WELLBEING RANKING

People stated that households in the better-off wellbeing category have a regular income due to employment, and also because they own livestock. With regard to the poor category, it was pointed out that many people in this category tend to abuse alcohol. Some go early in the morning to shebeens where they find casual work and are given alcohol or a very small amount of money in return for their services. It was also said that one can get out of the poor category when one stops drinking. Many participants had abused alcohol at times in their lives.

Health

Quite often people have to walk long distances to the nearest hospital or clinic, and some participants stated that health service delivery was poor. Complaints ranged from a lack of hospital facilities to long queues, unsatisfactory treatment from nursing staff, doctors being too tired to examine patients properly, and old people being hesitant to go to hospital due to fear of being discharged before being cured. Participants felt that San communities especially are excluded from health services. At Tsintsabis there is a clinic, but the mobile clinic serving Farm Six stopped its service there some years ago. People on Farm Six have severe problems with accessing health facilities due to transport problems.

Education

In Tsintsabis it was reported that in the years 2006 to 2009, at least one or two children passed Grade 10 each year. However, since 2010, no Hai||om child has passed Grade 10. The school was established in 1993, and according to the community, it is a poor educational institution due to unqualified teachers and a shortage of teachers. Also it was said that the children are losing their mother tongue as they are taught in a Damara language and English, whereas Hai||om or ǂ||Akwe are spoken at home. Some children do not want to go to school simply due to feeling ashamed because their parents cannot afford soap.

MIGRATION

The migration rates in these Hai||om communities are not as high compared to the rates of the Topnaar community. Almost all of the questionnaire respondents were permanent residents of either Tsintsabis or Farm Six. However, as in other San communities, mobility is relatively high. This is related to the importance of sharing: schoolchildren sometimes move to reside with relatives who live closer to the school, and people who have family ties to a farm worker or other employed individuals might visit them for an extended period.

4.2.1.4 Access to land and natural resources

Policies and programmes converning land and natural resources (access, availability, quality and distribution) and climate change

The lack of access to land is a serious problem in both Hai||om communities: it a major impediment to bushfood collection and hunting as well as animal husbandry and gardening.

The area of Tsintsabis is 3000 ha in size with a population of 3 000-4 000. More farms were bought in the vicinity with the idea that Hai||om with livestock could use these farms for grazing, but it turned out that mainly other ethnic groups got hold of the grazing. There were also accusations that the headman was allocating land on these farms to outsiders – which would be outside his powers as resettlement farms fall under the Ministry of Lands and Resettlement.

The 10 ha plots allocated to individual Hai||om are not fenced off and do not provide any infrastructure for sustainable gardening or animal husbandry projects.

If Hai||om trespass on land to collect firewood, medicinal plants or bushfood, they risk being beaten up. There were reports that on a commercial farm owned by a previously disadvantaged Namibian, Hai||om women from Tsintsabis were caught with firewood and beaten on their legs by the farm owner.

Access to bushfood

Since Hai||om, like other San groups in Namibia, were nomadic hunter-gatherers in the past, it is worth going into some detail with regard to access to bushfood. Currently, none of the San groups can survive anymore from only hunting and gathering.

Today, the most important natural products harvested by Hai||om are firewood, wood for construction and woodcarvings, thatching grass, medicinal plants and foods (from nuts,

fruits, leaves, roots and bark) and meat, which these days is hunted illegally. Prosecution for illegal hunting does occur and penalties are strict, but due to necessity, most poor rural people in Namibia, including the Hai||om, do hunt, albeit illegally.

Bushfood collection is restricted by the lack of access to land. Although hunting is illegal, Hai||om on Farm Six still do some hunting of small animals (e.g. duiker, steenbok, porcupine, tortoise and springhare). With domestic animals present in all of the areas surrounding the Tsintsabis settlement, some desperate Hai||om resort to stealing and slaughtering livestock.

4.2.2 Impact of climate change and variability on indigenous peoples in the sub-region

4.2.2.1 Local perceptions

It proved difficult to discuss climate change impacts on the livelihoods of the Hai||om communities studied. However, they undoubtedly view the lack of access to land as the major cause of their poverty.

4.2.2.2 Key impacts

According to the Hai||om, the rains have decreased and the rainy season starts and ends later, with the result that the plants no longer produce enough food or the food rots.

Participants reported that severe frost in 2011 – said to be the worst frost ever in the area – killed most of the former wide variety of bushfood (e.g. berries).

Occasionally the area receives heavy rains which result in floods. One result of a flood is sicknesses such as parasites/worms, and also malaria as flooded areas are breeding places for mosquitoes.

4.2.2.3 Contributing factors

In summary, the most important interrelated contributing factors are:

- land degradation and mismanagement;
- an influx of outsiders onto Hai||om land;
- living on an NDC farm (Farm Six) or a resettlement farm (Tsintsabis) –
  - hampers access to natural resources;
- a lack of education;
- remoteness (Farm Six);
- other Namibians discriminating against San;
- a lack of proper political representation –
  - hampers access to other livelihood strategies such as employment and further outside support;
- a vulnerable economic position;
- a lack of proper political representation; and
- a lack of access to resources for investing in education, livestock or alternative livelihood strategies such as gardening.

4.2.3 Traditional knowledge and adaptation to climate change and variability

4.2.3.1 Indigenous peoples' adaptive capacity and resilience

KEY FACTORS

The findings of the fieldwork point to several factors that reduce indigenous peoples' ability to minimise the impacts of climate change and adapt to it. The three key factors are a lack of access to land, the influx of outsiders and a lack of political representation.

Recent changes such as fewer employment opportunities, reduced availability of bushfood and increased dependency on pensions and food aid are due mainly to political developments (e.g. land reform and the introduction of the labour law), and are less directly related to climate change. Bushfood availability is limited by the lack of access to land and by overgrazing, but not yet by climate change.

LIVELIHOODS

Bushfood

It is clear that the importance of bushfood has decreased for the time being: 40% of the respondents thought that the importance of bushfood is currently low. Its importance will even be lower in the future.

Hunting

Hunting was extremely important in the past, but over 60% of the respondents thought that it is of low importance today and likewise in the future. This perception is due to the fact that hunting is illegal in the area in which they live. However, questionnaire responses indicated that Hai||om still hunt occasionally, especially smaller animals.

Salaries/income

Around 60% of the questionnaire respondents thought that income is somehow an important livelihood activity. Furthermore, more than half thought that having an income will be very important in the future. It is also evident that respondents regarded the high unemployment rate among the Hai||om as a major problem, and many indicated that they would like to be employed. However, when asked if employment is in fact important as a livelihood strategy, it turned out that they thought it was more important in the past than it is today (especially because of the increased availability of farm work in the past).

Livestock

Around a third of the respondents thought that husbandry was an important livelihood strategy in the past, and 30% thought that it is of low importance today. The importance of livestock is higher in Tsintsabis than on Farm Six. This might be due to the fact that many members of the Tsintsabis community are former farm workers who had easier access to livestock either because they bought it from the farm owner or because the farm gave it to them as a long-service benefit.

4.2.3.2 Indigenous peoples' adaptation strategies

The adaptive strategies of the Hai||om on Farm Six and in Tsintsabis are very limited. Due to the lack of access to land, traditional gathering has decreased considerably over the last few decades. Bushfood availability and species vary from season to season. Some plants can be used in more than one season, or they start growing at the end of one season and ripen in another.

Lifestyle changes

In the past the Hai||om communities were far more dependent on bushfood than they are today, thus in the past they could easily recall the droughts of previous years. Nowadays, however, people no longer remember droughts because they do not depend on bushfood as much as they used to, hence the droughts have had a lesser impact on their livelihoods. Both Hai||om communities thought that the droughts will get worse in the future, but also that more food relief from the Government would not be an option. There are people who could farm themselves, and respondents felt that the Government should buy land for them to farm and support their efforts to become sustainable farmers, because "food aid is not a solution".

The Hai||om participants had difficulty conceiving of more adaptation strategies because they currently face constraints (chiefly a lack of access to land) which profoundly influence their livelihoods. Their access to resources is limited, and is likely to become even more limited due to the influx of people and livestock into their area. These Hai||om communities are highly dependent on government aid in the form of pensions and food relief.

5. Lessons learned and recommendations

The research focused on the selected Hai||om and Topnaar communities' adaptability to climate change, and it established some differences between the communities studied. The Topnaar are less poor than the Hai||om, and have more assets (livestock and equipment such as donkey-carts). For their livelihoods the Topnaar rely chiefly on two resources, namely livestock and the *!nara* plant, both of which are subject to climate change. Other livelihood strategies (pensions, food aid, employment and piecework) supplement their livestock farming and *!nara* harvesting. However, despite being less vulnerable in the overall picture (more assets and a lower level of poverty), the Topnaar might be more vulnerable than the Hai||om to the impacts of climate change, because, due to their lack of access to land, the Hai||om are highly dependent on government aid and less dependent on natural resources. This was confirmed in assessing Hai||om perceptions of climate change.

5.1 Lessons learned on local knowledge and adaptation strategies

Both the Topnaar and Hai||om communities still possess extensive traditional knowledge on natural resources and the management of these in their respective areas. Communities

should be encouraged to treasure this knowledge because it is likely to play an important role in the future when these communities have to adapt to climate change.

5.2 Recommendations: adaptation, mitigation and capacity-building at local level

The research has made clear that both the Topnaar and Hai||om communities mistrust their respective traditional authorities, and that presently there is poor communication between the community members and these authorities. The Government should therefore play an active role in developing a strategy to finance mitigation and adaptation to climate change at local level, and should directly involve the communities in strategic planning for climate change. Government could also consider establishing a sustainable development fund for climate change emergencies at local level to support communities such as these. Furthermore, the involvement of NGOs and CBOs is important for fostering awareness of the impacts of climate change, and for mobilising financial and other resources for local communities to adapt to and mitigate climate change.

For the Topnaar, recommendations on the following are discussed in the main report:
1. Establishment of a community association
2. Eco-tourism
3. Diversification of coping strategies

For the Hai||om, recommendations on the following are discussed in the main report:
1. Access to land
2. Overgrazing
3. Proper community consultation on the kinds of support needed

Chapter 1
Introduction

This study examines the impact of climate change on indigenous people and their strategies for adapting to climate change. Such a study is necessary because it has been recognised that more research is needed to better understand the particular challenges and changes that indigenous peoples face in relation to climate change, and to understand the local and traditional knowledge that informs their adaptation strategies.

Case studies in Namibia were undertaken in partnership with Charapa Consultants for the World Bank's Trust Fund for Environmentally and Socially Sustainable Development (TFESSD) study on the *Impacts of Climate Change on Indigenous Peoples and Traditional Knowledge.*

The specific objectives of the case studies are to:

- document how indigenous peoples are affected by climate change through a thorough review of existing data and literature;
- analyse and document in a participatory way how indigenous peoples (a) perceive climate change, (b) adapt to and minimise the adverse impacts of climate change, and (c) leverage opportunities presented by climate change, including through the use of local and traditional knowledge and practices; and
- provide recommendations for strengthening indigenous peoples' engagement and direct participation in the formulation of national and international public policies regarding climate change.

At global level, the case studies will inform policymakers involved in designing climate change adaptation programmes that take into account indigenous peoples' issues. At local level, the case study findings and recommendations will aid indigenous communities and their leaders in formulating plans to minimise the adverse impacts of climate change, to leverage opportunities presented by climate change and to adapt to climate change.

In Namibia, Topnaar and Hai||om communities were selected for the case studies for the overall study on *Impacts of Climate Change on Indigenous Peoples and Traditional Knowledge*.

The Topnaar community lives in small settlements along the Kuiseb River in the Namib Naukluft National Park. This area has been arid or semi-arid for an estimated 80 million years. Over this extensive period the plants and animals have been able to adapt to extremely harsh climatic conditions, as has the Topnaar community for centuries.

The Hai||om are one of the six San groups in Namibia. Two Hai||om settlements were visited for this study: Tsintsabis on the western edge of the Kalahari Basin, and Farm Six located about 50 km north-west of Tsintsabis. These areas were traditional ancestral lands of the Hai||om, but their access to land in these areas became increasingly limited in colonial times, and this trend has continued in post-colonial times.

Chapter 1 of this report conveys the study background and methodology. Chapter 2 provides background on Namibia's indigenous peoples. Chapter 3 focuses on the vulnerability and opportunity context in Namibia, with environment, climate change, governance, socio-economic status and access to land and natural resources considered. Chapters 4 and 5 present the two community case studies, focusing on the Topnaar and Hai||om livelihoods, perceptions of climate change and possible adaptation strategies. Finally, Chapter 6 presents recommendations based on the findings of the two case studies, and lessons learned from these studies.

1.1 Conceptual framework

The overall methodological approach to these case studies entailed:

- collaborative research between indigenous peoples and scientists with the aim of combining the knowledge of these indigenous peoples;
- using scientific knowledge in assessing issues relating to the impacts of climate change on indigenous peoples;
- recommending measures to minimise the impacts of climate change; and
- improving local indigenous peoples' adaptation strategies.

The impacts of climate change (with reference to scale, intensity, predictability, etc.) on indigenous peoples are related to their adaptive capacity and vulnerability. Indigenous peoples' adaptive capacity and vulnerability depend on the nature and types of assets that they possess, including human capital (e.g. skills and knowledge), social capital (e.g. relationships and institutional access), and cultural, political, natural, financial and physical capital. The fieldwork assessed the vulnerability and adaptive capacity of local indigenous communities, including the factors that facilitate or hinder successful adaptation, using the vulnerability concept developed by the Intergovernmental Panel on Climate Change (IPCC)[1] and the framework used for the World Bank study on Indigenous Peoples and Climate Change in Latin America and the Caribbean Region, which was adapted from the UK Department of International Development (DFID) Sustainable Livelihood Framework as a tool to assess the vulnerability of different socio-economic groups and their adaptive capacity.

The following are the elements of the adapted Sustainable Livelihood Framework used for the World Bank study: [2]

- *vulnerability context* – relates to the external environment (trends, shocks, seasonality, climatic variability, etc.);
- *livelihood assets* – refers to human, natural, financial, social, cultural and physical capital;
- *transforming structures and processes* – relates to formal and informal institutions either facilitating or hindering individuals' and communities' adaptive capacity;
- *livelihood strategies* – influenced by the first three elements; and
- *livelihood outcomes*.

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1 See IPCC Third Assessment Report (TAR), 2001, and IPCC Climate Change 2001: *Impacts, Adaptation and Vulnerability, Summary for Policymakers*, WMO. See also the following link for a discussion of IPCC and other concepts of vulnerability: http://www.nickbrooks.org/publications/TynWP38.pdf.

2 See Kronik, Jakob and Dorte Verner, Indigenous Peoples and Climate Change in Latin America and the Caribbean. Washington D.C.: The World Bank, 2010; Figure 1.3, page 9.

Figure 1: **Vulnerability and impacts of climate hazards on indigenous peoples**

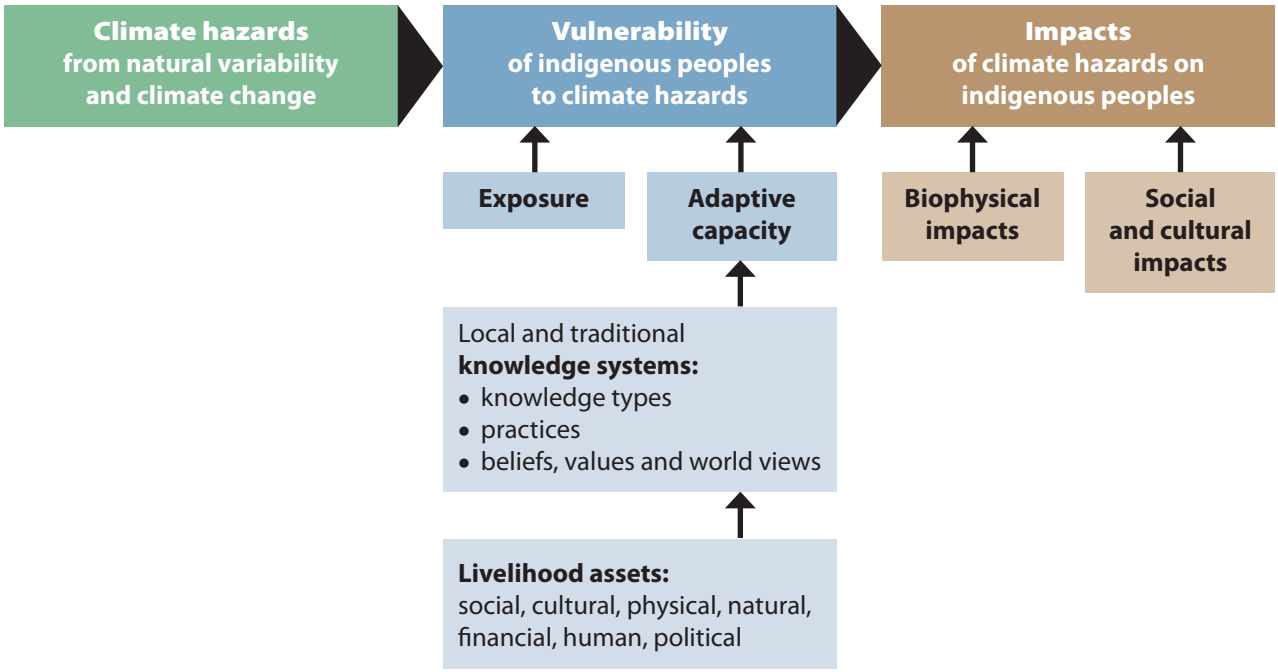


Figure 1 illustrates the causal relationships between climate change and natural variability, and the effects of these on the environment and consequently people's livelihoods and mitigation and adaptation strategies. The case studies focus on the relationship between the impacts of climate change on indigenous people' livelihoods (including the social implications of climate change and variability) and indigenous peoples' knowledge and adaptive strategies. It has to be stressed here already that the adaptive capacity of the two indigenous communities studied are very limited.

Having completed the two case studies, the research team members believe that the methodological framework has to be expanded. This is because, in these Namibian case studies, it proved problematic to separate the impact of climate change from other factors impacting on the lives of indigenous peoples. It is our opinion that climate change and factors such as governance, access to land and socio-economic status are interrelated, and therefore, whether studied separately or in combination, they all impact on indigenous peoples' livelihoods and adaptive strategies.

1.2 Methodology

The research methods used in these case studies were:

- a literature review;
- data collection through a household questionnaire, focus group discussions, semi-structured interviews with experts and other individuals, and participatory methods; and
- data analysis with a focus on identifying cases of indigenous peoples knowledge having resulted in successful management of, or adaptation to, the social implications of climate change.

In addition, the following post-study activities are planned:

- workshops and discussions with other experts and relevant stakeholders (e.g. local, national and international indigenous peoples' organisations) on the preliminary findings of the fieldwork;
- capacity-building activities; and
- dissemination of the case study results.

The literature review focused on acquiring a good understanding of climate change and climate variability occurring in Namibia, as well as a good understanding of the areas in which the two case studies were conducted. The fieldwork entailed identifying and assessing local perceptions and understanding of climate change and its impacts, and analysing adaptation strategies, including the use of traditional knowledge and practices, and the immediate cultural, socio-economic and political environment in which these strategies are undertaken.

The Namibian research team adjusted its approach slightly so as to obtain reliable data. After consultation with Charapa Consult and partners, some changes were made to the methodology manual (see progress reports). We agreed to combine qualitative and quantitative research methods, because a mixed-method approach allows for a clearer understanding of the situation as well as better cross-checking of the findings of the quantitative and qualitative research.

The qualitative data was gathered through various workshops with the two communities. In the first round of community-level fieldwork, the research team focused on the various livelihood strategies and developing a village/area resource map, which included resources in the direct vicinity of the settlement as well as other relevant resources further away. Further, hazards and coping strategies were assessed, and a seasonal calendar of livelihood strategies (and in one case bushfoods) was developed for each of the two communities. In the second round of fieldwork in each community, the hazards related to livelihood strategies were further assessed, several trendlines were produced, social mapping and a wealth ranking were carried out, a transect drive was undertaken and focus group discussions were conducted to assess the importance of institutions, the climate change impacts and the strategies for coping with climate change. These sessions provided much more insight into the impacts of climate change on each community, the role of each community's traditional knowledge in adapting to climate change, and each community's vulnerability to climate change.

The quantitative date was gathered by means of a household questionnaire which two local research assistants completed in interviews with household members. The questionnaire designed by Charapa Consult and partners in Nairobi in January 2012 proved to be too extensive for this study: during the initial meetings with these Namibian communities, participants expressed discomfort with extensive questionnaires. Therefore the Namibian research team developed an abridged questionnaire.

The Topnaar research assistant conducted a household survey in 5 of the ±12 Topnaar settlements (most of which had only 4-6 households) along the Kuiseb River, gathering data on the number of household members, sex, age, livelihood activities and migration patterns. These surveys provided the first insights into Topnaar livelihood activities,

and in this regard the findings in one community (Soutrivier) provided a relatively clear picture of the Topnaar community as a whole. The community of Soutrivier consented to participating in research workshops. This settlement had 9 households with around 46 household members in total, 18 of whom reside in the settlement permanently. The permanent residents are largely dependent on livestock, and some depend also on the seasonal harvesting of *!nara* (*Acanthosicyos horridus* – local name "*!nara*") and the availability of various other natural resources.

The Hai||om research assistant conducted household questionnaire interviews with 11 households (45 individuals) in Tsintsabis and 16 households (76 individuals) on Farm Six.

Lastly, to complete the data collection, several key informant interviews were conducted – with the Topnaar Traditional Authority, the Walvis Bay Municipality's former disaster manager, Desert Hills (a company that buys *!nara* seeds), the manager of Treesleeper (a community campsite) and the farm manager on Farm Six. Several life histories were recorded during interviews with community members.

The questionnaire data was entered into Excel, and the Excel sheets were sent to Charapa for some of the data analysis. Further analysis was done by the Namibian research team, which also compiled detailed workshops reports which were submitted to Chapara in the required formats.

1.2.1 Fieldwork

The Namibian research team visited each community selected for participation in this study to introduce the Legal Assistance Centre (LAC) and explain the purpose of the study and the research meetings.

The first meeting with the Topnaar community took place at the Gobabeb Research and Training Centre in the Namib-Naukluft Park in February 2012. Personnel at the station facilitated the meeting at the nearby settlement of Soutrivier. During this initial-contact session we explained the purpose of the study, obtained the community's free prior consent to their participation in the study, and reached agreement on the organisation of the fieldwork. A local research assistant was contracted to help with field research and to serve as translator in the workshops. He conducted most of the household questionnaire interviews before the first round of fieldwork. A second visit for the first round of fieldwork took place in March. Thereafter, the research assistant conducted questionnaire interviews in other Topnaar settlements. The second round of fieldwork was done in June, whereafter the team returned to the areas twice to conduct key informant interviews and record life histories.

In March the team visited the Hai||om community at Tsintsabis. As with the Topnaar community, this initial-contact session with the Hai||om community entailed explaining the purpose of the study, obtaining the community's free prior consent to their participation and reaching agreement on the organisation of the fieldwork. After this meeting, the local research assistant conducted questionnaire interviews with the community households. The first round of fieldwork was done in April, and the second round towards the end of June.

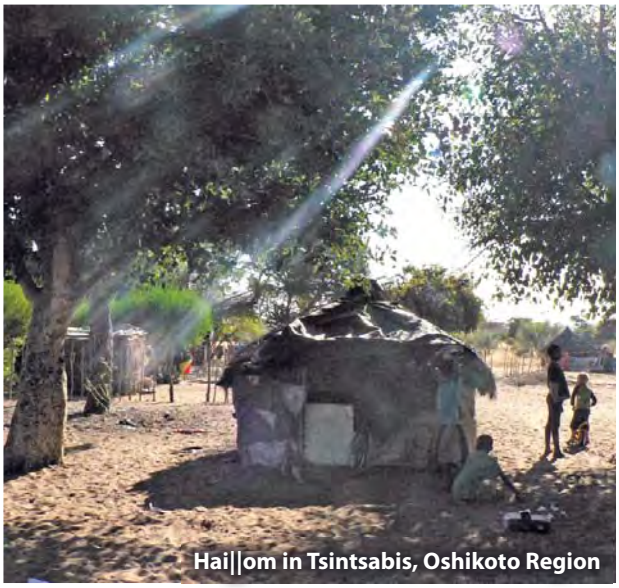
1.2.2 Methodological considerations

As already mentioned, we had to modify the methodology to obtain the most reliable and most valid data possible. It must also be noted that some of the tools were so time-consuming that respondents lost attentiveness. Other challenges we faced were as follows:

CHALLENGES	REMEDIAL MEASURES
People lacked understanding of the concept of 'climate change'.	Asking for adaptation strategies for climate change is difficult if the community does not completely understand 'climate change'. Therefore, we had to merge the scenario outline and the discussion on adaptation strategies. In this way the community understood what the research team meant. We also talked about environmental changes rather than climate change.
Potential interviewees refused the extensive original questionnaire.	We developed a briefer version of the questionnaire.
Separating the climate change factor from other factors (e.g. political and socio-economic) which endanger indigenous peoples' livelihoods. In our case studies, the increasingly limited access to land due to political factors and favouritism within the Traditional Authority system seemed to be perceived as much more threatening to livelihoods than environmental factors. At both sites, the participants depended on government aid to a considerable (though varying) degree. Due to the limitations of access to natural resources, the direct impacts of climate change seem to be minimal in comparison to other hazards.	We focused first on livelihood factors and potential hazards rather than impacts of climate change (see next row).
People were more eager to talk about their current problems (e.g. extreme poverty) than about climate change.	We found a compromise between the schedule and the participants' needs.
The methodology as agreed by Charapa and the partners in the meeting in Nairobi was not feasible for the circumstances and the budget.	We modified the methodology (see document feedback on methodology and progress reports).
Trendlines were too time-consuming and sometimes difficult for the participants to relate to. Furthermore, sometimes it was difficult for them to remember specific events or livelihood activities over the given time line (e.g. 1990-2012).	The research team considered the timelines on livelihood activities and climate change to be the most important, so these two were done in the way suggested in the methodology manual. However, with the Topnaar, the other two timelines were done in a different way: in the discussion on the importance of traditional institutions, we asked whether this has changed over time, and likewise for formal institutions. Also, the team conducted key informant interviews with the relevant institutions to fill possible gaps.
Using different participatory methods for the discussion on the importance of institutions.	During the second round of fieldwork in Gobabeb, the research team noticed that participatory methods worked well, but the Venn diagram was not used. Rather, we drew circles on the board that represented the different institutions and their importance – the larger the circle, the more important the institution.
It was difficult to use qualitative data for quantitative data sheets, for example in copying community responses into individual rows. The trendlines, for example, were discussed at community level whereas the sheets ask for individual responses (the same applies for wellbeing ranking).	In accordance with Charapa's requirements, the team provided the household *and* community data for every individual.

Chapter 2
Indigenous Peoples of the Sub-Region


Topnaar in the Namib Desert, Erongo Region


Hai||om in Tsintsabis, Oshikoto Region

The category of "indigenous peoples" is not specifically defined by either the UNDRIP or ILO Convention 169 on Indigenous and Tribal Peoples – the two main international documents specifically addressing indigenous peoples. However, these documents and others do outline certain characteristics, including: self-identification; descent from original inhabitants of the territory; close relationship with the land and land-use strategies that differ from those of the majority; cultural distinctiveness; and an experience of marginalisation within the state.

Being aware of concern about the term "indigenous peoples", the ILO and the African Commission on Human and Peoples' Rights included the following as a criterion for 'indigenousness': "self-identification as being indigenous by those groups of people that are in structurally-subordinate position to the (politically and socio-economically) dominant groups and the state, leading to their marginalisation and discrimination. 'Indigenous' is a term through which these groups, among the variety of ethnic groups within a state, identify themselves as experiencing particular forms of systematic discrimination, subordination and marginalisation of their culture and way of life and mode of production." In the context of Namibia, the San, the Himba and the Nama have generally been regarded as meeting these criteria, and thus as being "indigenous peoples" (Hays and Dieckmann, forthcoming).

2.1 History, culture and ethnicity, institutions, social organisation and demographics

The San (Bushmen) who number 32 000-38 000 in Namibia, are indigenous to this country. There are six different San groups in Namibia, with different languages, distinct customs, traditions and histories. San are spread throughout many parts of the country, especially the central and northern parts. The San groups include: the Khwe, most of whom live in Caprivi Region; the !Xun, who live in Kavango, Otjozondjupa, Ohangwena and Oshikoto Regions; the Hai||om in the Etosha area of north-central Namibia; and the Ju|'hoansi who live mainly in Tsumkwe District East in Otjozondjupa Region. Over 80% of the San have been dispossessed of their ancestral lands and resources, and today they are among the poorest and most marginalised peoples in the country. The extent of San marginalisation is clearly evident in the United Nations Development Programme's socio-economic indicators of human development, where the situation of the San is consistently worse than that of other groups in Namibia (UNDP 2007).

Another group usually recognised as indigenous to Namibia is the Himba, who number some 25 000 and who reside mainly in the semi-arid north-west (Kunene Region). Another indigenous group is the Nama, a Khoe-speaking group who number some 70 000. The Nama include the Topnaar of the Kuiseb River valley and the Walvis Bay area in west-central Namibia, a group of some 1 800 people. Taken together, the indigenous peoples of Namibia constitute some 8% of the country's total population.

2.2 Livelihood and traditional knowledge

The indigenous groups in Namibia live on privately owned commercial land and in urban areas, as well as on communal land. The livelihoods in commercial and communal areas differ significantly. The majority of San living on commercial land have no right to any land and have to make a living as farm labourers, domestic workers or urban squatters, whereas San, Himba and Nama living on communal land have access (albeit limited) to land and its resources. On communal land, rural communities have the option to establish conservancies and community forests. In Namibia, conservancies are locally planned and managed multipurpose areas on communal land, in which the land users have pooled their resources for wildlife conservation, tourism and wildlife utilisation. Conservancy members are granted wildlife resource rights under Namibia's Nature Conservation Amendment Act of 1996. There are at least 15 conservancies in Kunene Region in north-western Namibia, where the Himba live. Nama communities in the south of Namibia are involved in the management of at least six conservancies. In Otjozondjupa Region there are currently two San majority conservancies: N‡a Jaqna Conservancy in Tsumkwe District West and Nyae Nyae Conservancy in Tsumkwe District East. In the Bwabwata National Park in Caprivi, the Khwe San are involved in the Kyaramacan Association which has special privileges with regard to the natural resource management of the park. The conservancies and the Kyaramacan Association generate some income through tourism, hunting concessions (in Nyae Nyae), and

filming and recording fees, a substantial portion of which is divided among all conservancy members and distributed annually. Some individuals are employed by the conservancies, but employment opportunities are generally scarce and attempts at providing sustainable livelihoods have proved difficult to maintain. Some food is still obtained by traditional subsistence methods. However, the San living in the two conservancies in Otjozondjupa Region and the Bwabwata National Park are fortunate in comparison to most other San in Namibia in that they have access to land, are managing the natural resources on the land and are able to practice, to varying degrees, their traditional lifestyles (Dieckmann 2012a). Most of the Topnaar live in the Namib-Naukluft National Park. They reside in more than a dozen small settlements and depend on small-scale livestock production, use of *!nara* melons (*Acanthosicyos horrida*), and tourism. Some of them live in the nearby town of Walvis Bay.

