HEINRICH BÖLL STIFTUNG
SOUTHERN AFRICA

Gender and Climate Change:
Namibia Case Study

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Table of contents

List of Figures

List of Tables

Abbreviations and Acronyms

CCA	Climate Change Adaptation
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
DRFN	Desert Research Foundation of Namibia
FGD	Focus Group Discussion
GAF	Gender Analysis Framework
GAM	G
GDP	Gross Domestic Product
GEM	Gender Empowerment Measure
GEF	Gender Enviroment Facility
GFP	Gender Focal Point
GHG	Green House Gases
HBF	Heinrich Boell Foundation
IPCC	Intergovernmental Panel on Climate Change
INC	Initial National Communication
ISDR	International Strategy for Disaster Reduction
IUCN	World Conservation Union
LME	Large Marine Ecosystem
MAWF	Ministry of Agriculture, Water and Forestry
MDG	Millennium Development Goals
MET	Ministry of Environment and Tourism
MGECW	Ministry of Gender Equality and Child Welfare
NDPs	National Development Plan
NGO	Non Government Organization
NGP	National Gender Policy
NGPA	National Gender Plan of Action
NPC	National Planning Commission
NRM	Natural Resources Management
PPA	Participatory Poverty Appraisal
SADC	Southern African Development Community
SARDC	Southern African Research and Documentation Centre
SME	Small and Medium Enterprises
TA	Traditional Authority
UN	United Nations
UNAM	University of Namibia
UNDP	United Nations Development Program
UNFCCC	U
WIDSAA	Women in Development Southern Africa Awareness

1. Introduction

There is a strong relationship between gender, livelihood and poverty. This relationship has been explored by many researchers, and significant to their findings is the relationship between climate change and people's livelihood, which is dependent on natural resource base and poverty. The subordinate role of women in societys plays a critical role in determining peoples ability to cope (Wamukonya and Rukato, 2001; Banda, 2005). Recognised in studies of this link is that the majority of the poor, worldwide, are women because of existing gender inequalities. Despite this established linkage, gender issues have not played a major role in climate change discourse. This has inevitably affected both policy and planning for sustainable development in many developing countries. However, focus on gender differentiated impacts of the climate change and gender nexus has only recently gained momentum around the world. It is also noted that communities in developing countries that are highly dependent on local natural resources are likely to be vulnerable to effects of climate change (Tandon, 2007). Gender analysis in disasters and risk studies provides a benchmark for understanding gender differentiated impacts of climate change.

Gender analysis focuses on understanding the relationship between men and women, gender household relations, empowerment, access and control, and participation in decision-making at all levels (Meena, 1992 and Iipinge and Williams, 2000). Gender relations are socially constructed power relations between women and men in society. They determine the benefits that women and men can derive from natural resources (Watson, 2006). Climate change on the other hand refers to any change in climate over time, whether as a result of human activity or due to natural variability (IPCC, 2001). With regards to climate change, the rationale for differentiating impacts on men and women is the different roles, and responsibilities that the two gender play in different societies. The key issue is whether women and men are impacted by climate change differently (Banda, 2005). Because of this, vulnerability and adaptation to climate change concepts are social issues that are extremely important for policy and programme intervention.

Southern African countries differ in geo-physical, economic, social, cultural and political characteristics. Nonetheless, the largest share of these countries' population lives in rural areas and is heavily dependent on subsistence, rain-fed agriculture (Wamukonya and Rukato, 2001). According to the GCA report (1999), agriculture plays an overall role in the SADC economy. Although the SADC region contributes only 2% to global emissions, it is more vulnerable to impacts of climate change (Wamukonya and Rukato, 2001). Historically people in southern Africa were nomadic and could withstand impacts of natural climatic variability. Due to changes in settlements and population growth in the last century, balancing vulnerability and risks in subsistence agriculture is no longer easy. This makes coping with anticipated climate change difficult in southern Africa.

In the context of southern Africa, Wamukonya and Rukato (2001) argue that the dependency on natural resources by women for their livelihood has come about due to the limited opportunity that exits for them to forge a decent livelihood. Recognised by Wamukonya and Rukato (ibid), is the lack of concrete data to enable gender and climate change policy making and planning in southern Africa, particularly as regards differentiated impacts of climate change in the region (ibid).

It is against this background that, the Heinrich Böll Foundation (HBF) commissioned a study in southern Africa to understand the relationship between gender and climate change. This study aims to

provide new information in this area to influence policy and decision makers to take into account the gender aspects of climate change at all levels.

Taking into account the aforementioned considerations, the aims and objectives of this study were to answer the following research questions:

- Are women and men in Southern Africa differently impacted by climate change?
- How are women and men differently impacted?
- What are the physiological, political, economic and societal causes for the differences experienced, if any?
- What are the current coping and adaptation strategies and capacities?
- How can the capacity of women and men be strengthened to better adapt to climate change and climate variability?

HBF commissioned studies in Mozambique, Namibia, Botswana and South Africa. This report focuses on the Namibian case study. Due to the fact that climate change and gender has strong links to poverty, and that the majority of rural poor are women engaged primarily in subsistence agriculture, the research primarily examined rural communities of Namibia. Fieldwork was carried out in Epyeshona village located in northern-central Namibia and Daures Constituency in the North-western region (*Figure 1*).

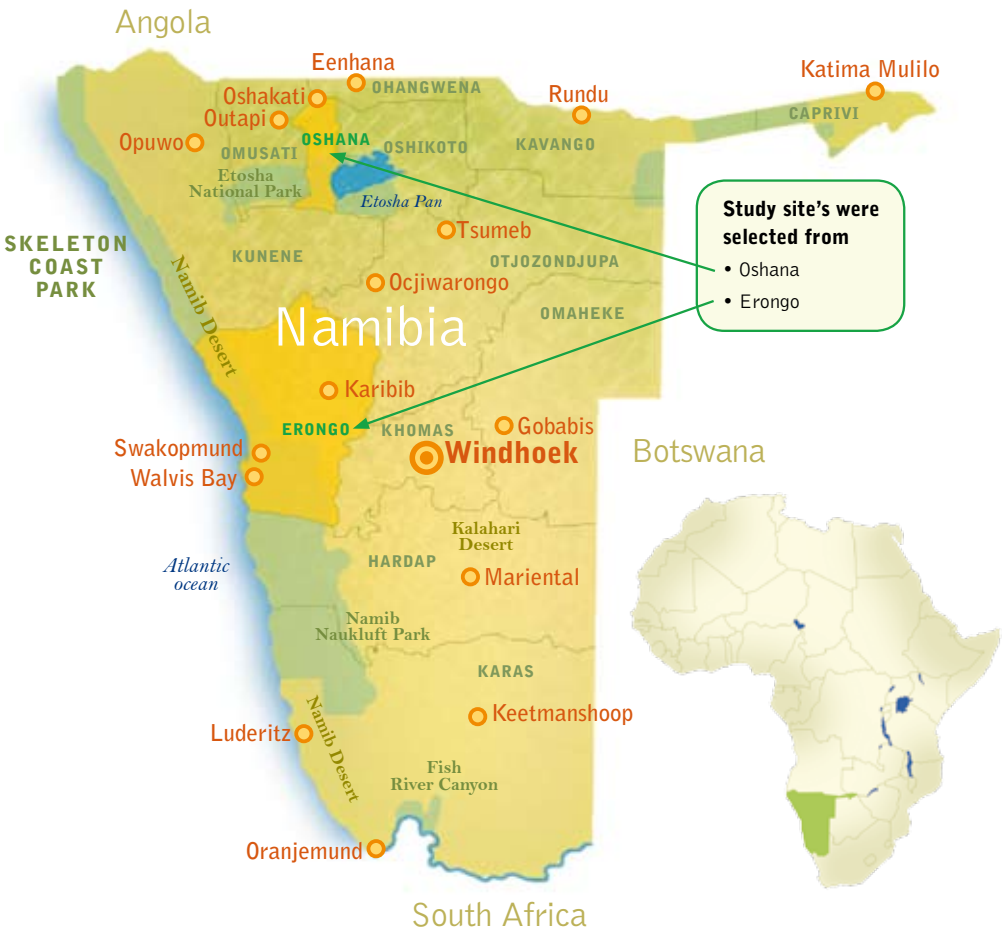

Figure 1: Administrative regions of Namibia (Source: Matengu, 2003)

2. Description of the case study: Namibia

2.1 Geographical situation, women's situation and governance system

Namibia is a Republic which gained independence from apartheid South African rule in 1990. It is situated on the south western coast of Africa, approximately between 17°S and 29°S, 11°E and 25°E. It shares borders with Botswana in the east, South Africa in the south and south east, and Angola to the north (*Figure 1*). Namibia is a large country, covering an area of approximately 824 268 km^2 (Mendelsohn et al. 2002).

The population is estimated at 1 826 854 for 2001 (2 million according to 2008 estimates – Ambunda and De Klerk, 2008), of which 51.3% are women. The population growth rate declined from 3.1% in 1991 to 2.6% in 2001. The spread of HIV/AIDS is one of the major factors contributing to this decline, and has led to other poverty related impacts on most communities. The majority, over 60%, reside in the north where five out of six most populous regions of Namibia are located. The other region is Khomas where Windhoek the capital city is located. The density of the population is approximately 2.2 inhabitants per square kilometre (NPC, 2002).

Namibia is divided into 13 administrative regions (*Figure 1*), which are further sub-divided into constituencies. Each administrative region is governed by a governor together with a number of councillors, each representing a constituency (Fuller, 2006). Women in the country make up 8% of regional councils and of the 13 Governors, 3 are female (Beall, 2005). Urban settlements are administered through local authorities. The local and regional development portfolio is allocated to the Ministry of Regional, Local Government and Housing. The National Planning Commission coordinates local and regional developmental programs (Matengu, 2003).

There are several ethnic groups in Namibia, and their Traditional Authority (TA) has jurisdiction over a particular tribal area. In particular there are eight tribal authorities among Owambo, one among Damaras and two among Herero tribes. These tribes are either administered by councils of senior headmen or by king rule in conjunction with councils of senior headmen. Each Senior Headman is in charge of a district within a tribal area, and each district is divided into villages with a headman/woman in charge of each village.

The roles of the TA are to administer tribal affairs, resolve conflicts and allocate land and grazing rights. With the establishment of Communal Land Boards in 12 Regions of Namibia (with exception of Khomas Region), the TA has less influence on allocating land and most of the functions are either carried out in conjunction with Regional Council or Communal Land Boards (Fuller, 2006). Article 66 (1) of the Constitution states that customary and common law may be practised if they do not conflict with the constitution and other statutory laws.

These laws allow citizens in rural communal areas to choose either customary or common law in dealing with local and domestic disputes, conflicts over land and inheritance. Although major offences and disputes are dealt with through common law, local and domestic disputes are primarily reported to the headman who is the representative of the TA at village level.

2.2 Natural environment

Namibia is one of the driest countries south of the Sahara and is typified as an arid country. Namibia's climate is strongly influenced by the cold *Benguela* current that flows north along the west coast. The altitude range in Namibia is from sea level to 2 606 m

(Barnard, 1998). Much of the interior basin has a mean altitude of 1000 m (Republic of Namibia, 2002). Annual rainfall is low and highly variable between years, ranging from an average of 25 mm in the southwest to 700 mm in the northeast. Most rain falls in the summer months (November to April) in the form of thunderstorm and showers except in the southwest where winter rains account for at least half of the annual total. The combination of cold water and high pressures leads to subsidence of cold dry air over much of Namibia, which generally suppresses rainfall (Republic of Namibia, 2002).

Fog constitutes another source of moisture in the cooler coastal regions where it may reduce visibility to as little as 146 days per annum (Midgley et al., 2005). This moisture source is important to biota and desert plant species. Coastal lows occasionally develop over the west coast during the autumn and more frequently spring seasons. Cut-off low pressure systems are also found during these seasons. These systems often move slowly and can result in heavy rains and flooding, especially if fed with moist tropical air from the north (Midgley et al., 2005). High solar radiation, low humidity and high temperatures lead to very high evaporation rates, thus only about 1% of rainfall ends up replenishing the groundwater aquifers that many Namibians depend on. The main perennial river courses flow along the national's borders and include the Orange, Zambezi, Kwando-Linyanti- Chobe, Okavango and Kunene Rivers. Rivers, springs, pans and wetlands within the territory of Namibia are generally not permanent. In the north central area, temporary water bodies called *oshanas* form after rainfall (DRFN, 2004).

The natural resources base comprises mineral deposits, a largely intact biodiversity (including wildlife and woodlands), a large area of arid rangeland, and small area (2%) of arable land. Three main vegetation types predominate: desert, savannah and woodlands (Giess, 1971). There are 687 known endemic plant species (17% of the total flora) located particularly on the escarpment and southwest winter rainfall area (Barnard, 1998). The Benguela Upwelling System in the Atlantic Ocean to the west is highly productive and is the basis of the important fisheries industry (O'Toole, 2001).

Scenery and wildlife are the major tourist attractions. Protected areas comprise 13% of the land surface. About 41% of the land is State owned communal land, on which over two thirds of the population rely for subsistence farming. Commercial farmers own about 44% of the land. Agriculture is dominated by livestock production and dry land crop production. The majority of Namibians depend on subsistence agriculture; farming pearl millet, sorghum, livestock and fruits. Commercial crop production includes maize, pearl, millet, sunflowers, and wheat. Grapes, vegetable and dates are grown under irrigation where water from rivers, dams or artesian sources is available. Forest and wood resources are used under permit control (Republic of Namibia, 2002).

2.3 Description of communities selected

2.3.1 Epyeshona village

Epyeshona village is located in the northern central region of Namibia, approximately 3 km north-east of Oshakati and 2 km north of Ongwediva Towns (*Figure 2*). This village falls within the communal area of the Okatana Constituency, Oshana Region. There are approximately 93 households and about 900 people living in Epyeshona. The household size varies from 5 to 25 people per household with an average of 9.7 members per household.

Although most of the households in this village are considered poor, there are a number of employed household members within the community. This is attributed to the fact that the village is not far from the main towns (Oshakati and Ongwediva) in the North-central Namibia and also, there is a clinic and school in the village.

