Towards gender-sensitive strategies for responding to challenges posed by climate-related impacts

Report to the

WATER RESEARCH COMMISSION

by

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WRC Report No. 2314/1/17

ISBN 978-1-4312-0933-0

November 2017

WATER RESEARCH COMMISSION

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EXECUTIVE SUMMARY

Background

Gender specialists contend the gendered nature of climate change discourses. For them, too much attention has been paid to the geophysical, and to the measurement of climate change impacts, without much attention to aspects of quality of life. For this reason, our study shines the torch on the qualitative aspects of human well-being associated with climate change. In so doing, our own study is gendered – this means that we look at both male and female responses and consider whether, and in what ways, women's experiences differ from those of men, and secondly, we look at the subjective, the qualitative and thus the feminine. In order to capture the emotional and quality-of-life aspects of climate change – turning away from a simple geophysical approach – the theoretical frame that is chosen ensures that quality of life, ideas of social justice and human well-being are at the forefront.

As conventional climate change research has been criticised for its masculine, technological focus, it was also important to ensure that the findings would be accessible not only to male technical experts but to people on the ground. Our methodology was therefore chosen with care to ensure the co-production of knowledge and a study focus that was participatory. Our focus on emotions – using the technique of emoticons – ensures that information is accessible and that it can be understood, interrogated and validated by people on the ground. The information obtained is also co-produced and does not emanate from a laboratory where the scientific evidence is likely to be available to a few qualified climate change scientists rather than to the broader population who are affected by climate change impacts.

Women's limited access to resources and decision-making processes increases their vulnerability to impacts of climate change. Despite their own vulnerability, women are also often responsible for caring for extended family and friends during hazardous and traumatic events (whether famine, floods, drought or forced displacements). Based on experience and knowledge, women are more vulnerable to the effects of climate change than men, primarily as they constitute the majority of the world's poor and are more dependent for their livelihood on natural resources that are threatened by climate change. Gender-sensitive policies are needed to safeguard the rights of women to equal access to resources, especially in times of insecurity caused by climate change. While the project team was open to a range of aspects of climate change that might be of interest, particularly aspects identified by the residents of Lambani, the case study village, themselves, for the purposes of scoping this project, the focus was primarily on two dimensions of climate change:

- ✓ occurrence of floods and droughts;
- ✓ intensified hot or cold periods.

Rationale

Those who live in remote rural settings remain largely absent from climate change-related decision-making processes and, in particular, the voices of women who are affected by climate change have not yet been adequately captured. The language of climate change is highly technical, and policy makers, researchers, development practioners and planners

claim to represent the voices of the poor, but all too often use language that is likely to be inaccessible to those communities who are most vulnerable to these changes. Importantly, more concrete examples of the linkages between environmental degradation (due to climate change) and human security are required to better understand the pathways and effects of vulnerability and resilience.

Aims

The main objective of the study was to understand the survival strategies of poor rural women in response to the two dimensions of climate change, and the impact that extreme climatic conditions have on poor rural women. The inquiry was organised under six objectives:

1. Investigate the enabling factors and constraints for women's participation in decision-making processes within the water sector;
2. Undertake a vulnerability assessment of rural women under changing climatic conditions;
3. Investigate the challenges that women encounter around water security;
4. Evaluate the extent to which policy frameworks and strategies that address access to resources are gender sensitive;
5. Identify barriers to women's access to resources such as land, water and finance and recommend how these could be addressed;
6. Make recommendations and institutionalise good policy and practice, and design a framework for mainstreaming gender into climate change adaptation.

Structure of the report

The report is divided into nine chapters: introduction, methodology, description of study site, theoretical framework, case studies, policy environment, barriers to access to resources for women and finally the vulnerability assessment framework towards a gender-sensitive mainstreaming strategy. The products and capacity-building component of the study are then presented before the conclusion with recommendations.

Methodology

The first step was to gather geophysical data, including soil, geography and climate change data. This was followed with a socio-demographic profile of the population of Lambani. These two steps mapped "tangible" goods (e.g. roads, types of dwelling, number of schools, health status) while complementary selected participatory methods tapped into "intangible" goods (perceptions and experiences of climate change) at the grassroots level. We observed verbal, physical, emotional and other reactions during the participatory exercises and this data also informed the analysis. The ethnographic component of the study was interactive to ensure that participants contributed to the production of knowledge. The methods used were: 1) a desk-top review to obtain secondary data on climate change and the socio-economic profile of the targeted communities; 2) qualitative data – participant observation, transect walks through villages with men only, women only and both men and women; participatory mapping; focus group discussions, and application of emoticons chart; and 3) quantitative data – survey application using a standardised questionnaire sampling 262 households, with the head of household as the respondent, in four sub-villages of Lambani - Ndzanwe; Mahagala; Vhufumba and Madandila.

The team were able to tap into intangible goods such as trust, shame, fear, anger and so forth that are not commonly brought into development discourse. This study brought emotion to the fore. Inquiry into emotions allowed the researcher to better understand barriers to coping with climate change and the impact of climate change on everyday living. The emoticon tool was used to capture emotions. Intense moments and experiences of people residing in Lambani were mirrored through emotional states in lieu of static narratives.

Site selection

A number of potential areas were identified but Lambani was finally chosen as the study site due to factors such as the vulnerability of women and the impact of climate change on both locals (villagers and farmers) and crop production. Lambani is located about 60 km north of Thohoyandou and 13 km from the Punda Maria Gate of the Kruger National Park in the Limpopo Province, South Africa. Lambani has a history of droughts, floods and high temperatures. Droughts are sometimes followed by severe floods. This was the situation in 1988, 2000 and during the 2012/2013. During January 2013, more than 600 mm of rain was recorded in less than two weeks, when croplands and homestead gardens were flooded and all crops were destroyed. Clay houses collapsed leaving many community members without food and shelter. Community members did not receive any flood disaster assistance from the State.

The non-human is a semi-arid and harsh landscape. There were areas where the landscape has been ravaged by floods and there were huge ravines in the middle of the roads. (Some have still not been fixed at the beginning of 2017). There is an eery feeling of severe devastation but the villagers don't speak about it.

Theoretical frame

The capability approach (CA) was chosen as the theoretical frame because of its focus on quality of life which enables the researcher to tap into perceptions and feelings and the effect of emotions, such as fear, anger and hope on how people react, and whether or not they have agency. The connection between the CA and water is still in its infant stage. The CA framework is used: 1) to define people's well-being, 2) to assess social arrangements and 3) for the design and evaluation of social interventions, social arrangements and policy interventions. It is thus ideal when considering social interventions around climate change. It is a normative framework because it claims that freedom to achieve well-being and an improved quality of life is of primary moral importance. It is also normative because it claims that people can decide for themselves what works and what does not work.

The CA is expanded to take on board feminist socialist theory which goes a long way to address the multiple dimensions of gendered vulnerabilities and strengths in general and around climate change in particular. Unlike other alternatives, an approach based on capabilities and focused on outcomes can draw policy makers towards the information that is most relevant – how vulnerable communities are actually experiencing climate impacts and whether, or in what ways, there is "*climate change justice"*.

Key findings

Water problems, water facilities and water security

Lambani is plagued with problems around water. Taps are more than 200 metres from most dwellings and there is poor assurance of supply. Many taps are broken. Due to constant water leakages, water is contaminated because livestock drink from the same place where drinking water for households is collected. During adverse climatic conditions such as droughts and floods there are problems of cost and water quality – people cannot afford either to buy the necessary chemicals to treat water or to buy borehole water. A very low percentage of the population (8% of males and a smaller percentage of females) is satisfied with their water supply. Sixty-seven percent of females and 50% of males indicated, in response to a survey question, that they are not satisfied at all with their water facilities – this means that far more women than men are not satisfied at all with their water facilities.

Food security and crop production

Food security is precarious in Lambani. Only 59% of respondents sometimes have sufficient food to eat while only 28% say that they always have sufficient food to eat. Twelve percent say that their household never has sufficient food to eat. When asked whether there are adults who go to bed hungry at night only 2% say “yes, always” and 48% say “no, never”. An already precarious position is aggravated by extreme drought and floods when crop production is severely curtailed.

Socio-economic, infrastructure and development problems

Lambani is characterised by bad roads, poor access to health facilities, poor nutrition and extreme poverty. Physical security is absent. Health facilities are poor - there is only one small clinic; other wards or sub-villages are serviced by mobile clinics, which are available one week a month. During the weekends and after hours, the villagers have difficulty in accessing health facilities such as an ambulance and doctors. Adverse climatic conditions such as drought and floods impact on a wide range of developmental concerns: roads and transport, poor nutrition, education, water security, etc.

Unemployment and access influenced by floods

Unemployment is the main constraining factor in Lambani. Most of the youth, household heads and senior citizens (those who still able to work) are unemployed. There are very few job opportunities within the village. Those who work in towns nearby are unable to go to work when there are floods because the roads are too bad. Most people are subsistence farmers with no cash income. Their non-wage status creates an unstable population as most people want to leave to look for work in towns. Eighty percent of the total population are unemployed, and of the total female population almost all (95%) are unemployed. The unemployment figures are better for the men as 66% of the total male population are unemployed. A large percentage of the unemployed are youth (21 and over) and those under 50 years old. Among the female cohort between the ages of 21 and 30, 90% are unemployed, and between the ages of 31 and 40, everyone is unemployed.

Sports and recreational facilities

Poor recreational and sports facilities make it difficult for the village children to unleash their potential talents, especially in the sports domain. There are no proper sports facilities in the village, not even school sports facilities, except the dusty and depleted soccer fields around the village. Adherence to a sports club is usually quite high in South Africa and the national

statistics show that sports affiliation comes second after church belonging; however, in Lambani, affiliation is very low as only 8% of females and 17% of males belong to a sports association.

Communication with the outside world and access to (school and work)

It is very difficult for Lambani villagers to access, receive and send information from and to the outside world. Scholars and those who work in towns nearby are unable to attend school or go to work during extreme events such as droughts and floods because the roads are too bad. The girl child seems to be more affected than the boy child – "*in terms of getting to school, difficult for everyone, but for those that cross the river by foot, girls tend to be more afraid and come (to school) less".* School attendance during the floods was at times dangerous and during the floods a child drowned and, as poignantly expressed here, – "*we were scared because houses were flooded and we were hopeless because the one child drowned while going to school".* School attendance has also been affected by lack of water. Learners will go to school but – "*they will let us go and we won't do studies because we can't study when we are thirsty - sometimes we would go to school without eating food. […] sometimes no water".*

Climate change and emoticons

The climate is unstable and 87% of respondents thought that "*things are changing around here because of climate change".* Old women are more affected than young ones. The most affected are the sick, elderly, women and children. Eighty-two percent of women think that children would be most affected while only 72% of men do. Ninety-five percent of women think that the elderly will be affected; 80% of women think that women will be most affected while only 69% of men say that women will be most affected. Villagers say that it is worse to feel very cold because they do not have enough clothing and that they can cope better with the extreme heat although they get headaches and diseases.

Emoticons were used as a participatory tool to flesh out the different ways in which climate change is experienced. Emotions that were captured included pain, anger, worry, annoyance, scared/fearful, sad, powerless, not okay, helpless. Eighty-one percent of men felt angry while only 70% of women did. When asked whether they feared losing their culture women were more fearful that they might lose their culture (83%) compared to men (71%). The vast majority of males (96%) and females (99%) were fearful (in general). Eighty-four percent of males and 90% of females felt that they were scared that "things were changing around here". A large percentage of men (78%) and women (76%) felt that they were powerless and helpless.

Vulnerability assessment framework

The key product of the study is a vulnerability assessment (VA) framework. A VA framework is the process of isolating, organising, quantifying, and prioritising (or ranking) the vulnerabilities and strengths that exist in a given system. The frame considers both internal and external stressors, accounting for "double exposure". The idea of "double" means that the schema captures both human and environmental factors as not being separate but co-existing and entangled with each other. By "double exposure" the notion of internal aspects (site specific) and external aspects (policy, and an enabling – or disabling – environment) is captured. The double dimension has focus also on the external stressors that might be socio-political (e.g. the policy environment) and climate change stress that affects a given region.

The data required to populate the VA framework includes: geography, socio-economic profile, education, culture and religion, communication, health, infrastructure, mobility, climate change data, employment status, recreational facilities, emotions and aspirations.

The steps that were required to populate the VAF are as follows:

- ✓ Collect and integrate secondary and primary data on the physical, climatic and social assets of the village
- ✓ Assess the data critically to determine the strengths and weaknesses of these assets (and also of the data itself)
- ✓ Choose a theoretical frame for the study
- ✓ Identify and demarcate the site of investigation
- ✓ Approach key stakeholders such as tribal chiefs and councillors with the purpose of the study and solicit access to the study area (opening doors)
- ✓ Design appropriate instruments (in this case quantitative and qualitative)
- ✓ Train interviewers to implement the survey instrument and follow all steps (laboratory and field pilots, validation, preliminary analysis and so forth) required to implement the survey
- ✓ Conduct the qualitative component of the study
- ✓ Collect all data (qualitative and quantitative)
- ✓ Analyse data.

Three key concepts inform the VA framework:

- ✓ **Exposure** where the characteristics and components of exposure are classified around concerns of sensitivity, resilience, adaptation, external and internal stressors and health hazards.
- ✓ **Temporality,** which assesses whether particular events are once-off events and if not, how often a particular stressor is likely to occur. It is important to identify whether it is an ongoing or a once-off situation by asking questions such as: how sporadic is this event? Is it iterative? Is it once-off or can a recurrence be anticipated?
- ✓ **Asset base:** the asset base needs to be known as this influences adaptive capacity and coping strategies. Here both the material and non-material goods that are present in a given site are assessed.

Conclusion

The study has focused on creating a VA framework that is gender sensitive. It has done so by developing a methodology which taps into the feminine and subjective attributes, and measuring human well-being and quality of life within the context of a particular site that has been impacted on by extreme events such as floods and droughts and extreme changes in temperature – heat and cold. It has brought to the fore the emotional responses of residents to these external stressors through the use of a qualitative research methodology coupled with a quantitative research instrument that was also able to tap into intangible and non-material goods that are rarely considered. The theoretical frame, the capability approach, is well suited to gauge intangible goods because of its concern for human well-being and quality of life rather than material goods. In line with feminist critical theory, the study focus was on difference and particularity where the specific feelings and experiences of individuals were identified. In this way, we were able to affirm that older

women were the most affected by climate change, that women between the ages of 31 and 40 were coping badly with climate change and that children – in particular, the girl child – was affected by stressors in the environment such as floods and droughts. In this case, it was the girl child who was more likely to stay away from school during floods because of her fear of crossing a river with icy cold water. Climate also affected social capital because meetings that were usually held under a tree in the central part of the village could not take place when it was raining heavily. Access to towns was limited during floods as the roads were destroyed which meant that people could not gather outside of their immediate surroundings for markets and/or meetings, limiting the perpetuation or brokerage of social capital. In some instances, gender matters, for instance females are coping a lot less then their male counterparts as 53% of males are doing well while only 39% of females are. Put differently, 28% of males aren't coping well whereas 49% of females aren't. There are also more females (59%) than males (41%) who think that there are different challenges for men than there are for women.

The real contribution of this study is the design of an original template for a VA framework. In this framework the concept of double exposure brings together the biophysical as well as the social dimensions of climate change. Three core notions organise the data. These are exposure, temporality and resource base. The data is "hard" data that captures the state of roads, transport, tangible assets such as clinics and so forth as well as "soft" data which is the intangible assets that add depth and meaning to experiences of diverse members of society – such as the women, the men, the young and the old, the employed and the unemployed. The study presents a step-by-step approach to the design of the VA framework, explaining the preferred methodology and providing a guide on how to populate the schema once the data is collected. Gender is not left behind and nor are the voices of those most affected by climate change silenced. On the contrary, the proposed VA framework puts a human face on discourses around climate change, counteracting a science which has an over emphasis on the biophysical, the masculine and the top-down.

Recommendations

- Identify rural disaster areas and develop disaster management plans in collaboration with the community to mitigate future climate change impacts.
- Create a disaster management fund that is managed by the community themselves with assistance from local government targeting primarily (but not only) women and children.
- Identify other threats that make communities that are vulnerable to climate change more vulnerable (for instance elephants that trample fields and frighten villagers).
- Increase water availability in rural communities through, for instance, i) revitalisation of old boreholes iii) installation of new boreholes iii) roof water harvesting.
- Emphasise quality of life data to counter the focus on the biophysical.
- Assess material (tangible) and non-material (intangible) elements.
- Build capacity around water storage, water usage and water purification.
- Integrate both the approach and the knowledge produced to create a gender-sensitive VA framework.
- Develop robust intellectual concepts as a scaffold for the VA framework (in this case exposure, temporality and resources).

- Popularise the application and use of the VA framework as a tool to assess gender and climate change.
- Train researchers to apply the vulnerability assessment framework.
- Interrogate categories, and variables within categories.
- Take cognisance of multiple scales (macro and micro) and external and internal socio-political and environmental elements.
- Use, test and validate the newly developed VA framework in varied local contexts.
- Document constraints experienced by women around climate change in user-friendly language.
- Share climate smart agricultural technologies with communities such as Lambani in order to mitigate for climate change impacts.
- Identify where gender matters and where it does not matter as much.
- Make information that shows gender dimensions available to policy makers in user-friendly language.
- Encourage better communication between local government and communities so that the efforts made by the community and by local government are made visible, and collaboration and trust between the two more possible.
- Departments need to deliver on their mandate and deliver on what they say they will do – this requires capable government officials driven by commitment to basic service delivery.
- Clarify which responsibilities and roles are in the domain of the community and which are in the domain of government.
- Challenges faced by rural women in the water sector in particular contexts such as Lambani to inform policy and be taken into consideration by local government and community structures.
- Given that the results show pressure on rural women around climate change, provide support systems at local and national levels for rural women facing constraints around climate change.
- Focus on programmes in rural areas to build capacity for people to maintain roads etc. (public works programmes).
- Design a mixed methodology for climate change studies that triangulates findings, is participatory, and is qualitative as well as quantitative.
- Ensure knowledge is co-produced and not provided top-down.
- Better understand the demographics and research categories so as to better inform the communities themselves, local and national governments for better preparedness in the case of climate change (better data means better preparedness).
- Climate change studies should create the space for theoretical frameworks that can focus on ethics and social aspects of climate change.
- Carrya out further case studies so that the findings from this study can be improved and validated.
- Roll out the methodology in differing cultural contexts.
- Create facilities for sports and recreation for rural adults and children.
- Over time, replace mobile clinics with brick and mortar clinics in the village.
- Create a dedicated community centre.

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ACKNOWLEDGEMENTS

- ✓ The project team is grateful to the Water Research Commission for sponsoring this research project. A particular thank you to Eiman Karar for her inspiration at the inception of the project, and to the project manager, Dr Brilliant Petja, for seeing the project through to its final stage.

- ✓ Thank you to the dedicated project team for their commitment and hard work from day one to the end of the project.

- ✓ Special thanks to Professor Xu, UNESCO Chair for Groundwater, for his support for the project team at the University of the Western Cape.

- ✓ The Management and Administration of the Agricultural Research Council -Institute for Soil, Climate and Water for their continual support in many ways.

- ✓ The project team are grateful to all community members of Lambani who participated in – and validated - this study and provided the rich narratives and data, as well as to all the gender experts that have patiently given of their time during the trajectory of the project.

- ✓ The valuable inputs and support from the Reference Group are greatly acknowledged:

Mr. J. Carstens	(ARC-Institute for Soil, Climate & Water)
Dr. P. Esterhuyse	(University of the Free State)
Dr. E. Mapedza	(International Water Management Institute)
Dr. N. Monde	(University of Fort Hare)
Dr. A. Sullivan	(Private Consultant)
Ms. J.R. Wilson	(Environmental Monitoring Group)

- ✓ We also acknowledge the valuable inputs and support from experts in the field, in particular:

Dr. W. de Clercq	(University of Stellenbosch)
Prof. L. Harris	(University of British Columbia)
Prof. W. Mulwafu	(University of Malawi)
Dr. M. Musemwa	(University of Witwatersrand)
Mrs. S. Stuart-Hill	(University of Kwa-Zulu Natal)
Dr. B. Van Koppen	(International Water Management Institute)
Dr. A. Van Rooyen	(ICRISAT)

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LIST OF ABBREVIATIONS

AMCOW	=	African Ministers' Council on Water
AU	=	African Union
AWW	=	Africa Water Week
BPfA	=	Beijing Platform for Action in Africa
CA	=	Capability Approach
CAADP	=	Comprehensive African Agriculture Development Programme
CBO	=	Community-Based Organisation
CCMA	=	Commission for Conciliation, Mediation and Arbitration
CEDAW	=	Convention on the Elimination of All Forms of Discrimination against Women
CGE	=	Commission for Gender Equality
CM	=	Capabilities metric
CSOs	=	Civil Society Organisations
CoGTA	=	Department of Cooperative Governance and Traditional Affairs
CWWLs	=	Council of Women World Leaders
DEA	=	Department of Environmental Affairs
DIRCO	=	Department of International Relations and Cooperation
DRDL	=	Department of Rural Development and Land Reform
DWAF	=	Department of Water Affairs and Forestry
ECD	=	Early Childhood Development
EPWP	=	Expanded Public Works Programme
GMS	=	Gender Management System
GWP	=	Global Water Partnership
FAO	=	Food and Agricultural Organisation
GGCA	=	Global Gender and Climate Alliance
HFA	=	Hyogo Framework for Action
ICASA	=	Independent Communications Authority of South Africa
ICT	=	Information Communications Technology
ISDR	=	International Strategy for Disaster Reduction
IPCC	=	Intergovernmental Panel on Climate Change
IWSC	=	International Water and Sanitation Centre
IWRM	=	Integrated Water Resources Management
LVAW	=	Limpopo Violence Against Women
MDDA	=	Media Development and Diversity Agency
MDGs	=	Millennium Development Goals
NDCs	=	Nationally Determined Contributions
NAPA	=	National Adaptation Programme of Action
NEMA	=	National Environmental Management Act
NEPAD	=	New Partnership for Africa's Development
NCWSTI	=	National Community Water and Training Sanitation Institute
NGM	=	National Gender Machinery
NGP	=	National Gender Policy
NGO	=	Non-governmental organisation
NIWLGSS	=	November International Women Leaders Global Security Summit
OP-CEDAW	=	Optional Protocol to the Convention on the Elimination of All Forms of Discrimination against Women
ORASECOM	=	Orange-Seqnu River Commission

PA	=	Procedural approach
PVA	=	Participatory vulnerability assessment
RBO	=	River Basin Organisation
RDP	=	Reconstruction and Development Plan
RISDP	=	Regional Indicative Strategic Development Plan
RSAP	=	Regional Strategic Action Plan
RWP	=	Regional Water Policy
RWS	=	Regional Water Strategy
SADC	=	Southern African Development Community
SADC WD	=	SADC Water Division
SAGPA	=	Southern African Gender Protocol Alliance
SAHRC	=	South African Human Rights Commission
SALGA	=	South African Local Government Association
SAWV	=	Southern African Water Vision
STC	=	Specialised Technical Committee
UNCBD	=	UN Convention on Biodiversity
UNCED	=	United Nations Conference on Environment and Development
UNFCCC	=	United Nations Framework Convention on Climate Change
VAW	=	Violence Against Women
VA	=	Vulnerability Assessment
WEDO	=	Women’s Environment and Development Organization
WEN	=	Women’s Environmental Network
WRDM	=	Water Resources Development and Management
WWF	=	World Water Forum
2D	=	2 dimensions of climate change

1 INTRODUCTION

1.1 INTRODUCTION AND BACKGROUND

Women's limited access to resources and decision-making processes increases their vulnerability to impacts of climate change. Despite their own vulnerability, women are also often responsible for caring for extended families and friends during hazardous and traumatic events (whether it is famine, floods, drought or forced displacements). Based on experience and knowledge, women are more vulnerable to the effects of climate change than men, primarily as they constitute the majority of the world's poor and are more dependent for their livelihood on natural resources that are threatened by climate change. During trying times women often care not only for themselves but also for the wounded, the sick, the old and vulnerable members of their family and community. During times of famine, it has frequently been shown that women endure the most of food shortfalls (similar results have been suggested for water scarcity). Women charged with securing water, food and fuel for cooking and heating face the greatest challenges. Women experience unequal access to resources and decision-making processes, with limited mobility in rural areas. Indeed, cross-national data, looking at disasters, suggests that women suffer higher morbidity and mortality from these events. This is not necessarily due to the event itself, but more likely gender unequal aid and post-disaster recovery processes (Neumayer & Plümper, 2007).

For all these reasons, gender-sensitive policies are needed to safeguard the rights of women to equal access to resources especially in times of insecurity caused by climate change. Are existing policies and legislative frameworks adequately gender sensitive? If not, what would be required for them to be more sensitive to the requirements of women? In cases where the policy itself is gender sensitive, has it been successfully implemented and if not, what have been the hurdles to its implementation? This project tapped into the specific adaptive strategies of women in a particular area and, in so doing, considered how policies are – or are not – supporting these adaptive strategies. Women are not the only vulnerable segments of the population, but, for the purpose of this research, the focus was on women in Lambani, Limpopo Province. The project team have also sought to better understand the differentiated responses of men and women to climate variations and stress such as extreme heat, cold, droughts or floods. It is important to identify gender-sensitive strategies that respond to these crises for women (Habtezion, 2013).

1.2 RATIONALE

Those who live in remote rural settings remain largely absent from climate change-related decision-making processes and in particular the voices of women who are affected by climate change have not yet been adequately captured. The language of climate change is highly technical, and policy makers, researchers, development practioners and planners claim to represent the voices of the poor but all too often use language that is likely to be inaccessible to those communities who are most vulnerable to these changes. Importantly, we require more concrete examples of the linkages between environmental degradation (due to climate change) and human security to better understand the pathways and effects of vulnerability and resilience. Women's experiences and voices are key to such an enriched understanding. For this reason, the study proposed to capture the narratives and voices of relatively impoverished rural women and in so doing to bring the wisdom, experience and concerns of

women facing the effects of climate change in their everyday life, to the fore. While the project team was open to a range of aspects of climate change that could be of interest, particularly as identified by residents of Lambani themselves, for the purposes of scoping this project the focus was primarily on:

- ✓ occurrence of floods and droughts
- ✓ intensified hot or cold periods.

These are several possible climate change outcomes that were likely to be of concern for rural populations in the heavily agricultural region that is the focus of our study. These are refered to as the two dimensions (2D) of climate change.

1.3 PROJECT OBJECTIVES

The main objective was to understand the survival strategies of poor rural women under the two dimensions of climate change and the impact that extreme climatic conditions have on poor rural women:

- ✓ occurrence of floods and droughts
- ✓ intensified hot or cold periods.

The inquiry was organised under six objectives:

1. Investigate the enabling factors and constraints for women's participation in decision-making processes within the water sector;
2. Undertake a vulnerability assessment of rural women under changing climatic conditions;
3. Investigate the challenges that women encounter around water security;
4. Evaluate the extent to which policy frameworks and strategies that address access to resources are gender sensitive;
5. Identify barriers to women's access to resources such as land, water and finance and recommend how these could be addressed;
6. Make recommendations and institutionalise good policy practice and design a framework for mainstreaming gender into climate change adaptation.

1.4 LAYOUT OF REPORT

The objectives mentioned in Section 1.3 will be addressed in the chapters that follow, as explained in Table 1. The report is devided into nine chapters. These chapters are:

Chapter 1: Introduction
Chapter 2: Methodology
Chapter 3: Description of study site
Chapter 4: Theoretical framework
Chapter 5: Case studies
Chapter 6: Policy environment: Barriers to access to resources for women
Chapter 7: Vulnerability assessment framework towards a gender-sensitive mainstreaming strategy
Chapter 8: Products and capacity building
Chapter 9: Conclusions and recommendations

Table 1 Layout of the final report

OBJECTIVE	CHAPTER
Objective 1 Investigate the enabling factors and constraints for women's participation in decision-making processes within the water sector	This objective is addressed in all the chapters since it is the foundation of the whole report. Nevertheless, it is mostly covered in Chapter 3, with recommendations given in Chapter 9 as to how to address these factors and challenges.
Objective 2 Undertake a vulnerability assessment of rural women under changing climatic conditions	Chapter 2 describes the tools or methods that were adopted. In Chapter 7 it is defined (7.1), discussed under the concepts (7.2) and the requirements (7.3).
Objective 3 Investigate the challenges that women encounter around water security	Chapter 3 under the challenges for water security (3.3) and experiences (3.4).
Objective 4 Evaluate the extent to which policy frameworks and strategies that address access to resources are gender sensitive	The policy framework is a very important aspect of the report, and is addressed in Chapter 6. It is firstly defined (6.1),the legislative and policy framework is discussed (6.5.2), issues of access and gender sensitivity are discussed (6.5.3 – 6.5.7), concluding with women development and landownership (6.6.1 – 6.6.5).
Objective 5 Identify barriers to women's access to resources such as land, water and finance and recommend how these could be addressed	These barriers are identified and discussed throughout the report, but especially in: (i) Chapter 5, where gender and climate hazards (5.2.1) and the gendered impact of drought are covered (0) and gender vulnerability to climate change (5.2.3) are discussed; then in (ii) Chapter 3, where access to basic services (3.2.6), infrastructure and facilities (3.2.5) are covered.
Objective 6 Make recommendations and institutionalise good policy practice, and design a framework for mainstreaming gender into climate change adaptation	The framework is presented in Chapter 7. In concluding the report, the recommendations are very important in terms of achieving the final objective of the report, therefore all the recommendations are gathered together in Chapter 9.

1.5 CLASSIFICATION OF TERMS

This section describes the terminology for eight concepts that are key to a vulnerability assessment: gender, climate change, resilience, sensitivity, enabling environment, loss and damage, and the term vulnerability asssessment itself. The terms and their description are presented in Table 2.

Table 2 Classification of key terms used and their description

Term	Description	Source
Gender	Gender refers to the socially constructed, rather than the biologically determined, roles of men and women, as well as the relationships between them in a given society at a specific time and place. These roles and relationships are not fixed but can and do change. They are usually unequal in terms of power, freedom, agency and status as well as access to and control over entitlements, resources and assets.	Global Water Partnership: TEC, 2006
Case study	A case study is an in-depth study of a particular situation that narrows down a very broad field of research and, in so doing, makes it manageable. While it does not answer all aspects of the question that is being posed (in this case, the topic of gender and climate change), it gives some indications and allows for further elaboration on a given topic. It is useful for testing whether scientific theories work in the real world, in this case testing whether the theory of the capability approach and social capital are helpful in deciphering patterns of behaviour in a real-life situation. Psychologists, anthropologists and social scientists have regarded the case study as a valid method of research for many years. Scientists are sometimes guilty of becoming bogged down in the general picture and it is important to understand a specific situation that is bound in time and space in a more holistic way.	Adapted from https://explorable.com/case-study-research-design?gid=1582
Climate change	"Adverse effects of climate change" means changes in the physical environment or biota resulting from climate change which have significant deleterious effects on the composition, resilience or productivity of natural and managed ecosystems, or on the operation of socio-economic systems, or on human health and welfare. "Climate change" means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.	http://unfccc.int/essential_background/convention/background/items/2536.php
Resilience	Resilience is the ability of a system to reorganise itself after it has undergone a shock and to recover so that it can continue to survive – or rather to thrive in the same or different form.	
Vulnerability assessment	A vulnerability assessment is the process of recognising, categorising and prioritising (or ranking) the vulnerabilities in a system and organising them within a given framework.	
Enabling environment	An enabling environment is determined by national, provincial and local policies and legislation that constitute the “rules of the game” and facilitate all stakeholders to play their respective roles in the	http://www.gwp.org/en/ToolBox/TOOLS/The-Enabling-Environment/

Term	Description	Source
	development and management of water resources. It also includes the forums, mechanisms, information and capacity building created to establish these “rules of the game” and to facilitate and exercise stakeholder participation. A proper enabling environment ensures the rights and assets of all stakeholders (individuals as well as public and private sector organisations and companies, women as well as men, the poor as well as the better off), and protects public assets such as intrinsic environmental value. A successful enabling environment protects social and environmental assets - this includes both environmental resources and intangibles such as environmental values.	
Sensitivity	This is the degree to which a built, natural or human system is directly or indirectly affected by changes in climate conditions (e.g. temperature and precipitation) or specific climate change impacts (e.g. sea level rise or increased water temperature). The degree to which a system is likely to be affected by projected climate change determines its sensitivity to stress.	
Loss and damage	Loss and damage have usually been viewed as the entire range of damage and permanent loss associated with climate impacts that can no longer be avoided through mitigation and for which adaptation is difficult or no longer possible. Increasingly, the relationship between mitigation, adaptation, and loss and damage is being seen as more complex, highlighting the role that each plays in influencing the other. The loss and damage attributable to climate change is expected to increase over time due to increases in frequency and magnitude of extreme weather events, as well as impacts of slow-onset events.	Klinsky *et al.* (2014)

2 METHODOLOGY

2.1 INTRODUCTION

The project team opted for a phased methodological approach, using multiple methods. Multiple methods are recognised as a common approach to secure in-depth understanding of a research topic. Because of the recognised difficulty of achieving objective reality, both in quantitative and qualitative research methods, the multiple methods focus attempts to “secure an in-depth understanding of the phenomenon in question” (Denzin & Lincoln, 1998). This approach is also referred to as triangulation and can be considered as an alternative method of validation (Goldin, 2005; Denzin, 1989; Fielding & Fielding, 1986). Like Denzin and Lincoln (1998), the project team used the term “bricoleur”, and although it can have a pejorative meaning, implying, for instance, an amateur, it is believed that it describes the astuteness and flexibility of a researcher who is able to “perform a large number of diverse tasks” (1998, p. 4) in order to achieve rigour and breadth in the study. Table 3 illustrates the phases and multi-methods approach.

Table 3 Multi-methods approach used by the research team; April 2014–January 2015

Time period	Phase	Type of activity	
April 2014–April 2015	1	Literature review and theoretical pursuit on all related topics	Desk-top (1) literature review on climate change, resilience, gender, sensitivity, Limpopo Province stats and overview, household strategies of survival, safety nets, poverty, capability approach and human well-being with intersections and cross-cutting themes across all these topics. Desk-top (2) water policy, disaster management, agricultural policy, social development and other relevant policy and strategy documents. Desk-top (3) selection of case studies that validate or complement the primary and secondary data of this study
June 2014–July 2014	2	Questionnaire design (quantitative component)	Five drafts of the questionnaire were designed, to ensure question flow and the establishment of indicators that tapped into the constructs captured. The drafts made sure that the response categories were correct. Sample size was 262 households – approximately 66 in each of four zones. The respondent was the household head. The survey was piloted (field pilot and laboratory pilot). The surveys were 40 minutes and were divided into sections, as follows: demographics, livelihoods, water security, experiences of climate change, emotions and subjective well-being. The data was captured and analysed using STATA 11[1]
August 2014	3	Training of interviewers	Training in the field prior to survey implementation and during the survey
August 2014	4	Fieldwork: participant observation	Throughout the fieldwork, notes were taken from observations as to how people went about their daily lives. Notes were also taken during focus groups discussions and interviews to pick up non-verbal protocol that gave insights into “feelings” and the emotional well-being of respondents wherever appropriate.
August 2014	5	Fieldwork: semi-structured, face-to-face interviews with key informants (phase one)	Informants were identified using a snowball effect. The team began with the chief, counsellors, church leaders, an NGO, CSO and a teacher. The team snowballed to make sure that they captured the voices of key informants in the four zones.

[1] See questionnaire attached to this report (

Appendix 1)

Time period	Phase	Type of activity	
August 2014	6	Fieldwork: participatory mapping and transect walks	Workshops were conducted in each zone using participatory mapping techniques. Three transect walks with women and another one with men were conducted. Maps were drawn after the walk to capture important places and feelings that emerged during the walk.
August 2014	7	Fieldwork: focus group discussions	Three focus groups in four zones (one with men only, one with women only and one with both men and women) were conducted.
September 2014 – November 2014	9	Fieldwork: semi-structured, face-to-face interviews with key informants (phase two)	Key informants in the sector who have been working on climate change and policy-related documents as well as gender issues were interviewed. Information was collected at the Conference in the Eastern Cape in November from presenters working in the related fields of gender, climate change and gender and climate change.
September 2014 – November 2014	10	Data capturing, validation of responses, preliminary analysis	Organised the narrative texts that were gathered for the qualitative component of the study, entered the data, and analysed the survey using SPSS or STATA.
December 2014 – January 2015	11	Writing and analysis	Analysis.
August – September 2016	12	Validation and knowledge dissemination workshops	A workshop was held in Stellenbosch with gender experts in August 2016 to disseminate and validate the findings. In September a knowledge dissemination workshop was held in Lambani to disseminate and validate the findings.

Both quantitative and qualitative research methodologies offer the potential for rigour and error, but this study was not tasked with examining, in too much detail, the comparative strengths and weaknesses of both. Suffice to say that adequate cautionary measures are required to mitigate for bias in both approaches. Qualitative research has been criticised for not being "scientific", although practitioners of quantitative research are more frequently bringing qualitative components into their research design (Grootaert & van Bastelaer, 2002; Seale, 2004). Research into intangible assets, such as emotions and social *processes* that give insight into vulnerability, are prey to a range of problems that are common to *both* quantitative and qualitative research methods.

A first challenge presented was for instrument design and the effort to measure not only the tangible but also "invisible" and "intangible" goods. Differences in meaning exist for different people and a methodological challenge is evident in efforts to create measures that actually tap into what they are supposed to – or claim to – be measuring. Another challenge, associated in particular with the creation of a standardised measure of intangible or invisible assets, was the need to develop robust instruments which can measure across cohorts, such as age and gender, and across location – in this case the two distinct zones that were the site of the investigation.

The first year of the project involved a critical review and synthesis of important gender and climate change literature. It was helpful that there was a significant international conference on gender and water that took place in the Eastern Cape early on in the project cycle (November, 2014). The debates, discussions and presentations at this conference guided and informed the project at its inception and gave it new directions as it moved onto its second year (2015).

The approach to data collection was threefold. The first step was to gather geophysical data about the area, including soil typology, geography and climate change data. This was followed with the creation of a socio-demographic profile of the population of Lambani. These two steps mapped "tangible" goods (e.g. roads, type of dwelling, number of schools, health status) while complementary selected participatory methods tapped into "intangible" goods (perceptions and experiences of climate change) at the grassroots level. There were verbal, physical, emotional and other clues from the women that were observed during the participatory exercises and these informed the analysis. We call these "clues" as they are pointers as to what is real and how people are feeling. They assist in better understanding the everyday reality that faces women and men around climate change. The ethnographic component of the study was interactive. Care was taken to note sameness and differences around gender, observing who was there, who was not there and when and in what way men and women participate or do not participate in activities and discussions as the case might be.

The methods were:

- ✓ desk-top review to obtain secondary data on climate change and the socio-economic profile of targeted communities;
- ✓ semi-structured interviews with key informants (government, NGOs, community leaders);
- ✓ three transect walks through villages (with men only, women only and both men and women);
- ✓ participatory mapping;
- ✓ focus group discussions;
- ✓ application of emoticons chart; and
- ✓ survey application with a standardised questionnaire, sampling 262 households;
- ✓ two knowledge dissemination workshops.

The qualitative methods used were: semi-structured, face-to-face interviews, transect walks, participatory action research workshops, participatory observation, participatory mapping, and the emoticon tool. The quantitative methods used were: a standardised survey instrument, using a sample size of 262 households. The respondents were the head of the household in four sub-villages of Lambani (Ndzanwe; Mahagala; Vhufumba; Madandila). The questionnaire took 45 minutes to administer. The survey instrument was administered to validate findings from the qualitative data. The survey instrument included a battery of questions designed to tap into intangible goods. The qualitative component of the study also builds on desk-top studies.

2.2 SITE SELECTION

A number of areas were identified and considered but Lambani was finally chosen as the study site due to a number of factors such as the vulnerability of women and impact of climate change on both locals (villagers and farmers) and crop production. Furthermore, Lambani is prone to adverse weather conditions, ranging from severe mid-summer droughts to floods. Lambani has a history of droughts, floods and high temperatures. The area regularly experiences droughts resulting in low or no yields. Droughts are sometimes followed by severe floods. This was the situation in 1988, 2000 and during 2012/2013. During 2012/2013, before the floods there was no crop production taking place due to drought, and planting was only done in January 2013 (Figure 1). Later, during January 2013, more than 600 mm of rain was recorded in less than two weeks, causing erosion and lots of damage (Figure 2). Croplands and homestead gardens were flooded and all crops were destroyed. Clay houses collapsed and valuable topsoil was washed down the river. This left many community members without food and shelter. Community members did not receive any flood disaster assistance from the State.

Droughts and floods in Lambani have a large impact on household food security and the security of rural livelihoods. For these reasons, Lambani was an ideal location to conduct empirical research into the relationship between resilience, gender and climate change. Four sub-villages within Lambani were selected as places to conduct the project, namely: Ndzanwe, Mahagala, Vhufumba and Madandila.

Figure 1 Maize suffering from the drought

Figure 2 Damage caused by the floods and high rainfall

2.3 VULNERABILITY ASSESSMENT METHODS

2.3.1 Participant observation

Participant observation and unstructured and semi-structured, face-to-face interviews were used in this research project to gather raw data. According to Tashakkor & Teddlie (1998), the Lambani study is typically exploratory in nature and the data is neither controlled nor manipulated. The *process* itself informs the finished product and so methods were employed to capture and report on the process as much as on the end product. Participant observation was used around boreholes, windmills, irrigation canals, etc. Participant observation was also used in this exercise where hesitation or "exclusion" of bias in speaking was noted, which is due to the gendered nature of the villagers and farmers. The interest was to observe:

(i) whether or not women took a less active role in identifying certain roles and responsibilities that was reflected in this exercise;
(ii) how equal were the voices of men and women in drawing up the matrix, and
(iii) if they were unequal, was there a pattern of inequality or bias that could be observed.

There were verbal, physical, emotional and other clues from the women that were observed during the participatory exercises and this also informed the analysis.

This ethnographic component of the study was interactive and was designed to provide rich and important data to tap into survival strategies, vulnerability and resilience and the way in which the embeddedness of individuals contributes to their resilience (or vulnerability). Particular care was taken to tap into gender dimensions through the observations and careful noting of behaviour – who was there, who was not there and when and in what way the person participated or did not participate in activities and discussions. Even anthropologists have taken the view that society can be studied best from inside by the immersion of the researcher in the study. Walsh (2004, quoted by Seale, 2004) presents an argument that ethno-methodology is part of a constructionist approach and it encourages the researcher to focus not so much on how people see things but what they are doing. A realist and "scientific" view of the world is optimal, even if this is guided by feeling, perception and qualitative research methods. Of course, one's own subjective lens on the world acts as a filter, amplifying some events and muting others.

Geertz (1973) sees culture as a system of signs, and for him the task of the ethnographer is to produce a "thick description". The ethnographer is then able to find a whole web of meaning, cultural structures and knowledge that is superimposed on what he calls the layers of a cultural script. Walsh (2004) suggests that being a storyteller and conveying arguments and persuading readers that their accounts are "plausible constructions of social actors and social scenes" is lesser science. It was believed that true science does not need to persuade the reader that the accounts are "plausible" because the utterances of social actors are "facts" and "real" and truly empirical and "scientific" in their exactitude even though there is the filtering effect of the researcher. Participant observation requires

an open heart, alert eyes and ears and a fair mind to observe the field reality and to allow for that necessary agility that was mentioned above.

The onus was on the researcher to constantly re-evaluate the “facts” and to reconsider fairness, correcting for the effects of the filter where possible. Even though an interview is subjective, bias was reduced by been alerted to subjectivity and trying as best as possible to ensure that the knowledge generated remained as valid and reliable as possible. The multiple methods approach allows for this crosschecking and self-verification activity but so too do the ongoing debriefing sessions that were held after a day’s work in the field and the post-field analysis, brainstorming and writing back in the office. As a participant observer, Walsh (2004) recommends good relationships should be established with the people that are able to generate the data needed but this is an ideal only, because in effect gaps in knowledge, feelings of social uncertainty and “uneasy trust” do inhibit data-collection procedures. The team was particularly careful not to perpetuate feelings of shame by making respondents felt uneasy or “stupid” because they could not answer questions.

The team was fairly balanced, with technical experts (who know about climate change) and social experts (who are more familiar with gender issues). Inexperience in the “scientific” realm might inhibit information flows because once the door is unlocked and information is forthcoming, the information might be difficult to grasp. In order to avoid cognitive dissonance between respondent and interviewer the researchers were very careful and alert not to close doors and block information flows. Whenever there was cognitive dissonance, the team found the right match and approached the respondent in a different context (e.g. writing, telephonic, follow-up visits). Thus, the problem was not only external gatekeepers who restrict access to information but also own subjective and personal blockages that impacted on information flows.

A questionnaire was designed to capture the project’s interests as per research category presented above. The following data was also captured: demographics (health, age, education, income, household head); access to services (land, water and finances); ease of access to water for productive and domestic uses; sanitation; type of dwelling; food security (a typical question was: do people in the household go to bed hungry at night?); mental health (typical question was about sleeping well or having worries at night that impacted on sleep). It was believed that the emotional well-being of residents was critical for a vulnerability assessment and therefore a battery of questions was designed around mental health. Indicators were also used that tapped into social capital and social cohesion. A battery of questions was also designed around real and perceived climatic events (droughts, floods, heat and cold) and the impact of these events on their own household. The final vulnerability assessment report drew on qualitative and quantitative data extracted from the processes outlined above. Contextual evidence was included that was gained from face-to-face interviews with key informants (e.g. local government, councillors, teachers, NGOs and other experts living in and around Lambani). The evidence was validated by desk-top research drawing on reports and studies of climatic

conditions in the Limpopo Province. This research helped to answer the contextual questions that were posed above.

Staying within the discipline of academia and furthering excellence in the social sciences does not imply that the emotional or feeling context of a research project must be denigrated in any way. Vincent's (2004) article "What's love got to do with it? The effect of affect in the academy" is indicative of the way in which academic excellence assumes the exclusion and repression of emotion. Vincent argues that the binary between reason and emotion is questionable and notes Freire's (1972) distinction between "true words" and inauthenticity (Vincent, 2004). "Inauthentic words are unable to transform reality for they lack connectedness to the world and to the lived experiences within which they are spoken" (*ibid.*). The onus is on researchers to bring out that passion and to be as true to the lived experiences of others as they can. The dominant view, according to Vincent (2004), is that "strong emotions are quite out of place in the academy, belonging as they do to the realm of the intensely private." Vincent goes on to argue that this view has become so dominant that it has managed to cast itself as common sense and that, she asserts, speaks loudly of the prevailing power relations (*ibid*.).

Following on from this argument, the team were able to tap into intangible goods such as trust, shame, fear, anger and so forth that are not commonly brought into development discourse, because it was believed that these emotions are determinants of social action. There are often fuzzy or puzzling distortions less welcome in the ordered universe of "science". It is particularly relevant when working with the feminine and subjective aspects of human well-being and the team were not afraid to voice the "fuzzy", the uncertain, the tentative and the intangible because, as they ascertain, it was within this minimal space where the voices and actions of women were often the loudest. Women are not always heard in the formal and the formed but rather in the informal and "unformed". This study brought emotion to the fore. Inquiry into emotions within this context provided clues to understanding barriers to coping with climate change. Emoticon tools were used to capture emotions.