On commercial land, in 2010, the Namibian Government continued with its land reform programme aimed at giving the historically disadvantaged majority access to some of the commercial land. Prior to 2012, under the Government's San Development Programme, six farms were bought for resettlement of the Hai||om San on the southern border of the Etosha National Park (the ancestral land of the Hai||om) and one farm in Otjozondjupa region was bought for resettling other San groups. However, as on other resettlement farms in Namibia, the establishment of sustainable livelihoods independent from government food aid and massive external support is difficult if not impossible at the moment. Furthermore, many San are working as farm workers on commercial farms. San farm workers are often the last to be employed and the first to be dismissed in times of economic uncertainty. Land reform initiatives have not provided adequate coverage for farm workers, some of whom have been expelled from farms on which they had worked for many years, due to the introduction of the labour law and the minimum wages (ibid.). San workers' knowledge of labour laws remains poor, and farm workers have often reported problems with accessing information due to their isolation. A low level of literacy among the San is an additional barrier to their knowledge of labour laws.

2.3 Non-climatic drivers of change

The indigenous groups currently facing the most challenges are the San groups, especially in respect of access to resources and opportunities to secure basic livelihoods. One of the primary factors creating dependency and marginalisation among the San of Namibia is their widespread loss of land and lack of access to natural resources, especially during the past century of colonial rule. Under the apartheid administration of South West Africa, while most other ethnic groups in the country were granted "homelands" (inadequate as they were), most San found their land subsumed into commercial farming areas, the "homelands" of other ethnic groups, game reserves or national parks. As their options diminished, San in many areas became progressively more dependent on others for their survival – primarily white farmers, military employment and salaries, and later the patronage of communal area farmers.

For San communities residing on commercial farms, the problem of landlessness has worsened since Namibia became an independent state in 1990. At the turn of the century, the vast majority of San (about 90%) lived either in commercial farming areas or in communal areas in which they form small minority populations (Suzman 2001). However, new labour

laws led to a massive reduction of the number of workers on commercial ranches, and over the past decade, several thousand San farm workers and their families have lost their residency rights and are trying to make a living in nearby townships with piecemeal work and pension money. One of the driving forces for San loss of land historically and today is the perception that they "do not use the land" because they do not practise intensive patoralism or agriculture – their low-impact subsistence strategies make the land appear available for grazing or other intensive use. This perception makes them vulnerable to invasion (where they occupy land) and exploitation by black cattle owners who regard them as inferior people and cheap labour. The protection and expansion of land rights, and achieving land security in general, is thus a high priority in efforts to ensure human rights for Namibia's indigenous peoples.

Without access to land, livelihood options depend on access to wage employment. However, low educational levels, stigmatisation by other groups, residence in "remote" areas, and a variety of other factors combine to create conditions of high unemployment. The vast majority of those who are employed are working as farm workers, for very little pay (or in some cases only for food and/or alcohol rations) or in menial labour positions. Some are able to earn a little money gathering high-value plants such as devil's claw, and some are employed by NGOs and conservancies, or by national parks as trackers and resource monitors, but these positions are limited. For most San, access to cash is a major challenge. In many areas, San still rely on bushfood (or 'veld food') for a part of their subsistence; however, opportunities to obtain these resources are very restricted everywhere (except within the Nyae Nyae Conservancy). Thus the San overall have very limited livelihood options, and throughout Namibia they rely heavily on government food aid and old-age pensions for their survival (Hays and Dieckmann, forthcoming; see more in section 3.5).

Another concern for indigenous peoples in Namibia, specifically the Himba in Kunene Region, is the plan of the Governments of Angola and Namibia to build the N$7 billion Baynes Dam on part of the Himba ancestral land. A previous effort to build a dam and a power station in the same area – known as the "Epupa Dam Project" – was shelved in the 1990s, and the plan for the Baynes Dam was announced in 2010. The Himba are concerned that the influx of outsiders will cause them to abandon their tradition and culture. The potential removal or destruction of ancestral graves located along the Kunene River is another major concern for the Himba.

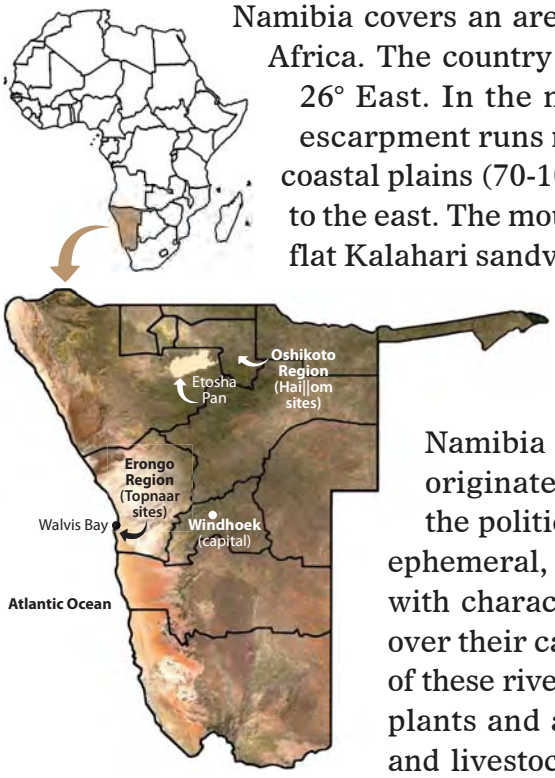
Topnaar habitat

Hai||om habitat

Chapter 3
The Vulnerability and Opportunity Context in Namibia

3.1 Environment, climate hazards and impacts

This section provides broad geographical and climate information for the Republic of Namibia. It includes existing climate data and information about climate changes predicted for southern Africa by the IPCC (2007; 2007(a)). This section also presents recent models run specifically for Namibia (in Turpie et al. 2010) which convey the general climate change predictions for the country as a whole, and these are followed by predictions for the specific case study areas under review. Most of the geographical information presented below is drawn from Turpie et al. (2010).



Namibia covers an area of 823 680 km² on the Atlantic coast of southern Africa. The country is located between 17° and 29° South and 11° and 26° East. In the north, south-central and southern areas, a steep escarpment runs north-south and divides the country into low-lying coastal plains (70-100 km wide) to the west and a higher inland plateau to the east. The mountainous plateau gives way in the east and north to flat Kalahari sandveld, sloping gently to the east and south, and blown into dunes in some areas. Large isolated rocky outcrops (Inselbergs) lie scattered throughout the central and western areas.

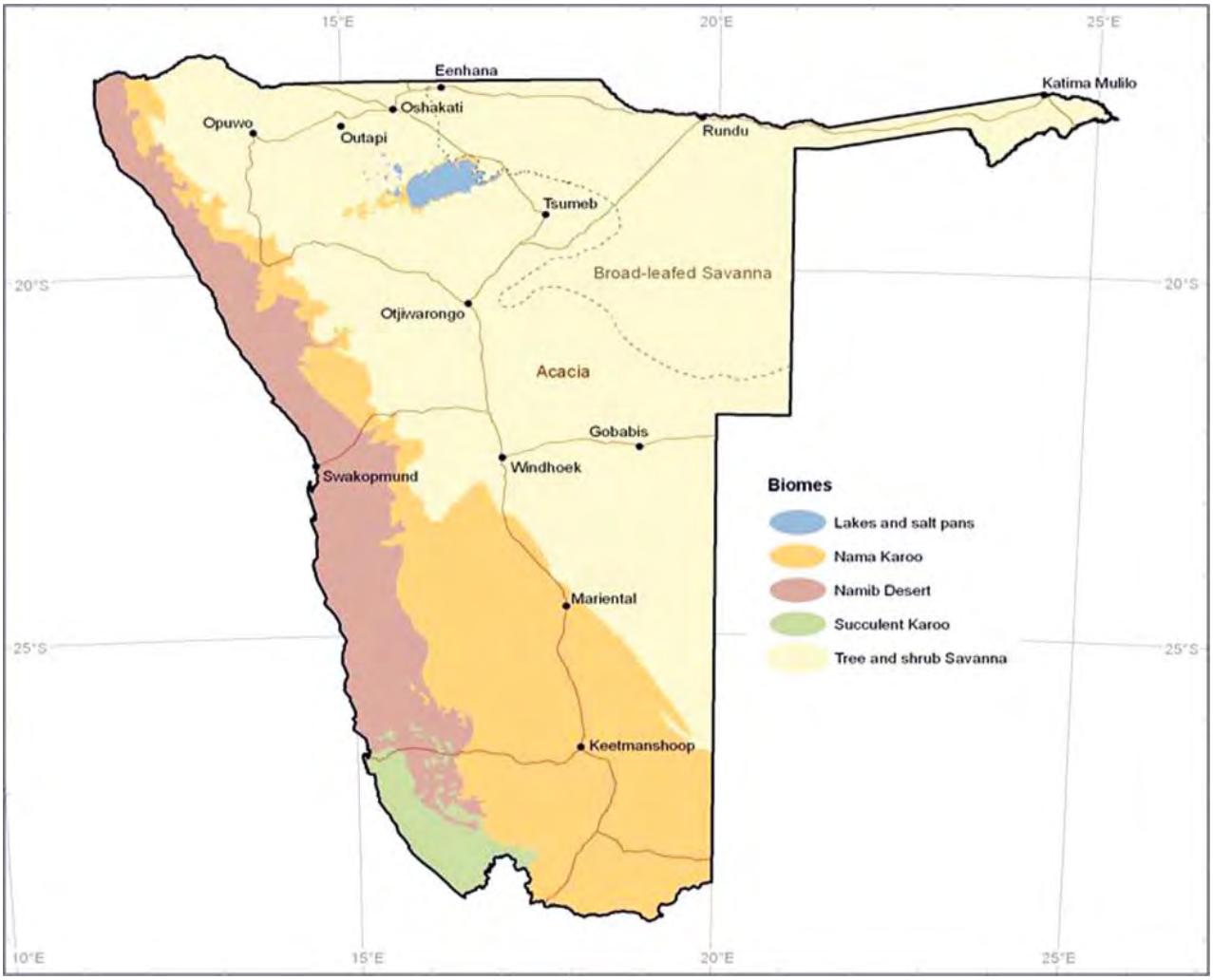
Namibia has only four perennial river systems, all of which originate in neighbouring countries and lie close to or on the political borders. All other rivers within the country are ephemeral, and dry for most of the year, flowing only briefly with characteristic 'flash floods' when enough rain has fallen over their catchment areas. The vegetation that lines the banks of these rivers supply important wood and bushfood (wild edible plants and animals) for communities and fodder for wildlife and livestock in the arid areas of Namibia. Large numbers of

rural households depend on these resources for their survival, particularly during times of drought (Jacobson et al. 1995).

Due to low availability of surface water, the water stored beneath ephemeral river courses or in underground aquifers (dependent on annual rainfall for recharge) provides essential water for rural and urban communities (ibid.).

Namibia is characterised by five major biomes (see Figure 2), four of which are desert systems: firstly, the Namib (characterised by a vast coastal dune area to the south of the Kuiseb River and stony gravel plains) which runs along the entire west coast from the port town of Lüderitz into southern Angola; secondly, the Succulent Karoo (characterised by a high number of endemic floral assemblages) which lies south of Lüderitz and extends across the Orange River into South Africa; thirdly, the Nama Karoo (which also supports a high degree of endemism) which occurs immediately to the east of the previous two desert systems and covers most of the southern third of Namibia, tapering to a narrow belt from central Namibia northwards; and lastly, the Southern Kalahari (characterised by arid shrub savannah in the west and sub-humid tree savannah in the east) which extends eastwards towards Botswana.

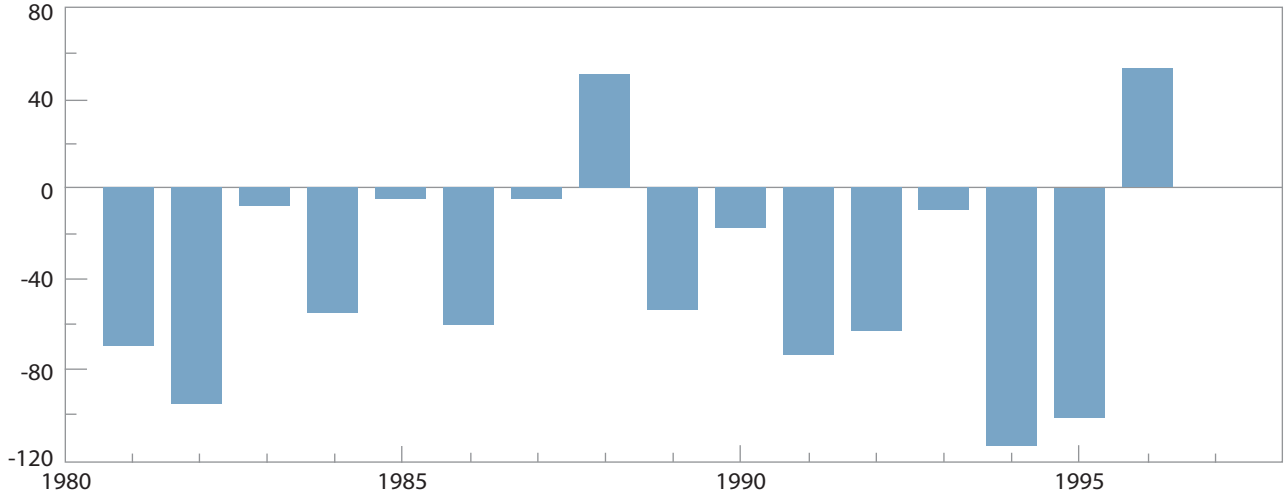
Figure 2: Main biomes of Namibia



Source: **Mendelsohn et al. 2002**

Namibia is the most arid country in Africa south of the Sahara. Rainfall ranges from about 600 mm in the extreme north-east (in an area of <6% of the country) to less than 50 mm in the extreme south and along the entire coast (Mendelsohn et al. 2002). Central- to north-western Namibia experiences one of the steepest rainfall gradients anywhere in the world, ranging from about 400 mm to less than 50 mm over a distance of just 230 km. Rainfall is highly variable and unpredictable, with an inter-annual coefficient of variation that ranges from about 30% in the north-east to over 100% in the driest areas.

Figure 3: Deviation from average rainfall (mm) in Namibia 1981-1997



Source: **P. Hutchinson, unpublished data in P. Tarr 1999**

The north and south of the country experience the highest temperatures with the average 1999 maximum for the hottest month being over 34°.

For most of Namibia, rain falls in the summer months of November to March, but the Succulent Karroo in the south-west receives a significant amount of its meagre rainfall in the winter months of June to August.

About 22% of Namibia's land is classified as hyper-arid desert, 70% is classified as arid to semi-arid savannah, and the remaining 8% (in the north-east) is classed as dry sub-humid savannah (Mendelsohn et al. 2002).

High temperatures and low humidity over most of the country for most of the year result in high rates of evaporation.

The climate of the coastal belt to the escarpment differs from the rest of Namibia and is influenced mainly by the cold Benguela Current. Temperatures here are generally moderate, fog is frequent (about 125 days per year at the coast, dropping to about 40 days per year 80 km inland) and wind is a dominant feature.

Namibia's climate has been arid for millions of years. As a result, the soils are generally poor, and many plants and animals display a high degree of adaptation to dry conditions. The Kalahari sands in particular are extremely low in nutrients. The combination of poor soils and low rainfall means that primary agricultural production is low throughout the country, and highly dependent on annual rainfall. This is reflected in both rain-fed crop production, which is limited to the northern and eastern parts of the country where output

is marginal to low, and livestock production, which ranges from marginal in the south and west to moderate in the north and east.

High rainfall variability leads to a corresponding variability in runoff, soil moisture and stream flow (DWA 1991). Due to the high inland temperatures, vegetation suffers high levels of evapotranspiration. The rate of groundwater recharge is very low (<1%) and the arid areas (more than half of the country contribute very little to the replenishment of vital groundwater supplies (ibid.).

Namibia ratified the UNFCCC in 1995 and acceded to the Kyoto Protocol in 2003. As a developing country party to the UNFCCC, Namibia is not required to reduce its emissions, but can trade carbon credits under the Clean Development Mechanism (CDM) of the Kyoto Protocol. The trading in carbon credits may result in significant investment in Namibia by companies that wish to make use of opportunities such as agro-forestry or energy production. Namibia's Second National Communication to the UNFCC and National Policy on Climate Change was completed in 2011 (GRN 2011 and 2011(a)).

3.2 Scale, intensity and predictability of identified key climate phenomena

The IPCC Fourth Assessment Report[3] published in 2007 confirmed that global climate change is already happening. This report found that communities who live on marginal lands and whose livelihoods depend directly on natural resources are the most vulnerable to the impacts of climate change. The IPCC identifies the southern African region (particularly the inland area around the Kalahari Desert) as one that will experience some of the highest temperature rises, and, as a result, some of the most extreme impacts of global warming. Available trends for southern Africa and Namibia are provided below.

The IPCC (2007) report states that between 1961 and 2000, there was an increase in the number of warm spells over southern Africa, and a decrease in the number of extremely cold days. Data from 1950 to 1997 (Figure 4) show that mean temperatures for Windhoek displayed an average increase of 0.023°C per annum over that period (Tarr 1999).

The 1980s and 1990s were the hottest decades of the 20th century, and together with global trends, several records were broken in Namibia for maximum temperatures in the summer of 1997/98. Warbuton and Schultz (2005) report that numerous new record temperature highs and lows were recorded over South Africa in 2003, 2004 and 2005.

Midgley et al. (2005) examined temperature records from all available long-term weather stations in Namibia and the bordering Northern Cape Province in South Africa. Roughly half of the stations showed significant increases in temperature over their recording period, and none showed a significant decline. The mean decadal increase across all stations during this interval was 0.2°C (s.d.=0.1°C) – an increase that is roughly three times the global mean temperature increase reported for the 20th century.

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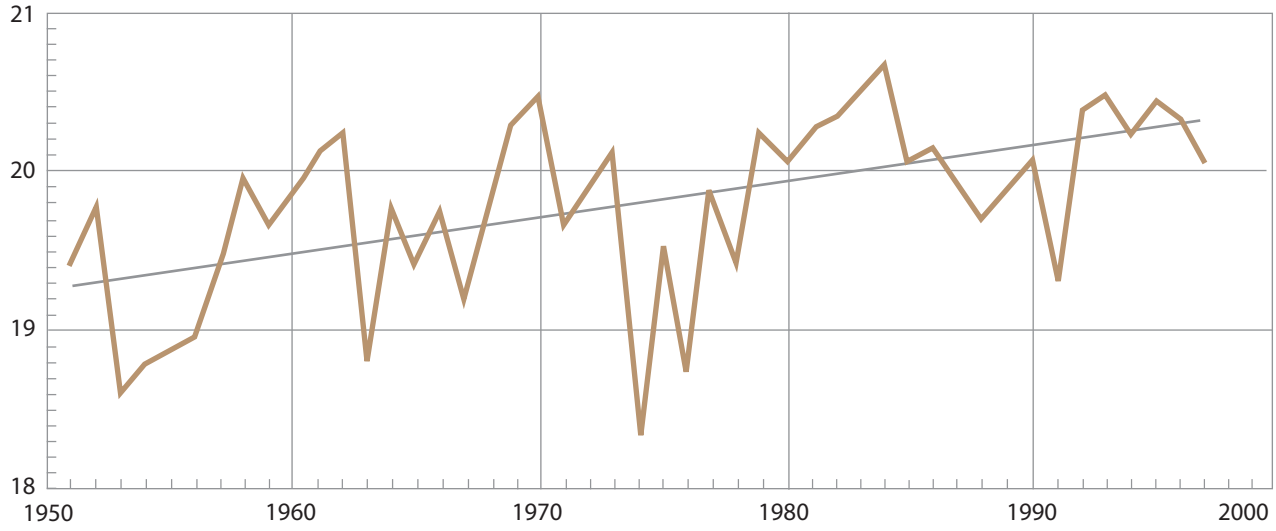
[3] All climate and sea-level change data in the IPCC Fourth Assessment Report of Working Group One represent an average prediction of climate models for the A1B emissions scenario projected to the period 2080-2099.

Figure 4: Windhoek mean temperatures (°C) 1950-1997



Source: **Nambia Meteorological Services, unpublished data**

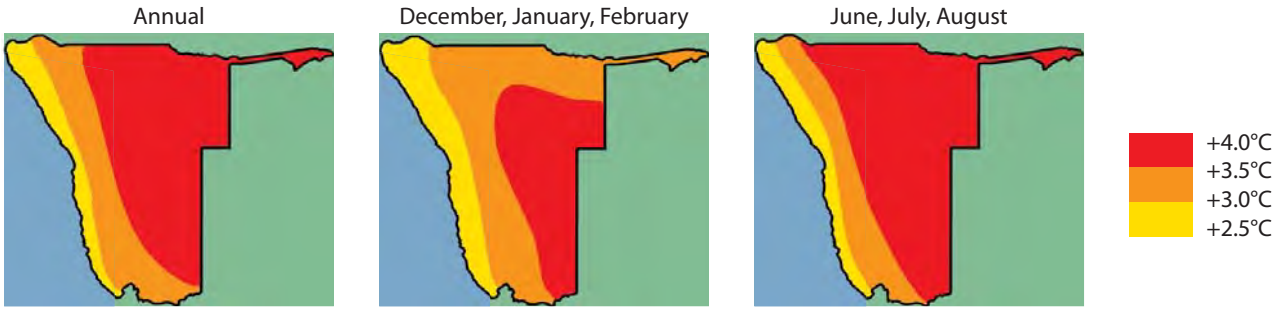
The IPCC (2007(a)) also reports increased inter-annual variability in rainfall across southern Africa since 1970, with higher rainfall anomalies and more intense and widespread droughts. Central Namibia falls directly within the 'drought corridor' – the area between 20° S and 25° S that experiences high dry-spell frequencies linked to El Niño events. These phenomena have become more frequent and intense since the 1970s (Usman and Reason 2004). Lower flow regimes in major river basins in Namibia and the southern parts of Zambia are also linked to the more frequent occurrence of El Niños (Alemaw and Chaoka 2006). Furthermore, Midgley et al. (2005) state that water balance, a composite measure of temperature and rainfall that determines the water available to plants, has shown a significant decline at five of the fifteen weather stations investigated in Namibia and the Northern Cape. No stations showed a significant increase in water balance over this period. These authors also report that a sign of climate change is indicated by the response of populations of *Aloe dichotoma* to apparent trends in recent climate. These responses indicate warming and drying trends in the southern parts of Namibia over the past 15-30 years.

Besides the changes in temperature and rainfall, a sea-level rise (SLR) was noticed. Tide gauge records taken from Namibia (Lüderitz) and the west coast of South Africa (Port Nolloth and Simon's Bay) between 1960 and 1992 display increasing sea levels. The average rate of rise was 27 mm per decade (Hughes et al. 1992). The IPCC's (2007(a)) predictions for global SLR (a best-estimate rise of less than 2 mm per year) were lower than the actual rise (3.3 mm per year) between 1993 and 2006 (Rahmstorf et al. 2007).

As the above has already taken place, it can be assumed that more changes will occur. It is predicted with a high degree of certainty that Namibia (and the rest of southern Africa) will continue to experience an increase in temperature in forthcoming decades (IPCC 2007). Changes in precipitation remain harder to predict than temperature (ibid). Namibia's naturally high climatic variability compounds this uncertainty, and for this reason, Turpie et al. (2010) considered a range of outcomes by running 21 different models (based on the AR4 and A1B emission scenarios) which present a variety of high, median and low climate change estimates for the years 2050 to 2100.

In summary, their research suggests that maximum temperature increases (2-6°C) will occur in Namibia by the 2050s. Due to the influence of the cold Benguela Current, warming in Namibia is likely to be considerably less near to the coast than along the escarpment and inland regions of the country (Figure 5). Oshikoto Region falls within an area where extreme increases in annual temperature are expected (possibly in excess of 4°C).

Figure 5: Predicted changes in temperature for Namibia (AR4 and A1B emission scenarios)



Temperature changes over Namibia from the MMD-A1B simulation. Annual mean for December, January and February, and June-July-August temperature change from 1980 to 1999 and from 2080 to 2099, averaged over 21 models.

Source: **Turpie et al. 2010**

The 21 models run by Turpie et al. (2010), and the median of these, concur with the IPCC predictions which indicate major decreases in precipitation across the southern African sub-continent. By 2080 the northern regions of Namibia (including Oshikoto Region where the Hai||om reside) are expected to experience a 10% decline in rainfall while the central regions (including the inland Erongo Region) could experience a 20% decline. These figures are predicted to worsen to 20% and 30% respectively by 2080.

Increasing temperatures will be accompanied by increasing rates of evapotranspiration at all localities, with maximum increases in the interior and over the Kalahari Desert (IPCC 2007).

Turpie et al. (2010) estimate that for every degree of temperature rise in Namibia, potential evaporation (already extremely high) will increases by 5%. Thus, soil moisture levels are projected to decline dramatically with the cumulative impacts of higher temperature, lower rainfall, lower humidity and higher rates of evaporation. This will have severe implications for plant growth and carrying capacity of rangelands throughout Namibia (although the CO_2 fertilisation effect may counter this in some areas – exacerbating the problems linked to some weed and alien invasive plant growth).

The IPCC (2007(a)) and Turpie et al. (2010) predict that rainfall variability is likely to increase over southern Africa, and extreme events such as droughts and floods are likely to become more frequent and more intense.

There are currently no credible projections of changes to Namibia's coastal fog regime, which is known to be vital for most endemic and many other plant and animal species that thrive outside the westward flowing ephemeral river systems (e.g. the Kuiseb River which sustains the Topnaar community) in the coastal Namib Desert.

Coastal areas are likely to see increased incidents of flooding and inundation, affecting low-lying areas (IPCC 2007(a)). Saltwater intrusion into underground aquifers is also

predicted, which could influence the survival of certain desert plants (e.g. the *!nara* plant – an important seasonal staple of the Topnaar living in the Kuiseb River valley).

3.3 Governance: legislation, policies, institutions, recognition of indigenous peoples' rights, political participation and conflicts

Namibia, a post-colonial African state, celebrated its liberation from South African apartheid rule 22 years ago, on 31 March 1990. It is still in the process of redressing past historical and legal inequalities that were premised on racial discrimination. At Independence, the Namibian Government established itself as a sovereign, secular, democratic and unitary state founded upon the principles of democracy, the rule of law and justice for all. It ratified most regional and international human rights instruments. It continues to position itself politically, and possibly legislatively, as a government accommodating its indigenous communities in line with international expectations.

The Constitution of Namibia provides for the devolution of limited powers and an advisory role to the country's Traditional Authorities. However, there is no specific recognition of the rights of indigenous peoples or minorities in the Constitution.

3.3.1 Recognition of indigenous peoples' rights in Namibia

The rights of indigenous peoples are most explicitly and most extensively laid out in two documents. Namibia signed the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) in 2007, after initially spearheading the "Africa Group" opposing it in 2006. Following a year of negotiations and consultations, Namibia and the rest of the Africa Group signed the UNDRIP in 2007. The UNDRIP is technically not binding, however the standards it contains are based on existing human rights, or on declarations about existing human rights which have been formulated in the context of indigenous peoples and have been signed by Namibia. The Special Rapporteur on Indigenous Peoples conducts country visits in response to reports of violations, and at a country's invitation (Hays and Dieckmann, forthcoming). The Special Rapporteur undertook an official visit to Namibia in October 2012. Namibia has not yet ratified the only binding international document dealing specifically with indigenous peoples' rights, i.e. International Labour Organisation (ILO) Convention 169. However, the ILO is working closely with the Office of the Prime Minister's San Development Programme to promote the signing of the document and the rights of San peoples in Namibia.

Initially, the ILO certainly hoped that Namibia would be one of the first countries to sign ILO Convention 169. The ILO progress report for 2011 states: "The Government of Namibia has initially showed willingness for the development of a regulatory framework and has requested to develop this legal framework according to ILO Convention No. 169, but has now proposed to reprioritise without discarding entirely the policy framework. An additional assessment of Government interventions and impact upon San communities

was requested to be done before entering into the policy framework." (ILO 2012a). In its work plan for 2012, the ILO still mentions, "support OPM in the development of a regulatory framework/white paper on indigenous peoples (indicators: 1 policy roadmap will be drafted in consultation with stakeholders and [led] by the Office of the Prime Minister)" (ILO 2012b).

Namibian legislation includes a number of interconnected Acts that provide opportunities to implement indigenous rights as outlined in the international declarations – in particular in the areas of land, leadership, natural resource management and education. Traditional leadership in Namibia is closely connected with land and resource rights. Government structures responsible for overseeing the enforcement of various Acts related to traditional leadership, land and resource rights are spread across several ministries. There are also various responsible leadership positions and boards, and a number of different supporting organisations (Hays and Dieckmann, forthcoming).

The Communal Land Reform Act (2002) provides for the allocation of rights in respect of communal land, the establishment of Communal Land Boards, and powers of Chiefs and Traditional Authorities (TAs) in relation to communal land (including limits on the amount of land that a chief is allowed to allocate). The Act also makes provision for incidental matters (see section 3.3.2 below). Communal Land Boards resort under the Ministry of Lands and Resettlement (MLR). Anyone who "uses or occupies" communal land needs authorisation under the Act. In practice this has been applied to "changes" in occupation/use, whereas traditional grazing and traditional gathering have not required authorisation. In conjunction with the legislation cited in the next paragraph, this Act provides an avenue for indigenous communities to gain control of traditional lands – although in practice there are barriers to implementation in this regard (see section 6).