However it should be noted that some household members are employed elsewhere and only visit the village either during the weekend or festive holidays. There are 13 teachers, 5 nurses, 13 Defence & Police officers, 3 cleaners one doctor, 125 orphans and 14 disabled people in the village. No orphan-

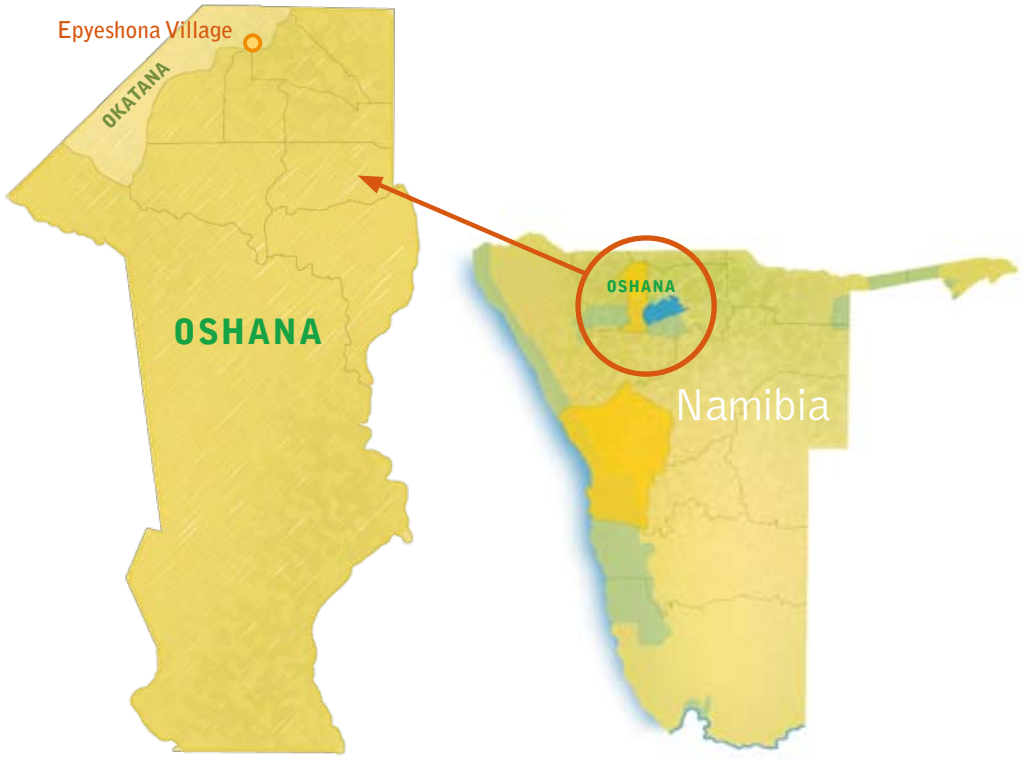

Figure 2: Study area 1 - Oshana region showing the location of Epyeshona village in Okatana constituency

headed households are reported in the village. Inhabitants are Oshiwambo-speaking, either born in the area or joined the community through marriage or as extended family members. The village is governed by a Headman who operates under the Uukwambi Traditional Authority.

The tarred road from Oshakati ends at Okatana Roman Catholic Church situated on the eastern side of the village. The village consists of informal sand tracks and paths. There is a church, clinic, one school and a kindergarten in the village. Therefore children have access to primary and junior secondary education in the village. Some houses are connected to the electricity grid, provided through the rural electrification programme in Namibia. There is no public telephone and police station in the village. The village is however connected to the cellular mobile network. It is noted that there is a trend of people from rural communities owning mobile phones. There are three water points in Epyeshona village; therefore all people have access to potable water. There is also one earth dam for livestock. The nearest local market is at Oshakati town, 3 km from the village. There are a few individualy owned cuca shops (spaza shops) where community members buy and socialise basic needs.

2.3.2 Daures Constituency

Daures constituency falls within the Erongo Region, western north of Namibia (*Figure 3*). Daures Constituency: Comprises Tubusis, Okombahe, Omatjete and Spitzkoppe settlements.

This constituency is divided into centres which constitute individual farms. The settlement pattern in this constituency is sparsely populated and the distances between farms are vast. The selected settlements are main centres where facilities and services for surrounding farms are located. These settlements, surrounding farms included, are governed by a Headman. The Traditional Authority is

located at Okombahe and governed by a council of senior headmen. The nearest towns are Usakos and Omaruru. Tubusis is about 60 km from Usakos, Spitzkoppe 50 km, Okombahe 80 km and Omatjete 115 km from Usakos and 60 km from Omaruru.

Interviews were carried out as follows:

- Tubusis (Youth and Elderly male FGDs)
- Spitzkoppe (Middle-age men and Middle-age women FGDs)
- Omatjete (Elderly Female FGD) – not included in the analysis.
- Okombahe (Traditional Authority and Community worker from MGECW). These settlements are equipped with the following infrastructures that are serving surrounding farms as well:
- Primary school
- Clinic
- Church
- Connection to the electricity grid (except for Spitzkoppe)
- Access to portable water, diesel generated boreholes
- Public telephones
- Police station (Except for Spitzkoppe)
- Agricultural Extension Office
- Ministry of Gender Equality and Child Welfare (at Okombahe)
- Regional Constituency office (at Okombahe)
- Gravel roads
- Community Campsites at Spitzkoppe and Tubusis

The population of Daures is diverse and has seen an increase in numbers of Oshiwambo speaking individuals since 1991. The area has Damara speaking and Herero speaking ethnic groups among its original settlers. The Damara ethnic group has been the majority in this area (NPC 2007a).

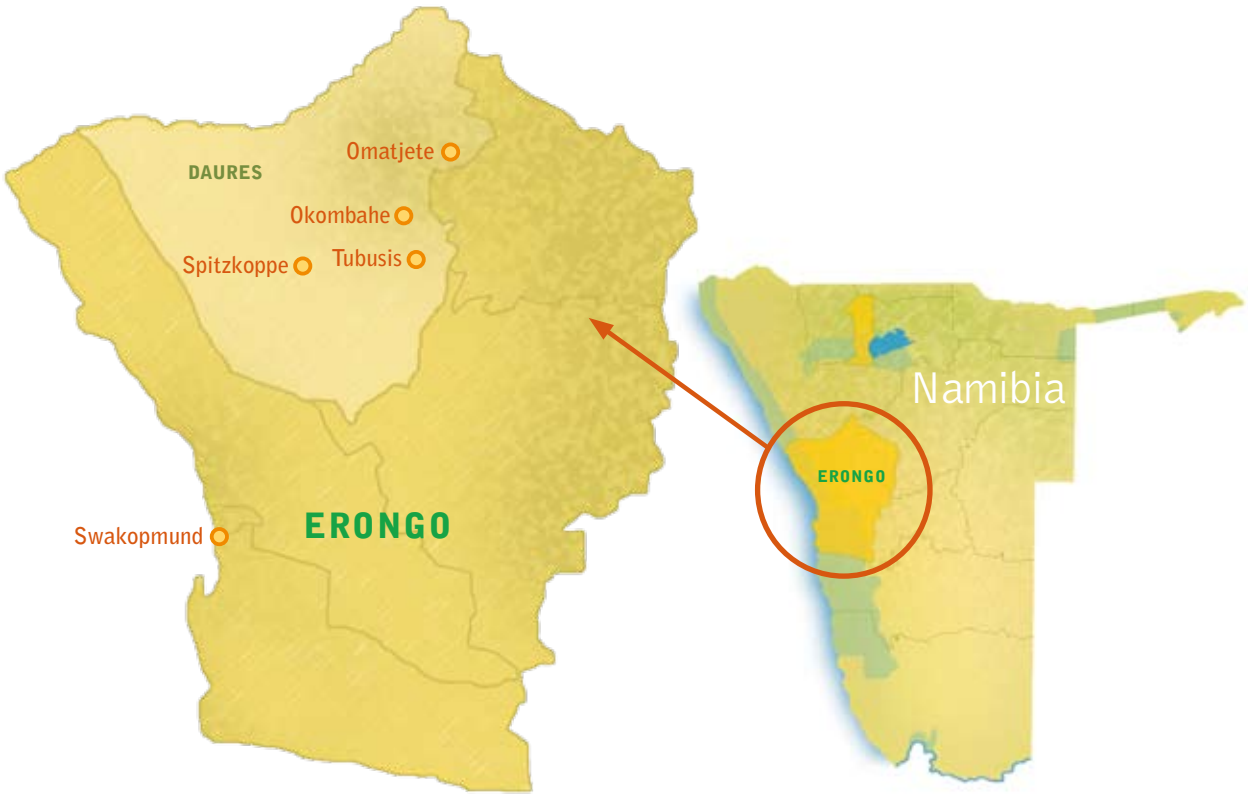

Figure 3: Study area 2 – Erongo region showing the location of Omatjete, Okombahe, Tubusis and Spitzkoppe settlements in Daures constituency

3. Approach and methodology

3.1 Field work process

The research process commenced with a social research methodology training workshop, held at HBF, Cape Town. The workshop covered aspects of Gender Framework of Analysis (GAF) and general social research methodology. During this workshop, the research team (consultants, trainers and HBF staff) agreed upon the five main research questions, designed the fieldwork strategy (*Box 1*) and agreed upon selection criteria for study areas (*Box 1*). The study also aims to create awareness amongst policy and decision-makers about the need for gender differentiated adaptation policies. It addresses the following key questions;

- Are women and men in differently impacted by Climate Change?
- How women and men are differently impacted?
- What are the physiological, political, economic and societal causes for the differences experienced, if any?
- What are the current coping and adaptation strategies and capacities?

Box1: Fieldwork guidelines

OVERALL METHODOLOGY:

- Qualitative research
- Rural appraisal
- Focus groups
- Life histories (case studies)
- Key informant interviews
- Keep a journal & try to make the research and report more personal.
- Concentrate on 2 rural areas with two different climatic conditions

CRITERIA FOR SELECTION OF AREAS:

- Vulnerability
- Poverty / relative poverty (according to country guidelines)
- Climate change and variability – where impacts are already visible
- Areas where subsistence farming & livelihood strategies are dependent on climate – influenced by climate change
- Try to avoid sites where previous studies have been done
- Don't include urban areas

SAMPLING FOR FOCUS GROUPS:

- Key informant interviews to be use to select people for focus groups
- To be relatively homogenous groups
- Younger women (maybe as a mixed group)
- Elderly women
- Elderly men (separate from elderly women)
- Formal work
- Informal work
- Women farmers
- Resource user women
- Mixed women group – age, employment,
- Female headed households
- Possible mixed women / men group
- Vulnerable groups (minority ethnic group, disabled etc.)
- Community / women leaders

SELECTION OF PEOPLE FOR LIFE HISTORIES:

- Lived in area long enough (over 50 years) to be able to notice change
- Women & men
- Environmental history
- A specifically vulnerable person

- How can the capacity of women and men be strengthened to better adapt to climate change and climate variability?

The study was carried out over a period of 20 days; with 10 days spent on fieldwork in each area of the selected population group. This study used the focus group discussion, life history and Key informant interview research methods. This was done with a gendered research approach and analysis.

Gender analysis concentrated on the collection and examination of information about the different roles of women and men, the relationship and inequities between them, their different experiences, capacities, needs, constraints, rights issues and priorities, and the reasons for these differences as well as the needed strategies and opportunities for change.

The Focus Group Discussions were carried out with homogenous groups of men and women:

- Elderly men (60 – 60+)
- Elderly women (60 – 60+)
- Middle-age women (30 – 59 years)
- Middle-age men (30 – 59 years)
- Youth (mixed men and women between age of 18-29)
- Workers (only in Epyeshona)

The selection was based on the fact that it was important to understand whether knowledge is gendered in terms of climate variability and change between the elderly women and men and active groups of women and men. Dividing the selected population was done, taking cognisance of levels of literacy, especially between middle-age women, men and the youth. The majority of youth under 30 have attended school up to junior or upper secondary level (That is Grades 10 and 12 school leavers). The key focus of interviews and discussions during FGDs was to assess local people's perception of environmental change, its impacts on agriculture and natural resource base, household coping mechanisms as well as gender relations in the community (*Guiding questions are listed in Appendix A*).

Daily activities charts were used to identify time spent on different activities in one day during a particular season. It was used to explore the differences between the activities and workloads of women and men. Life histories interviews with older people who have lived in the area long enough to be able to notice change was used to determine environmental history of selected communities.

Key informants (Traditional Authority, committee members and/or government developmental workers) were selected for In-depth interviews. The fieldwork study was carried out in the following communities:

- Okatana Constituency in Oshana Region: Epyeshona Village
- Daures Constituency in Erongo Region: Tubusis, Okombahe, Omatjete and Spitzkoppe Settlements

The two sites were selected taking into consideration the following criterion:

- socio-economic factor of poverty,
- climatic vulnerability of the community,
- Population size.

3.2 Rationale for selection of community

Epyeshona village was selected because it had experienced flood event during 2007/2008 and 2008/2009 rainy seasons. The village is densely populated, and practices a mixture of crop and animal production for subsistence agriculture, there is evidence of land degradation. Daures on the other hand, is sparsely populated, located within one of the most harsh and drier environments of Namibia. The main practice here is small livestock farming.

3.3 Fieldwork activities

The fieldwork activities were started by establishing contacts with the Regional Council and Traditional Authority upon arrival at each study site. This was done mainly to introduce the study and be granted permission to carry out research work in respec-

tive communities. In Epyeshona, the local Councillor put a radio announcement so that community members were aware of the study. In Daures Constituency, the traditional authority informed people about the study and assisted in identifying participants for FGDs. The selection of participants, construction of community profiles and key questions were asked during interviews with key informants. Three and one life histories were contacted in Epyeshona and Daures areas respectively. Two FDGs per day were conducted in each area and each comprised a group of 5 –10 people. These interviews were tape recorded.

3.4 Challenges and limitations of the study

This study encountered some challenges and limitations. The following are some of the limitations and challenges:

The Selection of two study sites that met all criteria was not an easy task. The Research team opted to select a village from the populous Oshana Region and selected four settlements of a Constituency from a sparsely populated Erongo Region.

The major limitation was time. Time allocated for planning and carrying out of the fieldwork, especially for planning was not adequate. Upon arrival in the study area, up to two days was spent on making contacts and seeking permission from the local government and traditional authority. A local person from Epyeshona was employed to assist in informing individuals participating in FGDs.