The team were watchful of the pressure to "find results" and to be inhibited by a question such as "so what have you found?" In the quest for "truth" the research team did not underestimate information that was "doubtful" and not positivist, reliable yet ambivalent and realistic yet incongruous. The social scientist often reproduces perplexing truths and reflects back social uncertainties and ambivalences that go with deep change.

Face-to-face interviews provided raw data in the form of narrative texts. The data was transcribed within hours of the interview and a method of open coding was used where phrases or key words were coded, using theoretical themes to organise the texts. This was adjusted from what is known as grounded methodology. Grounded methodology

generates an indexing system through which segments of raw data can be accessed more readily.[2]

2.3.2 Transect walk

A transect walk is a helpful tool which provides an opportunity for researchers to engage with village residents in a non-threatening environment while getting to know the "lay of the land." It is literally a walk through a transect; in this instance, cutting through four villages (Figure 3). As researchers accompanied residents on this walk, residents were invited to identify taps, toilets, boreholes, their churches, non-governmental organisations (NGOs), shops, spazas or other places that are of note in their everyday. The walks provided an opportunity to discuss village matters and to gauge feelings about particular spaces. A transect walk is a useful tool to compare different views as information gathered on one walk by one set of residents might differ from observations or information gathered from another set of residents on a different walk. The transect walks were validated in a day-and-a-half working session where ten women and then ten men (separately) who had participated in the walk were asked to draw a decisive map using participatory mapping techniques. The selection of women included: young unemployed women, young female farmers, older female farmers, and female teachers and women from local NGOs.

Figure 3 Transect walk by project team members and villagers and/or farmers in Lambani

The second session of participatory mapping was with men. The research team believe that men and women (and young and old, and so forth) "see" certain village icons and spatial symbols differently and that, through their "eyes" and "ears", they would be able to apply a gender-sensitive lens. The participants were not prompted when drawing the first draft of the map but they were encouraged to mark on the map where the most "sensitive" parts of the landscape were with regards to the three dimensions of climate change. Even as they did not map water points such as rivers during the first phase, they were prompted to do so during the second phase of the mapping, after the transect walk. Women and men were invited to identify meeting places and to describe what the meetings are about.

[2] See also Seale (2004) Generating grounded theory

Further, women were asked about their experiences in decision-making within these structures to assess barriers that women might encounter in decision-making around water concerns as well as the insecurities that they experienced around resources such as water. Gender-differentiated access was considered around water resources for domestic and productive uses (such as drinking water, multiple use systems and small water infrastructure). Women emphasised water points – such as the wells, community taps, the Levubhu river as well as small streams - and reflected on the difficulty they have in collecting water. They were also anxious about the taste and the quality of the water that they have to drink every day. The women seemed eager to share their experiences and spoke with passion about how difficult it is to keep the water clean and how water from the wells and other sources is too dirty and all too often scarce.

The women used thorny tree branches to surround the area around the well as a deterrent against animals. Women also “used their own heads” to transport collected water from the wells, to transport collected soil from the termite hills for their gardens and also to make bricks for their dwellings. Women manoeuvre within the non-human elements that are part of their daily lives, like gathering firewood from the forest and carrying heavy loads on their heads back to their dwellings, often from many kilometres away. On the other hand, men did not focus on the water issues nor on their relationship with the forest nor did they draw attention to wells and other sources of water that they passed during the transect walk. Their focus was on trees that have fruits, such as the Marula fruit, that they eat and that are used to make traditional wine or beer. Men also consider rights of passage into manhood as being significant and they identified with spaces where young boys gather to participate in initiation schools in and around the village. Men also identified places where firewood is gathered to be used by women for cooking in their households. Men were proud to show the team the termite hill which produces a particular type of soil that is used to build their houses. Men also showed the team where bricks are manufactured and sold.

The non-human is an arid and harsh landscape. There were areas where the landscape has been ravaged by floods, and there were huge ravines in the middle of the roads. (Some had still not been fixed at the beginning of 2017). There is an eery feeling of severe devastation but the villagers don’t speak about it. Further inquiry might help unpack the silences around the wreckage from the floods. Is it possible that the everyday for women and men is so entangled with the 3D’s that were identified that this aspect of the non-human is not seen as separated from the human (both men and women in this case) and is therefore nothing to be remarked on? Is it perhaps because there is a feeling of helplessness and “no point in talking about it” or are these things that are not discussed in public but rather in private? Perhaps disruptions in the natural environment and the uncomfortable geography to which the women and men are connected are seen as “normal” and part of the everyday entanglements between the human and non-human?

2.3.3 Participatory mapping

The transect walk was then validated in a day-and-a-half working session, where a decisive map was drawn using participatory mapping techniques with a group of women and a group of men separately (Figure 4). The “map” was workshopped with ten women in the village who were identified by the team. Once again, the selection of women included young unemployed women, young female farmers, older female farmers, female teachers and women from local NGOs. The second session of participatory mapping was with men. As presented above, the team believed that men and women “see” village icons and spatial symbols differently and therefore believed that the mapping process was not complete unless the “eyes” of both men and women (gendered lens) were included. Strengths of the villagers were included in the assessment by asking questions such as who would or might assist with relief. Participants were not prompted in drawing during the first draft of the map as already been mentioned. However, once the map was drawn, they were then prompted with questions such as “If there is a natural disaster, who would you turn to?” or “Who did you turn to?” These questions were taken up again in the quantitative component of the study, but they were an essential part of the mapping process as well and participants were asked to identify all “systems” that operated (or were dysfunctional) in the village.

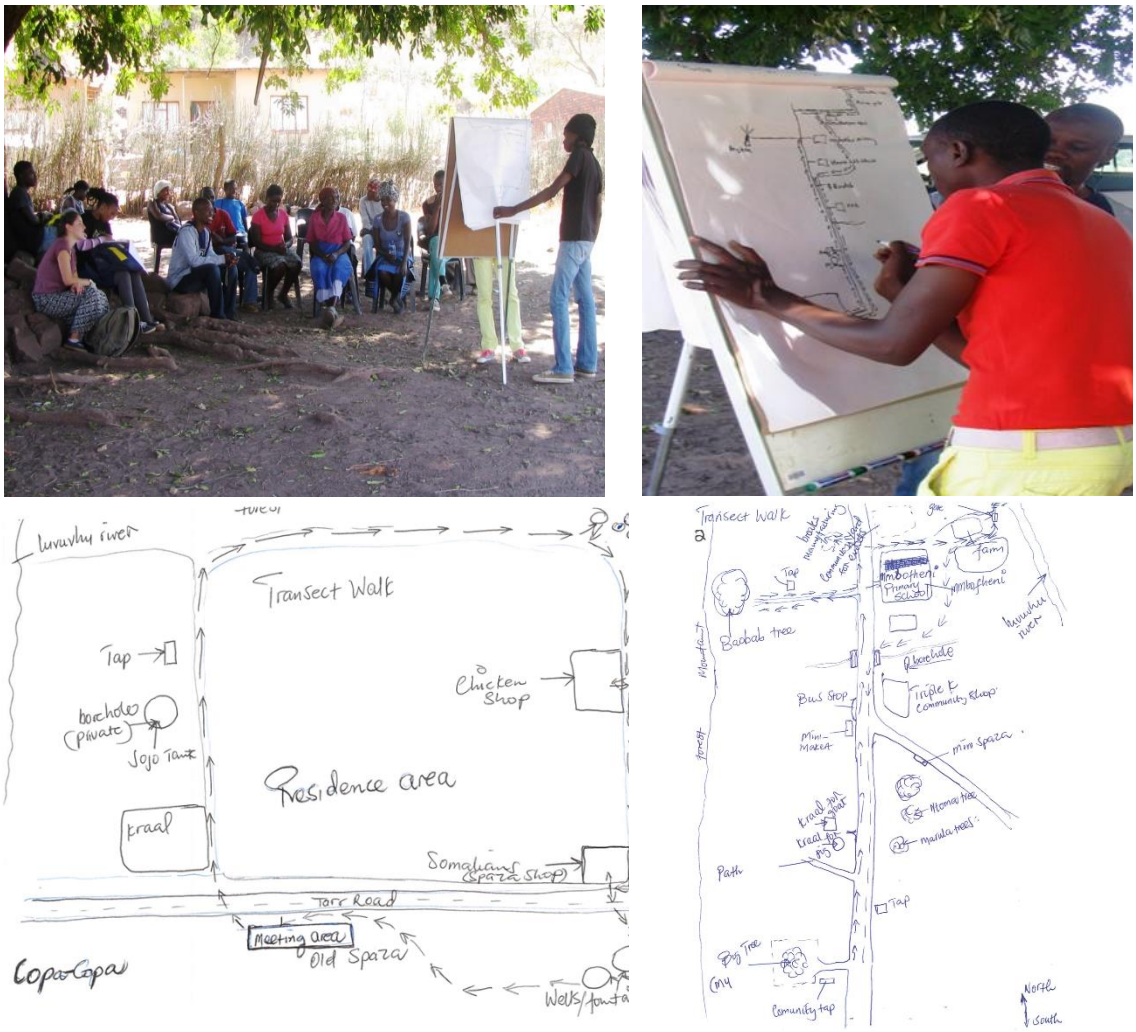


Figure 4 Mapping with the villagers and or farmers in Lambani

Answers that did not fit on the map were recorded as narrative texts. The participants were asked to mark on the map where the most “sensitive” parts of the landscape were, in relation to the four dimensions of climate change. Where they did not map water points, rivers and so forth, they were prompted to do so during the second phase of the mapping. To answer the research question on gender and decision-making around water, any informal or formal institutions that exist for water-related concerns were specifically identified. Women were asked about their experiences in decision-making within these structures to assess barriers that women experienced in decision-making around water concerns and the insecurities that they experienced around water. With respect to access, gender-differentiated access to the resource for domestic and productive uses (drinking water, multiple use systems and small water infrastructure) was also evaluated.

2.3.4 Emoticons

The word “emoticon” is constructed from the words “emotion” and “icon’, and refers to graphic representations of facial expressions (Skovholt *et al*., 2014). Emoticons can be

produced by symbols such as (:-)) or by pictograms which are graphic icons (*ibid*)[3]. Emoticons are commonly used in studies such as social media and computer-mediated business communication. In this study the team asked respondents to circle emoticons depicting their emotions and to expand on the way in which a given emoticon mirrored a given emotion (Figure 5). People may find it difficult to express themselves in words and as such find it easier to identify with a variety of emoticons. While initially recognising a number of emoticons, respondents were encouraged to select a single emoticon which best described their feelings[4].

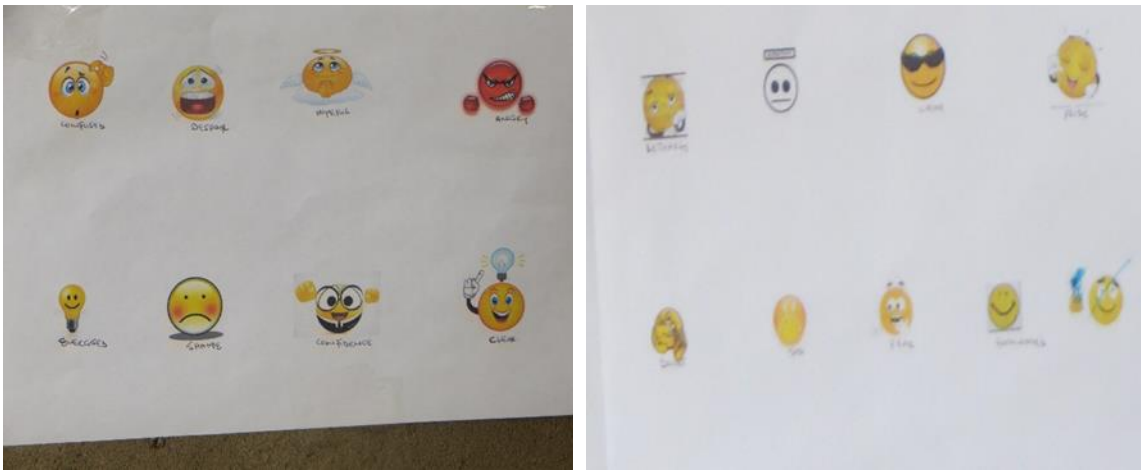


Figure 5 Some of the emoticons that were used in Lambani for emotional expressions

The team found the emoticon tool to be helpful when considering ways in which the human and non-human mesh and where, by encouraging women and men to identify feelings with the use of the icons of their choice, sameness and difference were seen side by side. A smiley face for instance, could mean the same thing to two people, or different things, and as such the transitory – and also engrained – way in which emotions trace lines in people's bodies and minds – engages with ideas of difference and offers a continuum of meaning rather than fixed points of meaning. In this study, emoticons were used as a participatory tool to flesh out the different ways in which climate change is experienced. A respondent might be frightened and identify with the "fear" emoticon, while at the same time, this affect (fear) becomes a moment of "becoming" and opportunity, as is discussed below, where, side by side with the fear emoticon, a phrase such as "*we adapt because that is what we do"* reverberates.

[3] According to Krohn (2004) cited in Skovholt *et al*. (2014), the emoticon was first used in written text in 1982 by computer scientist Scott E. Fahlman at Carnegie Mellon University in the United States.

[4] Emoticons have been used by Germaine Owen in her doctoral thesis to capture the public's emotions/feelings with regards to using reclaimed water for domestic applications. The thesis title is "Opportunity for implementing reclaimed water for domestic applications in South Africa: public perceptions and institutional engagement."

With the use of emoticons, work was aligned to the research by scholars in pedagogy that was identified above, namely Bozalek and Zembylas (2016), whose work draws attention to the way in which methodology itself challenges our impulse to organise the world. In line with critical pedagogy, which considers entangled realities rather than fixed spaces between researcher and researched, claims in the literature were adopted that there is an urgent need for women to express their own view on climate change and how they are affected by climatic traumas and, in turn, themselves influence these moments by their discursive engagement with climatic conditions on the ground. Alongside the idea of diffraction, it was noted that the process itself of identifying the emotions becomes entangled between the researcher and the respondent, as icons were selected and justified. Experiences that may have been obfuscated can bloom as a particular symbol was chosen over and above another, allowing experiential moments to be articulated, defended and shared.

The emoticon chart encouraged residents who were part of the study to consider their gamut of realities through icons and, in so doing, to bring personal experience vividly to the fore. Intense moments were mirrored through emotional states and, in the process, the experience of the particular individual was expressed via icons which were themselves in (e)motion, in lieu of static narrative. Communications between humans exist through disembodied symbols, which carry the voice of the individual further and as such take the human experience into the realm of symbol and becoming.[5]

2.3.5 Quantitative data: Questionnaires

A survey instrument was administered to validate findings from the qualitative data collected and to provide additional quantitative data to complete the vulnerability assessment (VA). The survey data was analysed using the software package STATA. The survey sample unit was 262 households, which was the sample size for the study. Ten (five girls and five boys) locally based young adults from the village of Lambani assisted with data collection and used the questionnaire to capture the data. The questionnaire was written in English but translated into Tshivenda by the interviewees (interpreters) during the interviews. The interviewers were trained prior to implementation so that they grasped well the meaning of words and the purpose of the study. They were trained after the pilot study to avoid interviewer bias and again after the first 10% of the questionnaires had been implemented.

Without the assistance and dedication of the interpreters it would have been very difficult to achieve the objectives of the study. All intrepreters assisted with the translation of the questionnaires during the interviews, assited in one-on-one discussions, in the meetings, in transect walks with the farmers and villagers, etc. All of the interpreters have completed their matric, but were unable to further their education at various tertiary institutions due to financial issues.

[5] Neither the transect walk nor the emoticon tool are standalones

3 DESCRIPTION OF STUDY SITE, RESEARCH UNITS AND COPING MECHANISMS

3.1 DESCRIPTION OF THE STUDY SITE

3.1.1 Introduction

Lambani is located about 60 km north of Thohoyandou and 13 km from the Punda Maria Gate (Kruger National Park), in the Limpopo Province, South Africa. Its geographical coordinates are 22° 43' 0" South, 30° 50' 0" East. The village is between a small stream (northern side) and the Luvuvho River (south). Lambani is a mountainous village that shares a border with the Kruger National Park. Its original name (with diacritics) is Ha-Lambani.

Thohoyandou is the administrative centre of Vhembe District Municipality and Thulamela Local Municipality. It is also known for being the former capital of the Bantustan of Venda. The town called Thohoyandou was built at Tshiluvhi, which was under Khosi vho Netshiluvhi. The Netshiluvhis were the first occupants of the area as far back as 1400 AD. They were forcefully removed from the area between 1960 and 1970 by the apartheid government. Thohoyandou was established in 1977 with the construction of P-east and P-west residential areas/locations as R293 town. It has a shopping centre and Venda government building.

After the democratic electons in 1994, the village was reintegrated into the new South Africa and the province was named Northern Province. Later, the province was re-named Limpopo. The province, initially, was sub-divided into six district municipalities, *viz.* Bohlabela, Capricorn, Vhembe, Sekhukhune, Mopani and Waterberg, before re-demarcation of the transboundary municipalities, which resulted in Limpopo having five districts, *viz*. Capricorn, Mopani, Greater Sekhukhune, Waterberg and Vhembe (Figure 6).

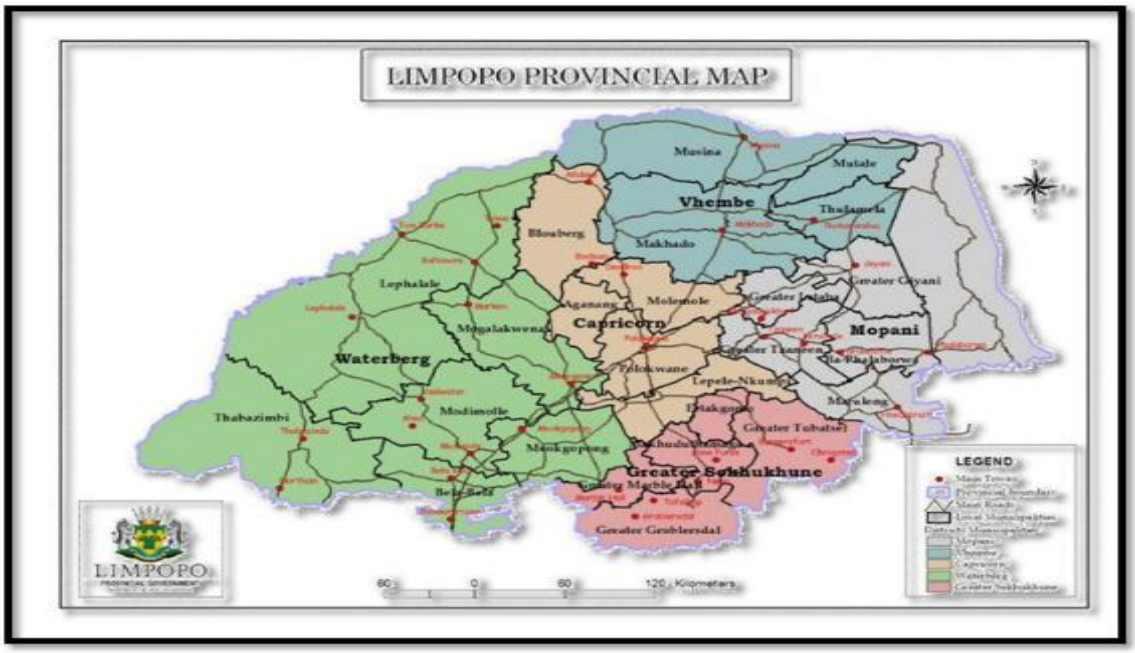


Figure 6 District municipalities in Limpopo Province (Ramugondo, 2014)

Lambani village is found in Vhembe District Municipality, which is sub-divided into four local municipalities, *viz*. Thulamela, Musina, Makhado and Mutale municipalities (Figure 7). Lambani is situated within the Thulamela Local Municipality of Vhembe District Municipality. The district links South Africa, the economic hub of Africa, to Zimbabwe and the rest of Africa, via the Beitbridge border. It plays a crucial role in the import and export of goods between the two countries of South Africa and Zimbabwe.

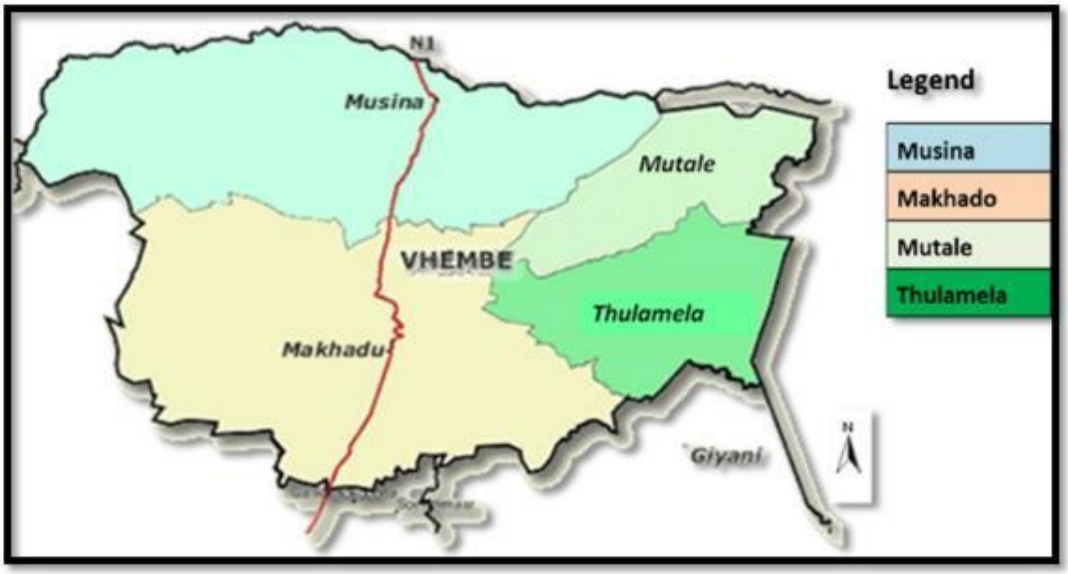


Figure 7 Vhembe District with four municipalities (Ramugondo, 2014)

Lambani is comprised of 19 sub-villages, *viz*. Mahagala, Vhufumba, Nzanwe, Madandila, Tshihothi, Tshamulavhu, Masetoni, Pfukoni, Lulonwe, Luembeni, Gondeni, Tshimbolimbo, Tshapapame, Tshitomola, Tshifendeni, Thondoni, Tswinganani, Satani and Maduluni (Figure 8). This study was conducted in four of the sub-villages: Ndzanwe, Mahagala, Vhufumba and Madandila.

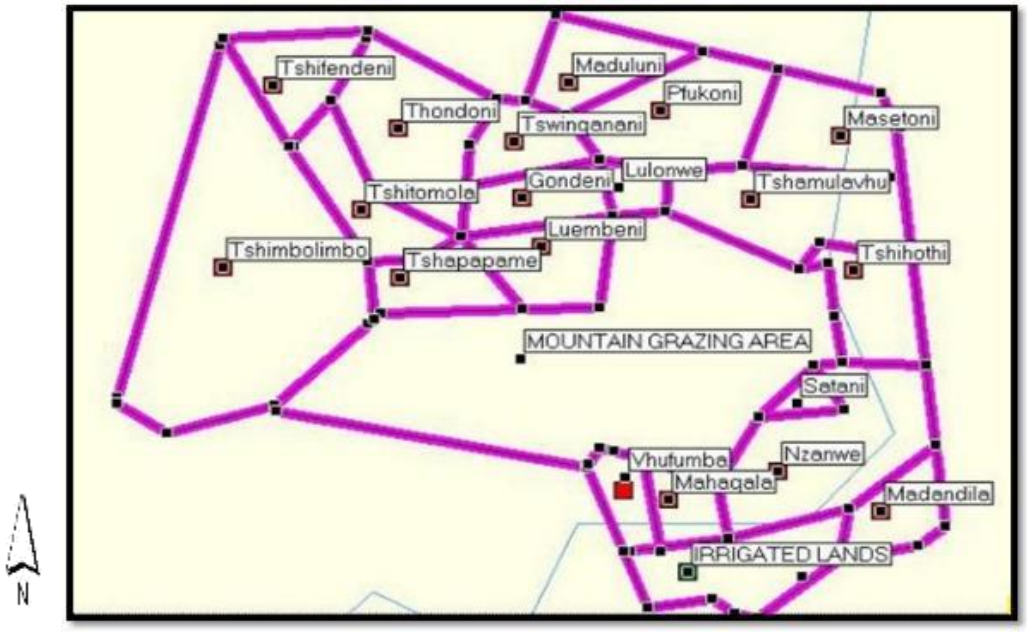


Figure 8 Sketch map of Lambani sub-villages (Ramugondo, 2014)

3.1.2 Natural resources

3.1.2.1 Climate

Long-term climate data of 44 years indicates that the study area is semi-arid, due to low annual rainfall and high evaporative demand. The climate data in Table 4 indicates that the area received 587 mm of rain with 1395 mm of evaporative demand, and summer rainfall coupled with high temperatures during the summer months. The aridity index of 0.42 is in agreement with the semi-arid conditions of the study area. The highest monthly average rainfall (115 mm) occurs in January while the lowest (6 mm) occurs in June and August. December, January and February are the warmest months with an average temperature of 27°C and July is the coldest month with an average temperature of 18°C. No frost occurs during the year.

Table 4 Long-term (1965-2009) monthly and annual climate data from the Punda Maria meteorological station (South African Weather Service data)

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Rain	115	108	65	28	17	6	9	6	24	34	80	96	587
T	27	27	26	24	27	19	19	21	23	25	26	27	24
Rs	23.02	21.53	19.79	17.29	14.91	13.27	13.67	17.49	17.95	21.84	22.13	23.06	225.94
U2	-	-	-	-	-	-	-	-	-	-	-	-	-
RH	-	-	-	-	-	-	-	-	-	-	-	-	-
Tx	32	32	31	30	28	25	25	27	30	31	32	32	30
Tn	21	21	20	18	15	13	12	14	16	18	20	21	17
RHx	-	-	-	-	-	-	-	-	-	-	-	-	-
RHn	-	-	-	-	-	-	-	-	-	-	-	-	-
Hu	484	385	401	360	311	250	244	293	350	355	334	439	4205
Cu	-711	-588	-629	-609	-517	-369	-339	-458	-568	-581	-511	-639	-6516
ETo	5.45	5.07	4.69	3.98	3.5	3.11	3.09	4.05	4.28	4.98	5.13	5.66	53
Evap	145	136	97	88	85	73	82	114	146	149	140	139	1395
AI	0.79	0.79	0.67	0.32	0.2	0.08	0.11	0.05	0.16	0.23	0.57	0.7	0.42

Rain	Average Total Rainfall	(mm)	Tn	Average Daily Minimum Temperature	(°C)
Evap	Evaporation [Class A pan]	(mm)	T	Average Hourly Temperature	(°C)
ETo	Average Total Evapotranspiration	(mm)	Rs	Average Total Radiation	(MJ m^{-2})
AI	Aridity Index		U2	Average Wind Speed	(m s^{-1})
RHx	Average Daily Maximum Relative Humidity	(%)	Hu	Heat units	ºC
RHn	Average Daily Minimum Relative Humidity	(%)	Cu	Cold units	ºC
RH	Average Relative Humidity	(%)			
Tx	Average Daily Maximum Temperature	(°C)			

Figure 9 presents the annual rainfall at the Punda Maria rainfall station between 1965 and 1993. The year with the lowest rainfall was 1965 when 190 mm was recorded and the year with the highest rainfall was 1977 when 1087 mm was recorded. It can also be observed that, over the 29 years, the annual rainfall starts at a minimum in 1965, increases to a maximum in 1977 and then decreases to the end of the period. Tropical cyclones that develop over the south-western Indian Ocean and in the Mozambique Channel can greatly affect the rainfall of the Limpopo Province as these systems can yield up to 500 mm rainfall per day (Anthes, 1982). The years 1972 and 1977 are examples of years when tropical cyclones affected the rainfall of this station. Tropical cyclones mainly occur between November and April and therefore a maximum of 437 mm recorded over the 29-year period for January can be attributed to the occurrence of this weather phenomenon.

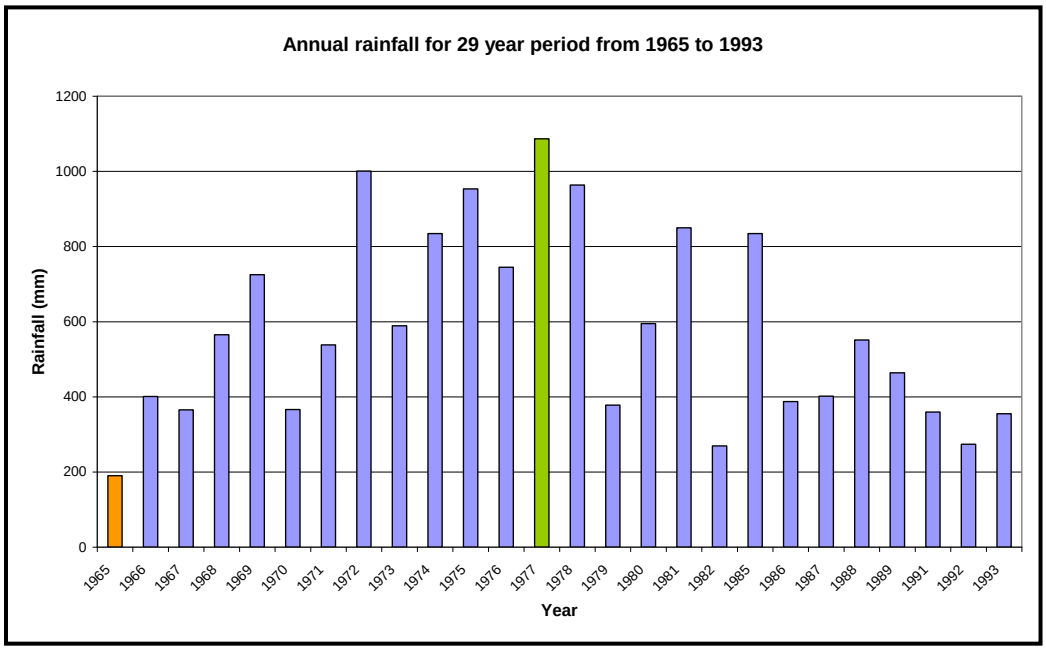


Figure 9 Annual rainfall for the Punda Maria rainfall station from 1965 to 1993

3.1.2.2 Soil

The general terrain morphology of the area can be classified as lowlands with mountains (Kruger, 1983). Generally, 90% of the slopes in the village are less than 2%. The terrain plays an important part in the distribution of the soils. According to Botha *et al*. (2014), the majority of soils on the crest morphological terrain unit are shallow while the ones occurring on the valley bottom morphological terrain unit are moderate to deep. The mainly shallow and stoney soils (Mispah form) occur mostly on the plateau of the study area. The plateau is used for communal grazing purposes. The soil depth varies between 160 and 2200 mm. The parent material of the soils is mainly derived from the sandstone, shale and basalt of the Fundudzi Formation (Botha *et al*., 2014).

The most dominant soil form in the valley bottom terrain morphological unit is the Hutton (Figure 10). These red, structureless soils, with clay contents of 10–20% in the topsoil and

20–30% in the sub-soil, are mostly used as croplands. Soil forms with similar characteristics, like Clovelly, Pinedene and Avalon, also occur in the valley bottom. These soils have similar properties: soil colour and clay content. The topsoil colour is dark yellowish-brown while the sub-soil is brownish-yellow. The clay content in the topsoil ranges between 8 and 15% while the sub-soil clay content is about 40%. The main difference between these three soil forms is the third diagnostic horizon. The Clovelly form has a non-diagnostic horizon while the Pindene and Avalon forms have unspecified material with signs of wetness and soft plinthic horizon, respectively. The latter diagnostic horizons have an implication for crop production, especially in the semi-arid areas, because of the potential for storing water for crop uptake. The Hutton soil form occupies the largest part of Lambani, followed by Clovelly and Avalon. The Hutton soil form occurs mostly within the villages and on the riverbanks in the northern direction of the river. In contrast, Avalon, Clovelly and Westleigh soil forms are found mostly in the southern direction and upstream, with few occurring within the villages (Botha *et al*., 2014).

Two similar duplex soil forms are also found; i.e. Swartland and Valsrivier. These are clearly typical duplex soils with sandy topsoil and very clayey sub-soil. The clay content in the topsoil is between 15 and 20%, and more than 40% in the sub-soil. The difference between these soil forms is that the third diagnostic horizon is saprolite and unconsolidated material without signs of wetness for Swartland and Valsrivier forms, respectively. The Oakleaf soil form, which is well drained, is also found. This Oakleaf form has a dark brown to dark yellow-brown colour and clay content ranging between 15 and 20% in the topsoil; and to up to more than 30% in the sub-soil (Botha *et al*., 2014).

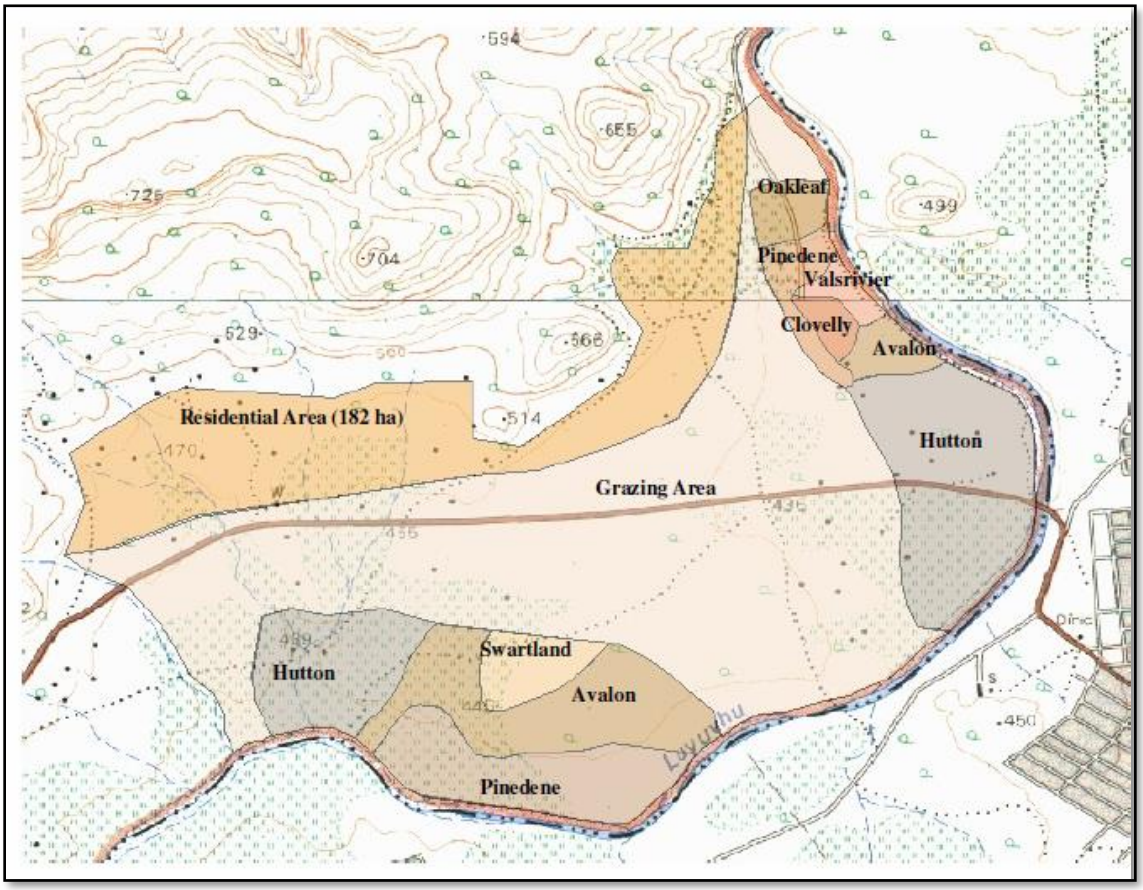


Figure 10 A soil map indicating dominant soils in Lambani (Botha *et al.,* 2014)

3.1.2.3 Water resources

Clean water is a very scarce resource in Lambani since no households have piped water in their houses. Even though there are both modern and old taps situated along the streets, 57% of survey respondents indicated that they have a community tap less than 200 m from their dwellings, while 33% indicated that they only have a tap more than 200 m from their dwellings. Many of the taps are broken or leaking and many are completely dysfunctional. Most of the taps are placed in insecure sites since even animals drink from the water that is leaking from those taps (Figure 11).

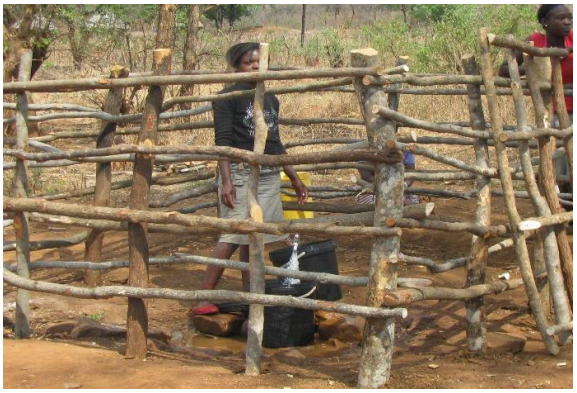


Figure 11 Protection of the taps from animals

Villagers thus struggle to get water and taps are often running dry for more than two weeks. Once water is available, long queues of villagers, especially women and children, are found around the watering points in the village. Women and children queue in large numbers so that they may be the first to receive water, some of which they will store for future use (Figure 12). Although most of the taps do not function properly, it was reported that “no one made an effort to fix them” and “not even the municipality.”

Figure 12 In Lambani the villagers wait in long queues to collect enough water for their households (top). Most of the taps are leaking or broken (bottom).

All the boreholes that were constructed by the previous regime of Venda are either broken or have dried up (Figure 13). Substantial repairs would be needed to get the boreholes to be operational again and this would depend, of course, on the availability of groundwater. Since 2009, the municipality has been trying without success to collect water from the Nandoni Dam in Thohoyandou, one of the biggest dams in the area, that runs parallel to the Levubu river. The last contractor (or company) that was hired to do the job, did install pipes from the dam to Lambani, but there were no water flows.


Figure 13 Unused and broken boreholes in Lambani

Only 3% of females and 8% of males indicated that they are very satisfied with the water facilities, while 30% of females and 42% of males indicated that they are not very satisfied with the water facilities. In terms of not being satisfied at all with their water facilities, 67% of females and 50% of males agreed with this statement. This is an indication that females are far less satisfied with the current water facilities compared to men. *One of the reasons might be that water collection is mainly the responsibility of females and children.*

3.2 DESCRIPTION OF RESEARCH UNITS

3.2.1 Introduction

The discussion below covers a description of the research units which formed part of the study within the village of Lambani. Data gathered from these different units played a crucial role in determing the gender-sensitive strategies within the village. The discussion is organised under the following categories: demographics, educational background, employment status, monthly income and expenditure.

3.2.2 Demographics

There are more women in Lambani than men. About 49% of the population are males and 51% are females, which reflects the national gender skew. The residents of Lambani are all Venda speaking even though their neighbouring village is Shangaan. Foreign nationals, for instance Pakistanis and Bangladeshis, are very few, estimated to be less than 1% of the population (Botha *et al*., 2014), and they are mainly spaza shop owners in the village. The majority of the household heads in Lambani are married and are living with their families (Figure 14). There are households who have met challenges in their lives and couples who decided to end their matrimonial relationships, and there are those who either lost their partners through death or who never got married. Household size differs from family to family; it ranges between one and ten (Figure 14), excluding grandchildren who are living with their grandparents because their parents are unable to look after them due to financial problems (Botha *et al*., 2014).

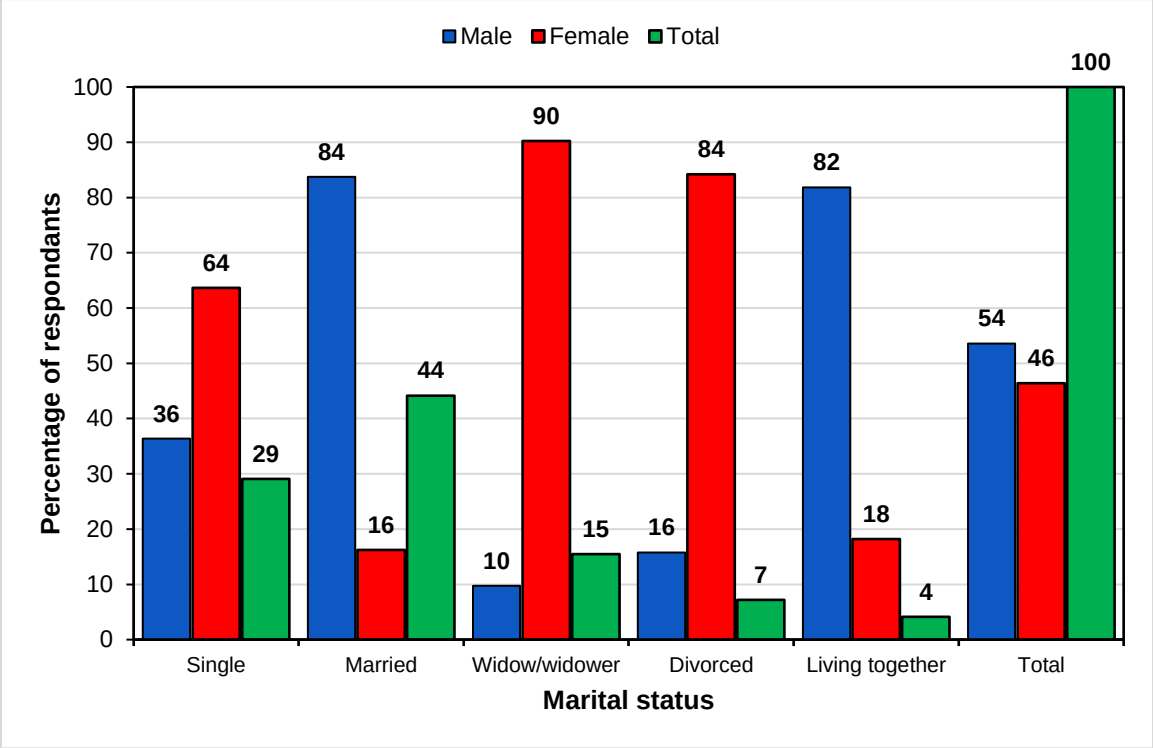


Figure 14 Marital status of household heads in Lambani

The national average household size is between 4 and 5 but our own data on Lambani shows that 55% of households have 1–3 members, 39% have 4–6 members, around 3% have 7–8 members and 3% have more than 8 members of the household (Figure 15). In many cases grandchildren are living with a grandparent or grandparents, since the parents have left for urban areas to search for employment.

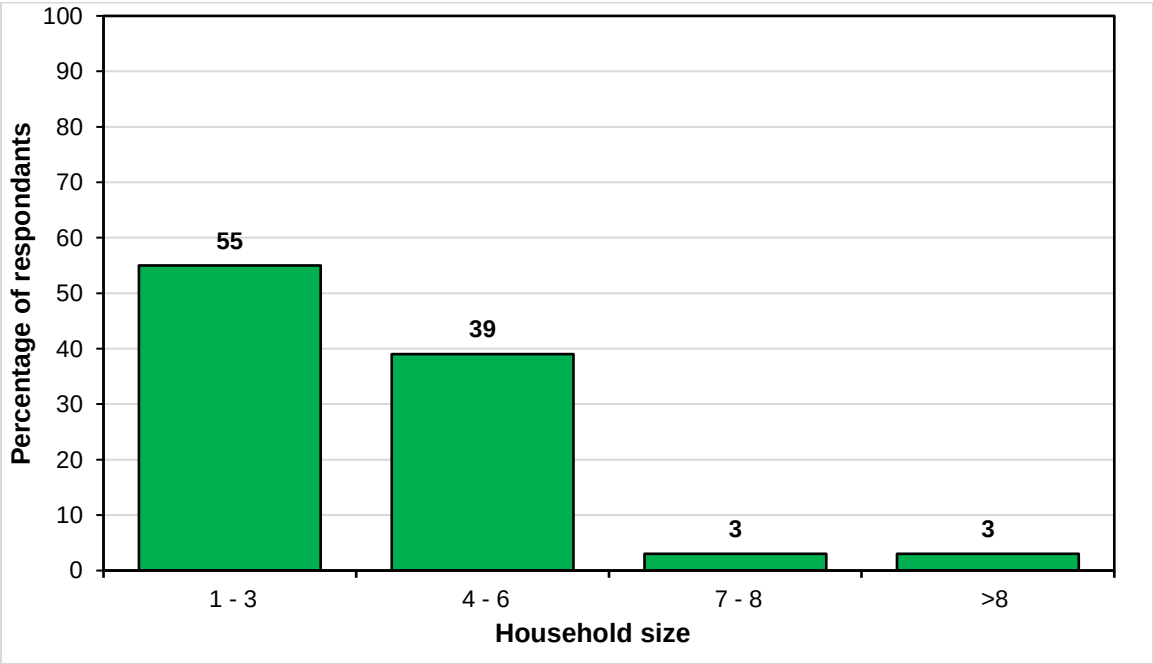


Figure 15 Size of households in Lambani

When one turns to the dependancy ratio, we find the following: There are 9% who have no dependants, 13% have 1 dependant, 31% have 2 dependants, 22% have 3 dependants, 12% have 4 dependants, 4% have 5 dependants, 2% have 6 dependants, 3% have 7 dependants, and 5% have 8 dependants (Figure 16). When considering the gender skew, there is some variation between male and female.

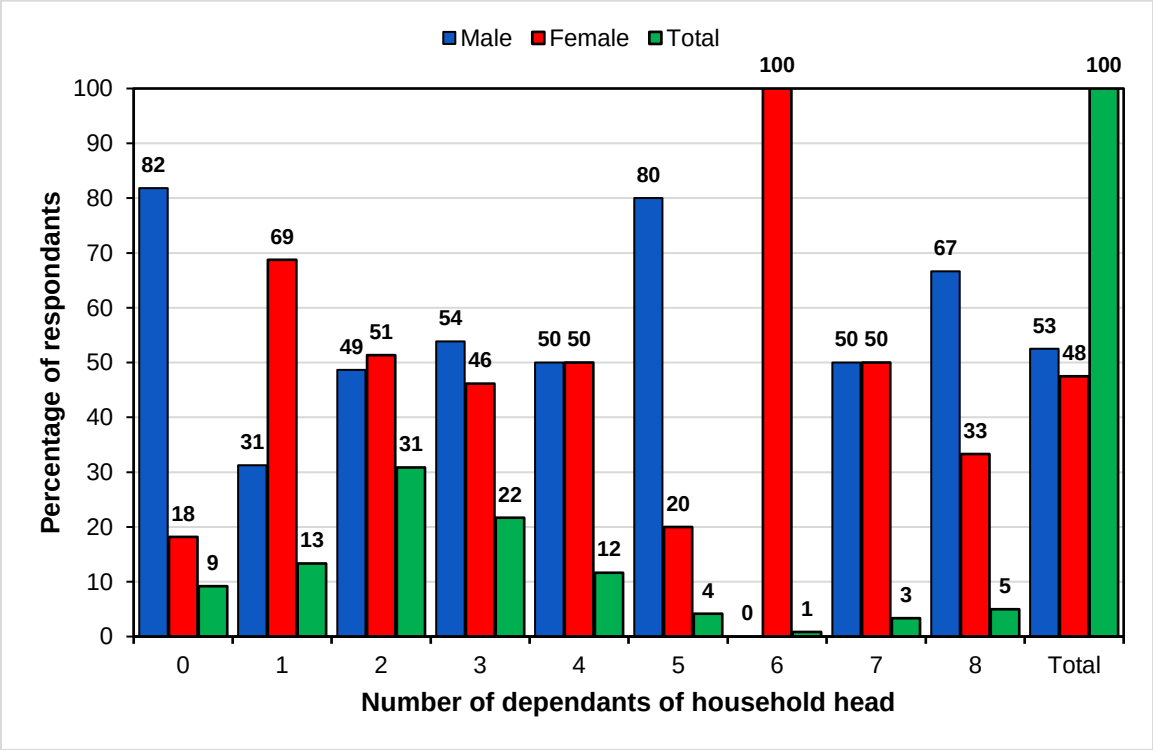


Figure 16 Number of dependents of household heads in Lambani

When looking at the age cohorts, we have 15% of the population between the ages of 21 and 30, 30% between the ages of 31 and 40, 25% are between the ages of 41 and 50 and 18% are between the ages of 51 and 60. Twelve percent are over the age of 61.