Namibian policy also provides options for indigenous peoples' enjoyment of land rights by way of these peoples' innovative approach of integrating conservation and development, known as community-based natural resource management (CBNRM). An integral part of Namibia's CBNRM programme is conservancies, these being areas of communal land in which conservancy members are granted wildlife resource rights under Namibia's Nature Conservation Amendment Act of 1996. With wildlife as a main focus, conservancies provide management units that cover geographically defined areas, and these organisational systems can be extended to encompass other resources including water points and woodlands/forests, and to address social and economic issues. Overall, there are 76 registered conservancies in the country. There are at least 15 conservancies in Kunene Region in north-western Namibia where the Himba live. Nama communities in the south of Namibia are involved in the management of at least six conservancies. In Otjozondjupa Region there are currently two majority San conservancies: N‡a Jaqna Conservancy in Tsumkwe District West and Nyae Nyae Conservancy in Tsumkwe District East. Both of these conservancies face a number of problems, including illegal occupation of their land by other ethnic groups. Although it is not a conservancy, some resource rights are available to San in the Bwabwata National Park in Caprivi, where the Khwe involved in the Kyaramacan Association enjoy special privileges with regard to the management of the park's natural resources.

The MLR is responsible for facilitating the resettlement of destitute and landless people of Namibia, and in so doing, redressing past imbalances in the distribution of land and natural resources. The National Resettlement Policy of 2001 outlines the aims and objectives

of resettlement, and addresses the main target groups, the settler selection process, the settlers' occupational rights, resettlement areas, types of resettlement, and support from the Government and NGOs. This includes, first and foremost, purchasing and allocating land. However, it is also stated that the MLR must provide settlers with necessary initial support such as infrastructure (e.g. shelter and water) to enable them to start making a living and to meet their basic needs, and to enable them to continue on their own after the withdrawal of such support. The resettlement policy defines the potential recipients of land somewhat ambiguously, in that virtually all rural and/or poor people in Namibia fit the definition. The MLR therefore prioritised beneficiaries, specifying the main target groups as: members of the San community; ex-soldiers; displaced, destitute and landless Namibians; and people with disabilities. Today San are living on various resettlement farms. With this resettlement policy, the Government is making an effort to address the land issues identified in both the UN Universal Periodic Review (UPR) and the Convention on the Elimination of All Forms of Racial Discrimination (CERD). However, in a 2010 Government of Namibia report it is noted that after 19 years the objectives of resettlement have not yet been achieved.

In addition to access to land, Namibia's education policy provides options for indigenous peoples to access education. The Ministry of Education's National Policy Options for Educationally Marginalized Children (2000) identifies the San, the Ovahimba and the children of farm workers (a great many of whom are San) as the three major "educationally marginalized" groups in the country. According to this document, in addition to an overall lack of schooling that recognises and validates their language, culture and background, these minority groups experience barriers to formal education stemming from poverty, low socio-economic status, stigma surrounding their culture, and "remoteness." The policy document strongly emphasises the need for flexibility in several places, noting that "it is necessary to use a number of unconventional approaches in order to achieve education for all educationally marginalized children" (MBESC 2000). In practice, however, San children have no option but to attend government schools, which in many instances are far from their homes, and which do not accommodate the San language and culture, nor other specific needs of the San. This group has by far the lowest educational levels of any group in the country (MEC 2009; Davids 2011; Hays 2011).

3.3.2 Recognition of traditional authorities in Namibia

With regard to traditional leaders, the Traditional Authorities Act 25 of 2000 (under the ambit of the Ministry of Regional and Local Government, Rural Development and Housing) establishes the legal framework for the recognition of traditional leaders, or "Traditional Authorities" (TAs) as they are officially known in Nambia. The Act allows for a community to designate one person as their TA, in accordance with customary law, and this person then has to be approved by the Minister responsible for Regional and Local Government. The traditional community resorting under a TA is understood to be an entity sharing a common language, culture and heritage. To be a part of such a community, one has to (a) identify oneself as such and (b) be accepted as such by the rest of the community. The main functions of TAs are to: co-operate with and assist the Government; supervise and ensure the observance of the customary law; provide support, advice and information; and promote the welfare and peace of rural communities. There are currently about 49

recognised TAs in Namibia, with more applications for recognition to be considered by the Council of Traditional Leaders. A TA can make decisions about civil cases according to customary law, as long as all decisions accord with the Constitution of Namibia. The Act thus allows for indigenous communities (and others) to choose their own leader.

However, appropriate training for the TAs, and monitoring of their performance and accountability, are virtually non-existent, and the Government is not providing any support to them to fulfil their duties with some degree of competency. It is an important fact that TAs receive monthly remuneration as well as a car and other provisions from the Government. The monthly remuneration is far higher than the average monthly income of San.

Government institutions such as ministries and the Office of the Prime Minister (OPM) mainly negotiate with the TAs (this is true for both the San and the Topnaar communities), ignoring issues regarding the legitimacy of the TAs and the existence of other community-based organisations. Benefits for the communities, such as land, job opportunities (e.g. those provided by the OPM Division of San Development) are channelled through the TAs – a system which is prone to abuse. Still, the Government claims that this approach ensures the participation of San communities in development, and ensures proper consultation of the San communities. In fact, however, San TAs run the risk of becoming government agents instead of being real community representatives. The system, as it operates at the moment, has some similarities with the colonial strategy of divide-and-rule.

3.3.3 National climate change policies and consultation

As mentioned above in section 3.1, Namibia ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1995, and hence became legally obliged to adopt and implement policies and measures designed to mitigate the effects of climate change and to adapt to such change. Parties to the UNFCCC are obliged to make periodic submissions including Initial National Communications to Conferences of the Parties (COPs). Namibia established a Namibia Climate Change Committee (NCCC) in 2001, the main functions of which are to advise and make recommendations to the Government on climate change and how the Government can meet its obligations to the UNFCCC. The Ministry of Environment and Tourism (MET), through its Directorate of Environmental Affairs (DEA), hosts the NCCC and is responsible for overseeing the coordination of climate change issues in Namibia. The NCCC members are representatives of various government ministries, NGOs, parastatals and the private sector. Namibia's Initial National Communication to the Conference of Parties of the UNFCCC was submitted in 2002 in accordance with decisions taken at various COPs (Ruppel and Ruppel-Schlichting, 2011: 290). The *Namibia Second National Communication to the UNFCCC* was officially launched in November 2011. In addition to the NCCC, Namibia has the following instruments in place to meet its obligations under the UNFCCC:

- Legislation and policies related to global challenges and environmental management and protection, such as Article 95(l) of the Namibian Constitution, the Environmental Management Act 7 of 2007, Vision 2030, National Development Plan 4, and various policies and Cabinet directives. Of special significance in this regard is the National Policy on Climate Change for Namibia (NPCC), which focuses mainly on adaptation, coping strategies and disaster management.

- Reports on the greenhouse gas inventory based on 1994 and 2000 data were completed in 1998 and 2009 respectively.
- An assessment of capacity needs required to implement Article 6 of the UNFCCC was completed in 2005. Article 6 requires parties to develop and implement educational and public awareness programmes on climate change and its effects.
- A Directorate of Disaster Risk Management is operational in the Office of the Prime Minster.
- A National Drought Policy was developed in 1997.
- A Technology Needs Assessment was conducted in 2005 to identify financial and research needs.

But, despite a relatively broad climate change implementation framework, the assessment of capacity needs to implement Article 6 of the UNFCCC concluded that ordinary people, particularly in the rural areas, have little knowledge about climate change, global warming and their effects (*The Namibian*, 4 April 2005). In addition, a factor that could hamper the implementation of the national climate change policy is the lack of capacity within the DEA to effectively run environmental valuation programmes informing climate change policies and decision-making (LAC 2009: 31).

Various community-level activities have been initiated for communities to adapt to climate change by means of improving traditional crop cultivation and livestock farming to enhance the adaptive capacity of farmers, pastoralists and natural resource managers mainly in the central northern regions of the country (Ruppel and Ruppel-Schlichting, 2011: 307). According to National Development Plan 3 for 2007-2012, an Early Warning System was planned in Omusati Region. However, no information is available yet on the outcome of this plan. It appears that no specific arrangement and activities are in place to address the impacts of climate change on indigenous peoples other than the Directorate of Disaster Risk Management in the Office of the Prime Minister which coordinates the distribution of drought and flood relief to communities including the Topnaar and Hai||om communities (and their livestock).

National Development Plan 4 (NDP4) for 2013-2017 is less specific on how climate change is to be addressed within the various sectoral development plans. NDP4 deals briefly with climate change in Chapter 8 which covers the topic of "extreme poverty": "... since subsistence farmers are more affected by extreme poverty than the population in general are, Government will supplement cash transfers with interventions such as the promotion of Conservation Agriculture in order to increase subsistence farmers' productivity and reduce their vulnerability to climatic conditions."

The Access to Benefit Sharing Bill is currently under discussion. The aim of this proposed legislation is "to ensure the conservation, evaluation and sustainable use of genetic resources and associated traditional knowledge and technologies", while the motivation for the Bill is that "... the conservation and sustainable use of biodiversity is more likely to occur when the traditional stewards of this biodiversity have the necessary rights to continue this role." In this regard, once the Act is in force, the participation of indigenous people in exerting legal control over their sustainable utilisation of the natural resources available to them could become more of a certainty.

3.4 Socio-economic conditions

Namibia has an estimated 2.1 million inhabitants spread over an area of approximately 824 000 km^2 with an urbanised population of 31.3%. This means about two persons per square kilometre on average, making Namibia southern Africa's most sparsely populated country. It should be noted that since the 1991 census, the ethnic identity of people is no longer taken into account as a criterion for classification.

Poverty in Namibia is linked to unemployment. In 2004 about two-thirds of Namibia's unemployed fell into the most productive age group of 16-45 years (NPC 2008). Unemployment continues to rise in Namibia, and the Ministry of Labour and Social Welfare's most recent Labour Survey (MoLSS 2008) states that by 2008 the unemployment rate had reached 51.2%. Namibia is often reported as having the most unequal distribution of income in the world. The Gini Coefficient of 0.63 in 2003/04 placed it at the top of a selection of 30 countries. Explanations for this include the racist policies of the apartheid regime prior to Independence which restricted the access of the majority of citizens to economic and social resources. In addition, Namibia's traditional reliance on the extraction of natural resources such as diamonds has meant that production is highly capital-intensive rather than labour-intensive (Central Bureau of Statistics 2008: 37).

The first few years following Namibia's Independence in 1990 saw a rise in the share of the budget allocated to Health Affairs and Services (particularly for primary health care), but, although a share of 10% or more was sustained for seven years, the allocation has since declined. The allocation has consistently fallen short of the 15% recommendation contained in the 2001 Abuja Declaration (Sherbourne 2009). This has come at a time when the country has started to face the full costs associated with the HIV/AIDS crisis which is considered to be one of the major drivers of falling life expectancy[4] and poverty in the country. The 2008 National HIV Sentinal Survey of prevalence rates in pregnant women aged 15-49 found that national prevalence of the disease in this group of Namibians was 17.8% (MoHSS 2008(a)). Communities in Oshikoto Region suffer above-average HIV/AIDS prevalence (22%). The incidence of orphans and vulnerable children (OVC) – a major consequence of the HIV/AIDS epidemic – is highest in Namibia's rural areas with the lowest wealth quintiles (including Oshikoto which has an HIV prevalence of approximately 34%).

Since Independence, Education Affairs and Services has consistently received the highest share of resources from the national budget. Huge improvements for previously disadvantaged people in Namibia have occurred since Independence. Nevertheless, there are still large urban-rural disparities in educational attainment: 23% of the population in rural areas have no formal education as opposed to 7% in urban areas (NPC 2006). Despite the improvements in school attendance and facilities, and the high budgetary allocation for education in Namibia, this sector is constantly under criticism. One of the main issues is that a high percentage of teachers are not deemed proficient in the language of tuition (English),[5] with the result that standards in education remain low. This problem arose after Independence

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4 Life expectancy fell by 11 years for men and 13 years for women to 48 and 50 respectively between 1991 and 2001.

5 D. Kisting, "98 Percent of Teachers Not Fluent in English", *The Namibian*, 9 November 2011.

when the new Government suddenly shrugged off Afrikaans as the *lingua franca* for the country without easing in English at a suitable pace for training the large numbers of new teachers.

3.5 Access to land and natural resources

Namibia and most former white-ruled colonies of southern Africa share a common history of expropriation of land from indigenous peoples. This resulted in an agricultural dualism, with black subsistence agriculture on the one hand and white commercial farming on the other. In addition, their post-colonial constitutional and legal frameworks have shaped their ability to address the skewed land distribution patterns, the notable exception being the 'fast-tracked' land reform programme of Zimbabwe (Odendaal 2010: 193).

Constitutional references to land

The Namibian Constitution makes numerous references to land issues and the justification for the land reform programme. Article 16(1) provides for all persons to acquire, own and dispose of all forms of immovable and movable property in any part of Namibia. Acquisition and ownership of land by foreigners (non-Namibians) could be regulated or prohibited by an Act of Parliament. The Constitution makes provision for expropriation of land "in the public interest" while subjecting payment of just compensation in accordance with the requirements and procedures to be determined by an Act of Parliament. Article 21(1)(g) and (h) draw attention to the principle of all persons having the right to "move freely throughout Namibia" and "reside and settle in any part of Namibia". Article 23 provides for policies and programmes that aim to address the social, economic and educational imbalances emanating from past discriminatory laws under apartheid. All of the above-mentioned Articles are in Chapter 3 of the Constitution, which deals with "fundamental human rights and freedoms". In effect, the constitutional principles that guide the Namibian land reform process are entrenched in the preamble to the Agricultural (Commercial) Land Reform Act 6 of 1995, which declares, among other things, that the Act is –

> "… to provide for the acquisition of agricultural land by the State for the purposes of land reform and for the allocation of such land to Namibian citizens who do not own or otherwise have the use of any or of adequate agricultural land, and foremost to those Namibian citizens who have been socially, economically or educationally disadvantaged by past discriminatory laws or practices … ."

It is thus clear that the drafters of the Constitution intended that Namibia's land issues should be dealt with within the chapter dealing with "human rights and fundamental freedoms".

The 1991 Land Conference

Although the 1991 Land Conference resolutions did not result in a binding policy, it served as a platform from which the land reform programme, policies and legislation would be developed (Odendaal 2010: 195).

Some of the most important conclusions and resolutions made at the end of the conference were as follows (Land Conference Report 1991: 34-36):

- Something practicable must be done to rectify the injustices concerning the acquisition of land in the past.
- Given the complexities in redressing ancestral land claims, restitution of such claims in full is impossible.
- Foreigners should not be allowed to own farmland, but should be given the right to use and develop it on a leasehold basis.
- Land owned by absentees should be expropriated.
- Ownership of very large farms and ownership of several farms by one owner should not be permitted and such land should be expropriated.
- Government should enact legislation providing for a charter of rights for farm workers.

The National Land Policy

The National Land Policy (NLP) of 1998 is based on the principles expressed in the Namibian Constitution, and on the national commitment to redressing the social and economic injustices inherited from the colonial past. The NLP commits the Government to securing and promoting the interests of the poor. The "poor" are defined as "the landless or those with little or insufficient access to land who are neither in formal employment nor engaged in non-agricultural business activities" (MAWRD 1998: 1). Consequently, the Government must not only ensure equity of access, but must also secure poor people's land rights and consider special programmes to assist the poor in acquiring land and developing it.

Key land reform issues

Commercial land reform

After Independence the Government embarked on two parallel commercial land reform programmes: the Resettlement Programme and the Affirmative Action Loan Scheme (AALS). The Resettlement Programme is run by the Ministry of Lands and Resettlement, with the objective of resettling poor and landless Namibians on state-acquired commercial farmland. The AALS is implemented by the Agricultural Bank of Namibia (Agribank), with the primary objective of assisting strong communal farmers to acquire commercial farms with subsidised interest rates and loans guaranteed by the State (Odendaal 2005: 24).

The selection of resettlement beneficiaries is a serious sticking point in the land reform programme. The cause of this controversy is that the criteria for selecting beneficiaries do not include any income-related criteria, with the result that well-off people such as Permanent Secretaries, Governors and other senior civil servants have been benefiting from the programme (Werner and Odendaal 2010: 37).

The National Resettlement Policy sets out three broad categories of potential beneficiaries, defined by three asset bases: (1) people with no land, no livestock and no employment; (2) people with some livestock but no land and no income; and (3) people with income and livestock but no land. In addition, specific target groups were identified for resettlement: San community members; ex-soldiers; displaced, destitute and landless Namibians; people with disabilities; and people living in overcrowded communal areas (MLRR 2001: 3-5).

The Resettlement Policy also lays down other criteria, including: having a background and interest in agriculture or other related activities on resettlement farms; and being prepared to

hold the allocated land under leasehold and adhere to the stipulations of the lease agreement under threat of eviction in case of transgression (ibid.: 5). These criteria are so broad that it was difficult to apply them in a transparent and consistent manner across the country. They are wide enough to give Regional Resettlement Committees (RRCs) considerable space to recommend people not necessarily in need of land. This has led to allocations of land to people who might have been previously disadvantaged, but more than made up for this since Independence by, for example, being appointed to well-remunerated government and parastatal posts. Public dissatisfaction with the beneficiary selection has surfaced in the national press from time to time. In Omaheke Region, accusations were made of widespread favouritism in allocating land. In 2007, *New Era* newspaper reported that relatives of the Regional Director of Planning had been allocated land, and that he had been a member of the RRC. *New Era* criticised the fact that there was no transparency about land allocations. The MLR's practice of placing advertisements in local newspapers announcing successful beneficiaries was said to have ended in 2002 (*New Era*, 28 September 2007).

The MLR is currently discussing a Draft Resettlement Manual in an effort to solve many of the issues raised by members of the public and politicians.

The current AALS framework is criticised in that it helps only those who are already well off. One initial strategy of the AALS was to free up communal resources to benefit poorer communal farmers. However, it appears that this has not materialised and that the unlawful enclosures of communal land continue unabated.

As already noted, many San residing on commercial farms derive their livelihood directly from these farms as farm workers, thus the exclusion of farm workers as targeted beneficiaries in the land reform process has been criticised. In the first Resettlement Policy of 1997, however, farm workers are still last in the list of the five main target groups. The 1997 policy argued that many farm workers were dismissed from farms after Independence and "became literally destitute and devoid of food, shelter and land to settle on" (RoN 1997: 4). Furthermore, section 20(6) of the Agricultural (Commercial) Land Reform Act 6 of 1995 declares that the Land Reform Advisory Commission [should], "... where the Minister decides in terms of subsection (1) to expropriate any agricultural land, consider the interests of any persons employed and lawfully residing on such land, and the families of such persons residing with them, and may make such recommendation to the Minister in relation to such employees and their families as it may consider fair and equitable in the circumstances."

In the revised National Resettlement Policy of 2001, farm workers are no longer listed as a specific target group for resettlement. Instead, a general reference to thousands of people who have been retrenched from farms and other sectors of the economy, and who are forced to seek a livelihood from the land, is found under the main target group of "Displaced, destitute and landless Namibians" (MLRR 2001: 4). This arguably amounts to a downgrading of the plight of farm workers (Permanent Technical Team 2005: 27). Given that many farm workers possess the skills and experience necessary to become a successful farmer, they should be an obvious choice to benefit from the land reform programme.

Another bone of contention in the commercial land reform process is that the National Resettlement Policy stipulates that beneficiaries be self-reliant and self-sufficient by the fourth year (MLRR 2001). However, virtually all resettlement projects older than four years still depend heavily on government support for things like food, drought aid and technical

assistance, with the result that they have not achieved self-sufficiency (Odendaal 2005). A major shortcoming of these resettlement projects seems to be a lack of management capacity – a crucial element of self-sufficiency. Moreover, it appears that beneficiaries are not encouraged to participate in decision-making on their respective projects. In most instances, resettlement beneficiaries seem to wait for the MLR to make decisions for them. On most projects, beneficiaries complain that the MLR seldom visits the projects, and therefore is not always aware of the beneficiaries' needs and concerns. In addition, a lack of basic agricultural skills among beneficiaries is important in making resettlement projects self-sufficient, as this would lead not only to more skilful farming methods, but also to more frequent and higher incomes.

Finally, the lack of tenure security for resettlement beneficiaries remains a contentious topic in the Resettlement Programme. The Resettlement Policy stipulates that land acquired for resettlement purposes will be provided to beneficiaries on leasehold of 99 years. This will be arranged so that beneficiaries can use the lease agreement as collateral for a loan from lending institutions for agricultural production purposes (MLRR 2001). However, Agribank is cautious with granting loans to resettlement beneficiaries because to date not a single beneficiary has received a leasehold agreement from the Government, which means that beneficiaries have no legal ownership interest in their land. Agribank is not clear about what procedures to follow should such a resettlement farmer default with repayments. The repossession of land should a resettlement farmer default on his or her mortgage bond would surely defeat the aims of resettlement. At the same time, denying resettlement farmers commercial credit may undermine their ability to farm successfully.

Communal land rights

Parliament passed the Communal Land Reform Act 5 of 2002 in 2003. During the decade-long negotiation process, the absence of any constitutional recognition of customary land tenure rights in communal areas resulted in communal farmers and Traditional Authorities having no statutory law remedy to defend their rights. As a result, powerful interest groups such as civil servants, political figures and self-made businessmen often used this policy and administrative vacuum to their advantage, ignoring customary land tenure rights to fence off large tracts of communal land to the detriment of subsistence communal farmers (Odendaal 2010: 3). Various cases of alleged unlawful communal land enclosures in Omusati, Oshikoto, Kavango and Otjozondjupa Regions have been reported in the media over the years.

Often those who unlawfully fence off land claim that they obtained permission from the relevant Traditional Authority to do so (Werner and Odendaal 2010). The negative effects of land enclosures are that they diminish grazing land in size and quality. Diminished grazing land results in weaker animals that develop slower, costing subsistence farmers more in supplemented fodder. While subsistence farmers express much dissatisfaction with enclosures, most fear some form of retribution if they openly challenge the practice.

Section 17(1) of the Act ensures that the landless and those with insufficient access to land receive the main benefit from communal land, and section 17(2) provides that no right conferring freehold ownership may be granted to any person in respect of communal land. The core principle is that individuals who wish to farm commercially and thus require large tracts of land should do so within the commercial farming areas and not the communal

farming areas. This principle underpins the concept of a safety net which communal land provides for the poor and those who cannot find employment in the formal sector.

However, the MLR has been slow to enforce the relevant sections prohibiting unauthorised land enclosures. Despite widespread criticism of such practices in forums such as Parliament, the Government has yet to formulate and enforce guidelines on removing unauthorised fences.

Land rights issues affecting indigenous/marginalised communities

One 1991 Land Conference resolution was that the land rights of disadvantaged communities should receive special protection. The San and disabled communities were specifically mentioned (OPM 1991: 36). The National Resettlement Policy (MLRR 2001: 3-4) identifies the San as a specific target group for resettlement: "Members of the San Community have endured exploitation and discrimination at the hands of their citizens throughout history … [They] have suffered tremendously as a result of historical changes caused by the political constellations and ecological constraints … [They] need to be helped in realizing a new living by developing existing skills and acquiring new ones to be able to secure their sustenance."

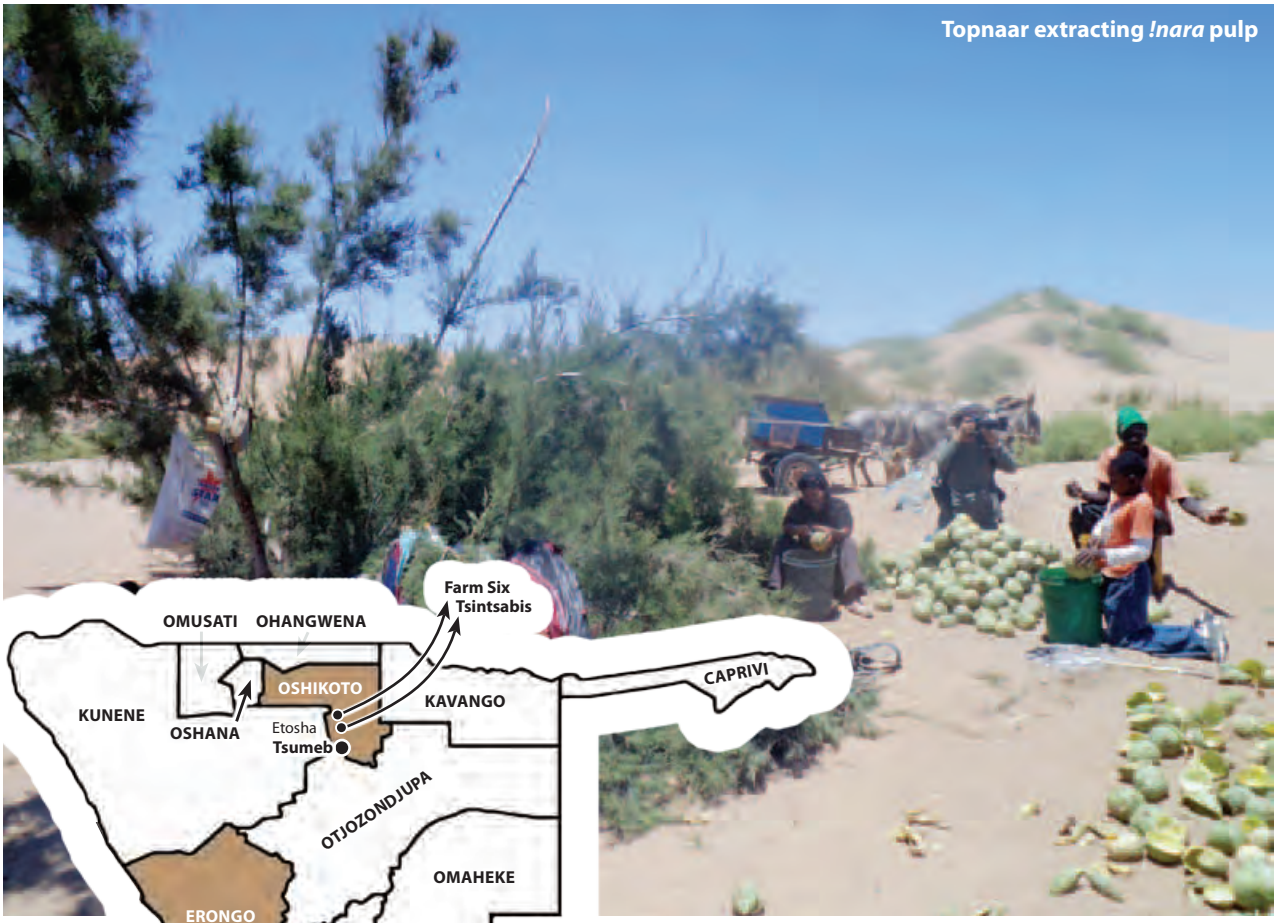
As already mentioned, Namibia has no national legislation that deals directly with indigenous peoples, and the Namibian Constitution does not mention indigenous peoples. The OPM has a San Development Programme aimed at helping San citizens and other poverty-stricken minorities and marginalised groups such as the Himba. Namibia voted in favour of the UN Declaration on the Rights of Indigenous Peoples. In 2010 the Cabinet approved a Division for San Development in the OPM which is an important milestone for the promotion of the rights of indigenous peoples or marginalised communities in Namibia (Dieckmann 2011: 467).

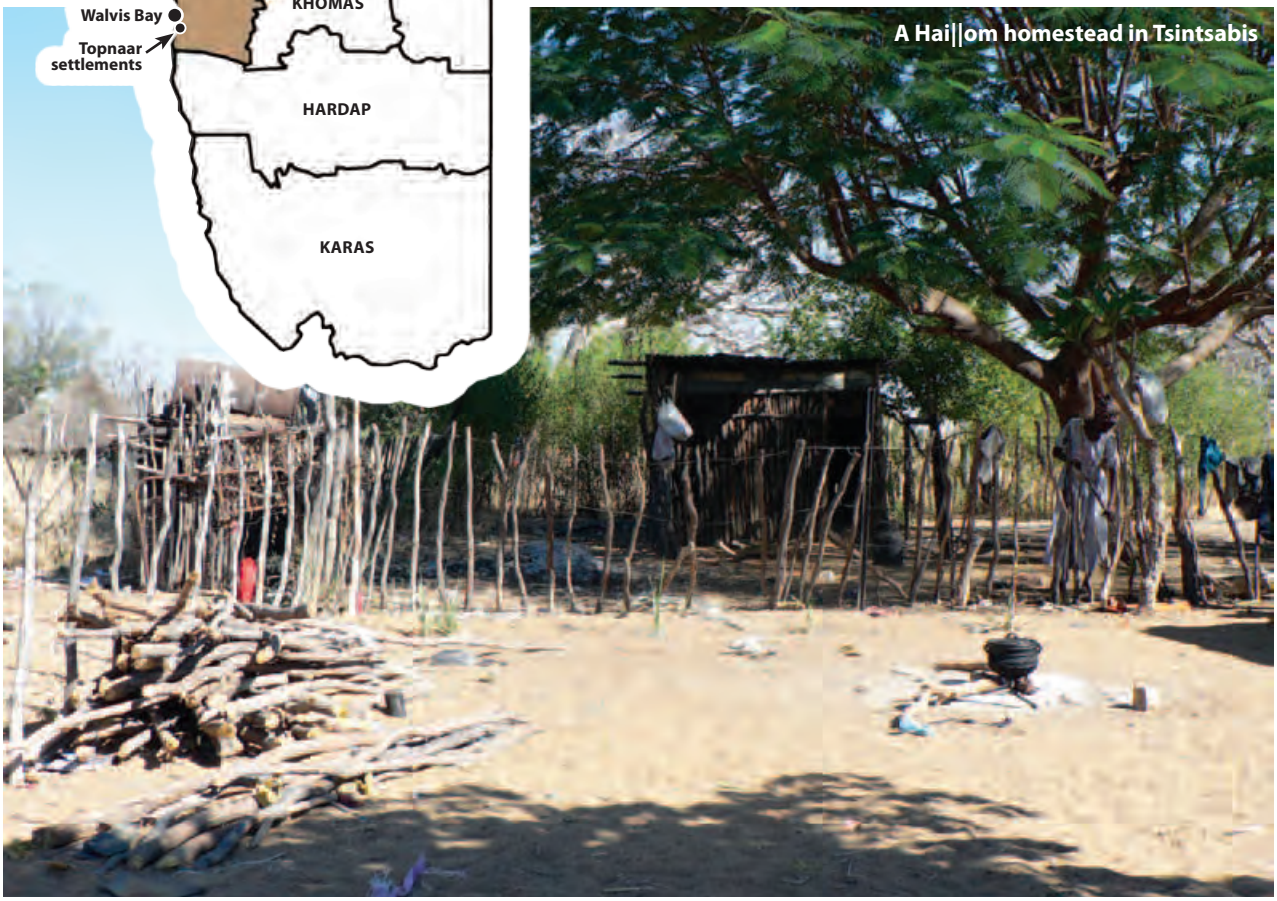
Conservancies and National Parks

Both communal conservancies and national parks loom large in the past, present and future of the Topnaar and San peoples in Namibia. The Topnaar live in the Namib-Naukluft National Park, and the Hai||om San have close historical and cultural ties to the Etosha National Park. The Khwe San living in the Bwabwata National Park in West Caprivi and the !Kung San and Ju|'hoansi San living in the N#a Jaqna and Nyae Nyae Conservancies, respectively, are currently benefiting through hunting and tourism agreements.