Appointments made with traditional authority members in Omatjete (Daures Constituency) were unsuccessful. Only two women turned up for the elderly female FGD in Omatjete. Thus, this activity was excluded from the analysis.

With regard to FGDs, we encountered different challenges from each area. In Epyeshona village, all local meetings were held under a "famous" tree and it was the only available venue for FGDs. Translators were hired for Daures constituency because the research team is not fluent in Damara and Herero languages.

In Daures constituency, there was a centenary celebration of a Rhenish missionary at Okomabahe, thereby losing a day of fieldwork research. A funeral in Epyeshona led to the FGD scheduled with workers to be moved to another date.

4. Conceptual framework

4.1 Concept of gender

The concept of *Gender* has been generally described as socially constructed, culturally variable roles that women and men play in their daily lives (Meena, 1992). It also refers to expectations which society has of women and men based on sexes (Iipinge and Williams, 2000). However, there is a distinction between concepts of gender and sex. Gender identities and roles are constructed in society but are not fixed, not universal and do change over time. Sex is biological and sex roles are fixed and universally similar (Meena, 1992 and Iipinge and Williams, 2000). Gender relations are socially constructed power relations between men and women in a given society; they determine the different benefits that men and women can derive from natural resources (Watson 2006). Women's and men's differential access to social and economic resources is one of the key aspects of gender inequality (Brody, Demetriades and Esplen, 2008). Women occupy subordinate social positioning because their roles are less visible and often, especially in rural areas, do not earn wages. However, they are expected to assume primary responsibility for their families' subsistence, agricultural production and sustainable livelihood (Brody et al, 2008 & Banda and Mehlwana, 2005).

4.2 Gender in Southern Africa

In Southern Africa, the gender approach has historically been used in: (i) human rights issues regarding women's oppression and subordinate position in respective cultures (ii) economic issues regarding the division of labour, employment patterns and social security policies and, (iii) political issues regarding law, policies and participation in decision-making at all levels (Meena, 1992 and Mbilinyi, 1992). The rationale for research and gender studies in Southern Africa and in Namibia particularly are documented in Meena (1992) and Iipinge, Phiri and Njabili (2000) respectively. The rationale is to explore issues related to relationships between men and women, gender household's power relations, understanding issues of empowerment, access to economic and market facilities, access and control issues as well as examining participation of women in decision-making.

4.3 Conceptualisation of gender in Namibia

The construction of gender in Namibia has been influenced both by colonial administration historical policies and Christian mission's influences. These influences transformed gender relations among indigenous tribes (Iipinge et al., 2000). The colonial policies also influenced gender relations among other races. However, the post independent Namibia displays a mixture of traditional/cultural and modern values and norms shaping current gender relations in the country. Iipinge et al. (2000) show that at ethnic level, the cultural perception of gender is seen in relation to men and women's roles and responsibilities as well as symbolism attached to a concept of man or woman. Hence the Owambo symbolise a "man" as a bear, an axe for his father and a bone for hunger. Yet clearly noted over time has been the dynamism of gender relations.

4.4 Conceptualising gendered meanings in Namibia

Conceptualising gender shows how men are seen as the stronger sex compared to women. In the Namibian case this implies that a man is a strong person, he is an indispensible tool and that where

a man is there should be no hunger. A "woman" however, is symbolised as a clay pot, spoon or as a child. These similes imply that a woman is physically weak, she is an indispensible tool for the man and that she cannot lead an independent life without a man.

Amongst the Damara the man is defined a "man" as the middle pillar of the house. This is the central pole that holds the house intact. He is the tough tree that can survive long period without water. This implies that a man is strong and can endure hardship and is able to protect his household. The "woman" on the other hand is defined as the foundation and keeper of the house. The Damara further regard a woman as a right-hand of the man. The Herero regard a "man" as a protector of the family, collector of food and a fighter. A "woman" is known as a mother of the nation and a collector of wild food. The differences in conceptualisation also affect roles, responsibility and power relations in the two societies.

4.5 Climate change concepts

The UNFCCC defines climate change as change of climate that is observed over long periods of time, attributed directly or indirectly to human activity, above that caused by natural climate variability (UNFCCC, 1992). However, according to IPCC (2001) climate change refers to any change in climate over time, whether as a result of human activity or due to natural variability. Schneider et al. (2007) define an impact as a specific change in a system caused by its exposure to climate change. This exposure may be judged as harmful or beneficial. The degree to which these systems are susceptible to and unable to cope with the adverse impact of climate change is referred to as vulnerability (ibid). The UNFCCC has identified two responses to climate change (i) mitigation of climate change by reducing green-house gases and enhancing sinks and (ii) adaptation to impacts of climate change, by making communities engage in coping mechanism that assist in preparedness measures (Klein et al., 2007).

Human societies and activities are sensitive to climate in some way or other. Where people live and the way they generate a livelihood and wealth is influenced by the ambient climate. Climate is naturally variable and human societies have always had to develop coping strategies when faced with unwelcome variations in climate or weather extremes (Adger, 2006). This study represents an attempt to highlight gender differentiated impacts of climate change. Determining how men and women are vulnerable to climate change and their associated adaptive capacity provides an explanation as to how they are differently impacted. Vulnerability is a concept that has been used in various disciplines, notably in the field of disaster and risk management (Kasperson and Kasperson, 2001, Galloppin, 2006). Adger (2006) concluded that vulnerability is conceptualised as being constituted by components that include exposure to perturbations or external stresses, sensitivity to perturbations and the capacity to adapt. Adaptive capacity is therefore a component of vulnerability (Adger and Vincent, 2005). Furthermore, Babugura (2005) argues that vulnerability can be viewed as a state of well-being.

4.5.1 The concept of vulnerability and differentiated impacts

The concept of vulnerability has been used closely with poverty and sustainable livelihood stemming from the study of hazards and disasters (Prowse, 2003). Studies on natural hazards suggested that human's social, economic, political and psychological circumstances mediate how they experience changes (Bradshaw, 2004). Therefore, the concept of social vulnerability takes into account people and differences among them. This concept is also seen as a condition and an ability to cope depend on socio-economic factors listed above. Following Babugura (2005), Adger (2006) and Bradshaw (2004) contributions, this study defines vulnerability as the ability or inability of individuals, or groups of people to respond, cope, adapt or recover from impacts of climate change on their livelihood. The differences in exposure to climate change, sensitivities to the impacts of past and current climatic

conditions and capacity to cope and adapt were taken into account to assess men and women differentiated vulnerability to climate change.

4.6 Gender and climate change in Southern Africa

According to Wamukonya and Rukota (2001), the main rationale for differentiating between men and women as far as climate change is concerned, is the different roles that the two sexes play in different societies. Understanding how the different expectations, roles, status and economic power of men and women affect and are affected by climate change will improve interventions to reduce vulnerability in the developing world. Effective design and implementation of adaptation measures could be enhanced by acknowledging and taking into account different ways in which climate change impacts on men and women (Wamukonya and Rukota, 2001). The differences in gender roles indicate that climate change will impact women and men differently, based on their different roles and responsibilities in their community and their level of access to natural and other resources including knowledge (ibid)

Discussions on gender (Wamukonya and Rukota, (2001); Iipinge and Williams, (2000) and Meena, (1992) in Southern Africa, confirm gender inequality, lack of empowerment and limited access to and control of assets. Lopi (2004) claim that in southern Africa, women experience subordinate legal status, limited access to productive resources such as land, technology, credit, education and training, formal employment and training, as well as susceptibility to HIV and AIDS. These factors not only intensify inequalities between men and women but also, make woman more vulnerable to poverty, disasters, risks and climate change.

An approach to establish linkages between gender and climate change should attempt to create an understanding of factors listed in subsequent paragraph and ways in which climate change can exacerbate inequalities between men and women. Such an understanding would highlight ways in which these inequalities can intensify the impacts of climate change for individuals and communities. Brody et al., (2008). Brody (2004) also caution that a gendered approach to climate change study should not only be about women. Men, women, youths and children are vulnerable to impacts of climate change but in different ways.

Existing frameworks for gender and poverty (Chant, 2003b) as well as gender and disaster studies (Bradshaw, 2004) provide a conceptual framework applicable for gender and climate change studies. In addition, gender and climate change analyses could draw on studies conducted on gender-specific aspects of disaster prevention and mitigation (Dankelman, 2002).

4.6.1 Gender differentiated impacts

Denton (2002) argues that women play a major role in natural resource and environmental management yet their contribution is ignored. Dankelman (2002) adds that it is helpful to consider studies of the relationship between gender and the environment, in order to determine the gender dimension of climate change. Women in developing countries are responsible for climatically sensitive tasks such as securing food, water and energy which ensure food security and household well-being (Aguilar, 2007).

Men are responsible for climatically sensitive tasks as well such as livestock farming, land management and forestry. It is clear that ways in which individuals, groups of people and communities interact with their natural environment are different. It is also clear that climate change does not affect women and men in the same ways. Therefore, this study explores differentiated impacts of climate change on women and men. The differentiated impacts concept is an aspect of the overall concept of vulnerability. Studies on disasters risk management and adaptation discuss differentiated impacts of climate change in relation to disaster, health, food security, water and income (Aguilar, 2007; Bradshaw, 2004). These discussions differentiate how women and men are affected by impacts of climate change and variability and further show how women are vulnerable to adapt and cope with these changes.

5. Literature review

5.1 Gender and sustainable development

The Human Development Index (2001 and 2007/2008) has shown that there is a strong relationship between human development and income. This is especially true for southern Africa, confirming a strong relationship between poverty and gender equality. The gender empowerment measures[1] (GEM) – 1997 in southern Africa has shown that South Africa (0.529), Botswana (0.423) and Lesotho (0.390) had the highest measures. The 2007/08 figures show that Namibia, Tanzania, Mauritius and Botswana have the highest GEM measures in southern Africa. These values are very low in comparison to developing countries.

Studies have shown that the level of gender inequality is greatest among developing and the poorest countries (Chant, 2003b; Bibars, 2001 and Chant, 1997). Still, in countries such as Sweden which has the highest level of gender equality, men earn more than women in all income groups (Johnson-Latham, 2007). Studies focusing on women have shown that women have limited range of options, suffer more from lack of leisure time and give priorities to others (Chant, 2003a, Jonathan-Latham, 2007). Southern African studies focusing on women and men, reported that men and women play substantial roles in southern African economies. However they are not equally distributed across productive sectors, neither are they equally remunerated for their labour. In terms of land, women's access to arable land is less than men. Further analysis of gender-specific access to financial facilities, allocation of time on labour (market and household) as well as data on health and HIV/AIDS indicates inequalities in favour of men (Lopi, 2004).

Given the exsisting gender inequalities reported in literature, women are clearly more socially vulnerable than men. Additionally, Chant (2003b) stresses that there is much going on within the household than outside it, which determines women's poverty, well-being and power. Studies that focus on the gender and climate change nexus (Brody et al., 2008; Aguilar, 2007; Banda and Mehlwana, 2005; Denton, 2002 and Dankelman, 2002), disaster and risk management (literature Bradshaw, 2004; International Strategy for Disaster Reduction- ISDR, 2008) as well as poverty and sustainable livelihood literature (Chant, 2003b) highlights the following factors that seem to promote gender inequalities:

- Women form a disproportionate share of the poor whereby 70% of human beings worldwide livings below the poverty line are women.
- In the event of natural disasters, women and men are affected differently because of their social roles, responsibilities and access to support.
- Women and children are collectors, users and managers of water in the household.
- Women are responsible for 60-80% of the food production in developing countries.
- Women are responsible for more domestic tasks than men.
- Women have unequal access to information and resources, and are under-represented in decision-making. Women and youth are marginalised

[1] *GEM provides a general measure of the extent of inequality between women and men in areas of economic and political participation and decision-making in the public and private sector.*

in the decision-making processes at both community and household levels.
- Women have less opportunity to negotiate upon their concerns regarding food production at policy level.

The status of women development and empowerment suggests that not with standing interventions aiming at empowering women and addressing women practical needs, achieving gender equality remains a challenge. These inequalities and social gender relations seem to suggest greater vulnerability among women to poverty, climate change and natural disasters (Chant, 2003b).

5.1.1 Gendered relations in Namibia

There is matrilineal descent (Owambo and Kavango communities), bilateral system (Nama and Damara) and double or bifurcate descent (Herero communities) in Namibia. Caprivi communities are matrilineal with a strong patriarchal influence. These descent patterns have influence on customary marriages, methods of inheritance and control of children. The Iipinge and LeBeau (2005) profile explain that, all ethnic groups in the country exhibit gender inequality in the form of patriarchy. Women are still viewed as second-class citizens and at worst as the property of men. Cultural attitudes vary from relative equality to rigid inequality. The reported incidences of violence against women and children continue to increase in Namibia. More than 90% of convicted perpetrators are men between the ages of 21 and 39 (Iipinge and LeBeau, 2005). As in most African cultural communities, duties and responsibilities are divided among husband, wife and siblings based on stereotypes of what men and women should do and how women should behave and not necessarily based on skills or ability (Ambunda and de Klerk, 2008). The majority of Namibian women are responsible for most of the household chores and have no decision-making power within households and community. This is exemplified by the definitions of women across ethnic groups in Namibia:

The "*mother of the nation*", "*mother creator*", "*keeper of the house*" and "*keeper of the cooking fire*". A national gender study concluded that decision-making powers usually belong to the man. Women are thus regarded as dependants and therefore required to follow decisions and directions by the man. The study also revealed that although decisions are made in consultation with a woman, the man has the power to overrule a womans decision. Resources management and control over resources such as livestock and income from all sources is vested in the man.

This follows the notion that men are the head of the household as reflected by similes symbolising a man in various ethnic groups. The literature is however silent as to how decision-making and power relations take place in female-headed households in contemporary Namibia. Nevertheless, a female-headed household is traditionally regarded as insignificant and ranked very low in the community. The eldest son makes all major decisions in a female-headed household.