3.2.3 Educational background and food access

There are a number of pre-primary, primary and secondary schools in the village (Figure 17). Even though there are enough schools, quite a number of the youth did not complete their matric (Grade 12) due to financial constraints their families were facing and other related matters including laziness and not wanting to go to school. Those who completed matric are unable to further their studies due to lack of funding and or bursaries. According to Botha *et al*. (2004) almost 57% of the elderly never attended school and therefore have no formal education or training. Thirteen percent of the villagers never reached standard four (Grade 6), 25% completed between standard four (Grade 6) and matric (Grade 12) and a mere 5% have post-matric qualifications (Botha *et al*., 2014).

There is a clear gender dimension to school attendance, and anecdotal evidence from interviews indicates that the boy child is far less likely to attain matric level than the girl child because *"boys like to reject advice and rebel and this is part of cultural norms and pressure from other boys"* (interview: Lambani, August, 2014). Also "*there are more girls than boys in schools since many boys drop out or fail and drop back because of drugs and alchohol"* and "*boys often drop out if they don't do well ... girls are more persistent ... they listen to advices*" (interview: Lambani, August, 2014).

School attendance is also affected by extreme events such as droughts and floods. As the extract below indicates, the girl child seems to be more affected than the boy child;
"In terms of getting to school, it's difficult for everyone, but for those that cross the river by foot, girls tend to be more afraid and come (to school) less than boys."

Figure 17 A high school with a food garden (left), and a church that is used for pre-primary children during the week (right)

All schools in Lambani have access to a feeding scheme and they also have their own food gardens as a supplement to their feeding scheme. The purpose of the gardens is to ensure that children who do not have enough to eat at their homes can be provided with something to eat so that they can concentrate on their school work and not "bunk" school because of hunger. However, this is not always the case and the survey data reflects the food insecurity of households in Lambani. Responding to the question "Does your household always have sufficient food to eat?", only 46% of the respondents said that they sometimes have sufficient food to eat in their households for children, while only 3% of respondents say that yes, their household members (children) always have enough food to eat. Fifty-one percent say that they never have sufficient food to eat. When asked differently, whether there are children who go to bed hungry at night, only 3% say "yes, always" and 51% say "no, never." Broken down by gender, the following percentages are of interest. Fifty-seven percent of female-headed households say they have children or adults who always go to bed hungry, while only 43% of males say this is true (Figure 18). Forty eight percent of females say "yes, sometimes" and 46% say "no, never", while more males say "yes sometimes" (53%) and "no, never" (54%). Food insecurity affects children – and there is no doubt that it does impact on school performance. A child, even if "yes sometimes" goes to bed hungry is unlikely to be able to concentrate and perform at school.

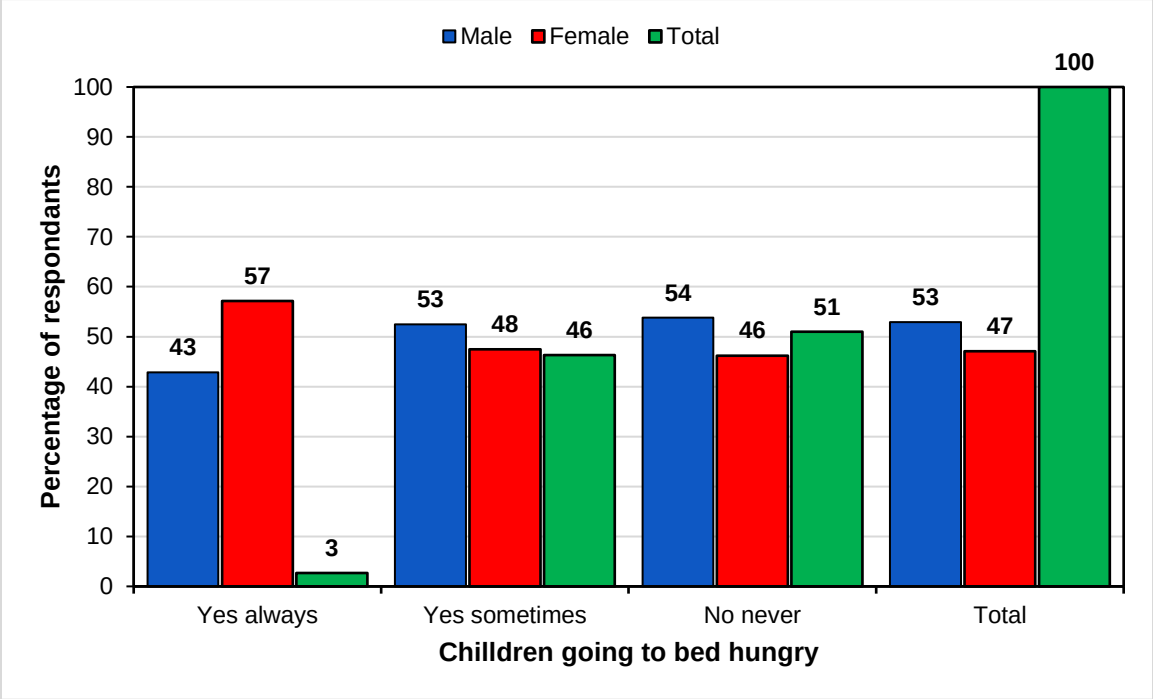


Figure 18 Food accessibility to children in Lambani

School attendance has also been affected by both hunger and poor access to water. Learners will go to school but as stated "*they will let us go and we won't do studies because we can't study when we are thirsty*." And again "*the problem was err [pause] the poverty and sometimes we would go to school without eating food. […] sometimes no water*." According to school heads in the village, the number of learners that came to school hungry has decreased drastically since they initiated feeding schemes at the schools. The initiative was the idea of the Vuvumtshena Secondary School princpal after she reaslised the poor concentration of scholars and serious attrition rates. The principal then called a meeting with all school principals who then reached a consensus that they would have to establish feeding schemes at their schools. Today parents, teachers, government and principals are involved in the feeding schemes.

There are also adults that go to bed hungry. Of the 2% of adults who always go to bed hungry, 60% are female and 40% are male. Of the 51% of adults who sometimes go to bed hungry, 46% are female and 54% are male. Then there are those who never go to bed hungry (47%) and of this segment 46% are female and 53% are men. This graph shows that there are more women than men who go to bed hungry all the time (Figure 19).

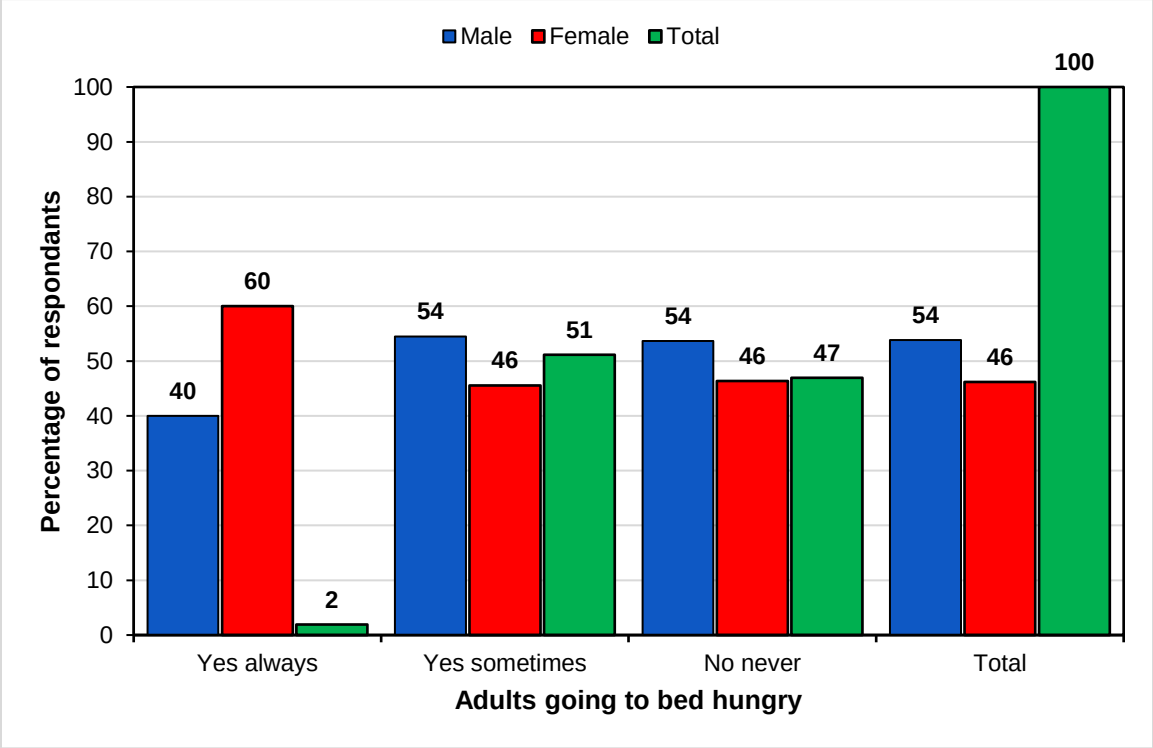


Figure 19 Food accessibility to adults in Lambani

3.2.4 (Un)employment, monthly income and expenditure

Unemployment is the main constraining factor in Lambani because most of the youth, household heads and senior citizens (those who are still able to work) are unemployed. Those who are working have mainly left for greener pastures in other places such as Malamulele, Thohoyandou, Polokwane, Johannesburg or Pretoria, and they hardly return to Lambani. There are very few job opportunities within the village. Initially, 262 household heads were interviewed, of which 179 are unemployed (Figure 20). Of the 179 household heads that are unemployed, most are women. It is unsuprising that the number of household heads aged 11–20 or 61 and above that are working is low, because they are either too young or too old to form part of the workforce. What is alarming is that most of the unemployed fall within the catergory of 31–40 and 41–50 years old, age groups which are eligible to work – but are not working. Between the ages of 21–30 there are more men unemployed than women. This might well correlate with the fact that young men did not complete their schooling and therefore their chance of finding work is poor.

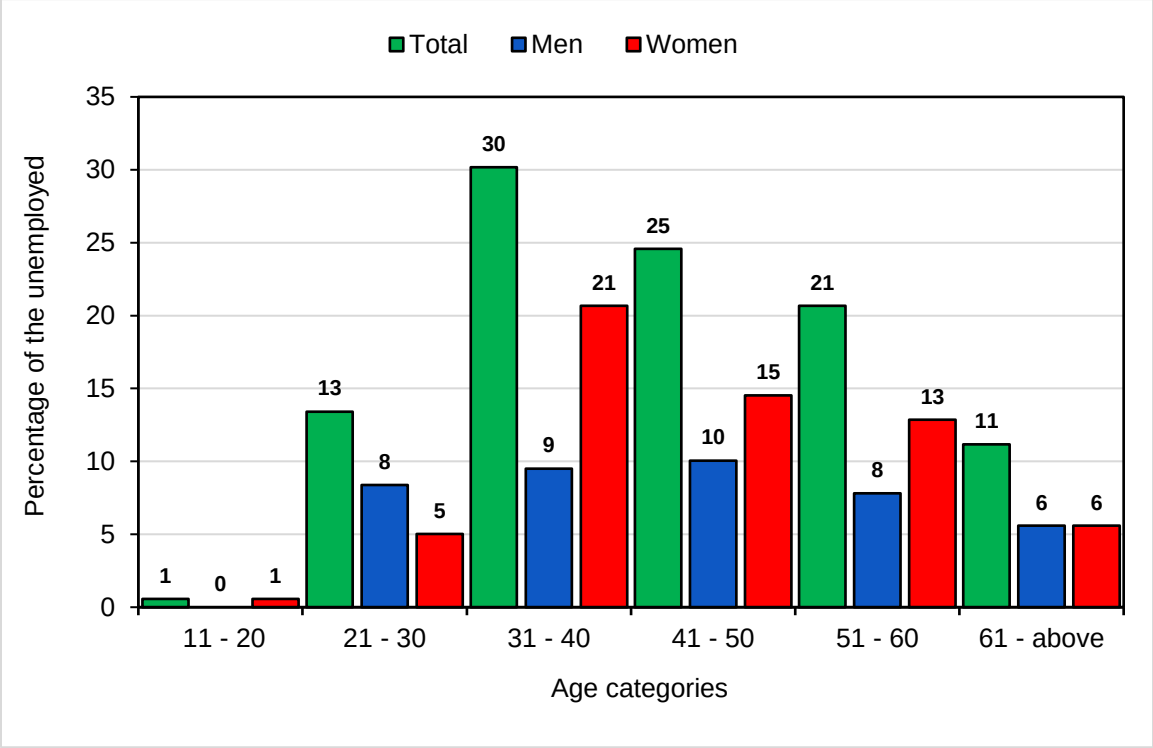


Figure 20 Unemployment status of household heads as per gender

The statistics indicate that women are less likely to be employed. Despite the high unemployment rates, women are expected to feed, clothe, protect and provide shelter for household members when the men go out to search for employment in the village or in other urban areas. Women need to develop coping strategies to respond to challenges posed to them in their everyday living which today is further aggravated by climate-related impacts.

Experiences of unemployment are different in urban areas because, in the ideal, in rural areas villagers are able to bring in a meagre cash flow through the sale of their vegetables in their village or in nearby market places. However, in reality, villagers are hindered because of lack of funds to buy seeds and fertilisers, lack of rainfall and the impact of drought. Running water is very scarce within the village and the taps run dry for long periods. It is very difficult for villlagers to find ways to survive.

Unemployment cannot be de-linked from expenditure. As per the graph below, 71% of females and 49% of males earn between 1 and 1500 rand per month as their monthly household income, 15% of females and 33% of males earn between 1501 and 2500 rand per month and only 7 percent of both males and females earn 7%. According to anecdotal evidence from the qualitative component of our study, those who earn more than R7000 are children of the respondents who are working outside the village and only come home after a month or two. About 54% of the households spend between R1 and R450 of their total monthly income on groceries, which illustrates that just 46% of households spend more than R450 of their total monthly income on groceries (Botha *et al*., 2014) while almost half spends less than R450 per month on groceries.

Sixty percent of the population receive less than R1500 per month as their monthly household income. Of this 60%, 59% are female and 41% are male. Of the 24% of the population who receive between R1501 and R2500 per month, 32% are female and 68% are male. Seven percent of the population earn between R2501 and R3500 and, of these, 50% are female and 50% are male. There is a small percentage (4%) of the total population who receive an income between R3501 and R5500, and of these, 22% are female and 78% are male. Only 3% of the population earn between R5501 and R7000 and here this is evenly spread between male and female. A small percentage of 2 percent earn more than R7000; there are more males (60%) than females (40%) in this category (Figure 21).

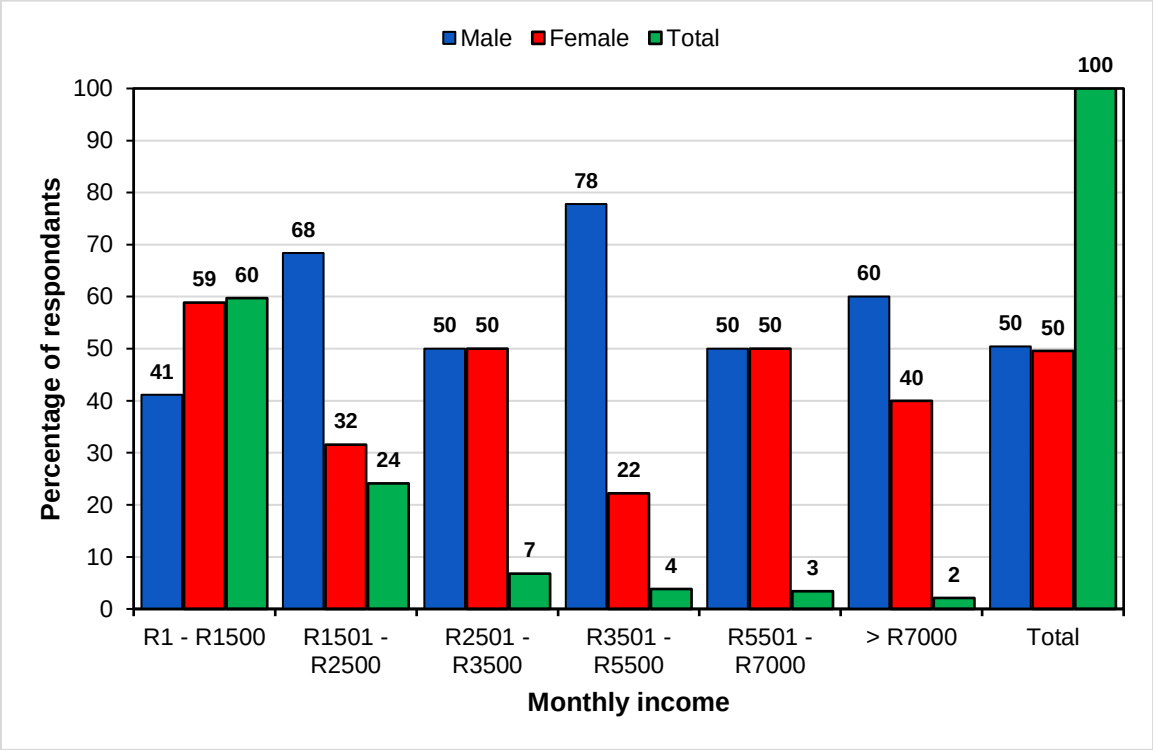


Figure 21 Monthly income of household heads (males and females) in Lambani

Anecdotal evidence confirms that households depend on their backyards (where they have planted vegetables) as well as on their neighbours for food, especially during the winter months.

3.2.5 Infrastructure and facilities

Village meetings and other community gatherings take place at either the Chief's kraal, where there is a community hall, or otherwise under a big tree on the Headman's property (Figure 22). No village hall has been built for the villagers, even though the villagers have requested one from both government and tribal council. During the rainy season, or when it is either very cold or too hot, villagers are unable to attend any meetings because there is no shelter for them.

Figure 22 Meetings taking place at the Chief's kraal (left) and under the big tree (right) in Lambani

Poor recreational and sports facilities make it difficult for the village children to unleash their potential talents, especially in the sports domain. There are no proper sports facilities in the village except for the dusty and depleted soccer fields around the village. Even the schools in Lambani do not have sports facilities. The soccer fields neither have goal post nets nor lines marked on the ground which would show where the field starts and ends. Lines are drawn in an ad hoc way when a game is underway by using a pick. The field's corners are marked with stones or bricks. Adherence to a sport club is usually quite high in South Africa and national statistics show that sports affiliation comes second after church belonging; however, in Lambani, affiliation is very low with only 8% of females who belong to a sports association and 17% of males who do. These statistics also impact on social capital as networks and affiliations are forged during sports events and sports is a known "glue" that binds social groups together.

3.2.6 Access to basic services

Basic services for the villagers are not being supplied as promised by government. Within the village there are no reconstruction and development programme (RDP) houses, as government has promised. Villagers and farmers build their own houses using mud bricks or concrete bricks and cement (Figure 23). Even though there is a variety of dwellings, the majority of the villagers are still staying in old traditional houses (rondavels). The reason behind this is financial constraints even though villagers aspire to a "decent" home. According to the villagers, no one has ever informed them that they can apply for RDP houses if they so wish. Even those who would most likely qualify for these houses have never heard of this opportunity.

Figure 23 Types of houses villagers and farmers are staying in, in Lambani

Proper access to good sanitation is supposed to be one of the basic services that government supplies to the people. In Lambani, there are no sewerage facilities. Villagers use pit latrines that they have built themselves without the assistance of the government (Figure 24). Poor sanitation has an impact on health on the one hand but also (as the work of Goldin, 2010, has shown) on feelings of pride and dignity.

Figure 24 Types of self-made toilets in Lambani

The socio-economic status of the village is impacted on negatively, not only from water insecurity but by many other issues such as bad roads, poverty, poor access to health facilities, physical insecurity, poor nutrition, floods, etc. The main road that passes next to Lambani is tarred, but within the village there are only gravel roads; even the short cut to Musina is gravel (Figure 25). The roads are very dusty and poorly maintained. There are huge potholes and these have become much worse since the 2012 floods. Villagers rely on buses and taxis that transport them to either Thohoyandou, Malamulele or other

surrounding villages. Taxis are available at all times but buses are only available every 1½ hours, from 5h00 to 19h00. Those who cannot afford to pay for a taxi or bus, hitchhike. Transport has relevance to social capital, because a lack of good transport means that people battle to get to meeting points and are less likely to engage in social events that are outside their immediate borders.

Figure 25 Some of the roads of Lambani (top) and inaccessible roads during rainy seasons (bottom)

At all times transport on the roads is problematic. During the rainy seasons it becomes extremely difficult to access the deep rural areas of Lambani, especially those areas behind the mountains. Those who need to access doctors, catch taxis or visit their relatives in other areas have to make some plan to get access to the main road. Some buses try to enter Lambani to reach those deep rural areas but they run intermittently.

Health is also a very crucial and important aspect in the lives of people. There is only one small clinic that was built with the request of Chief Lambani. Other wards or sub-villages in Lambani are serviced with mobile clinics which are available one week a month from 09h00 to 13h00 on selected days - Monday and Thursday (Figure 26). During the weekends and after hours, the villagers have difficulty in accessing health facilities, and ambulances and doctors are out of range. Those who visit the clinic are mainly children suffering from malnutrition and children's diseases, and the elderly who suffer from high blood pressure, heart problems, strokes, etc. As the mobile clinics assist only with the basic needs of the patients, a host of people who are in need of more specialised medical care are not catered for. Those who need to see a doctor are sent to either Mhinga Local Clinic, Malamulele Hospital or Thohoyandou Hospital for further medical observation and/or treatment, at least 15 kilometres away on a bad road.

Figure 26 Consultation, and villagers queuing outside the mobile clinics in Lambani

One further problem is that the mobile clinics do not provide a space where patients can consult in privacy; those queuing right next to the open door for their turn to be attended to, can hear everything that is being discussed between the nurse and a patient. This lack of privacy also impacts on patients who feel shame, lack of dignity and other negative emotions. As a health facility is considered to be of prime importance, villagers have bought bricks, doors, windows and other material out of their own savings to build a clinic that will be easily accessible to everyone within the village, as an additional clinic to the only one that is available in the village. The municipality and provincial government were informed about the villagers' contribution, but nothing has materialised for over four years since they started with the plan. Even though no proper plans for a building were drawn up, what was important was that the villagers felt that there should be some assistance from government since they (the villagers) had already contributed their own resources (time and financial) to get the building off the ground.

Electricity is a necessity for everyone and the villagers of Lambani believe that they deserve to have access to electricity and that this is part and parcel of their right to a dignified life. More than 90% of the households are electrified and the municipality is continuing with the project of electrifying all the households. Coupons for electricity can be bought either in town or from vendors within the village. Due to the high rate of unemployment, most of the households use electricity for lighting purposes only while some do not use it at all since they do not have money to buy coupons (Figure 27). Some rely either on solar energy systems and/or firewood as their energy source (Figure 27). Firewood is easily accessible because Lambani is a mountainous area with plenty of trees and shrubs that can be used to make fire. There is a threat to the long-term sustainability of the environment because of the overuse of wood. Unsurprisingly, it is the women who labour to collect the firewood, sometimes carrying large burdens on their heads.

Figure 27 Energy sources in Lambani village

Given these living conditions, respondents were asked whether or not they were satisfied with their lives. When asked whether they were very satisfied, not very satisfied or not satisfied at all, 63% responded that they were not satisfied at all with the health and water facilities in their village, 35% said they were not very satisfied and only 2% said that yes, they were very satisfied (survery data, August, 2014).

3.2.7 Access to information and communication facilities

It is very difficult for Lambani villagers to access, receive and send information from and to the outside world. Their access to various resources, such as media, telephones, cell phones, etc. is very poor. They do not get first-hand exposure to current affairs via television but only though their community radios; as for television, very few villagers or households have satellite dishes (DSTV) in their houses (Figure 28). Due to a poor signal, aerials, for those who do not have satellite dishes, have to be raised very high to be able to receive clear and good pictures. Most households (not all) own a cell phone but they experience signal problems. The reception is worst for those staying deeper or closer to the mountains. Those who do not have electricity use mainly solar panels to either charge their cellphones or for televisions. There are no public phones available in the villages since they were broken and destroyed by vandalism.

Figure 28 Access to information via television, and solar panels used to charge cellphones

3.2.8 Reflections on the research units

It is impossible to isolate the units or categories that we have discussed above and it is also difficult to decipher the effect of climate change on these particular categories. Women are expected to perform most of the chores in the household, especially in this deep rural area. These duties include cooking, taking care of the children, cleaning the house, collecting water for different purposes, etc. They are also expected to perform supplementary tasks such as looking after livestock (provided the family have).

The level of education that every individual has access to helps them to make sound decisions when they are faced by different challenges including challenges around climate change. Access to food and other essential needs is also very crucial as it is difficult for a child to concentrate in class with an empty stomach and it is difficult for a mother (or father) to feel comfortable with their lives if their children (or themselves) are going to bed hungry at night. Access to food is very important before, during and after disaster. Food can be difficult to access for the unemployed who have meagre cash flows.

A lack of basic services impacts negatively on men and women in their everyday lives and more particularly at times of disaster. Housing, for instance, becames a crucial aspect because it is proven that women are are most affected when they lose their dwelling due to a natural disaster. Most dwellings were destroyed durng the recent floods in the village and what roads did exist were badly damaged. Women were faced with the burden of making sure that they provide alternative accomodation for their children and themselves. Furthermore, since there not enough clinics in the village, it is extremely difficult for the women to care for their sick.

It is essential when scrutinising climate change impacts – in particular the gendered nature of climate change impacts – to consider demographics and other socio-economic phenomena as discussed in section three above. We must also note that cultural traditional norms and values place the burden on women to supply food and care for their

household members and these cultural attributes make the everyday lives of women difficult and lives of women facing climate change even more so.

3.3 WATER SECURITY

Information on water security is based mainly on qualitative data. The water security of the villages is affected negatively by the lack of piped water and poor service delivery, but also by adverse climatic conditions such as drought and floods.

The folowing anecdotal evidence confirms water insecurity in Lambani. For instance, a shortage of water is experienced "*Most of the times we have about 3 to 6 month since December 2013 we have not being receiving water from the community tap. Sometimes we wait and still not getting the water at the end of the day"* (interview: Lambani, August, 2014).

And again:

"I experience problems – especially the shortage of water in the house. On that period our taps and water well were dry" (interview: Lambani, August, 2014).

"Yes, we have a water supply system. I think the water people controls the water that supplies the community taps, because they switch our water on and off, without consulting us as a community. I think the Department of Water knows who is doing that...".

"I think the problem that we are normally facing from collecting water are that the community taps always have issues of shortage of water and some of the taps are leaking. The community taps are always crowded, sometimes taps are broken...".

There is also a gender dimension to water insecurity which confirms that women are affected more than men during water insecurity situations and times:
"I think the women are having the challenge. Like now, if we don't have water, womens are going to fetch water from rivers or from other places far from our village" (interview: Lambani, August, 2014).

The collection of water is time consuming, while the purification of water is not only time consuming but also has financial implications. Survey information, from August 2014, reported that 39% of the sample indicated that water was collected once to twice a day, while the same percentage indicated that it was collected as much as three to four times a day. Eighteen percent of the respondents indicated that it was collected as much as five to six times a day. The water also needs to be purified but this has financial implications and despite the quality of the water being poor, 64% of respondents said that they never purify water. Water quality is of particular concern in Lambani as the extracts from semi-structured, face-to-face interviews during August, 2014, reflect:

"I do purify water sometimes, but it takes my time to do something else. I boiled water, or I sometimes put bleach (JIK) in the water but I am not sure about right measurements for example in one container of 25 litre I put 1 cap filled with bleach…"

"We did not know how to treat the water from the well and there was no money to buy mishonga (chemicals) to treat it. I do not know how to purify water".

During the floods the issue of water quality was particularly a challenge:

"It was painful to me, especially after the flood, because there were no place to report the matter of water quality, I thought of reporting to Water Affairs, but it does not help, we always report to extension officer or to the Water Affairs but they take time to fix the taps and pipelines".

Another challenge around water is that people regard the purchasing of water as a solution to water supply (and quality) costly:

"I buy water from private boreholes or the shop Triple K and it is very expensive". "I spent R2 for each 20 litre or 25 litres from the shop, and for our house we spend R8 per day."

During droughts people have different coping strategies as indicated from the following anecdotal evidence:

"*I think our coping strategy during drought was buying water from the private boreholes and to do other activities like laundry and bathing in the river.....".*

"During the flood we harvest water from rain, we also boil it....."

"I was doing my laundry and bathing in the river all the time to save energy and time collecting water, because the wells were dried up....".

"It is not easy to cope without water. Our coping strategy was to use water in streams....". "During droughts I used the water from the school. I think that is my coping strategy.....".

The information above confirms the water insecurity people face in Lambani and indicates water stress due to the lack of piped water, poor service delivery, adverse climatic conditions such as drought and floods and poor water quality. Water stress impacts negatively on people's time and finances and women are the most affected.

3.4 CLIMATE CHANGE: CHALLENGES AND EXPERIENCES

Adverse climatic conditions such as drought and floods impact on infrastructure such as on roads and transport and on general human well-being – for instance nutrition, education, water security and social capital. The climate is not stable and 87% (females: 84%; males: 90%) of respondents, feel that "*things are changing around here because of climate change*" and that this has an impact on health and human well-being. As reflected in the following extract, adverse climate conditions impact negatively on people's lives:

"during the floods, they have a lot of problems, the livestock, the homes, the roads and the diseases of which malaria and cholera are worst after the floods; so much water...".

With regard to experiences of extreme cold and heat, villagers say that it is worse to feel very cold because they do not have enough clothing, but that they can cope better with extreme heat. They are just uncomfortable when it is hot but it is much better for them than being too cold.[6]

[6] Much of the additional information on climate change, and villager's feelings about this phenomenon, is captured in Chapter 7 on aspirations and emotion.

Learners face particular problems during extreme cold and extreme heat, as well as during times of floods and droughts.

"*We could not go to school for one month because the road was damaged*" although some of the learners interviewed said that it was for "*as long as three to four months that they could not go to school*" or "*for three to four months livestock died, huts broke and a bridge collapsed*."

The learners reported that "*it was was hard to get everyone back to school,.... local authority had to tell people to come back"* and "*it was hard to catch up on the time lost"*.

Some of the extracts reflect hazards that face learners during floods and droughts and during conditions of extreme cold or extreme heat. When the learners were asked how they felt during these times they responded:

"terrible because our mud house cracks." Or "*the rain was very heavy. Like it ... the rain would fall from 6 in the morning to 6 at night .... we couldn't carry out daily life"*.

Figure 29 Destroyed houses and roads during the floods in Lambani

The following extract reflects the gender dimension:

"Some of these women they are at school; when they are back from school, they go to fetch water and you can see this is too hard; they don't have time."

This could be a challenge for their studies, in particular for doing homework after school. Here the effects of extreme cold on school attendance are expressed:
"Not go to school in extreme cold because of crossing the river water: too cold ... and it is dangerous".

"Sometimes they come later because much colder early in the morning, students cope better in extreme heat than in the cold, because this is not a clothes issue. However, there is a concentration issue because it is uncomfortable".

School attendance during the floods was at times dangerous and during the floods a child drowned, poignantly expressed here:

"*we were scared because houses were flooded and we were hopeless because the one child drowned while going to school*."

The results above clearly indicated that adverse climatic conditions as a result of climate change such as droughts, floods, cold and heat impact negatively not only on roads, transport, poor nutrition and water security but also on education and other aspects of quality of life.

3.4.1 Coping strategies

Fifty-three percent of the male population are doing well whereas 28% of the male population are not doing well at all and 19% don't know. Of the 53% of male respondents who are doing well, 22% are aged 21–30, 25% are aged 31–40, 22% are aged 41–50, 16% are aged over 51 and 14% are above 60. When one turns to the females, irrespective of age, only 39% are doing well compared to the 53% of males, 49% are not coping at all and 12% don't know. We see from this that females are coping a lot less than males. The differences are significant. Of the 39% of females that are doing well, only 2% are between 11 and 20 years old and 6% between 21 and 30 years old, whereas in the age bracket between 31 and 40, 25% of females are doing well. Between 41 and 50 there are 16% of females doing well. Only 8% between the ages of 41 and 50 are doing well, while of those aged over 60, 15% are coping well. Between the ages of 21 and 30, there are 11% of males not coping well, between the ages of 31 and 40 there are 34% not coping well. Twenty-four percent aren't coping well between the ages of 41 and 50 and between the ages of 51 and 60 there are 18% not coping well. Over and above 60, there are 13% not coping. When one compares the "non-coping" population of men with the female cohort, in the age group 21–30, 10% are not coping at all. Between 31 and 40, 42% are not coping well. Between 41 and 50 there are 15% and between 51 and 60, 24%. Over and above 60, there are 8% not coping well. Not coping seems to be very similar between men and women except for the age group 31–40 which is quite different with women coping less than men. Above 40, the men seem to be coping less well than the women.

We asked the question whether the community are coping well and whether “you yourself” are coping well. The following holds true: Fifty-nine percent of the males say that the community are coping well and 41% say they don’t cope. On the other hand, 45% say yes and 55% say no.

When asked whether there are particular challenges for women that are different from the challenges for men, 44% of males say yes and 56% say no. And among the female segment of the population, 59% of females say yes while 41% say no.

When asked whether being married or single makes any difference, irrespective of gender, 18% say yes, it makes a difference, and 82% say that it does not make a difference. Of those who are single, irrespective of gender, 13% say yes and 87% say no. Of those who are married, 19% say yes and 81% say no. There is no real difference between the responses from married or single people.

3.5 CLIMATE CHANGE PREDICTIONS

The climate is changing on a global scale because of global warming (IPCC, 2007). Across the world, climate change has resulted in rising temperatures (Lugina *et al.,* 2005) and is associated with changes in atmospheric circulation patterns (Engelbrecht *et al.,* 2012) and higher climate variability. South Africa relies on rainfed agriculture and is vulnerable to the impacts of rainfall variability (Vogel & O'Brien, 2003). It is also accepted that any potential climate change will not only have an influence on mean climate but also alter climatic variability significantly, which implies a change in the frequency of extreme events (Engelbrecht *et al*., 2012).

Weepener *et al.* (2014) conducted a study which analysed high-resolution simulations of the present day and future climate over South Africa, with the emphasis on identifying the impact of future climate change on climate zones and crop suitability. Their study relied on detailed projections of a regional climate model. Their projections were obtained through the dynamic downscaling of six different Coupled Global Climate Model (CGCM) projections of future climate change to high resolution over southern Africa.

Weepener *et al.* (2014) summarised the daily data into monthly rainfall totals, monthly average maximum temperatures and monthly average minimum temperatures. The monthly data was in turn averaged over 30-year periods, centred around the following years: 1970, 1985, 2000, 2015, 2030, 2045, 2060, 2075 and 2090. For example, the average rainfall for January 2015 would be the average of rainfall in January from January 2001 to January 2030. According to Weepener *et al.* (2014) Figure 30, Figure 31 and Figure 32 illustrate the climate change to be expected for rainfall, maximum temperature and minimum temperature, respectively, expressed as the medians of the six climate projections. The Lambani area is indicated with a red circle on the maps.

Figure 30 indicates that rainfall is expected to decrease over time. Figure 31 indicates that the average maximum temperatures are expected to increase over time. Figure 32 indicates that the average minimum temperatures are expected to increase over time.

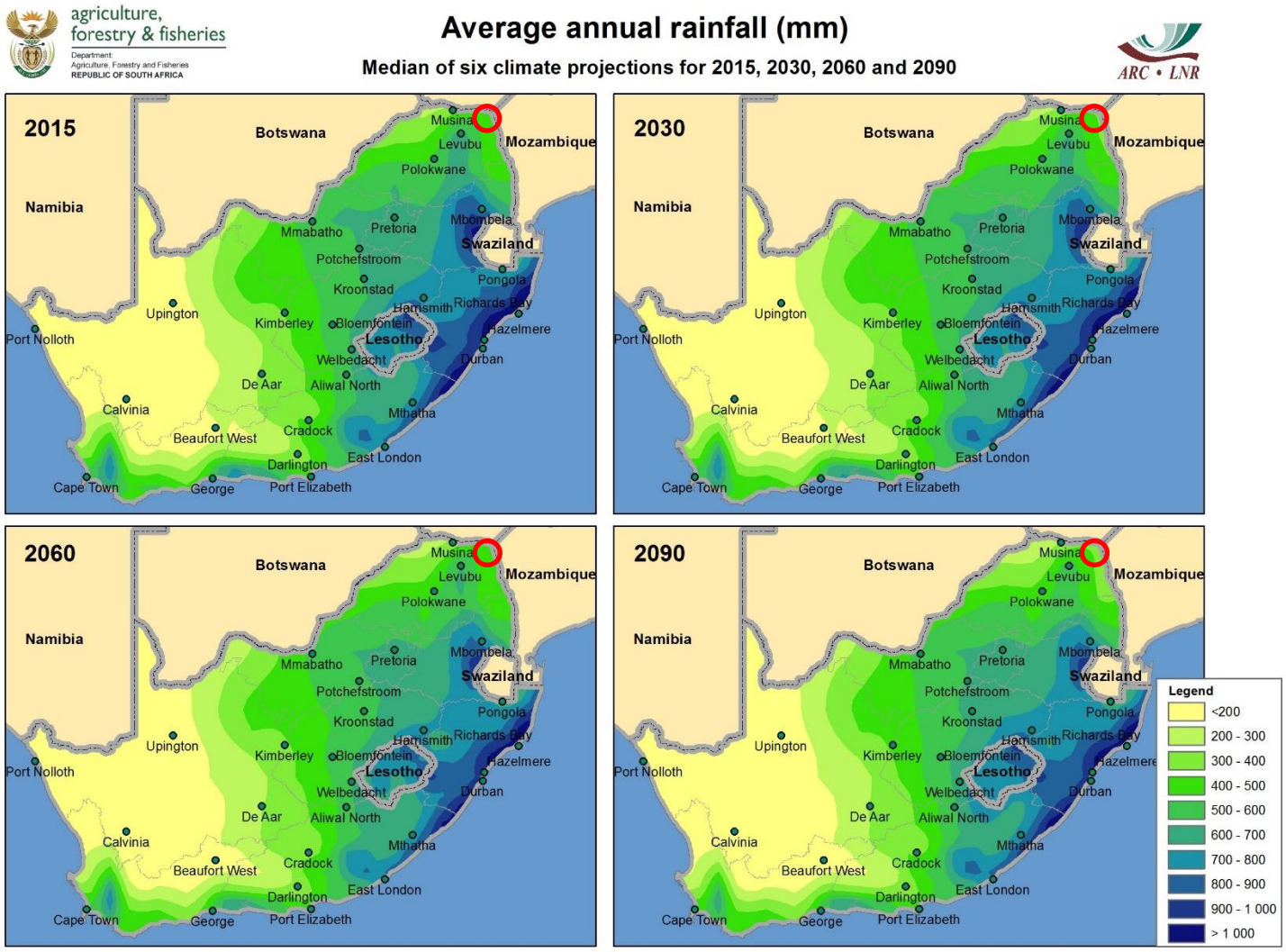


Figure 30 Median for average annual rainfall (mm) of six climate projections for 2015; 2030; 2060; 2090 (Weepener *et al.,* 2014)

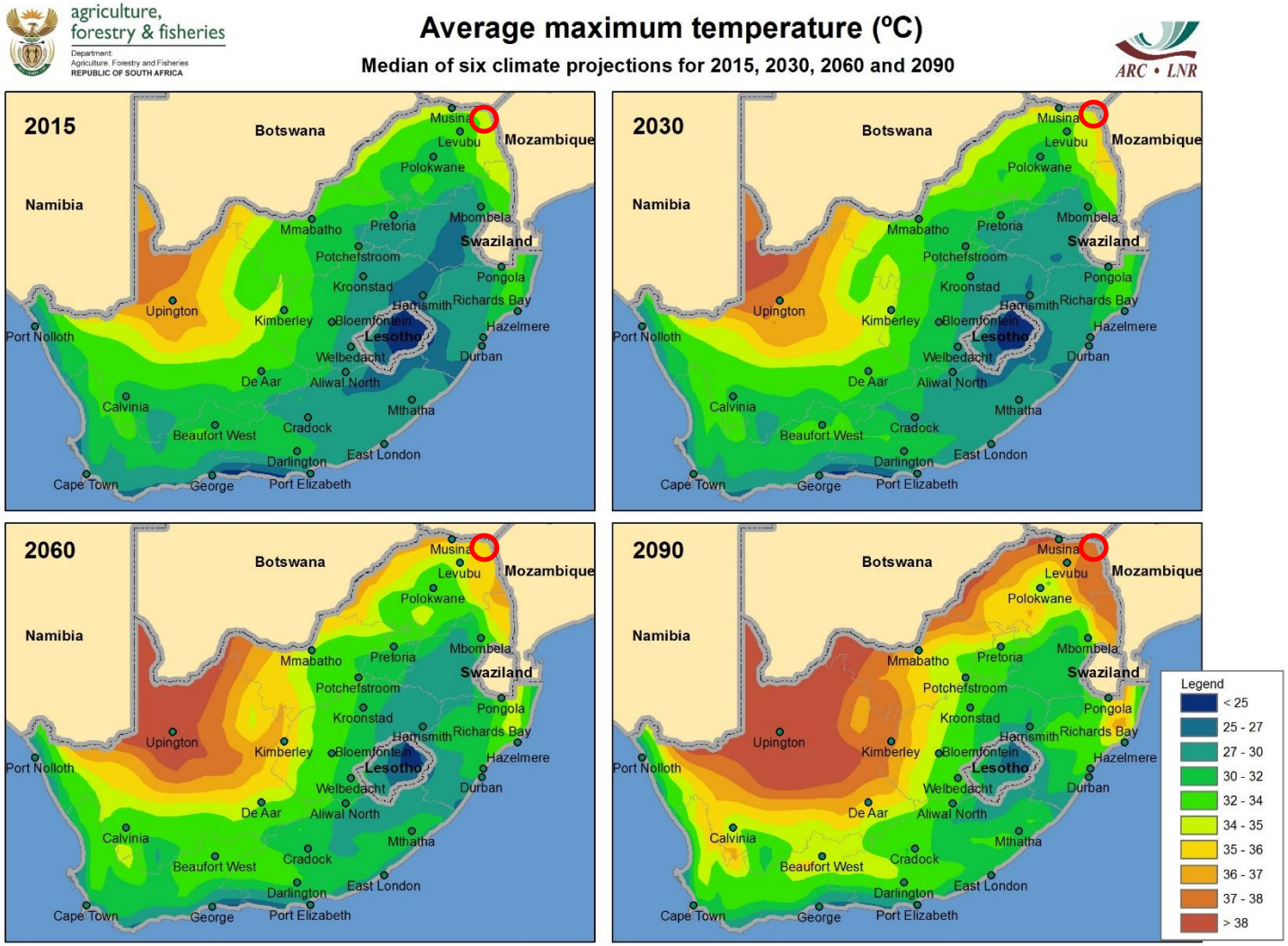


Figure 31 Median for average maximum temperature (˚C) of six climate projections for 2015; 2030; 2060; 2090 (Weepener *et al.*, 2014)

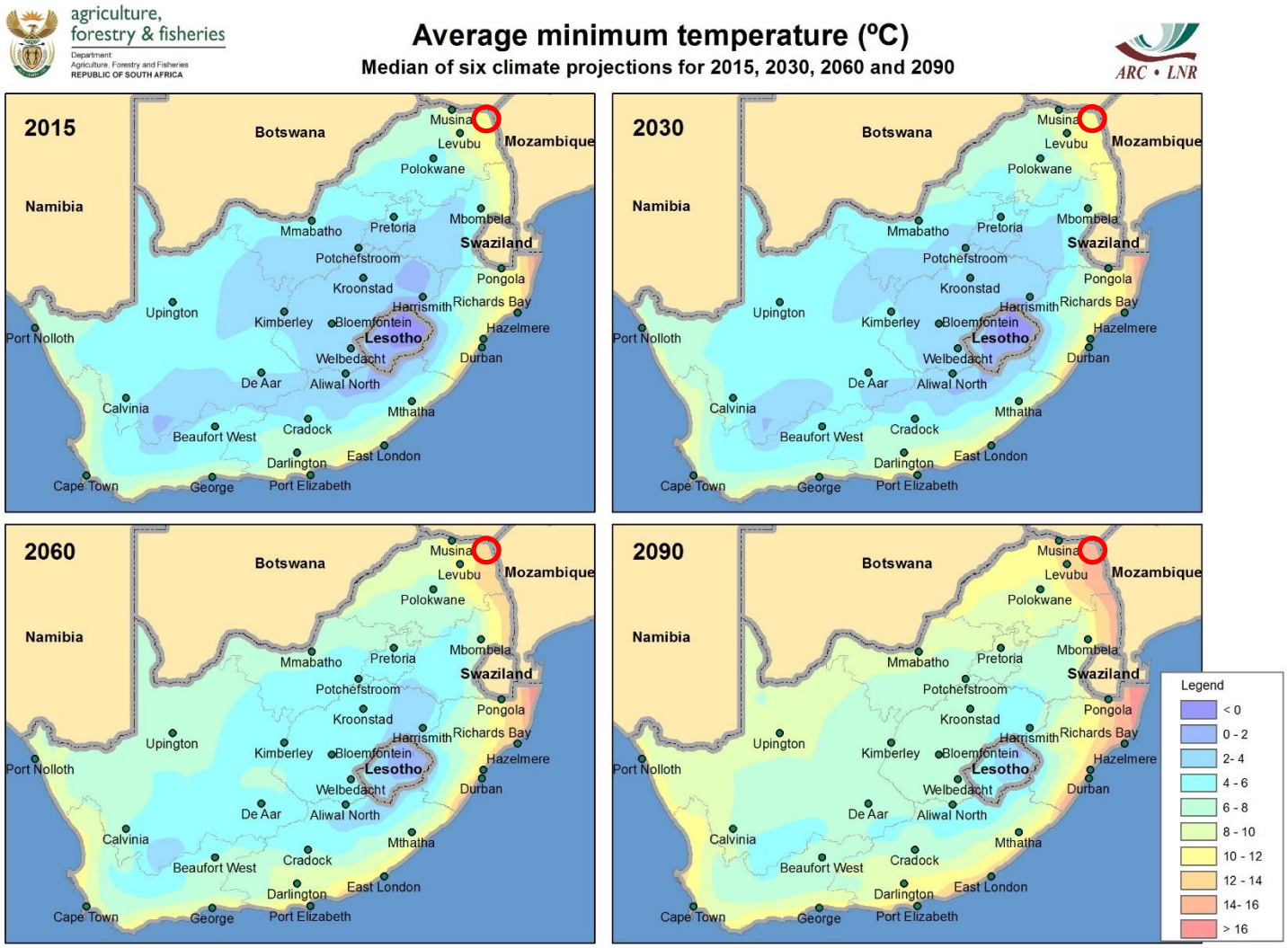


Figure 32 Median for average minimum temperature (˚C) of six climate projections for 2015; 2030; 2060; 2090 (Weepener *et al.*, 2014).