The conservancy movement, CBNRM and other strategies planned offer much promise for San development in particular. These programmes have to be supported, but also carefully researched and monitored to ensure that San choices are respected and that these institutions truly benefit the San. However, there are some critical issues looming. Tourism is a risky and difficult economic development strategy with some clear costs to the San. Indeed, few San actually work in the tourism enterprises on their lands. The long-term economic benefit to the San offered by hunting is a matter requiring close monitoring.

Also, the disjunction between land rights and natural resource rights in the communal conservancies has to be addressed by means of statutory law which must give communal conservancies the legal authority to administer their own lands with support of their respective Traditional Authorities and Communal Land Boards to meet the needs of conservancy members in accordance with their management plans. The issue of communal land rights must therefore be directly addressed in conservancy law (Harring and Odendaal 2006).


Topnaar extracting !nara pulp
Farm Six
Tsintsabis
OMUSATI
OHANGWENA
OSHIKOTO
KUNENE
OSHANA
Etosha
Tsumeb
KAVANGO
CAPRIVI
OTJOZONDJUPA
OMAHEKE
ERONGO
KHOMAS
Walvis Bay
Topnaar
settlements
HARDAP
KARAS


A Hai||om homestead in Tsintsabis

Chapter 4
Case Studies

For the purpose of this study, two communities were selected: the Topnaar and the Hai||om communities. The selection was based on the differing environmental conditions in which they live.

The climate at Gobabeb (Topnaar area) is hyper-arid. The average annual rainfall is only 27 mm, and the average annual precipitation derived from fog (which reaches the study site on an average of 37 days per year) is 31 mm (Lancaster et al. 1984). In 2010/11 an extreme rainfall of about 165 mm was measured at the study site during the rainy season.

By contrast, Tsumeb, located 60 km south of Tsintsabis (Hai||om area), has a sub-tropical climate, with very hot summers and mild winters. The mean maximum temperature is 29.7° C and the mean minimum is 14.4° C. Occasional thunderstorms occur during the summer rainfall months (October to March). The average annual rainfall is 555 mm.

Thus the climatic conditions and climate change impacts facing the two communities differ considerably. In addition, in both communities we found very limited adaptive livelihood strategies, and likewise a very limited role of traditional knowledge in both communities' adaptive strategies. This is due to non-climatic drivers of change and the vulnerability context of these communities.

Information on a total of 295 individuals was collected, 140 of whom were male and 155 female. In general it can be stated that more than half (65.1%) of the members of these communities are not permanant residents of their respective villages, however there are big differences between the Topnaar and Hai||om in this regard.

Regarding livelihood strategies/activities, the importance of some of these has changed over time, although again there are big differences between the Topnaar and the Hai||om communities in this regard. For example, 90% the respondents in both communities said that wild meat was important in the past, and only 10% still deem it important today. The same applies for wild plants, with 97% saying that these were important in the past and only 10% deeming them important today. More than half of the respondents in both communities do not consider it important to have livestock. People in both communities have access to other sources of income such as a salary or pension, but access to these sources is relatively low, with only 12.5% of all respondents receiving a pension and 28.5% receiving a monthly salary. People stated that it was not important to have an income in the past, but today more than 60% overall think that an income is an important livelihood strategy. Food aid delivered by the Government is another important livelihood strategy in both communities.

4.1 Case Study One: the Topnaar

The Topnaar community lives in small settlements along the banks of the Kuiseb River in the hyper-arid western part of the central Namib Desert (Erongo Region), in the Namib-Naukluft National Park. The population of Topnaar living in the Kuiseb valley has fluctuated over the years, but records suggest that their numbers have never been very large. In 1870, Palgrave provided an estimate of 750 Topnaar in the area, of whom 150-200 had settled in Walvis Bay. In 1966, Jenkens and Brain counted 130 Topnaar living along the Kuiseb River, but they assumed that this was not the total population as many were reportedly living and working on road construction sites at the time.

Kraemer (2009) stated that around half of the all-in-all 600 Topnaar were living in the 14 settlements along the Kuiseb River. In 1994, the total number of residents recorded was just 424 (see Werner 2003: 9). This considerable variation in numbers is due to the high degree of mobility between Walvis Bay and the settlements along the river. Also, people might be registered as a household or household member in a settlement along river (to receive flood or drought aid and to keep livestock there) although they live in Walvis Bay most of the time. During the major flood of 2011, a list of Topnaar households was compiled for the provision of flood aid, with 300 households and 1 600-1 800 individuals recorded. These were the calculations of the Traditional Authority, Chief Kooitjie, who may have provided such high estimations for political reasons. According to Werner in 2003, Chief Kooitjie estimated that only 350-380 people were living in the 14 settlements (Werner 2003: 7). In this study, 174 Topnaar community members were interviewed. This was not the total number of Topnaar in the area at the time: there were difficulties with tracking people down due to migration and because some of the community members are not permanent residents.

The interviewees are residents of the settlements of Swartbank, Armstraat, Homeb, Klipneus, Natab 1, Natab 2, Os-Water and Soutrivier. Their average age is 35.55 years. Table 1 shows the number of households per settlement and the average number of household members.

Table 1: Total number of Topnaar households interviewed

Settlement	# of households interviewed	Average # of household members
Swartbank	7	4.1
Armstraat	6	4.2
Homeb	2	3.0
Klipneus	5	5.0
Natab 1	4	6.0
Natab 2	4	2.5
Os-Water	2	4.5
Soutrivier	9	5.1
Total	**38**	**4.3**

4.1.1 Vulnerability and opportunity context for the case study

4.1.1.1 Environment, climate hazards and impacts

The area in which the Topnaar live has been arid or semi-arid for an estimated 80 million years. Over this extensive period, the plants and animals found here have been able to adapt to extremely harsh climatic conditions, with the result that many are endemic to the area.

The Kuiseb River is typical of the many westward-flowing ephemeral rivers that characterise the Namib Desert. Surface water flow in these rivers is erratic and depends on seasonal rainfall in their respective catchment areas. A permanent, subterranean water flow occurs beneath the surface of these usually dry river beds – enough to maintain a narrow strip of vegetation or a westward-flowing 'linear oases'. The Kuiseb River is flanked in the south by large sand dunes (a sea of sand extending for several hundred kilometres southwards), and in the north by gravel plains (flat stony areas that support an exceptionally low biomass of vegetation with a ground cover of 0.1-5%). These seemingly barren plains also support fog-dependent lichen fields and scattered herds of arid-adapted wildlife (springbok, oryx, ostrich, zebra, black-backed jackal and spotted hyena) (Mendelsohn et al. 2002).

Although the average annual rainfall for Gobabeb (the study site) is only 27 mm, the average annual precipitation derived from fog (which reaches the study site on an average of 37 days per year) is 31 mm (Lancaster et al. 1984). When sufficient rain falls in the Kuiseb's catchment area to the east, the river is subject to 'flash floods', which prevent the Namib dune sea from shifting north. The floods replenish the large trees and underground water reserves. Although the river has experienced large-scale flooding in recent years (2010 and 2011), Masaaki (2005) states that instances of flood water reaching as far as the Kuiseb Delta (at the coast) in the past 50 years, as compared to the previous 160 years, has become a rare event.

Much of the flora and fauna found in this area (including spiders, insects and reptiles) are dependent on the coastal fog as a means of survival.

In extraordinary years, when high precipitation occurs in the Namib Desert, both the inter-dune valleys and the gravel plains become covered in high-density strands of grass (predominantly *Stipagrostis sp.*), but this is not considered to be the norm.

Under expected climate change conditions, the Kuiseb River will be subject to decreasing rainfall, increasing temperatures and increasing rates of evaporation. Less-frequent and lower-magnitude flooding is predicted for these 'linear oases', but due to higher rainfall variability, the years with excessively high rainfall (as experienced in 2011) will cause high rates of runoff and excessive flooding (Turpie et al. 2010).

Furthermore, Schactsneider and Edmunds (2010) illustrate that the large trees (confined to the banks of ephemeral rivers) are reliant on a seasonally fluctuating combination of groundwater, shallow soil water and deep soil water), directly depend on Kuiseb aquifer recharge resulting from flood-water infiltration. If predictions for increased upstream water abstraction (due to increasing numbers of permanent water points and dams of farmers and other users) and global climate change are realised, then water levels of the Kuiseb aquifer will decline substantially. Ultimately, water availability and the vegetation structure along the river will be seriously threatened. The implications for biodiversity and Topnaar survival along the Kuiseb River could be severe as large trees in riverbeds provide essential shade, fodder and habitat to many species of wildlife as well as fodder for the small herds of goats kept by the Topnaar.

Turpie et al. (2010) report that reductions in vegetation cover and declining surface water (small springs, seeps, etc.) are likely to affect wildlife presence. The reduced presence of wild ungulates will affect scavengers and predators (most notably black-backed jackal and

hyena). Their populations may eventually decline, but there is a likelihood that the lower number of wild ungulates will make Topnaar goats more vulnerable to predation. There may be changes to the quantities, quality and seasonality of all important bushfood plant species. In some cases (e.g. plants well-adapted to hyper-arid conditions, such as the *!nara* plant, *Acanthosclus horrida,* an important seasonal staple of the Topnaar), no change or improvements in availability may occur due to higher temperatures, although the lowering of the water table may affect them negatively.

Due to the possible lower availability of water, there may be a drive to increase the number of boreholes, which will increase overgrazing and land degradation rates. Werner (2008) estimated that at least 1 290 boreholes existed in the Kuiseb Basin in 2008 (see Appendix, Figure 1). The increasing number of boreholes and dams throughout the Kuiseb Basin impacts negatively on aquifer recharge, amounting to an estimated 21% reduction in flow to the lower reaches of the Kuiseb River. This effect is exacerbated in drier years and could be further exacerbated under climate change conditions.

Lastly, according to Nicholls et al. (2007) sea–level rise will increase the risk of saltwater inundation into coastal aquifers. This could affect the quality of water available to the Topnaar and to many of the plants on which they depend (the *!nara* melon in particular with its dependence on deep groundwater). The scale of saltwater intrusion of coastal aquifers will depend on the size of the aquifer, geological factors, groundwater withdrawals, surface water recharge and precipitation.

In summary, the few first-order bio-physical impacts are as follows:

1. Heat stress and higher rates of evaporation.
2. Probable (but as yet unquantified) changes to the fog regime – less/more fog days will affect the level of heat stress for humans, plants and livestock.
3. Lower rates of aquifer recharge (water stress), lower water tables and a decline in plant cover in the Kuiseb linear oases (higher losses of trees and other plants like *!nara*).
4. Increased runoff during abnormally high rainfall years inland, with prolonged and intense floods of the Kuiseb River.
5. The possibility of saltwater intrusion into coastal aquifers.

Besides these first-order bio-physical impacts, there will be social and economic impacts. First of all, as temperatures rise, humans and livestock will suffer from the increasing heat stress, and increasing heat means an increasing plant, animal and human demand for water, and thus higher costs for providing water to humans. Secondly, prolonged floods, similar to the flood of 2011, can wash away infrastructure, livestock, trees, deadwood and *!nara* plants. Thus, during flood periods, access to water, energy and livestock fodder is compromised. On the other hand, prolonged floods recharge the aquifers; once they have subsided they improve the quality and availability of water for humans, and livestock and the dune vegetation on the southern bank benefit too. However, if, as predicted, rainfall declines progressively, the dunes will begin to encroach on the riverbed. Ultimately this sand 'creep' will smother the vegetation and encroach on the northern bank, making living conditions much more difficult for the Topnaar. Furthermore, lower rainfall results in fewer floods and thus reduced rates of underground aquifer recharge, which in turn will impact on water quality.

4.1.1.2 Governance

For a long time, the Topnaar lacked strong political structures. The previous Topnaar Chief, Piet ǂEibeb, died in October 1910 (Dentlinger 1983: 72-73; Werner 2003: 26ff), and for the next 70 years there was no proper traditional leader. With the advent of political reforms in 1975, things changed. The Turnhalle Conference of 1975 and subsequent political developments were premised on ethnic representation and government, following the recommendations of the Odendaal Commission in 1964. Consequently, the first Administrator-General of South West Africa appointed a temporary Headman for the Topnaar in 1978. In 1981 an election was held for a successor and four Councillors.

The Topnaar Traditional Authority presently consists of Chief Seth Kooitjie and several Councillors. All members of the Traditional Authority were recognised by the Government and accordingly gazetted in 1998.

In addition to customary matters, the Traditional Authority has sought to facilitate and encourage socio-economic development along the Kuiseb River. Among other things, the Chief claims to have been instrumental in successfully lobbying the Government in 2002 for the construction of a school hostel and clinic at Utuseb, and the employment of an agricultural extension technician – who happens to come from the Kuiseb (see Werner 2003: 27).

To generate and receive financial support from the community, own resources and donors, the Traditional Authority has established and registered a community trust fund in terms of the provisions of the Traditional Authorities Act. The purpose of a trust funds is to finance projects in a community and cover the Traditional Authority's administrative costs. Small amounts of money (mostly donations) have been deposited into the Topnaar trust fund (ibid.) – a fact that the respondents did not mention in the research discussion.

According to Werner (ibid.), a potential source of income was the Topnaar community's 10% shareholding in the !Aonin Fishing Company. The company was established in 1993 when the Chief and two community members successfully applied for a fishing quota. An important argument in lobbying for a quota was that the Topnaar were deprived of benefiting from marine resources, and a quota would go some way to redressing this deprivation.

The Topnaar Community Foundation (TCF) was registered in 1996. The community elected a board of trustees which the Master of the High Court registered in 1999. The purpose of the TCF is to receive dividends and other payments from !Aonin, and to use these monies to finance development projects designed to improve the community's standard of living.

Information obtained in Werner's interviews in 2003 (ibid.: 28) suggests that the community received very few benefits from !Aonin. Very few community members knew about !Aonin and the TCF, and they were hard pressed to identify any concrete benefits received apart from sporadic financial support provided to community members for funerals and other unforeseen costs. These were generally appreciated. Also, many people had heard that a few select pensioners received a cash payment of N$1 000 at Utuseb in December 2002, apparently from !Aonin. None of the informants were quite clear about where this money came from and how pensioners were selected. A former TCF trustee stated that the total support from !Aonin to the community in the last 10 years was about N$46 000 (ibid.).

There is a widespread perception among the Topnaar that their traditional leadership is divided on some important issues, and that this is hampering socio-economic development. While nobody was bold enough to state exactly what the nature of this problem is, it would appear that power struggles exist among the leadership, probably centring on the control of financial resources. On the one hand the Chief and his Council have established the community trust fund in terms of existing legislation, and on the other hand, one of his Senior Councillors was at the helm of the TCF (ibid.: 28).

There is a great deal of mistrust among community members, and between community members and their leadership. This seems to be fuelled by a lack of transparency on the part of those controlling funds on the community's behalf. For example, nobody, including the Chief, was aware or had seen any annual reports of either the !Aonin Fishing Company or the TCF. As a result, the community at large is left in the dark as to what monies the community receives and how these are utilised. Similarly, none of the people interviewed knew how much money the Lauberville tourism camp near Rooibank had generated since it was handed over to the Topnaar in 1995/96, nor how that money was spent (ibid.: 29). The Lauberville tourism camp has received some donor support in recent years for constructing a community campsite to benefit the Topnaar community at large, but some community members are speculating that the Chief and his Council are using funds for their own gain.

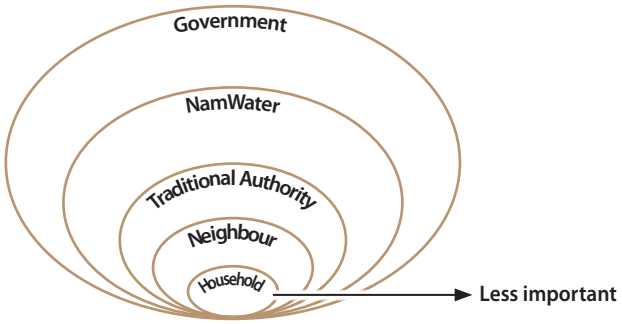
The data collected in the present study reiterates the problems mentioned by Werner in his 2003 study report. Before elaborating on the general problems cited by the Traditional Authority in the present study, the community's views on the matter of fish shares are provided. It was stated that the Topnaar community used to receive fish every Thursday, and people knew that they have shares in the fishing factory, but they do not know what the current status is in this regard, as the following quote suggests:

> "I saw myself that the chief was collecting fish from a factory and I helped him taking this to his home. Then I saw his freezer, which was already full of fish, but he will only give this to his relatives."

Community members noted that the Government is there to help them in times of need, but it appears that this support hardly reaches them (as the quote above indicates). It was said that the Traditional Authority (TA) is not distributing the support equally among the community members. In general the lack of trust in the TA is high, and this is why the community is not asking for support. It was mentioned that whenever people direct requests for support to the Government, NGOs and other institutions, they are referred back to the TA. The community felt angry and disappointed by this situation, but respondents felt that there is nothing they can do.

Based on the community's flood experience 2011, a diagram was produced to determine which institutions were the most important for this community – the larger the circle, the less important. As Figure 6 shows, the TA is still important because it was the first institution that came to ask the community members about their needs – since the Government deals with the community via the TA, and the Erongo Regional Council works closely with the TA, e.g. in the needs assessment undertaken during the flood. NamWater was also an important institution in this particular case, because on every visit its representatives carried messages to and from family members in Walvis Bay.

Figure 6: Importance of institutions: perceptions of the Kuiseb River Topnaar community



The Gobabeb Research and Training Centre was another institution said to be important to the Topnaar community living in close proximity to it. Community members rely on this institution for employment and regular income. For example, the husband of one of the study respondents is working at the centre and provides his family with a secure monthly income. This money makes it possible for the couple to send their children to a school in Walvis Bay.

4.1.1.3 Socio-economic conditions

In 2003/04 an estimated 41% (750 000) of all Namibians[6] could be classified as either poor or severely poor (NPC 2008). Nevertheless, the incidence of income poverty varies considerably between administrative regions and between urban and rural areas. Erongo Region, in which the Topnaar live, is the second wealthiest region due to the towns of Swakopmund and Walvis Bay providing employment opportunities (see Appendix, Figure 2). The most recent Namibia Household Income and Expenditure Survey (NHIES 2009/10) also stated that Erongo Region is the second wealthiest region (see Appendix, Figure 3). However, the Topnaar have been identified (in Hoadley 2005) as the most marginalised group in Erongo Region. In this region, high levels of unemployment, due to poor education and low levels of skills, is a major cause of poverty (NPC 2006). Poor education can be caused by a number of factors, but in the rural areas where the Topnaar live, long distances to schools and limited education opportunities close to the homestead often result in a high incidence of school dropout.

We describe the livelihoods of the community in more detail in this section because the research findings clearly indicate that these livelihoods do not yet 'qualify' as a strategy for adapting to climate change. Rather, the different livelihood strategies are the factors which have to be considered when the impacts of climate change are analysed.

Livelihoods

The livelihood strategies described below are sequenced according to the 'importance' ranking worked out in the community workshops: keeping livestock, harvesting *!nara* plants, and pensions, drought relief and employment.

Livestock and chicken

Livestock is important for the Topnaar in two ways: it provides food security and it can provide income. Table 2 on the next page shows that livestock ownership differs between the different Topnaar communities. In this table, livestock includes goats, sheep, cattle and donkeys. The average number of livestock per household in Homeb and Natab 2 is 41, while in Armstraat[7] it is only 1. More interesting is the average number of livestock per individual, which is relatively high in Homeb, Natab 1, Natab 2 and Os-Water.

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6 Namibia's population in 2003/04 was estimated to be 1 830 000 (NPC 2006).

7 *Armstraat* can be translated as 'poor street'.

Table 2: Average number of livestock per Topnaar household and per household member (N=174)

Settlement	Average # of livestock per household	Average # of household members	Average # of livestock per household member
Natab 2	41	2.5	16.4
Homeb	41	3.0	13.7
Natab 1	14	6.0	2.3
Os-Water	19	4.5	4.2
Swartbank	13	4,1	3.2
Southriver	7	5.1	1.3
Klipneus	6	5.0	1.2
Armstraat	1	4,2	0.2

When a Topnaar household owning livestock needs food, they slaughter their livestock, and when in need of money, they sell their livestock. However, when they want to sell the meat of the livestock in Walvis Bay, permits are necessary for transporting the meat or the livestock itself out of the national park. This limits such sales as it is difficult and expensive for the Topnaar to obtain the permits. In addition to using and selling livestock meat, community members use the milk of their cattle and goats, and sometimes sell milk to 'outsiders'. Almost all the respondents stated that chickens are very important because of their eggs.

!Nara fields

Of all the plants (nonvascular and vascular) harvested, the *!nara* plant is the most important to the Topnaar. It is used for food consumption, whereas the other plants are used mainly for medicinal purposes. Other fruits are scarce in this area. Of the 38 households interviewed, only 3 said that they were not involved in *!nara* harvesting. In total, 92 of the 174 individuals are involved in harvesting wild plants, and only 8 are not involved in *!nara* harvesting. Those who harvest *!nara* have 7 livestock on average (which is relatively high, as Table 2 shows). Thus, having livestock and harvesting *!nara* are important livelihood strategies.

In the past, wild cucurbit was the community's staple food, and according to Van Damme et al. (1992), corn has taken over, but *!nara* remains important. Over the years, the *!nara* has provided food, fluid and an income to the Topnaar. The flesh of the fruit (often cooked into a pulp) can be eaten or used (concentrated or dried) for a variety of dishes (e.g. jam). The seeds can be baked and salted, or pounded into a powder to which water is added to make porridge, which, according to one participant, can "fill you up for a very long time". Preparing *!nara* seeds is a very time-consuming process: once harvested the plants are buried below ground in sandy soil for 2-3 days to promote ripening. Then the plant is skinned, the skin is given to donkeys to eat, and the flesh (including the seeds) is cooked into a pulp for 2-4 hours. The pulp is then spread out on a blanket to dry, and the seeds are separated for eating – they are known as "Nama chocolate".


!Nara fruits


!Nara pulp drying


!Nara seeds – "Nama chocolate"


!Nara seed porridge

Nowadays the *!nara* seeds are mostly sold to one agent in Swakopmund, the company Desert Hills, which produces oil and other products from the seeds. This company has a non-Topnaar trader to whom the community members can sell their *!nara* seeds. Desert Hills buys the seeds from the trader after every harvesting season, and pays the trader a fixed price, but there is no clarity on what share the trader gets. For business protection reasons, the price per kilogram is not made known. Harvesters usually harvest the *!nara* seeds when in need of money, thus it is difficult to get a clear idea of the income of one person per season. The director of Desert Hills said that more and more people have become involved in harvesting *!nara* again since the company's inception in 2007. However, due to the flood of 2011, there was a surplus of seeds and no market for them.

The Topnaar community used to have exclusive rights to harvest the *!nara* plants, but today more outsiders are coming to their area to harvest *!nara*. Community members said that the outsiders are damaging the bushes and harvesting unsustainably. The *!nara* bushes provide shelter to mice and rats, and it also attracts snakes, so the harvesters need to be careful while harvesting. It was mentioned that two Oshiwambo-speaking harvesters were bitten by snakes and one of them subsequently died as a result. However, the Desert Hills director said that some harvesters are too old to harvest for themselves and thus hire Oshiwambo-speaking people. She agreed that the number of harvesters should be more controlled, and suggested that every harvester should have a letter from the Chief.

Pensions

Pensions received by elders in the Soutrivier community are regarded as vital support for households. Currently, all Namibian citizens aged 60 and older are entitled to a state pension of N$750 per month (increased from N$550 in August 2012). Some Soutrivier residents still have a South African ID and are thus entitled to a monthly pension of N$1 100. Pension money is usually used to buy basic household necessities such as maize-meal, sugar and cooking oil, and to cover children's school-related costs. Pensions are regarded as the most reliable source of regular income. One respondent said that cash is important "because it pays for food, transport, clothing and telephones". Sometimes money is saved at the bank in Walvis Bay, but savings are small as cash in hand is required daily to buy necessities.

The quantitative data made clear that 14 of the 37 households interviewed receive a pension, and 23 do not. Table 3 shows that no household in Homeb, Oswater and Natab 2 receives a pension.

Interesting is the fact that, on average, the people who receive a pension also have more livestock compared to those who don't. Another source of cash income is a salary for people who do not receive a pension. Of the 158 people who do not, 53 have a salary.

Table 3: Number of Topnaar households that receive a pension (N=37)

Settlement	Pension received		
	Yes	No	Total
Swartbank	4	2	**6**
Armstraat	1	5	**6**
Homeb	0	2	**2**
Klipneus	2	3	**5**
Natab 1	2	2	**4**
Natab 2	0	3	**3**
Oswater	0	2	**2**
Soutrivier	5	4	**9**
Total	**14**	**23**	**37**

Drought/flood relief

Drought relief has been important for the Topnaar community since Independence (1990), and from 2000 onwards the community received flood relief more often. Drought relief (i.e. three 12,5 kg bags of maize-meal, three bottles of cooking oil and some fish per household)

is distributed around three times per year, and flood relief (maize-meal, fish, beans, oil and sugar) is distributed every two months. However, both types of relief are distributed only to people who have a homestead, and only when they are at home. According to the interviewee from the Regional Council in Walvis Bay, Topnaar no longer qualify for drought aid. Topnaar participants in the third meeting were unaware of this and were still waiting for food aid (the flood aid was stopped several months prior to the third visit).

Employment

The Topnaar community is highly dependent on employment in Walvis Bay, and rural community members who do not work depend on those who do. In turn, rural community members may, for example, look after the animals of a livestock owner who stays in Walvis Bay due to employment there. However, employment is not regarded as a highly important livelihood strategy as job opportunities are rare and educational levels among Topnaar are rather low. Participants also said that they cannot compete with other ethnic groups in terms of employment. It was said that they do not get jobs because they don't have the 'right connections'. Along the Kuiseb River, job opportunities are even more limited: the Gobabeb Research and Training Centre provides a few formal jobs (7 Topnaar are employed there permanently) and some casual work and piecework. There are a few job opportunities in Utuseb (mainly cleaning jobs) and four Topnaar are employed at the campsite at Rooibank. NamWater provides casual work along the Kuiseb River but no formal employment.

Migration

In- and out-migration is quite common in the Topnaar community, mainly due to employment. People work in the towns, especially Walvis Bay, but they still consider themselves to be community members, and the other community members also regard them as such. The questionnaire responses confirm these migration patterns: 53.4% of the 174 individuals were not permanent residents. Table 4 shows the household picture that emerged.

Table 5 clearly shows that half of the non-permanent residents earn a salary, whereas only 8.8% of the permanent residents do.

Table 4: Number of Topnaar households with non-permanent residents (N=35[8])

Settlement	# of households with non-permanent residents	# of households with only permanent residents	Total
Swartbank	6	0	**6**
Armstraat	3	3	**6**
Homeb	2	0	**2**
Klipneus	5	0	**5**
Natab 1	3	1	**4**
Natab 2	3	0	**3**
Os-Water	2	0	**2**
Southriver	8	1	**9**
Total	**30**	**5**	**35**

Table 5: Non-permanent residents and income in the Topnaar community (N=173)[9]

	Earn a salary	Do not earn a salary	Total
Non-permanent residents	51.0%	49.0%	**100%**
Permanent residents	8.8%	91.3%	**100%**
Total	**31.0%**	**69.0%**	**100%**

[8] This lower-than-expected number is due to missing data.

[9] The other non-permanent residents are most likely the !nara harversters who do not regard harvesting as employment, although they do get an income for this activity.

Wellbeing ranking

According to the community there are three different categories: poor, medium and better off. The characteristics of these three categories are as follow:

Table 6: Characteristics of wealth categories: perceptions of the Topnaar community

Better off	Medium	Poor
Non-permanent due to employment in larger towns	Mostly permanent	Non-permanent (always trying to find some work)
Formal employment (mining and teaching)	Small business (sell soap and tea); casual work	No formal employment (only 'stuk werk' or selling firewood)
Children attain high education level	Children schooled up to Grade 10	No education
Big garden	Garden	Only a garden for tobacco for own consumption; rely on bushfood
Livestock: 200 goats, 100 cattle	Livestock: 5 goats, chickens, 2-3 cattle	No livestock
Able to hire workers (even if one is around to do the work oneself)		
Receive maize-meal	Receive maize-meal	Receive maize-meal and also the leftovers
Flush toilet	Normal toilet	No toilet
House has planks, ceiling and floor	House made of iron sheets	Natural resources used for housing
Household items: two generators; solar power; table; bed, matress and blankets	Household items: gas stove; carpet; bed and matress	Household items: no matress – goat skins used for bedding

Participants in Soutrivier said that there are three wellbeing categories: poor, medium and better off. After categorising the households of their own community accordingly, the participants were able to do the same for the households of other Topnaar communities. In total there were 8 poor households, 12 medium households and 13 better-off households. It was said that people can move up in life when they get employed. However, people can also move to a lower category due to environmental conditions, e.g. people can lose their livestock due to predators, floods or lightning. During the same discussion the list of the interviewed households was divided into the different wellbeing categories, as shown in Table 7. Armstraat (literal translation 'poor street') is by far the poorest community, while Homeb and Swartbank are considered to be financially better-off communities.

A cross-tabulation of the questionnaire responses confirmed the responses in qualitative discussions about the well-being groups. Table 8 shows that more than half of the better-off people earn a salary, while only five poor people do. It was said that both poor and better-off households on the Kuiseb River are likely to have non-permanent residents, but the questionnaire responses indicate that this applies only to the better-off households, as Table 9 shows.