Ambunda and De Klerk (2008) made an interesting point that, the socialisation of women and girls with administration of the household and exclusion from decision-making, leads to their development of inferiority complex when they have to compete with men in the job market or in the urban household. This creates a vicious cycle of inferiority throughout the life of a female Namibian. As discussed in the preceding section, women are the main producers of subsistence agriculture and main guardians of the environment[2]. This observation is also true for Namibia; women constitute the

[2] *Equal rights to apply for land rights among men and women in communal areas have been granted through the Communal Land Reform Act, Act No. 5 of 2002. This Act also, protects the surviving spouses, who are predominantly the wives, and gives them the right to apply for the land to be registered in their names (Lendelvo, 2008)*

majority of those engaged in subsistence farming (Iipinge and Le Beau, 1997).

Labour force statistics from 2005 indicate that in rural Namibia 40% of women above the age of 15 compared to 51% of men actively participate in formal and informal employment and income generation activities (Andongo, 2006). The income levels among household heads in rural communities are low and unable to secure access to information technology, financial facilities and services available to most people in urban areas. Adongo (2006) reported that the use of informal micro lenders seems to be present among low-income households in rural areas. Formal microfinance is available through the Ministry of Agriculture, Water and Forestry (co-operatives), Ministry of Trade and Industry (SMEs) and NGOs (funding agencies). According to Adongo (2006), extension of banking and other financial institutions in rural areas is difficult due to environmental, demographic and technical challenges[3].

Until Namibia gained its independence, its society was deeply patriarchal (as discussed above) and divided along racial lines. However, upon gaining independence there has been a paradigm shift in human rights concepts. This has led to adoption of human rights laws guided by the Namibian constitution (Ambunda and De Klerk, 2008). These laws specifically those focusing on gender, eliminate all forms of gender inequalities and women discrimination as well as promoting women empowerment as discussed earlier. Despite these developments, most women in contemporary Namibia still face challenges due to influences of the historical imbalance of power between men and women, social structural factors, unemployment and related social problems. Men welcome these laws and acknowledge that some customs discriminate against women, but their attitudinal change is not forthcoming (Iipinge and LeBeau, 2005).

5.1.2 Gender regulatory framework for Namibia

Governments in the SADC region have set a gender policy framework to address gender disparities and engender human development programmes. Twelve of the 15 SADC countries have gender or women empowerment policies in place. The commitment is cemented by ratifying the Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW) and adopting the Protocol to the African Charter on Human and Peoples' Rights on the rights of women in Africa. Furthermore, SADC governments have put institutional structures to address challenges of achieving full equality between men and women and in particular advance women's empowerment (Lopi, 2004).

The Namibian constitution makes provisions to eliminate all discriminatory practices based on sex, colour and race (Namibian Constitution Article 10 (2). Furthermore the previously disadvantaged position of women is recognised and the implementation of affirmative action is encouraged. Equal power relations in all spheres of social and legal and economic life are acknowledged and encouraged through the Constitution (Iipinge and LeBeau, 2005). Marriages, co-habitation, family and domestic issues are some of the gender aspects that were legally inadequately addressed before independence. The National constitution recognises these rights and as such, identifies the family as a basic fundamental human right and also provides for equal rights in and during marriage and in divorce.

There has been significant progress on gender in Namibia since independence in the areas of government policies and programmes, ratification

[3] *Challenges to put banking facilities in rural areas include: Harsh and dry environment, sparsely distributed rural population, high per unit cost of serving rural poor due to the relatively small size of each transaction and oligopolistic market structure that inhibits innovation due to limited competitive pressure (Andongo, 2006).*

of international instruments as well as gender-related law reform. The Namibian government has also established several institutions and a system to address gender inequalities. The Women's desk was established in 1990, which was upgraded to the Department of Women Affairs in 1997 and later in 2000 to the Ministry of Women Affairs and Child Welfare (Iipinge and LeBeau, 2005). In 2005 it was finally renamed the Ministry of Gender Equality and Child Welfare (MGECW). MGECW is tasked with the implementation of the Convention on the Elimination of All forms of Discrimination Against Women (CEDAW), ratified in 1992 and provisions of the Namibian Constitution relating to human rights (Iipinge and Williams, 2000 and Iipinge and LeBeau, 2005).

The MGECW's mandate is to co-ordinate national gender developmental programmes, constitute gender sectoral committees, organise ministerial Gender Focal Points (GFPs), co-ordinate international affairs and maintain bi-lateral relations. Gender research and legislation activities are also facilitated by this ministry. Namibia has two national documents that guide gender policy: the National Gender Policy (NGP) and the National Gender Plan of Action (NGPA).The NGP, seeks to recognise and address the priority needs of women, to identify targets and actions that will increase women's access to resources and facilities, and to ensure growth in participation of women in decision-making. The NGPA identifies each of the critical areas of concern with NGP goals as well as objectives, planned activities, role players and expected outputs for reaching these goals. The NGPA's goal is;

"to promote gender-equality by empowering women through the dissemination of information, co-ordination and networking with all stakeholders, mainstreaming of gender issues, promotion of law and policy reform, and monitoring of progress to ensure that women, men, children and people with disabilities have full and equal participation in the political, economic, social and cultural development of the nation" –Iipinge and LeBeau, 2005

5.2 Climate change and Namibia

5.2.1 Anticipated climate change and variability

It is widely recognised that there has been a detectable rise in global temperature during the last 40 years and that this rise cannot be explained unless human activities are accounted for (IPCC, 2001; IPCC, 2007). Impacts of climate change and variability identified in the third IPCC assessment report (IPCC, 2001) remain valid in the fourth assessment report (IPCC, 2007). These impacts are: decrease in grain yields, changes in runoff and water availability in the Mediterranean and southern Africa, increased stresses resulting from increasing drought and floods and significant plant and animal species extinction and associated livelihood impacts. In southern Africa, the increase in temperature will combine with drying that will affect most ecosystems, crop and livestock production. The major consequences of these changes pose a threat to livelihoods, with the poor bearing the brunt of the impacts. The impacts of drought and less precipitation will be most adverse in arid and semi-arid countries such as Namibia which is the driest south of Sahara (Christen et al., 2007).

Namibia contributes little to global greenhouse gas (GHG) emissions. Instead, Namibia was estimated to be a net sink for carbon dioxide in 1994, as a result of increasing woody biomass in the rangelands due to the process of bush encroachment (Republic of Namibia, 2002). There is a large degree of uncertainty on the extent and rate of bush encroachment and hence the magnitude of CO_2 uptake estimate for 1994. Projections of climate change in Namibia are presented in Namibia's Initial Communication to the UNFCCC report (2002), the book Benguela Predicting a Large Marine Ecosystem (LME) (Shannon et al., 2006), the Namibian Country Study (Barnard, 1998) and recent related assessment reports (2003- on going).

The Initial National Communication (INC) report suggests a 2-6°C temperature rise above the 1961-1990 mean surface air temperature for Namibia by

2100. The sea surface temperature of the Benguela Current Ecosystem has risen by approximately 1.0°C between 1920 and 1990 (Clark, 2006).

Precipitation is expected to decrease and by the 2080s the western subtropical region (including northern Namibia) is expected to become drier due to fewer rainy days and less intense rainfall (IPCC, 2007; Hudson and Jones, 2005). Rainfall is expected to be more variable in the future than present. Rainfall reductions are expected to be greatest in the North West and central regions of Namibia (Republic of Namibia, 2002).

An increase in evaporation of about 5% is expected per degree of warming for Namibia. This implies that water balance is expected to be drier due to increases in evaporation rates as temperatures increase.

Sea level measurements of southern African coasts show an increase of 1.2 mm per year over the last three decades (Shannon et al., 2006). Although it is not clear whether it is due to climate change, projected changes may exacerbate this trend.

The frequency of extreme events of hot days, heat waves, drought, heavy rainfall and floods is also expected to increase in Namibia (Reid et al, 2007).

5.2.2 Climate change and vulnerability in Namibia

Climate change, especially changes in rainfall distribution, will have effect on Namibia. Water scarcity is already a major constraint to development and this is likely to get worse under the existing climate change scenarios. Namibia is also vulnerable in sectors such as human health, crop and livestock production, fisheries, ecosystems and biodiversity. Moreover, over half of the population depend on subsistence agriculture and income distribution in Namibia is not equitable (Gini co efficiency is 0.7 for 2001). This makes Namibia one of the most vulnerable countries in the world to climate change and associated impacts. The INC (Republic of Namibia, 2002) has identified the following sectors as most vulnerable to climate change:

- Water
- Agriculture
- Fisheries
- Ecosystems, biodiversity and tourism
- Coastal zone
- Health
- Energy

5.2.3 Water, women and climate change

The water sector is the most vulnerable to climate change. Even without the threat of climate change, Namibia faces absolute water scarcity by the year 2020 (Republic of Namibia, 2002). The combined flow of the rivers Namibia shares with its neighbouring countries is 66 500 million m^3 per year. Groundwater and ephemeral water bodies supply the rest of Namibia's water needs. The assured annual yield of water is about 500 million m^3. The per capita water supply is thus below 300 m^3 per person per year, making Namibia a nation with absolute water scarcity. Even in the case of a moderate increase in evaporation of 15% and no change in rainfall, the additional stress on the water sector due to climate change would be severe. If rainfall decreased by 30% and coincided with an increase in evaporation of 30%, as projected by some models, then the impact on the water sector and human development in Namibia would be extreme.

Water supply for irrigation of crops and livestock watering amounts to about 120 million and 6 million m^3 per year respectively, while mining activities require about 8 million m^3 per year. Water flow in the Kunene River is essential to ensure the continued functioning of the Ruacana Hydropower plant, which supplies almost half of Namibia's electricity needs (Republic of Namibia, 2002). During periods of drought and low river flow; electricity production at Ruacana is severely shortened. Under climate change scenarios of increased evaporation and reduced rainfall, electricity generation would be adversely affected. Under some scenarios, rainfall is predicted to increase in the southern parts of Angola, in which case the catchments of the Kunene River could receive more rain (Republic of Namibia, 2002).

5.2.4 Energy, women and climate change

Namibia's energy needs in rural areas are largely met by traditional biomass fuel which account for over 60% of rural energy needs. The supply of wood for fuel is increasing because of bush encroachment in some parts of the country, but these are often remote from the areas of fuel wood scarcity. The high sunshine hours in Namibia make the country ideally suited to exploit solar power, but this renewable energy source is currently underutilised. The direct effects of climate change on the economic sectors described above would be felt throughout the economy, ultimately reducing productivity, influencing sustainable development options and affecting social stability (Reid *et al.*, 2007). The increased diminishing of marginal environment for energy needs means a lot of hardships for women to meet their reproductive and productive chores at household level. Studies in Namibia by several researchers illustrate the hardship met by women in procurement and utilisation of indigenous biomass.

Other climate related challenges have been periodic droughts, which are attributed to stock losses and reduced grain production. Aridity is indeed regarded as an expected state of the environment, although agricultural systems are not always adapted to this reality. In times of drought, livestock production is reduced because the availability of forage is reduced, milk production declines, health status deteriorates and growth rates decline. Over two-thirds of the population practise subsistence cropping with staple crops such as millet. Impacts of climate change on household food security in the subsistence farming area could be dramatic. The agricultural sector is crucial to national food security. The sector's sensitivity to climate change amplifies social vulnerability of subsistence farmers, whose majority are women. In the extreme, climate change could lead to social disruptions and displacement amongst rural communities. Maize is the principal commercial crop but only half of the country's needs are met locally. Maize yield is likely to decrease under climate change scenarios of increased temperatures and less rainfall (Republic of Namibia, 2002 and Mfune and Ndombo, 2005). All these factors impact negatively on women's livelihood.

5.2.5 Fisheries, women and climate change

Fisheries are the mainstay of livelihood of coastal peoples. However, the marine fisheries are threatened by possible changes to the ocean current on Namibia's west coast. The fisheries rely on nutrient-rich upwelling of the cold *Benguela* Current. Any change in the frequency, timing or distribution of the upwelling would influence production, with significant economic impacts due to the prominence of marine resource industries in Namibia (Republic of Namibia, 2002). Over the last decade, a trend of warmer sea surface temperatures has been noted over the northern Benguela region (Republic of Namibia, 2002). This warming trend may be one of several environmental factors that have contributed to declining fish stocks in recent years. Marine biodiversity may also be impacted if there are shifts in the Benguela Current system. The predicted rise of 0.3 m or more in sea level would certainly inundate significant parts of Walvis Bay, the main port of Namibia. The coastal towns of Swakopmund and Henties Bay are also vulnerable, to a lesser degree (Republic of Namibia, 2002). It is women who will most likely suffer the consequences of reduced household incomes and nutrition as this industry is impacted further.

Changes in rainfall and temperature would impact on biodiversity and ecosystems in Namibia. Endemic species, such as those found on the escarpment and in the winter rainfall area of the southwest, and wetland ecosystems, are particularly vulnerable. In particular, the Succulent Karoo biome is vulnerable to ecosystem boundary shifts and local species extinctions due to climate change. Impacts on the natural resource base, on which the tourism, agriculture, inland and marine fisheries, craft, wildlife and many subsistence sectors rely, are difficult to predict but may be substantial. (Midgley et. al. 2005).

Malaria is one of the main causes of children

and adult mortality (Republic of Namibia, 2002). Projected changes in climate could extend the area at risk of malaria southwards into the centre of the country, a trend that is already apparent. In short, if as some models predict, the climate of Namibia becomes hotter, drier and more variable over most of the country, marginalised rural populations and the urban poor will be most severely affected particularly women, children, the aged, and the disabled (Mfune et al, 2007).

5.2.6 Adaptation and climate change policy in Namibia

Since climate change will affect the environment as well as livelihood of Namibians, and that Namibia is a net sink for GHG as opposed to a new emitter, adaptation is crucial in addressing climate change issues and environmental sustainability. Adaptation issues in Namibia are dealt with at local and national levels with involvement of NGOs and development partners (which may be both from the private sector or international). Since the local people bear the brunt of climate change, adaptation strategies at this level are important. Local people have indigenous knowledge that reveal mechanisms used, for instance, to cope with severe drought, crop failure or an epidemic of livestock. Some local adaptation measures are:

Planting local (longer growing period) or improved varieties (grow faster) such as *okashana* depending on the timing of the onset of rains. Okashana is only grown if rains come late while they prefer to grow the local millet if rains come early.

Namibia has benefited from GEF and the UNDP funds through the climate change specific case study: "*Adapting to climate change through the Improvement of traditional crops and livestock (CCA) in Namibia*". This study investigates traditional crops in order to identify drought resistant crops or varieties, or faster growing varieties such as *okashana* millet and livestock farming to improve indigenous breeds such as *saga*. The study is being carried out in Oshana Region.