According to Nhemachena & Hassan (2007), most of the Southern African Development Community (SADC) region is expected to become warmer and drier with climate change. Therefore the results from Weepener *et al*. (2014) correspond with the observations from Nhemachena & Hassan (2007). Figure 30, Figure 31 and Figure 32 project that in the Lambani area rainfall will decrease, temperatures will rise, with minimum temperatures rising faster than maximum temperatures. According to Schulze (2011) the change in temperature may lead to:

- Changing patterns of rainfall
- Change in the spatial and temporal distribution of runoff
- Depletion of soil moisture and groundwater reserves
- An increase in the frequency of occurrence of droughts and floods.

This is an indication that villagers at Lambani might be even more vulnerable in future due to the effects of climate change.

4 THEORETICAL FRAME

4.1 CAPABILITY APPROACH

The capability approach (CA) was pioneered by the Nobel prize winning economist, Amartya Sen. The main argument of Sen's (1999) seminal work "*Development as Freedom"* is that individuals achieve freedoms – or fail to achieve them – because of social, political and economic constraints or opportunities. People can be deprived of physical (material) goods – such as pipes, toilets and taps and this lowers their living standards, narrowly defined. However, there is also deprivation of intangible goods and this has an effect on dignity, agency and empowerment that undermines multiple aspects of well-being. These deprivations are in domains that are less easily measured because they are invisible and as Krishna (2002) says when speaking of attitudinal components of social capital such as trust, these are often only carried around in people's hearts and heads. Perceptions and intangible goods such as dignity, trust – or disgust and anger – are often invisible and are carried around in people's hearts and heads.

The capability approach is also sometimes called the human development approach and is historically associated with the Human Development Report lodged in the Office of the United Nations Development Programme. It provides a framework for evaluating a wide range of projects and programmes around civil society issues. It was used recently in a Water Research Commission Project (K5/1971) by Goldin *et al*. (2013)[7] to evaluate institutional settings within the context of water resources management.

Collective capabilities (opportunities) are crucial for public reasoning and democratic processes; they are *group*-based phenomena that affect human capabilities (Sen, 2002). Collective capabilities are also instrumentally valuable, especially for the poor, to enhance their bargaining power, to encourage resource sharing (Thorp, Stewart and Heyer, 2005) and importantly within the context of this project, to find coping strategies to survive under extreme duress caused by floods or droughts.

Cleaver (2007) adds that people act collectively to negotiate norms, challenge existing inequalities and to defend their rights. The generation of collective capabilities therefore demonstrates how individuals can act together as agents of change, rather than each one of them pursuing his/her choices alone. Capability analysis therefore needs to account for the instrumental role that collectivities can play in promoting the individual's ability to achieve the life that s/he values. Sen asserts that ''no individual can think, choose, or act without being influenced by the nature and working of the society around him or her'' (Sen, 2002) and thus emphasises the importance of collective processes, such as public reasoning. The generation of collective capabilities needs to be through the *free and voluntary* participation of the members of the collective, rather than through force or coercion. Within the context of this project, women are able to negotiate their social and

[7] Entitled "Development of an institutional adequacy index using the multi-dimensional poverty framework."

institutional spaces and to draw on public reasoning to survive under extreme duress. The project team looked for signs as to how women are excluded (or included as the case might be) from “collectivities” and how this exclusion/inclusion might impact on their strategies of survival.

Problem-solving processes around the issue of water tend to neglect the fact that they are, essentially, dealing with humans. The CA is guided by the fact that it is dealing with humans, and not just with the way they feel but also with what constitutes a just society. The application of a new approach in dealing with climate change might offer new answers because it will have as its central focus people rather than technology or scientific “facts”. It will also shine a torch on the perceptions and feelings of people that have informed their actions. This means looking both at individual as well as institutional spaces (such as CBOs, NGOs, government and so forth). Emotions (fear, anger, hope, etc.) are a function of social relations and processes, and, as Goldin’s (2003, 2010) work on shame has shown, some water users feel helpless – and this might be how they feel in the face of extreme climatic events - and this might result in emotions such as anger, hope, shame etc.

Use of the CA to explore people’s relationship to water is still in its infant stage. As noted above, the CA framework is used 1) to define people’s well-being; 2) to assess social arrangements; and 3) for the design and evaluation of social interventions, social arrangements and policy interventions. It is thus ideal when considering social interventions around climate change. It is a normative framework because it claims that freedom to achieve well-being and an improved quality of life is of primary moral importance. It is also normative because it believes that people can decide for themselves what works and what does not work. Certain social environments and social interventions will promote positive attributes, such as a sense of agency, empowerment, self-respect and autonomy, while others will perpetuate deprivation and exclusion and even, as Goldin (2010) and Wutich and Ragsdale (2008) have shown, feelings of disgust, fear or shame.

Within the framework of the CA there is a positive feedback loop when people are engaging with decisions that affect their lives – a decision for instance to reconstruct their hut when it has been demolished by a flood or storm. When people are grappling with decisions that affect their lives there is dissent, debate and discussion. This brings an experience of autonomy, understanding and self-esteem, thus enhancing opportunity and choice (freedoms) for people to be or to do what they value being and doing. As people learn about what works and what does not work for themselves, the assumption is that they will become more active in making decisions that affect their everyday lives. The opposite of dissent, debate and discussion is disengagement or exclusion, which can activate or exacerbate feelings of anger, shame and humiliation (from being excluded or coerced), largely due to inequalities and infringements on freedoms.

Sources that draw on poor people’s own perceptions of their situation often report that a lack of agency is central to their description of ill-being (Narayan *et al*., 2000a and 2000b).

What is also evident is that agency or empowerment can be experienced with respect to different tasks – the ability to have a conversation in the bank or, as in our case, the ability to change a crop, to plant at a different time, to move one's home somewhere else or to rebuild a hut that has been destroyed by a flood. A positive feedback loop increases feelings of engagement, autonomy, understanding and self-esteem, and enhances opportunity and choice (freedoms).

The CA is about an assessment of quality of life. It claims that good societies should be promoting for their people a set of opportunities, which people may, or may not, exercise in action but the choice is theirs. It commits itself to respect for people's powers of self-definition. Applying the CA to life decisions in Lambani will help us understand whether women who did, for instance, rebuild their dwellings, felt good about themselves or whether they felt resentment, anger or even shame because they were forced to live in such severe conditions and because no one came to their help during times of trouble.

Capability failure is the failure to respect or promote social justice and human dignity and this can be because people are denied choice. These ideas are not of interest (within this context at least) simply as a philosophical question but rather because they have a practical implication. In other words, is it just that a woman should have to build her home on her own without state intervention or disaster relief? Did a particular woman have choice or was there no choice and opportunity but simply a "no choice" situation?

Within this context the word capability can be replaced by opportunity and capability is therefore the opportunity to select. The notion of freedom to choose is thus built into the notion of capability. The comparison made by Sen of a person who is fasting and a person who is starving is pertinent – the person who fasts is able not to fast but the starving person has no choice. This might be applicable in the case of the women in Lambani. Did a particular woman have choice? Choice has intrinsic and not only instrumental value. Options are freedoms and freedom has intrinsic value.

Sen's work has focused on the intrinsic and instrumental value of democracy and public debate. The empowerment of citizens through public reasoning and public debate is a recurring theme. Some approaches deny this; they hold that the right thing is for government (or others) to make people lead healthy lives, do activities (that they decide on), take on technologies – and so on.

4.1.1 Expanding the capability approach

Climatic impacts are moments when the human and non-human rub up against each other, and in the chafing affect emerges. Here the attention to affect is twofold. Not only does it allow for a more realistic reflection of entanglements with nature and their multiple 3D experiences that shape the everyday of women and men – but affect as being more than emotion. It is, as Hardt (in Clough 2007:9) claims, "our power to affect the world around us and our power to be affected by it, along with the relationship between these

two powers." It is a dynamic opening up to possibilities that can affect change. This transition is explained as a "passing of a threshold, seen from the point of view of the change in capacity." Thus as Massumi (2011) affirms *"when you affect something, you are at the same time opening yourself up to being affected in turn, and in a slightly different way than you might have been the moment before. You have made a transition, however slight*." This understanding sits well with our quest to "undo" the binary of victim and hero – of those that suffer, those who succumb and those who surmount the multiple challenges of climate change. The individual is affected by 2D experiences and in turn affects others around herself/himself, including the researcher who enters into spaces of affect. Within this cadre, women cannot simply be victims because their affect is a dynamic opening up to possibilities that can bring about change.

4.2 SOCIAL CAPITAL

Social capital is a concept that is worth considering because it is relevant when considering the CA and the way in which women do – or do not – engage with others. With its focus on trust and intangible goods that are carried in the hearts and heads of people, it fits well with the CA. For Coleman (1988), social capital is defined by its function. Social capital consists of social structures which facilitate the actions of actors. Just like human or financial capital, social capital is productive. It makes possible the achievement of certain ends that in its absence would not be possible. Social capital is not completely fungible but may be specific to certain activities. Important to note is that a given form of social capital that is valuable in enabling certain actions for some, may be useless or even harmful for others (*ibid*). Van Staveren and Knorringa (2007) examine the economic spin offs of social relationships and "*what they are and what they do*" (2007:117). The consequences are not just economic gains because deprivation can perpetuate feelings of shame and humiliation and aggravate degrees of social exclusion. The opposite is also true, productive relations with others can activate and nurture feelings such as pride, dignity, empowerment and self-esteem.

The link between social capital and the CA is illustrated in the following questions, for instance, when reconstructing a dwelling did the person speak to neighbours or to an NGO? Who was involved? When were they involved? Did the person rely only on their own resources or did they tap into community resources? What were the networks or engagements that prompted action (or inhibited it as the case might be)? What was the outcome of the involvement (e.g. more knowledge about what to do and how to do it, building trust). What opportunities are opening up for actors because of climate change? What choices are being made available and how do these choices contribute to the nurturing or activation of intangible assets (fear, anger, shame, dignity, hope etc.).

Social capital has two components, and both are of interest to us. The first is the structural component of social capital – here, there is an interest in belonging; do the women take part in stokvels, burial societies, church organisations, choir etc. and the second is attitudinal social capital, which is to do with trust and intangible goods. Trust is an invisible "glue" that binds people together, smoothes relationships and makes things work.

5 CASE STUDIES

5.1 CAPABILITY APPROACH CASE STUDIES

5.1.1 Assessing the capability approach as an evaluative framework for climate justice

Asma Atique's[8] Master of Law dissertation examines climate change, juxtaposing the North (countries with most CO_2 emissions) and the South (countries that are affected by the emissions from the North). The author states the urgency of addressing adaptation since those who are first and most likely to be affected by climate impacts are those living in developing and disadvantaged countries. Developing countries, who have contributed the least to the problem of emissions, lack the necessary resources and infrastructure to cope with the consequences of climate change.

The author notes that the literature on climate justice and adaptation is vast, but it has not yet employed one of the most popular recent developments in contemporary liberal justice theory, i.e. the CA. The author compares the CA and the Rawlsian theory (being insufficient) and notes that the CA can take account of a range of factors: diversity, recognition, flexibility, and the intergenerational aspect and multidisciplinary nature of climate change adaptation. The paper focuses on the advantages of the CA in the context of climate change and provides an example of how the approach can be used to evaluate adaptation.

Although Sen only briefly discusses the role of the environment, he acknowledges how "variations in environmental conditions, such as climatic circumstances (temperature ranges, rainfall, flooding, and so on), can influence what a person gets out of a given level of income."[9] Hence, Sen recognises the role that the environment plays in the provision of capabilities or opportunities and freedoms.[10]

Atique states that the CA creates a space where the human dependence on the natural world can be considered, because of the explicit ways basic capabilities depend on the environment and on a stable climate system. For instance, being well fed and the ability to live a life of normal length can be threatened by an increase in droughts, severe climatic events and the spread of water-borne diseases, which are all adverse effects of climate change. Another example is climate refugees who have to relocate as a result of rising sea levels.[11] The author draws attention to the way in which not only freedom of movement is curtailed, but that individuals have to suffer from emotional loss, increased stress, loss of social affiliations as well as rights to participate in politics. Furthermore, many natural areas, plants and animals could have aesthetic, spiritual or cultural significance, which

[8] Atique, 2014 Assessing Capabilities Approach as an Evaluative Framework for Climate Justice
[9] Sen, 2001 (cited in Atique, 2014)
[10] Pelenc *et al*., 2013 (cited in Atique, 2014)
[11] Kim, 2012 (cited in Atique, 2014)

could also be lost. This would directly influence one's capability of senses, thought and imagination, which are one of Nussbaum's ten basic capabilities.[12]

The breadth of the CA allows it to take account of diversity and plurality. The CA takes diversity into account in two ways: through its focus on capabilities as a metric of justice and the use of conversion factors (see discussion above), as well as social and institutional contexts that determine the feasibility of the capability. In his well-known Tanner lecture "Equality of What?" Sen's take on Rawls and his "primary goods approach (which) seems to take little note of the diversity of human beings. If people were basically very similar, then an index of primary goods might be quite a good way of judging advantage. But in fact, people seem to have very different needs, varying with health, longevity, climatic conditions, location, work conditions, temperament, and even body size. So, what is involved is not merely ignoring a few hard cases but overlooking very widespread and real differences (*ibid*). The author draws attention to Sen's central argument, which is based on the need to account for diversity.

Using a capabilities metric rather than one based on a primary goods approach (Rawls) gives a clearer picture of well-being, individual advantage and, particularly, vulnerability. Thus, it is helpful when addressing climate change because the way an environmental benefit or burden is experienced can vary according to both geography and available capabilities. For instance, the largest number of fatalities caused by the Asian Tsunami were women and children. It has been documented that due to cultural and social norms re female mobility, women in Bangladesh did not leave their house during the floods, and those who left did not know how to swim.[13] Therefore, the CA is able to picture vulnerability with higher specificity, taking into consideration differences in gender, age, class, etc. Applying the CA to notions of adaptation to climate change encourages an assessment of vulnerability which takes into account differences.

Schlosberg[14] also claims that capabilities can include aspects of social and political recognition, which can bridge the gap between an ideal notion of justice and practical policy making. Powless (2014), also cited in Atique (2014), highlights the fact that indigenous people whose capabilities are increasingly threatened by climate change face a lack of recognition and struggle to get their voices heard in international climate change negotiations.

The author reminds us that not only are individual and cultural recognition identified as central capabilities by both Sen and Nussbaum, but that the CA emphasises political participation and procedural justice. As already discussed above, the CA is well suited to evaluate social and institutional contexts, and ideals of social and political recognition because it can simultaneously address the various demands of autonomy, rights and recognition as well as emphasising spiritual and non-commercial relationships with the

[12] Schlosberg, 2012 (cited in Atique, 2014)
[13] Arora-Jonsson (cited in Atique, 2014)
[14] Schlosbertg, 2012 (cited in Atique, 2014)

natural environment,[15] thus acknowledging the relationship between cultural identity and the natural environment. These features allow the CA to better comprehend the relationship between people and place – and by extension, their capabilities.[16]

5.1.2 Application of a capabilities-based approach in evaluating adaptation at the community level

Atique notes that evaluation can be further enhanced if community-level studies are integrated in a way that give a comprehensive picture of justice issues in international adaptation. The author notes that since the CA is famously under-specific, such a study would have to make three specifications. There is the specification of what theory of justice or welfare it is using and what normative assumptions are being made. Secondly, the choice between functionings and capabilities would have to be made and supported and that, if the study is done on a small scale, a focus on capabilities may be feasible. Participatory methods can be used to ascertain what capabilities are valued and to what extent and, it can also involve a procedural approach, which builds on existing literature supported by a public discussion. Lastly, there is the question of aggregation – whether capabilities can have tradeoffs, and if so, how would each be weighed. This, too, will have to be chosen and supported.

5.1.2.1 Atique's (2004) conclusion

The CA makes two normative claims: human well-being is of utmost moral importance, and that it is to be interpreted as one's freedom to achieve the life he/she has reason to value. A theoretical framework based on the CA can better evaluate environmental inequalities related to climate change because it focuses on people's freedom to choose and convert their resources to be and do what they have reason to value. The CA is able to take account of diversity, which impacts on one's vulnerability. It can also include social and political recognition, which vulnerable communities recurrently fight for. Moreover, its open-ended nature makes context-specificity and flexibility possible.

It can also be supplemented by community-level studies that make the required specifications and use participatory or procedural methods to determine what capabilities individuals in vulnerable communities value. Unlike other alternatives, an approach based on capabilities and focused on outcomes can draw policy makers towards the information that is most relevant – how vulnerable communities are actually experiencing climate impacts and climate justice.

5.1.2.2 Atique and the case of Lambani

Even though Atiques's paper deploys the CA within the wider climate change mitigation and adaptation literature, the author has advanced the importance of applying the CA

[15] Powless (cited in Atique, 2014)
[16] Schlosberg, 2012

when investigating adaptation to climate change at the community level and, in particular, when considering human well-being from a gender perspective. Atique notes that in climate change situations, as in the case of the Asian Tsunami, most fatalities were women and children.

In the Lambani case study, climate change has an impact on school attendance, and the girl child is more affected than the boy child; *"in terms of getting to school, difficult for everyone, but for those that cross the river by foot, girls tend to be more afraid and come (to school) less."* Another quote from a respondent in Lambani illustrates that women are more challenged in extreme events, "*I think the women are having the challenge. Like now, if we don't have water, women are going to fetch water from rivers or from other places from far from our village."* Even though the gender dynamics illustrated by Atique in the Tsunami case are not the same as in Lambani, what is clear is that women and children – in particular, the girl child – appear to be the most vulnerable during extreme weather conditions.

Atique claims that the CA is particularly useful when considering human dependence on the natural world because of the explicit ways that basic capabilities depend on the environment and a stable climate system. The case of Lambani is indicative of an unstable climate and 87% of respondents thought that "*things are changing around here because of climate change*" and that this has an impact on health and human well-being. Atique notes that, faced with extremes in climate, people's ability to move freely is curtailed and that they can suffer from emotional loss, increased stress etc. And that natural areas - plants and animals - could also have aesthetic, spiritual or cultural significance, which could also be lost. The relationship between the environment and the human is interrupted when there are severe climatic events, and this influences assets – both tangible and intangible. This would directly influence capabilities such as attributes listed by Nussbaum (2011), senses, thought and imagination. In Lambani, because of extreme weather conditions, community members experienced loss of livestock, houses, roads, bridges and pipelines that curtailed their freedom of movement and activated feelings such as fear, worry, pain, sadness, being powerless and feelings of helplessness.

As mentioned in the case study report on Lambani, the CA is about an assessment of quality of life. It claims that good societies should be promoting for their people a set of opportunities which people may, or may not, exercise in action, but the choice is theirs. A good society commits itself to respect for people's powers of self-definition. Applying the CA to life decisions in Lambani will help us understand whether women who did, for instance, rebuild their dwellings, felt good about themselves or whether they felt fear, resentment, anger or even shame because they were forced to live in such severe conditions and because no one came to their help during times of trouble. Our study has focused on gender disparities and this means not only a focus on women but on all who feel the brunt of extreme weather conditions. Men and boys, and people with disabilities are vulnerable. Nevertheless, our own empirical data reflects that it is old women, young women and the girl child who are the most vulnerable.

Powless[17] highlights the fact that indigenous people whose capabilities are increasingly threatened by climate change face a lack of recognition and struggle to get their voices heard in international climate change negotiations. Although not at the scale of an international platform, our empirical evidence showed that community members felt sad, neglected and helpless, because they hoped that government would come to their rescue during extreme weather events, especially the floods, but they found themselves isolated and alone.

Atique's conclusion draws attention to the way in which the CA can be applied at the community level to better understand what capabilities individuals in vulnerable communities value. It can mean the application of participatory methods, but it can also involve what Atique calls a procedural approach. Such an approach builds on existing literature where evidence is validated by public discussion. Our own qualitative approach uses participatory methods to tap into the vulnerabilities of community members and the way in which they have experienced external factors (their environment). The study identified capabilities such as agency (decision-making), dignity, pride, etc. It identified access to basic health care, access to resources like water and feelings of belonging to organisations. Atique's thesis resonated with our own study and motivated the research team to identify the capabilities that community members of Lambani value.

It is believed that the emotional well being of community members is critical for a vulnerability assessment. Therefore, developing a vulnerability assessment framework for extreme weather conditions that is gender sensitive is crucial in informing policy in its adaptation strategies. The vulnerability framework would then guide policy and contribute to an understanding that women and girls cannot be overlooked in adaptation strategies.

5.1.3 Building climate equity: creating a new approach from the ground up

This report begins by highlighting how climate policies within countries, including policies directed at both low-carbon energy development and resilience to climate change effects, can simultaneously build the capabilities of individuals and communities. These policy examples are drawn from 30 case studies in 23 countries around the world, including renewable energy, equitable carbon pricing, fossil fuel subsidy reform, low-carbon transportation, community forestry, and a range of adaptation and resilience policies. The focus was, in particular, on the capabilities of the most vulnerable and least well off because their capabilities are most at risk and in need of strengthening. Building on the findings in these case studies, this report provides recommendations about ways that international institutions and policymakers can concretely support the development and implementation of these types of actions at the national and sub-national levels. Next, the report specifically addresses how the 2015 Paris international climate agreement can take account of and help build capabilities. This approach enhances the meaning of "respective

[17] 2014 (cited in Atique, 2014)

capabilities" within the United Nations Framework Convention on Climate Change (UNFCC)'s principle of "common but differentiated responsibilities and respective capabilities."[18]

To provide a framework for developing and evaluating countries' intended nationally determined contributions (NDCs) in UNFCC negotiations, this report proposes equity criteria based on national capabilities along with emissions responsibility. It then suggests how a capabilities approach can focus attention on the ways in which each element of the 2015 Paris Agreement can build the capabilities of countries and communities. The main capabilities identified in this report at the national scale include: governance capacity, economic capacity, resilience to climate impacts and human development. At the community scale, the authors propose: livelihoods, sufficient nutrition, physical safety, adequate shelter, health, access to education, and decision-making opportunities.

Applying a capabilities lens to adaptation and resilience serves as a reminder of the equity dimensions present in adaptation. Different populations are affected by climate change in varying ways and to differing degrees, often due to disparities in social and economic contexts and people's underlying capabilities. Moreover, climate policies themselves may not be designed in ways that take into account these diverse levels of capabilities. Just as with low-carbon development, a capabilities approach in the adaptation arena helps to identify policies that will enhance equity and build capabilities, as well as avoid unintended negative consequences, particularly for the least well off.

The CA provides a lens to understand the challenges in the design and implementation of adaptation policies and projects. This lens highlights the importance of understanding differing types and levels of vulnerability, and incorporating that understanding into the design of adaptation policies; it shows that adaptation policies must be highly diverse and variable and based on inclusive and participatory planning processes that meet specific populations' needs; and it supports the ability of the most vulnerable and least well off to pursue innovation in the design and implementation of adaptation policies and projects.

Multiple and overlapping factors shape each person's capabilities and, as a result, influence their vulnerability to climate impacts. Gender, economic resources, physical ability, age, and ethnicity are just some of the factors that combine to make it more or less difficult for individual people to build their capabilities. Some of these factors may be equally experienced by all members in a specific community or locality, but some of them will not. For instance, gender norms about access to education or to financial resources such as credit will shape the capabilities of men and women differently.

Individuals or communities with a broader range of capabilities may have reduced vulnerability because they have access to more resources or abilities to deal with potential climate impacts. Effective adaptation policies must be sensitive to, and address, these

[18] UNFCCC, 1992

differences in vulnerability and capabilities, including by avoiding approaches that exacerbate existing vulnerabilities. Policies and projects that are designed to respond to the differentiated nature of capabilities and vulnerabilities, and that also deliberately aim to build capabilities, can be highly effective in building adaptive capacity and enhancing equity for those who are most vulnerable. Adaptation processes in line with development strategies that reduce vulnerabilities and increase people's adaptive capacity in a broad sense would bring immediate benefits as well as strengthen people's ability to deal with future threats.[19] The importance of considering differing types and levels of vulnerability is especially stark in efforts to build resilience in the agriculture sector, particularly in poorer rural communities. Agriculture is central to many people's livelihoods, particularly in developing countries, where it constitutes approximately 29% of GDP and employs 65% of the population.[20]

The connection between nutrition and livelihoods is particularly close for the rural poor, many of whom depend on subsistence agriculture.[21] As a source of food and livelihood, agriculture supports many other capabilities, such as access to education and shelter. However, there are substantial variations in the vulnerability and capabilities of communities facing potential climate impacts to agriculture. For instance, in the case of Uganda, disparities in access to credit and education shape the options farmers have when addressing climate risks.

Designing effective and long-term adaptation responses requires understanding the pathways that people are currently pursuing towards greater well-being, and ensuring that interventions are aligned with, and ultimately support these goals. A capabilities approach enables policymakers to do this, as well as to identify the specific opportunities and barriers that make their ability to achieve well-being more or less successful. From this perspective, a capabilities approach draws attention to local contexts, suggesting that each adaptation project or need must be designed with inclusive participation by those affected by climate impacts, particularly the most vulnerable.

Applying the capabilities approach to climate change strongly emphasises the need to ensure that vulnerable populations are included in research on climate impacts and adaptation responses. Men and women play different roles in society and can bring different sets of resources, capacities, and knowledge, as well as different needs and requirements, to initiatives for climate change adaptation. Furthermore, there is increasing recognition of the value of indigenous knowledge in improving observations of climate change and its impacts, and for the assessment of impacts, vulnerability, and adaptation, particularly in vulnerability assessments.[22]

[19] Burton *et al*., 2002; Huq *et al*., 2003; Adger *et al*., 2007
[20] Campbell *et al.,* 2011
[21] Campbell *et al*., 2011
[22] UNFCCC, 2013

5.1.4 Capability approach case study: reducing risks and vunerability to climate change in Kerala, India

Roy and Venema (2002) argue that the ability of women to adapt to climate change pressures will be enhanced by using the CA to direct development efforts. The CA can be used to target efforts so that women are able to improve their well-being, providing them with foundations that support their efforts to be agents of change within their communities. The authors build on evidence from previous research on gender and livelihoods as well as their own study conducted in rural India. Empirical evidence to back up the authors' argument is based on the experiences of poor, rural women in India, who are particularly vulnerable to climate change impacts. Their survival is dependent on them being able to tap into essential resources. However, these women lack many of the requirements for well-being, such as access to health care and literacy and this inhibits them from being able to control their own lives. Access to basic goods and services would mitigate their vulnerability. Roy and Venema (2002) note that the need to respond and adapt to climate change has become widely recognised, and that people will have to deal with the impacts whether or not they receive help from government.

Poor rural women in India generally have fewer rights and assets than men. They experience inequalities in such areas as health care and they take disproportionate responsibility for housework and child-care.[23] As a result, Roy and Venema note that this asymmetrical division of labour, rights and assets leaves women more vulnerable to – and less able to cope with – the additional stress and deprivation brought about by climate change. The authors claim that even if severe weather events such as cyclones, monsoons and droughts cannot be directly attributed to climate change, they nevertheless illustrate the very real and probable impacts of climate change on the rural poor. Women working as agricultural labourers and those whose livelihoods depend on cultivating small plots are particularly vulnerable.

According to Sen (1999), the five instrumental freedoms that should be present and that women should have access to are: political freedom, economic facilities, social opportunities, transparency guarantees and protective security. Access to these is necessary for women to gain a better quality of life and to acquire the capabilities they need to act as their own agents of change. As from the discussion above, the CA goes beyond asking about satisfaction of people's preferences to ask what women's opportunities and liberties actually are, as well as how available resources work or do not work in enabling women to function. For Sen, the CA has considerable potential for enabling and empowering poor rural women:

These different aspects (women's earning power, economic role outside the family, literacy and education, property rights and so on) may at first sight appear to be rather diverse and disparate. But what they have in common is their positive

[23] Patel, 2002 (cited in Roy & Venema, 2002)

contribution in adding force to women's voice and agency through independence and empowerment[24]

The case study of Kerala, a state in southern India, which provides some insight into the usefulness of Sen's approach, claims that several aspects of the state's development path bear similarities to those advanced as part of the CA. Despite its low per capita income, Kerala has the lowest birth rates, high literacy rates and the longest life expectancy in India – hence delivering a higher quality of life:

The government started a "land literacy" programme known as the "People's Resource Mapping Program", in which local villages map their local resources. These community maps are then combined with scientific maps to guide local environmental and social planning, with villagers taking and implementing the decisions[25]

The authors note that informal institutional reform, whereby individuals at the community level become agents of change, appears to be a good option for increasing the ability of the poor to adapt to climate change. The best development approach is through improved environmental and land management in communities and this should be based on Sen's concept of five freedoms. The process of achieving these improvements challenges the status quo.[26]

In conclusion, the authors claim that it is by using the capabilities approach to direct land and environmental management changes in communities, that the well-being of the rural poor can be improved. This then has the potential to reduce their vulnerability to the risks of climate change. Poor rural women, who are already among the most vulnerable, must be specially considered in such development efforts and their right to participate in decision-making must be promoted and protected.

As indicated above, this paper focuses on improving the well-being of women faced with gender inequalities and even more so during climate change impacts. The authors advocate the benefits of the CA in improving their well-being which then reduces their vulnerability to the impacts of climate change. Our study reveals that women are the most affected during extreme climate conditions; and 68% of men say *women would be more affected than others* while 80% of women say this. Results reveal that more women than men are not hopeful that things will get better, they do not feel proud they can make a difference and they do not feel they can change things at all. These attributes are proxies for empowerment and indicate the low levels of agency experienced by women in Lambani.

[24] Sen, 1999, pp. 191-2
[25] McKibben (1996) cited in Roy and Venema (2002)
[26] Chopra and Duraiappah (2001) cited in Roy and Venema (2002), indicate how vested interests work to prevent institutional change.

5.2 GENDER AND CLIMATE CHANGE CASE STUDIES

5.2.1 Cannon (2002) - gender and climate hazards in Bangladesh[27]

Bangladesh is one of the world's most densely populated countries. The country is low-lying which means that people will be badly affected by any rises in sea level. Natural disasters include floods and cyclones that claim the lives of people every year; for instance, 500 000 lives were lost in floods in the 1970s. Bangladesh experiences monsoon rainfall, and the three major river systems swell and struggle to find outlets to the sea. Tropical cyclones strike the coast at least once a year, bringing rainwater floods, salt-water incursions, and wind damage. People lose lives, lose land from erosion as river channels shift, and lose assets, becoming even poorer as a result of floods.

Despite the fact that since 1990 the number of deaths has been reduced through the early warning system, the principal climatic hazards affecting Bangladesh (floods and cyclones) are likely to increase in frequency, intensity, duration, and extent. The glacial melting in the Himalayan headwaters will also increase spring and early summer flows, further increasing the flood risk. These increased hazard impacts will affect women in particular and they are extremely difficult to predict. The link between poverty and vulnerability is clearly crucial and extreme events affect women disproportionately. Economic factors can increase vulnerability. The author agrees that non-economic (cultural) factors which produce gender inequality need also to be addressed – for instance, so that women can adequately seek shelter without shame and harassment, and are not condemned to poverty and increased vulnerability when widowed or divorced.

Disaster happens when a natural hazard impacts negatively on vulnerable people. The severity of a disaster is therefore a reflection both of the location and intensity of the hazard, and of the number of people and their levels and types of vulnerability. To understand a disaster, there is a need to understand the components of vulnerability of different groups of people, and relate these to the hazard risk. Vulnerability differs according to the initial conditions of a person, for instance how well fed they are, what their physical and mental health and mobility are, their morale and their capacity for self-reliance. It is also related to the resilience of their livelihood – in other words how quickly and easily they can resume activities that will earn money or provide food and other basic goods.

The hazard itself must be recognised. Vulnerability will be lower if people are able to put proper "self protection" in place; for example, the right type of building to resist high winds, or a house site that is raised above flood levels. People also need some form of "social protection" from hazards; forms of preparedness provided by institutions at levels above the household. This supplements what people can afford or are able to do for themselves,

[27] Site of investigation: rural Bangladesh. Theoretical frame: vulnerability theory and gender inequality theory.

and creates opportunities to implement measures that can only be provided collectively (e.g. codes to improve building safety, warning systems).

Social protection depends on adequate government or non-governmental systems being in place, while self protection generally relies on people having an adequate income, knowledge of the hazard, and the propensity and capacity to take precautions. In many hazardous places, people's vulnerability is also reduced if they are able to draw on adequate social capital. People may need to rely on each other, on family, and on organisations, at all stages of a disaster – from search and rescue after impact, to coping and sharing in the recovery period.

How are these components of vulnerability affected by gender relations, and how different are the vulnerabilities of men and women in relation to disasters in Bangladesh? From an analysis of existing gendered vulnerabilities, is it possible to project what may happen in terms of climate change and the possible increase in frequency and intensity of climate hazards? Vulnerability in Bangladesh correlates strongly with poverty, and it is widely accepted that women make up a disproportionate share of poor people. How much of women's vulnerability to hazards can be apportioned to them being poor, and how much is due to specific “gendered” characteristics of self protection, social protection, and livelihood resilience? And how will this be affected by climate change? It is difficult to separate these two aspects of female vulnerability, precisely because gender plays a significant role in determining poverty. As a result, vulnerability to hazards involves a complex interaction between poverty and gender relations, in which women are likely to experience higher levels of vulnerability than men**.**

Women's poorer nutritional status is a key aspect of their reduced capacity to cope with the effects of a hazard. In Bangladesh, women of all ages are more calorie-deficient than men. For example, an increase in discrimination against females in food consumption would have serious consequences. Women also receive less and poorer-quality healthcare in comparison with men. Bangladesh is one of the few countries in the world where men live longer than women.

Cannon also reminds us that floods increase women's domestic burden. The loss of utensils and other household essentials is a great hardship, and floods also undermine women's well-being in general because of their dependence on economic activities linked to the home. Poverty means that women’s ability to provide sufficient self protection and to create safe conditions in the face of impending floods or cyclones is reduced. As was noted, the right quality of housing, a location on raised ground and adequate storage for food are all crucial to self protection, but are more difficult for poor women to achieve. For example, self and social protection are affected by gender issues related to culture. Throughout cyclones, women are handicapped by fear of the shame attached to leaving the house and moving in public. Societal attitudes restricting interaction between men and women make women more reluctant to congregate in the public cyclone shelters (raised concrete structures that protect from wind and flood) where they are forced to interact with

men. Women's mobility is further restricted as a result of their responsibility for their children. Their clothing restricts their mobility in floods, and in addition, women are less likely than men to know how to swim.

According to Cannon, there is evidence that some aspects of social change in Bangladesh are improving women's lives and reducing gender inequalities. The average number of children that a woman bears has declined significantly over the last 20 years, from 6.34% in 1975 to around 3.3% in 2001. Less attention to women's child-care results in suffering, and in Bangladesh more women die in childbirth than anywhere else in the world. Whether the significant cultural shifts inherent in the decline in fertility rates can have any impact in other areas of society, including on gender differences in vulnerability to climate hazards is impossible to predict. Gender inequalities can also be diminished through other initiatives such as micro-credit schemes for women, and associated empowerment activities. In conclusion, there is potential to reduce women's unequal vulnerability despite the fact that hazards are increasing with climate change.

Being female is strongly linked to being poor, and therefore, unless poverty is reduced, the increase in disasters and extreme climate events linked with climate change is likely to affect women more than men. As a result, vulnerability to hazards involves a complex interaction between poverty and gender relations, in which women are likely to experience higher levels of vulnerability than men.

Cannon's study informs our current work, helping us to understand women's vulnerability to natural hazards and differences in terms of how men and women are affected by disasters and climate extremes such as floods. Secondly, the level of vulnerability of men and women is not the same. It is also known that women's vulnerability increases with poor nutrition, low education levels and low income. For example, female-headed households are unable to provide a safe environment for their family because of their limited ability to improve the poor structure of their houses so that the houses could protect them during heavy rainfall and floods.

As in our Lambani study, Cannon (2002) dwells on gender and climate hazards, and considers the relationships between poverty, gender and vulnerability within the context of environmental hazards. Cannon (2002) looked at floods in particular. Our Lambani case study considers four climate hazards, the more commonly understood phenomena of floods and drought, and also extreme heat and extreme cold. Nonetheless, both studies consider climatic factors that affect women in rural areas and in instances where they are more vulnerable than men. Cannon (2002) proposes that social change brought about by an extreme event may reduce women's vulnerability and lessen gender equality. In the Lambani case study it was also considered whether and in what ways an extreme event might generate new social capital or new "intangible assets."

Cannon (2002) uses language reflecting emotions. He looks at those aspects of everyday life that make women more vulnerable and considers poverty not simply as

income/economic poverty but also as poverty related to nutrition, household burdens, coping strategies, safety nets and so forth. Poverty exacerbates the burden on women during extreme climate events – for instance having a house with an inadequate structure, which cannot protect the family against heavy rainfall and flooding.

Table 5 Cannon (2002) study and Lambani compared

	Lambani (our study)	**Cannon (2002)**
Scale	Local (village level)	Country level (Bangladesh)
Methodology	Multiple methods (transect walk, two-way matrix, participatory mapping, interviews and survey)	
Hazards	Floods, droughts, heat and cold	Floods
Key ideas	Expanded notion of poverty Links between vulnerability, poverty and gender Opportunity to gain social capital	Expanded notion of poverty Links between vulnerability, poverty and gender Opportunity to gain social capital Self protection Social protection Societal attitudes that inhibit women Women's mobility restricted (responsibility for children, clothes, less likely to swim, not wanting to mix with men in public) Emotions – for instance shame experienced when have to be in a public shelter with men Fear and worry not being able to protect family
Theoretical frame	Capability Approach and social capital	Gender inequality theory Social vulnerability theory
Vulnerability differs according to the baseline conditions of a person – how well fed they are, what their physical and mental health and mobility are, and their morale and capacity for self-reliance. It is also related to the resilience of their livelihood which means how quickly and easily they can resume activities that will earn money or provide food and other basics (Cannon, 2002).		

5.2.2 Alston (2006) - the gendered impact of drought

Alston's focus is on New South Wales, Queensland and Victoria, Australia, where drought has been described by the Australian prime minister as the worst in one hundred years. Australia is a dry, arid land, providing a conducive environment for drought, which is a major concern to Australians. The event of drought is traumatic to those dependent on agriculture for their livelihoods.

Traditionally, women have held a subordinate position as a result of male-dominated ownership and inheritance practices. Serious problems caused by drought aggravate power and unequal gender relations. The author provides a brief outline of the context of Australian agriculture, claiming that this shows its gendered nature. He goes back to the 19th century, at which time, he tells us, the state supported a 'yeoman' model of production which was patriarchal and that this is a model that continues to influence agriculture to this day. Traditionally, farms were inherited by sons. Furthermore, women were excluded from enrolling in most agricultural colleges until the 1970s.

The common entry point for women into agriculture was through marriage, but women entered into an intergenerational kinship arrangement which kept them in a subordinate position. Today, the farm business is more complex and financial management practices and government regulations demand greater accountability. Despite the fact that Australian farm women, on average, are twice as likely to have a general university education than their male partners, farm roles and representation continue to assign particular roles to women on farms.

Recently, the fact of women achieving higher levels of education, the acceptability of women in the workforce, the downturn in agricultural commodities coupled with the perils of globalisation, have resulted in women moving into the paid workforce and their work off-farm has become critical as an economic contribution to the farm family unit. Over 50% of farm families are now reliant on off-farm income, and over 80% of these jobs are now taken up by women.

Nonetheless, women's efforts to find paid work are undermined by trends in rural community employment markets, where a rise in the casualisation of the labour force is evident. Rural policy concerning droughts has both ignored gendered consequences and exacerbated trends of rural community decline, which creates additional hardship for farm women seeking paid work. For farm women seeking off-farm work, the loss of rural employment options places them under significant pressure.

One of the consequences of rural community change has been the extent of out-migration, particularly of young people, as well as some notable in-migration. Evidence shows that population trends in Australia in recent times have seen a drift from the inland areas to the coast and capital cities. Particularly significant is out-migration of young people from the inland areas in search of employment as well as the pursuit of higher education. There

are more young women leaving rural areas, not only for furthering higher education but also because many farm jobs are still reserved for men. Migration patterns, both into and out of farm areas, are complex, but highly gendered.

The trend is that it is women who are migrating from remote areas – unlike in Europe where it is the other way round. In rural areas, young women move, leaving their children behind, to source income for the farm. These trends – and the links between drought and migration - are not well documented. The most significant finding, then, of this research is that there is a gendered experience of drought. Men take on the physical labour and women perform a “farm wife” role. It is known too that farm families are dependent on off-farm income and this is usually generated by women. Overall, jobs in government are normally held by women. This results in women leaving home to find work to generate income for the family to survive.

Alston reports on the stress experienced by women due to increased workloads as a consequence of the drought. The severity of the drought has drained energy and spirit and many expressed feeling of despair – feelings that are not necessarily shared with their partners because they want to avoid adding another stress to an already stressful situation.

Despite the contributions made by women it is evident that the discourse surrounding faming still gives primacy to the role of the male farmer making little of the role of women. Policy decisions act to reinforce this situation. The rural out-migration has led to a significant loss of young people, especially young women, as well as of skilled professionals. Out-migration encompasses farm women seeking income to keep the family’s farming hope alive. Neither government nor NGOs address the gendered impacts of drought and its implication for the lives of women. Discourses around women (both from policy and ngo’s) and their role in agriculture are mute.

While women are more likely to question the different roles that family members play in agriculture, they nonetheless comply with the system that is demanding so much of them. They play a secondary role – their core function being to support the efforts of men in agriculture.

Table 6 Alston (2006) study and Lambani compared

	Lambani (our study)	Alston (2006)
		The research was conducted by the writer, and co-researcher Jenny Kent, from the Centre for Rural Social Research at Charles Sturt University the leading team of five researcher assistance with a PhD student at the body University. The study was funded by the New South Wales Department of Agriculture and the premier's department, the result of ongoing pressure from communities and service providers to assess the major social implications of devastation of drought.
Scale	Local (village level) – one village	New South Wales, Australia – three communities
Methodology	Multiple methods (transect walk, two-way matrix, participatory mapping, interviews and survey)	In-depth interviews: 120 interviews were conducted. 62 of these were with farm family members (37 women and 25 men)
Hazards	Floods, droughts, heat and cold	Drought
Key ideas	Expanded notion of poverty Links between vulnerability, poverty and gender Opportunity to gain social capital	Trauma, gendered impacts, migration, social impacts, women, gender and stress. Keeping hope alive by working in town. More women than men leave (out-migration). Women work to support men in agriculture. Keep feelings (stress) away from the men. They are expected to play "farm wife" even though many are more educated than men
Theoretical frame	Capability Approach and social capital	Gender and social impact
Does not speak of vulnerability		

5.2.3 Waite (2000) - How is household vulnerability gendered? Female-headed households in the collectives of Suleimaniyah

Waite's aim is to contribute to the current gender and development debates which are concerned with improving understanding of the specific gendered forms of disadvantage faced by female-headed households rather than assuming the universal poverty of this group.

Her focus is on vulnerability alongside poverty as elements of well-being, because focusing exclusively on a narrow poverty conceptualisation carries notions of “the poor”, often with an accompanying “victim” perspective, whereas a focus on vulnerability is desirable because a gendered understanding of vulnerability remains a relatively unexplored area. The key factor of importance in this research is the degree of voluntarism with regard to a female-headed household’s status.

Waite’s research establishes the methodological necessity of examining intra-household distributive mechanisms that determine individuals’ well-being. The respondents were asked if any possessions had been sold in the last six months. Of those households that owned one or more possession, it was a slightly higher proportion of male-headed households that had sold possessions in the last six months compared to female-headed households.

Semi-structured interview questions were carefully devised, and interviews were conducted with 100 households in five different collectives. Seventy-five female-headed households and 25 male-headed households were randomly (and informally) selected. Local interviewers were hired and the people posing the questions were always women, in an attempt to minimise the effect of cultural restrictions on women talking freely.

This study raises several interesting conceptual themes. First, the discussed complexities of intra-household allocation patterns have barred coherent conclusions and perhaps render the concept of household vulnerability obsolete. Although it is often practically desirable to collect data at the household level, the data is constrained by the notion of “household vulnerability” partially existing as an academic inaccuracy due to it being no greater than the sum of its individual members’ vulnerability and therefore composite in nature. While it is unwise to assume a reduction of household vulnerability necessarily translates into a reduction of each household member’s vulnerability; it is also implausible to suggest that efforts to reduce vulnerability at the household level have no beneficial effect at the level of any household member’s vulnerability. The household as a unit may not be framed around “perfect” intra-household welfare maximisation, but there must be some individual well-being advantage to living in a communal, resource-pooling arrangement that potentially facilitates “trickle across.”

Secondly, the increased concern with “female-headed households” in the social science arena has been shown to be translated into targeting at the policy level in Iraqi Kurdistan. Blind targeting of female-headed households that are perceived to be vulnerable is not appropriate, as both female- and male-headed households experience vulnerabilities; but experience them in different gendered ways.

Furthermore, the disaggregation of data by the gender of the household head may not suffice; it appears that household size can also be a critical indicator of vulnerability in the collectives of Iraqi Kurdistan. It is difficult to recommend a more suitable method of

targeting (rather than, for example, the gender of the household head or geographical location targeting of collectives) as choice will obviously depend to a great extent on the particular type of assistance being implemented. The author claims that if this paper can contribute to a raising of awareness of how vulnerabilities differ for female- and male-headed households then targeting aimed at reducing these vulnerabilities may be more successful.

In terms of vulnerability and material assets, 22% of the female-headed households own land in comparison to a slightly smaller proportion of male-headed households, at 16%. The average area of land owned is larger for female-headed households at 7.75. Female-headed households own an average number of livestock per household, which is over double the number of livestock compared to male-headed households, when the figure is adjusted to per household adult. Furthermore, the value of female-headed households' livestock is considerably greater than male-headed households' livestock. In general, male-headed households are in a more vulnerable position than female-headed households with regard to livestock assets.

In terms of home ownership, female-headed households are more likely to be in the vulnerable situation of renting their house (48%) as opposed to male-headed households (36%) being more likely to have a secure material asset base through home ownership. Therefore, female- and male-headed households experience different vulnerabilities with regard to material assets, as female-headed households are more likely to be vulnerable in terms of household possessions and home ownership, and male-headed households experience greater vulnerabilities in their land and livestock assets. This relative lack of vulnerability for female-headed households in terms of their land and livestock assets is surprising given that the lack of these assets for women is often the focus of theories to explain female subordination.

The average household weekly income for male-headed households is greater than for female-headed households, but when this is adjusted for household size, it appears that members of male-headed households are actually more vulnerable monetarily than members of female-headed households. A more detailed disaggregation by household size reveals a rather complex picture. While female-headed households are only marginally worse off than male-headed ones in the 1–4 size bracket, the situation is not only reversed to a greater degree in the mid-sized households (5–8), but also their average weekly money per-capita levels are the lowest of the three household size divisions. It is in the largest sized households (9–12), however, that the greatest disparity between female and male-headed households is seen with female-headed households worse off in terms of their weekly income per person.