Table 7: Topnaar household wellbeing ranking (N=33)[10]

Settlement	Better off	Medium	Poor	Total
Swartbank	4	2	0	**6**
Armstraat	0	0	6	**6**
Homeb	2	0	0	**2**
Klipneus	1	2	2	**4**
Natab 1	2	2	0	**3**
Natab 2	3	0	0	**3**
Soutrivier	1	8	0	**9**
Total	**13**	**12**	**8**	**33**

[10] This lower number is due to data missing for Os-water.

Table 8: **Number of Topnaar receiving a salary per wellbeing category (N=165)**[11]

	Better off	Medium	Poor	Total
Gets a salary	25	21	5	**54**
No salary	27	58	29	**120**
Total	**52**	**79**	**34**	**165**

Table 9: **Number of permanent Topnaar residents per wellbeing category (N=165)**

	Better off	Medium	Poor	Total
Permanent	18	33	26	**80**
Non-Permanent	**34**	45	8	**93**
Total	**52**	**78**	**34**	**165**

A tabulation of the number of livestock per wellbeing category provides further insight. Table 10 shows that the poor households have either no livestock or between 0 and 25 livestock, while the better-off households have up to 250 livestock.

Table 10: **Number of livestock of Topnaar per wellbeing category (N=165)**[12]

# of livestock	Better off	Medium	Poor	Total
0-25	40	72	34	**153**
25-75	5	6	0	**11**
75-250	**7**	1	0	**10**
Total	**52**	**79**	**34**	**165**

According to the Erongo Regional Council's former Disaster Manager who coordinated the flood aid in 2011, the Topnaar are living in chronic poverty. By this he meant a survival deficit as well as a livelihood deficit. He said, for example, that people cannot go to the clinic, are dependent on others and have no coping strategies. However, the overall picture of the Topnaar data, and a comparison with the Hai||om (Case Study 2), show clear differences in wellbeing within the Topnaar community as well as a generally better situation than that of the Hai||om (see Chapter 5).

Education

As already mentioned, educational opportunities are low in the areas where the Topnaar live. A number of education-related issues were clarified in discussions with the community. It was said that people do not find employment chiefly because they lack qualifications. However, some were sceptical about education being of any help for finding work in the formal sector: "What is the use of education if it doesn't give you a job?"

This was said to be a reason for parents not being particularly interested in investing in their children's education. A reason for children dropping out of school is the lack of money to cover school-related costs. According to the Erongo Regional Council's former Disaster Manager, a lack of money is one major reason for parents not being able to send their children to school in Walvis Bay or Swakopmund as the schools fees amount to N$600 per year.[13] Also, the few school hostels are expensive. It was also noted that the many distractions that life in town offers is another reason for children dropping out of school. In total only four Topnaar (in the Soutrivier settlement) had completed, or were about to complete, their secondary schooling (i.e. Grade 12). One now attends college in Windhoek, one is employed in the tourism sector, one is unemployed in Walvis Bay and the fourth is unemployed and living in the settlement.

[11+12] Lower number due to data missing for Os-water.

[13] *It must be noted that as of January 2013, the constitutional right to free education in state pre-primary and primary schools became a reality, hence payment of school fees is no longer required.* However, there are other school-related costs which are unaffordable for a high number of Namibian families.

Health

There are hospitals in the major centres of Erongo Region. People in urban areas do not seem to have a problem with accessing health facilities, although some still say that they are refused access to medicine and services if they cannot pay – which contradicts government policy. In Armstraat (one of the Topnaar settlements closest to Walvis Bay), community members considered the Government's medical services to be excellent (NPC 2007). In rural areas, communities are served by either static or mobile clinics. The Topnaar who do not live close to a town depend on the mobile clinic that comes from Walvis Bay every month, since finding transport to any hospital/clinic is a big problem. A lack of food is another problem with regard to health: when taking medicines, one must also eat, and people living in poverty do not always have access to food.

4.1.1.4 Access to land and natural resources

The Topnaar live in one of Africa's largest protected areas, i.e. the Namib-Naukluft Park, which spans an area of almost 50 000 km^2. The Topnaar live along the Kuiseb River inside the park, and were guaranteed rights of residence by Queen Victoria more than a century ago. Evidence of Stone Age life along the Kuiseb River dates back 200 000 years. Other archaeological finds indicate that the area was used by semi-nomadic communities when rain provided enough grazing for animals (MET[14]).

In 1907, German Governor Friedrich von Lindequist proclaimed the park as Game Reserve No. 3. Initially it was to serve as a buffer zone to restrict English sovereignty of Walvis Bay. With the creation of the Naukluft section it was enlarged to serve as a sanctuary for Hartmann's mountain zebra which are endemic to Namibia. The most significant change in the park boundaries occurred in 1986 when the old Diamond Area No. 2 and a portion of Diamond Area No. 1 were incorporated into the park (ibid.).

Park and conservation regulations prevent the Topnaar from hunting inside the park. However, the MET and the Topnaar Traditional Authority collaborate in harvesting game in the park once per year, and meat is distributed to the Topnaar settlements. Due to the area's aridity, farming is possible only along the Kuiseb River, and livestock never stray too far from water points on the riverbanks. Sometimes during good rainy spells, livestock are allowed to share grazing with game on the plains.

Traditionally the Topnaar were nomadic hunter-gatherers, entirely dependent on the seasonal harvesting of *!nara* melons and other plants, fishing and hunting wildlife. Reports from the 19th century (Koehler, cited in Dentlinger 1977) state that fish were caught in the vicinity of Walvis Bay. Palgrave reported in the 1890s that Topnaar men were sometimes employed to help unload cargo at the Walvis Bay docks (Koehler 1969). Thus the purely traditional lifestyle of the Topnaar has not been in evidence for at least 120 years, and since the 1960s or even earlier, wages and small pensions from family members working in Walvis Bay or at the Gobabeb Research and Training Centre have played an important role in shaping the livelihoods of the Topnaar in the Kuiseb Basin. Today many Topnaar turn to the labour market for work on commercial farms and in towns such as Walvis Bay where they are

[14] http://www.met.gov.na/Documents/Namib-Naukluft%20Park%20Profile.pdf (accessed 11 September 2012).

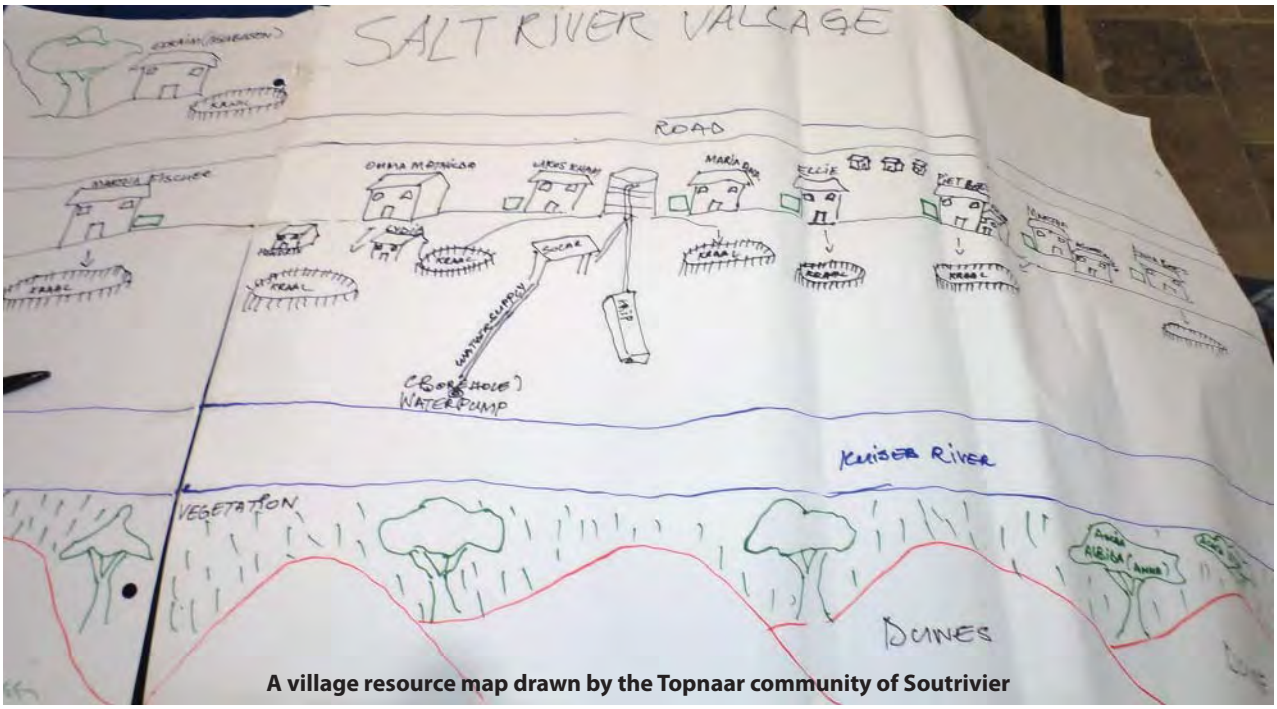
employed mainly in the fishing industry. Without education and skills, their opportunities for employment in Erongo Region are limited (Hoadley 2005). Opportunities for employment on farms in this mostly hyper-arid and arid region are also severely limited. Recent decades have seen an ever-increasing volume of tourism through the region, but this too provides only limited jobs to unskilled people.

Industrial activity in Erongo is limited and based on fish processing which is concentrated in Walvis Bay. Small and medium enterprises (SMEs) in the region have concentrated mainly on trade and services, and to a lesser extent manufacturing, in the urban areas. The SMEs depend primarily on the buying power of those in formal-sector employment.

Apart from the *!nara*, several plants, also dependent on the seasonal flooding of the river, still have significance for Topnaar livelihoods in the Kuiseb Basin. *Acacia erioloba* (Camelthorn) is a hardwood tree with profuse pods that thrives throughout Namibia along the ephemeral rivers. It provides an important source of shade, firewood and food for wildlife and goats. The gum, bark and roots are used medicinally (Van Wyk and Gericke 2000), and the Topnaar eat the pulp of the pods during extreme droughts (Mizuno and Yamagata 2005). The leaf litter of the *Faidherbia albida* (Ana), a large tree which sheds its leaves and pods annually, is a vitally important food source for goats in the dry season.

According to Hartman (2010), the Topnaar were renowned for their agricultural activities along the Kuiseb River, but due to industrialisation, water shortages and competitive prices for agricultural products, this activity deteriorated dramatically. In October 2010 the Ministry of Agriculture, Water and Forestry opened an office in Utuseb. Hartman's article quotes the Topnaar Chief deeming this a crucial step in reviving Topnaar agriculture.

The Soutrivier community drew a village map to help us understand the importance of several natural resources and livelihood strategies (see photo below and the transect-drive findings in the Appendix, Figure 5). The map shows the road that divides the residential



A village resource map drawn by the Topnaar community of Soutrivier

area, and the Kuiseb River lined by trees such as Camelthorn and Ana. It also shows water points, livestock kraals and areas of vegetation (grazing and *!nara* bushes). Lastly, although not drawn on the map, the Gobabeb Research and Training Centre is important as it provides employment and possibly emergency support. The importance of livelihood strategies and access to natural resources has changed over time, as discussed in section 4.1.3.1.

Water

As water is a precondition for having livestock, it is important to look at access to water in detail. The development of permanent water points in the late 1970s and early 1980s encouraged settlement and an increase in livestock (10 boreholes were drilled along the Kuiseb River). Before the permanent water points were drilled, the Topnaar community depended on water from natural pools, springs in the river and hand-dug wells (*gorras*).

In the year 2000, solar pumps were introduced to replace the windmills and the diesel engines. The Government has made efforts since the middle of the present decade to hand over the ownership and management of water points to communities throughout Namibia. The Topnaar, however, have experienced a number of problems with the management and maintenance of their water points. For example, some have never been fully operational and some are in need of repair. Such problems have hampered the handing over of the management responsibility. Community members remarked that they do not want to be the owners of a system that is in bad condition.

4.1.2 Impacts of climate change and variability on indigenous peoples in the sub-region

4.1.2.1 Local perceptions

The Topnaar could not directly identify any impacts of climate change on their livelihoods, thus the research team decided to develop trendlines to determine their perceptions of the changes in environmental conditions and the impacts of these on their livelihoods. The changes in floods, droughts, wind, rain and temperature were discussed, and Figure 7 on the next page shows the changes in climate-related factors over time (line relationships rather than absolute numbers), which had various social, economic, physical and natural impacts. Figure 7 shows that the number of floods increased in the years 1990-2000, and there was a major flood in 2011 – as also documented by the Gobabeb Research and Training Centre (see Appendix, Figures 4a and 4b). The community assumed that the following five years (2012-2017) would see a decline in the number of floods, and this is borne out by the findings of our literature study. Figure 7 reflects the close relationship between rain and floods, and community members also saw a relationship between droughts and floods in these trendlines.

In 1990 there was a strong east wind which affected Topnaar livelihoods because people could not leave their houses or cook outside, and winds damaged plants and gardens. However, strong winds have the positive impact of blowing down tree pods which the Topnaar use as animal fodder. According to the community, the winds increase when the floods decline.

The temperature trendline shows that temperatures were more or less constant between 1990 and 2000, and decreased as from 2000. The Topnaar prefer cold temperatures because

they afford them more energy to work. The community assumed that temperatures will decrease in the future, but the literature study found that they are more likely to rise.

Figure 7: Trendlines on climate change hazards: perceptions of the Topnaar community

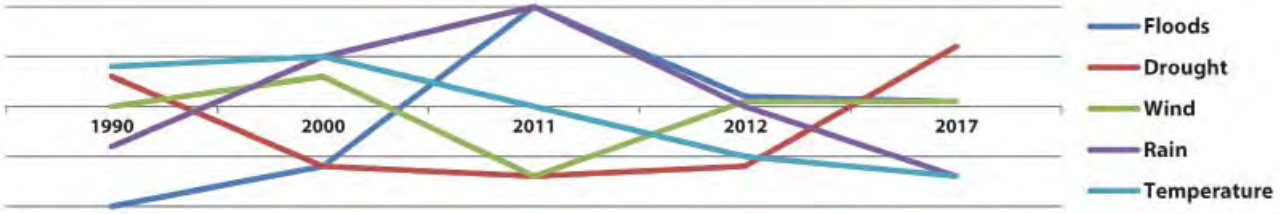


Figure 7 shows the trends of climate-related factors as perceived by the community. The Gobabeb Research and Training Centre has recorded the annual rainfall for decades (see Appendix, Figure 6), and this record accords with the perceptions of the Topnaar community. The Gobabeb record shows that rain has increased in most years since 2006, with heavy rains in 2011, and no increase in the years 1990-2006 as there was no rain in that period.

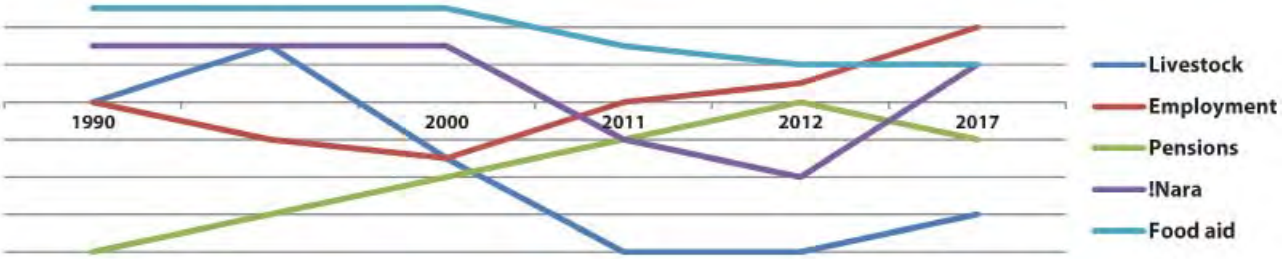
Figure 8 below shows the livelihood changes as perceived by the community. Relationships between environmental issues and livelihood strategies can be detected, but most of the changes are due to non-climatic drivers of change (e.g. access to education and employment, and opportunities to sell *!nara* seeds). The changes in livelihood strategies as shown in Figure 8 are related to time; the figure says nothing about the importance of each strategy, which has been discussed above.

The importance of livestock increased in the years 1990-2000. In that period the Government gave the Topnaar a lot of support (food aid), thus they did not have to sell most of their livestock to eat or to buy food. However, since 2000 the importance of livestock has decreased due to floods, in which livestock drowned or got stuck in mud and died. It was said that the importance and number of livestock can only increase when there is more employment (i.e. more wealth to invest in livestock instead of selling it in times of need) and when there are fewer predator attacks. These usually take place towards the end of the year, being a dry period. At this time of year, goats have given birth and the young are more vulnerable to predators. It is interesting that the community made this point because Turpie et al. (2010) noted that a reduced presence of wild ungulates renders goats more vulnerable to predation. The community also experienced a high number of attacks during the flood of 2011 because jackals also usually feed on *!nara* plants and these were washed away, so they had to look for alternative food sources.

The *!nara* harvest was not the most important livelihood activity in the years 1990-2000 because the harvest is seasonal and did not provide a monthly income. However, at that time the harvest was carried out sustainably, which, according to the Topnaar, is often not the case today due to the influx of 'outsider' harvesters. The importance of the *!nara* plants can only increase when harvesting is done sustainably again. More information on the *!nara* plants is provided in section 4.1.2.2 on the key impacts of climate change.

As Figure 8 shows, employment became an important livelihood strategy directly after the floods of 2011. This is due to temporary casual work (fixing fences, etc.). The Topnaar believe that employment opportunities will increase due to more support coming from people outside the community.

Figure 8: Trendlines on livelihood strategies: perceptions of the Topnaar community



Other important livelihood strategies which are not directly affected by climate change are pensions and food aid. Pensions are very important because they assist families every month with paying children's school-related costs and other costs. However, the community said that pensions will become less important when the current pensioners die because the younger generation will not be eligible for pensions for some years to come. Food aid has been important only since Independence in 1990. In 2000 this support declined due to stricter requirements, but it increased again in 2011 due to the floods.

4.1.2.2 Key impacts


The Kuiseb River flooding in 2011

To illustrate the impacts of environmental changes, we used the example of the floods of 2011. This was a major environmental event that impacted significantly on the Topnaar livelihoods – mostly negatively but in some respects positively. When the river started to flow, the Topnaar first perceived this as positive because the area had not received a lot of rain for a long time. But when the Kuiseb continued to flow – and not only the Kuiseb but also the small rivers draining rainwater from the nearby Namib plains – they began to worry about their livestock and houses. The community relates this flood to climate change because they had never experienced this kind of flooding in their lives.

The flood caused a loss of livestock which either got washed away or got stuck in the mud and died. There was also less access to the pods of the Ana tree (*Faidherbia albida*) which are used as animal fodder; these trees occur mainly on the south bank of the river and are accessible only when the water level is low. The Government helped the community with fodder for their livestock. Other impacts of the flood were inaccessible roads and damaged *!nara* fields – especially those along the river. The *!nara* bushes in the dunes bore higher-quality fruits, but they were difficult to access. In general the *!nara* harvest was better in 2011 compared to previous years due to the high groundwater level. On the other hand, it was said that too much water is not good for *!nara* because it rots the plants.

The community also had to re-bury some coffins as the cemetery was located too close to the river (*The Namibian*, 24 May 2011). Up to 14 graves were relocated to prevent their

being swept away by the Kuiseb. The stronger and wider river of 2011 had already carved away the ground of the graveyard. The 'head side' of some coffins was washed away, and the private sector donated seven coffins to replace the damaged ones.

Table 11 shows us the positive and negatives outcomes of the flood in 2011, according to the participants.

Table 11: Impacts of floods in 2011: perceptions of the Topnaar community

Positive impacts	Negative impacts
1. *!Nara* bushes bore more fruits 2. We get good grazing areas along the gravel roads, but we can't move far because there are wild animals there (predators). 3. It's good for the gardens when it rains. 4. The water level is rising (being replenished).	1. Water points were destroyed. 2. *!Nara* plants got washed away. 3. *!Nara* rots if it gets too much water. 4. Roofs were leaking because of all the rain. 5. When you use wood for cooking, it is very difficult because the wood is always wet. 6. The rains are not good for the kraals because you get worms and the livestock will eat them and as a result they get sick. 7. Lightning can kill the livestock (that comes together with rain and the smell of the seeds attracts the lightning). 8. Trees in the riverbed get uprooted.

According to the Regional Council's former Disaster Manager, children developed diseases from playing in the river during the floods. Moreover, it was the first time that mosquitoes occurred in this area.

If floods occur annually, the Topnaar would be pleased because good *!nara* harvests would continue. However, annual floods would force them to move their houses away from the riverbed. With more refuent floods, the trees in the riverbed will not have enough time to recover, and more invasive grasses will grow. The former Regional Disaster Manager said that around 80% of the *!nara* plants were destroyed in the flood of 2011, and that it could take 10-20 years for them to recover. The box below provides more information on the impacts of floods on vegetation along the Kuiseb River.

Flooding of the Kuiseb River – vital for the survival of *!nara* and other vegetation

The livelihoods of the Topnaar living in the Kuiseb valley are closely linked to the annual flooding of the Kuiseb River which ensures that the water table is high enough to sustain its function as a linear oasis.

Van Damme et al. (1992) report that the Topnaar community makes use of at least 50 different desert plant species for dietary and medicinal purposes, but one plant in particular, the *!nara* (*Acanthosicyos horrida*), an endemic, arid-adapted plant which grows in the dune areas on the southern bank of the river, has served as a vital source of income and nutrition for the Topnaar since their arrival in the Kuiseb valley (Dentlinger 1977). This plant has an extensive taproot system that reaches to the water table. Water is stored in its melon-like fruits which produce large numbers of oil-rich seeds.

Annual flooding of the Kuiseb is considered vital for the regeneration and survival of *!nara* (Masaaki 2005) and the large trees that line the banks (Schactshneider and Edmunds 2010). The Topnaar use its seeds seasonally as a staple food and a source of cash income at harvest time. In 2005 it was reported that 40% of Topnaar harvesters had no other source of income in the harvesting season (January to May) (Masaaki 2005).

The highest density of these plants is found at Nara Valley (an inter-dune valley) situated 15 km downstream from Soutrivier village. Shilomboleni (1998) reports that conditions for *!nara* growth have deteriorated over the decades, and crop yields have decreased in recent years. This could be due to changes in the Kuiseb's flow, the flood protection walls built in 1961, the lowering of the water table and altered climatic patterns (Masaaki 2005).

On the other hand, should floods no long occur, this will have an impact on the livelihoods of the Topnaar. Turpie et al. (2010) state that when the upstream water abstraction increases and global climate change becomes a reality (rainfall declines), the Kuiseb water levels will decline. This will have implications for the area's biodiversity and the Topnaar survival methods since the large trees provide shade and fodder for their goats. Indeed the community noted this: "Fewer floods will lead to [the production of] less seeds for our livestock since the water level is low the trees will die." Their area is protected from sand dune 'creep' by the periodic flowing of the river which scours the riverbed and stops the dunes from moving northwards. If the river does not flow, the dunes will begin to encroach on the riverbed, and this will encroach on the vegetation, making living conditions even more difficult.

In sum, regular floods which are not as extensive as those in 2011 are considered to have a positive impact on the Topnaar livelihoods.

According to the community, the Government reacted fast to the floods, providing lots of support (e.g. toiletries and clothing) in collaboration with the Red Cross. However, the community complained that some of these items never reached them because they reside far away from the distribution point (at Utuseb) and they lacked transport to access the aid. Thus the aid was not equally distributed among all of the Topnaar settlements; some people received it and others did not – and the TA played a major role in this regard (see section 4.1.1.2 above). The Walvis Bay Council donated N$10 000 worth of basic necessities such as flour, mealie-meal, salt, sugar and oil, as well as juice and Vaseline, for over 480 people. In addition, businesses and local authorities provided aid, which was distributed free of charge through the office of the Erongo Regional Governor (*The Namibian*, 24 May 2011).

In comparing their strategies for coping during the floods of 2011 with the strategies of people in Walvis Bay, community members argued that they could cope better, because, whereas they could collect water directly from the river, people in Walvis Bay had to stand in a queue for a long time to collect water (since the main pipe to the town was washed away in the floods). However, the community did experience problems with firewood, which was wet, whereas people in Walvis Bay did not face that problem.

The Regional Council's former Disaster Manager said that the Topnaar community does not have a coping strategy as the river is their main livelihood source. He compared their livelihoods with people in Kavango Region who can find bushfood, whereas the Topnaar cannot because of their environment. The Regional Council and the Office of the Prime Minister (OPM) provided flood relief to the Topnaar community. For one thing, they transported potable water to the tanks of all settlements along the Kuiseb River weekly. Before providing other flood aid (maize-meal, sugar, fish and cooking oil), they carried out a rapid assessment. The flood aid was then delivered per household rather than per individual, but this made the distribution to smaller and larger households inequitable and unfair. The UN normally works with a standard of 2000 kilocalories per individual, but this standard was not applied for the Topnaar due to high costs. Moreover, the Regional Council reduced the number of households on the list as there was not enough food for all of the households. For the community's livestock they provided fodder, which was delivered every two weeks. Even springbok came to eat this fodder. To cope with the floods as a community, the Regional Council advised them to sell some of their livestock and to form cooperatives. The former Disaster Manager said that the Government copes with transitory situations, but the impact in this

area is chronic. As a way of making positive use of the floods, he suggested using the water for agriculture, and channelling the water to dams. He also noted that to date the Government has mitigation strategies in place, but no prevention strategies. Support for diversifying livelihoods would fall under the latter.

Community members mentioned some coping strategieis. To cope with a situation such as the floods of 2011, people "pray every day and night". Besides this, they moved their kraals towards the gravel plains and away from the river. When pumps are washed away in a flood, people can dig holes in the river to abstract water. This strategy is used mainly at Klipneus and Swartbank, where they also bought a generator to abstract water from the river when needed. Some people said that they prefer the water from the boreholes as the taste is not as brackish as water abstracted by the solar pumps. Communities that live in closer proximity to the Gobabeb Research and Training Centre collect water from there during floods. The community also said that they could respond better to floods if they could know when the floods are coming. For example, they could keep their animals in the kraal to stop them straying away from home. But better communication strategies (i.e. "early flood warning systems") would be needed for taking such preventive measures.

4.1.2.3 Contributing factors

We dealt with this in the vulnerability context under section 4.1.1 in detail. In summary, the most important interrelated contributing factors are:
In summary, the most important interrelated contributing factors are:

- the aridity of the land;
- living in a national park –
  - this hampers access to natural resources such as hunting;
- a lack of education;
- Favouritism on the part of the Traditional Authority –
  - this hampers access to other livelihood strategies such as employment and access to further outside support;
- a vulnerable economic position;
- the Ministry of Agriculture, Water and Forestry's lack of capacity to maintain the water points;
- a lack of access to resources needed to invest in education, livestock and alternative livelihood strategies (e.g. gardening);
- the influx of outsiders to the *!nara* fields;
- the conditions of the *!nara* commercial market in Namibia; and
- The increase of *!nara* harvesting.

4.1.3 Traditional knowledge and adaptation to climate change and variability

4.1.3.1 Indigenous peoples' adaptive capacity and resilience

The Topnaar have lived in a harsh environment for centuries, so they have several livelihood strategies, described in section 4.1.1.3. These strategies can be understood as strategies for adapting to the environment even before climate change began to have a serious impact.

Farming with small livestock (rather than with large livestock) and harvesting *!nara* are Topnaar strategies for adapting to their harsh environment. Another adaptation strategy in this super-arid environment is the diversification of livelihood strategies – combining livestock, *!nara* harvesting, pensions, food aid, employment and piecework.

Climate change will impact on the Topnaar livelihood strategies. The community identified different wellbeing categories, and said that the strategies of better-off households for coping with the changing environmental conditions will differ to those of the other categories. Regarding frequent floods, it was said that the better-off households can collect food aid with a car, whereas the medium and poor households have problems with transport. Further, the better-off households can collect the Ana tree pods with a car before a flood starts, so they have fodder reserves when the flood starts, whereas the medium and poor households collect pods with a donkey-cart or on foot, and so do not have enough fodder reserves for their livestock during a flood. In general it was argued that the better-off households can cope better than the other two categories, also because they can afford to pay workers and they have better connections to the Government (e.g. family relations with the TA).

4.1.3.2 Indigenous peoples' adaptation strategies

We begin this section with an overview of the community's perceptions of the climate hazards facing them and their potential responses.

Table 12: Correlation between hazards and responses: perceptions of the Topnaar community

Hazard result	Response 1	Response 2	Response 3
Floods			
1. Water pumps washed away	Dig water from river bed and use traditional wells	Buy generator to abstract water from the river	Collect water from other communities
2. Animal diseases	Use natural remedies	Ask Agricultural Extension Officer for advice	
3. Animals washed away or stuck in mud	Better monitoring of own livestock	Better system of communication on floods	
4. Reduction of fodder (pods)	Cooperative to collect pods before flooding starts		
5. *!Nara* fields affected	Allowing *!Nara* fields to recover	Small-scale cultivation of *!Nara*	Stress the importance of sustainable harvesting methods (without success)
Drop in water level			
Changes in vegatation	No response given	No response given	No response given
Drought			
Lack of grazing	Focus on adapted livestock such as goats and donkeys	Go to other grazing areas	
Wind			
Solar panels blown away	Wait for NamWater to fix		
Lightning			
Livestock killed	Get livestock out of kraal		
Bush fires			
Trees affected	No response given	No response given	No response given

As mentioned earlier, the community also faces problems with predators, and literature cited above predicts an increase in attacks in the future. However, living in a national park, the community is not allowed to kill the predators. Suggested coping strategies were keeping a closer eye on goats when they graze, and keeping them in the kraal overnight.

Access to *!nara* fields is an important livelihood strategy, but nowadays these are harvested unsustainably. Although this is not directly caused by climate change, it is important to look at this problem in terms of adaptation strategies. Community members had talked to "outsiders" whom they accused of harvesting the *!nara* unsustainably, but this did not seem to help. Secondly, they had approached their Chief in this regard, but did not know if he had taken the necessary steps because the situation had not changed. The community fears confronting the outsiders because they come in groups and Topnaar fear being beaten up. The research participants argued that the community's exclusive right to harvest *!nara* is not being enforced, but the researchers could not verify this.