UNDP also funded a study during 2008, which specifically investigated climate change impacts on crops and livestock. The financial assistance from development partners is highly valuable to adaptation. A lot still needs to be done in order to address adaptation to climate change in Namibia (Mfune et al., 2007).

Namibia still needs to put a policy and action plan in place that would effectively respond to climate change.

Namibia has been commended for its sound environmental legislation framework, being one of the first countries in the world to incorporate clauses on environmental protection in its constitution. To date, there is no policy on climate change in Namibia that incorporates a gender focus. Activities that address climate change mitigation, vulnerability and adaptation are being coordinated by the national climate change committee comprised of line ministries and governmental agencies (Nghitila, 2006). Some laws, regulations and policies relevant for the implementation of the UNFCCC are listed in Appendix B.

5.2.7 Measures to address vulnerability and differentiated impacts to climate change in Namibia

Existing legislation related to environmental management in Namibia adequately addresses synergies between biological diversity, climate change and desertification. For example, the National Drought Policy has strong emphasis on drought, emergency relief and early warning systems. These measures are relevant to improve long-term coping mechanism to possible impacts of climate change. Moreover, there is a shift towards mainstreaming concerns and issues related to sustainable environmental management into cross-cutting legislation (National Poverty Strategy Plan) and National Developmental Plans (NDP3 – 2005/6 – 2009/10). Thematic working groups that formulated NDP3, worked on environmental sustainability, in which concerns of climate change are addressed (Mfune et al., 2007).

5.2.8 Gender and climate change conclusion

Until very recently, gender issues have not played a major role in climate change discussions in many developing countries such as Namibia. To date there are few studies that have specifically addressed gender aspects of climate change. Moreover, many projects in developing countries are now addressing the different situation of women and men with respect to their different vulnerabilities to climate changes (Hemmati, 2008). It is widely acknowledged that the negative effects of climate change are likely to hit the poorest people in the poor countries the hardest. In other words, the poor are the most vulnerable to climate change.

In particular, Tandon (2007) noted that in developing countries and communities that are highly dependent on local natural resources, women are likely to be largely vulnerable to the effects of climate change. Approximately 67% of the Namibian population live in rural areas and depends upon subsistence agriculture. There are a disproportionate number of women in rural areas due to male migration to urban centres in search of employment opportunities (Iipinge and LeBeau, 1997). According to Wamukonya and Rukato (2001), Aguila (2007), and Boko et al. (2007) climate change often impacts the areas that are the basis of livelihoods for which women are responsible, for example, nutrition, water and energy supplies. The effects of climate change are likely to affect men and women differently due to gender differences in property rights, access to information and in cultural, social and economic roles (Ambunda and De Klerk, 2008).

Studies on hurricane Mitch, the Tsunamis in India, Bangladesh and floods in Mozambique (Bradshaw, 2004; ISDR, 2008 and Osbar et al., 2008) indicate that women face a range of vulnerabilities. Bradshaw, (2004) identified these vulnerabilities as:

Financial – women are poorer due to lower incomes, lack of job stability and dependence on men's income.

Social – female headed households and teenage mothers are more vulnerable.

Psychological – increasing violence towards women.

Physical – poor populations are settled in areas of risk, without contingency planning and disaster preparedness.

These studies also confirm that children and elderly are more marginalised and prone to suffer fatal consequences of natural disaster (especially hurricanes and floods).

Brody et al., (2008) state that, the effects of climate change on gender inequality are not limited to immediate impacts and changing behaviours but also lead to subsequent changes in gender relations. Furthermore, spending more time on traditional reproductive tasks reinforces traditional work roles and works against a change in which women might begin to play other roles (Ibid.). For instance, because women are primary care-givers in times of disaster and environmental stress, the occurrence of magnified burdens of care giving is likely to make them less mobile. Also, since climate change is expected to exacerbate existing shortfalls in water resources and fuel wood, the time taken to fetch water or wood (which in most countries is the responsibility of women) will certainly increase women's workloads, thus, limiting their opportunities to branch out into other, non-traditional activities (Bradshaw, 2004 and Brody et al., 2008).

Although most studies on the climate change, MDG and sustainable development nexus lack a gender focused analysis (Desert Research Foundation of Namibia – DRFN, 2004; Zeidler, 2005; Angula, Nangulah and Smit, 2005; Mfune et al., 2007 and Reid et al., 2007), the Participatory Poverty Assessment (PPA), conducted in each Region of Namibia at local and village level (during 2005/6) had a gender perspective. The resultant report discussed poverty, vulnerability and well-being of men and women in Namibia. This detailed information is meant to aid the identification of poverty reduction strategies in Namibia. Although, silent on links of gender to climate change, this report highlighted some links

between livelihood and gender among rural and peri-urban communities (NPC, 2007a and NPC 2007b).

The rest of Namibian literature on climate change is silent on issues of gender and marginalised groups. Earlier studies on gender roles as described in sections 3 and 4, illustrate the role of women in agriculture and their reliance on climate related sectors for livelihood and food security. National studies on poverty have made superficial links between gender, poverty and agriculture, in terms of gender disaggregated data only (NPC, 2002 and NPC, 2006). The image and status of women in these studies is absorbed by focusing on household dynamics of rural communities. The analysis does not go beyond differences between female and male headed households. This study however looks at gender aspects from both men and women point of view irrespective of their marital status or social positioning in their community.

6. Main findings from the fieldwork

The findings were analysed using GAM to understand situations of women and men whose livelyhoods are likely to be impacted by climate change. Within the Gender analysis framework is the vulnerability assessment. This framework was used to examine why women and men are affected differently by climate change. It examines the exposure, sensitivities and adaptive capacity of women, men within their livelihood system.

This section presents the findings of the study. It describes how the communities of Epyeshona and Daures are affected by climatic variability, assesses the women and men's roles and responsibility and how this makes them socially vulnerabil to impacts of climatic variability and anticipated changes.

The section also discusses how men and women are coping with these impacts. Aspects of gender equality, gender relations and gender roles within the two communities are presented as well as their understanding of the concept of climate variability and change. The findings on gender differentiated impacts of climate variability and change are presented based on the local perception of environmental, climate variability and change as well as climatic risks. Due to cultural and environmental differences between Epyeshona village and Daures constituency, findings are presented differentiated both by gender and study area.

6.1 Understanding gender and climate change

6.1.1 Understanding gender relations

This study found more women participating in leadership of local institutions. In Epyeshona, the village secretary and the community liaison officer from the Constituency office (Oshana Regional Council, Ministry of Regional and Local Government and Housing) are both female. The Key informant from Epyeshona (Male, Water point committee), reported that there is an equal representation of women and men in water point committees, drought relief committees and constituency development committees. In Daures Constituency, women are also equally represented in water point committees, conservancy committees, constituency development committees and school boards. These findings are in line with those of the NPC (2007a&b) study on gender equality which states that, access, ownership and control of resources has improved in Oshana and Erongo Regions.

However, the study illustrates that in Epyeshona village, traditional gender based roles still persist.

"Traditionally, women are responsible for fruit harvesting, thatching grass and all tasks of preparing and processing food. Men mostly engage with livestock farming related activities" (Epyeshona-Female Key informant: Village secretary).

Elder people (both men and women) who participated in life history interviews have reported that women are becoming more involved in decision-making and are more empowered than in the past (before independence). The youth reported that women are better at running households than men. They also reported that most men were supportive of their spouses in the past years but now they do not really care and are more engaged in alcohol abuse.

"The man was and has always been the head of the household. The woman was more active in the kitchen to make sure that the family has something to eat every day. A house without a woman is not a house, although in the past men had more to say and made most of the decisions" (An 80 year old male life history respondent – Epyeshona)

The researcher noted interesting behaviours during FGD. The elderly women FGD were passive and less expressive during discussions as compared to middle-age women. The elderly women appear to be content with contemporary gender

relations and were not as expressive as the middle-age group. Middle age women were free to express their views during discussions citing their dissatisfaction with regard to decision-making processes within their community.

A Female key informant (Ministry of Gender and Child Welfare) from Daures constituency reported that traditionally, men have always been the head of the household and women had to obey everything they say. However among the contemporary Damara culture, women have more rights and have equal power sharing and decision making as their spouses at household level. This is confirmed by one male participant from the Daures FGD who stated that:

"The decision-making between men and women is 50/50. The man decides on livestock and other matters outside the house in consultation with his wife. If there is a food shortage in the house, the woman also approaches her husband to discuss how they can best solve the situation".

The Youth feels that in a Damara society a man is tasked with major responsibility of ensuring household food security, while the woman is only concerned with cleaning and cooking. One female participant from the Daures middle-age FGD aired her views that;

"women are regarded as masters who know how to save money, food and other household resources. Women know it best when it comes to well-being of the household"

This study found that, rural villages and settlements are headed by headman/woman who is a representative of the traditional authority. Also, in rural areas household matters are dealt with under traditional (customary) law and justice system. In Epyeshona village, the inheritance process is supervised by family members and relatives. In the post independent Namibia, women are protected by law and automatically can inherit land from their spouses. In Daures Constituency (Damara culture), the 'Will" directs how property will be inherited and culturally men and women have a 50/50 ownership of resources. Although these laws exist, in Oshiwambo culture (Epyeshona), women are not empowered to make their own decisions. Land grabbing is a very rare phenomenon in Namibia. Household and cultivation equipments and livestock are inherited by the husbands relatives. The lack of agricultural equipment and livestock in a household undermines the quantity and quality of crop produce.

Gender roles still exhibit conventional division of labour between men and women in rural settings. As in other southern African countries, these roles and responsibilities are very much linked to the utilisation of natural resources (land, water, rangeland and forestry). Using the activity profile assessment, Table 1 (see next page) lists daily and seasonal activities that men and women are involved in throughout the year.

Table 1: Labour activities that men and women mainly engage in

	EPYESHONA VILLAGE	DAURES CONSTITUENCY
WOMEN	• Cultivating fields • Weaving baskets • Making traditional drinks (*omagongo*, *omalodu* and *ontaku*) • Collecting firewood • Cooking • Picking spinach • Fetching water • Cleaning the house • Washing clothes • Caring for the sick • Collecting indigenous fruits • Reproductive roles of child bearing & nursing • Taking care of the rest of the family • Processing marula oil • Pounding *mahangu* and sorghum grains • Harvesting crops • Preparing "olupale" (a place where grain is processed)	• Cooking • Cleaning • Looking after children • Tending for the sick • Selling semi-precious stones • Assisting in livestock rearing • Collecting veld product
MEN	• Grazing livestock • Cultivating fields • Harvesting crops • Maintaining water points • Build granaries • Cutting wood and carve household utensils • Fixing fences	• Livestock rearing (grazing) • Maintaining water point • Mining semi-precious stones • Maintaining house and fixing fences • Migrating for seasonal grazing
HOUSEHOLD	• Cultivating fields • Fetching water • Fishing • Thatch grass	• Fetching water • Feeding young livestock
COMMUNITY	• Attending church services • Attending and assist at wedding ceremonies • Assisting other households during funerals and mourning • Serving community committees on water, development and village traditional activities	• Attending church services • Attending communal meetings • Attending and assisting at wedding ceremonies • Assisting other households during funerals and mourning • Serving community committees on water, development and conservancy

During the harvest or rainy season, household labour is intensified whereby tilling of land, planting of seeds, weeding, harvesting of *mahangu*, sorghum and beans as well as processing of *mahangu* require all household members to participate. Livestock grazing, inspection and kraal maintenance also require additional attention during this season. During the dry season, household maintenance livestock inspection and leisure activities dominate. However, daily household labour activities and reproductive roles (where applicable) require women's consideration throughout the year.

There are social and psychological concerns that make gender relations in rural areas problematic. These concerns affect women more than men because it is their responsibility to care for other household members. Table 2 below lists some of identified social issues facing men and women in Daures and Epyeshona communities.

Table 2: Societal and psychological concerns in the communities studied

EPYESHONA VILLAGE	DAURES CONSTITUENCY
• Alcohol and drug abuse • Laziness among the youth • HIV/AIDS, TB and malaria • Unemployment (problem among the youth) • High rate of Grades 10 and 12 school leavers with no opportunities to enhance their skills • Absence of developmental projects to improve the people's standard of living	• Alcohol and drug abuse • Laziness among the youth • Unemployment (problem among the youth) • High rate of Grades 10 and 12 school leavers with no opportunities to enhance their skills • High rate of Grades 10 and 12 school leavers with no opportunities to enhance their skills • Stock theft

Declining social relations

It was found that social relations amongst communities are declining. People are not as compassionate as they used to be and the culture of sharing of food resources at the community level is diminishing. At household level, alcohol abuse is affecting women as some men are not taking responsibility of their households and therefore spend most of their income and pensions on alcohol (Middle-age female FDG – Epyeshona).

The increasing number of unemployed youth (Grade 10 drop outs) in the community is another social and psychological problem reported. This has coincided with the increasing number of incidents of stock theft in Daures constituency. These social ills exert additional psychological and emotional burden upon women who as discussed earlier, are regarded as mothers, caretakers and mothers of the nation.

Understanding climate change

The study probed awareness of climate change and local perceptions of observed changes in rainfall patterns, temperature, humidity, extreme events and wind. Therefore, participants were assessed on their knowledge of climate change and whether they could distinguish natural climatic variability from climate changes definitions. When men and women attempted to describe the climate change concept, no distinction was made between climate change and climate variability. Their understanding and perception of climate change indicate that their views on climate change are closely linked to observed changes experienced over the past 2 to 3 decades.

The youth and middle-age men FDGs participants from both communities reported that they are aware of climate change through education (geography curriculum) and radio respectively. However, most adult women and elderly members of communities are not aware of what climate change is. Nevertheless, there is a general agreement that today's climate is different from the past 30 years. Local perceptions of climate variability and change are summarised in Table 3. A parallel study commissioned by UNDP in Omusati Region, during 2008, has reported similar findings to those of Epyeshona community (Kuvare, Ogunmokun and Maharero, 2008).