In terms of domestic labour, it is not only impossible to conclude that either female-headed households or male-headed households are more vulnerable in human capital terms, but discussion has also revealed the importance of recognising intra-household gendered patterns of vulnerabilities. The vulnerabilities examined so far have a weakness in shifting

the focus away from supra-household social female-headed households in Iraqi Kurdistan. In terms of social capital, a gender disaggregation by household head reveals virtually no difference in household ability to borrow money. The average male-headed household borrows a much larger amount of money than the average female-headed household, which indicates the greater capability of male-headed households to mobilise social networks to gain access to money lending. Although the female-headed households appear to be in a more vulnerable position with regards to access to social capital, this relative lack of informal social capital (or possibly financial prudence) results in the female-headed households being considerably less vulnerable in terms of debt repayment. As regards household size, the larger households are more likely to borrow money and they predictably incur larger amounts of debt. Despite relative levels of benevolent informal social capital implicated in the coping response of borrowing, members of male-headed households appear to be more vulnerable, both through actual levels of indebtedness and also through being more likely to have their household decision-maker as the male head with possibly inequitable intra-household distributive mechanisms in operation.

Although it is often practically desirable to collect data at the household level, the data is constrained by the notion of "household vulnerability" partially existing as an academic misnomer due to the household being no greater than the sum of its individual members' vulnerability and therefore composite in nature. However, we should be cautious of subsuming the concept of household vulnerability entirely into measurements of individual vulnerability. While it is unwise to assume a reduction of household vulnerability *necessarily* translates into a reduction of each household member's vulnerability; it is also implausible to suggest that efforts to abate vulnerability at the household level have *no* beneficial effect at the level of any household member's vulnerability. The household as a unit may not be framed around "perfect" intra-household welfare maximisation, but there must be some individual well-being advantage to living in a communal, resource-pooling arrangement that potentially facilitates "trickle across".

The increased concern with "female-headed households" in the social science arena has been shown to be translated into targeting at the policy level in Iraqi Kurdistan. Blind targeting of female-headed households that are perceived to be vulnerable is not appropriate due to both female and male-headed households experiencing vulnerabilities; but experiencing them in different gendered ways. Both men and women are vulnerable, but the brunt of poverty – and vulnerability – is felt by women. The disaggregation of data by the gender of the household head may not suffice; it appears in the collectives of Iraqi Kurdistan that *household size* can also be a critical indicator of vulnerability. It is difficult to recommend a more suitable method of targeting (rather than, for example, the gender of the household head or geographic location targeting of collectives) as choice will obviously depend to a great extent on the particular type of assistance being implemented. If this paper can contribute to a raising of awareness of how vulnerabilities differ for female and male-headed households then targeting aimed at reducing these vulnerabilities may be more successful.

Table 7 Waite (2000) study and Lambani compared

	Lambani (our study)	**Louise Waite (2000)**
		Durham University research team's work in Iraqi Kurdistan (1998)
Scale	Local (village level) – one village	5 collectives, Suleimaniyah, Iraqi Kurdistan
Methodology	Multiple methods (transect walk, two way matrix, participatory mapping, interviews and survey)	Semi-structured interview questions were carefully devised; interviews conducted with 100 households in five different collectives. Seventy-five female-headed households and 25 male-headed households were randomly (and informally) selected. Local questioners were hired and the people posing the questions were always women in an attempt to minimise the effect of cultural restrictions on women talking freely
Hazards	Floods, droughts, extreme heat and extreme cold	General hazards
Key ideas	Expanded notion of poverty Links between vulnerability, poverty and gender Opportunity to gain social capital	Intra-household dynamics important. Women not always more vulnerable than men. Men more able to borrow money but this makes them more vulnerable. Men own homes, women don't (so women more vulnerable in this regard). Women have more land (assets) but men have more "other" assets. Women more livestock than men. Questions the value of talking about household vulnerability rather than individual members. Larger female-headed h/hs vulnerable but smaller female-headed h/hs less vulnerable than male-headed h/hs (attention to h/h size) School attrition – seems higher with boys Trickle across (not just h/h intervention although this might trickle across to members – but rather be aware of individual differences within h/hs) H/h size matters (not just h/h unit)
Theoretical frame	Capability Approach and social capital	Gendered vulnerability (poverty and vulnerability) Social capital (ability to borrow money)

Poverty is generally a static concept whereas vulnerability is a more fluid and dynamic concept which is more suitable for a life course perspective that better captures processes of change. The concept of household vulnerability is obsolete. Chambers (1998) in Waites (2000) defines vulnerability as defencelessness, insecurity and exposure to risks, shocks and stress which can all be experienced without actually being poor

5.2.4 Kakota *et al*. (2011) - gender vulnerability to climate variability and household food insecurity

It is assumed that hazards are experienced by all households in a community, but exposure to hazards varies among individuals depending on their roles and responsibilities and this leads to different exposure to climate risks and access to resources. As a result, households have varied adaptive capacity to respond to climate risks and hence differ in their vulnerability to food insecurity.

Impacts from risks occur when a person is exposed to such risks and these impacts may vary among individuals and households. Exposure to risks depends on several factors that place people at the risk of becoming livelihood and food insecure. The highly vulnerable are those who are especially exposed and sensitive to risks and whose adaptive capacity is constrained by natural, social, economic and physical factors. The way an individual responds to risks depends on many factors such as access to resources and cultural issues. The study by Kakota *et al*. (2011) provides evidence of local dynamics and underlying vulnerabilities in two villages in Malawi, Manjawira and Mitole, that require attention before pursuing adaptation policies and interventions.

Focus group discussions revealed that women and men have different roles and responsibilities in their homesteads; this is also applicable to our project. The responsibilities among gender groups are different between cultures while the roles are common across cultures. For example, the provision of household needs is the responsibility of men in the matrilineal culture in Manjawira, while it is the responsibility of both men and women in male-headed households in Mitole. However, these trends have changed with climate variability; responsibilities which were previously male are now shared between men and women, because of the increased demand at the homestead. Apart from roles and responsibilities common to men and women, women have extra roles and responsibilities such as collecting water and firewood, fetching and preparing food, household chores, taking care of children and the sick and child bearing. Women in Lambani face the same challenges.

In addition, most women's roles involve routine activities which must be repeated daily in the homestead, unlike men's roles which are mostly demanded when need arises. Culturally, women engage in one role or the other throughout the day. Women and girls suffer greatly when resources are scarce while men have some free time which they can use to engage in income generating activities. Most of the women's roles are dependent

on natural resources such as water and fuel wood. This research raises concerns that are also raised in our project and also in Waite (2000) highlighted above. In female-headed households all the roles and responsibilities are taken by women, sometimes assisted by their elder children (especially girls). This makes them more vulnerable when resources are scarce.

Access to and control over these resources are different for men and women, with men having more access. For instance, male heads of households had attended at least primary education (mean 1.12 for Manjawira, 1.04 for Mitole) while most female heads of households had no formal education (median 0.88 for Manjawira and 0.63 for Mitole). The availability of food through production is influenced by the availability of land, inputs and human labour. All these factors are gendered. For example, the quality of labour for women is constrained by household chores which demand more of their time as resources become scarce due to climate variability. Access to nutritious foods depends on the availability of income or social networks. However, income is influenced by access to diversified livelihoods, which is also a constraint for women. Moreover, women are responsible for household food preparation and nutrition. Poor access to resources and livelihoods implies a poor quality of food for the household. Therefore, adaptation can be gender biased if gender vulnerabilities are not taken into consideration, and this can lead to different food security status.

Similar coping and adaptation strategies were observed in Mitole and Manjawira, which are also applicable to our work. Coping strategies for a shortage of food due to less rainfall, dry spells and droughts included skipping meals or reducing the number of meals per day so that food can last longer; reducing the quantity of food; and substituting usual meals (nsima) with less preferred meals like vegetables, fruits, porridge and locally diluted drinks. In the case of reduced water and firewood resources, households cope by using water sparingly and using energy-saving technologies for cooking. Other strategies like selling livestock and other assets, food for work, finding alternative livelihoods like selling charcoal and off-farm employment also provide a temporary relief for the households. It was, however, noted that few male-headed households would skip meals because men had diverse livelihoods that complemented other sources of food and income in the homestead.

Adaptation strategies to address effects of dry spells, droughts and less rainfall include soil and water conservation technologies, planting trees to establish community woodlots, community grain banks in Manjawira, planting early-maturing and drought-resistant crops, planting different types of crops such as maize, cassava, groundnuts, sweet potatoes, millet, cotton and sorghum (intercropping and mixed farming), using modern agricultural technologies such as hybrid seeds and conservation agriculture, and using energy-saving stoves. Migration was also common among communities in Mitole.

However, it is mostly men who migrate to look for employment or food because, culturally, women do not provide for the needs of the household. Engaging in small-scale businesses

is a common adaptation strategy among women while men engage in selling charcoal and firewood. Women were more active in establishing community woodlots by participating in tree nurseries and planting trees. This was so because woodlots provided solutions to the depleted firewood, thereby reducing their workload. Additionally, women had strong and organised networks that could easily be used for interventions.

Agricultural policies that support adaptation strategies should take into account the diverse responses to climate impacts and gender vulnerabilities. Policies that improve agricultural production, health facilities, availability of water sources and energy-saving cooking technologies, and promote the empowerment of women are more likely to improve household food security in Malawi. In addition, interventions must target a wider population because climate variability is a community issue and affects all households. This will increase food security at the community level and also improve household food security through social networks. Furthermore, policies that restrict the minimum age for marriages and child labour can likely increase the education levels of girls in areas that are highly affected by climate variability. Although some gender roles change due to climate variability impacts, there is a need for sensitisation and empowerment for both men and women to build strong networks in order to effectively adapt and reduce vulnerability to food insecurity. Exposure and sensitivity to climate risks varies between men and women; each gender responds differently to climate risks – and in this case, men have more opportunities than women. The results highlight the need for policies and interventions to empower women so that they have access to resources that can strengthen household resilience to climate variability.

Table 8 Kakota *et al.* (2011) study and Lambani compared

	Lambani (our study)	Kakota, Nyariki, Mkwambisi & Kogi-Makau (2011)
Scale	Local (village level) – one village	Two extension planning areas, Mitole in Chikhwawa district and Manjawira in Ntcheu district, Malawi
Methodology	Multiple methods (transect walk, two way matrix, participatory mapping, interviews and survey)	Cross-sectional comparative data was collected through household questionnaire interviews and key informant interviews, in Chikhwawa and Ntcheu districts, located in the southern and central areas of Malawi. A total of 200 households were randomly selected and among these were 96 (48%) female-headed households and 104 (52%) male-headed households. Cross-sectional comparative data was collected from the study areas over a period of three months, from January to March 2010. Focus group discussions were conducted with groups of men and women separately in 15 villages. A total of 30 focus group discussions were conducted. Participatory data-collection techniques in gender analysis, such as activity profiling, livelihood profiling, impact assessment, free listing, preference ranking, seasonal calendars and time lines were used to solicit information on climate risks, impacts, gender roles and responsibilities, sources of livelihoods and access to and availability of resources. From this data, capabilities, challenges and opportunities to implement adaptation strategies were identified among gender groups
Hazards	Floods, droughts, heat and cold	General hazards
Key ideas	Expanded notion of poverty Links between vulnerability, poverty and gender Opportunity to gain social capital	Men more educated than women Survival strategies – skipping meals or changing to less preferred foods. But men don't skip their meals. Out-migration of men not women as men seen to be the providers. Changing pressure on h/hs has resulted in changes in roles where both men and women perform duties that used to be traditionally for men only
Theoretical frame	Capability Approach and social capital	-

5.2.5 Amuzu *et al*. (2010) - gender risk, poverty and vulnerability in Ghana. To what extent is the LEAP cash transfer programme making a difference?

The authors posit that the importance of social protection has become increasingly recognised in recent years in Ghana, especially in the wake of the recent food price and global economic crises, but there has been little attention to the role that gender plays in

the implementation and effectiveness of social protection programmes. Drawing on evidence that women are more likely to invest additional income in family well-being, it is often assumed that gender is already being addressed in social protection initiatives because many cash or asset transfer programmes and public works schemes target women, The role that gender relations play in social protection effectiveness is, however, more complex. Gender norms and dynamics may affect the type of risk that is tackled, the choice of social protection modality implemented, awareness-raising approaches, public buy-in to social safety net programmes and, most importantly, programme outcomes. In Ghana, there has been growing policy momentum around social protection issues over the past five years, motivated by a concern to reduce poverty and vulnerability. Amuzu *et al*. (2010) analyse the extent to which gender-specific economic and social risks inform LEAP[28] programme design and implementation, with the aim of informing ongoing initiatives to strengthen the program's effectiveness.

The LEAP programme design has a strong focus on addressing the care burden of women and it highlights the particular vulnerabilities faced by elderly women. Coping strategies drawn on by male- and female-headed households were relatively similar, although some gender differences did emerge. Male-headed households were more likely to resort to adverse coping approaches, whereas women will work on others' farms or harvest leftovers as an economic coping strategy – an activity never done by men (especially in Gushiegu). There is generally also less female than male migration, although in Gushiegu there are more cases of women migrating. In addition, in order to cope with intersecting economic and social vulnerabilities, households rely on a wide range of coping mechanisms, such as formal/government social protection mechanisms like cash or asset transfers, individual efforts (undertaking additional paid or unpaid work, reducing quality and quantity of food consumption, harvesting crops early); adverse coping strategies (including distressed sale of assets, increasing indebtedness, migration, relying more on children's labour inputs and withdrawing children from school); and social/community-based help (relying on family members, social networks). Faith also emerged as a critical coping mechanism, with many respondents referring to divine intervention as a way of understanding their life trajectories. Religious faith helped respondents accept their circumstances better but also appeared to lessen their impetus to seek to change their lot.

LEAP is helping households to meet a range of practical gender needs, including covering the costs of essential food items, school supplies and the national health insurance card. The cash transfers are also facilitating households to receive and repay loans from family and friends, to better withstand environmental shocks such as droughts and floods and related price increases and to more easily participate in community social networks.

The research methodology involved a mixed methods approach of qualitative and quantitative work. It was structured around the following four areas: (i) understanding the diversity of gendered economic and social risks (ii) gender analysis of social protection

[28] Livelihood Empowerment Against Poverty.

policy and design (iii) effects of the social protection programme on gender equality, food security and poverty/vulnerability reduction at community, household and intra-household levels and (iv) implications for future policy and programme design to improve social protection effectiveness.

Given the cultural, ethnic, agro-ecological and religious diversity that characterises Ghana, there is significant variability across regions. Here the authors look at the context-specific economic and social vulnerabilities experienced by men and women in the Northern Region, particularly in the two districts, Chereponi and Gushiegu and consider the coping strategies at their disposal.

The household survey asked LEAP programme beneficiaries to identify two main quantifiable trends: i) the dominant vulnerabilities and risks among households below the poverty line and the extent to which these risks are gendered and generational; and ii) to provide an understanding of both household and individual coping strategies in the face of the above risks, including both informal and formal social protection mechanisms. FGDs[29] were then used to tease out the details of the social protection impacts, both direct and indirect, at individual, household and community levels.

The report looks at the key gendered economic and social risks and vulnerabilities facing poor people in Ghana. It emphasises the marked geographical variation and the rural–urban divide in terms of the nature and intensity of economic risks and vulnerabilities. Gendered risks and vulnerabilities include an increasing trend of feminisation of migration, women's higher illiteracy rates, greater time poverty, overrepresentation in the informal sector and limited land rights. Elderly women appear to be especially vulnerable, on account of their lower lifetime earnings, weaker social ties and networks as they age and high burden of care, particularly in the context of human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS). Many of these economic risks and vulnerabilities are reinforced or exacerbated by gendered social institutions and practices. On the one hand, there has been considerable progress in terms of legislation to advance gender equality in recent years in Ghana, including the 2005 Human Trafficking Act and the 2007 Domestic Violence Act. Despite this, a range of discriminatory gendered practices persist that undermine girls' and women's human capital development. Intra-household gender power relations appear to be highly unequal in many households.

Social risk is aggravated by gender inequality, social discrimination and unequal distribution of resources and power at the intra-household level. This includes women's limited say over their time use, and in some cases gender-based violence. Child labour and trafficking remain significant problems and are highly gendered; child and early marriage, although decreasing, is still practised in some areas, with negative implications not only for girl education but also for future intra-household power relations. Polygamy,

[29] Focus group discussions.

as a social institution, is widely practised in parts of Ghana and, as it remains outside many aspects of family law, it is disadvantaging many women.

Importantly, the cash transfers do not seem to have notably reshaped household dynamics. This is in part because the transfer amount is low and does not provide women with any significant financial independence or start-up capital for petty income generation projects. It is also perhaps because of a dearth of public awareness and educational efforts linking the transfer to women's care-giving responsibilities, and a relatively thin civil society engaged in gender equality issues which could help reinforce messages and initiatives at the community level. Moreover, in the absence of complementary empowerment measures, there has been little change in women's community participation, with attendance at meetings failing to translate into an effective voice.

The Amuzu *et al.* (2010) study draws attention to restricted networks due to the burden of age. Amuzu *et al.* (2010) are aware, too, that there are instances where women do have control over decisions and instances where they are dominated and where the unequal distribution of resources and power is more explicit. Vulnerability is one of the major themes of this article. It is linked to the economic and social risk and vulnerability facing poor people in Ghana such as income and consumption shocks and stresses.

Women's access to and control of assets and productive inputs is a major challenge for women in Ghana. Women still play an important role in agriculture but their productivity is constrained by limited access to and ownership of land and credit or inputs. Small-scale farmers, of whom many are women, are disadvantaged in credit markets since land is a common basis for collateral in Ghanaian financial institutions. Women generally have less access to extension services/officers, which translates into lower incorporation of technological innovations, and even with access to extension services, women's access to credit for agricultural implements is still limited.

Social protection is commonly defined as encompassing a subset of interventions for the poor carried out formally by the state (often with donor or international non-governmental organisation (INGO) financing and support) or the private sector, or informally through community or inter and intra-household support networks. Social protection is an increasingly important approach to reducing vulnerability and chronic poverty, especially in contexts of crisis. To date, however, there has been a greater focus on economic risks and vulnerability. Social risks such as gender inequality, social discrimination, unequal distribution of resources and power at the intra-household level, and limited citizenship are often just as important in pushing and keeping households in poverty.

Table 9 Amuzu *et al*. (2010) study and Lambani compared

	Lambani (our study)	**Amuzu, Jones and Pereznieto (2010)**
Scale	Local (village level) – one village	Research was conducted in six sites in two districts, Chereponi and Gushiegu, in Ghana's Northern Region, one of the poorest areas in the country. Sites were selected drawing on a purposive matched sampling technique, which involved selecting two districts with a similar poverty ranking, of neither transient nor extreme poverty (approximately "middling poor"), using the Ghana Statistical Service (GSS) 2000/01 district poverty map.
Methodology	Multiple methods (transect walk, two way matrix, participatory mapping, interviews and survey)	Used semi-structured questionnaires, key informant interviews were carried out in October 2009 to provide a broader understanding of social protection design decision-making processes and to explore the political economy dimensions of the integration of gender into social protection policies and programmes. At the sub-national level, key informant interviews with implementing agencies aimed to provide a better understanding of the key challenges of implementing social protection at the local level and the implications/impacts of implementation challenges on households and individuals.
Hazards	Floods, droughts, heat and cold	General vulnerability
Key ideas	Expanded notion of poverty Links between vulnerability, poverty and gender Opportunity to gain social capital	Social protection Social risk LEAP programme evaluation Intra-household inequalities Age disparities (older people had dimnished social capital)
Theoretical frame	Capability Approach and social capital	

5.2.6 O'Brien *et al.* (2004) - Mapping vulnerability to multiple stressors: climate change and globalisation in India

Although vulnerability has been recognised as a recurring theme in the human dimension of climate change research, it is usually studied in isolation of other stressors. Thus, despite acknowledgement of the fact that exposure to multiple stressors is of great concern in developing countries, until this study was carried out there had been no method developed to express or define vulnerability in the context of multiple stressors. This study therefore presents a method of mapping vulnerability to two stressors at a sub-national level in four main steps. The project mapped vulnerability of a region in relation to multiple stressors in a four-step approach. The two stressors, which were mapped, are climate change and economic globalisation.

The article is divided into four main subsections, which provide detail and insight into how each of the steps was carried out, where the data for each step was obtained and the output of each step. Sixty-eight percent of India's one-billion strong population is directly or indirectly involved in the agricultural sector – a sector vulnerable to climate variability (low and erratic rainfall) and the considerable uncertainties associated with climate model projections of tropical monsoon behaviour.

India's agricultural sector is influenced by more than varying climatic conditions. Widespread promotion of Green Revolution technologies during the 1960s increased agricultural yields in India for some crops and farmers by introducing high-yielding varieties that depend on inputs, including irrigation, chemical fertilisers, and pesticides.[30] In recent years, national and state agricultural policies have emphasised decentralised and participatory natural resource management, particularly for practices such as watershed development and agroforestry.[31] The effects of the economic changes are expected to be uneven with some farmers and districts benefiting from market liberalisation (in the form of investments and technology) while others may have difficulty adjusting.

The authors approach to developing a climate change vulnerability profile uses the Intergovernmental Panel on Climate Change (IPCC) typology to develop measures of adaptive capacity, sensitivity and exposure.

> … *the (IPCC) provides a useful typology suggesting that vulnerability may be characterized as a function of three components: adaptive capacity, sensitivity, and exposure.*[32] *Adaptive capacity describes the ability of a system to adjust to actual or expected climate stresses, or to cope with the consequences. It is considered a*

[30] Goldman & Smith (1995); Freebairn (1995)
[31] Sanyal (1993)
[32] McCarthy *et al*. (2001)

function of wealth, technology, education, information, skills, infrastructure, access to resources, and stability and management capabilities[33]

Sensitivity refers to the degree to which a system will respond to a change in climate, either positively or negatively. Exposure relates to the degree of climate stress upon a particular unit of analysis; it may be represented as either long-term changes in climate conditions, or by changes in climate variability, including the magnitude and frequency of extreme events. The vulnerability profile was constructed by combining indices for adaptive capacity with sensitivity indices based on the assumption that climate change exposure would affect the current sensitivity (positively or negatively) and that farmers will respond to these changes if they have the necessary adaptive capacity.

Based on conditions as far back as 1991 the authors identified significant biophysical, socio-economic, and technological factors that influence agricultural production. The socio-economic factors consisted of levels of human and social capital, and the presence or lack of alternative economic activities. The presence of alternative economic activities provides an indicator of the ability of farmers to move to other economic activities in response to adverse climate conditions. Technological factors consisted of the availability of irrigation and quality of infrastructure. Districts with higher irrigation rates and/or better infrastructure are expected to have a higher capacity to adapt to climate fluctuations and other economic shocks. Irrigation rates are measured by net irrigated area as percentage of net sown area.

Since most of the country is heavily dependent on the monsoon rains for 80% of the total annual rainfall, a climate sensitivity index (CSI) was constructed to measure sensitivity to exposure. The CSI measured dryness and monsoon dependence where the dryness index was considered a representation of drought sensitivity and monsoon dependence was considered to represent an average of extreme rainfall events.

While the liberalisation of agricultural trade may have provided new opportunities for some Indian farmers to engage in production for export markets, at the same time, it may have exposed other farmers to competition from imported agricultural products. The second step of the study was the mapping of globalization, i.e. the liberalisation of agricultural trade. Although a vulnerability framework is not typically applied to economic studies (within a context of globalisation), a growing literature shows that some regions and social groups are likely to be disproportionately vulnerable to the negative effects of globalisation.[34]

The vulnerability to globalisation profile was also developed through the typology of adaptive capacity, sensitivity and exposure. The same biophysical, socio-economic, and technological indicators that represent adaptive capacity for climate change also serve to

[33] McCarthy *et al.* (2001), p.8

[34] Conroy and Glasmeier, 1993; Mittelman, 1994, 2000; Deardorff & Stern, 2000; O'Brien & Leichenko, 2003

characterise adaptive capacity for agricultural trade liberalisation: soil conditions and groundwater availability influence the types of crops that can be cultivated, while literacy levels, gender discrimination, infrastructure, and the availability of irrigation provide indicators of social and economic means of adapting to changing conditions of production.

When mapping globalisation under sensitivity and exposure at a district level, focus was placed on exposure to import competition. Growing dependence on crops for export may have left some farmers vulnerable to global price fluctuations and subsequently economic disruption. Attention was therefore limited to import-sensitive crops since it was import competition, which represented the greater immediate threat to the Indian agricultural sector. Import sensitivity took into account cropping patterns and the productivity of a representative basket of crops that may be subject to competition from imports, and the distance of the district to the nearest international port.

Identifying areas of “double exposure” is the third step in the project. By combining information from the climate and globalisation vulnerability maps, the authors were able to identify districts and areas vulnerable to both stressors. Areas which fall into the high to very high category for both climate change vulnerability and globalisation vulnerability are areas of “double exposure” where globalisation and climate change may pose challenges to the agricultural sector.

Areas of “double exposure” are a cause for concern. They are likely to be areas where farmers are adapting to a variable and changing climate under conditions of economic stress. Reacting to two processes of change simultaneously will, of course, present challenges throughout India, but the “double exposure” districts are likely to feel disproportionately more stress, particularly if there is a mismatch between climate-compatible crops and market-driven demand for those crops. It is in these areas of double exposure where policy changes and other interventions may be most needed in order to help farmers to negotiate changing contexts for agricultural production.

Case studies carried out at the ground level enabled the authors to identify state and local-level institutions and policies which influenced the coping and adaptation strategies used by farmers. Carried out between 2002 and 2003, the case studies used a range of rural assessment techniques that allowed for the cross checking of responses to key research questions across multiple data sources. Government officials were interviewed to determine “which agriculturally relevant state policy reforms had been implemented since the liberalisation process”. Villages were then selected for local-level studies on the basis of both secondary statistics of socio-economic and climatic conditions in various parts of the district, and discussions with local experts from governmental and non-governmental organisations. Lastly, household interviews were conducted to assess how agricultural reforms have influenced farmers’ and agricultural labourers’ livelihoods and ability to cope with calamities such as drought. The goal of the research was thus to provide a systematic methodology to operationalise vulnerability in the context of multiple stressors.

There is growing recognition in the human dimensions research community that climate change impact studies must take into account the effects of other ongoing global changes. Yet there has been no systematic methodology to study climate change vulnerability in the context of multiple stressors. Using the example of Indian agriculture, this paper presents a methodology for investigating regional vulnerability to climate change in combination with other global stressors. This method, which relies on both vulnerability mapping and local-level case studies, may be used to assess differential vulnerability for any particular sector within a nation or region, and it can serve as a basis for targeting policy interventions.

It is important to note that the districts with the highest (or lowest) climate sensitivity under the scenario of climate change used here are not necessarily the most (or least) vulnerable. For example, most districts in southern Bihar have only medium sensitivity to climate change, yet are still highly vulnerable to climate change as the result of low adaptive capacity. By contrast, most districts in northern Punjab have very high sensitivity to climate change, yet are found to be only moderately vulnerable as the result of high adaptive capacity. Assessment of both adaptive capacity in combination with climate change sensitivity and exposure is thus crucial for differentiating relative vulnerability to climate change. The case study results further suggested that state-level agricultural policies, which vary across India, may play a critical role in increasing local adaptability to climate variability and change in the context of trade liberalisation.

The methodology applied provides a means for evaluating the relative distribution of vulnerability to multiple stressors at a sub-national level. This is accomplished by applying the IPCC framework to map regional vulnerability as a function of adaptive capacity, sensitivity, and exposure to climate change and other global stressors. The second strength is the use of both top-down and bottom-up approaches to understanding vulnerability. By combining regional vulnerability mapping with local-level case studies, it is possible to capture factors and processes operating and interacting at different scales, and to understand how local-level decisions are shaped by factors at the national and international level. And the third is that the method helps identify those locations where policy intervention is most critical—both geographically and thematically.

The methodology employed in the study can be used to map areas/regions of vulnerability to any number of stressors in the study area. The development of a vulnerability framework may significantly influence the development of policy and legislation. Multiple stressor mapping may help in the formulation of a vulnerability framework, as it is a good way to identify the degree to which a region is vulnerable to a particular stressor as well as providing some insight into the adaptive capacity of the same area. This would allow for a well-informed decision to be made regarding policies, interventions and initiatives in the area of interest.

The farmers in this case study may face shortfalls in production of a selection of crops due in part to trade liberalisation but mostly to the effects of climate change. In our own case,

Lambani, agricultural activity was destroyed due to floods, while in India the lack of floods caused significant damage to agriculture. Unlike the Lambani case study, this study paid no attention to nuances of feelings or aspirations. The closest O'Brien and Leichenko get to emotions is the use of the term sensitivity. However, in the 42 instances where the term is used it is never used to refer to people but rather to a condition or state of climate change or the effects of trade liberalisation.

Table 10 O'Brien *et al.* (2004) study and Lambani compared

	Lambani (our study)	**O'Brien *et al.* (2004) (researchers involved in the study: Robin Leichenko, Ulka Kelkar, Henry Venema, Guro Aandahl, Heather Tompkins, Akram Javed, Suruchi Bhadwal, Stephan Barg, Lynn Nygaard and Jennifer West)** This project was undertaken with the financial support of the Government of Canada provided through the Canadian International Development Agency and the Government of Norway through the Royal Ministry of Foreign Affairs
Scale	Local (village level) – one village	India – two districts and regional level analysis
Methodology	Multiple methods (transect walk, two way matrix, participatory mapping, interviews and survey)	The study was carried out in four steps: 1) Development of a national vulnerability profile for climate change at district level 2) Development of a national vulnerability profile for an additional stressor at district level (economic globalisation) 3) Superimposed profiles to identify "doubly exposed" districts in India 4) Case studies in selected districts A combination of investigative techniques, data analysis and interviews was used
Hazards	Floods, droughts, heat and cold	Droughts and floods
Key ideas	Expanded notion of poverty Links between vulnerability, poverty and gender Opportunity to gain social capital	Globalisation Double exposure Multiple stressor mapping Trade liberalisation Climate change Adaptive capacity, sensitivity and exposure

		Sensitivity only refers to physical/natural environment Regional (policies, institutions) and local-level analysis (apply adaptive capacity, sensitivity and exposure criteria) May be cc vulnerable but not adaptive capacity vulnerable – advantage of multiple stressor approach
Theoretical frame	Capability Approach and social capital	IPCC framework

5.2.7 Babugura (2010) - Gender and climate change: a South African case study

While climate change is global in nature, its impacts are not expected to be globally homogeneous but rather differentiated across regions, generations, age classes, income groups, occupations and between women and men. The consequences of climate change are predicted to be potentially more significant for the poor in developing countries than for those living in more prosperous nations.[35] Africa being a home to many of the world's poorest nations, has already demonstrated its vulnerability to the effects of current climate variability (e.g. effects of events such as droughts and floods). Key impacts of climate change are associated with sea level rise, changes in the intensity, timing and spatial distribution of precipitation, changes in temperature and the frequency, intensity and duration of extreme climate events such as droughts, floods, and tropical storms.[36]

The continent not only faces the challenge of dealing with the possible consequences of future climate change but it is also exposed to multiple stressors (socio-economic, health, political and environmental factors), which serve to exacerbate climate stress events. These stressors affect the ability to anticipate, prepare for and respond to current climate variability and may further heighten vulnerability to future climate change. Addressing the threat of climate change has therefore become a global priority.

The concept of gender-differentiated impacts is traditionally used in the context of poverty and disaster studies to identify and address factors that constrain the development of gender-responsive policies and strategies. The gender-differentiated impacts in poverty and disaster studies have been attributed to gender inequalities, women's status, their activities and socio-economic vulnerabilities in general. In the climate change discourse, the same rationalisation is used to justify gender-differentiated impacts of climate change. Gender-differentiated impacts in the context of climate change are linked to differentiated vulnerabilities. The vulnerability of men and women to the impacts of climate change would therefore imply examining their exposure to climate change, which includes climate variability and extremes, their different sensitivities to these direct effects which lead to

[35] Olmos, 2001; IPCC, 2007; USAID, 2007; UNDP, 2009; USAID, 2009
[36] IPCC, 2001; IPCC, 2007; USAID, 2007; UNDP, 2009

different impacts, and their adaptive capacity (the ability to adjust to the changing climate so as to moderate potential damage, to take advantage of opportunities or to cope with the consequences). Given the gender-differentiated impacts and vulnerabilities, men and women will also have different priorities and responses to climate change in terms of coping and adaptation so as to build resilience. Adaptation is key to the enhancement of resilience of vulnerable systems. Within a social context, resilience depends on people's capabilities to adapt to internal and external shocks and stresses. This means that when change such as climate change occurs, resilience provides the mechanisms for restoration and reorganisation, which are critical for adaptation.[37]

One of the key attributes of resilience lies in the variety of functional groups and the accumulated experience and memory that provides for reorganisation following disturbances. It is therefore vital to understand the actions taken by men and women to help them moderate, cope with, or take advantage of actual or expected changes in climate conditions. For coping and adaptation to be successful (resulting in resilience), resources that would enhance men and women's capacity to adapt to climate variability and change need to be equally accessible. With appropriate resources, women and men have the ability to develop complex adaptive strategies, differentiated by gender so as to build resilience to climate variability and change.

The study was carried out using qualitative techniques, which were guided by a combination of gender analysis tools. The data collected through these techniques was then used to understand the differences in gender roles, activities, needs and opportunities within the context of climate change. The purpose of the study was to examine the interrelations between climate change and gender and thereby contribute to bridging the information gap on gender-differentiated impacts of climate change. The study was also an attempt to create awareness among policy and decision makers about the need for gender-differentiated adaptation policies.

The study was carried out in rural areas of two district municipalities in KwaZulu Natal, namely, uMzinyathi and uMhlathuze. This region was selected according to a study published by the South African Human Sciences Research Council in 2004 which stated that KwaZulu Natal was the province with the greatest poverty gap, with 60% of the population living in poverty. This study was conducted as part of a regional project funded by the Heinrich Böll Foundation, through its southern African regional office. The project is aimed at investigating the gender-differentiated impacts of climate change in South Africa, Namibia, Botswana and Mozambique.

Given that the men and women in both study areas are poverty stricken and depend on agriculture and natural resources for their livelihoods, climate change poses a risk for them. Gender-differentiated impacts of climate variability were manifested in the unequal

[37] Gunderson & Holling, 2002; Berkes & Folke, 2002

distribution of roles and responsibilities of men and women in both study areas. Results reveal that through socially constructed roles and responsibilities, women seem to bear the brunt of problems resulting from climate variability impacts. Women's burdens were more evident in their response to the impacts of climate variability. Women were found to have extra workloads when faced with climatic stressors as they made efforts to cope with them. Working longer hours than men affected them not only physically but emotionally drained them as they constantly have to worry about the well-being of their household members, especially their children and the youth who depend on them.

Although the men's workload is lighter than that of women, they are also impacted by climate variability. Men's impacts are more psychological than physical. Their psychological effects are further compounded by unemployment resulting in negative coping mechanisms. The results also show that gender roles are undergoing change due to climate-related impacts which are further heightened by factors such as unemployment, HIV/AIDS and poverty which forces men and women to engage in different activities leading to new roles. With more women diversifying their livelihoods, gender roles are also being impacted. There is a change in gender roles to accommodate responses to the impacts of climate variability.

It was evident that women are now involved in activities that generate earnings, thus reshaping relationships between men and women. The income generated by women through trade is used to sustain the household. Women generating an income also have more opportunities and power to decide what the income can be used for. The shift is also driven by the country's Constitution, gender legislation in the KwaZulu Natal province, the need for women to provide for their families and women's determination to see change that will improve their position in society. Women have also come to realise that it will take more than the Constitution and decent laws to end gender inequalities. They strongly believe that, in addition to the Constitution and the laws, men need to accept the changing role of women in post-apartheid society. Women are aware that the Constitution and the laws simply provide an enabling environment and a platform from which women can voice their concerns. The study shows that women are very knowledgeable and innovative with regards to coping with the impacts of the changing climate. Lessons can be drawn from their knowledge of how women can be better assisted to adapt to climate change. Results confirm that women play an important role in supporting households and communities to cope and adapt to climate variability.

There is a clear use of nuance of feelings and aspirations. Words such as hope, fear, worry, motivation, etc. are all used when reporting the results of the study. Themes, which run throughout the report, are vulnerability, resilience, coping, adaptation and mitigation. All terms are used in relation to the condition of the environment as well as the well-being and circumstances of people in the study area. This case study resonates with our own work in Lambani. It is also explicitly stated in the report that the work conducted cannot be used to generalise the gender and climate change dynamic for the whole of South Africa. It seems as though the similarities arise based on the type of area the study was

conducted in. As in Lambani, the communities in the literature are heavily dependent on agriculture as means of livelihood, which makes them extremely vulnerable to the effects of climate change.

The author also explicitly states that “access to land, credit, agricultural inputs, decision-making bodies, and technology and training services, education, natural resources, mobility, access to equal economic opportunities, information and communication systems” would enhance the ability of people to better adapt to climate change and variability. Some of these (access to decision-making bodies and resources) were also identified in the Lambani case study as being required to improve and better the circumstance of men and women.

Table 11 Babugura (2010) study and Lambani compared

	Lambani (our study)	**Dr. Agnes Babugura (2010)** The findings published in this study are one part of a regional project funded by the Heinrich Böll Foundation. The same study was conducted in Mozambique, Namibia and Botswana.
Scale	Local (village level) – one village	KwaZulu Natal, namely, uMzinyathi and uMhlathuze.
Methodology	Multiple methods (transect walk, two way matrix, participatory mapping, interviews and survey)	Qualitative research techniques included focus group discussions, role play, life history and key information interviews
Hazards	Floods, droughts, heat and cold	Climate change
Key ideas	Expanded notion of poverty Links between vulnerability, poverty and gender Opportunity to gain social capital	Gender impacts (differentiated) Feelings and aspirations (e.g. worry, fear, hope) Changing roles with women becoming more empowered Awareness of national policies (eg the Constitution) but that these are enabling but insufficient in themselves to bring about change Cannot generalise and need case-specific material Men’s psychological experiences also noted
Theoretical frame	Capability Approach and social capital	Gender analysis

5.3 SUMMARY

According to Sen (1999), the five instrumental freedoms that should be present and that women should have access to are: political freedom, economic facilities, social opportunities, transparency guarantees and protective security. Access to these is necessary for women to gain a better quality of life and to acquire the capabilities they need to act as their own agents of change. As from the discussion above, the CA goes beyond asking about satisfaction of people's preferences to ask what women's opportunities and liberties actually are, as well as how available resources work or do not work in enabling women to function. Designing effective and long-term adaptation responses requires understanding the pathways that people are currently pursuing towards greater well-being, and ensuring that interventions are aligned and ultimately support these goals. CA enables policymakers to do this, as well as to identify the specific opportunities and barriers that make people's ability to achieve well-being more or less successful. From this perspective, CA draws attention to local contexts, suggesting that each adaptation project or need must be designed with inclusive participation by those affected by climate impacts, particularly the most vulnerable.

Atique (2014) points out that the CA is able to take account of diversity, which impacts on one's vulnerability. It can also include social and political recognition, which vulnerable communities recurrently fight for. Moreover, its open-ended nature makes it context-specific and allows for flexibility. It can also be supplemented by community-level studies that make the required specifications and use participatory or procedural methods to determine what capabilities individuals in vulnerable communities value.

Roy and Venema (2002) focus on improving the well-being of women faced with gender inequalities and even more so during climate change impacts. The authors advocate the benefits of the CA in improving their well-being which then reduces their vulnerability to the impacts of climate change. And Klinsky *et al.* (2014) offer a new approach to these challenges by linking actions to combat climate change with broader equity objectives, placing the well-being of people and communities at the core of climate action. Attention is now drawn to lessons learnt from the selected literature that expands on the work on gender, climate change and vulnerability in Lambani. First, the study by Cannon (2002) is presented where the focus is on experiences of floods in Bangladesh. Cannon considers an expanded notion of poverty and makes the links between vulnerability, poverty and gender explicit. The point is also made that floods – however devastating – have provided an opportunity to build new social capital. Cannon goes on to explore the idea of self protection and claims that it is in the absence of self-protection capacity, that people rely on social protection. Cannon's study examines societal attitudes that inhibit women and states that their mobility is restricted for a number of reasons: they have responsibility for their children, their clothes hinder their movement and they are less likely to swim. Furthermore, women experience shame-based feelings at the idea of having to mix with

men in public shelters. They also experience fear and worry at not being able to protect their families.

Alston (2006) writes about New South Wales, Australia, where there are extreme experiences of drought and he examines the gendered aspect of these experiences. Alston's work adds value to our study. In this study the idea of trauma and gender and stress is presented. Women migrate more than men (out-migration) as they seek opportunities to bring income to the home and, at the same time, to support their men who are working on the farms and to keep hope alive. Women are expected to play the role of "farm wife" even though they more often than not have higher levels of education than men.

Waite (2000), writing on Iraqi Kurdistan, draws our attention to intra-household dynamics, warning that it is unhelpful to consider the household as the unit of analysis without taking into consideration diversity within the household. She draws attention to the different strengths that men and women have – for instance, women own more livestock and land whereas men own their houses. Intra-household dynamics are especially important and women are not always more vulnerable than men. Men are more able to borrow money, but this makes them more, not less, vulnerable. Women have more land (assets) but men have more 'other' assets. The study is important as it questions the value of talking about household vulnerability rather than individual members. Household size matters when considering vulnerability; Waite found that larger female-headed households are vulnerable but smaller female-headed households are less vulnerable than male-headed households. Although there is diversity within the household, helping the unit as a whole is likely to have a "trickle across" effect. In Iraqi Kurdistan, school attrition of the boy child is higher than that of the girl child.

Kakota *et al.* (2011), from their case study in Malawi, present the argument that impacts from risks occur when a person is exposed to such risks but these impacts may vary among individuals and households. Exposure to risks depends on several factors that place people at risk of becoming livelihood and food insecure. The highly vulnerable are those who are especially exposed and sensitive to risks and whose adaptive capacity is constrained by natural, social, economic and physical factors. The way an individual responds to risk depends on many factors such as access to resources and cultural issues. The study therefore provides evidence of local dynamics and underlying vulnerabilities that require attention before pursuing adaptation policies and interventions.

Amuzu *et al.* (2010) focus on Ghana and analyse the extent to which gender-specific economic and social risks inform the LEAP programme's design and implementation, with the aim of informing ongoing initiatives to strengthen the program's effectiveness. The authors draw attention to the care burden of women and highlight particular vulnerabilities faced by elderly women. Coping strategies employed by male- and female-headed households were relatively similar, although some gender differences did emerge. Male-headed households were more likely to resort to adverse coping approaches, whereas

women will work on others' farms or harvest leftovers as an economic coping strategy – an activity never done by men (especially in Gushiegu). There is generally also less female than male migration, although in Gushiegu there were more cases of women migrating. Age is significant with older women being more vulnerable than younger women; one factor is that they are more restricted in their social networks.

The case of India is presented by O'Brien *et al.* (2004). O'Brien *et al.* (2004) present a method of mapping vulnerability to two stressors at sub-national level in four main steps. The project mapped the vulnerability of a region in relation to multiple stressors. The two stressors, which were mapped, were climate change and economic globalisation. The authors consider the idea of double exposure – stressing that vulnerability depends on whether there is single or double exposure. The study examines the effects of climate change and and trade liberalisation on farming. The effects of globalisation are analysed through the lens of adaptive capacity, sensitivity and exposure. The natural/physical environment is considered to be sensitive and sensitivity refers to this domain – and not to humans. The authors add value by considering multiple scales. On the one hand the regional (policies/institutions) can be vulnerable and in turn cause vulnerability while the criteria of adaptive capacity, sensitivity and exposure are applied to the local-level analysis. A particular site may be vulnerable to climate change but not adaptive capacity vulnerable. This is the advantage of a multiple stressor approach.

Babugura (2010) chose KwaZulu Natal, South Africa, as the site for an investigation into gender and climate change. One of the key attributes of resilience lies in the variety of functional groups and the accumulated experience and memory that provides for reorganisation following disturbances. It is therefore vital to understand the actions taken by men and women to help them moderate, cope with, or take advantage of actual or expected changes in climate conditions. The author considers differentiated gender impacts. Feelings and aspirations are isolated and the author refers to worry, fear and hope. This study highlights changing gender roles where women are becoming more empowered. There is an awareness of national policies (such as the Constitution) but also awareness that these form part of an enabling environment and as such are necessary but not sufficient to bring about change. Like many of the other authors presented here, Babugura warns that case-specific material is needed and that generalisations are not helpful. There is also a focus on the psychological experiences of men – their worries and concerns. The study was also an attempt to create awareness among policy and decision makers about the need for gender-differentiated adaptation policies.

Applying a capabilities lens to adaptation and resilience serves as a reminder of the equity dimensions present in adaptation. Different populations are affected by climate change in varying ways and to differing degrees, often due to disparities in social and economic contexts and people's underlying capabilities. However, climate policies themselves may not be designed in ways that take into account these diverse levels of capabilities. Just as with low-carbon development, a capabilities approach in the adaptation arena helps to identify policies that will enhance equity and build capabilities, as well as avoid unintended

negative consequences, particularly for the least well off.

The team believes that the emotional well-being of community members is critical for a vulnerability assessment. Therefore, developing a vulnerability assessment framework for extreme weather conditions that is gender sensitive is crucial in informing policy in its adaptation strategies. The vulnerability framework would guide policy and contribute to an understanding that women and girls cannot be overlooked in adaptation strategies.

6 THE POLICY ENVIRONMENT: BARRIERS TO ACCESS TO RESOURCES FOR WOMEN[38]

Barriers to access to resources for women originate in a wide range of structural problems, such as the enabling policy environment, cultural attributes, issues of class, race and gender as well as the plethora of meanings and confusions assigned to ideas of gender, vulnerability and climate change. In order to complete the gender mainstreaming framework, the project team examined selected policies so that the framework is contextualised within a current "enabling" policy environment at multiple scales (global, continental, national and local). The project team also undertook a brief overview of gender policies that are pertinent to the study with a particular emphasis on the national policy environment and whether, and in what ways, it speaks to the themes of gender and/or climate change.

6.1 DEFINING AN ENABLING ENVIRONMENT

What is an enabling environment? According to the Global Water Partnership (GWP) [2013][39], a proper enabling environment ensures the rights and assets of all stakeholders (individuals as well as public and private sector organisations and companies, women as well as men, the poor as well as the better off), and protects public assets such as intrinsic environmental values. The enabling environment is determined by national, provincial and local policies and legislation that constitute the "rules of the game" and facilitate all stakeholders to play their respective roles in the development and management of water resources. It also includes the forums and mechanisms, information and capacity building, created to establish these "rules of the game" and to facilitate and exercise stakeholder participation *(ibid).* It is a set of interrelated conditions – such as legal, organisational, fiscal, informational, political, and cultural – that impact on the capacity of development actors such as civil society organisations (CSOs) to engage in development processes in a sustained and effective manner" (Thindwa, 2001).[40]

In order to achieve efficient, equitable and sustainable water management within the integrated water resources management (IWRM) approach, both a top-down and a bottom-up approach for the participation of all stakeholders needs to be promoted — from the national level down to the catchment or watershed level. Decision-making in this context needs to be governed by the principle of subsidiarity, which drives down action to the lowest appropriate level (GWP 2013). In addition to government agencies and private companies, water development and management should involve NGOs, CSOs that have

[38] The project team is grateful to the Water Research Commission, the Institute for Women and Gender Studies at the University of Pretoria and the Global Water Partnership for content taken from the study entitled "Gender and Water Policies in Africa Project' (2013) for Chapter 6 of this report which has drawn heavily on this report

[39] http://www.gwp.org/en/ToolBox/TOOLS/The-Enabling-Environment/

[40] Thindwa, J., "Enabling environment for Civil Society in CDD Projects", Washington, DC: World Bank, Social Development Family, CDD Learning Module, 2001. Available at: http://www.worldbank.org/participation/enablingenvironment/EnablingenvironmentCECDD.pdf

full participation of women and disadvantaged groups, and other sections of civil society. All these organisations and agencies have an important role to play in enhancing access to water, in bringing about a balance between conservation and development, and in treating water as a social and economic good (*ibid*). Importantly, and as seen from the discussion that follows in this report, an enabling environment for gender and climate change at multiple scales is lodged not only in the water sector but also beyond.