A suggested adaptation strategy for the Topnaar community to enable them to cope with changes in their environment, such as increased floods, is to diversify their livelihoods. However, the Regional Council's former Disaster Manager emphasised that they would need a lot of support in this regard. He had looked into the possibility of date and olive plantations north of the river, and the Erongo Regional Council decided to implement this project for the Topnaar. The date trees were a donation from the Namibian Development Corporation, and the Regional Council provided the olive trees. Around 18 of the 20 olive trees grew, and only a few date trees survived. Around seven community members were involved in this project. The problem with the project was that the community members could not afford to invest all of their work time in a project that would reap an income only two years later when the plants are ready for harvesting. They would need support from the Government while waiting for harvesting time. The Regional Governor had visited the project, but apparently took no further action. According to the interviewee, the government representatives have a good knowledge of the circumstances and challenges of the various communities, but they are challenged by the frequent lack of resources at regional level: regional and local government can develop promising project ideas, but the financial resources needed to make them a reality are not always forthcoming from central government.

Diversification as an adaptation strategy was also mentioned by community members in individual interviews. More work opportunities are needed to facilitate diversification. Casual work (e.g. at Gobabeb) is preferred because people do not enjoy life in the towns; they find it hard to adapt, and town life is more expensive. Another strategy could be producing and selling crafts (e.g. jewellery fashioned from *!nara* and Ana pods) or traditional Nama dresses along the road, which tourists might buy. However, there are no sewing machines for producing the crafts. Desert Hills is very interested in selling Topnaar arts and crafts in the company's farm shop, but the quality of the crafts produced thus far is not good enough.

4.2 Case Study Two: the Hai||om

For this case study, two Hai||om communities were selected: the Tsintsabis and Farm Six communities. The research team decided to visit both communities because there are considerable differences in the arrangement of the two villages and in their poverty levels. For the purpose of this study, several community workshops were held at both sites, and a questionnaire was conducted with a total of 25 households (121 individuals – 45 in Tsintsabis and 76 on Farm Six). The average age of the interviewees was 41.


Tsinsabis


Farm Six

Tsintsabis

After Independence, several Hai||om were resettled at Tsintsabis, located about 60 km north of Tsumeb. Most of them had been farm workers on white-owned farms established before Independence on the Hai||om ancestral land in the areas surrounding Tsintsabis. To the south, Tsintsabis is flanked by commercial farms (historically owned by white settlers but nowadays increasingly owned and managed by emerging black farmers). To the north and north-east, Tsintsabis is flanked by semi-commercial farms owned by Owambo and Kavango farmers.

The settlement of Tsintsabis occupies a 3 000-hectare (ha) piece of land. Before Independence it was first a commercial farm and then a South African Police "rehabilitation" station where captured fighters of the People's Liberation Army of Namibia (PLAN) were detained. After Independence it became a resettlement project mainly for San families. It was meant to accommodate 80 households, with 80 plots allocated, each measuring 10 ha. The plots are not all suitable for intense agriculture; some are too sandy. More people moved into Tsintsabis later. Before the Roads Contractor Company (RCC) started to build a road from Tsintsabis to Katwitwi on the Angolan border on 9 May 2009, Tsintsabis had around 3 000 residents, most of whom were San. Since then, an estimated 1000 people have moved in (mostly Hai||om, but also Kavango, Owambo, Damara, !Xun and Caprivian), so today there are about 4 000 residents. It was mentioned that some Owambo people have occupied land which the Ministry of Lands and Resettlement (MLR) had not allocated to them, and that some of them have illegally fenced off bigger plots for their livestock and *mahangu*. It was said that the new incomers include government officials (e.g. a magistrate living in Tsumeb, nurses, teachers and doctors). There is conflict over who is allowed to allocate land – whether the MLR or the Traditional Authority. San at Tsinsabis feel that they have

poor land rights. Some feel that others just take land away (e.g. the RCC "took" plot from one person and Mobile Telecommunications Ltd (MTC) erected a cellphone tower) without compensation for the land lost.

Farm Six

Situated 50 km north-west of Tsintsabis is the Mangetti West Block, an area of about 80 000 ha which was originally acquired by the South African Administration for use as a quarantine camp for livestock moving from the northern communal areas into the commercial farmlands to the south. Farm Six is one of eight cattle posts in the Mangetti West Block. Today the Namibian Development Corporation (NDC)[15] leases the Mangetti West Block from the Government of Namibia. Originally this area was inhabited by Hai||om San who survived mainly from hunting and gathering. Areas further north of Tsintsabis are traditional communal lands used by agro-pastoral Oshiwambo-speaking communities.

It is not clear how many Hai||om reside on Farm Six. The Hai||om say that they cannot count, so the number is unknown to them. However, according to the farm manager, the NDC counted about 400 San in 2011. The Government's regional poverty profile of 2007 (NPC 2007(a)) provided an estimate of 110 households at that time. The living standards of the Hai||om on Farm Six are even lower than those of the Hai||om in Tsintsabis. The Farm Six community depends to a higher degree on natural resources, particularly bushfood, but their access to land is increasingly limited. A major impact on this access was the allocation of a considerable amount of land in the Mangetti West Block to Owambo farmers who had to move from an area in Kavango Region due to a grazing dispute with the Kavango community in that area. Three cattle posts totalling 30 000 ha north of Farm Six, inside the Mangetti West Block, are currently being sub-leased by the NDC to the Owambo farmers until they can find alternative grazing for their cattle. The cattle posts allocated to these farmers include areas with valuable bushfood previously used by the Hai||om, which are now off limits to them; they have been fenced off, and the Hai||om are only allowed to use the area in exchange for doing piecework for the farmers. Owambo farmers apparently accuse the Hai||om of cattle theft when they enter the area.

4.2.1 Vulnerability and opportunity context for the case study

4.2.1.1 Environment, climate hazards and impacts

Oshikoto Region supports a fairly high plant diversity, with over 400 species recorded (Mendelsohn et al. 2002). Similarly the region has a moderately high natural diversity of birds and mammals. Large game species that still thrive here include ostrich, springbok, oryx Burchell's zebra and hartebeest, but their densities in rural areas outside parks and conservancies are now likely to be very low due to illegal poaching. Elephants periodically

[15] The NDC was established under the Namibia Development Corporation Act 18 of 1993. The Government of the Republic of Namibia has a 100% shareholding in the NDC, but the corporation is controlled by an autonomous board of directors. The NDC's objective is the provision of financial and related services on the basis of sustainable operations (http://www.ndc.org.na).

break through the fences of the Etosha National Park, and these animals are capable of causing immense damage to infrastructure and subsistence crops.

Seasonal flooding sustains small seeps and *omurambas*. The latter remain dry for most of the year, but, like the ephemeral rivers in the Namib Desert, they support areas of higher biodiversity and vegetation.

In the area around Tsintsabis, Acacia savanna dominates the landscape. It is characterised by open expanses of grasslands dotted with mostly thorny Acacia trees, but it also includes areas where mopane (*Colophospermum mopane*) and other trees such as Commiphora dominate. *Colophospermum mopane* and *Dichrostachys cinerea* are invader shrubs which cause bush encroachment in this area. Bush encroachment is a form of land degradation that lowers the land's carrying capacity. It occurs in Namibia mostly on soils that have been extensively overgrazed by domestic cattle.

As the Hai||om livelihood strategies become more threatened by difficult climatic conditions, their poverty is likely to increase. Information provided in Turpie et al. (2010) together with baseline information presented in Mendelsohn et al. (2002 and 2006) points to the possibility of various climate changes occurring Oshikoto Region:

- Firstly, the temperature will rise by 4°C.
- Secondly, aridification is liekly to increase throughout the region, with a corresponding reduction in primary productivity and agricultural potential. Rainfed crops will become increasingly less viable by 2050, and cattle will have to be replaced by more arid-adapted goats and sheep. Commercial farms that offer employment to Hai||om will become less viable, and opportunities for wages or working for food from the formal farming sector will decline.
- Thirdly, although some commercially valuable bushfoods or indigenous natural products (INPs) (e.g. *Commiphora* sp., Devil's Claw and Hoodia) may benefit from climate change in Namibia, and may perhaps even expand their range into new areas in response to the expected aridification (see SAIEA 2010), many other valuable plants (specifically the less arid-tolerant savanna species such as marula) are likely to shift out of their current ranges. Overall there is likely to be a decline in the variety and availability of many plants and small animals currently encountered in Oshikoto Region. This will threaten food security, especially for those Hai||om who depend heavily on bushfood for their survival. Declining food security throughout the region will result in increased competition and potential conflicts over available grazing, bushfoods and INPs with potentially high commercial value. Illegal poaching in conservancies and parks is also likely. There will be insecurity of both food and water availability due to reduced groundwater recharge, lower water tables and less surface water (small seasonal springs and seeps).
- Fourthly, Turpie et al. (2010) report that reduced primary production and carrying capacity will lead to a decline of 11-22% in the numbers of the main grazing wildlife species throughout Namibia. This will reduce potential for hunting and tourism in the area, which will indirectly reduce opportunities for some Hai||om to earn a living through this sector.
- Lastly, climate changes beget several health constraints, particularly those related to vector-borne diseases. The incidence of malaria could increase in Oshikoto Region during wet years (Tarr 1999).

4.2.1.2 Governance

San development

In 2005, seeking to "develop" San communities in Namibia, the Office of the Prime Minister (OPM) implemented the San Development Programme, which the Cabinet approved in November 2005 (Cabinet Decision No. 25/29, 11.05/001). The main objective of the programme is to ensure the integration of the San into the mainstream Namibian economy in line with Vision 2030 (the country's long-term development policy) and specific national development programmes (ODPM 2008: 2). In 2007 the programme mandate was expanded to include the Ovatue, Ovatjimba and Ovahimba communities, whom the Government held were also marginalised and in need of special support. The Topnaar were mentioned in the discussions on expansion, but to date they are not included as a target group. In 2009, the San Development Programme was transformed into the Division for San Development, still within the OPM. This upgrade from programme to division was influenced by the ILO programme mentioned below. With this upgrade, the Government made a political statement, i.e. a statement of its intention to place importance on San development, and through the ILO programme it acquired more funding to support this effort. It is unclear why the division's name was not changed from "San development" to "development of marginalised communities", considering that this development effort was extended to other communities.

Projects of the Division for San Development since its inception as a programme in 2005:

- *Resettlement:* more than seven commercial farms were acquired, and members of the targeted marginalised communities were resettled on these farms.
- *Youth Skills Development and Employment Opportunities:* the OPM facilitates the recruitment of young people in marginalised communities in collaboration with various government ministries and other governmental or parastatal institutions.
- *San Women Projects:* thus far these include needlework/tailoring projects for producing school uniforms, another tailoring project and a bread-baking project.
- *Apiculture* (a beekeeping project)
- *Education*
- A *Coffin Manufacturing Project*
- *Aquaculture*
- *Gardening*
- *San Feeding Programme:* this is a monthly feeding programme run with assistance from the Directorate of Disaster Risk Management (DDRM) which also resorts under the OPM (see http://www.sandevelopment.gov.na/index.htm).

The San Development Progamme is clearly characterised by a top-down approach and a paternalistic attitude towards the various San communities. It lacks a clear vision, and handouts rather than empowerment are predominant. For the people in Tsintsabis and on Farm Six, food aid (see below) is the most tangible outcome of the programme.

Inspired by the Government's recognition of the special needs of the San, the ILO implemented the Namibia component of its Indigenous Peoples Programme in 2009, with the objectives of contributing to reducing poverty levels and improving the socio-economic situation of the San peoples through a rights-based approach. The main outputs are public and private stakeholders' improved awareness and acknowledgement of indigenous peoples' rights,

and improved capacities of government ministries and other selected actors to apply the principles of ILO Conventions 169 and 111 in development programmes and activities with San communities across Namibia (ILO 2008).

In short, the ILO acknowledges the Namibian Government's goodwill with its San support, but has also identified shortcomings in the programme, hence it is trying to bring the Government more in line with ILO principles, and to improve the coordination of San support in Namibia. However, the OPM Division for San Development, with its paternalistic and welfare approach, is facing many obstacles in implementing the programme.

Traditional authority and political representation

Customarily, as with many other hunter-gatherer societies, the social organisation of the various San groups made no provision for a single traditional leader. Instead, headmen of smaller family groups had certain responsibilities, especially in the context of the management of natural resources. The Traditional Authorities Act 25 of 2000 essentially applies the traditional system of northern Namibia (i.e. the systems of Oshiwambo-speaking groups, who constitute over 50% of the Namibian population) as a model, and takes a one-size-fits-all approach, which poses many risks. Moreover, the Act makes provision, albeit limited, for the involvement of rural communities (via their Traditional Authorities) in decision-making processes. As a result, San communities perceive the institution of Traditional Authority (TA) as defined by the Act as an important tool for making their voices heard, and they have fought, with the support of NGOs, for official recognition of their own TAs. After many years, five of the six San TAs (Hai||om, !Kung, Ju|'hoansi, Omaheke North and Omaheke South) were eventually recognised. Only the Khwe TA in West Caprivi, having waited for 10 years already, is still waiting for official recognition. The Chief of the neighbouring ethnic group, the Hambukushu, opposes the recognition of the Khwe TA, claiming that the Khwe fall under his authority, and the Government has yet to reach a decision in this regard.

Nevertheless, since their inception, three of the five recognised San TAs have faced serious complaints from their communities on issues such as a lack of consultation, corruption, a lack of transparency and favouritism. A TA, according to the Act, should be designated according to the customary law of its traditional community. The customary laws of the San communitieis, unlike those of many other traditional communities in Namibia, do not make any provision for the establishment of TAs. In some cases it is unclear how the San TAs came into power. Party politics are said to play a role in this regard.

Because the customary social organisation of the San groups made no provision for a single traditional leader, the San TAs lack internal role models for their own leadership roles; they have only a vague idea of the roles and duties linked to leadership positions. Also there is often a lack of understanding regarding their role in the overall national governance system, and a lack of awareness that their jurisdiction is limited to their customary laws and practices. The Hai||om TA, which was recognised in 2004, is no exception in this regard. Many community members do not know how exactly their Chief came into power, and interviewees stated that affiliation to the ruling party, SWAPO, might have played a strong role. They do not feel properly represented by the Chief, who is based in the town of Outjo (south of Etosha) and is said to care mostly for the Hai||om in that area and for his own relatives.

Moreover, the Hai||om TA, with its headquarters in Outjo, is not known to the Hai||om in Tsintsabis, many of whom have never even seen the Chief, despite his having served as the recognised Hai||om traditional leader for nine years. Tsintsabis has a local Headman, who is also the TA's Senior Councillor, but he has been facing criticism for allegedly giving land away to outsiders. Also, the Hai||om of Tsintsabis appear to want to split from the overall Hai||om TA and have an independent TA, but it is not clear whether this is just the Headman's ambition or one that the whole community supports. It was difficult to discuss the TA-related issues due to the presence of one of the TA advisors during the meetings.

Whenever the community has a problem, for example losing land to other ethnic groups, it appears that they can turn only to the local Headman. They have made their complaints clear to him, but the community does not know whether he goes to the Chief to talk about these issues. Nonetheless it seems that the community has lost faith in him over the years.

Regarding local government institutions, the MLR office in Tsintsabis is not perceived to offer much help to the community. Apparently this office does not want to offer assistance in response to their pleas, and when community representatives take complaints to the Regional Councillor they are referred back the Tsintsabis MLR office. For this reason the Hai||om do not consider the Regional Councillor to be of any help to them either.

The situation on Farm Six is even worse. The Hai||om there have no elected representative or official Headman. They do not know the Chief based in Outjo and do not feel represented by him. It does not seem that they make any effort to communicate their problems to the TA in Outjo, firstly because they do not trust in the TA, and secondly because a big effort is required to reach the TA, due to transport costs especially.

Regarding local, regional and national government, the situation is equally appalling due to the area's remoteness. For the people on Farm Six, it is even more difficult to reach government offices due to considerable transport costs and the effort required to secure transport: there is no public transport between Farm Six and Tsintsabis, so people rely on lifts for that trip, and transport between Tsintsabis and Tsumeb is expensive in view of their low income). Moreover, they feel that the Government turns a blind eye to the Hai||om because they do not have a strong leader who supports their cause. The Farm Six community argued that their lives changed after Independence, since the "black people" do not care about the San people. One person said that they were told at Independence that Namibia was now a democratic country so everything would be fine, and yet the only thing brought to Farm Six was poverty. The community feels that the Government and Regional Council visit and listen to their problems only in the run-up to elections, and that they make empty promises. The same applies to the other political parties, which usually turn up at election time. It appears that the ruling party intimidates the Hai||om of Farm Six, as reportedly the Regional Councillor tells them before elections that they will die of poverty if they do not vote for the ruling party. One may conclude from the discussion at Farm Six that the Hai||om there have no faith in the political system, and that voting has no meaning for them because they feel it has not changed anything for them.

4.2.1.3 Socio-economic conditions

In Figure 1 in the Appendix, it can be seen that Oshikoto Region, where the Hai||om San live, is the third-poorest region in the country.

In general, the San are arguably Namibia's poorest people. Most San communities in Oshikoto do not participate in an agriculture-based economy, and very few have access to employment on farms. They consider themselves to be poor because they depend on government aid, and also they depend directly on nature for their livelihoods. Although permanent water points have been established in most settlements, the poorest Hai||om in the region do not have the means to access sufficient water for irrigating small gardens. They also have very limited opportunities to earn cash, and as their environment degrades due to climatic factors and their own over-exploitation of food plants and animals (Barnes 2005), they have to walk increasingly long distances to find food. The NPC (2007(a)) records that many of the poorest people in Oshikoto feel impoverished due to residing on someone else's land. This restricts their sense of freedom of movement (ibid.).

Livelihoods

As with the Topnaar case study, we deal with Hai||om livelihoods in some detail in this section, as one cannot gauge the potential impacts of climate change on the Hai||om if one has no understanding of their livelihood system as the whole and their various livelihood strategies. The livelihood strategies described below are sequenced according to the 'importance' ranking worked out in the community workshops – the ranking shown in the box on the right.

Most important

- Sharing
- Pensions
- Food aid
- Chickens
- Goats
- Irrigated gardens
- Rainfed gardens
- Family members working in crop production (outside Tsintsabis)
- Piecework (*zula*)
- Livestock
- Bushfood, small business, employment, farm work, game

Least important

Sharing

Sharing is of primary importance to the Hai||om, as it relates to many other livelihood strategies, such as pensions, food aid and employment. To understand how Hai||om (and other San groups in Namibia) survive, one has to take the concept of sharing into account. As one participant put it, "Sharing is part of our lives; it is in our blood." Sharing was also said to be a reason for Hai||om people not being able to 'get rich'. The local research assistant interpreted sharing not as "a strategy of the poor", but rather as a primary aspect of Hai||om culture. The Hai||om have various methods of sharing among themselves, and the terms of sharing differ for each method. This information is consistent with anthropological literature on (former) hunter-gatherer societies which always points to the importance of sharing.

Table 13: Number of people receiving another income: Hai||om community at both sites (N=121)

Other source of income	Percentage
Receives income from another source	35.5%
Does not have another source of income	62.8%
Missing	1.7 %
Total	**100.0%**

The household questionnaire data confirms the importance of sharing. Asked whether they had other sources of income, 35.5% of the household respondents replied that they did have another source of income. A detailed look at the other sources of income (see the list on the next page) shows that sharing between members of the extended family, who are not necessarily household members, is important (see also under "small business" below).

This "other income" can include money that is earned by a boyfriend, girlfriend, husband or wife. Other sources are, for example, the pensions of relatives or self-employment (e.g. selling alcohol, chickens, crops or sugar).

Other sources of income:

- Husband
- Husband is a builder
- Husband is cow "watchman"
- Wife is a cleaner
- Wife's pension
- Boyfriend
- Boyfriend works at a school
- Former boyfriend
- Girlfriend
- Parents
- Grandmother's pension
- Mother's pension
- Father's pension
- Help from a relative
- Daughter
- Children
- Church pastor
- Cleaner
- Former member of the Electoral Commission of Namibia
- Making alcohol from mangetti
- Self-employed
- Selling chickens and eggs
- Selling surplus crops
- Selling cakes, sugar and tea
- Selling sugar, tea and maize-meal
- Shoemaker
- Short-term casual worker
- Used to herd goats

There is only a small difference between the Hai||om community on Farm Six and the community of Tsintsabis, as almost 40% of the Farm Six community has another source of income vs 30% in the Tsintsabis community (as can be seen in the following tables).

Table 14: **Number of people receiving another income: Tsintsabis Hai||om (N=45)**

Other source of income	%
Receives income from another source	28.9%
Does not have another source of income	66.7%
Missing	4.4%
Total	**100.0%**

Table 15: **Number of people receiving another income: Farm Six Hai||om (N=76)**

Other source of income	%
Receives income from another source	39.5%
Does not have another source of income	60.5%
Missing	0.0%
Total	**100.0%**

Pensions

Apart from sharing as the overall framework, the workshop participants deemed pensions the most important livelihood "strategy" – a common pattern among San and other poor households in Namibia. Pensioners (aged 60+), usually share their pensions with family members (see above). According to the the Hai||om, pensions will remain important because the pension amount is usually increased before every election, so in 2017 it might even be N$1 000. At the time of the research it was N$550, and it increased to N$750 in August.

People of Farm Six experienced several problems with this important livelihood strategy, such as the wrong age written on their ID card, or not having an ID or birth certificate because the regular burning down of huts had destroyed their documents. One participant said that he went to register for a pension since his ID stated that he was born in 1951, but he was sent away because the officers said that he looked too young and that he should first bring his birth certificate. Hai||om in general have a low education level, and quickly feel intimidated by officers and government officials. Furthermore, transport is costly and

people often cannot travel to the closest town Tsumeb (around 60 km from Tsintsabis and 110 km from Farm Six) to get to the offices of the respective ministries.

According to the questionnaire responses, 6 households in Tsintsabis receive a pension and 5 do not. On Farm Six, 9 of the 16 households receive pension. Looking at the Hai||om community in general, 95 of the 121 individuals do not get a pension and only 23 of the 95 receive a salary.

Food aid

Food aid was the next most important livelihood strategy. Most of the resettled Tsintsabis community receive food aid – usually consisting of two 12.5 kg bags of maize-meal and some cooking oil – under the above-mentioned programme of the OPM Division for San Development). One community member had lost his job and was depending solely on food aid and sharing for survival. Before Independence, people did not receive any food aid.

People on Farm Six are also highly dependent on food aid. However, it seems that they experience more irregularities and sometimes wait for months for the next provision. This seems to be the rule rather than the exception for San communities in remote areas of Namibia. Also, they only receive maize-meal (no cooking oil), and this, they say, motivates illegal hunting because you cannot eat maize-meal (mealie pap) on its own.

Chickens

At both sites chickens are regarded as an important livelihood strategy since people can fall back on chicken if there is no other food. Furthermore, chickens can be exchanged for maize. Eggs are also considered important.[16]

Piecework/employment

Piecework[17] is especially important for the younger people, but it is scarce. This changed somewhat between 2009 and the end of 2011 when the Roads Contractor Company (RCC) provided piecework opportunities, with people earning N$800 per month. Other piecework includes collecting and selling firewood, and working on commercial farms or at the Treesleeper campsite (operational since 2006). The campsite project plays an important role in the community because of the piecework available there, and the community relies on the eight community members who are permanent employees there. A lodge with bungalows is being constructed there, raising hopes that it will employ an additional 10 people.

Only a few Hai||om in Tsintsabis are permanently employed (22 of the ±2000 Hai||om). On Farm Six, only 8 of the 200-300 Hai||om are employed (by the NDC). The participants said that no young people were working in towns and supporting the households on Farm Six, which is not surprising given the area's remoteness and the very low level of education.

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16 The data sheets provided by Charapa did not separate chickens from other livestock. This might distort the picture as chickens are important for the Hai||om at both sites, whereas livestock is not important (see livelihoods ranking). Questionnaire respondents asked about the importance of livestock over time might have referred to chickens instead, but this is not reflected in the data.

17 The translator explained that the word for piecework is "*zula*", but this seems to include begging, so the word and the concept of *zula* may mean something like 'going around to look for something'.

The Hai||om on Farm Six also rely on piecework for the Owambo farmers, but this is even more scarce compared to the situation in Tsintsabis and other semi-urban areas. Most of the Owambo farmers have brought their own families to do the work. Moreover, the relationship with these farmers seems to be highly exploitative: one participant, for example, said that he had worked for 1½ months for one of the farmers but was paid for only one month.

Bushfood

In the past farmers allowed their Hai||om workers to collect bushfood during their free time, but nowadays the lack of access to land hinders this activity. However, collection of bushfood is still used as a coping strategy as soon as maize-meal fails to arrive from the Government (see more on bushfood in section 4.2.3.2).

For Farm Six, collection of wild fruits, bulbs and tubers is still one of the main livelihood strategies. Gathering still seems to supply a lot of their food today. "When we are very hungry we go to collect bushfood". A wide variety of fruits, and especially mangetti and *oonkete*, are consumed on a regular basis. Once the fruits are dry, they are peeled and the flesh is eaten; the nut inside the inner kernel is removed from its shell and pounded for consumption. Some households make this secretly because the farm manager prohibits this practice, for reasons not known to the Hai||om. The availability of wild fruits depends heavily (less for mangetti than for other bushfoods – see below) on the weather conditions; for example frost last year killed many plants.

Livestock

The number of livestock owned by Hai||om is low, especially compared to the Topnaar community; the average numbers are 0.29% in Tsintsabis and 0.78% on Farm Six. Of the 20 workshop participants, 4 had cattle, 3 had goats and 1 had sheep. The number of livestock per individual seems to be under 5 as a norm, and participants said that they don't own enough to slaughter and sell: "When you have more than 10, you can start to slaughter and sell." Thus livestock is used mainly for the milk – both to drink and to sell.

An NGO, KOMEHO, was running a project through which cattle were allocated to some Hai||om. However, land and grazing are limited, and it is not viable to keep cattle on the 10 ha plots without fences or water points. This results in conflict because livestock often eat other people's crops. Again, the cattle were used mainly for the milk.

The local research assistant pointed out that the concept of keeping livestock was introduced by the NGO, but the concept was alien to the Hai||om. People would not sell the animals because there were so few of them. According to the research assistant, people do not really appreciate the value of livestock.

On Farm Six, unemployed community members are not allowed to keep livestock. As only eight Hai||om on the farm are permanently employed, the numbers of goats and cattle are small, and livestock is not considered to be an important livelihood strategy.

In short, the lack of access to land and/or infrastructure (e.g. fences and water points) and the fact that livestock do not feature in the traditional livelihood systems of the Hai||om, means that livestock are not an important livelihood strategy for them.

Small business

As mentioned above under "sharing", some people are engaged in small business such as selling sugar and chickens. However, the participants did not consider this to be an important livelihood strategy as it is seldom sustainable. Many people who had tried it had given up after a month or so. This was said to be due to the importance of sharing and also empathy: "You cannot say no if someone is hungry." Consequently, people buy on credit and may never pay back the credit. Only one participant seemed to have been operating a small business for some time. In this context, the importance of sharing was mentioned again, and it was explained that a surname tells Hai||om the relationship of those with whom they have to share. The Owambo people, on the contrary, "would not feel mercy", it was stated. Were Hai||om to go "far away" (from their family) to run a small business, it might succeed as there would be no pressure to give goods to family members on credit.

Wellbeing ranking

The discussion with the Hai||om of Tsintsabis on different wellbeing categories in their community made clear that it is difficult for them to think of characteristics. Even owning a plot of land does not affect the level of poverty since portions of one's land can easily be taken away. Furthermore, it is difficult to place people in certain categories based on their appearance because people can look neat even though they are poor, while people in a medium category can look dirty because they do not care. Nevertheless, the research team was able to produce a table with the different wellbeing categories and their characteristics.

Table 16: Characteristics of wellbeing categories: Hai||om community at both sites

Better off	Medium	Poor
Regular income	Churchgoers – benefits such as clothing donations	No hope
Livestock	Pensions	Hunger
No hunger	Clothing	Very few items of clothing
	Small income from craft-making	Drinking of *otombo*
		Lack of ownership of land and livestock

People said that the households in the better-off category have a regular income due to employment, and they also own livestock. Of the 12 participants in the discussion, only one person said that he was in the better-off category. Five participants placed themselves in the medium category, mainly because they have a pension. Half of the participants said that they would categorise themselves as poor or even very poor due to owning no land and livestock, and having no money to pay the children's school-related costs.

It was pointed out that many people in the poor category tend to abuse alcohol. Some go early in the morning to shebeens where they find casual work and are given alcohol (*otombo*) or a very small amount of money in return for their services. It was also said that one can get out of the poor category when one stops drinking. Many participants had abused alcohol at times in their lives.

Some of the Tsintsabis community members are living in brick houses built by the National Housing Enterprise (NHE). Eighty brick houses were built(most of them have electricity), but the process of selecting the beneficiaries was discriminatory because those who were not around at the time did not get a house. Six of the 20 participants in the first round

of discussions were living in one of these houses. Electricity has to be paid in advance and costs N$10 for 6 units. The other participants were living in corrugated-iron shacks which they got from former employers (white farmers). Some Hai||om are living on the outskirts of town, where they are threatened by snakes and wildlife and have no lights. People formulate their own class differentiations based on the type of house in which they live.

Health

Not all villages have a clinic (Farm Six does not), and there are only two hospitals in Oshikoto Region. Quite often people have to walk long distances to the nearest clinic. Due to budgetary constraints, the Regional Health Directorate had not been able to implement its outreach programme as planned. Service delivery has also been criticised. Complaints ranged from a lack of hospital facilities to long queues, unsatisfactory treatment from nursing staff, doctors being too tired to examine patients properly, and old people being hesitant to go to hospital due to fear of being discharged before being cured. Participants felt that San communities especially are excluded from health services (a similar finding was reported in NPC 2007(a)).

At Tsintsabis there is a clinic, but the mobile clinic serving Farm Six stopped its service there some years ago. It had not always served Farm Six on a monthly basis. People on Farm Six have severe problems with accessing health facilities due to the transport problems mentioned above. The farm manager said that he sometimes provides lifts to Tsintsabis in emergency cases.

Education

The quality of education in Oshikoto Region was criticised during the Government's recent Participatory Poverty Assessments (PPAs) (NPC 2007(a)). Many communities said that more effort needs to be put into developing vocational training institutions and encouraging the unemployed youth to enrol for technical training at such institutions. It is reported that many children of poor households in Oshikoto stay away from or drop out of school, and this is a challenge particularly for San households. The PPA report for Oshikoto states that for as long as San communities remain dependent on gathering natural foods for subsistence, the children are likely to accompany their parents to search of food, particularly in the dry season, rather than attend school (NPC 2007(a)). However, our own observations are that this is a rather simplified picture as there are many reasons for the high rate of San dropout from Namibia's education system, such as discrimination of San by other children, no financial means to pay school-related costs (e.g. school uniforms and hostel fees), no money for toiletries (e.g. soap) and no mother-tongue tuition.