Table 3: Local perceptions and observed changes in climatic and environmental conditions over the past 10 – 20 years

EPYESHONA VILLAGE	DAURES CONSTITUENCY
• Frequent drought • Late arrival, early withdrawal of rainfall • Irregular dry spells coinciding with critical growing stages of crops and vegetation • Reduced length of growing period • Floods of 2008	• Frequent drought • Late arrival, early withdrawal of rainfall • Reduced grazing area • Poor aquifer recharges • Good river flow and aquifer recharge (2008) • Strong winds blowing away pods which goats feed on

In focus group discussions, participants perceived that rainfall patterns have changed both in duration and season. In Epyeshona village, the start of the rainfall season has shifted from September/October to December/January and end of the season has shifted from April/May to February/March. The duration of rainfall has also been shortened from 7 months to 3 months.

Droughts have been occurring in the former Owamboland (North-central Namibia) in the past (*see Table 4*) but over the past 2 decades, have become more frequent.

During 2007/2008 season, the village experienced a worm outbreak associated with severe floods. Although most participants expressed their opinions that the area has never experience a flood of such an intensity, an article in the Namibian Newspaper (3 November 2008), reported heavy floods experienced in Northern Namibia during the year 1934. "*The flood we experienced this year (2008) is really something strange to us, we have never seen this type of flood before*" (FGD Participant: Middle-age man from Epyeshona). Moreover, participants felt that summer days are getting hotter (noted an increase in average temperatures), wind intensity has increased and wind direction has changed.

In Daures constituency, FGD participants perceive that the rainfall season has shifted from October to January. The middle-age men FGD observed that appearance of fog during July and August months has been reduced to an occurrence of a day or two in a year. The winter season is also noted to have been extended to September and October months. Furthermore, participants suggested that the wind has changed from moderate to strong in intensity. The middle –age FGD female participants reported that the weather and climate in their constituency is no longer fixed and they find it difficult to describe and predict.

6.2 Differentiated impacts of climate variability and change

The impacts of current climatic events such as floods, drought, insect outbreaks and reduction in fog are already felt as reported from all FGD, from Epyeshona and Daures communities. Both men and women reported that these impacts are aggravated by human influence on the natural environment, population growth and increased demand for settlement. Still, the climate change projections for southern Africa (Wamukonya and Rukato, 2001) and Namibia in particular (Republic of Namibia, 2002), anticipate these changes to increase.

Both men and women reported that changes in today's climate results either in insufficient rainfall or heavy rainfall events. The consequence is

Table 4: Past periods of famine and drought experienced in north central namibia

1820s	Known as drought years
1877-79	Recorded as famine years
1896-98	Famine as a result of a rinderpest epidemic and massive locust attacks on crops
1907 -08	Harvest destroyed by severe locust attack, followed by a major drought during which an estimated 20,000 people died
1915	An army worm plague followed by drought caused a famine which reportedly killed over 20,000 people
1920	Reported as famine year
1929-31	"Famine of the Dams" when people built dams during the first food-for work programme.

(Source, Mendelsohn, Obeid & Roberts, 2000).

either drought or floods, as mentioned earlier, are becoming more frequent and severe. The severity of these unpredicted events is measured in terms of amount of food available or lack thereof. In Epyeshona for example, concepts of famine and drought are used as synonyms. Rainfall is therefore an important determinant of harvests, successful livestock farming and better livelihood options. The impacts of inadequate or too much rainfall are presented in succeeding sub-sections.

6.2.1 Environmental degradation

Epyeshona and Daures communities rely to a greater extent on the natural environment for their livelihood. Daily activities and responsibilities are also closely linked to the natural environment. It has been reported earlier (sections 4 and 5) that women are responsible for chores that are impacted by weather and climate such as collection of wild fruits, medicinal plants and harvesting of other natural resource products for food. The participants (middle-age and elderly FGD, both male and female) have noted environmental degradation, deforestation and overgrazing. They also noted that changes in vegetation cover, coupled with strong winds and erratic rainfall culminate as effects on land productivity. This is especially true for the Epyeshona community that relies heavily on crop harvests as their main source of livelihood. A quote below presents narratives of an Okombahe TA representative. This narrative represents local environmental problems and changes observed for about 20 – 40 years ago.

"If we compare the changes over time, we observe that the rain has decreased drastically. The last (2007/8) rain season was the only closest to compare with 3 to 4 decades ago. Drought was not that common in the past and rivers at Okombahe used to flow throughout the year. Christmas was celebrated in green surroundings but now everything has dried up even trees along the river are dying. In the 1950's 1960's and 1970's people were planting corn and wheat along the river bed, this practice was reduced at the beginning of 1980's and declined completely during 1990's and 2000s. This was due to less rainfall received during those specific years. The rain received during this period was not even enough to make the river flow. The 2007 rainy season was the only year in which people started planting maize and wheat again." (Key informant, male – Traditional Authority Okombahe, Daures Constituency)

Climate variability and change

One of the life history respondents (80 years old, male) reported that early settlers in the village managed to own more productive land. He also narrated that, female-headed household[4] young couples and late arrivals owned land that was less productive and yielded less harvest. One participant from the middle-age male FGD and another from the middle-age female FGD (Epyeshona) confirmed that crop fields had lost their fertility.

Daures and Epyeshona communities (both men and women) noted the link between rain and trees. They believed that deforestation has also contributed to less rainfall, soil erosion and reduced grazing quality. Although livestock farming is traditionally a man's world, women also contributed to the discussion that population increase in the village and demand for land had led to the reduction of grazing area available for livestock. Both men and women (Epyeshona and Daures) concurred on the late arrival and short duration of rainy season as well as poor grazing land.

[4] *Women have only been allowed to own land (north-central Namibia and other communal area) since 1990 after law reform in post-independent Namibia.*

Life history of Mr Bonaventura Ipinge

Mr Bonaventura Ipinge migrated from another village and settled in Epyeshona in 1960. He remembers that Epyeshona's natural environment has been more or less similar as it looks today. It was never a forested area and has always been characterised by sparse trees and shrubs vegetation cover. He also say that the rangeland was very good and there has always been abundant grazing for livestock. He has observed that there have been changes in weather and he perceives that September is much hotter than it used to be in the 1960s. Drought phenomena were less frequent and he has noted that they are experiencing more droughts than in the past. Furthermore people coped better in the past because livestock and crop farming complimented each other well. He says the impacts of climate variability were not severe because there were few people around sharing grazing and available natural resources; there was enough grazing; and livestock provided sufficient manure for fertilising the land. He mentiones that those who settled in the village first got better quality land for cultivation. He has observed over the years that social structures, cultural norms and values are breaking down. He fears that poor and vulnerable members of the community will find it hard to cope during famine because social relations and a culture of helping each other are no longer exist.

Adaptation strategies

Men and women have been coping and adapting to effects of drought/floods and other climate related variability for years. In order to ensure good productivity, crop field requires manure. Concerns were raised that the declining numbers of livestock compromise, this farming method especially as there are no other sources of fertiliser available. Indigenous knowledge of local land units also helps to decide what to plant where during floods or dry years. The poor households do not own sufficient livestock to produce manure and usually are settled on poor arable land. During female middle-age FGD, (Epyeshona), it emerged that women are mainly responsible for preparing the fields. Therefore women are expected to cope and develop adaptation strategies to deal with reduction in land productivity. Also, as reported by a key informant (80 year old man), women and young couples are forced to settle on marginal and fragile land that are prone to both floods and dry environmental conditions. The only way to cope with lack of grazing is to migrate to other areas for seasonal grazing. A male participant from the middle-age FGD – Daures, argued that, another way of improving livestock survival was to collect pods (from acacia trees) for feeding.

6.2.2 Impacts of climate variability and change on water eesources

The Epyeshona community reported that (all FGD) there were no variations in water availability apart from lack of infrastructure, maintenance and the newly introduced consumption cost. There is a water supply network throughout the entire Oshana Region and other settled areas in north-central Namibia. On the contrary, men and women from Daures Constituency reported that water availability is the main climatic factor creating hardship. Poor rainfall negatively affects recharging capacity for the aquifers and boreholes in the area.

Water supply in rural Namibia is not free, and natural water sources provide livestock with drinking water. In order to adapt to changing patterns of water access, the country and villages have

Figure 4: Potable water supply in Epyeshona village

instituted stringent measures for water management practices and measures to minimise the costs especially in Epyeshona village. In Daures, the community is responsible for supplying diesel to pump water. These socio-economic challenges are indirectly related to climate variability. However putting a strain on existing livelihood resources would jeopardise household's ability to afford water. Female-headed households might be affected more in this scenario.

6.2.3 Diseases and pests

Epyeshona village and its surroundings usually suffer from locust outbreaks and in recent years, pest incidents have increased. The worm outbreak associated with floods of 2008 made it impossible for a majority of households to harvest anything. The worms destroyed both crops and grass cover. Incidents of insect outbreaks are managed through de-worming and pest control methods of digging trenches around the field and manual removal of insects. Both men and women reported that they were unable to control the recent outbreak.

Problems associated with pest, were not reported in Daures. Although the increase in diseases such as diarrhoea, stomach cramps, HIV/AIDS and fever has been reported both women and men did not make the link to climate related phenomenons. Both communities have access to health communities, but caring for the sick is an additional burden to women responsibilities. Women's time to concentrate on empowering activities such as informal business would be compromised in the process.

"Modernisation has caused a lot of problems in Epyeshona and people are more vulnerable to diseases and all sorts of social ills". (88 Year old woman – Life history)

6.2.4 Floods

During floods, Epyeshona crop fields become inundated with water and all the pans and grazing fields are filled with water. However, during the middle-age female FGD and middle-age male FGD in Epyeshona, both women and men reported that during flood years most households had a good harvest of beans and melons. Millet and sorghum which comprise the main stable diet in the village are reported to be mostly vulnerable to climate variability and change. Good rain years or extreme rain events are proven to be beneficial in Daures Constituency, as they recharge aquifers, improve grazing quality and sporadic rivers tend to have standing water for much of the year.

There were no reports of lost lives during the study in Epyeshona village. Severe floods often associated with damage to property, human and livestock loss of life was reported in Daures Constituency. The national disaster risk management through Oshana Regional office assisting re-locating household members that are affected by floods. During the study (2008), one of the key informants (Epyeshona- female, village secretary) reported that some households did not have any food. The village headman/woman is responsible for identifying affected households and recommends them for drought relief. Priority is given to the elderly and children. Coping strategies required in event of drought are also applicable to dealing with flooding impacts.

Table 5: Impacts of drought on livelihood, livestock and crop production

EPYESHONA VILLAGE	DAURES CONSTITUENCY
• Reduced agricultural crop yield • Reduced grazing area and overgrazing • Reduced number of livestock • Reduction in land productivity • Declining quality of soils for sorghum and *mahangu* farming • Deforestation and land degradation • Lack of construction materials • Soil erosion	• Reduced grazing area and overgrazing • Reduced number of livestock • Land degradation • Water scarcity and boreholes becoming non-functional • Strong winds blowing away pods which goats feed on • Shift from livestock farming to semi-precious stones mining • Reduced sale of small stock – loss of income • Reduced quality of small-stock thereby affecting auction prices

6.2.5 Impacts of drought

Drought is associated with short rainfall durations and/or low rainfall figures (dry years). Not surprisingly, both men and women of all ages from Epyeshona agreed that, drought has a severe impact on crop yields and reduces livestock numbers (*Table 5*). Drought (Epyeshona – Female elderly and middle-aged FGD) affects food security in the household.

During the discussion, one participant (Daures, Female Middle-age FGD) noted that droughts experienced during 1991, 2000 and 2006 were characterised by loss of livestock and money. There are existing coping strategies when the community is faced with impacts of climatic variability. However, existing adaptive capacity is not sufficient to deal with long-term impacts of climate change. In Epyeshona village as with the rest of Namibian communities that are involved in crop production, selecting crop variety that are resistant to drought is very important. Women make use of 'Okashana' variety that requires fewer amounts of water and shorter rainy seasons than traditional millet variety. There is some resistance from elder people (elderly female FGD – Epyeshona) to use 'Okashana'. They believe 'Okashana' millet cannot be stored for longer (years) period of time. Women also, make attempts to re-plant and refill the gaps.

Women and men who participated in FGD, and key informants were asked to identify community groups whose livelihood is more vulnerable to climate related events. They identified the following groups as more vulnerable to impacts of climate variability and change:

- Elderly
- Children
- Widows
- Young couples

Livestock farming in Oshana region has become increasingly difficult over the past years. Households in Epyeshona are reported to own fewer livestock than in the past. During famine, men select from remaining livestock either to barter for *mahangu* or sell to earn a cash income. Epyeshona female FGDs reported that usually women make decisions regarding goats, pigs and chicken to either sell or slaughter for household consumption. Men from Epyeshona (elderly male FGD), stressed that the practice of seasonal grazing is declining, because livestock is stressed and cannot reach cattle posts. Men and women are engaged in other income generating activities to supplement the main livelihood systems available.

Women are first to adapt

During the FGD with middle-age female in Epyehsona, it was revealed that women are the first to diversify their livelihood. They do basketry, process marula nuts and oil or sell their chickens, pigs or

goats to raise money in order to buy food. Remittances and relying on neighbours for assistance is also considered to be a crucial coping mechanism. The discussion with workers in Epyeshona village revealed that earning a salary helps them cope better with poor crop yields. A man from this group reported that he regards employment as the main source of livelihood. Most households in Epyeshona have a member who is employed either in the area or elsewhere. The presence of an employed household member or receiving remittances from relatives improves household security. Opportunity to participate in economic activities is limited to informal business such as shebeens (home based liquor bars/stores), sale of natural products (mainly women), wood carving (mostly men, but it is no longer sustainable), basketry, traditional brew, brick-making and domestic work. A market exist, some 3 km from Epyeshona village where men and women can sell local products.

Figure 5: Semi-precious stones sold to tourists in Daures constituency

In Daures Constituency, there are limited formal employment opportunities. However the tourism potential in the area has created jobs for a few household members in Spitzkoppe. It has also created a market for semi-precious stones.

The Daures Constituency area offers opportunity for people to move livestock around for seasonal grazing. However, the harsh conditions and scarcity of water in Erongo communal areas make it difficult to comprehend. The community is assisted by the government to transport their livestock to better grazing areas. This coping mechanism is only offered during famine years. Because livelihood in Daures Constituency revolve around livestock farming, ensuring livestock survival is very crucial to all farmers (The majority of whom are men).