Policy environments enable rural women's empowerment when they address the gender disparities and discrimination that exist across different sectors, such as agriculture, rural development, forestry, fisheries, trade, finance, education, health and environment. As such, policies that are complementary and coherent are essential to rural women fully enjoying their rights, and participating and leading in economic, social and political matters. This report turns now to global, continental and regional platforms, with a particular focus on gender concerns at those multiple scales.

6.1.1 Climate change and gender

There has been relatively limited in-depth analysis of the gender dimensions of climate change to date, partly because of the uncertainties of climate change science and the lack of downscaled data which makes it hard to predict how the climate will change at a very local level, and because social change processes are difficult to predict. However, the literature indicates that women are disproportionately vulnerable to climate change, because they are more likely to be found in the poorest sections of society, have fewer resources to cope and are more reliant on climate-sensitive resources because of the gender division of labour. They tend to have lesser access to livelihood resources and hence more limited capacity to participate in climate change adaptation processes – although they should be treated as active agents rather than victims. Although all members of poorer villages are affected, women and female-headed households are likely to be most affected by increasing extreme weather events, greater climate variability and long-term shifts in climate averages. Children and the elderly have certain unique vulnerabilities and capabilities with respect to climate change, but these are also shaped by social determinants. So, while all societies will be affected by climate change, the impacts will vary by location, exposure, and context-specific social characteristics, identity, power relations and the political economy (Nelson, 2011).[41]

Attention to gender and equity has lagged behind in climate change research, programming, national policy making and in international negotiations.[42] Studies on climate change and gender have initially, by necessity, been somewhat speculative in nature. The impacts of climate change are affecting and will affect disproportionately poorer rural and urban communities in developing countries, but few of the vulnerability

[41] Nelson (2011), Gender, Generation, Social Protection and Climate Change, a thematic overview. Overseas Development Institute (ODI)

[42] Masika, ed. 2002; Wamukonya and Skutsch, 2002; Nelson *et al*, 2002; Cannon, 2002; Skutsch, 2002; Dankelman, 2008; FAO, 2007; Lambrou and Grazia, 2006; Terry, 2009

and adaptation assessments adequately explore the gendered or socially differentiated nature of those impacts. This is starting to change with more evidence being gathered from the field of how increased climate variability and climate change is affecting developing countries' populations, and with potential future scenarios being explored - but a great deal more of this kind of analysis and understanding is needed.

As stated before, there is a lack of representation of women and of gender issues in climate change policies and decision-making from local to international levels. At national levels, vulnerability assessments and the National Adaptation Programmes of Action for Least Development Countries have lacked adequate gender analysis (Dankelman, 2008; Dankelman *et al.*, 2008; Nelson, 2009), although there are a few positive elements in a small number of cases (UNFPA and WEDO, 2009). At the international level in the climate negotiations this absence has been noted for some time and gender activists are attempting to tackle it, with some progress on inclusion in the UNFCCC texts (Dankelman, 2008).[43]

It is important to recognise that the discourse framing women as "vulnerable, passive victims" risks reinforcing the exclusion of women as "active agents" in responding to climate change, and ignores their capabilities, knowledge and relevant skills, which should be built upon in climate responses (e.g. FAO, 2007; CARE, 2009). With appropriate support, they can be – and are already – successful protagonists in action on climate change at all levels. Many of the publications rightly emphasise **women's capacity to act** and the fact that gender norms and division of labour also creates gender-differentiated knowledge. Thus women may have specific skills, for example as seed managers, which can be built upon in climate change adaptation. Women's knowledge and capacity as managers of natural resources are discussed – e.g. see the 14 case studies in International Strategy for Disaster Reduction (ISDR, 2008), which demonstrate grassroots women's leadership in disaster risk reduction, adaptation and development, and also evidence from this project team's findings (K5/2314). But at the same time other papers note the importance of not conflating "women" with "nature" (Nelson *et al*., 2002) and of exploring how gender roles are constantly changing (Babagura, 2010).

A recent study by the Women's Environmental Network (WEN, 2010) also concludes that women are more likely to live in poverty, and because of gendered social roles, they are more likely to be negatively affected by climate change. Inequality based on gender is the most widespread form of oppression, and development and climate change can only be *equitable* if they place women's empowerment and the tackling of gender inequality centre-stage – it cannot be treated as an optional extra (Neefjes *et al.*, 2009; Neefjes & Nelson, in Dankelman, 2010). Gender inequality intersects with other types of discrimination, such as ethnicity, caste, class and age, but analysis of these other forms of discrimination in the context of climate change is relatively undeveloped (see Enarson, Fothergill & Peek, 2006). It is not enough just to "add on" a concern for women's issues in

[43] Sorely missing from the 1998 Kyoto Protocol to the UNFCCC

climate responses – gender equality and women's empowerment is not an optional extra but a critical part of equitable development (Nelson, 2011).

6.1.2 Gender and climate change policy

Policy literature and toolkits on gender and climate change have increased in the last few years (see, for example, the "Training Manual on Gender and Climate Change" by Aguilar, 2009) alongside increased lobbying and advocacy by activists in international negotiations. These activities have sought to challenge the undifferentiated focus and technocratic orientation of previous climate change debates,[44] encouraging greater attention to the climate justice imperatives of equitable climate change mitigation and adaptation. Until lately, the international policy discourse, including the UNFCCC and its Kyoto Protocol has hardly included consideration of gender issues (e.g. Lambrou and Lamb, 2004; Skutsch, 2002; Rodenberg, 2009). Any international, post-2012, Kyoto Protocol agreement will have enormous implications for gender equality.[45] Gender activists and development agencies have been supporting participation of women from developing countries and consideration of gender issues in the negotiations processes (FAO, 2007). The parties to the UNFCCC are involved in negotiating a post-2012 agreement to follow up the Kyoto Protocol that expired in 2012. The post-2012 framework was supposed to cover not just mitigation, but also adaptation, technology transfer, capacity building and finance (Dankelman, 2010). Gender advocates achieved a status for women's civil society groups as a Provisional Constituency in the UNFCCC process, a formal recognition which has not yet materialised although, in 2012, it "was likely to be become fully established soon." Civil society engagement has been fairly weak in the UNFCCC process but women's NGOs and development NGOs have worked hard to ensure that women are now one of the groups that are part of the formal fora for civil society engagement in the UNFCCC process, enabling them to make official interventions from the floor on behalf of women and gender equality (Dankelman, 2010).

To build women's participation in national climate change adaptation planning, participatory processes are required that enable the voices of diverse groups of disadvantaged women, as well as men, to be heard by policy makers. There is no straightforward way of successfully challenging dominant narratives and inequitable power relations. Moreover, participatory processes risk exacerbating divisions, especially if not well facilitated. However, deliberation and awareness-raising is required in climate change and efforts to ensure that policy making is more gender sensitive. Khamis, Plush & Zelaya (2009) used a participatory video as a tool to promote women's engagement in adaptation and planning in Nepal. Their main aim was to explore how the use of participatory video could help poor and marginalised women secure their rights in the face of the effects of climate change. Nelson (2011) stated that sharing and discussing both meteorological data and scenario building with local communities to explore climate

[44] Dankelman, 2008; Neefjes *et al*, 2009; Minu and Rohr, 2009; Terry, 2009
[45] Skutsch, 2002; Dankelman, 2008; Terry, 2009

futures is part of many adaptation programmes – but space and support is needed if more disadvantaged groups are to have a voice.

6.2 GLOBAL GENDER PROTOCOLS

6.2.1 Beijing Platform for Action[46]

The United Nations convened the Fourth World Conference on Women on 15 September, 1995, in Beijing, China. The delegates had prepared a “Platform for Action” that aimed at achieving greater equality and opportunity for women. The official title of the conference was "The Fourth World Conference on Women: Action for Equality, Development and Peace".[47] The Platform for Action was an agenda for women's empowerment. It aimed at accelerating the implementation of the Nairobi Forward-looking Strategies for the Advancement of Women and at removing all the obstacles to women's active participation in all spheres of public and private life through a full and equal share in economic, social, cultural and political decision-making.

The Economic Commission for Africa’s (2010) main report titled: *“A Fifteen-Year Review of the Implementation of the Beijing Platform for Action in Africa (BPfA) +15 from 1995–2009,”* took place against a setting of frameworks put in place to accelerate implementation of commitments to gender equality, equity and empowerment of women. The review covers the extent to which countries have met their commitments to implementing the BPfA, within the specific context of the 12 critical areas of concern. These include:

- Women and poverty;
- Education and training for women;
- Women and health;
- Violence against women;
- Women and armed conflict;
- Women and the economy;
- Women, governance, power and decision-making;
- Institutional mechanisms for the advancement of women;
- Human rights of women;
- Women and the media;
- Women and the environment; and
- The girl child.

Equality between women and men is a matter of human rights and a condition for social justice and is also a necessary and fundamental prerequisite for equality, development and peace. The Platform for Action reaffirmed the fundamental principles set forth in the

[46] http://www.wikigender.org/index.php/Fourth_World_Conference_on_Women
[47] The United Nations Fourth World Conference on Women
http://www.un.org/womenwatch/daw/beijing/platform/index.html

Vienna Declaration and Programme of Action adopted at the World Conference on Human Rights in Vienna in June 1993. The Platform required immediate and concerted action by all to create a peaceful, just and humane world based on human rights and fundamental freedoms, including the principle of equality for all people of all ages and from all walks of life. To this end it recognises that broad-based and sustained economic growth in the context of sustainable development is necessary to sustain social development and social justice. The Fourth World Conference on Women (in Beijing) accelerates the process that formally began in 1975 which was declared International Women's Year by the United Nations General Assembly. That year was a turning-point in that it put women's issues on the agenda. The UN Decade for Women (1976–1985) was a world-wide effort to examine the status and rights of women and to bring women into decision-making at all levels (*ibid*).

6.2.2 CEDAW[48]

The Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) was adopted in 1979 by the UN General Assembly. It is often described as an international bill of rights for women. It consisted of a preamble and 30 articles defining what constitutes discrimination against women and sets up an agenda for national action to end such discrimination. The Convention defined discrimination against women as:

...any distinction, exclusion or restriction made on the basis of sex which has the effect or purpose of impairing or nullifying the recognition, enjoyment or exercise by women, irrespective of their marital status, on a basis of equality of men and women, of human rights and fundamental freedoms in the political, economic, social, cultural, civil or any other field.[49]

Part 3, Article 14(h) of CEDAW notes that women are: *"to enjoy adequate living conditions, particularly in relation to housing, sanitation, electricity and water supply, transport and communications."*

6.2.3 United Nations Conference on Environment and Development (UNCED) 1992

The United Nations Conference on Environment and Development (UNCED), 1992, is also known as the Rio summit, Rio Conference and Earth Summit. Over 172 governments participated.[50] The UNCED, having met at Rio de Janeiro from 3 to 14 June 1992, reaffirmed the Declaration of the United Nations Conference on the Human Environment, which was adopted at Stockholm on 16 June 1972, seeking to build upon it, with the goal of establishing a new and equitable global partnership through the creation of new levels of cooperation among states, key sectors of societies and people. Working towards international agreements which respect the interests of all and protect the integrity of the

[48] http://www.un.org/womenwatch/daw/cedaw/cedaw.htm
[49] http://www.ohchr.org/Documents/ProfessionalInterest/cedaw.pdf
[50] See http://habitat.igc.org/agenda21/rio-dec.htm for declarations of UNCED 1992

global environmental and developmental system, it recognises the integral and interdependent nature of the Earth, our home. It proclaims 27 principles, and Principle 20, in particular, states that: “Women have a vital role in environmental management and development.”

Numerous international agreements and mechanisms address human rights, population issues, sustainable development, climate change and disaster planning. Together they offer a framework of rights and commitments that support the inclusion of gender concerns in national climate change policies and legislation (*ibid*). The UNFCCC is a vehicle to prioritise and fund most immediate climate change adaptation needs. Guidelines state that National Adaptation Programmes of Action should be participatory and involve both women and men at the grassroots level, recognising that some climate change impacts are gender specific. In practice, the integration of gender and reproductive health issues has been weak.

The UN Convention on Biodiversity (UNCBD) was adopted in 1992 for the conservation and sustainable use of biodiversity. The UNCBD has clear sustainable development and climate change implications, but it mentions women only in the preamble. Targeting women’s biodiversity knowledge is crucial because of the link to household-level food security. It does however recognise women’s knowledge, practices and gender roles in food production.[51]

Launched in 2007, the Global Gender and Climate Alliance (GGCA) works to ensure that climate change policies, decision-making, and initiatives at global, regional and national levels are gender responsive, which is critical to solving the climate crisis. GGCA brings a human face to climate change decision-making. It fosters initiatives to integrate a gender perspective into policy and decision-making, ensure that financing mechanisms on mitigation and adaptation address the needs of poor women and men equitably, build capacity at all levels to design and implement gender-responsive climate change policies, strategies and programmes, and share practical tools, information, and methodologies to facilitate the integration of gender into policy and programming.

The World Summit on Sustainable Development (Johannesburg, 2002) reaffirmed and strengthened commitment to Agenda 21 – the action plan which was a product of UNCED (1992) – and recognised the adverse effects of climate change. Gendered analysis of climate change will be improved through the Summit’s call for more effective and accountable institutions to ensure women’s equal access to full participation in decision-making.

The Hyogo Framework for Action (HFA, 2005) was developed at the World Conference on Disaster Reduction with the goal of substantially reducing disaster losses by 2015. It

[51] In the Subsidiary Body on Scientific, Technical and Technological Advice. Source: WEDO 2008. Gender, Climate Change and Human Security: Lessons from Bangladesh, Ghana and Senegal, New York: WEDO: http://www/wedp/prg/wp-content/uploads/hsn-study-final-may-20-2008.pdf

explicitly incorporates gendered aspects of disaster planning and response. The HFA states that "a gender perspective should be integrated into all disaster risk management policies, plans and decision-making processes, including those related to risk assessment, early warning, information management and education and training. It also recognises that climate change, climate variability and demographic shifts contribute to the vulnerability of peoples and places.

The United Nations High Level Focus on Climate Change (2007) recognised climate change as a global issue. The UN General Assembly held an informal thematic debate on Climate Change as a Global Challenge, and the Secretary General convened a high level event on climate change where the Women's Environment and Development Organisation (WEDO) and the Council of Women World Leaders organised a Roundtable on Gender and Climate Change with, as keynote speaker, Dr Gro Harlem Brundtland, UN Special Envoy on Climate Change. Consequently, the November International Women Leaders Global Security Summit (NIWLGSS) acknowledged that climate change poses significant security risks, particularly for women, and that women have to be included in decision-making at all levels.

The Human Security Network, under the Hellenic Presidency for 2007–2008, concentrated on the impacts of climate change on vulnerable populations (see WEDO's Gender, Climate Change and Human Security report).

6.3 CONTINENTAL LEGISLATIVE FRAMEWORK ON GENDER

6.3.1 African Ministers' Council on Water (AMCOW)

"AMCOW provides a platform on the continent to unpack gender issues and it provides a space to debate issues of human rights."[52]

Ministers responsible for water in 41 African countries met in Abuja, Nigeria, in April 2002, and decided to form an African Ministers' Council on Water (AMCOW) to promote cooperation, security, socio-economic development and poverty eradication through better management of water resources and provision of water supply services. AMCOW's mission is to provide political leadership, policy direction and advocacy in the provision, use and management of water resources for sustainable social and economic development and for the maintenance of African ecosystems. AMCOW is actively engaged in keeping the state of Africa's water under review and in promoting actions of common interest to African stakeholders.

At their second Extraordinary Session in 2004, the African Union (AU) heads of state and/or governments declared their support for AMCOW and its role in developing plans and policies related to the management of all water resources in Africa. AMCOW's major

[52] Interview with Barbara van Koppen, from the International Water Management Institute (8 October, 2013)

functions are: (i) to facilitate regional and international cooperation through the coordination of policies and actions among African countries on water resources issues; (ii) to review and mobilise additional financing for the water sector in Africa; and (iii) to provide a mechanism for monitoring the implementation progress of major regional and global water resources, water supply and sanitation initiatives. As a specialised technical committee of the AU, AMCOW does not implement any activities. It provides a forum for dialogue on water issues with UN agencies and other partners, promotes government participation in regional studies of climate change and the development of observation networks. It also facilitates information exchange and aims to develop policies and strategies to address water issues facing the continent.[53] The AMCOW gender strategy has identified seven mutually reinforcing objectives that should be pursued by all member states, partners and water authorities (Table 12).

Table 12 AMCOW gender strategy objectives

1	Policy positions on gender in the water sector in Africa supported and strengthened through policy formulation and implementation
2	Adequate human and financial resources allocated to gender mainstreaming through strategic resource mobilisation activities
3	Gender approach to implement project interventions at all levels within the water sector, including economic empowerment, through equal access to water for productive purposes developed and adopted
4	Strategic research and collection of operational information on gender undertaken, produced, shared and used by stakeholders to inform evidence-based responses
5	Human and institutional capacity developed to support gender equality interventions at all levels
6	Mechanisms to promote cooperation and coordination to mainstream gender in the water sector strengthened
7	Monitoring and evaluation system and indicators to support gender equality interventions in the water sector developed and implemented

6.3.2 Protocol to the African Charter on Human and People's Rights on Women's Rights.

The Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa, better known as the Maputo Protocol, guarantees comprehensive rights to women, including the right to take part in the political process, to social and political equality with men, to control their reproductive health, and an end to female genital mutilation. As the name suggests, it was adopted by the AU in the form of a protocol to the African Charter on Human and Peoples' Rights.

[53] AMCOW Policy and Strategy for Mainstreaming Gender in the Water Sector in Africa (2011)

The graph below shows the three decades that have passed between CEDAW (1979) and AMCOW (2011). It shows the first significant agreement, CEDAW, in 1989 and the most recent, AMCOW, in 2011.

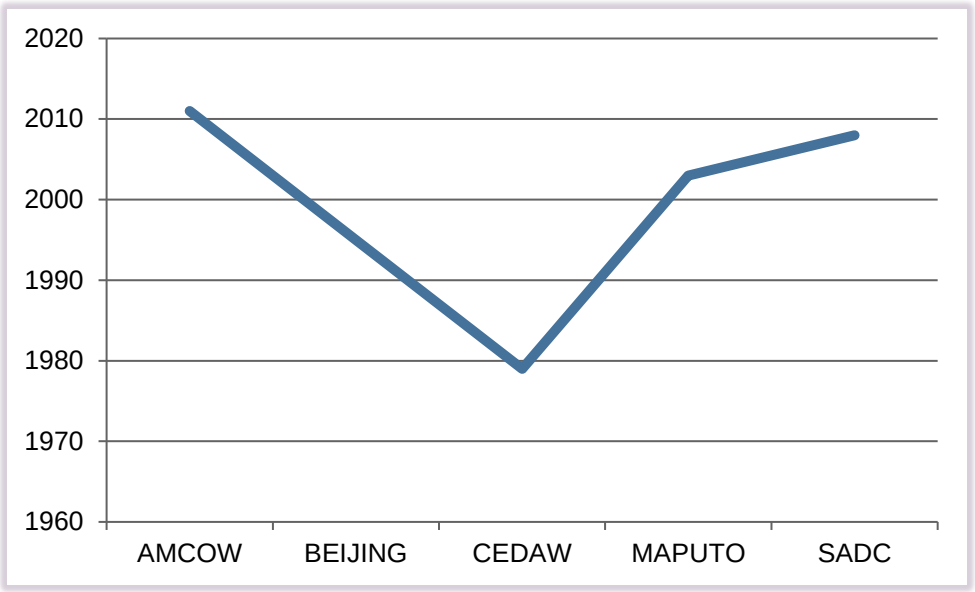


Figure 33 Timeline CEDAW to AMCOW

6.3.3 Background to African water policy and gender

At the first Africa Water Week, which took place in Tunis, in 2008, the idea of developing the AMCOW Strategy for Mainstreaming Gender in Africa's Water Sector was born. As Ms Maria Mutagamba, Minister for Water and the Environment in Uganda at that time, reminded everyone, awareness of gender in the water resources and sanitation sector was low. Gender issues therefore needed to be better understood and addressed within AMCOW, by states, development banks and partners. Ms Mutagamba noted that although good practices were used, knowledge was limited and there were no gender monitoring tools at a regional level. All agreed that much could be gained through enhanced learning, exchange of good practice and better national and regional monitoring of gender impacts in the sector. By 2011, 40 African countries had endorsed the AMCOW initiative. The Review of the Extent of Gender Mainstreaming in the Water Policy and Practices in Southern Africa scrutinises seven selected countries to assess whether – and in what ways – there has been enhanced learning or good practice exchange within or across these seven selected countries in response to international, regional and national gender initiatives, with a particular focus on AMCOW initiatives. To date, no sustained careful review of African countries' water polices has been conducted to assess whether and to what extent gender has been mainstreamed.

6.4 REGIONAL LEVEL – REGIONAL WATER NETWORKS AND POLICIES[54]

6.4.1 Introduction and overview of SADC and water

Johannesburg 9 August: The clock is ticking louder and louder in the count down to 2015, the deadline for achieving the targets of the SADC Protocol on Gender and Development, according to highlights of the 2013 Barometer, released on Women's Day in South Africa.[55]

The Southern African Gender Protocol Alliance had campaigned for this unique sub-regional instrument that has 28 time-bound targets. At a preview of the report with former South African deputy president and head of UNWOMEN designate, Phumzile Mlambo-Ngcuka, at a round table meeting stated that:

Even though we have made great strides in the emancipation of women, gender justice and the struggles of women remain challenging, from gender-based violence, high poverty amongst women, exclusion of women in significant positions, the burden of disease and more. Our work is not yet done … we need to work just as hard to mobilise key institutions in society: our churches, schools, sporting bodies, who must continue the struggles. We also need to broaden the base as many more people are needed for us to overcome the complex battles we face. As foot soldiers in this struggle we need to continue to lead from the front, back and sideways. As people of SADC let us use the SADC Protocol on Gender and Development to entrench and advance the women's cause in our countries. The Protocol must be a living document in all our countries: we must take it to the people. (Barometer, 2012)

Established in 1980, the Southern African Development Community (SADC) is an international organisation with 15 member states: Angola, Botswana, the Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, United Republic of Tanzania, Zambia and Zimbabwe (SADC, 2009).

The SADC Declaration by the Heads of State or Government of Southern African States was adopted in 1992 in Windhoek and the SADC Treaty came into effect in 1993. The overarching goal of the organisation is to enhance socio-economic development, regional integration and the quality of life of all people in the region.

The SADC Secretariat consists of four directorates, *viz*:

- Food, Agriculture and Natural Resources
- Trade, Industry, Finance and Investment
- Infrastructure and Services

[54] SADC Regional Strategic Action Plan on Integrated Water Resources Development and Management, June 2005

[55] http://www.safpi.org/news/article/2013/sadc-gender-protocol-barometer-highlights

- Social and Human Development

Water scarcity has a region-wide negative impact on human populations and not one SADC member state demonstrates a score higher than 61.9 on the Water Poverty Index.[56] More than half of the sub-Saharan population lack access to safe water while more than 40% lack adequate sanitation. The IWRM paradigm ensures environmental sustainability and is critical as a component of poverty alleviation and socio-economic development in the region. Lack of access to safe drinking water and sanitation, for instance, are central components of poverty, and IWRM is a prerequisite for ensuring such access.

As the region's economic grouping, SADC has acknowledged the importance of water in regional integration and development and has adopted a range of measures in support of the joint management of water resources. The Protocol on Shared Watercourses signed in 1995 and amended in 2003 bears testimony to this fact. The adoption of the Southern African Water Vision is yet another testimony. The successful establishment of the SADC Water Division in the Directorate of Infrastructure and Services, within the framework of the new SADC structure, demonstrates the prioritisation of water and its institutionalisation in the new operating environment. The SADC region is aware of the need to respond to these new challenges of how water in general, or IWRM in particular, can contribute to meeting the Millennium Development Goals (MDGs).

As SADC is part of the international community, water-related developments at the international level influence the SADC water agenda. The following have been significant:

- The Second and Third World Water Forum (WWF), held in March 2000 and 2003 respectively, helped to define development and management of water resources within the IWRM paradigm in line with the Dublin principles. An important feature of WWF meetings has been agreements by participating countries to implement specific targets and objectives, not only to improve the status of water resources, but also to ensure that the resource is optimally utilised for the benefit of human kind, e.g. for attainment of the MDGs.
- The adoption of the MDGs in 2000 by world leaders highlighted the contribution water can make to human development and included targets such as reducing poverty, halving the number of people without access to the basic services of water supply and sanitation, ensuring environmental sustainability in all developmental activities, and full exploitation of public private partnerships;
- The Johannesburg 2002 World Summit on Sustainable Development set targets to help countries accelerate the provision of water to people, including the

[56] Of the many water poverty indexes developed, the most notable is that conceptualised by Lawrence, Meigh and Sullivan (2002). Their composite water poverty index has three components, namely, water availability, access to safe water and sanitation, and time and effort to collect domestic water. Lawrence, Meigh and Sullivan (2002) took it further and developed a more comprehensive composite WPI. Using a methodology similar to that of the Human Development Index, they constructed a Water Poverty Index consisting of 5 main components, each with their own sub-components. The main components are *Resources*, *Access*, *Capacity*, *Use and Environment*

development of IWRM and efficiency plans by 2005; and
- The 2004 AU Summit re-emphasised the importance of water in socio-economic development.

The Regional Indicative Strategic Development Plan (RISDP) reinforces the fact that gender is one of the "integration and development enablers" and a cross-sectoral intervention area. There is a need to reinforce efforts towards sustaining the Gender Management System in the form of theoretical and conceptual information as well as practical customised tools on gender mainstreaming. It is against this background that the Secretariat undertook to develop a SADC Gender Mainstreaming Resource Kit which serves as a day-to-day reference for staff of the Secretariat, to facilitate their efforts in integrating gender into their specific sectors, such as:

- Trade, Industry, Finance and Investment
- Infrastructure and Services
- Social and Human Development and Special Programmes and HIV and AIDs
- Food Agriculture and Natural Resources
- Organ of Politics
- Defence and Security Cooperation
- Administration
- Human Resources and Public Relations[57]

The SADC Water Division, within the SADC Directorate of Infrastructure and Services, is tasked with overall coordination and management of the SADC Water Programme. SADC's approach to the water sector is founded on the principles of IWRM and enabled by tools related to institutional development, capacity development, stakeholder participation, information management, integrated planning, conflict resolution and environmental management (SADC, 2007).

The role of the Regional Water Policy and the Regional Water Strategy is to promote regional integration and poverty alleviation within the SADC region. Achieving these goals requires:

- Cooperative management of shared watercourses within the region guided by the principles outlined in the Protocol on Shared Watercourses.
- Harmonisation of national water sector management to facilitate integration and achieve the targets between member states (SADC 2007).[58]

6.4.2 SADC water policy and strategy

6.4.2.1 Protocol on shared watercourses in SADC

[57] The Economic Commission for Africa (2010) main report review titled: "A Fifteen-Year Review of the Implementation of the Beijing Platform for Action in Africa (BPfA) +15 from 1995-2009" henceforth referred to as the BPfA + 15

[58] SADC Regional Water Policy and Strategy-Orange-Senqu River Awareness Kit

Water has played a unifying role in the SADC region, leading to regional cooperation. The Revised Protocol on Shared Watercourses in SADC (Revised Protocol) was the first binding agreement amongst SADC member states, which illustrated the important role water plays within the region (UNESCO, 2009). Botswana, Lesotho, Namibia and South Africa have all ratified this agreement, making it the applicable treaty law for the Orange-Senqu River Basin.

The Protocol on Shared Watercourse Systems (Original Protocol) was originally drafted in 1995 to be aligned with the Helsinki Rules, but was revised to reflect the 1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses (UN Watercourses Convention). The Revised Protocol was signed in 2000 and came into force in 2003 (ORASECOM, 2007j).

The proposal for a protocol on shared watercourse systems came about out of a realisation by the regional leadership that cooperation in the utilisation of shared water resources was necessary and that such cooperation needed a guiding framework. The protocol defines common terms and general principles for water management as well as prescribed procedures for negotiations and conflict resolution.

The SADC Water Division is mandated to implement the Protocol on Shared Watercourse Systems. In its Preamble, the Protocol stipulates a clear commitment to a participative approach by relating to Agenda 21 and the principles of community interests. It recognises the relevant provisions of UNCED's Agenda 21, the concepts of environmentally sound management, sustainable development and equitable utilisation of shared watercourse systems in the SADC region.

The member states undertake to respect and apply the existing rules of general or customary international law relating to the utilisation and management of the resources of shared watercourse systems and, in particular, to respect and abide by the principles of community interests in the equitable utilisation of those systems and related resources.

The Revised Protocol defines a watercourse as "a system of surface waters and ground waters constituting by virtue of their physical relationship a unitary whole normally flowing into a common terminus such as the sea, lake or aquifer." A watercourse state is a state "in whose territory part of the watercourse is situated."

The Revised Protocol stresses the importance of taking a basin-wide approach to water management rather than emphasising the principle of territorial sovereignty. It outlines specific objectives, including improving cooperation to promote sustainable and coordinated management, protection, and utilisation of transboundary watercourses and promoting the SADC Agenda of Regional Integration and Poverty Alleviation (ORASECOM 2007j). It provides the flexibility for countries to enter into specific basin-wide agreements, which is the approach promoted under the Watercourses Convention. The agreement allows for planned measures, such as environmental protection,

management of shared watercourses, prevention and mitigation of harmful conditions and emergency situations (*ibid*). The Protocol was signed by all of the seven countries which are the focus of this study, on 7 August, 2000, in Windhoek.

The Revised Protocol on Shared Watercourses in SADC (Revised Protocol) provides the context for the Regional Water Policy which states overarching goals designed to be put into practice by the Regional Water Strategy. Important inputs to the Regional Water Strategy are the SADC Vision for Water, Life and the Environment, and the Regional Framework for Action. These led to the development of national frameworks for action, the national IWRM Plans (SADC, 2007).

The overarching strategies within the Regional Water Policy are:

- Regional cooperation in water resources management
- Water for development and poverty alleviation
- Water for environmental sustainability
- Security for water-related disasters
- Water resources information and management
- Water resources development and management
- Regional water resources institutional framework
- Stakeholder participation and capacity development
- Accessing funding and resources.

Under the gentle prodding of the SADC Water Division in its oversight role, river basin agreements have been negotiated and are in force in all but a few of our basins. These agreements establish river management bodies on which member states enjoy equal representation, and determine the basin management framework, including members' obligations and roles, rules of engagement, and procedures. In a fair number of these bodies, often referred to as Commissions, the requirement that member states inform other basin states of intended developments in their territories, has become a fixed item on the agenda. This requirement obliges states to inform others even as early as the pre-feasibility stage, thus enabling them to comment and raise their concerns as early as possible in the planning of a project. This has already proved quite effective and satisfactory. Already, all these river basin organisations are delivering on their basic mission to undertake joint studies, share information, build a common information base, coordinate plans, etc.

In almost all cases, member states have had to review water legislation to bring it in line with the Protocol. This process has been undertaken under a special programme driven by the SADC Water Division. The regional body has at times been called upon to interpret clauses of the Protocol thus avoiding potential deadlocks. By and large, however, it has been the political will of member states that has carried this potentially difficult process forward. Meeting international obligations in our management and use of transboundary waters, is explicitly listed as a purpose of South Africa's National Water Act 36 of 1998.

6.4.2.2 Regional Strategic Action Plan (RSAP) on Integrated Water Resources Development and Management (2011–2015).

The Regional Strategic Action Plan on Integrated Water Resources Management (RSAP) is the framework for action to achieve the sustainable development of water resources in the region, through the development of water infrastructure on the basis of sound water governance and water management. One of the goals of the RISDP is to facilitate the achievement of substantive equality between women and men in the SADC region, through mainstreaming gender into all national and regional policies, programmes and activities, and the adoption of measures to accelerate progress in this regard. In the RISDP, gender has been defined as one of the "integration and development enablers" and a "cross-sectoral intervention area".

The gender focus areas of the RISDP are:

- Gender policy and institutional frameworks
- Women's human and legal rights, including elimination of violence against women
- Gender mainstreaming
- Access to, and control of, resources
- Access to key political and decision-making positions.

The SADC Water Division is currently coordinating implementation of the third phase of the RSAP, i.e. RSAP III, 2011–2015. The RSAP III serves as a work plan to guide the development and implementation of activities in the SADC water Sector for the period 2011–2015.[59]

The first RSAP on integrated water resources development and management was approved by the SADC Summit in August 1998. It ran from 1999 to 2004. The main focus of RSAP I was to create an enabling environment for the joint management of regional water resources. It laid the institutional basis for the execution of infrastructure projects and other related development initiatives.

RSAP I supported the implementation of 31 projects, falling into 7 broad categories:

- Legal and regulatory framework
- Integrated basin-wide approach
- Macro-policies
- Knowledge management
- Public awareness
- Stakeholder participation
- Infrastructure investment

[59] www.sadc.int/files/2113/5298/2099/20120229_-Implementation_of_Regional_Strategic_Action_Plan_on_IWRM_and_Development.pdf

RSAP I was reviewed in 2004 to provide recommendations for the formulation of RSAP II (2005–2010). The review concluded that RSAP I "*was the most advanced and comprehensive multi-country freshwater programme in the world*."

The second Regional Strategic Action Plan (RSAP II) on integrated water resources development and management was structured around four strategic areas:

- Regional water resources development, planning and management
- Infrastructure development support
- Water governance
- Capacity building.

Like all SADC sector plans, RSAP II constituted an integral part of the Regional Indicative Strategic Development Plan. RSAP II was reviewed in late 2009 to assess progress made with the implementation of the plan. The results of the review confirmed that good progress had been made against the overall strategic objectives as well as with the implementation of projects relating to regional water resources planning and management, water governance and capacity building.

Some examples of progress made in implementing RSAP II include:

- Development and approval of the Regional Water Policy
- Development and approval of the Regional Water Strategy
- Development of the Regional Awareness and Communication Strategy
- Procurement, distribution and installation of equipment under SADC HYCOS2
- Completion of integrated water resources planning studies at basin level
- Development of basin strategies and databases
- Completion of IWRM demonstration projects in 5 SADC countries
- Establishment and strengthening of several river basin organisations (RBOs)
- Development of guidelines to strengthen RBOs

The New Partnership for Africa's Development (NEPAD) provided another forum for highlighting the importance of water to the continent's socio-economic development. NEPAD selected its Comprehensive African Agriculture Development Programme (CAADP) as the initial programme to demonstrate practical results and impact on gender mainstreaming. CAADP is the NEPAD Agency's framework to stimulate increased agricultural productivity and agriculture-led socio-economic development and growth. One of the thematic focus areas for NEPAD's framework for action is gender mainstreaming under the thematic area of Water Wisdom.

The Review of RSAPII also showed that significant progress had been made in facilitating the setting up of the transboundary RBOs, e.g. the Zambezi Watercourse Commission, ZAMCOM, the Limpopo Watercourse Commission, LIMCOM, and the Orange-Senqu Watercourse Commission, ORASECOM. The review highlighted challenges to implement the plan but gender was not mentioned. Gender mainstreaming is mentioned under

poverty alleviation (Section 3.1.1. of the review). Section four presents four strategic areas, one of which is water governance:

Developing, promoting and implementing best practices regarding effective participation by various stakeholders in water resource development and management, including women, youth and other disadvantaged groups.

Of the targets listed, the second is “increased awareness, broad participation and gender mainstreamed in water resources development and management by 2005” and gender mainstreaming is listed as a priority intervention target. Gender mainstreaming is also mentioned in the policy structure and statements of the regional water policy under the strategic area of stakeholder participation and capacity building. Projects should also not be standalone projects as there is also a need to note that during project development effort should be made to ensure that cross-cutting issues such as gender mainstreaming are competently addressed.

RSAP III (2011–2015) is the third phase of the SADC Water Programme. Its emphasis is on infrastructure. Chapter 2 of RSAP III opens with a photograph showing three girls collecting water. Chapter 3, on the implementation plan, shows eight men laying down pipes. There is one photograph of a women training and the conceptual framework (in Chapter 4), shows a woman teaching in an outdoor classroom. In section 4.2.1 in Chapter 4 on strategic objectives, there is a photograph reflecting a woman working in a laboratory. In the same chapter, in the section on social development (4.2.4), we see women at a borehole pumping water. Overall, the RSAP visuals seem to show a bias with more emphasis on women as collectors of water than as technical experts or scientists.

Programe 6 is on Stakeholder Participation. The objective of this programme is to involve stakeholders in the management of transboundary water resources. One of the priority interventions (6.5) is gender mainstreaming and youth involvement. Women and youth are to be involved with the development and implementation of RSAP programmes and interventions to facilitate the achievement of intergenerational equity, and equality between men and women in the SADC region.

The RSAP is vague in other programmes in its reference to gender. For instance, programme 10 is on water and sanitation, and its reference is to stakeholders in general without any emphasis on gender.

6.4.2.3 Southern Africa Gender Protocol Alliance

The Southern Africa Gender Protocol Alliance was established in 2005. It is a network of networks that has campaigned for the adoption, and now the implementation, of the SADC Protocol on Gender and Development. The alliance consists of national networks of gender NGOs. The Gender Protocol was adopted by SADC Heads of State at the 2008

Summit. It sets 28 realistic, measurable targets and timeframes to achieve equality in line with MDG 2[60] by 2015.

Since 2011, the Alliance has been working closely with the SADC Gender Unit to provide technical assistance to national gender machineries to update national gender policies and to develop costed gender action plans that are aligned to the SADC Gender Protocol, as shown in Figure 34 below.

Figure 34 SADC Gender Protocol.

6.4.2.4 SADC Protocol on Gender and Development

The SADC Gender Protocol was adopted on 17 August, 2008, and it is founded on the rights-based approach to development. It is both a policy document and an implementation framework for mainstreaming gender equality and equity. The Protocol has 28 substantive targets for achieving gender equity by 2015 and it is a global first, placing SADC at the cutting edge of innovative strategies that are able to give substantive meaning to global and continental commitments at the level of a region.

Over 40 national and regional gender NGOs have been running a campaign since 2005 for the adoption, ratification and implementation of the Protocol and together have formed the Southern Africa Gender Protocol Alliance. The Preamble to the Protocol notes that gender equality and equity are fundamental human rights arising out of various international instruments, including the Convention on the Elimination of all Forms of Discrimination against Women and the Protocol to the African Charter on Human Rights and Peoples' Rights on the Rights of Women in Africa (Munalula, 2011). According to Munalula (2011:191), the Protocol "articulates, in a more nuanced and peculiarly southern African way, a number of violations of women's rights, offering radical and practical ways of addressing such violations, particularly in the area of gender-based violence."

The Protocol should result in increased accountability on the part of member states on issues of gender equality, both domestically and regionally (*ibid*). The last part of the Protocol (part ten), contains the Protocol's implementation framework. In terms of this provision, each state is obliged to institute the requisite legislative framework articulating

[60] Achieve universal primary education (boys and girls alike)

appropriate remedies to promote gender equality, including adjudication by legally and formally constituted bodies. Also, a state budget should allocate the necessary human, technical and financial resources to implement the Protocol (Munalula 2011:193).

SADC Ministers for Gender/Women's Affairs met on 2 June, 2011, in Windhoek, Namibia, to design a roadmap that will operationalise the SADC Protocol.

The Protocol is divided into ten sections and has 43 articles. A summary of selected articles of the Protocol that are pertinent for the water sector in general, and in particular for achieving the ideals of IWRM, is presented here.

Part Two. Constitutional and Legal Rights, Articles 4–11
These articles provide for all constitutions in the region to enshrine gender equality and to give such provisions primacy over customary law. All laws that are discriminatory to women are to be repealed. The articles also provide for equality in accessing justice, marriage and family rights and the rights of widows, elderly women, the girl child, women with disabilities and other socially excluded groups.

Part Three. Governance, Article 12: Representation
State Parties shall endeavour that, by 2015, at least fifty percent of decision-making positions in the public and private sectors are held by women including the use of affirmative action measures as provided for in Article 5. States Parties shall ensure that all legislative and other measures are accompanied by public awareness campaigns that demonstrate the vital link between the equal representation and participation of women and men in decision-making positions, democracy, good governance and citizen participation.

Part Three. Governance, Article 13: Participation
States Parties shall ensure the equal participation of women and men in decision-making by putting in place policies, strategies and programmes for:

a) building the capacity of women to participation effectively through leadership and gender sensitivity training and mentoring;
b) providing support structures for women in decision-making positions;
c) the establishment and strengthening of structures to enhance gender mainstreaming and;
d) changing discriminatory attitudes and norms of decision-making structures and procedures.

States Parties shall ensure the inclusion of men in all gender related activities, including gender training and community mobilisation.

Part Five. Productive resources and employment, Articles 15–19
These articles provides for the equal participation of women in economic policy formulation and implementation. The article has provisions and targets on entrepreneurship, access to credit and public procurement contracts, as well as stipulations on trade policies, equal

access to property, resources and employment. Article 18, on equal access to productive resources, creates strong rights on paper, but it does not seem to create a responsibility on the part of the state to go beyond law and policy reform and actually ensure delivery, on an equality basis, of life-sustaining resources such as water and land – despite the fact that most of these resources are in the hands of the state.[61]

Part 6. Gender-Based Violence, Articles 20–25.
Part six on gender-based violence is divided into legal (article 20), social, economic, cultural and political practices (article 21), sexual harassment (article 22) and support services (article 23). Article 24 deals with training of service providers and article 25 with integrated approaches. Some of the specific targets set to eliminate gender-based violence include the comprehensive testing, treatment and care of survivors of sexual assault; review and reform of criminal laws and procedures applicable to cases of sexual offences and gender-based violence; the enactment and adoption of specific legislative provisions to prevent human trafficking and provide holistic services to the victims with the aim of re-integrating them into society; and to define and prohibit sexual harassment in all spheres and provide sanctions to deter perpetrators.

The following MDGs that are relevant to gender:
***MDG 3: promoting gender equality*:** women's excessive chores of fetching domestic water reduced, improved sanitation and hygiene, which is of special importance to women and women's increased own food and income from homestead-scale productive water uses.

6.5 NATIONAL GENDER PROTOCOLS AND THE NATIONAL LEGISLATIVE FRAMEWORK ON GENDER IN SOUTH AFRICA

6.5.1 Progress in context

The lives of women around the world have improved dramatically over the past few decades. Women have made unprecedented gains in the recognition of rights, education, health and access to jobs and livelihoods.[62] The progress made by South Africa in women's empowerment and gender equality, despite several challenges still encountered, is globally comparable, and in some instances the advances made puts us at the forefront of leadership in this domain. Nonetheless, there are blatant gaps in achievements at the global and local levels. Girls and women, who are poor, live in remote areas, are disabled or belong to minority groups, continue to lag behind. Women still fall behind in terms of their earnings and their productivity, and in far too many instances their voices remain mute. Women – especially poor women, have less say over decisions and less control over household resources.[63]

[61] http://www.kas.de/wf/doc/kas_23107-1522-2-30.pdf?110721140859
[62] World Development Report 2012: Gender Equality and Development
[63] *ibid*

The 2014 ANC policy discussion paper titled “An analytical framework for policy influence towards radical transformation of women’s socio-economic empowerment and rights” assists us in assessing the gains made over the past 20 years in women’s socio-economic empowerment and rights for women, and the challenges that persist. The paper considers what is conducive in terms of policy to move the women’s agenda forward. As the paper claims, it is not enough to influence policy decisions, as what is needed are policy proposals that are extraordinary, astonishing and beyond the realm of “business as usual”. A gender-based analysis of policies and policy gaps, programmes and interventions will assist in the process, as it questions the assumption made by gender-blind and gender-neutral policies that men and women can be treated in the same way as they are affected equally by these interventions.

Great steps have been made in women’s emancipation in South Africa by guaranteeing rights and access to services. There are major shifts in the status and conditions of women and to some extent, there is narrowing of the gender gap. With regard to *de jure* equality, or equality in the eyes of the law, law reform has seen to the removal of various discriminatory laws, and enactment of laws that foster an enabling environment for the advancement of women and the achievement of gender equality. With *de facto* equality, significant progress has been made but there is still much to be done especially with the full and effective implementation of laws, policies and strategies. Significant change is noted in areas such as legal status, attitudes, women’s involvement in decision-making, especially at the political level, employment, education, ownership of homes and businesses, the justice system and economic participation. However, the pace of change appears to be slow and trends indicate only very gradual progress towards real non-sexism and substantive gender equality.

6.5.2 Legislative and policy environment

The law prohibits gender and related forms of discrimination. The following avenues are available for challenging discrimination and obtaining recourse: the South African Human Rights Commission; the Commission for Gender Equality; Equality Courts; the Commission for Conciliation, Mediation and Arbitration; the Office of the Public Protector; Sexual Offences Courts; Family Courts; the Land Commission; and the Land Claims Courts.[64]

One of the key successes for women’s empowerment and gender equality has been the creation of an enabling environment through favourable laws and policies, and encouraging informal policy pronouncements. The National Policy Framework for Women’s Empowerment and Gender Equality (2000), adopted by the South African Government, is one of these key policy instruments. It sets the tone for gender mainstreaming across all sectors of society while adopting an approach for women’s

[64] ANC (2014). Analytical framework for policy influence towards radical transformation of women’s socio-economic empowerment and rights. Policy discussion document.

empowerment and gender equality. It further outlines a National Gender Machinery to support gender transformation and structural arrangements towards women's empowerment and gender equality in the country. It was regarded as international best practice and operated at its peak between 2003 and 2005, but its effectiveness has gradually faded over the years (*ibid*).

At the opening of Parliament after the first democratic elections in 1994, the then President, Nelson Mandela, declared:

It is vitally important that all structures of government, including the President himself, should understand this fully: that freedom cannot be achieved unless women have been emancipated from all forms of oppression. All of us must take this on board, that the objectives of the Reconstruction and Development Program (RDP) will not have been realized unless we see in visible and practical terms that the condition of the women of our country has radically changed for the better, and that they have been empowered to intervene in all aspects of life as equals with any other member of society.

The Constitution of South Africa (RSA, 1996) has key provisions for women that include the equality clause which states that the state may not unfairly discriminate directly or indirectly against anyone on one or more grounds, including race, gender, sex, pregnancy, marital status, ethnic or social origin, colour, sexual orientation, age, disability, religion, conscience, belief, culture, language and birth. Provision is made for affirmative action in the clause that states that "legislative and other measures" may be taken to "protect and advance" persons who have been disadvantaged. The clause on freedom and security of the person states that everyone has the right to "bodily and psychological integrity." This includes the right to make decisions concerning reproduction; and to security and control over one's body. A clause was included guaranteeing legal and other measures to promote land reform and equitable access to natural resources to redress the effect of past discrimination. The Constitution also makes provision for socio-economic rights, such as the right to adequate housing, health care services, food and water.