In Tsintsabis it was reported that in the years 2006 to 2009, at least one or two children passed Grade 10 each year. However, since 2010, no Hai||om child has passed Grade 10. The school was established in 1993, and according to the community, it is a poor educational institution due to unqualified teachers and a shortage of teachers. Also it was said that the children are losing their mother tongue as they are taught in a Damara language and English, whereas Hai||om or ǂ||Akwe are spoken at home. Some children do not want to go to school simply due to feeling ashamed because their parents cannot afford soap. The participants stated that poor people in Tsintsabis were not exempted from paying school fees, contrary to Government policy, since parents were asked to work (e.g. clear

bushes) in lieu of paying school fees. (*As noted in on page 64 herein, the payment of school fees is no longer required as of January 2013*.) However, absenteeism is a big problem in Tsintsabis (*New Era*, 24 June 2010). During the first term of 2010, 103 of the 519 learners at Tsintsabis Junior Secondary School were absent, and 109 were absent at the start of the second term. San children (mostly Hai||om) make up 95% of the learners at the school. The reason for the high rate of absenteeism is not clear; one reason could be the cold winter weather. Among girls, pregnancy is a reason for dropping out. The school principal knew of only three Hai||om learners (two girls and a boy) who had completed their secondary schooling, and at the time of this interview, only the boy had a job (as manager of a lodge in the area), whereas both girls were pregnant and unemployed.

Again, the Farm Six situation is even worse. In 2003, |Khomxa Khoeda (Vulnerable People's) Primary School was established on the farm, with Damara as its medium of instruction. At the outset the school had 75 learners in Grades 1 to 5, but by 2005 the number had dropped to 55. In February 2006, various problems at this school were reported (*New Era*, 2 February 2006). The school has been without sufficient water since its inception, and consequently the learning environment was difficult for the children. The lack of water had created unhygienic conditions and was disrupting the education process. The school had tried to start a feeding scheme for the San children, but was unable to cater for such a scheme, with the result that the poorer learners were often absent because they were roaming the bushes in search of wild fruits. The school planted fruit trees, but this effort failed due to the lack of water. The NDC provided the land on which the school is built, but has refused to take responsibility for the school, according to the principal. The Hai||om on Farm Six said that access to education is one of their major problems. The teachers there said that learners had dropped out simply because they were getting tired of school. Some of these learners are still in the village and others are at a cattle post. Regarding further education, it was said that all of the Farm Six learners who had moved on to secondary school in Tsintsabis had dropped out quickly. Thus the education situation on Farm Six seems hopeless without further intervention. It is noteworthy that participants stated that they need education in order to "get leaders".

Migration

The migration rates in these Hai||om communities are not as high compared to the rates of the Topnaar community. Almost all (92.6%) of the questionnaire respondents were permanent residents of either Tsintsabis or Farm Six. However, as in other San communities, mobility is relatively high. Again this is related to the importance of sharing: schoolchildren sometimes move to reside with relatives who live closer to the school, and people who have family ties to a farm worker or other employed individuals might visit them for an extended period (because there is more food available).

4.2.1.4 Access to land and natural resources

In both communities, the lack of access to land is a serious problem, and a major impediment to animal husbandry, gardening, collecting bushfood and hunting.

At Farm Six, one elder interviewed said that he wanted us to note and "take to the offices" that "we feel like prisoners between the commercial farms and the Owambo farmers ...

people are coming from far to settle on our ancestral land". This statement sums up the land-related problems faced by the Hai||om at both sites.

At Tsintsabis, an area of 3 000ha with a population of 3 000-4 000, further farms were bought in the vicinity with the idea that Hai||om with livestock could use them for grazing, but it turned out that mainly other ethnic groups got hold of the grazing. There were also accusations that the headman was allocating land on these farms to outsiders – which would be outside his powers as resettlement farms fall under the MLR. The 10 ha plots allocated to individuals are not fenced off and do not provide any infrastructure for sustainable gardening or animal husbandry projects.

If Hai||om trespass on land in the vicinity of Tsintsabis to collect firewood, medicinal plants or bushfood, they risk being beaten up. There were reports that on a commercial farm owned by a previously disadvantaged Namibian, Hai||om women from Tsintsabis were caught with firewood and beaten on their legs by the farm owner.

The Hai||om on Farm Six face even worse problems with access to land. Owambo farmers had moved in about two years prior to the research, because they had been chased out of Kavango Region with their cattle and needed grazing. The Hai||om were not informed of this beforehand, but when the farmers arrived, the Hai||om were told that they would stay for only nine months. At first there was no real conflict with the farmers, but nowadays their cattle graze in the area where Hai||om used to set up temporary camps while hunting and gathering bushfood. It was said that when Hai||om go to that area to collect bushfood, the Owambo farmers feel threatened, and all of them have guns and assert their control. The only way to gain access to the area now is to assist these farmers, such as by doing piecework for them (milking cows etc.). Hai||om who do this are then allowed to hunt and collect bushfood in the area. One participant strongly stressed that the problems they were citing should be known by the Government: "If they cannot help us [with accessing land], then they should take a gun and shoot all Hai||om here so that they can take the land." Another participant felt that the fact that Owambo farmers were allowed to settle on Farm Six indicates that the Hai||om are not regarded as human beings. The NDC has made four farms in the Mangetti area available for the relocation of cattle owners who were accused of illegal grazing in Kavango Region. The Government spent N$3.5 million on erecting a high fence to prevent the mingling of cattle herds and the spread of diseases. This area has the capacity to carry 4 000 head of cattle, but the 57 registered owners had 7 630 head. This was a temporary solution in 2010, but their stay was extended by one more year. Not all 57 cattle owners moved to this area, yet the number of cattle has increased, placing a heavy strain on the area's water resources (Shivute 2010).

Access to bushfoods

Since Hai||om, like other San groups in Namibia, were nomadic hunter-gatherers in the past, it is worth going into some detail regarding their access to bushfood. As things stand, none of the San groups can survive from only hunting and gathering anymore.

Today, the most important natural products harvested by the Hai||om are firewood; wood for construction and carvings; thatching grass; medicinal plants; foods derived from nuts, fruits, leaves, roots and bark; and meat, which is now hunted illegally. Prosecution for illegal

hunting does occur, and the penalties are strict, but out of necessity, most poor rural people in Namibia, including the Hai||om, do hunt, albeit illegally.

Today Hai||om maintain that they do not know as much about plants and their uses as their nomadic forefathers knew, and that their forced sedentary lifestyle has resulted in noticeable environmental degradation in just a few generations (Widlok 1999). However, when the topic of bushfood came up in the first session on trendlines and changes in the last 30 years, it was clear that the participants still have very extensive knowledge of bushfood.

In Tsintsabis, however, although the knowledge prevails and people occasionally collect bushfood, it is not an important part of their diet (as can be gleaned from the ranking of livelihood strategies).

Bushfood collection is restricted by the lack of access to land. Before Independence, when Hai||om worked mainly on the farms of white farmers, bushfood collection was much more important and much less restricted. With the arrival of black farmers and the dismissal of Hai||om farm workers, access to land and its resources became a problem. Some medicinal plants are collected on the 10 ha plots in Tsintsabis, but for bushfood collection one has to go far away and this activity is restricted in most areas.

Many of the plants that were or are still collected are localised and seasonal. Mangetti nuts are an essential part of the staple diet of the Hai||om – when available. Other plants collected for eating are *!no* (*Strychnos cocculoides*), *|gui* (*Guibourtia coleosperma*), *||go* (*Grewia falcistipula*) and *tsi'xa* (*Cucumis sp.*) (see Widlok 1999 and section 4.2.3.2 below).

The areas in and around Tsintsabis differ in terms of bushfood availability. The area as a whole is rocky in some places and more sandy in others. In some areas (west of the river), one has to dig deeper to find food. Various foods occur in different areas, depending on the area's soil type. There is more food to the east of the river than to the west, and in the west the food is also deeper in the ground and more difficult to get to.

Hunting is illegal at both sites, but from the questionnaire responses it appears that it is especially the Hai||om on Farm Six who still do some hunting of small animals such as duiker, steenbok, porcupine, tortoise and springhare (see also Widlok 1999). With domestic animals present in all of the areas surrounding the Tsintsabis settlement, some desperate Hai||om there resort to stealing and slaughtering livestock.

Agriculture in the Tsintsabis area is limited by the hot, dry climate, sandy soils and lack of surface water. Much of the land given to the Hai||om at Tsintsabis is degraded and bush-encroached – as is the case on many other resettlement farms in Namibia. In severe drought periods (e.g. the early 1990s), agricultural production becomes even more difficult. In the Tsintsabis area, all successful farming enterprises rely on external inputs such as machinery, drought security and a readily available labour force.

In recent years, several NGOs in Namibia (e.g. CRIAA, IRDNC and the WWF) have recognised the commercial value of some wild products (referred to as indigenous natural products or INPs), and have developed products for trading, but there is no commercial exploitation of INPs occurring in and around Tsintsabis (ARD 2008(a)).

4.2.2 Impacts of climate change and variability on indigenous peoples in the sub-region

4.2.2.1 Local perceptions

It was difficult to discuss climate change impacts on the livelihoods of these Hai||om communities. Undoubtedly the lack of access to land is seen as the major cause of poverty.

4.2.2.2 Key impacts

The most important impact perceived by the Hai||om with regard to climate changes was the irregularity of rain with its negative impact on bushfood: "When the plants need rain, they get sun [instead]." According to the Hai||om, the rains have decreased and the rainy season starts and ends later, with the result that the plants no longer produce enough food or the food rots. They said that "normally" (meaning in former times), heavy winds would start in August, the flies would disappear and the weeds would start growing. The hard and regular rains would come later in the year (November/December), and would stop around April. However, nowadays the rain stops later (by May or even June), with the result that some of the ripe bushfood (e.g. Grewia berries) quickly rots – as did the sweet berries in 2011 because it was still raining in June.

Also it was said that in former times there was a wide variety of bushfood, but due to the worst-ever frost which occurred in 2011, most of the sweet berries and many other plants had died. In a normal winter there might be frost, but it kills only branches, so the plants recover soon, whereas in 2011 the frost killed whole shrubs, trees and other plants.

Furthermore, occasionally the area receives heavy rains which result in floods. One impact of a flood is sicknesses such as parasites/worms, and also malaria because flooded areas are breeding places for mosquitoes (Tarr 1999). During a flood, '*slangkop*' (a poisonous plant) grows, which threatens livestock. The floods that the community could remember were those of 2000, 2004, 2006, 2009, 2011 and 2012. The biggest flood that people could remember was the flood of 1973.

The road between Tsintsabis and Oshivelo during the floods of 2012

The community produced a graph (Figure 9), and one participant recalled the heights of the floodwaters by using measurements such as "up to the neck of a cattle", "... the hip of a woman" and "... the third wire of the fence". The flood of 2012 in this area was most likely due to the construction of pipes and a bridge. As Figure 9 shows, the floods of 2000, 2002 and 2004 were the most severe.

Figure 9: Trendline on floods: perceptions of the Hai||om community of Tsintsabis

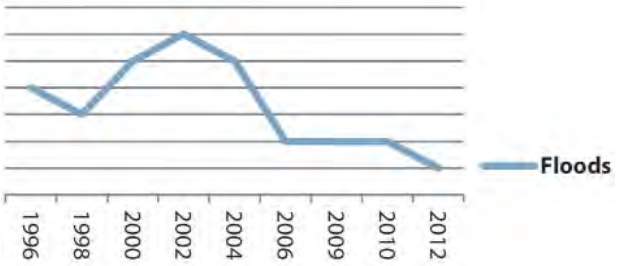
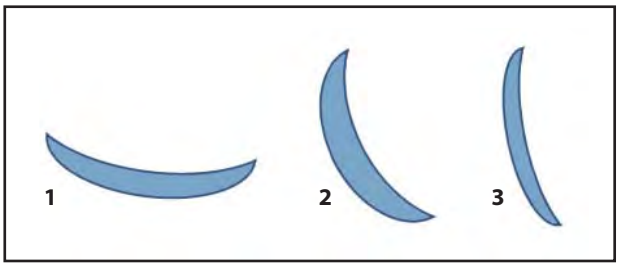


Figure 10: Position of the moon: perceptions of the Hai||om community



The Hai||om have different beliefs about why and when rain seasons change. For example, it was said that in the past one could see frost on the grass at the end of the rainy season, but not anymore, and this might be the reason that the rain continues. Also, when the ǂ*Naob* bird (Hamerkop) goes into the bush and makes a special sound, it is calling the rain. Lastly, the Hai||om look at the moon to see what will happen in the next season (Figure 10): a half-moon (1) means that there will be no rain; a half-moon with one side higher (2) means that the rain will start; and a half-moon with the left side even higher (3) is a sign of death.

The literature states that declining food security will increase competition for available grazing and bushfood, and the Hai||om confirmed this. An influx of people into the area with their livestock is also regarded as a factor that negatively affects bushfood availability.

In addition to irregular rainfall, the Hai||om, especially on Farm Six, have experienced droughts. In the local language there are three terms for droughts, but after we explained the English term, the participants agreed that the term |*khurub* should be used. The research team understood that this term means 'hunger' or 'no food', and that it is not used only with references to a lack of rain or a dry environment. One participant recalled a time when breastfeeding women died due to a lack of food and water resulting from drought. At that time, people depended only on bushfood and game, but today they depend on food aid too. If the Government stops this aid, the 'droughts' would return. The droughts are not felt so badly these days thanks to the government food aid and food-for-work programmes. The community foresees the droughts worsening in the coming five years as the 10 ha plots are not sufficient, and overgrazing will occur which will result in the death of plants. As long as the 10 ha policy continues, droughts will increase.

4.2.2.3 Contributing factors

We have dealt in detail with contibuting factors in the vulnerability context in section 4.1.2. In summary, the most important interrelated contributing factors are:

- land degradation and mismanagement;
- an influx of outsiders onto Hai||om land;
- living on an NDC farm (Farm Six) or a resettlement farm (Tsintsabis) –
  - hampers access to natural resources;

- a lack of education;
- remoteness (Farm Six);
- other Namibians discriminating against San;
- a lack of proper political representation –
  - hampers access to other livelihood strategies such as employment and further outside support;
- a vulnerable economic position;
- a lack of proper political representation; and
- a lack of access to resources for investing in education, livestock or alternative livelihood strategies such as gardening.

4.2.3 Traditional knowledge and adaptation to climate change and variability

4.2.3.1 Indigenous peoples' adaptive capacity and resilience

Key factors

The fieldwork for this study pointed to three key factors that reduce indigenous peoples' ability to minimise the impact of, and adapt to, the impacts of climate change:

1. A lack of access to land
2. Outsiders
3. A lack of political representation

The discussions with the Hai||om communities made clear that their adaptive capacity is limited. Also, most of their adaptation strategies are not directly related to climate change, but rather they relate to the broader situation in which they live today. The Hai||om of Tsintsabis are highly dependent on government aid: the most important livelihood strategy is a pension, which is used mainly to cover school-related costs and to buy food; and food aid is also a very important livelihood strategy.

Figure 11[18] presents trendlines for the most important livelihood strategies. The figures shows that there were no changes except in the case of pensions for the years 2012 to 2017. This is because the community has no hope for the future, and could not conceive of ways to improve their lives.

Further below, we will deal with the importance of livelihood strategies over time as gleaned from the questionnaire responses. As mentioned earlier, it became evident that the trends have been induced chiefly by changes in the political system, especially with regard to access to land, the introduction of new labour laws and the provision of welfare services.

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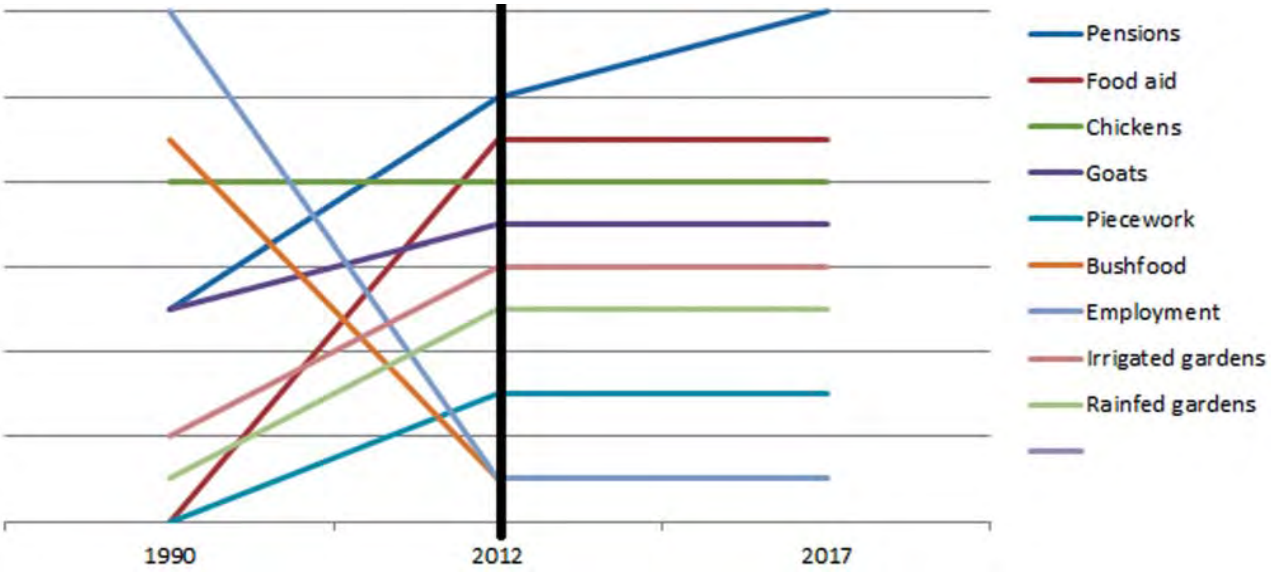
[18] The data presented in this figure is applicable only for the years 1990, 2012 and 2017. The lines merely reflect an increase or decrease between 1990 and 2012, and up 2017 in the case of pensions, because there is no data on the years in between.

Figure 11: Trendlines on livelihood activities: perceptions of the Hai||om community



We now look at the Hai||om livelihood strategies in 1990 in more detail, to detect whether climate change had an impact on these strategies at that time.

According to the workshop participants, up to Independence in 1990, employment (mostly farm work) was the most important livelihood strategy. The workers usually got rations (e.g. maize-meal, cooking oil, tea, sugar and occasionally meat) as well as a low salary, and they could still collect bushfood on the farms to supplement their rations. Further, some farmers allowed them to hunt for their own consumption, which discouraged workers from stealing and slaughtering the farmers' livestock. Some farmers also allowed workers to keep goats, on condition that there were not too many, and they were allowed to keep chickens. (As one participant put it, "Chickens don't need grazing – that's why the farmers allowed it.") Furthermore, workers were allowed to have small gardens at their homestead on the farm. Elderly people were also receiving pensions, but these were not as important as they are today as employment opportunities were much better in the past. The participants' ranking of the importance of their livelihood strategies in 1990 is shown in the box on the right.[19]

Most important
- Employment / farm work
- Bushfood / game
- Chickens
- Pensions
- Goats
- Irrigated gardens
- Rainfed gardens

Least important

The changes over time (especially the decline in employment opportunities and in bushfood availability, and the higher dependence on pensions and food aid) are due mainly to political changes (introduction of the labour laws, land reform, etc.); they are less directly related to climate change. The decline in bushfood availability is due to the lack of access to land and to overgrazing, but not yet to climate change. However, the picture that emerges from the questionnaire responses differs to these qualitative findings in some respects. This is because (a) the questions in the questionnaire refer merely to the past, present and future, and make no reference to a specific period of time, and (b) the questionnaire does not ask

[19] Non-existent at that time were food aid, large livestock (which farmers would take away if a worker had too many, and some farmers would not allow these at all), piecework, small business and work on crop farms.

for reasons for the categorisation of the livelihood strategies, which makes it difficult to assess the timeframe referred to in a participant's response. In the following section we present the questionnaire findings as well as possible reasons for the deviations from the findings of the qualitative data collected.

Livelihoods

Bushfood

The quantitative data clearly shows the importance of hunting and gathering in the past, present and future. Almost all of the respondents (93.4%) thought that gathering of wild plants was very important in the past, as Table 17 shows. It is clear that the importance of wild plants has decreased over time: around 40% of the respondents think that wild plants are of little importance today. (The same decline is shown in Figure 11 on the previous page.) The importance of wild plants will even be lower in the future.

Table 17: Importance (%) of wild plants over time: Hai||om community at both sites (N=121)

Time	Low	Medium	High	Not applicable	Don't know
Past	0.0	0.8	93.4	2.5	3.3
Present	43.0	24.0	24.0	2.5	6.6
Future	50.4	9.1	26.4	2.5	11.6

As can be seen in Tables 18 and 19, there are slight differences regarding the importance of wild plants in the present and future, but participants at both sites deemed the importance in the past to be high.

Table 18: Importance (%) of wild plants over time: Tsintsabis Hai||om (N=45)

Time	Low	Medium	High	Don't know
Past	0.0	0.0	91.1	8.9
Present	48.9	15.6	28.9	6.7
Future	48.9	11.1	33.0	6.7

Table 19: Importance (%) of wild plants over time: Farm Six Hai||om (N=76)

Time	Low	Medium	High	Don't know
Past	0.0	0.0	94.7	5.3
Present	39.5	28.9	21.1	10.5
Future	51.3	7.9	22.2	18.4

Gardening

Since the Hai||om already have little access to wild plants today, crop production could become an important livelihood strategy. However, the community did not see this as being an important strategy either today or in the future. Fifty-seven percent of the respondents thought that crop production was important in the past. The reason for this perception is that farm workers were allowed to have small gardens close to their homesteads. However, as access to land becomes more and more scarce, having a small garden becomes more difficult and less important as a livelihood strategy. Furthermore, even if households have small gardens, they face difficulties with accessing water, and with fences (because cattle destroy crops).

Table 20: **Importance (%) of crop production over time: Hai||om community at both sites (N=121)**

Time	Low	Medium	High	Don't know
Past	3.3	5.0	57.0	34.7
Present	23.1	32.2	18.2	26.4
Future	25.6	26.4	16.5	31.4

Hunting

Hunting was very important in the past, but more than 60% of the respondents thought that it is of little importance today, and likewise in the future, because hunting is illegal in the areas in which they live.

Table 21: **Importance (%) of wild meat over time: Hai||om community at both sites (N=121)**

Time	Low	Medium	High	Not applicable	Don't know
Past	0.8	4.1	89.3	1.7	4.1
Present	61.2	24.8	9.9	1.7	2.5
Future	69.4	8.3	12.4	1.7	8.3

However, the questionnaire responses indicate that Hai||om do still hunt occasionally, especially smaller animals. Participants at the two sites mentioned the following species in responding to the questionnaire – the interviewer did some probing on this issue:

Tsintsabis

- Cape Francolin
- Damara Dik-Dik
- Eland
- Ground Squirrel
- Guinea Fowl
- Hornbill
- Kudu
- Laughing Dove
- Leguan Lizard
- Porcupine
- Tortoise
- Warthog
- Wild Cat

Farm Six

- Aardvark
- African Hoepoe
- Buffalo
- Cape Francolin
- Damara Dik-dik
- Duiker
- Eland
- Kudu
- Leguan
- Porcupine
- Springhare
- Steenbok
- Termites
- Tortoise
- Warthog
- Zebra

The findings show that bushfood still plays a more important role than hunting.

Income (wages/salaries)

Cash income from wages and salaries is becoming a more important livelihood strategy for the Hai||om. Almost 70% of the respondents thought that income was of little importance in the past, whereas today it is of considerable importance and likewise in the future. In the ranking exercise the participants said that employment was most important in 1990. A possible explanation for this discrepancy is that the questionnaire respondents referred to a distant past (when hunting and gathering were the predominant livelihood strategies) and not necessarily to 1990 when the importance of employment was assessed as being high.

Table 22: **Importance (%) of income (wage/salary) over time: Hai||om community at both sites (N=121)**

Time	Low	Medium	High	Don't know
Past	69.4	2.5	9.1	18.2
Present	11.6	63.6	5.8	18.2
Future	13.2	5.8	56.2	24.0

Around 60% of the questionnaire respondents thought that income is somehow an important livelihood strategy, and more than half thought that an income will be very important in the future. In the workshops it was evident that the participants viewed the high unemployment rate among the Hai||om as a major problem, and that they would like to find employment. However, asked whether employment is in fact important as a livelihood strategy, they replied that it was more important in the past than it is today (especially because there is less farm work available today). This accounts for the differences between the livelihood trendline (in Figure 11) and the questionnaire findings on this strategy. A comparison between Tsintsabis and Farm Six shows only slight differences.

Table 23: Importance (%) of income (wage/salary) over time: Tsintsabis Hai||om (N=45)

Time	Low	Medium	High	Don't know
Past	66.7	0.0	6.7	26.6
Present	15.6	55.6	4.4	24.4
Future	17.8	2.2	55.6	24.4

Table 24: Importance (%) of wild plants over time: Farm Six Hai||om (N=76)

Time	Low	Medium	High	Don't know
Past	71.1	3.9	10.5	14.5
Present	9.2	68.4	6.6	15.8
Future	10.5	7.9	56.6	25

Livestock

The questionnaire responses indicate that the importance of livestock has also changed over time. Around a third of the respondents thought that husbandry was an important livelihood strategy in the past, and almost 30% think that it is of little importance today.

Table 25: Importance (%) of livestock over time: Hai||om community at both sites (N=121)

Time	Low	Medium	High	Not applicable	Don't know
Past	1.7	9.1	34.7	3.3	51.2
Present	29.8	11.6	8.3	3.3	47.1
Future	12.4	5.8	12.4	3.3	50.4

In entering data, Charapa placed chickens and small and large livestock in one category, which may distort the picture a bit because, as Figure 11 illustrates, chickens have been an important strategy over time.

As mentioned earlier, the average numbers of livestock owned at Tsintsabis and Farm Six are only 0.29 and 0.78 respectively. However, as Tables 26 and 27 show, the importance of livestock is higher in Tsintsabis. This might be due to the fact that many Tsintsabis community members were former farm workers who had easier access to livestock, because they either bought it from the farm owner or received it as a long-service benefit.

Table 26: Importance (%) of livestock over time: Tsintsabis Hai||om (N=45)

Time	Low	Medium	High	Not applicable	Don't know
Past	0.0	6.7	40.0	8.9	44.4
Present	35.6	8.9	6.7	8.9	40.0
Future	40.0	2.2	6.7	8.9	42.2

Table 27: **Importance (%) of livestock over time: Farm Six Hai||om (N=76)**

Time	Low	Medium	High	Don't know
Past	2.6	10.5	31.6	55.3
Present	26.3	13.2	9.2	51.3
Future	21.1	7.9	15.8	55.3

4.2.3.2 Indigenous peoples' adaptation strategies

As mentioned earlier, the adaptive strategies of the Hai||om at both sites are very limited. Although their knowledge of bushfood does not help the Hai||om to adapt, further detail on this knowledge is valuable for assessing their future adaptive capacity.

The workshop participants listed the following as the most important types of bushfood – the actual gathering of which has declined considerably due to the lack of access to land:[20]

- *Arub* (long roots, like sweet potato – *Vigna dinteri*)
- *|Horob* (tuber) (*Cucurbitaceae* – with tuberous rootstock and heartshaped leaves)
- *!Gubub* (roots)
- *||Nun* (wild potato – *Walleria nutans J. Kirk*)
- *!Aies* (roots, which are roasted in fire – *Ceropegia sp.*)
- Other: mangetti and marula nuts; game

Availability of bushfood

Hai||om divide the year into three seasons:

- *Sore Gamas* (hot season)
- *||Hao gamab* (rainy season)
- *Sao Gamas* (winter – "In the cold months, food is little.")

The availability of different bushfood species differs in different seasons. Some plants can be used in more than one season, or start growing at the end of one season and ripen in another.

***Sore Gamas* (hot season)**

- *Goarob* (marula)
- *!Nûnib* (young makalani)
- *||Gabab* (older makalani – up to 2 metres; roots edible)
- *|Gûi* (fruits)
- *!Noo* (monkey orange)
- *||Nâû* (on the ground)
- *|Gomn* (mangetti – *Schinziophyton rautanenii*)
- *Gunub* (*Hydnora africana* – grow only around *Acacia mellifera*)
- *ǂHabab* (*Fockea angustifolia* or *Brachystelma dinteri*)
- *Anis* (termites)
- *|Âb* (wild cucumber)
- *||Gani* (game)

[20] The botanical name, where provided, is from Dieckmann's dataset on bushfood of the Hai||om.

***||Hao Gamas* (rainy season)**
- *Nau-e* (termite mushrooms)
- *ǂHuin* (*Berchemia discolor*)
- Pumpkins
- Tomatoes
- Maize (mielies)
- *ǂAun* (*Grewia sp.*)
- Sabiron (*Grewia villosa*)
- *||Ari* (*Grewia sp.*)
- */Gani* (pots of brandy bush for coffee)
- *!Gai!gara* (nuts)
- */Irun* (*Commiphora* worms)
- *!Nu-ho* (*Lilie sp.* – produces an onion-like fruit)
- *||Gani* (game)

***Sao Gamas* (winter)**
- Honey
- *Arub* (long roots, like sweet potato – *Vigna dinteri*)
- *ǂHuin* (*Bermchemia discolor*)
- *Tsamas* (pumpkins) and tomatoes
- *ǂAun* (*Grewia sp.*)
- */Gani* (pots of brandy bush for coffee)
- *!Gai!gara* (nuts)
- /Irun (*Commiphora* worms)
- Maize (mielies)

Other interesting points made in discussions on bushfood:
- In winter Hai||om would still eat some food from *||Hao Gamas* because there is no new food in winter.
- Meat (game) is eaten in all seasons.
- Hunting starts in May – when meat does not rot so easily.
- Illegal hunting is not a topic openly talked about, but kudu is preferred all year round – "if we could get hold of it". However, security guards at Farm Six report illegal hunting today.
- The Shepperd's tree (*Boscia albitrunca*) is valuable: the roots are used to preserve meat; when dried, the roots are used to make tea; and the bark is boiled and drunk with water to cure colds and soothe toothache and stomach ache.
- Before maize-meal became a staple food, a plant (i.e. a grass) called *Mi-e* was harvested and crushed to make a flour that was eaten as *pap* (i.e. 'porridge', which can be thick or thin). One person, Justine, remembered *Mi-e* from her childhood, before the white farmers introduced maize-meal.
- Francina remembered *!Gub* from Etosha. This is a reed used to make flour and a type of bread.