"When survival gets tough, men migrate to nearby towns of Swakopmund, Omaruru Usakos, Walvis Bay etc. to look for employment. Some men migrate to other communal areas within the Constituency or to other Constituencies in search of better grazing opportunities" (Male FGD participant – Daures).

Attempts to achieve this involves, de-stocking by selling more livestock at auctions, collecting acacia pods to feed goats and sheep, seasonal migration for better pastures and shifting to semi-precious stones mining. Income from employment and selling semi precious stones becomes the main source of livelihood (*Figure 5*). For poorer households, particularly the elderly and widows and the employed, the only coping strategy available is to beg for food.

Both women and men reported that the government provides drought relief, and during discussions, it became clear that local people rely too much on government relief and are not attempting other means or mechanisms to enhance their adaptive capacities (Epyeshona key informant, male – Water point committee and middle-age male FGD) .What is more, there are no credit facilities for community members to engage in other livelihood or income generating activities. Developmental needs are discussed at Constituency Developmental Committee

level. The Regional Councillors are responsible for the development of respective communities.

Both communities have reported that employment and income generation activities are crucial to deal with impacts of climate change. Women from Epyeshona feel that there should be developmental projects for women to participate. The number of unemployed youths is increasing every year, because there are no other opportunities available if they fail Grade 10 and 12. Communities living in drier environments such as Daures are already reaching their maximum adaptive capacity to deal with impacts of climate related changes. Poor maintenance of water sources like boreholes exposes the community even further to poverty.

"Asking questions on what can be done to enhance our adaptive capacity only raises false hopes. You are asking a hungry man leading a hungry community. There have been other researchers and development workers who has been asking such questions over the years but nothing is happening" (Male Okombahe Traditional Authority – Daures).

The headman and councillor are up in arms as they have no resources to help their communities.

7. Analysis and conclusion

The following conclusions are made from findings:

The concept of gender and its associated variables is not constant in any society. Gender equality and gender relations change over time in any given society. Namibian literature on gender and women still describes differences between women and men and their respective roles in respect to traditional norms and values.

Some of these characteristics do not take into consideration the fact that the construction of the gender concept in Namibia has been shaped by colonialism, Christianity and modernisation.

This study has revealed that there might be changes among gender relations in rural areas due to equal opportunities awarded to women and men. These changes could be beneficial or detrimental to relations especially between wife and husband. Women in the age group of 30 - 59 display signs of empowerment to participate in decision-making and economic activities. The elderly women however, still understand and seem to accept the status quo.

The perception of gender as a unit for analysis is not given enough attention. Attitudes from local leaders seem to confirm this sentiment, given their reaction towards this study. One male leader remarked "gender, gender, gender" upon hearing the purpose of this study.

They do not seem to understand how women are affected by poverty and climate change. Also they do not seem to consider a possibility that men maybe more vulnerable to impacts of poverty and climate change than women.

There is a feeling of hopelessness among women in rural areas. This could be caused by attitudes among women stemming from long held beliefs that they are weak and should be looked after.

The youth have noted that women are much better at managing households than men. There is also a trend among Oshiwambo ethnic group whereby men are neglecting their duties as head of households. Perhaps equal distribution of power between women and men is causing gender relations to worsen much to the disadvantage of women.

The Damara ethnic group displays a mixture of conventional and contemporary gender relations. It appeared that women have more decision-making power than men but further discussion during this study revealed that women and men have equal decision-making power.

It is also clear from both communities that women have more decision-making power and control over domestic resources and men still have the power to make major decisions regarding assets and financial resources. Another dynamic that emerged is the differences between single and married women in terms of empowerment and gender equality.

Tracing changes in environment and climate is very difficult. There is no local or indigenous monitoring system for changes that are taking place. Women and men have become passive and believe it is the responsibility of the government to provide them with climate information.

Because rural communities are subsistence farmers, rainfall is the most important climatic variable determining crop yield and maintaining healthy livestock. Women and men from Epyeshona perceived changes in local climate over the past two decades.

There is a general agreement that current climate is different from the past. Climatic hazards such as floods and drought have become more frequent. The rainfall season has shifted, become shorter and irregular affecting the potential growth period

for *mahangu*, sorghum, beans, nuts and melons. These climatic shifts also affect regeneration of rangelands resulting in insufficient grazing opportunities for rural livestock populations. Immediate impacts of drought, floods and climate variability are decreased land productivity, reduced crop yields and loss of livestock.

The changes in climate affect the livelihoods of women and men differently. This study concludes that compared to female-headed households, widowed and bachelor households find it harder to balance the risks and vulnerability to impacts of climatic variability and changes.

This study confirms that women and men's relationship with climate related variables such as environment, agriculture and forestry is differentiated. In addition, the relationship between women and the environment is not homogenous across societies and environmental settings. It can be concluded that, among societies that practise subsistence crop and livestock farming as the main source of livelihood, women have a stronger link to environment and climate related sectors.

The activity profile assessment revealed that women in such rural settings interact with the environment more than their male counterparts. Clearly women are expected to maintain food security in the household. Maintenance implies complimenting the main source of livelihood with other sources in order to prolong household food security. Women and men in drier environments interact with the environment differently. Because in these environmental settings, livestock rearing is the main source of livelihood, men interact with the environment more. The environmental conditions do not offer many opportunities for women to participate beyond the household chores. In areas with high tourism potential, women engage in tourism related activities such as selling of semi-precious stones.

The degree of climate change impacts and exposure of women to climatic risks is high. Similarly, the emotional burden and extra effort is felt more by women than men. Because, traditionally women are submissive to their husbands, they would explore first other means of ensuring food security before they discuss the matters of food shortage in the household with their husbands, the head of household. Men are not concerned with worries and anxiety of where the next meal might come from, therefore the psychological effect and efforts are much less on men compared to women.

On the contrary, men are impacted more in events of climatic variability that severely affects the livelihood and minimise food security of the household. In Epyeshona village, a man is required to ensure that the household acquires food that would reach the next harvest season. In Daures constituency, a man is required to migrate to other towns in search of employment to sustain the household or to other communal areas in search of better grazing for the livestock. This also implies that women are left to manage households on their own and thus become de facto heads of household.

Women and men are already faced with social challenges of unemployment, alcohol abuse, crime, teenage pregnancies and social decay. These challenges make their households vulnerable to poverty. In particular women, engage in selling agricultural products or simply engage in informal business to generate money needed for the well-being of the household. Since women are responsible for the well-being of household members, such income is spent towards education, health, food and water payments. To sum up, women lack technical skills to participate in formal employment and are therefore engaging in informal economic activities. Income generating capacities between men and women also differ. In general men are better prepared for climatic events than women due to their improved socio-economic situations.

Non-Agricultural adjustment has been noted. Kuvare et al., (2008) listed examples such as sewing, brick-making, selling of traditional drinks, vending crafts and pottery items. These adjustments either exist or were recommended as coping strategies in Epyeshona village. In Daures constituency, there is a trend of farmers reverting to small-scale mining

of semi-precious stones. Improving access to resources, enhancing existing coping strategies and diversification of adaptive strategies for rural communities is imperative in order to enhance adaptive capacity of both men and women. However intervention should take into consideration the gender aspects of climate change impacts and adaptation.

8. Recommendations

This report offers a number of general and policy recommendations. Some are directed towards gender while others to climate change and differentiated impacts of climate change. Both levels demand response from government, private sector, local and donor community as well as research and academic institutions.

A study focusing on gender, climate change and development in southern Africa is required. Such a study need to examine how climate change will impact development of women and men. It will also examine how climate change affects gender equality in southern Africa. Research institutes such as the Southern African Research and Documentation Centre (SARDC) in conjunction with Women in Development Southern Africa Awareness need to collaborate with SADC governments to produce these data.

There is a need to conduct studies examining gender relations in contemporary Namibia. Such a study needs to show what is happening to the relationship between men and women given challenges of climate change affecting food security. It will also assess the progress of women empowerment and gender equality in Namibia. Finally, it will address challenges preventing realisation of women empowerment in rural Namibia. The Ministry of Gender Equality and Child Welfare and the Ministry of Agriculture, Water and Forestry (MAWF) need to facilitate this process. Climate change programmes should be developed that would enhance adaptive capacity of rural women.

The report offers recommendations that climate change programmes develop a comprehensive programme of service provision regarding seed, fertiliser, credit, market access and agricultural extension services. Such programmes should ensure that women access these services. Information and awareness programmes on climate change and agricultural production targeting rural women in order to enhance their capacities should be produced frequently. The Ministry of Agriculture, Water and Forestry, academic institutions such as University of Namibia and the Polytechnic of Namibia as well as United Nations Development Program need to engender their programmes of extension, research and service delivery.

More gender disaggregated data and focussed research is required to assess community's existing adaptive capacity in dealing with long-term impacts of climate change. There should be research to determine the advantage of implementing gender-sensitive adaptation programmes. More research to identify the gendered impacts, coping strategies and adaptation priorities of women and men in urban settings is needed. The NPC, MAWF and MET should acknowledge and mainstream gender and climate change into poverty, early warning system and environmental management policies.

9. References

• **Adger, W.N. 2006.** 'Vulnerability'. *Global Environmental Change*, 16, 268-281.

• **Adger, W.N. and Vincent, K. 2005.** 'Uncertainty in adaptive capacity'. *External Geophysics, Climate and Environment*, 331: 399-410.

• **Adongo, J. 2006.** 'Poverty alleviation in rural Namibia through improved access to financial services'. Windhoek: NEPRU Working Paper No. 19.

• **Aguilar, L. 2007.** 'Gender and Climate Change: women as agents of change. Climate change briefing', The World Conservation Union (IUCN).

• **Ambunda, L., & de Klerk S. 2008.** Women and customs in Namibia: A research overview'. In Ruppel, O.C. (Ed.). *Women and custom in Namibia: Cultural practice versus gender equality*. Windhoek: Macmillan Education Namibia.

• **Angula, M. Selma, N. & Pierre, S. 2005**. 'National level capacity assessment under the National Capacity Needs Self-assessment for Global Environmental Management (NCSA)'. Windhoek: Ministry of Environment and Tourism

• **Babugura, A. 2005.** Vulnerability to climate variability in Botswana 1972-2002'. PhD Dissertation. Johannesburg: University of Witwatersrand.

• **Banda, K. 2005.** 'Climate change, gender and livelihoods in Limpopo Province: Assessing impact of climate change, gender and biodiversity in Bahlabela District, Limpopo Province'. Johannesburg: University of Witwatersrand.

• **Banda, K., and Mehlwana, M. 2005.** 'Equity and gender in climate change'. NOVAFRICA.

• **Barnard, P. (Ed). 1998.** 'Biological diversity in Namibia'. Namibia National Biodiversity Task Force. Windhoek.

• **Bradshaw, S. 2004.** *Socio-economic impacts of natural disasters: a gender analysis*. Santiago: Sustainable Development Human Settlements Division, Women and Development Unit. Series, 32.

• **Bibars, I. 2001.** Victims and heroines: Women, welfare and the Egyptian state. London: Zed.

• **Boko, M., Niang, I., Nyong, A., Vogel, C., Githeko, A., Medany, M., Osman-Elasha, B., Tabo, R., & Yanda, P. (2007).** Africa. Climate Change 2007: 'Impacts, Adaptation and Vulnerability'. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Parry, M.L., Canziani, O.F., Palutikof, J.P., van der Linden P.J., & Hanson, C.E. (Eds.). Cambridge University Press, Cambridge UK, 433-467.

• **Brody, A., Demetriades, J., and Esplen, E. 2008.** Gender and climate change: Mapping Linkages, *A scoping study on knowledge and gaps.* Brighton: BRIDGE, University of Sussex.

• **Chant, S. 2003.** *Female households' headship and the feminisation of poverty: Facts, fictions and forward strategies*. London: London School of Economics, Gender Institute. New Working Paper Series Issue 9.

• **Chant, S. 2003.** 'The engendering of poverty analysis in developing regions: progress since the United Nations Decade for women and priorities for the future'. London: London School of Economics, Gender Institute. New Working Paper Series Issue 11.

• **Chant, S. 1997.** 'Women-headed Households: poorest of the poor? Perspectives from Mexico', Costa Rica and the Philippines. *IDS Bulletin*, 28 (3): 26-48.

• **Clark, B.M. 2006.** 'Climate change: A looming challenge for fisheries management in Southern Africa'. *Marine Policy*. 30:84-95.

• **Dankeman, I. 2002.** 'Climate change: learning from gender analysis and women's experiences of organising for sustainable development'. *Gender and Development*, 2: 21-29.

• **Denton, F. 2002** 'Climate change vulnerability, impacts and adaptation: Why gender matter?' *Gender and Development*, 2: 10 – 20.

• **Desert Research Foundation of Namibia. 2004.** Local/Regional level capacity assessment under

the *National Capacity Needs Self-assessment for Global Environmental Management (NCSA)*. Windhoek: Ministry of Environment and Tourism, Government of Namibia.

• **Fuller, B. 2006.** 'Improving tenure security for the rural poor: Namibia country study. Food and Agriculture Organisation (FAO)'. LEP Working Paper No. 6.

• **Gallopin, G.C. 2006.** Linkages between vulnerability, resilience and adaptive capacity. Global *Environmental Change* 16: 293-303.

• **GCA. 1999** 'Promoting agricultural productivity and competitiveness'. Accessed 10 June 2009. http://www.gca-cma.org/eecdoc1.htm.

• **Giess, W. 1971.** A preliminary vegetation map of South West Africa. Windhoek: Dinteria.

• **Hemmati, M. 2008.** 'Gender perspective on climate change: emerging issues panel'. United Nations Commission on the status of women, 52nd session. New York.

• **Hudson, D.A. and Jones, R.G. 2002.** 'Regional climate model simulations of present day and future climates of Southern Africa'. Hadley Centre, Bracknell, Technical Note 39.

• **Iipinge, E.M., and LeBeau, D. 2005.** *Beyond inequalities: Women in Namibia*. Windhoek and Harare: UNAM/SARDC.

• **Iipinge, E.M., Phiri, F.A., & Njabili, A.F. 2000.** *The national gender study*. Vol. 1. Windhoek: University of Namibia (UNAM).

• **Iipinge, E.M., & Williams, M. 2000.** *Gender and development*. Windhoek: John Meinert Printing.