Our Constitution is the binding document that holds South Africa to its commitment to achieve an equitable society. What is critical now is consolidation of the democratic ideal and an assessment of the extent to which women's empowerment and gender equality has been achieved in South Africa. Table 13 highlights what the Constitution has to say about gender.

Table 13 Constitution of the Republic of South Africa (Act 108 of 1996)

Chapter	Chapter title	Content
2. Clause 9 (3)	Bill of Rights	The state may not unfairly discriminate directly or indirectly against anyone on one or more grounds, including race, gender, sex, pregnancy, marital status, ethnic or social origin, colour,

Chapter	Chapter title	Content
		sexual orientation, age, disability, religion, conscience, belief, culture, language and birth
2. Clause 16 (2 c)		[The right of freedom of expression does not extend to] – advocacy of hatred that is based on race, ethnicity, gender or religion, and that constitutes incitement to cause harm
4. Clause 46 (1)	Parliament	Composition and election (1) Subject to Schedule 6A, the National Assembly consists of no fewer than 350 and no more than 400 women and men terms of an electoral system that-
6 Clause 105 (1)	The Provinces (Composition and election of provincial legislatures)	Subject to Schedule 6A, a provincial legislature consists of women and men elected as members in terms of an electoral system that -
8. Clause 174 (2)	Courts and Administration of Justice	Appointment of judicial officers – the need for the judiciary to reflect broadly the racial and gender composition of South Africa must be considered when judicial officers are appointed
9. Clause 186.2 (b)	State Institutions Supporting Constitutional Democracy (Commission for Gender Equality)	Broadly reflect the gender composition of South Africa
9. Clause 187.2		The Commission for Gender Equality has the power, as regulated by national legislation, necessary to perform its functions, including the power to monitor, investigate, research, educate, lobby, advise and report on issues concerning gender equality
9. Clause 187.3		The Commission for Gender Equality has the additional powers and functions prescribed by national legislation
9. Clause 193.2		The need for a Commission established by this Chapter to reflect broadly the race and gender composition of South Africa must be considered when members are appointed
9. Clause 193 (1)		Appointments – the public protector and the members of any Commission established by this Chapter must be women or men
13. Clause 221 (1)	Finance (Financial and Fiscal Commission)	Appointment and tenure of members: the Commission consists of the following women and men appointed by the President, as head of national executive
No of times gender mentioned		8

Chapter	Chapter title	Content
No of times women mentioned		4
No of times girl child mentioned		0
No of dedicated chapters to gender or women		0
Other observations regarding gender		Pregnancy mentioned once, in the Bill of Rights Chapter Nine: State Institutions Supporting Constitutional Democracy, includes a Commission for Gender Equality, and, under the Independent Authority to Regulate Broadcasting, indicates that there must be women and men
www.info.gov.za/documents/constitution/1996/a108-96.pdf		

6.5.3 Women in political and decision-making positions

Since democratic elections in 1994, South Africa has seen a number of women taking up leadership positions in areas previously dominated by men. There is progress made in the representation of women ministers in Cabinet (see discussion on South African performance below). One of the aims of the Department of Higher Education and Training, expressed in the article "Women in the Management and Leadership Position" is to incorporate women in management and leadership positions. Differences exist between male and female managers. Women managers bring a feminine touch to their job in an environment that may not be ready to embrace them for who they are. This environment is made up of both men and women and research indicates that female managers experience problems not only from male employees, but from female employees as well.[65]

6.5.4 Education

The National Education Policy Act 27 of 1996 and the South African Schools Act 84 of 1996 promote access to education for all. The Further Education and Training Colleges Act 16 of 2006 regulates further education and training and advancement of women in previously male-dominated fields. The report titled "Education for All" (2009) shows that gender parity access to primary and secondary education, including early childhood development, has almost been achieved. Completion rates of primary education improved from 90.1% in 2002 to 96.1% in 2011 for girls. The major challenge in the retention of girls in education is teenage pregnancy. Another concern is the high level of gender-based violence, which affects the girl child and her ability to work in school but also affects children whose mothers, sisters, grandmothers are being abused.

According to the South Africa Country Report "Climate Change Counts" (SARUA, 2014), there are a number of climate change education projects and programmes in South Africa.

[65] Available at http://www.dhet.gov.za

A recent national case study on climate change education produced for UNESCO shows that climate change education has been included in the National Curriculum and Assessment Policy Statement of the Department of Basic Education:

- A national teacher education project supported by the Department of Environmental Affairs, the Department of Basic Education, the Department of Water Affairs, the South African National Biodiversity Institute, the South African National Parks, all major national environmental NGOs as well as a number of South African universities, focuses on transformative environmental learning through teacher education. It has produced materials on climate change for teacher education to support teachers to engage with the new content that is required in the various subjects at all levels of the schooling system.
- The report highlights the fact that the climate change science and academic community must work together to improve projections of climate change, its impacts, and key vulnerabilities in affected sectors and communities. They need to explore appropriate improvement and adaptation responses; continue to build capacity in climate change science; and inform government and the public of climate change-related socio-economic challenges and opportunities.

The National Climate Change Response Strategy for South Africa (2004) highlights the following:

- The Department of Environmental Affairs and Tourism (DEAT) in collaboration with the Department of Education (DoE) saw the need for climate change activities to be incorporated into educational curricula at primary, secondary and tertiary levels, in order to broaden public awareness of the issue. In this regard climate change needs to be seen as an integral part of modules on the environment and sustainable development.
- The need for DEAT to undertake analysis for education and training requirements, together with the National Department of Education, within all spheres of government and formulate suitable plans accordingly for the government sector. Extensive use can be made of donor funding for actualisation of education and training needs on a national basis. Particular emphasis should be placed on “training the trainer” programmes, through suitable interaction with overseas experts in the field and institutions. Certain tertiary education establishments could be selected to develop, or extend, “centres of excellence” in environmental education, specifically including climate change and sustainable development, to ensure continuity of the education process. This could also be encouraged in privately funded institutions.

6.5.5 Violence against women and girls

South Africa is concerned about high levels of gender-based violence (GBV), especially sexual violence and has sought to reform its laws and policies regarding GBV. Priority has been given to sexual offences and domestic violence, trafficking of women and child and child pornography. Thuthuzela Care Centres operate 24hrs around the country and

provide victim support through services such as police, counselling, doctors, court preparation and prosecution. The Limpopo Violence Against Women (LVAW) Baseline Study established that there are high rates of violence against women (VAW) in the Province. Much of the violence is occurring within the domestic sphere with emotional intimate partner violence being the most dominant. Results of the LVAW Baseline Study have shown that over two thirds of women (77%) in Limpopo have experienced some form of GBV in their lifetime, including partner and non-partner violence. About half of men, (48%) admit to perpetrating VAW at least once in their lifetime. Most of the violence occurs within intimate relationships and is predominantly emotional - a form not usually addressed. Thirty-one percent of the women experienced emotional violence while over a third of men (36%) perpetrated emotional intimate partner violence in their lifetime.

Prevention efforts at provincial level thus need to be accelerated and include raising awareness among women. Provision of psychosocial support should be prioritised and up scaled in responding to VAW, especially emotional violence. More resources should be allocated towards a health sector response that places mental health services at the centre. Striking in these findings is the rate of underreporting to the police and health department which is very low.[66]

The Department of Social Development provides funding and support to organisations that work with women and gender issues. These organisations offer a range of services, including shelters for abused women, victim empowerment, counselling to abused women and their children/families, skills training and development, referrals to legal and medical services, HIV/AIDS counselling and guidance on personal development. Those qualified for such benefits include any woman who is a victim of domestic or sexual abuse, and her children.

The Department recognises that women and girls with disabilities are more often subject to various types of violence, particularly sexual violence, and are more vulnerable to HIV & AIDS transmission, given the increased risk of sexual violence. Inclusive programmes and accessible services that would ensure the necessary special support for women and girls with disabilities, is the only form of ensuring respect for and protection of the rights of women and girls with disabilities, and their empowerment.

Development programmes for women and girls with disabilities include:

- Services for women with disabilities who have to acknowledge the various levels of discrimination that these women experience, i.e. gender discrimination; discrimination on the basis of their disability, and in some instances discrimination on the basis of race, religion, sexual orientation, etc.
- As in the case of children and youth with disabilities, the services that are provided must be specific and responsive to the needs of women with disabilities. Activities that can promote the development of women with disabilities can include:

[66] www.genderlinks.org.za

- Ensuring the inclusion of issues of women and girls with disabilities into the agenda of the departmental gender-sensitive development programmes and targeting them as beneficiaries;
- Building support and working in collaboration with disabled people's organisations towards the development and strengthening of existing disabled women's development programmes;
- Giving the necessary attention to the needs of women and girls with disabilities in addressing their specific barriers.
- Ensuring the right of women with disabilities to freedom from violence, including sexual abuse and discrimination based on disability;
- Designing programmes to promote positive images of women with disabilities that will make them self-reliant;
- Developing and implementing a communication strategy that will inform women with disabilities of the specific empowerment programmes and services available to them, thereby increasing their access to the services.

6.5.6 Health, gender and climate change

The Constitution (RSA, 1996) introduced a **human rights approach to health** and health care services, guaranteeing access to health care services, including reproductive choice and free maternal and child health care. The Policy on Universal Access to Primary Health Care, introduced in 1994, paved the way for effective health care delivery programmes, providing free health care to pregnant and lactating women as well as children under the age of six.

The South African health sector is one of the five key priorities of government. A significant proportion of South Africans, and in particular the poor, already have serious and complex health challenges compounded by poor living conditions. In particular parts of the country, the coverage of vector-borne diseases like malaria and rift valley fever may spread due to climate change, requires a simultaneous expansion of public health initiatives to combat these diseases.

Extreme weather events, and increased climate variability associated with climate change, provide a number of significant compounding factors that negatively affect the health and resilience of vulnerable communities. The South African Medical Journal highlights the fact that women and children are more vulnerable to effects of heat, water insecurity, extreme events, malnutrition, and infectious diseases. Women's "lower social standing within communities" results in greater economic stress and women face direct and indirect health impacts from climate change. Climate change could also have harmful effects on mental and occupational health, and its adverse impacts would be worsened by food insecurity, hunger and malnutrition. Social and economic disruption resulting from climate change impacts could also have implications for mental health and well-being.

6.5.7 Adaptation responses (climate change and human health)

- South Africa's National Climate Change Response Policy of 2011 advocated the following adaptation measures for reducing the impacts of climate change on human health: reducing certain criteria pollutants, developing and strengthening existing public awareness campaigns; developing heat-health action plans, improving bio safety, developing a spatial and temporal health data capture system, and integrating food security and sound nutritional policies into all adaptation strategies.
- A quantitative vulnerability and risk assessment for the health sector is an important step to identify the most critical climate change impacts and the most vulnerable populations and communities in South Africa.
- Approaches to reducing the impacts of climate change on public health need to be area-specific, linked to the demographic profiles of affected communities and informed by sector vulnerability assessments.
- Understanding the effectiveness of current policies and programmes, and shaping new ones to manage future climate change impacts, requires effective surveillance of public health, including high-quality observations of diseases and risk factors. Improving data and enhancing access to it, including building and strengthening the current system for reporting notifiable diseases run by the Epidemiology and Surveillance Directorate in South Africa, could allow for high-quality surveillance of diseases and risk factors to ensure successful adaptation planning.

The National Climate Change Response White Paper[67] recognises that children are more vulnerable to the health implications of climate change. The health and nutrition section considers a wide range of impacts on the health of children, covering infectious diseases, water-, air- and vector-borne diseases, malnutrition and poor indoor air quality.

- It calls for appropriate adaptation measures, including improvements in air quality in terms of national targets, in sound nutritional policies, healthcare, infrastructure and education through health adaptation strategies.
- Interventions that focus attention on children's nutritional status, especially girls who will become key determinants of their future family nutrition. Such measures must include giving support to food production, improved food access and food utilisation as well as the provision of food and nutritional supplementation for children.
- The White Paper provides a child-neutral but well-developed set of interventions to improve water storage, its use and monitoring, rather than meeting keen water deprivations and risks for children. Given the clear relationship between lack of access to clean, running water and health risks for children, this relationship could be highlighted. It could support calls for measures to address water service

[67] Available at http://www.sanbi.org/sites/default/files/documents/documents/national-climate-change-response-white-paper.pdf Accessed 22nd February 2016

backlogs for children, which are significant. A further compelling reason for the Paper to highlight children's water needs is the marked inequity in the rate of access between the provinces.

- The White Paper does not identify the impacts of climate change on children at a household and community level. It also does not identify how adaptation strategies might affect children directly as a result of distinct intra-household dynamics or how children can be part of community-level adaptation.
- Despite global evidence of children's keen vulnerability, the risk of physical harm and abuse children face in the context of climate change is still not recognised. It requires appropriate planning and programming to be included in policy strategies. The White Paper's section on disaster risk management does not include or call for a children's risk assessment or for appropriate responses to adequately protect children against harm and abuse in the face of climatic disasters - nor does it recognise the potential for schools and other child-focused forums to increase children's awareness on disaster risk reduction. There is an obvious gender dimension to this as women are most affected when their children are at risk – trying to mitigate for the risks and protecting and building safety nets for their children to reduce vulnerability as they endeavour to increase the resilience (or simple survival) of their household members.

Direct effects of climate change: There is an increased risk of death, injury and population displacement as a result of extreme climate events such as fires, droughts, hurricanes and floods. Anxiety, post-traumatic stress disorder, depression, and other mental health conditions follow trauma, loss of loved ones and property, and displacement.

6.6 WOMEN AND ECONOMIC, SOCIAL AND CULTURAL RIGHTS

6.6.1 The right to sustainable development including rights to property and access to land

The focus is on the implementation of the new legislative framework to transform labour market relations with a view to affirming women and enabling them to enter and advance in areas of the labour market that were previously closed to them.

The Employment Equity Act of 1998[68] section 1 (b) in the Department of Labour, identifies designated groups that include black people, women and people with disabilities. Firstly, the Act promotes equal opportunity and fair treatment in employment through the elimination of unfair discrimination. Secondly, the Act promotes the implementation of affirmative action measures to redress the disadvantages in employment experienced by designated groups, to ensure their equitable representation in all occupational categories

[68] http://www.labour.gov.za/DOL/downloads/legislation/acts/employment-equity/eea_amend2014.pdf

and levels in the workforce. The Act is quite clear that it will review and monitor the employment equity targets and take appropriate action to ensure that of people employed in small and medium entreprises, 45% are women.

The laws and policies that South Africa has put in place to address poverty among women are twofold: addressing women in abject poverty to meet the human rights need, and measures to empower women for entrepreneurship, employment opportunities and their economic independence and sustainability. An ongoing concern is the disparity between men and women in earned income. Despite an increase in the average income for females by 2011, female-headed households still earned less than 50% of male-headed households. The Expanded Public Works Programme (EPWP) is one of the many programmes supporting employment generation.

6.6.2 Environmental sustainability and ownership of land

South Africa recognises the link between gender and the environment and the role of women in planning and management for preservation of the environment. The National Environmental Management Act (Act 107 of 1998) acknowledges the vital role of women and youth in environmental management and development. It indicates that their role must be fully recognised and their full participation must be promoted.

The South Africa White Paper on Land Reform laid the policy framework for the abolition of all laws that discriminated against women regarding property ownership. However, there are challenges that still impair the achievement of equality between men and women. These include attitudes, beliefs and cultural and religious practices that entrench patriarchy while demeaning women.

The Land Reform *Gender Policy Framework* emphasises gender awareness around women's rights when it comes to land.[69] In particular, it calls for the use of gender-sensitive methodologies in project cycles, socio-economic empowerment of women. The South African *Women's Charter for Effective Equality*, like other laws, states that women must have access to land and tenure rights, including women living under customary law.[70] Land is also a focus area for South Africa's National Policy Framework for Women's Empowerment and Gender Equality.

6.6.3 Economic empowerment

In South Africa, it is estimated that around 38% of businesses are owned by women (BWASA, 2013),[71] and that the country has made use of preferential procurement policies

[69] http://www.economic.gov.za
[70] *ibid*
[71] Wits Business School Journal (2011) – as quoted in the research study by the Businesswomen's Association of South Africa, 2013: The current status of policies, practices, measures and barriers regarding women-owned businesses in government procurement.

to create greater opportunities for women to promote their access and visibility in public procurement spending. However, businesswomen still face barriers in accessing government procurement and supply chains. Their businesses are still under-represented in public procurement and are unlikely to account for more than 25% of procurement spend in the country.[72] Nonetheless, South Africa has put in place measures to encourage women to start their own businesses and also form cooperatives, which will open up employment opportunities for women.

The Department of Economic Development highlighted the National Movement of Rural Women Symposium held in Kliptown Hotel, Soweto, on 19 October, 2013, with its theme, "The Role of Rural Women in Economic Transformation". The symposium focused on the role of rural women in the transformation project, with the issue of land at its centre. It celebrated 100 years since the dissemination of the Native Land Act of 1913 which saw blacks as well as women being forcefully removed to the outskirts of the country away from commercial land, leading to struggles of gender and racial inequalities in terms of ownership. Women in particular were kept in these impoverished and often remote areas to bear the burden of caring for children and the elderly. Poor and rural women are most affected by the burden of unpaid labour created by the apartheid system. They are still more likely to have inadequate electricity, clean water and sanitation. In recognition of these appalling conditions under which rural women exist, government undertook to make rural development and land reform an important policy priority. The policy response includes:

- To improve and transform the condition of women, and society in general;
- Broaden ownership of assets to historically disadvantaged groups such as women and rural communities;
- Calls for action that will help achieve security of tenure for women communal farmers;
- Laws that still discriminate against women must be removed;
- All legal restrictions on women's access to and use of land must be removed:
- Calls on the Department of Rural Development and Land Reform to put measures in place for the promotion of women's participation in decision-making including giving them equal opportunities through land reform.

6.6.4 Development of rural women

A number of initiatives and programmes have been implemented to support rural women. Government will be upscaling programmes to develop women in rural areas, such as subsidising the sharing of commercial farms with farm workers, as well as the "One Hectare, One Woman" programme. However, disaggregation by gender shows that women have not benefitted equally to men.

[72] *ibid*

The Department of Rural Development and Land Reform (DRDL) highlighted the vulnerability and risk involved in situations of climate change in a paper titled “Climate Change Risk and Vulnerability Assessment for Rural Human Settlements” (July, 2013). The paper highlights the fact that gender inequalities in South Africa are often more pronounced in the rural areas where women experience multiple stressors like unpaid and lowly paid work, child rearing, and insufficient access to basic services. Further, it is challenging for women to gain possession of land under the governance of traditional leadership. Climate change therefore makes already existing development challenges worse; specifically for female-headed households.

The AU Summit 2015[73] highlighted in the Department of Public Service and Administration notes the following:

- Continental programmes on gender equality and women’s empowerment will be given the highest priority during 2015. The success of programmes will be measured by ensuring that women are represented in all peace processes; by increasing women representation in public life; by achieving economic empowerment and financial inclusion of women; and by modernising agriculture, and addressing women’s access to land, technology, markets, infrastructure and capital.
- These programmes are to ensure that by 2063, Africa’s women are fully empowered in all spheres, with equal social, political and economic rights, including the right to own and inherit property, sign a contract, and register and manage a business.
- By 2063, women in rural areas must have access to productive assets, including land, credit, inputs and financial services. All forms of violence and discrimination against women and girls should be eliminated.
- Africa by 2063 must have full gender parity with women occupying at least 50% of elected public offices at all levels and half of managerial positions in the public and private sector.

6.6.5 Women, the media and ICTs

Progressive legislation and regulatory frameworks exist to ensure meaningful participation of women in the media. The Independent Communications Authority of South Africa (ICASA) Act 13 of 2000 is a significant tool in the empowerment of women and promotion of other disadvantaged groups. It is an important piece of legislation towards meaningful participation of women in the media. The law encourages ownership and control of telecommunications and broadcasting services by people from historically disadvantaged groups, including women. The South African Gender Baseline study released in 2010 found that only 19% of news sources were women, and black women made up only 7%. There are more male voices in media and women are still greatly under-represented in

[73] AU summit, 2015 year of Women’s Empowerment and Development towards Africa’s Agenda 2063, 7-15 June 2015, South Africa

South Africa's newsrooms. However, South Africa's Information and Communications Technology (ICT) industry is gradually transforming to be more accessible to women. There have been a number of senior female executives that have moved up the ranks, but the numbers are still low compared to male counterparts.

The Media Development and Diversity Agency is one of the entities under the Department of Communications. Its vision is "access to diversified media for all". One of its mandates is to encourage the development of human resources and training and capacity building within the media industry, especially among historically disadvantaged groups – *including women*. There are a number of projects and community print projects on gender/women/children, some of which include:

- ✓ Agenda Feminist Media in eThekwini
- ✓ Womensnet in Gauteng
- ✓ Women on farms Cape Town
- ✓ Gender Advocacy Programme
- ✓ Children's Resource Centre.

6.7 REVIEWING GENDER MAINSTREAMING AS A STRATEGY

Evidence shows that gender mainstreaming as a strategy, through the establishment of gender focal points, has not been converted effectively into programmes with adequate resources, capacity and leadership to drive the process. Those who are expected to influence the mainstreaming process are not strategically placed to influence change at all levels of government.

A starting point would be to understand that women have differing needs and cannot be treated as a homogenous group. Rural women are likely to have more in common with rural men in their experiences of poverty and social exclusion than they do with women from urban areas. Young women are less vulnerable than older women; older women and older men are considered to be the most vulnerable in the community. The distinctions between age groups are significant and act as a reminder not to focus our lens on a single homogenous group – "the women of Lambani." Older women do not have the same resilience (and perhaps not the same burdens either) as younger women. The same is true of men. Perhaps younger men and younger women have more in common than one might think in terms of "keeping the village together" in the future. Women in rural areas and women with disabilities are particularly vulnerable with specific needs that need to be addressed, that will be different from. women who have been victims of gender-based violence. Thus, the accurate targeting of beneficiaries in social interventions has to be reviewed for any real impact to be made.

A National Gender Policy was drafted by the Office on the Status of Women. It builds on the draft National Policy for Women's Empowerment drawn up by the Gender Unit in the then RDP office. Among recommendations in this earlier document regarding water and sanitation were the following, that:

- All planning should seek out and respond to the needs of local women;
- Participatory action research methodologies should be used to involve rural women in natural resource management and increase livelihood options;
- Training of women in pump and water systems management and repair and maintenance should be a priority as they are the primary users of water;
- Policy makers should be trained to recognise and cater for the economic roles of women, and the strategic importance of water to their economic activities beyond the domestic sphere.
-

Pending the adoption of a national gender policy, several government departments have devised their own gender policies. The Department of Water Affairs and Forestry (DWAF) adopted a gender policy in 1996. This builds on the White Paper on A National Water Policy that states:

"The development of women in relation to water management is important for a number of reasons. Women are the traditional custodians of natural resources in the rural areas and they are also the people who suffer most from degradation of water and other natural resources. It is important that women are represented at all levels and in all spheres of water management activities in political, technical and managerial positions. The State must make sure that rural women have equal access to economic opportunities and enjoy adequate living conditions in relation to water supply and sanitation. In short, we support the feminisation of water management."

Despite this proclamation of commitment to women in 1996, there was uneven evidence of the feminisation of the water sector. A study commissioned by the Mvula Trust in 1998 on the role of women in community water and sanitation supply projects found that there were twice as many men than women in water committees and that the positions of chairperson, vice chairperson and treasurer were male−dominated while women largely held secretarial positions. Mjoli and Nenzhelele (2009) highlighted that all the women in their study lacked money for transport to attend meetings and they also indicated that the meetings were far away from their homes. Fifty-two percent of the women indicated that their lack of knowledge about water resources management issues limited their meaningful participation in management committees (MANCOs). According to Mehra and Esim (1998), as reported in Mjoli and Nenzhelele (2009), women were usually poorly represented in water user associations because membership was based on ownership of land and water rights. Even the few women that owned land and water feared participation in a male-dominated public gathering and facing men's resistance to women's participation (Mjoli and Nenzhelele, 2009:27).

Further obstacles to women's participation were identified as: a lack of confidence, looking after children with no crèche facilities, time constraints, household chores, traditional values and stereotypes, fears in relation to men, husbands who prevent women from participating, lack of education, and lack of interest. Many women said that their husbands did not support their participation in public life. Another study (Dunker, 1999), commissioned by the WRC, on "Strategies for the Empowerment of Women in Water

Supply and Sanitation Projects" included 218 interviews in the Northern Province and Eastern Cape in 1998, and found that:

- In the villages where the research was conducted, men played the prominent role and were seen by both men and women as leaders and decision makers;
- Cultural beliefs regarding men's superiority led to men feeling uncomfortable when women were allowed to participate in meetings and decision-making;
- Women tended to push men to the fore when interaction had to take place with people from outside the community;
- Women who were more educated were more confident about participating in the projects and decision-making processes;
- Water and sanitation projects did not necessarily empower the women in communities, but they did create an opportunity for women to be empowered should they want to;
- A gender-sensitive approach to projects requires a different attitude and improved support from male project planners and local authorities;
- Gender awareness among both men and women is a major need. Knowledge of gender and gender issues is very basic and more information is required in the villages.

In South Africa, the Office on the Status of Women, located in the President's Office, co-ordinates the development and implementation of gender policies in the different departments and at provincial level. Departments have been advised to form gender units that incorporate both the human resource and service delivery arms. This has not always been the case. The tendency has been for gender units to be located in the human resource division, where there already are transformation units. In the (then) DWAF Gender Policy, the need for an internal and external focus is recognised in the proposed structure for the unit. But the unit is placed under the Director of Special Programmes, under the Chief Director, Human Resources. This location is potentially problematic with regard to engaging and involving the policy, planning and implementation arms of the Department. In addition to formal structures, informal structures are an important and useful mechanism. As alluded to earlier, a gender forum may be one way of galvanising an organisation and encouraging buy-in. There is beginning to be some synergy between the gender structures in the bodies concerned with water and sanitation. The Department of Water Affairs and the South African Local Government Association (SALGA) have gender units and gender policies. The WRC has undertaken in-depth research on the level of participation in, and gender impact of, water and sanitation projects. Ms Nozibele Mjoli, who was research manager at the WRC, has written extensively on gender, water and sanitation (see discussion above). Mvula Trust has conducted similar research and has a gender desk. In August 2000, Mvula Trust convened a Conference on Women, Water and Sanitation.

The Third Women's Budget (Budlender, 2002) carries an analysis of the budget of the Department of Water Affairs, Forestry, Environmental Affairs and Tourism by Nthabiseng Seperepere. The study shows that:

- *Personnel expenditure*: white men predominate in the best-paid fields of the department.
- *Gender-specific expenditure*: the budget for the gender unit could not be disaggregated from the rest of the budget and was difficult to assess because a proposal for a 13-person directorate to staff the unit had not yet been implemented.
- *Mainstream expenditure*: the highest infrastructure expenditure was on the Lesotho Highlands Water Project, which has been criticised for displacing millions of people, the majority of whom are poor women and children.

The Community Water Supply and Sanitation Programme, the most important for women, received the lion's share of the budget, but 70 percent of this went into capital expenditure. There have been criticisms that the then DWAF had not paid sufficient attention to the need to balance fast tracking delivery with ensuring adequate participation and sustainability. The gender implications of this merit further investigation. The review also examines the implications of cost recovery charges on women. On the positive side, the Department insisted that, in its Working for Water Programme that employs local people for clearing invasive alien plants, that half of the benefits accrue to women. The Department specified benefits rather than number of jobs, in recognition of the fact that either because of lack of skills or the worth accorded certain job categories, women are frequently in the lower paid jobs. This is an excellent example of a gender-aware resource allocation decision.

The National Community Water and Sanitation Training Institute (NCWSTI), established by DWAF as a non-profit organisation to provide relevant training for the sector, planned to establish a centre of excellence on gender mainstreaming in partnership with the International Water and Sanitation Centre (IWSC) in the Netherlands (Ekstein, 2000).

A programme called "Gender Mainstreaming in South Africa (GEMSA)" has also been developed which aims to build up the NCWSTI into a resource centre for water and sanitation with a mandate to mainstream gender in the sector. NCWSTI is the national coordinator of GEMSA and is supported by the IWSC. The then Department of Water Affairs and Forestry[74] sub-contracted Gender Links to undertake a literature review on mainstreaming gender in the water and sanitation sector. Whereas the South African White Paper on Household Basic Sanitation (2001) discusses the roles and responsibilities of all players, no organisation is tasked with the responsibility of ensuring that gender is mainstreamed at all levels of sanitation programming (*ibid*). In the end, gender is addressed only at a project level thus focusing on practical and not strategic gender needs. With few exceptions, the last set of elections in the SADC region have been disappointing: women's representation decreased both at national and local level.

Women still lack access to economic decision-making (26%), land, credit and other means of production. They constitute the majority of the poor; the unemployed; the dispossessed

[74] 2001

and those who work in the informal sector. Women's lack of "voice" reflects in the media, where the proportion of women sources has risen only marginally from 17% in 2003 to 22%, in a self-monitoring exercise covering 76 media houses in the region. Since November 2011, the Alliance has been driving a campaign for an Addendum to the SADC Gender Protocol on gender and climate change. At a meeting held in Maputo in February 2013, gender ministers accepted the principle of the Addendum. Since then the tussle has been over whether to mainstream gender in the forthcoming SADC Protocol on Climate Change, or argue for an addendum to the SGP. The Alliance is arguing for both.

The plural character of the legal system has severe implications for the implementation of human rights standards in relation to reform in family, health and natural resources management (Mohammed, 1994). In communal areas and resettlement schemes, both men's and women's access to land and water rely heavily on customary use rights. Furthermore, when considering barriers, a fundamental concern is that gender mainstreaming has no fixed or static set of meanings. It is, as it is practised and implemented by different states and different jurisdictions, quite diverse.

It can be mentioned that legal pluralism is, from a women's human rights perspective, a two edged sword. At the family level, a series of customary norms embody male authority in decision-making. Male prerogatives in controlling property in terms of land and water, such as the marital power, are also at work. How influential these norms are with the new water laws and policies depends on a number of factors. First, do the law and policy makers promote women's rights to participation and property? Second, to what extent are women able to take advantage of eventual reforms in practice? Hellum (1999) has reminded us that customary norms are not static but constantly interacting with the surrounding social, economic and legal environment. There is today a vast body of literature demonstrating the uneven process of change whereby more egalitarian values are slowly making their mark on local customs and practices in the area of family and inheritance law. Women struggle to transform the normative basis for asymmetric gender relationships in both informal and formal water management.

As the region's economic grouping, SADC has acknowledged the importance of water in regional integration and development and has proceeded to adopt a range of measures in support of the joint management of water resources. The Protocol on Shared Watercourses signed in 1995 and amended in 2003 bears testimony to this fact. The successful establishment of the SADC Water Division in the Directorate of Infrastructure and Services, within the framework of the new SADC structure, demonstrates the prioritisation of water and its institutionalisation in the new operating environment. The RISDP reinforces the fact that gender is one of the "integration and development enablers" and a cross-sectoral intervention area. The SADC Water Division is mandated to implement the Protocol on Shared Watercourse Systems and it promotes the SADC agenda of regional integration and poverty alleviation. It provides the flexibility for countries to enter into specific basin-wide agreements, which is the approach promoted

under the Watercourses Convention. The Protocol was signed by all of the seven countries which are the focus of this study, on 07 August, 2000, in Windhoek.

One of the goals of SADC's RISDP is to facilitate the achievement of substantive equality between women and men in the SADC region, through mainstreaming gender into all national and regional policies, programmes and activities, and the adoption of measures to accelerate progress in this regard. In the RISDP, gender has been defined as one of the "integration and development enablers" and a "cross-sectoral intervention area". NEPAD provided another forum for highlighting the importance of water to the continent's socio-economic development. NEPAD has selected its CAADP as the initial programme to demonstrate practical results and impact on gender mainstreaming.

Water policy environments in the Region as a while are complex. For example in Zambia, the lead ministry for gender is the Ministry of Gender and Development. The Ministry of Planning is the lead ministry in the water sector and it plans for infrastructure development generally, with overlaps with the Ministry of Local Government and Housing and the Ministry of Agriculture. The Ministry of Planning constructs and rehabilitates dams and boreholes countrywide. Groundwater supply is used for emergencies in drought prone areas and for strategic sites such as schools, clinics and the chief's palaces.

With 49% of positions in local government being held by women, Lesotho has the highest proportion of women in any area of political decision-making in SADC. Despite a substantive increase in interventions in the water sector, this has not yet resulted in gender-disaggregated, district-specific analysis and mainstreaming of the water sector in Lesotho. Women face considerable restraints. In most cases, women are responsible for the hard and time-consuming task of fetching water for household use which they have to fetch from long distances away from their homes, and face the additional problem of long queues. In Lesotho, men might participate in water collection, when intermediate transport methods such as wheelbarrows or ox-drawn carts are used to transport large quantities of water. Women were also reported to be the majority of village water committee members that are democratically elected and in charge of collecting financial contributions and ensuring fair use of the water. The critical importance that women attach to the availability of water to household use was highlighted during the recent Poverty Reduction Strategy consultations for Lesotho. The Poverty Reduction Strategy reports that women consistently ranked "lack of water", as their fourth biggest poverty problem, while men ranked it as the 10th biggest. Lesotho has an abundance of water yet there is a lack of access to water in rural and urban areas. In Maseru alone, the population grew by about 7% per year between 1996 and 2003 and increased the demand for water and sanitation.

There is a lack of gender-disaggregated and context-specific information on sanitation, especially aspects that reflect cultural sensitivities related to sanitation; the different priorities, demands and needs of men and women; attitudes and practices in personal hygiene and how these practices differ between men and women, and the constraints on

the participation of men and women in sanitation-related activities. Timely gender disaggregated data of who is in charge of water and sanitation related information will be very useful for measuring progress and identifying constraints.

Over the years the Gender Alliance has been tracking knowledge of the SADC Gender Protocol and attitudes towards gender. This year, the Barometer drew on the Gender Progress Score (GPS) online tool developed by Gender Links for scoring responses to the 20-question attitude survey, from zero (regressive) to 100 (very progressive). Across the region, almost 50 000 citizens used this tool, and registered an overall score of 65% with significant country variations. Knowledge of the SADC Gender Protocol (based on five simple questions) was however only 53%. This reflects the need for continuing mobilising, public awareness and behaviour change.

6.7.1 South Africa's performance

In theory, South African women now have the same ownership rights as men, but as we have seen, there are considerable barriers, with numerous examples of discrimination evident. The situation varies, depending on the region and the influence of tradition, but, overall, women's access to land is very limited. Under the customary system, only men can exercise land ownership rights; women have access to land only through their husbands and single women are excluded because land is reserved for couples. When a man dies, his widow can retain the usufruct on his land only if they had a son, under whose name the land can then be registered. In Limpopo, as in many other provinces, women have no land ownership rights; in the north-west region, some village chiefs allow women access to land. It appears that women in urban areas have greater access to property other than land than their counterparts in rural communities. Since 1993, South African women have been entitled to the same legal ownership rights as men and the law guarantees them equality in the purchase, sale and management of property. Previously, they had to obtain permission from their husbands to enter into contracts. In rural areas, it is reported that husbands continue to make decisions about buying or selling property (Palmer, 2011).

Since the end of apartheid, numerous financial institutions have been established to help Africans obtain access to bank loans, primarily to set up or develop small businesses. Some financial institutions specifically target women, but these initiatives have rarely been successful for various reasons: rural areas have been overlooked; the procedures are too bureaucratic; women sometimes need their husbands' consent to obtain financing; and some institutions require security, which is difficult for women to provide. In effect, these factors create a form of discrimination against women. As a result, women feel their only option is to borrow from friends or family, or, in some regions, to participate in mutual credit associations.

Great strides have been made since 1994 to improve the status of women. Prior to 1994, the South African Parliament had a mere 2.7% representation of women, whereas

following the first democratic elections, women's representation in the National Assembly stood at 27.7%. In 1999, that figure increased to 30% and then to 32.7% in 2004. After the 2009 national elections, women's representation reached 42%. Currently South Africa has a high percentage of women in the Cabinet – of the 35 ministers, 22 are female (63%). Women make up 47% of the total number of deputy ministers, and 18 out of 35 are female (51%) and there is a 41% representation of women in the National Assembly.[75]

Some relevant statistics about women contextualise the status of women in our country. For instance, the Violence Against Women baseline study has now been conducted in four provinces of South Africa. South Africa has created specialised institutions to ensure that victims of abuse receive comprehensive services. South Africa has a higher than 80% coverage of anti-retrovirals for preventing mother-to-child transmission of HIV. However, South Africa is one of the nine SADC countries with the highest adult HIV prevalence rate in the world at 17.3%. South Africa has a maternal mortality ratio under 100 per 100 000 live births. South Africa's maternal mortality rate increased though, for a while from 64 in 1999 to 78 in 2001.

In September 1995, South Africa participated for the first time in the UN series of World Conferences on Women, at the Fourth World Conference on Women held in Beijing China. At this Conference the South African Government committed itself to the Beijing Platform of Action (BPA). The Platform compels the South African Government to report on its progress in addressing the 12 critical areas of concern outlined in the BPA. The focus of this reporting is on the processes engaged in institutionalising a Gender Action Plan within government departments, the legislature, and organs of civil society.[76]

The context against which the South African Government attempts to fulfil its commitments to the BPA is one of national transformation. To effect transformation, the government has enacted laws, formulated policies and passed bills which have a direct bearing on gender. Amongst these, as has already been discussed above, it has adopted the new Constitution for the Republic of South Africa and here the Bill of Rights is of direct relevance to gender equality. Other measures have been the Reconstruction and Development Programme, the White Paper on the Transformation of the Public service; the adoption and commitments to the implementation of the Beijing. Additional relevant legislation (Figure 35).

[75] South African Government (2015). http://www.gov.za/womens-month-1-31-aug-2015

[76] http://www.info.gov.za/vrw/downloadFileAction?id-70483

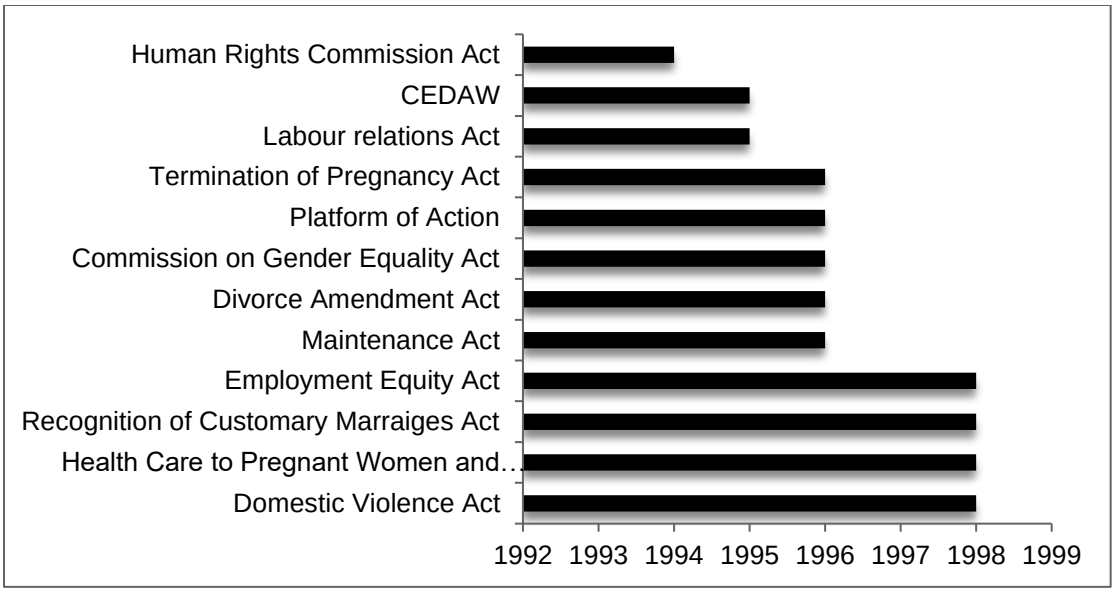


Figure 35 Selected relevant South African legislation in the 1990s that supported or preceded the Beijing Platform of Action

South Africa has higher proportions of women than men in tertiary level education. South Africa has 50% more young women in secondary school than men.[77]

6.7.2 Department of Environmental Affairs within a global climate change context

Global climate change is possibly the greatest environmental challenge facing the world this century. Although often referred to as "global warming", global climate change is more about serious disruptions of the entire world's weather and climate patterns, including impacts on rainfall, extreme weather events and sea level rise, rather than just an increase in temperature. The developing world faces greater challenges than the developed world, both in terms of the impacts of climate change and the capacity to respond to them.

Concerned with the implications of global climate change, several governments came together in 1988 and formed the IPCC. This led to the UNFCCC, which was tabled in 1992 at UNCED. The stated objective of the UNFCCC was to achieve stabilisation of the concentrations of greenhouse gases in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The South African Government ratified the UNFCCC in August 1997.

As is clear from our discussion above, it has been recognised that the commitments set out in the UNFCCC were inadequate for achieving its ultimate objective and this led to the adoption of the Kyoto Protocol in 1997, after much international negotiation. The South African Government acceded to the Kyoto Protocol in July 2002. In order to fulfil the

[77] South Africa has laws and policies that make primary education free and compulsory

requirements of the UNFCCC, South Africa prepared an Initial National Communication to the UNFCCC, in accordance with Article 12 of the Convention. In addition, detailed South African country study reports have been compiled on a sectoral basis. Using the results of this work, together with information from the IPCC Third Assessment Report, the Department of Environmental Affairs (DEA) and (then) Tourism developed a national climate change response strategy. The objective of this strategy is to support the policies and principles laid out in the Government White Paper on Integrated Pollution and Waste Management, as well as other national policies including those relating to energy, agriculture and water.

The strategies outlined in this document are designed to address issues that have been identified as priorities for dealing with climate change in South Africa. Whereas the national strategy must recognise international realities, including the growing pressure for quantified commitments of some kind by developing countries, including South Africa, it must be seen within the context of the present economic realities of the country and the inequitable distribution of global wealth. Thus, the point of departure reflected in this strategy is achievement of national and sustainable development objectives, while simultaneously responding to climate change.

- **Local climate change principles**

The achievement of South Africa's climate change response objective is guided by the principles set out in the Constitution, the Bill of Rights, the National Environmental Management Act, the MDGs and the UNFCCC. The principles include, amongst others:

- *Common but differentiated responsibilities and respective capabilities* – aligning our domestic measures to reduce the country's greenhouse gas emissions and adapt to the adverse effects of climate change with our unique national circumstances, stage of development and capacity to act.
- *Equity* – ensuring a fair allocation of effort, cost and benefits in the context of the need to address disproportionate vulnerabilities, responsibilities, capabilities, disparities and inequalities.
- *Special needs and circumstances* – considering the special needs and circumstances of localities and people that are particularly vulnerable to the adverse effects of climate change, including vulnerable groups such as women, and especially poor and/or rural women; children, especially infants and child-headed families; the aged; the sick; and the physically challenged.
- *Uplifting the poor and vulnerable* – climate change policies and measures should address the needs of the poor and vulnerable and ensure human dignity, while endeavouring to attain environmental, social and economic sustainability.
- *Intra- and Inter-generational sustainability* – managing our ecological, social and economic resources and capital responsibly for current and future generations.
- *The Precautionary Principle* – applying a risk-averse and cautious approach, which takes into account the limits of current knowledge about the consequences of decisions and actions.
- *The Polluter Pays Principle* – those responsible for harming the environment

paying the costs of remedying pollution and environmental degradation and supporting any consequent adaptive response that may be required.

- *Informed participation* – enhancing public awareness and understanding of climate change causes and impacts to promote participation and action at all levels.
- *Economic, social and ecological pillars of sustainable development* – recognising that a robust and sustainable economy and a healthy society depends on the services that well-functioning ecosystems provide, and that enhancing the sustainability of the economic, social and ecological services is an integral component of an effective and efficient climate change response.

Adaptation strategies will be integrated into sectoral plans, including:

- The National Water Resource Strategy, as well as reconciliation strategies for particular catchments and water supply systems.
- The Strategic Plan for South African Agriculture.
- The National Biodiversity Strategy and Action Plan, as well as provincial biodiversity sector plans and local bioregional plans.
- The Department of Health Strategic Plan.
- The Comprehensive Plan for the Development of Sustainable Human Settlements.
- The National Framework for Disaster Risk Management.

6.8 GENDER, POWER, CULTURE AND CLIMATE

Adaptation requires a range of actors *beyond* the local, but at the local level, community-based adaptation initiatives need to be grounded in a highly developed appreciation of local social dynamics to transcend overly simplistic analyses of power relations (Ensor & Berger, 2009). At the same time, gender studies reveal that local culture is oppressive to some, and finding ways to build adaptive capacity will require the development of a dialogue on climate change that encompasses engagement with politics, policy and power at multiple levels (Ensor & Berger, 2009).

It is usually overlooked in the policy literature that local interpretations of the causes of climatic events are frequently religious and spiritual (Strauss & Orlove, 2003). Better understanding of how culture shapes interpretations of the climate, of the “cultural construction of climate” (Nelson & Stathers, 2009) is needed, otherwise adaptation efforts will not be rooted in local culture and social forms, and nor will opportunities be identified for challenging myths and constrictive social norms.

Adaptation options are not unlimited because not every adaptation option will resonate with social forms. Culture is not fixed and the process of engagement is thus critical and must be based on participatory processes for identifying local problems and appropriate solutions (Ensor & Berger, 2009). In the remote islands of Yap, in the Pacific, women’s knowledge of island hydrology enabled them to find potable water and build new shallow wells during an ENSO-related drought. However, it is also clear that local and indigenous community responses may not be sufficient to cope with rapid environmental changes –

so it is important to understand the capacities of women, men, girls and boys in addressing their risks in each specific location (Anderson, 2009) and to adopt a long-term perspective in adaptive planning (Nelson, 2011).

The threat of climate change has been recognised as a global priority issue and therefore climate change is a sustainable development challenge, with broad impacts not only on the environment but also on economic and social development (UN, 2009). It can be seen from the discussion above that in the aftermath of disaster, women are the ones that are expected to pick up the pieces. The Minister[78] of the Department of International Relations and Cooperation (DIRCO) highlighted the fact that "Women are the face of the climate realities, while they as negotiators and political leaders are discussing, sometimes with questionable urgency, to find a global response that could address women's plight". Men depend entirely on women even though most of the times they are the ones who caused the problem. Cultural issues become a stumbling block in some scenarios where women are not allowed to voice an opinion. What is needed is far more insight and sensitivity around gender, tradition and culture. It is not always appropriate to consider gender through a western lens of social justice and equity. It could be said that women are being discriminated against in the way they position themselves in meetings in Lambani – sitting on the ground while the men sit on stools. Can this be termed discriminatory? No, because as project team members listened to the echos of the voices of the women, they learned that the women prefer this arrangement. In conducting a vulnerability assessment as the final output for the report, it became more difficult to categorically decide who is being marginalised and who is not being marginalised and in what way this marginalisation aggravates or creates vulnerabilities. A gendered lens requires the project team to position itself in the particular, and in the authentic experience of the "here and now". When doing this, the project team was sure to raise more questions and to tread more carefully when undertaking our final analysis. It can be claimed that vulnerabilities are fluid and that a women who is seemingly marginalised does have power and agency, and that to ignore her power is to be guilty, as a researcher, of discriminatory practice.