Lifestyle changes and bushfood still eaten

Although the Hai||om still possess extensive knowledge of bushfood, their lifestyle has changed considerably, and the information above refers mainly to the past.

Nowadays, due to changing weather conditions and plant cycles, maize-meal is more important throughout the year – "now it is mainly maize we eat as staple diet". Many bushfood species are no longer eaten, mainly because access to the bush is restricted, but when a species is available and accessible, it will be eaten. Some species have died out altogether in the study areas.

The bushfoods still eaten are as follows:

- Mangetti nuts – an important food source.
- Makalani – "you can still eat, but only as much as in your hands" (MET officers supervise), and "you are not allow to collect in order to store".
- Marula – eaten more on private farms but some can be found at the river in Tsintsabis.
- *ǂHaban* (*Fockea angustifolia* or *Brachystelma dinteri*) – occurring around Tsintsabis.
- *Anin* (termites) – caught with water at street lights.
- Figs from trees – eaten mainly in *Sore Gamas* (hot season).
- Mushrooms
- *ǂHuin* (*Berchemia discolor*)
- *Tsamas* (pumpkins) – eaten if animals don't eat them
- Tomatoes – planted and eaten
- *Grewia sp.*
- *!Gai!gara* (nuts) – very few at Tsintsabis, but more on Farm Six, so more of them eaten there.
- *|Irun* (*Commiphora* worms)
- *!Nu-ho* (*Lilie sp.)* – onion-like fruit still eaten at both Tsintsabis and Farm Six.
- ||Gani (game) – still hunted and eaten at Farm Six, but the hunters risk being caught and arrested.
- In Tsintsabis one mostly buys donkey meat, so that one is not suspected of having bought meat that was illegally hunted. Buying the meat of kudu that was illegally killed is encouraging illegal hunting, and the buyer could get into trouble with the law.
- Honey – eaten more at Farm Six. It comes mainly from Tamboeti and Marula trees, and is also found in dead termite hills.
- *|Gûi* and *!Noo* (monkey orange) – found far away from Tsintsabis (in Kavango Region).
- *||Nâû* – too far away in the north, so virtually never eaten anymore.

The situation differs for Hai||om living on farms where access to and gathering of most bushfood species is still possible.

Adaptation strategies

In the past, because Hai||om were more dependent on bushfood, they could easily recall the droughts of previous year. Today, however, because droughts have a lesser impact their livelihoods due to their lesser dependence on bushfood, they no longer remember the droughts. The participants thought that the droughts will worsen in the future, but also that more food relief from the Government would not be an option: "Food aid is not a solution." Rather, they said that there are people who could farm themselves, and that the Government should buy land for these people and support them in their efforts to become sustainable farmers.

It proved difficult for the Hai||om participants to think of more adaptation strategies because they face constraints (chiefly the lack of access to land) which have a bigger influence on

their livelihoods than climate change presently does. Their access to resources is limited, and it seems that this access will become even more limited due to the influx of other people and livestock into their areas. The community is highly dependent on assistance from the Government in the form of pensions and food aid. To adapt to the lack of access to resources, people have tried to diversify their livelihood strategies, for example they collect and sell firewood in Tsintsabis. However, the private farmers in the vicinity usually do not allow them to collect the wood, and people on Farm Six were beaten by farm owners while collecting wood. The Hai||om of Tsintsabis said that they want land on which to farm, keep livestock and produce charcoal. They had tried charcoal and pole production, but the veterinary officer told them that they would go to jail and confiscated the poles. Those poles, according to the participants, are now lying in Grootfontein where they are rotting and being eaten by termites. The reason for the veterinary officer's threat was not clear to the research team, but it might be that they did not have the right permits.

As can be seen in Table 28, the adapative 'strategies' are very limited – just about all of them being government aid and earning income from selling firewood and poles.

Table 28: Correlation between hazards and responses: perceptions of the Hai||om community

Hazard result	Response 1	Response 2	Response 3
Irregular rain			
Berries rot	Some berries can be collected and stored before they rot	Being more dependent on government aid*	Diversify livelihood strategies: collect firewood and produce poles**
Gardens affected	Being more dependent on government aid	Diversify livelihood strategies: collect firewood and produce poles	
Floods			
Some bushfood species affected	Being more dependent on government aid	Diversify livelihood strategies: collect firewood and produce poles	
Diseases	Use medicinal plants	Go to the clinic	
Drought			
Lack of bushfood	Being more dependent on government aid	Diversify livelihood strategies: collect firewood and produce poles	
Gardens affected	Being more dependent on government aid	Diversify livelihood strategies: collect firewood and produce poles	

* However, it was said in the discussion that this is not a real solution, but that other coping strategies are very limited due to the lack of land and due to poverty.

** Poles that participants had produced had been confiscated, possibly because they did not have the right permits.

Chapter 5
Lessons Learned and Recommendations

The research focused on the Topnaar and Hai||om communities' adaptability to climate change. The data collected revealed some differences between these communities in this regard. The Topnaar are less poor than the Hai||om, and have more assets in terms of livestock and equipment (e.g. donkey-carts). Their livelihoods depend mainly on two resources, namely *!nara* plants and livestock, both of which are subject to climate change. Other livelihood strategies (e.g. pensions, food aid and employment/piecework) supplement livestock farming and *!nara* harvesting. Although their assets and lower level of poverty may make them less vulnerable than the Hai||om in the overall picture, the Topnaar might be more vulnerable than the Hai||om to the impacts of climate change specifically. This is because the Hai||om are highly dependent on government aid and less so on natural resources due to their lack of access to land. The predicted impacts of climate change for the Hai||om are not yet being felt; it is the lack of access to land that makes them vulnerable at present.

Recommendations for both the Topnaar and Hai||om communities

1. **Use local knowledge for adapting to climate change**

   Both the Topnaar and Hai||om communities still possess extensive traditional knowledge on the natural resources in their areas and the management of these resources. These communities should be encouraged to treasure this knowledge, because it is likely to play a very important role in the future when it becomes necessary to adapt to climate change.

2. **Develop a strategy for adaptation, mitigation and capacity-building**

   It is clear that both communities mistrust their respective Traditional Authorities (TAs), and that communication between the community members and the TA is poor in both communities. The Government should thus play an active role in developing a strategy to finance mitigation and adaptation at local level, and should directly involve the communities in their own strategic planning. The Government could also consider establishing a sustainable development fund for climate change emergencies at local level to support these communities. Furthermore, the involvement of NGOs and CBOs is important to bring awareness of the impacts of climate change and also mobilisations of financial and other resources to local communities for climate change adaptation and mitigation.

3. **Establish community associations to give communities more power and a voice**

   A community association is needed in each community to circumvent the TAs which do not represent their whole community. An example exists in the Bwabwata National

Park in West Caprivi, where the Khwe San receive direct benefits through the Kyaramacan Association in the form of hunting concessions. The Kyaramacan Association negotiates benefit agreements with the Ministry of Environment and Tourism (MET) and tourism operations. For the Topnaar, for example, a community association could be a representative body that ensures democratic decision-making processes, e.g. on feasible diversification strategies. Such a body may also have a stronger voice for ensuring sustainable harvesting of *!nara* and preventing "outsiders" from harvesting unsustainably. In this way each community would be given more power and a voice for raising their concerns and for finding solutions.

Recommendations for the Topnaar community

The Topnaar have lived in an arid environment for centuries, and have adapted to it. However, recent heavy rains and floods have rendered their livelihood opportunities less upredictable. Their high dependence on *!nara* plants and livestock makes them vulnerable to floods. Floods might benefit the *!nara* plants that grow on the southern bank of the Kuiseb River, but the *!nara* fields and the pod-producing trees in the riverbed are negatively affected by the floods – either they are washed away or they rot due to too much water. The Topnaar adaptation strategies depend on people's wellbeing, since households in the wealthier category were found to be more likely than those in the other two categories to adapt to climate change. Besides the effects of floods, *!nara* harvesting is threatened by people from outside who are not harvesting the plants sustainably.

1. Invest in eco-tourism

More and more tourists are becoming interested in the Topnaar, thus the community should be trained in tourism. Tourism activities could be managed by the community in cooperation with the Gobabeb Research Centre. Presently tours are organised by agencies in Swakopmund and Walvis Bay which do not provide any benefits to the Topnaar. A large area along the Kuiseb River has considerable potential for community-based tourism, but options for developing and exploiting this potential are severely limited by the fact that much of it lies in a proclaimed national park. The Topnaar could benefit directly from a conservancy, but it will not be possible to establish one unless the MET grants specific concessions.

2. Invest in other livelihood diversification opportunities

There are various other ways for the Topnaar to diversify their livelihoods to become less dependent on the *!nara* fields and livestock. One is production of dates and olives in collaboration with an NGO or the relevant government ministries. Also, the floods of 2011 brought lots of fish, but the community was advised not to consume them as they were not tested. When more floods occur, the community should be able to make use of this benefit. Therefore, training and capacity-building for fish production should be provided.

Recommendations for the Hai||om community

The Hai||om have lost their ancestral land over time, with the result that they face several problems due to a lack of land. Their access to bushfood is limited because their settlements are small, and more and more of the settlement land is being taken away by outsiders

moving in (e.g. Owambo farmers), and access to bushfood on neighbouring commercial farms is restricted. Thus the Hai||om at both sites have become more and more dependent on government aid. Another finding of the Tsintsabis case study is that the authorities have restricted people who were trying to diversify their livelihoods.

1. Provide access to land

The most important issue for the Hai||om is access to land, because land is an essential requirement for supporting Hai||om livelihoods. If they do not have their own land when the predicted climate changes occur, their food security will be even further reduced. The obvious solution is to give the Hai||om more land as beneficiaries of the resettlement process – not least because large parts of the central northern regions used to belong to the Hai||om. Alternatively, it is suggested that the area around Farm Six be gazetted as a conservancy, since Namibian policy gives indigenous peoples options for the enjoyment of land rights through their innovative approach of integrating conservation and development, known as community-based natural resource management (CBNRM), and conservancies are an integral component of Namibia's CBNRM programme. Conservancies are areas of communal land in which conservancy members have wildlife resource rights under the Nature Conservation Amendment Act of 1996. CBNRM, the conservancy movement and other plans offer much promise for indigenous peoples in particular. All these have to be supported, but also carefully researched and monitored to ensure that they truly benefit the communities and that their choices are respected. Also, the disjunction between land rights and natural resource rights in the communal conservancies has to be addressed. This should be done by means of statutory law, which must give the conservancies the legal authority to administer their own lands, with the support of their respective TAs and Communal Land Boards, to meet the needs of conservancy members in accordance with their management plans. The issue of communal land rights must therefore be directly addressed in conservancy law.

2. Prevent further overgrazing

As livestock numbers are increasing, overgrazing will become a big problem when the predicted climate changes occur. This will reduce the numbers of wild animals and consequently the number of tourists. Therefore a strict policy on the number of cattle per hectare should be enforced. Bush encroachment is a direct result of overgrazing, and it is likely that encroachment of invader bush species will become a bigger problem due to climate change, which in turn will impact on the availability of grazing. The Government should invest, as a matter of urgency, in land rehabilitation schemes to improve the availability of grazing. In fact, rehabilitating bush-encroached land could give Hai||om communities additional income because they could use the invader species to produce charcoal and firewood.

3. Ensure proper consultation

It is necessary to consult the Hai||om community members about what kind of support they need in general, and about their concerns and needs relating to climate change specifically. Only if they are directly involved in planning for the future will their mitigation and adaptation strategies succeed.

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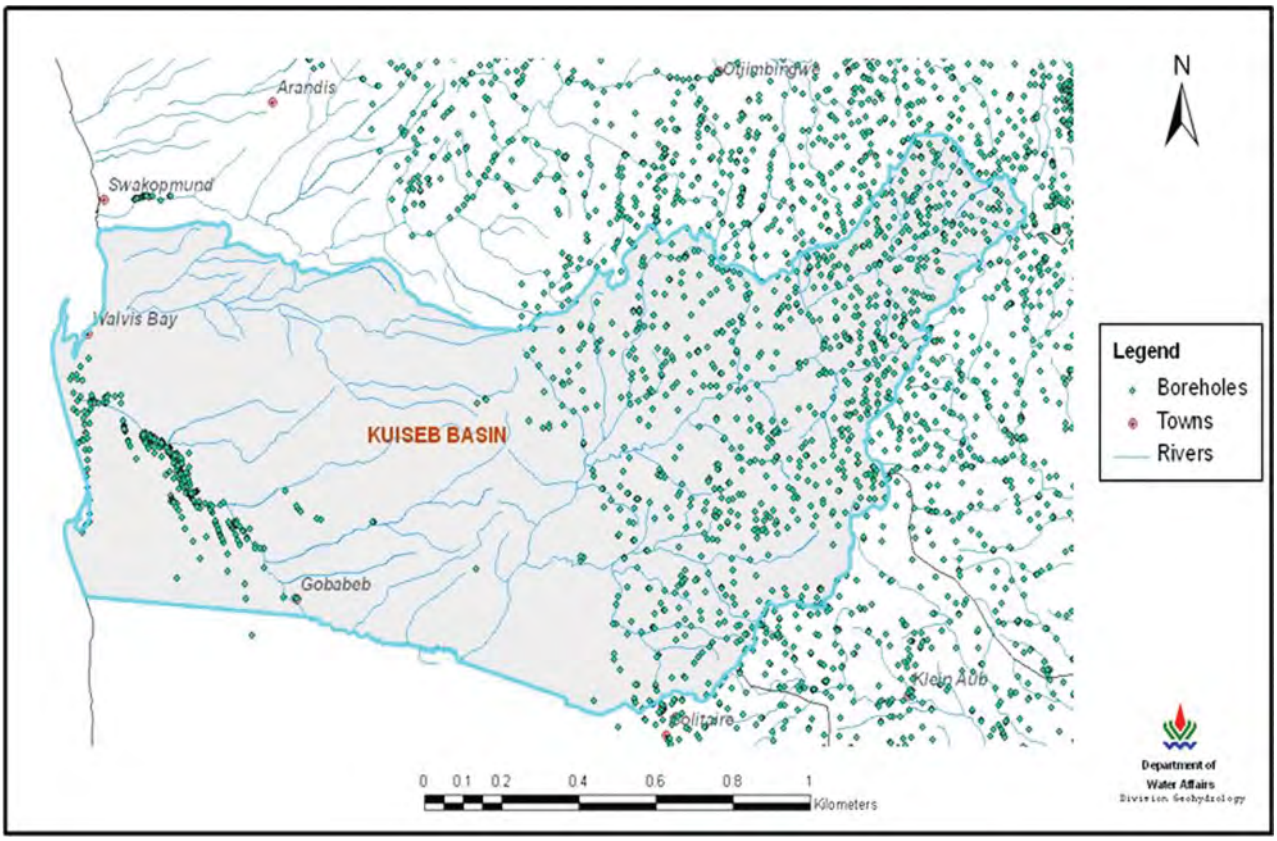
Appendix

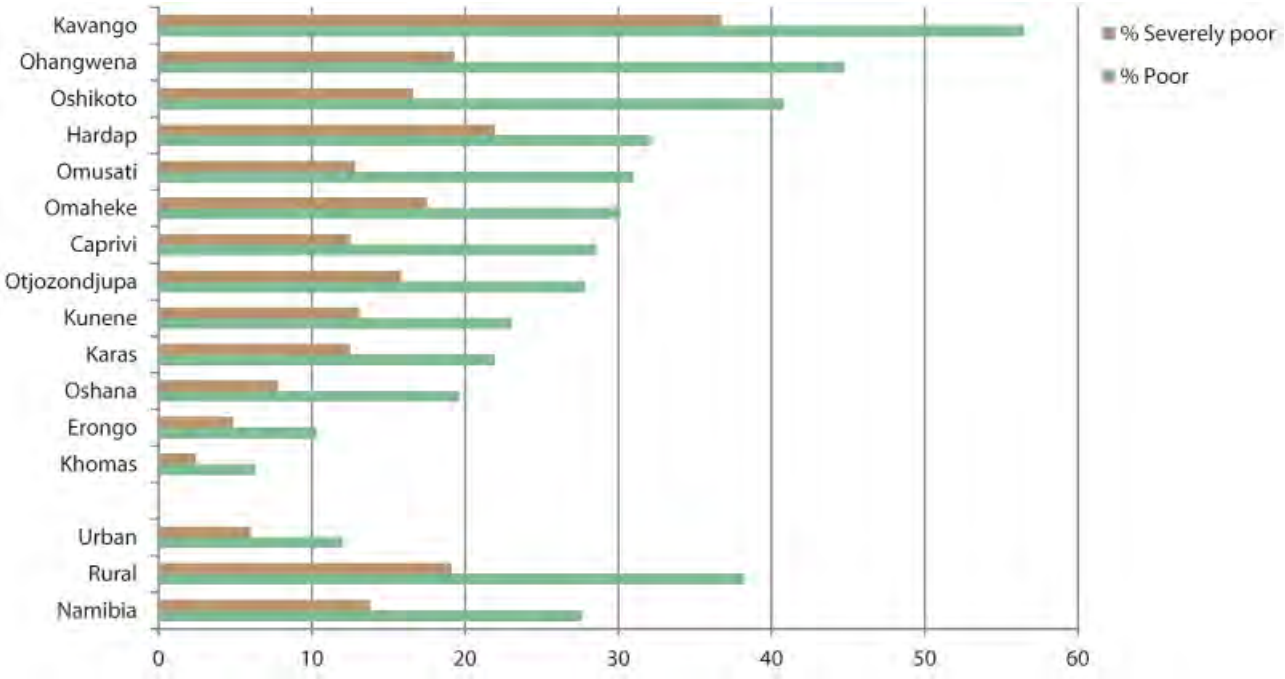
Figure 1: Boreholes in the Kuiseb Basin



Source: **W. Werner, *Livelihoods among the Topnaar of the Lower Kuiseb*, 2003.**

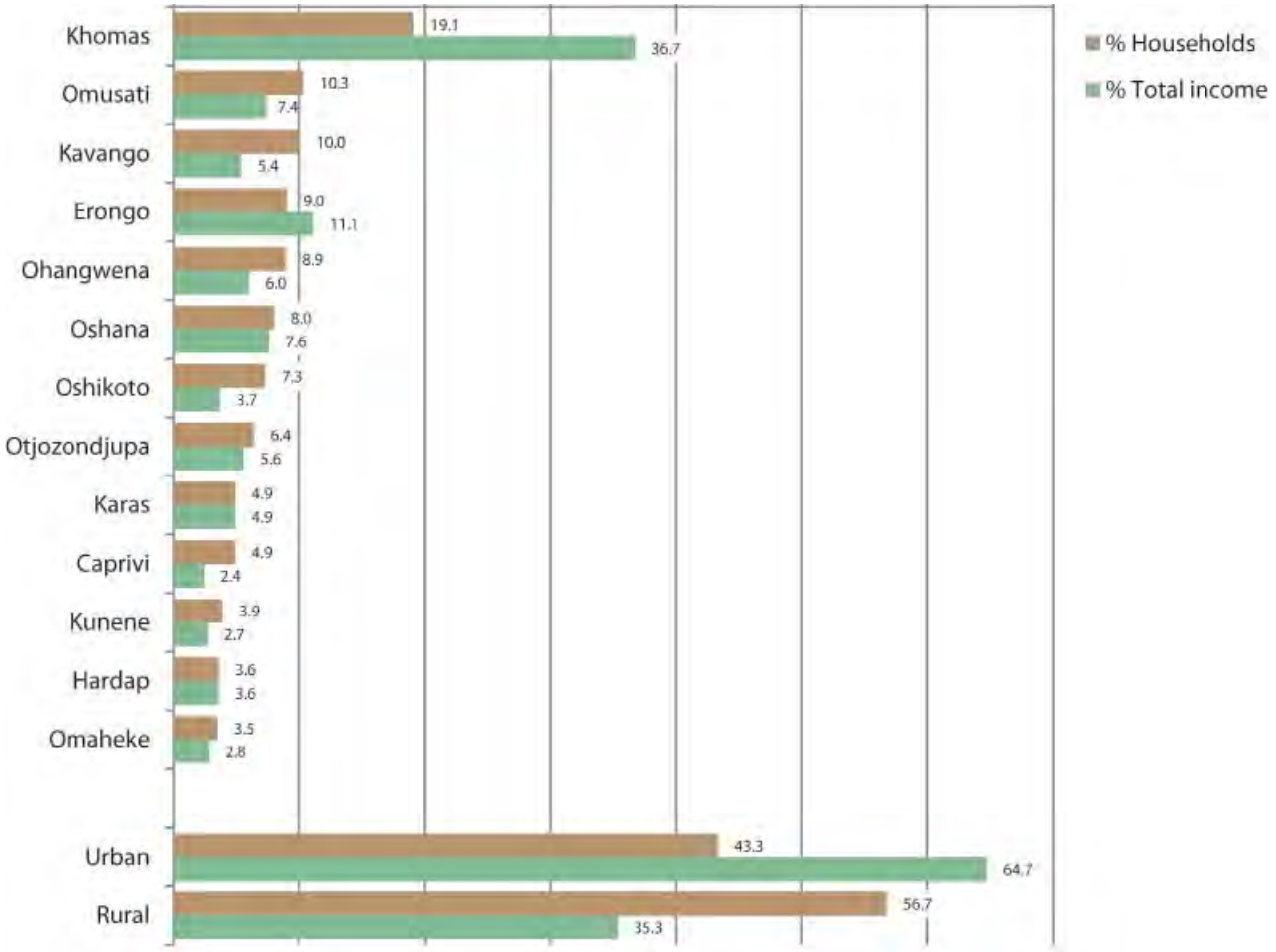
The flooding Kuiseb River (left) and the muddy riverbed in 2011

Figure 2: Incidence of income poverty by region in Namibia



Source: **National Planning Commission, *A Review of Poverty and Inequality in Namibia 2003/04*, 2008.**

Figure 3: Annual household income by region



Source: **Namibia Statistics Agency, *Namibia Household Income and Expenditure Survey (NHIES) 2009/10* (Main Report), 2012.**

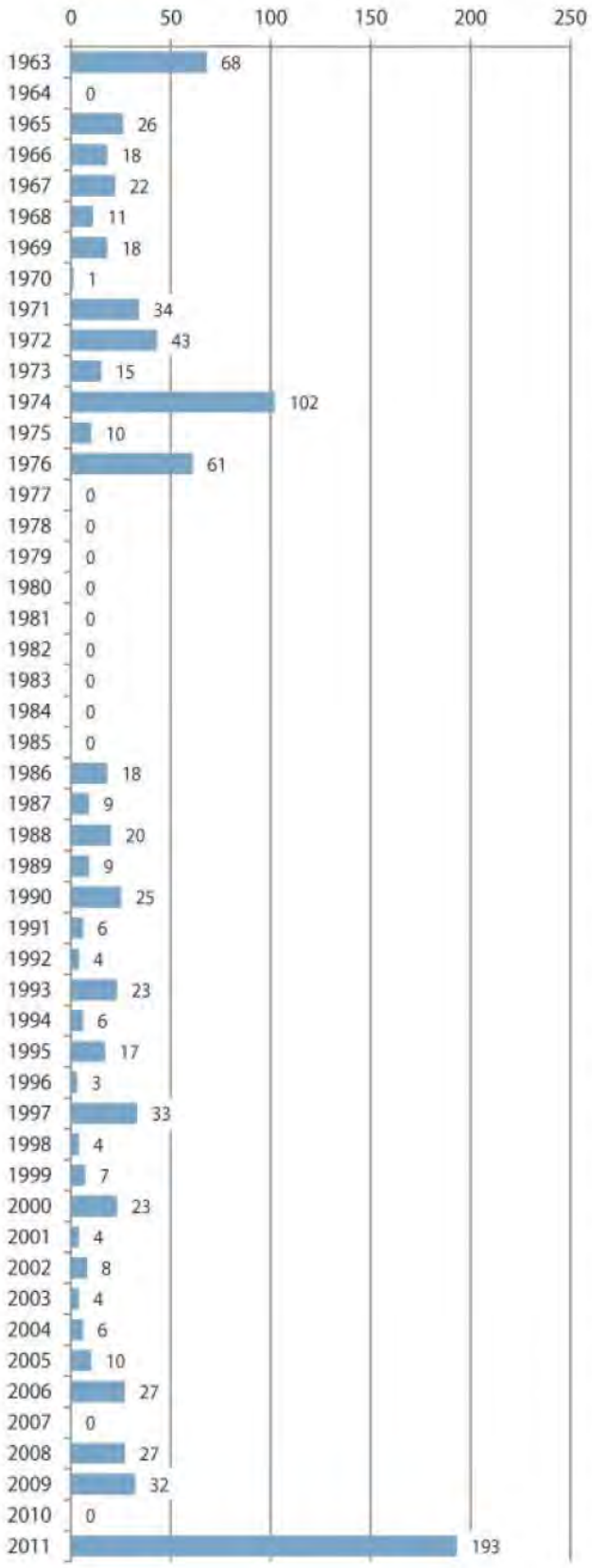
Figure 4a: Transect Drive 1 – from north to south along the Kuiseb River

ZONES					
Areas of interest	**Dunes (south) (grazing)**	**Riverbed**	**Homesteads with kraals and gardens**	**Road**	**Gravel plains (north)**
Water			water tanks		
Soil		good			
Forest species	*!nara*	*Faidherbia albida* (Ana tree), *Acacia eriobola* (Camelthorn), *Euclea pseudobenus* (False Ebony), *Prospopis glandulosa* (Prospopis), *Nicotiana glauca* (wild tobacco), *Ficus burkei* (fig tree), date trees, other trees			
Forest products	*!nara*	wood, figs, pods			
Crops			small gardens		
Livestock	grazing available	abundant grazing	lack of grazing	lack of grazing	grazing available
Fish					

Figure 4b: Transect Drive 2 – from east to west along the Kuiseb River

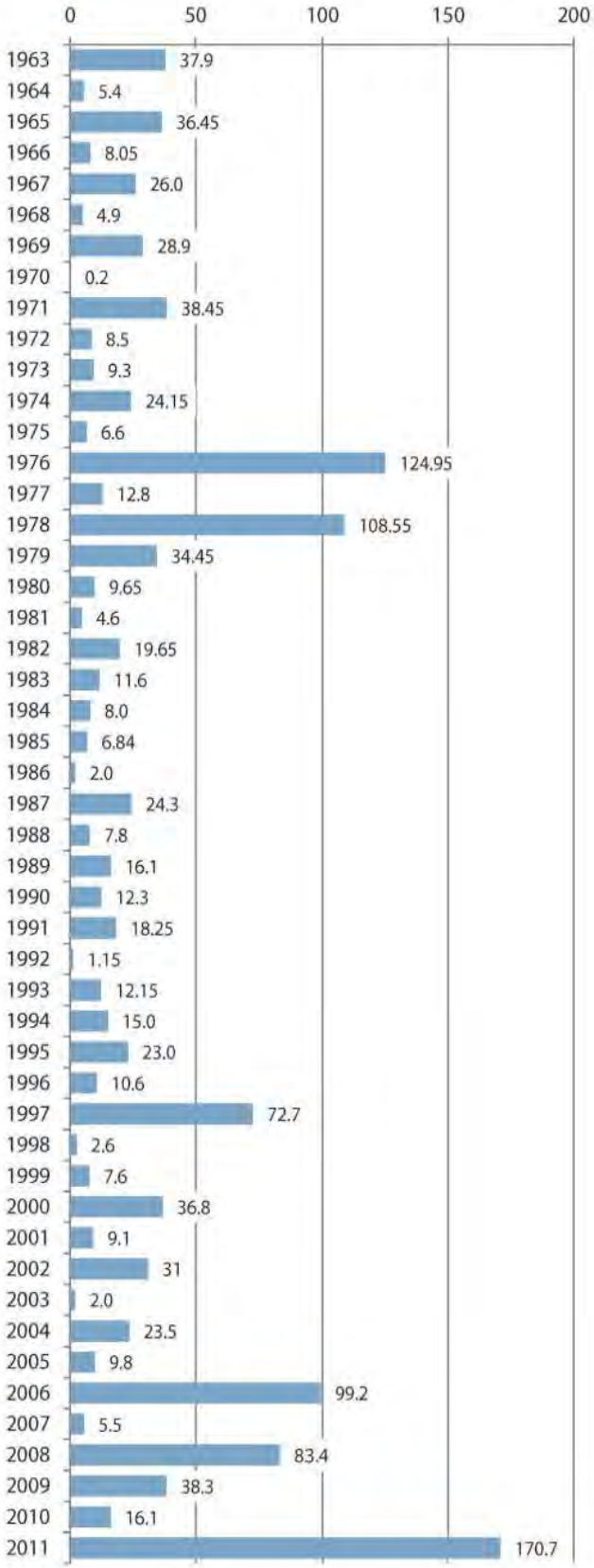
ZONES						
Areas of interest	**Settlements in the east (Homeb, Oswater, Natab)**	**Settlements around Gobabeb, Soutrivier, Klipneus and up to Swartbank**	**Settlement west of Swartbank**	**Utuseb**	**Delta**	**Walvis Bay**
Facilities				clinic, Ministry of Agriculture, Water and Forestry office, kindergarden, primary school		hospital, secondary school, offices
Soil		good				
water	from boreholes	from boreholes	water pipe	water pipe		water pipe
Forest products	*!nara*	abundance of trees: Faidherbia albida (Ana tree), Acacia Eriobola (camel thorn), Euclea Pseudobenus (fals ebony), wild tobacco (Nicotiana glauca), Ficus Burkei (fig tree), other trees	less trees in general, more date trees (Armstraat, Swartbank, Rooibank), more Prosopis (Swartbank)			
Crops	small gardens	small gardens	small gardens	small gardens		
Livestock				less grazing		no grazing
!Nara	few *!nara* fields (none at Homeb and Oswater)	small *!nara* fields	small !nara fields		*!nara* abundant	

Figure 5: Kuiseb River flow – number of days per year 1963-2011



Source: **Gobabeb Research and Training Centre**

Figure 6: Average annual rainfall (mm) at Gobabeb 1963-2011



Source: **Gobabeb Research and Training Centre**

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March 2013