• **Iipinge, E.M., and LeBeau, D. 1997.** *Beyond inequalities: Women in Namibia*. Windhoek and Harare: UNAM/Southern Africa Research and Documentation Centre.

• **International Strategy for Disaster Reduction (ISDR). 2008.** 'Gender perspective: Integrating disaster risk reduction into climate change adaptation, good practices and lessons learned'. Geneva: ISDR.

• **IPCC. 2001.** Summary for Policy Makers. In Climate Change 2001: *Impacts, Adaptation and vulnerability*. Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom.

• **IPCC. 2007. Summary for Policymakers. In Climate Change 2007:** Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Parry, M.L., Canziani, O.F., Palutikof, J.P., van der Linden P.J., & Hanson, C.E. (Eds.). Cambridge University Press, Cambridge, United Kingdom.

• **Johnsson-Lathan, G. 2007.** 'A study on gender equality as a prerequisite for sustainable development. Sweden: A report to the Environment Advisory Council'.

• **Kasperson, R.E. and Kasperson, J.X. (2001).** *Climate change, vulnerability and social justice*. Stockholm: Stockholm Environment Institute.

• **Klein, R.J.T., Huq, S., Denton, F., Downing, T.E., Richels, R.G., Robinson, J.B., & Toth, F.L. 2007.** Inter-relationships between adaptation and mitigation. Climate Change 2007: *Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Parry, M.L., Canziani, O.F., Palutikof, J.P., van der Linden P.J., & Hanson, C.E. (Eds.). Cambridge University Press, Cambridge, UK, 745-777.

• **Kuvare, U., Ogunmokun, A. and Maharero, T. (2008).** 'Draft report assessment of current and ongoing projects and programmes to identify existing coping strategies with regard to climate change variability'. Windhoek: United Nations Development Programme.

• **Lendelvo, S. 2008.** 'Women's access to land: A case study of the area under the jurisdiction of the Ondonga Traditional Authority, Oshikoto Region'. Windhoek: Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ).

• **Lopi, B. 2004.** 'Gender and poverty in the context of human development, health, education and the MDGs'. Paper presented to the Commission for Africa – Southern Africa Consultation, Lusaka.

Matengu, K.M. 2003. The diffusion of Modern Technologies in Namibia. Licentiate Dissertation. University of Joensuu.

• **Mbilinyi, M. (1992).** 'Research methodologies in

gender issues'. In Meena, R. (ed.) *Gender in Southern Africa: Conceptual and Theoretical Issues*. Harare: SAPES Books.

• **Meena, R. 1992.** 'Gender research/studies in southern Africa: An overview'. In Meena, R. (ed.) *Gender in Southern Africa: Conceptual and Theoretical Issues*. Harare: SAPES Books.

• **Mendelsohn, J., Jarvis, A., Robert. C. 2002.** Atlas of Namibia: *A portrait of the land and its people*. Cape Town: Philip Publishers.

• **Mfune, J.K., Karuaihe, S., Kakujaha-Matundu, O., Naimwhaka, E., & Angula, M.N. 2007.** 'Draft report millennium development goal 7 and climate change: challenges and opportunities, Namibia country study'. Windhoek, United Nations Development Programme.

• **Mfune, J.K. & Ndombo, B. 2005.** 'An Assessment of the capacity and needs required to implement Article 6 of the United Nations Framework on Climate Change (UNFCCC) in Namibia'. Windhoek: Ministry of Environment and Tourism, Government of Namibia

• **Midgley, G., Hughes, G., Thuiller, W., Drew, G. and Foden, W. 2005.** *Assessment of potential climate change impacts on Namibia's floristic diversity, ecosystem structure and function*. Cape Town: South African National Biodiversity Institute, Kirstenbosch

• **National Planning Commission. 2007.** 'Erongo regional poverty profile, main report'. Windhoek: National Planning Commission.

• **National Planning Commission. 2007.** 'Oshana regional poverty profile, main report'. Windhoek: National Planning Commission.

• **National Planning Commission. 2006.** 2003/2004 *Namibia Household Income and Expenditure Survey*. Central Bureau of Statistics, National Planning Commission, Main Report.

• **National Planning Commission. 2002.** *Preliminary national accounts 2001*. Windhoek: Central Bureau of Statistics.

• **Nghitila, T. 2006.** 'The status of environmental law and policy: Development and implementation in the Republic Of Namibia'. Presented at the Commonwealth Seminar for the Africa region on the Implementation of International Environment Instruments and Policy Development: Grand Baie, Mauritius – 31 October – 6 November 2005. Legal and Constitutional Affairs Division. Commonwealth Secretariat: London.

• **Osbahr, H., Twyman, C., Adger, W, N., Thomas, D. 2008.** 'Effective livelihood adaptation to climate change disturbance: Scale dimensions of practice in Mozambique, *Geoforum*, 39: 1951-1964.

• **O' Toole et al. 2001.** 'Integrated management of the Benguela Current Region: A Framework for future development'. In Bodungen B. & Turner R.K. (Eds). *Science and Integrated Coastal Management*. Dahlem: University Press.

• **Prowse, M. 2003.** *Towards a clear understanding of vulnerability in relation to chronic poverty.* Manchester: Chronic Poverty Research Centre, Working Paper No 24.

• **Reid, H., Sahlen, L., MacGregor, J., & Stage, J. 2007.** 'The economic impact of climate change in Namibia: How climate change will affect the contribution of Namibia's natural resources to its economy'. International Institute for Environment and Development, Environmental Economics Programme. Discussion Paper, 07-02.

• **Republic of Namibia. 2002.** 'Initial National Communication of the Republic of Namibia to the United Nations Framework Convention on Climate Change'. Windhoek, Namibia.

• **Schneider, S.H., Semenov, S., Patwardhan, A., Burton, I., Magadza, C.H.D., Oppenheimer M., Pittock, A.B., Rahman, A., Smith, J.B., Suarez, A., & Yamin, F. 2007.** Assessing key vulnerabilities and the risk from climate change. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.* Parry, M.L., Canziani, O.F., Palutikof, J.P., van der Linden P.J., & Hanson, C.E. (Eds.). Cambridge University Press, Cambridge, UK, 779 810.

• **Shannon, V., Hempel, G., Malanotte-Rizzoli, P., Moloney, C. and Woods, J. (Eds). 2006.** *Benguela: Predicting a Large marine Ecosystem.* Large Marine Ecosystem Series 14. Amsterdam: Elsevier.

• **Tandon, N. 2007.** 'Biopolitics, climate change and

water security: impact, vulnerability and adaptation issues for women'. Toronto.

• **UNDP. 2001.** Namibia Human Development Report 2000/2001: Gender and violence. Windhoek: UNDP.

• **UNDP. 2008.** Namibia Human Development Report 2007/2008: Gender and violence. Windhoek: UNDP.

• **Wamukonya, N., and Rukato, H. 2001.** *Climate change implications for Southern Africa: a gendered perspective*. Cape Town: Minerals and Energy Policy Centre.

• **Watson, E. 2006.** *Gender and natural resources management*. Cambridge: University of Cambridge.

• **Zeidler, J. 2005.** 'Final NCSA under the National Capacity Needs Self-assessment for Global Environmental Management (NCSA)'. Windhoek: Ministry of Environment and Tourism

10. Appendices

10.1 Appendix A: List of questions guiding the gender and climate change study

A.1 Life history questionnaire

- How long have you lived in this community?
- What climatic changes have take place over time?
- Would you describe the changes to be good or bad? If bad explain. If good explain.
- What changes have taken place due to change in the climate?
- What was it like in the past?
- What has changed today?
- What climatic events are most frequent?
- How do men and women cope with these climatic events?
- Are people coping better today than in the past? Explain your answer.
- What has caused the change in the way people cope to climatic events?
- How do men and women currently cope with climate variability?
- What are the existing challenges that affect men and women's ability to cope and adapt to current climate variability?
- What are the existing challenges that may affect men and women's ability to cope and adapt to future climate change?
- What makes men and women vulnerable?
- Are there any social networks to help reduce vulnerabilities of men and women? Explain.
- What would be the best way to empower men and women so as to reduce risk and vulnerability to climate variability and future climate change?

A.2 Focus group discussions and key informants

- Do you know about climate change? If yes,
- What do you know about climate change?
- Where did you get your knowledge on climate change?
- What is your understanding about climate variability?
- Would you say there is a difference between climate change and climate variability? If yes, what would you say the difference is?
- If no, why do you think there is no difference?
- What kind of activities are women and men involved in?
- What is the status attached to each activity?
- How much time is used in each activity?
- What are the main livelihood strategies?
- What other livelihood strategies are used and what is their contribution?
- What kind of formal and informal employment is available in the community?
- What criteria are used in recruitment?
- What natural resources are available in the area?
- What are the uses of these resources?
- Rank the natural resources in terms of value and importance
- What are the local rules with regard to the use of these resources?
- Who has access to the resources identified?
- Who has the right to use the resources identified?
- Who owns the resources identified?
- Who makes decisions about natural resource ownership, use, access and benefit sharing?
- What are the gender differences in access to resources and what is the reason for these differences?
- What are the current land tenure rights in the community?
- Who has land rights in the community?
- What are the major land uses within the community?
- How (and who) is land allocated in the community
- Do men and women have equal opportunity to own or inherit land? How?

- Who facilitates inheritance of land and property in the community?
- Who ensures that the laws on land and natural resource use are adhered to?
- Who resolves conflict in the community?
- Who decides how benefits from government, natural resources or donors are shared?
- Who prioritizes the needs of the community?
- What are local institutions and programmes exist in the community?
- What is the number of women and men in the management of such institutions?
- What do the institutions do?
- Who are the members and how does one become a member?
- Are certain people excluded from being members? If so why?
- What are the norms and values of the community?
- What is the justice system of the community and do women have access to it?
- What is the process of decision making and how do women participate in this process?
- Have women's and men's health changed over the years?
- How do women and men access health facilities? And health services?
- What are the most common health problems in the area?
- How are theses health problems dealt with?
- How far do the community/ individuals travel to collect fuel wood, water, fruits and edibles, thatch, and household construction materials?
- What community groups or resource user groups exist in the community if any?
- Are there any mechanisms that control who has access to and control of productive resources? If yes explain.
- How have women and men's agricultural practices changed over the years, if at all?
- What agricultural products are produced in the community?
- Is there a market for local products and produce?
- How does the community access markets for their agricultural products?
- Is there a market for local products and produce?
- Who possesses agricultural indigenous knowledge in the community?
- How useful is the knowledge?
- Does everyone have access to this knowledge?
- What other environmental problems are experienced in the area?
- How do they affect food security and livelihoods?
- Has there been any change in the amount and duration of rainfall in the community?
- Has there been any change in the quality and quantity of the crops harvested over the past ten years?
- Has there been any change in the quality of the soil over the past ten years?
- Has there been any change in the varieties, quantity and quality of wild plants, animals and grass species?
- Has there been a change in the number of livestock over the past ten years?
- Has there been any change in grazing: reduced grazing area, increased number of livestock, and lack of grass cover? Can these be attributed to a change in climatic conditions or poor management?
- What climatic events/ natural disasters have been experienced in the community?
- Which of the events are the most frequent?
- How do these climatic events/ natural disasters impact on the community and individuals within the community?
- What activities is the community/ individuals involved in that are affected by these climatic events/ natural disasters?
- How far does the impact of the climatic events stretch?
- Has there been an increase in the number of these extreme climatic events/ natural disasters?
- Is there a group of people that is better prepared for these climatic events/ natural disasters? Why is this so?
- Is there a platform where environmental problems are discussed and/ or information is shared?
- Who discusses these problems?
- How did each household and the community deal or cope with the climatic events/ natural

disasters mentioned above?

- What social structures (e.g. social networks) help the community to cope and deal with climatic events/ natural disasters?
- Who makes use of these social structures?
- Who benefits from these social structures?
- What norms, beliefs, laws and programmes (local and national) make dealing with climatic events/ natural disasters more difficult and reduce ability to cope?
- What norms, beliefs, laws and programmes (local and national) make dealing with climatic events/ natural disasters easier and increase ability to cope?
- Which weather or climate related problems make agricultural production difficult and also affect household livelihoods (access to natural resources)?
- What is done to prepare for and deal with such problems?

What will individuals; households and the community do if:

- Flooding becomes more frequent
- Drought becomes more frequent
- Pests and insect outbreak becomes more frequent
- Changes in growing seasons (shorter growing season)
- Shortage of water
- Areas suitable for crop production becomes less
- Areas suitable for grazing becomes less
- Conditions becomes more drier
- More disease outbreaks
- Increased good rainfall years
- What natural resources and services help individuals, households and the community cope better with climatic events/ natural disasters?
- During natural disasters are there natural resources (Mopani worms, thatch, indigenous fruits etc) that become more abundant and contribute towards household livelihoods?
- What are the aspirations of women and men in the community?
- What would you like to see happen that will help women and men cope better and adapt to climate variability and climate change?
- What adaptation options can be developed and implemented to lower risk and vulnerability to climate change?
- What kind of policies or programmes do you think would be effective in reducing vulnerability of women and men to climate variability and future climate change?
- Are there any specific needs you feel should be addressed urgently in order to build the coping and adaptive capacity of women and men?

10.2 Appendix B: Some laws, regulations and policies relevant for the implementation of UNFCCC

- Environmental Management and Assessment Act (2007)
- Ozone Depleting Substances Regulation (Import and Export Act 30 of 1994)
- Environmental Assessment Policy (1995)
- Environment Investment Fund Act
- White Paper on Energy Policy (1998)
- National Water Policy (2000)
- Water and Sanitation Policy (1993)
- Towards Responsible Development of Aquaculture Policy (2001)
- Development Forestry Policy for Namibia (2001)
- White Paper on the Responsible management of Inland Fisheries (2001)
- Towards Responsible Fisheries Policy (2004)
- Marine Fisheries Act (2000)
- Namibian Civil Aviation Regulations 2001 developed in compliance with Convention on International Civil Aviation (CICA), Annex 16: Environmental Protection
- Pollution Control and Waste Management Bill (1999)
- National Environmental Health Policy (2002)
- National Policy on Safe Use of Biotechnology in Namibia (1999)
- National Drought Policy and Strategy (1997)
- National Policy on Research Science and Technology (1999)
- Community Based Natural Resources Management Policy.

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