The Department of Arts and Culture has mainstreaming activities which include:

- Setting and achieving employment equity targets within all cultural and creative industries, institutions and structures.
- Setting and achieving preferential procurement targets for women, youth and people with disabilities within all cultural and creative industries, institutions and structures.

Whether it be violence (against women or against members in her family – her girl child, her boy child for instance), hunger, malnutrition, unemployment and even the impact of

[78] South African International Relations and Cooperation Minister Maite Nkoana-Mashabane ended her tenure as UN Climate Change President by launching "Thuto ya Batho" or "Teachings from my People - Women adapt to climate change" on Gender Day in Doha, Qatar, November 2012. http://www.southafrica.info/news/international/climate-book-281112.htm#.Vs1TUzbF6ll#ixzz4149QqDse

climate change, women are the first to feel the pinch. The project team discoverd that water scarcity is a serious concern in the village of Lambani yet men did not identify this as the most important issue when walking through the village, but women did. Women also informed the project team about the burdens they carry on their heads – e.g. the firewood that they collect kilometres away from their dwellings, yet men only mention firewood collection casually in passing. These are clear indicators of where the focus is in everyday life. Even though it is women who bear the brunt of food shortfalls and are most likely to suffer from climate change, they are also the most capable of creating change and adaptation within their village. What is more important is that drawing on women's experiences, knowledge and skills and supporting their empowerment will make climate change responses more effective. The project team did pursue this research focus during the duration of the project and filled in the many gaps and ambiguities that emerged during their first entry into Lambani in August 2014.

The Department of Cooperative Governance and Traditional Affairs (CoGTA) derives its mandate from Chapters 3, 7 and 12 of the Constitution of the Republic of South Africa (1996). As a national department, one of its functions is to develop national policies and legislation with regard to local government. The integrated urban development framework (IUDF) report on social empowerment[79] from the department highlights the growing inequality between men and women, rich and poor, urban and rural, and within communities, converging in a description of South African society as one of duality, disparity and inequality, which acts as a constraint to ensuring that economic growth results in significant declines in household poverty levels. The report highlights development frameworks relevant to social empowerment and inclusion and the importance of identifying notions of power as relational, moving beyond comparison of differential gendered experiences to articulating underlying social and structural determinants of inequality. There is also recognition of the way in which gender-based roles are connected to international capitalist systems where they are embedded in women's "triple" roles. One of the key findings in the report "Financing Climate Change", commissioned by the Department of Environmental Affairs in 2011,[80] is that the transition to a climate resilient economy requires a responsive, catalytic and coordinated development finance system. South Africa has a well established development finance system across national, provincial and local government, with common and differentiated development mandates including infrastructure delivery and industrialisation, microfinance and focused interventions for women, youth, human settlements and land.

Water policy is embedded in a global change towards an IWRM ethos. Principles that were agreed on by international fora engaging with water management are:

- Water should be seen as a social and economic good;
- Water management should be based on the user pays principle;

[79] Background Paper for the Integrated Urban Development Framework by Scott Drimie & Edgar Pieterse, 2013. http://www.cogta.gov.za/index.php/iudf/1077-iudf-background-paper-social-empowerment-draft-for-revie-1-1.
[80] Document bringing both departments (Finance and Environmental Affairs) together.

- Water management should be decentralised and user based;
- Water should be managed within an integrated framework drawing a balance between efficiency, insurance of basic needs and environmentally sound management;
- Women's central role as water managers and water users should be recognised.

All of these principles, particularly one, three, four and five are gendered because women are responsible for assuring that this vital resource, water, is available to meet the needs of the household. The links between poverty, development, water and gender are often implicit rather than explicit but they are crucial within the context of this study because the project team know now that poverty is gendered. The variegated ways in which water policy addresses gender and how all too often gender is simply merged into cross-cutting themes of HIV/AIDS, disability or disadvantage rather than given prominence in its own right were observed. Furthermore, women are not a homogenous group and they engage with multiple aspects around water – both water for productive use and water for domestic purposes (washing, feeding, cooking etc.). This calls for a differentiated reformed policy that addresses the multiple dimensions of gender and takes on board the feminisation of all aspects – rather than only some – of water management.

7 VULNERABILITY ASSESSMENT FRAMEWORK TOWARDS A GENDER-SENSITIVE MAINSTREAMING STRATEGY

In order to achieve gender-sensitive mainstreaming, a vulnerabity assessment (VA) framework was developed as a strategy for responding to climate change challenges. The framework draws on the empirical evidence gathered in Lambani. This section presents a step-by-step approach for conducting a gender-sensitive VA that can be adjusted, improved and applied in any given community. A schematic of categories and key variables has been suggested. The case study data from Lambani has been triangulated and validated through literature presented in Chapter 5, for instance, Alston (2006); Cannon (2002); O'Brien *et al.* (2004) and Waite (2000).

The first step was to identify categories which followed a schematic such as Ostrom (2009)'s "general framework for analysing sustainability of social-ecological systems", allowing the project team to populate the schematic with variables that have emerged both from the primary data collection undertaken for the VA and data that emerges from the desk-top studies. The data has also been validated in two workshops – one which was a knowledge dissemination workshop held with the community in Lambani in September 2016 and the other a workshop on resilience and equity held in Stellenbosh in August 2016[81] where a number of gender experts were invited to interrogate the schema and the proposed categories and variables. The proposed schema was redesigned following expert input from the two workshops. This validation process is an iterative one so as to ensure that the categories - and variables within the categories - are suitable for a robust gender-mainstreaming framework.

7.1 DEFINING THE VULNERABILITY ASSESSMENT

A VA is the process of isolating, organising, quantifying, and prioritising (or ranking) the vulnerabilities and strengths that exist in a given system. As the discussion above has indicated, although the impacts of climate change are affecting and will continue to disproportionately affect poorer rural and urban communities in developing countries, few vulnerability and adaptation assessments adequately explore the gendered or socially differentiated nature of those impacts.[82] The frame presented in this report takes into account not only external climatic stressors but also the multiple development concerns (economic profile, demographics, education, health etc) that exist in Lambani. The methodology was designed to assess the strengths and weaknesses that exist in the socio-political and geographical landscape of Lambani (see Chapter 2) and in so doing to capture what O'Brien *et al.*'s study (2004)above identifies as "double exposure" to address

[81] Workshop on Water Equity and Resilience in Southern Africa held 24-26 August, 2016, at The Stellenbosch Institute for Advanced Study, Stellenbosch, South Africa. The workshop was funded by the International Waters at the University of British Columbia, Peter Wall and the Water Research Commission, Pretoria

[82] Cannon (2002), Nelson *et al.* (2002), Skutsch (2002), Lambrou & Grazia (2006), Dankelman (2008)

multiple stressors. The idea of “double” means that the schema captures both human and environmental factors as not being separate but co-existing and entangled with each other. By “double exposure” the notion of internal aspects (site-specific) and external aspects (policy and an enabling – or disabling – environment) is captured.[83] Double exposure thus captures internal stressors which are due to poverty and deprivation and internal stressors due to the direct impact of climate change in a given locale. The double dimension has a focus also on the external stressors that might be socio-political (to do with the enabling policy environment for instance) and climate change stress that affects a given region. The research is thus concerned with multiple scales, micro and macro levels, and the broad-scale environmental and human systems within which local systems reside.[84]

Vulnerability can be viewed as an end point, where climate change results in vulnerability, or as a starting point which determines adaptive capacity and the impact that climate change will have (O’Brien *et al*., 2004). The NGO, ActionAid, uses a participatory vulnerability assessment (PVA) tool to investigate why floods occur and how villagers (at the local level) adjust to them. It is important to ascertain how villagers adjust to these stressors and to know who is responsible for reducing flood risk and consider what action a village itself can take. This will depend on the internal assets of the village as well as on the external assets – networks, neighbourhood alliances, government support in the form of safety nets, disaster management and so forth.

[83] O’Brien *et al.* (2004) map multiple stressors and vulnerability in India where they consider areas of “double exposure” that are a cause for concern. They are likely to be areas where farmers are adapting to a variable and changing climate under conditions of economic stress. It is in these areas of double exposure where policy changes and other interventions may be most needed in order to help farmers to negotiate changing contexts for agricultural production

[84] Because institutional arrangements, politics and stressors that exist at the macro-scale are likely to affect local systems, they are explored in depth in Chapter 6.

7.2 CORE CONCEPTS OF VULNERABILITY ASSESMENT

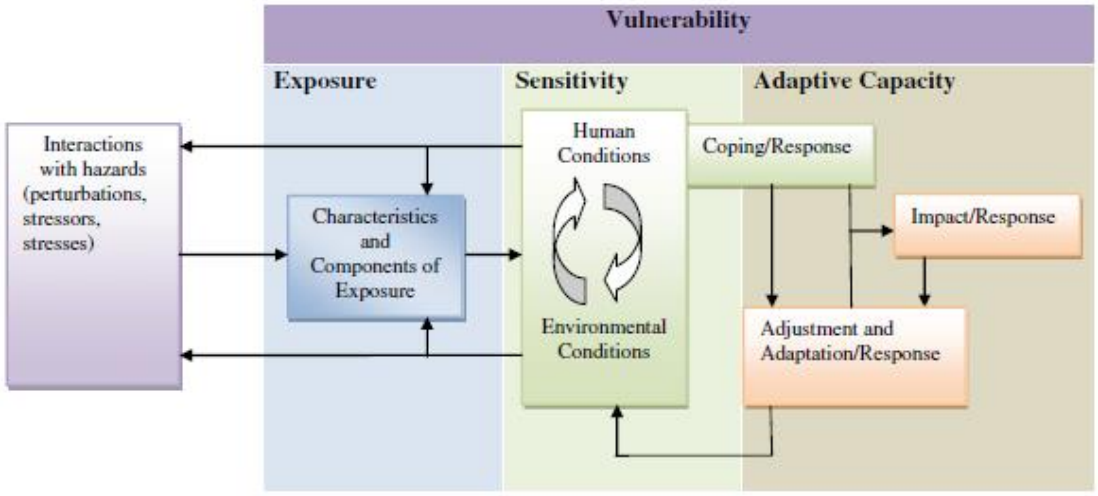


Figure 36 Vulnerability Assessment Framework (Sonwa *et al.,* 2012)

Similar to Sonwa *et al*. (2012), three core concepts that inform the VA framework were identified and these are adjusted from Figure 36 above. The first is the idea of exposure where the characteristics and components of exposure are classified around concerns of sensitivity, resilience, adaptation, external and internal stressors and health hazards. Heed is taken of patriarchal stereotypes – or lack thereof – and the way in which these prejudice some segments of the population – paying particular attention to gender divides. The second idea is that of temporality which assesses whether particular events are once-off events and, if not, how often a particular stressor is likely to recur. It is important to identify whether an event is ongoing or a once-off situation by asking questions such as: How sporadic is this event? Is it iterative? Is it once-off or can recurrence in the future be anticipated? For our own framework, temporality has been added alongside a third category, the resource base. Vulnerability cannot be measured unless the resource base is known as this influences adaptive capacity and coping strategies. Here both the material and non-material goods that are present in a given site are assessed. Under this rubric, the project also taps into the internal and external connections (social capital) of the village and considers how strong these networks are and whether and in what ways they serve individuals during times of stress. When considering the resource base, emotional well-being is pivotal. Here the idea of agency and control over one's life, life satisfaction, feeling valued in one's community, empowerment and a sense of hope and of belonging are all critical. Importantly, even in instances where there is resilience, adaptation cannot eliminate all risks from extreme events which is why a part of adaptation lies in the assets/resources, institutions and networks that can be activated post disaster (Hardoy & Pandiella, 2009).[85] Information is then gathered (Table 14) and organised within these

[85] Satterthwaite *et al*. (2009) carefully define the terms and place emphasis on the idea of adaptation – or lack thereof. Adaptation to human induced climate change, adaptive capacity,

three principles: (1) exposure, (2) temporality and (3) resources, which provide the scaffold for the VA framework.

The framework is a robust one because it accounts for key variables that are essential for any gendered assessment of vulnerability to climate change and these can be adjusted on a case by case basis. In populating the VA frame the works of Hardoy and Pandiella (2009), Satterthwaite *et al*. (2009) and Mukheibir and Ziervogel (2009) are also considered. Hardoy & Pandiella (2009) focused on urban poverty and vulnerability to climate change in Latin America. Over and above the project's three core concepts, six aspects of vulnerability have been proposed by these authors and, for the purpose of the VAF that has been developed, these six aspects have been expanded on, framing the project's inquiry in such a way that gender differences would be well captured. The next step is to consider these six questions that Hardoy and Pandiella (2009) proposed.[86]

adaptation deficit, adaptation and mitigation linkages, adaptation *in situ*, autonomous adaptation, climate change risk, limits to adaptation, maladaptation, planned adaptation.

[86] A seventh question is helpful – what prior knowledge (indigenous or acquired through external opportunities of learning) helps mitigate for vulnerability? This knowledge is classified as an asset.

Table 14 Six aspects of vulnerability (a gendered perspective)[87]

1	Who lives or works in the locations most exposed to hazards? (exposure)	e.g. Are there landslides or risk of flooding and who lives there? (exposure)
2	Who lives or works in locations lacking infrastructure that reduces risk? (exposure)	e.g. Where are there no storm water drains? (asset base)
3	Who lacks the knowledge, capacity and opportunities to take immediate short-term measures to limit impacts? (asset base)	e.g. to move family members to safer places, to consider alternatives, to draw on social capital and connectivity (asset base)
4	Whose homes and neighbourhoods face greatest risks when impacts occur? (asset base)	e.g. homes of poorer quality, less protection for inhabitants so that there is more injury, loss, death (asset base)
5	Who is least able to cope with impacts? (asset base)	e.g. illness, injury, death, loss of income, lack of insurance, lack of relation to government to get compensation (asset base)
6	Who is least able to adapt to avoid impacts? (asset base)	e.g. by building better homes, getting government to install needed infrastructure and to provide needed disaster preparedness (asset base)

The four major principles, as proposed by Mukheibir and Ziervogel (2009), are also relevant, namely that (1) adaptation to short-term climate variability and extreme events is included as a basis for reducing vulnerability to longer-term climate change, (2) adaptation policies and measures are assessed within a development context, (3) adaptation occurs at different levels of society, and (4) both the strategy and the process through which adaptation is implemented are equally important. The selected methodology for this study – ethnographic mapping and so forth (as presented in Chapter 3) as well as the knowledge dissemination workshop conducted among community members - has a deliberate focus on **process** and the co-production of knowledge.

7.3 DATA REQUIREMENTS FOR A VULNERABILITY ASSESSMENT

Table 15 presents an overview of data that was deemed essential for the VA. Each topic is organised within the VA framework core notions of exposure, temporality and resource base. [88]

[87] Adapted from Hardoy & Pandiella (2009)

[88] It is helpful to classify data within the concepts of exposure, temporality and resource base but these are not necessarily mutually exclusive and data can be organised under two or three categories

Table 15 **Data collection focus**

	Topic	Indicators	Vulnerability assessment framework core notions (exposure, temporality, resource base)
1	Geography	Site specifics	Exposure
		Locality	Exposure
		Soil topography	Exposure
		Spatial distribution	Exposure
2	Socio-economic profile	Number of households	Exposure
		Head of household	Exposure
		Gender skews	Exposure/resource base
		Age	Exposure/resource base
		Education levels	Resource base
		Marital status	Resource base
		Dependency ratio	Exposure
		Health	Exposure
3	Education	No. of primary and secondary schools	Resource base
		Physical condition of schools	Resource base
		Teacher/pupil ratio	Resource base
		School attrition	Resource base/temporality
		Climate hazards and schooling	Exposure/temporality
		Hunger[89] and schooling	Exposure/temporality
4	Culture and religion	Religious affiliation	Resource base
		Cultural beliefs and traditions (indigenous knowledge)	Resource base
		Do they feel that their culture might be affected and would this be permanent?	Resource base, temporality
5	Communic-ation	Networks (affiliations)	Resource base/temporality
		Able to go to meetings (disruptions in communication channels)	Temporality
		Telephone access	Resource base
		Printed media	Exposure/temporality
		Radio	Exposure/temporality
6	Health	No of mobile clinics, hospitals	Resource base
		Water quality and water-borne diseases	Exposure/temporality
		Disability	Resource base
		Mental health	Resource base
		Do they feel satisfied with health facilities?	Resource base

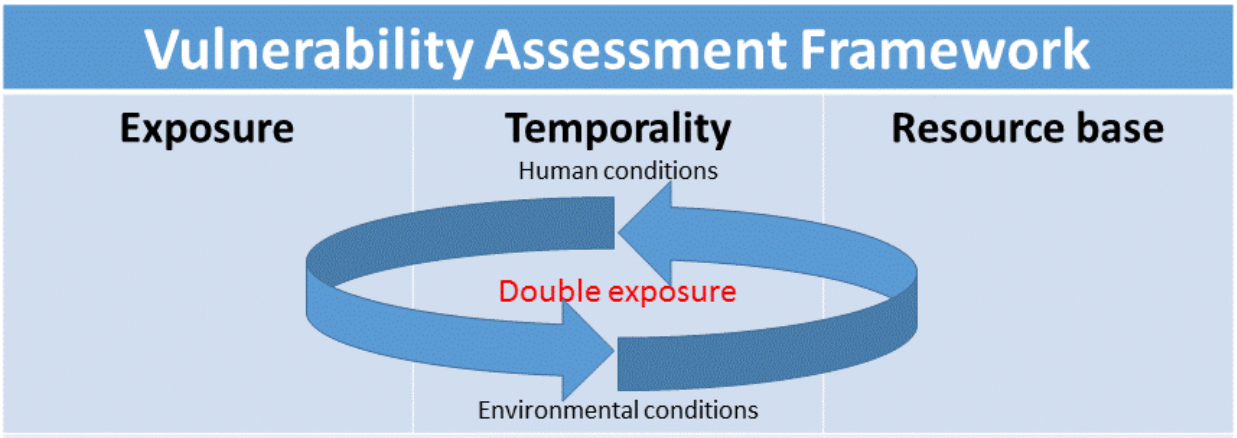
[89] Captured using the survey question “How often does a child (or an adult) in the household go to bed hungry?”

Topic		Indicators	Vulnerability assessment framework core notions (exposure, temporality, resource base)
7	Infra-structure	Types of dwellings Roads (includes climate hazards – erosion, flooding etc.)	Resource base Resource base/temporality[90]
		Water and sanitation (feeling satisfied with water)	Resource base/temporality, exposure
8	Mobility	Buses, taxis etc. Urban access	Resource base Exposure
9	Climate change data	Long-term monthly and annual climate data as well as short-term data	Exposure/temporality
		Short-term data	Exposure
		Being affected by climate change	Exposure, temporality
10	Employ-ment status	Unemployment	Resource base/temporality
		Migration to the towns	Exposure
		Income generating activities (formal/informal)	Resource base/exposure/temporality
11	Recreation-al facilities	Community centre	Resource base
		Sports fields	Resource base
12	Emotions and aspirations	How people feel about climate change	Resource base
		Social capital (trust)	Resource base/exposure/temporality
		How do people feel about themselves, do they worry, are they fearful, do they feel hopeful that they can do something etc.	Resource base
		Do they feel valued	Resource base
		Life satisfaction	Resource base/temporality
		Control over own lives	Resource base/temporality

Take, for instance, the question: Do you have control over decisions that affect your everyday life? Here, control over decisions is considered as an asset but the response categories also need to be considered in terms of temporality? How often do you feel that you have control over decisions that affect your life – is it always, sometimes, never? A person who does not have control over decisions is likely to be more vulnerable under the category exposure. As the proposed model also considers double exposure, the data was further interrogated by asking whether or not these decisions are internal (just to do with the household) or whether the question needs to be extended to cover external decision-making (in the village, or beyond). In some instances, how exposed the site is to external stressors, i.e. exposure would be considered as the most significant notion, but the idea of the site being an asset or the idea of temporality remains pertinent (how often is this

[90] For instance, how often have floods destroyed the road?

site subject to exposure, is it always, sometimes, never?). The schema below (Figure 37) is the proposed (final) VA framework developed for mainstreaming gender into climate change discourse.



Selected questions as guideline to populate frame:

1.	Who lives or works in the locations most exposed to hazards? (exposure)	e.g. Where there landslides or risk of flooding and who lives there? (exposure)
2.	Who lives or works in locations lacking the infrastructure that reduces risk? (exposure)	e.g. Where are there no storm water drains? (asset base)
3.	Who lacks the knowledge, capacity and opportunities to take immediate short-term measures to limit impacts? (asset base)	e.g. to move family members to safer places, to consider alternatives, to draw on social capital and connectivity (asset base)
4.	Whose homes and neighbourhoods face greatest risks when impacts occur? (asset base)	e.g. homes of poorer quality, less protection for inhabitants so that there is more injury, loss, death (asset base)
5.	Who is least able to cope with impacts? (asset base)	e.g. illness, injury, death, loss of income, lack of insurance, lack of relation to government to get compensation (asset base)
6.	Who is least able to adapt to avoid impacts? (asset base)	e.g. building better homes, getting government to install needed infrastructure and to provide needed disaster preparedness (asset base)

New schematic presentation of Vulnerability Assessment framework for gender sensitive mainstreaming strategy inspired by Sonwa *et al.* (2012).

Figure 37 Vulnerability Assessment Framework for Mainstreaming Gender

The steps that are required to populate the VA framework are as follows:

- Collect and integrate secondary and primary data on the existing physical, climatic and social assets of the village
- Assess the data critically to determine the strengths and weaknesses of these assets (and also of the data itself)
- Choose a theoretical frame for the study
- Identify and demarcate the site of investigation
- Approach key stakeholders such as tribal chiefs and councillors with the purpose of the study and solicit access to the study area (opening doors)
- Design appropriate instruments (in this case quantitative and qualitative)

- Train interviewers to implement the survey instrument (quantitative), and follow all steps (laboratory and field pilots, validation, preliminary analysis and so forth) required to implement the survey
- Conduct the qualitative component of the study
- Collect all data (qualitative and quantitative)
- Analyse data
- Identify key concepts (in this case exposure, temporality and assets) according to Figure 37.
- Identify key questions, each one relating to the key concepts (Table 15)
- Present the typology, socio-demographics of the site and populate the frame with empirical evidence
- Identify, categorise and rate vulnerabilities
- Present data – knowledge dissemination of data
- Validate data
- Adjust VA framework
- Make recommendations.

7.4 PERCEPTIONS

The way in which the non-human (in this case climate change) entangles itself with the human - forcing adjustments (and inconveniences) to the everyday, for instance "*there is no village hall built for the villagers even though the villagers have requested one from both government and tribal council. During rainy season or when it is either very cold or too hot villagers hardly attend any meeting*."[91] The theoretical frame captures quality of life and here we see the impact of external stressors on quality of life. In Section 3.2.5, it is noted that village meetings or other community gatherings take place at the Chief's kraal where there is a community hall or under a big tree. The absence of basic services such as a village hall outside the Chief's kraal, is not enabling and this perpertuates feelings of exclusion in decision-making around issues that concern them. As seen in Section 3.2.5, basic services are not provided as promised by the government and it is necessary that the tribal authorities engage adequately with the government in order that basic services, such as a village hall, are provided. Access to information and a space where community members can participate in decision-making regarding their everyday concerns is crucial as it brokers trust, dignity, hope and other "intangible" goods that inform social action.

Some of the extracts below reflect hazards that face learners during floods and droughts and during conditions of extreme cold or extreme heat. When the learners were asked how they felt during this time they responded, "*terrible because our mud house cracks*." Or "*the rain was very heavy. Like it ... the rain would fall from 6 in the morning to 6 at night .... we couldn't carry out with our daily life*."

[91] Semi-structured interview with key respondent, Lambani, August 2015. Meetings are usually held under a tree in the center of one of the sub-villages

The gender dimension is pertinent not only to climate change but to everyday life where "s*ome of these women they are at school;*[92] *when they are back from school, they go to fetch water and you can see this is too hard; they don't have time"* and this impacts on learners as *"this could be a challenge for their studies; for doing homework after school.*"

The effects of extreme cold on school attendance are evident "... *not go to school in extreme cold because of crossing the river water: too cold ... is dangerous."* School attendance during the floods was perceived as dangerous and, as is poignantly expressed in the following statement, "*we were scared because houses were flooded and we were hopeless because the one child drowned while going to school*."

The extracts above reveal that school attendance is limited, which of course, in turn, affects learners' educational level. As shown in Section 3.2.3, Lambani is characterised by low educational attainment due to several issues, but aggravated by extreme weather conditions such as droughts and floods. The risks involved during extreme floods are especially pertinent and should be addressed for the safety of learners.

The impact of the non-human (climate) on humans is expressed in other ways – for instance, because of lack of food security due to crop failure the towns become viable alternatives but not without risk and hazards*:*

Migrant workers as outsiders: sometimes if like… a rural boy goes to the city… there are many challenges to make you feel like you are backward. And you can make yourself start to look like you are.. you are coming from the rural areas. [When I go to Joburg] I feel like I'm different. […] because if you are growing here… [became sad] very different. In Joburg, everything is very fast […] they are not friendly there. And they don't get what they want …[93]

As observed in Section 3.2.3, the survey data reflects food insecurity in the households in Lambani, with cases of both adults and children sometimes going to bed hungry. Food security has been defined by the FAO (2009):[94] "food security exists when people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO, 2009, p. 8). From the definition, the people of Lambani should not be going to bed hungry, and, apart from quantity, the quality of food intake matters. Section 3.2.4 also reflects on the high unemployment rates in Lambani. As a result, young men are forced to migrate to the cities to fend for their families and as reflected in the extract above, such movements are not without risks.

[92] Ages at school range from the young girl child (10–14) to the older girls and young women (15–25)
[93] Interview young man, Lambani, August 2014
[94] Food and Agriculture Organization, (2009). The State of Food Insecurity in the World: Economic crises- impacts and lessons learned.

Extracts from respondents in Lambani capture the openess of the human to change and to what Massumi (2011) calls "becoming" and this resonates with ideas of resilience and agency.

... *I overcome the flooding by putting sand bags on the eroded area and that process usually takes the whole day"* or again *"... I overcome the effects of floods by ploughing in an opposite direction of the slope and I put stones at the beginning of the ploughing row that prevents the soil from moving."* Importantly, "*after all these events, we are able to go back to our normal lives. By virtue of the fact that we go back and plant in normal season, it shows we have adapted*.[95]

The extract above reflects the resilience and agency of community members. It shows how the villagers themselves have come together and implemented lessons learnt[96] and, as the extract reveals, this is evidence of adaptation during extreme floods.

The way in which the non-human entangles itself with the human is notable – in some instances, it is difference that is palpable, not sameness, as in the example of the girl child who feels the terror of the non-human in her life – "(*floods) takes over in terms of getting to school, difficult for everyone, but for those that cross the river by foot, girls tend to be more afraid and come (to school) less*."[97] Mothers said that they felt "*helpless and worried*" about school attrition " ... *(learners) could not go to school for one month because the road was damaged*." These extracts reveal that despite the fact that extreme events affect all community members, some segments are more likely to be affected than others. In this instance, girls and mothers are more sensitive to shock. Considering gender sensitivity around extreme weather conditions is fundamental in informing policy and its adaptation strategies.

Some of the learners interviewed said that it was for "*as long as three to four months that they could not go to school*" or "*for three to four months livestock died, huts broke and a bridge collapsed.*" The learners reported that "*it was was hard to get everyone back to school.... local authority had to tell people to come back*" and "*it was hard to catch up on the time lost*." This explains that school attendance is influenced by a host of factors, and because school attendance in Lambani has been shown to be difficult, the need for solutions to mitigate for extreme events is critical.

Extracts below further reflect hazards that face villagers during floods and droughts and during conditions of extreme cold or extreme heat. Emoticons that were chosen to express these feelings ranged from pain and worry to fear and annoyance, some of which are reflected in Table 16.

Table 16 Expression of emotion

[95] Participatory Action Workshop, Lambani, September 2016
[96] Previous project by the Agricultural Research Council
[97]Semi-structured interview with key stakeholders, Lambani, August 2014

Pain	*It feels painful when the crops are flooded during flooding events and it is also painful when there are droughts while the effects of extreme events get us worried*
Worry	*(see statement above)* *When there are floods I get worried and the chief does not do anything and I am used to the situation. I feel powerless* *When there are droughts the crops are destroyed and I get worried during droughts* *My house was leaking. I was worried about generating money for the house because we needed money to improve our house. The flood event was not good. I hate the times of flood because we suffer a lot. The times of flood our houses, roads, bridges, and pipelines were destroyed*[98]
Annoyance	*When there are floods I feel annoyed because rain get into my mud houses*
Scared	*I felt too scared because of the occurrence of floods* *I was very scared that flood will destroy my house too … every time it rains the channel keeps on increasing. I think we were coping but it is difficult to explain how we coped to the situation. We just adapted the situation. I felt very bad about it*
Sad	*When government do not come during floods we feel neglected and during droughts we feel sad* *I felt sad during (the) flood because it has destroyed my relative's house* *I felt very sad about it. I felt very bad about the situation, it was painful situation during drought, and I do not think I was coping during drought event. I was just used to the situation. I eventually adapted to the situation* *I felt sad, government did not help us at all, and I wish they could do something about it*
Powerless	See 'worry' in row 2 *I felt very upset and powerless because I could not help when my neighbours' houses get destroyed*
Not okay	*When there are floods they destroy crops and I do not feel okay* *The flood event was not good. I hate the times of flood because we suffer a lot. The times of flood our houses, roads, bridges, and pipelines were destroyed*
Helpless	*I felt helpless and defenseless*

The emotional well-being of community members is critical evidence needed to populate a vulnerability assessment framework. The emotional responses reflected in Table 16

[98] Seventy percent of men and 83% of women are worried that they might lose their culture. Put differently, only 17% of women say that they are not worried about losing their culture whereas 30% of men are not worried.

reflect the emotional state of community members during these extreme events. The fact that villagers have shown some resilience and agency does not outweigh their need to be looked after by the authorities; tribal authorities and government. The ways in which different segments of the population adapt to these extreme events are not the same. Gender, economic resources, physical ability, age etc. are some of the many factors that shape people's capabilities and vulnerabilities. Policies and projects that are designed to respond to the differentiated nature of capabilities and vulnerabilities, and that also deliberately aim to build capabilities, can be highly effective in building adaptive capacity and enhancing equity for those who are most vulnerable.

7.5 CLIMATE CHANGE: CHALLENGES AND EXPERIENCES

Respondents were invited to give their opinion on what they thought would change in the area where they live because of climate change. Figure 38 presents a wide range of events that are likely to affect their lives, and the vast majority of the sample, both male and female, feel that there will be more storms, more rain, more disease, trees dying, greater heat and greater cold, government utilities (such as roads, clinics etc.) being destroyed and private property being damaged.

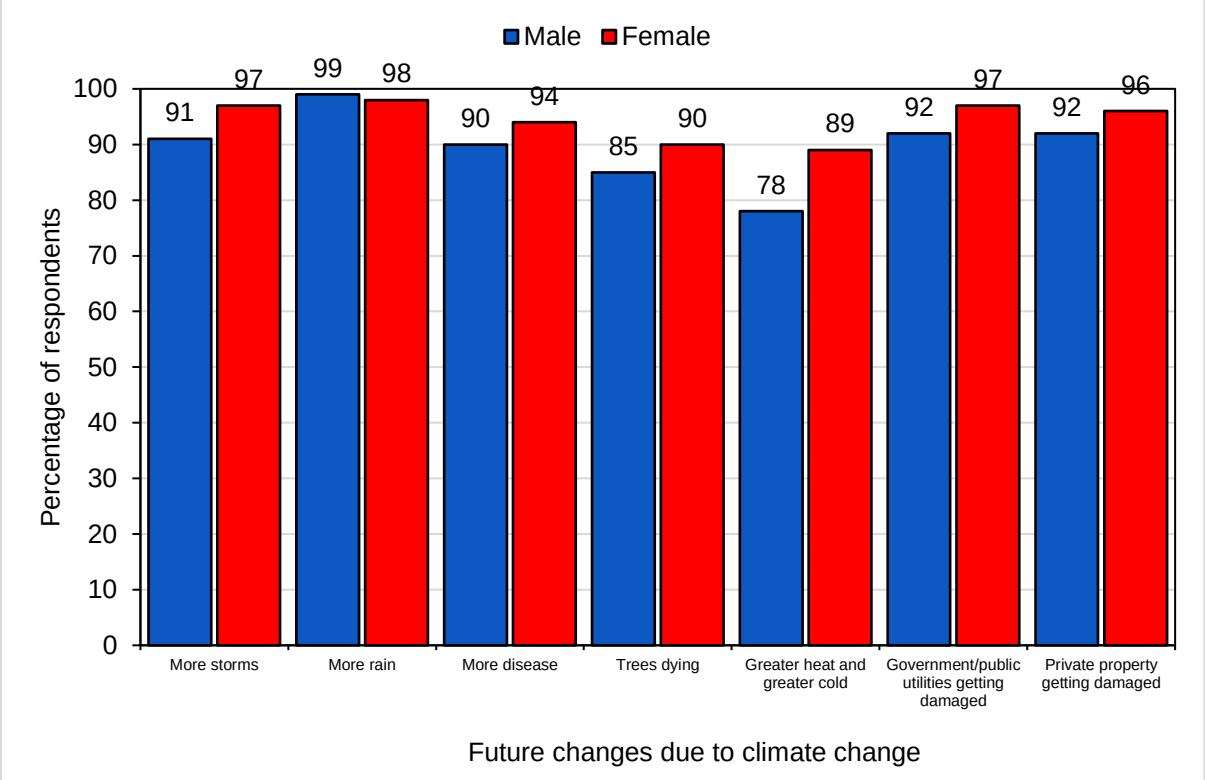


Figure 38 Perceptions of what will happen in future due to climate change

Figure 39 considers which segments of the population would be most affected by these changes. The ones who would be the most affected are the sick, elderly, women and children. Here there is some variation between the responses of men and women as 82%

of women think that children would be most affected while only 72% of men do. Ninety-five percent of women think that the elderly will be affected and 80% of women think that women will be affected while only 69% of men say that women will be most affected.

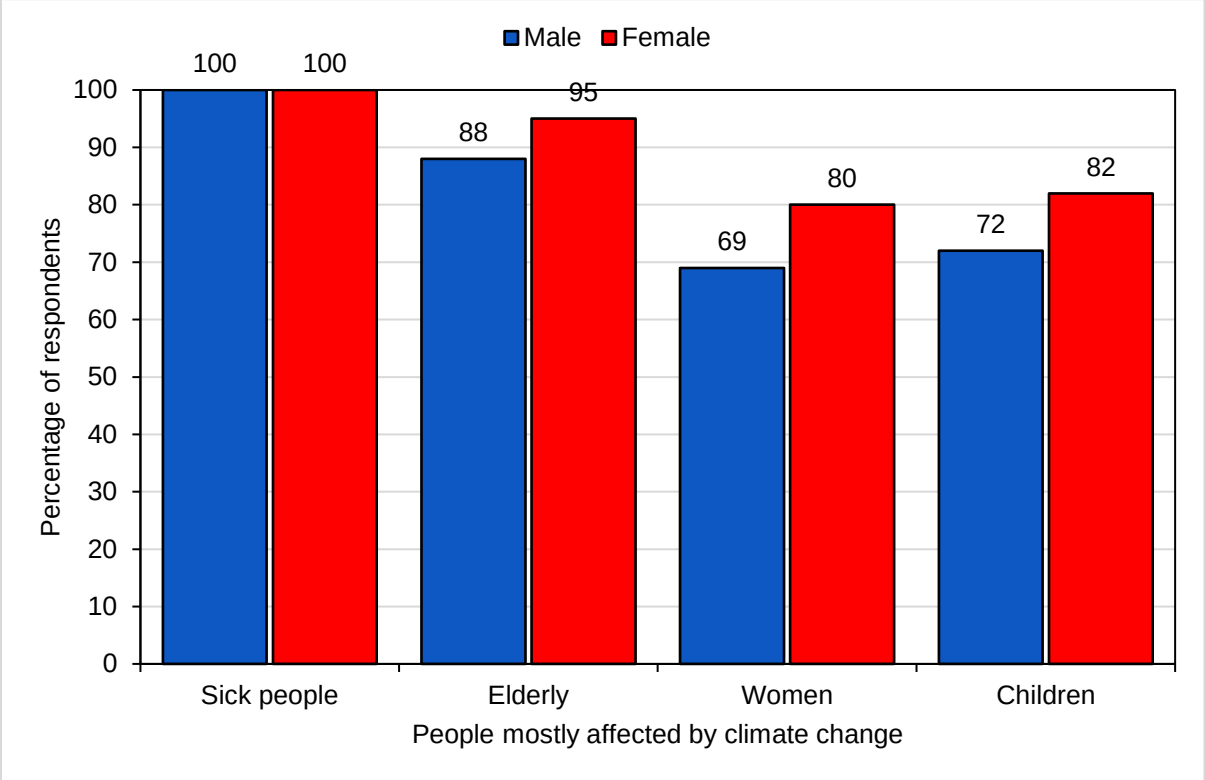


Figure 39 Segments of the population most affected by climate change

As per the discussion above, feelings were captured, and as Figure 40 below shows, there are some significant differences between male and female respondents where 81% of men felt angry while 70% of women did. It is possible, from these figures, that women do feel anger but are less likely to express it than men. Further research is required to tap into this evidence and to better understand what makes men – and women – angry. When asked whether they feared losing their culture a larger percentage of women were more fearful that they might lose their culture (83%) compared to men (71%). The vast majority of males (96%) and females (99%) were fearful (in general) and 87% of male and 90% of females felt that they were "scared that things were changing around here." A large percentage of men (78%) and women (76%) felt that they were powerless and helpless.

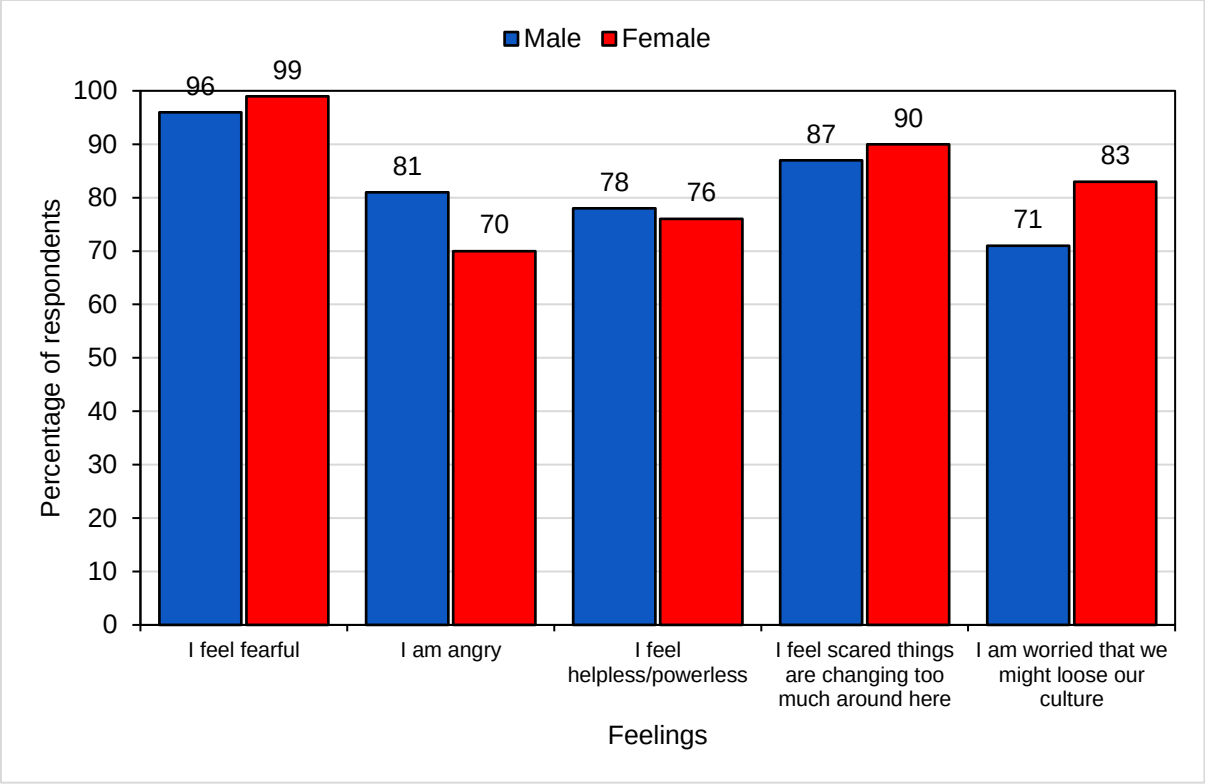


Figure 40 Feelings expressed around climate change

This is unsurprising because, as Figure 41 shows, the vast majority of males (84%) and females (90%) say that “things are changing around here because of climate change.”

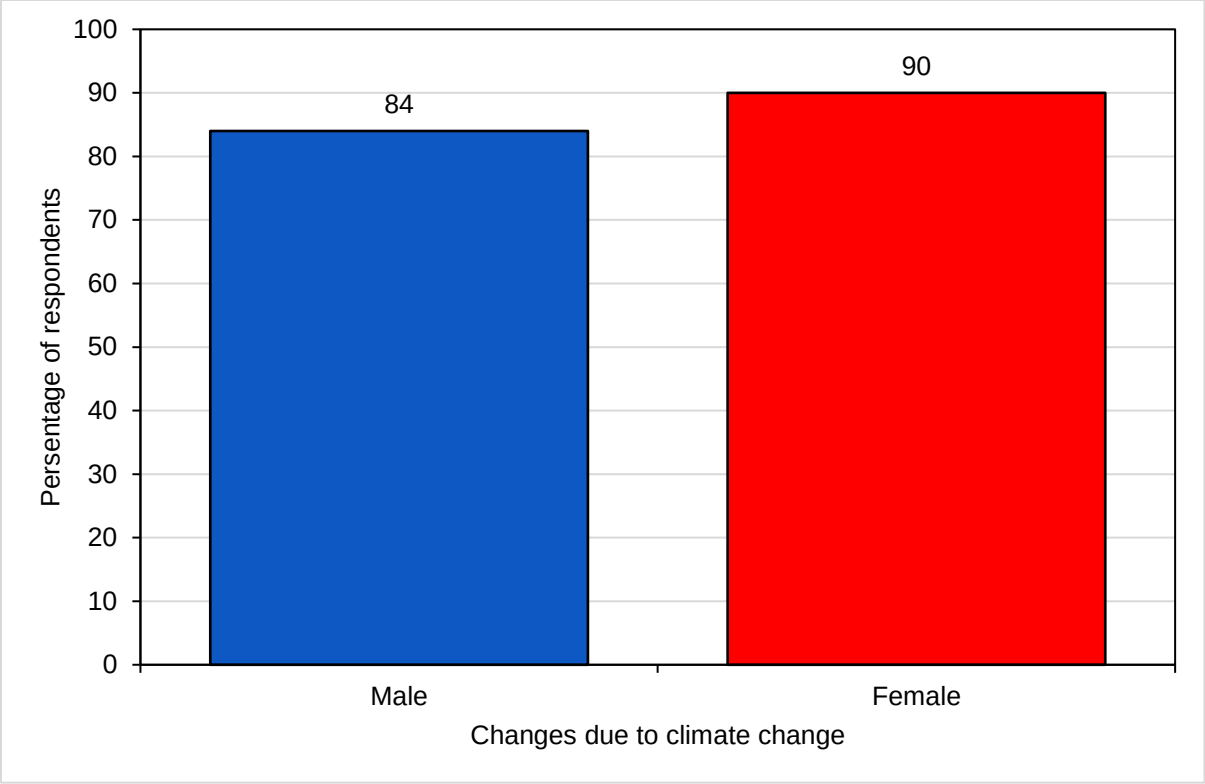


Figure 41 Perceptions of changes due to climate change

Figure 42 below indicates that only 14% of males and 23% of females feel that they can make any impact in making their neighbourhood a better place, 51% of males and 35% of females feel that they make a small impact while 35% of males and 43% of females feel that they are not making any impact at all. In contrast, and on the positive side, when asked the question “Do you feel valued by family and friends?” almost 100% of males and females say yes, they do feel valued.

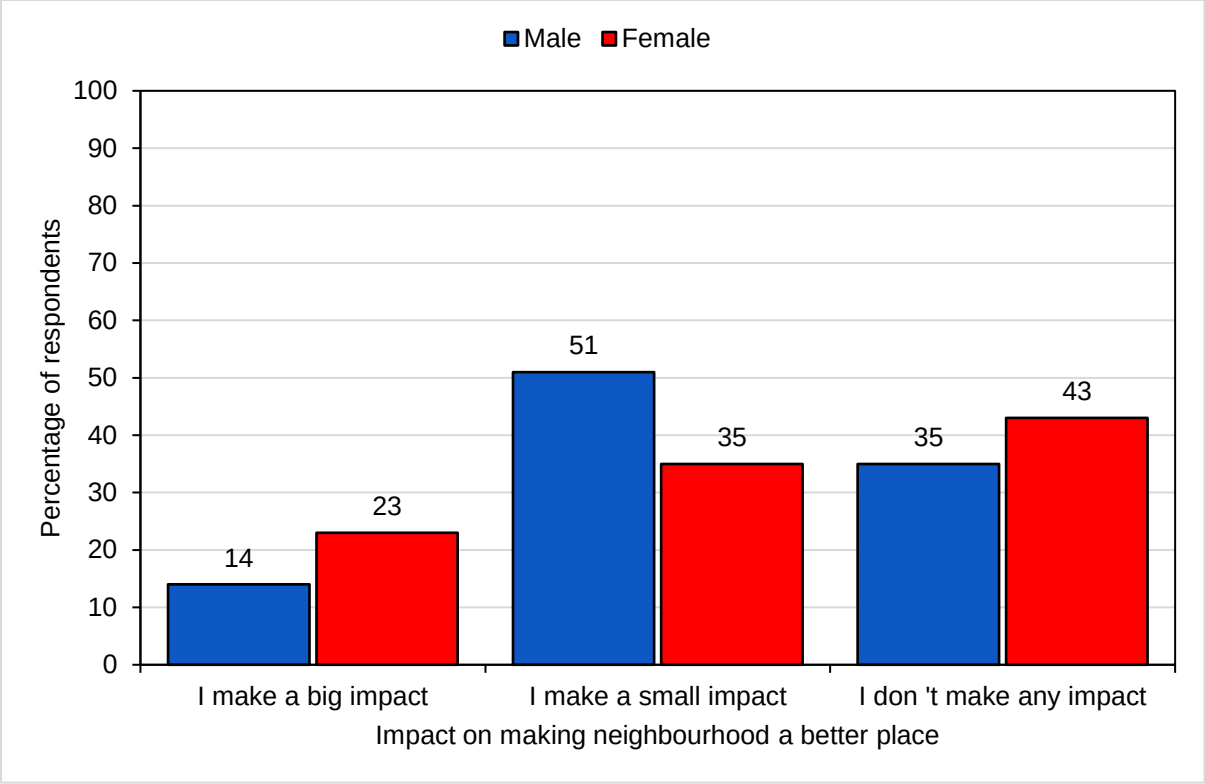


Figure 42 Perceptions on making an impact on their community

Feelings of control over one's own life are critical and reflect whether or not there is a sense of agency. The following data, reflected in Figure 43 on control over one's own life, is pertinent. Although not a large percentage of the sample, more females (36%) feel that they have control over their own lives than males (24%) while, at the same time, 28% of females feel they do not have any control over decisions compared to 21% of males.

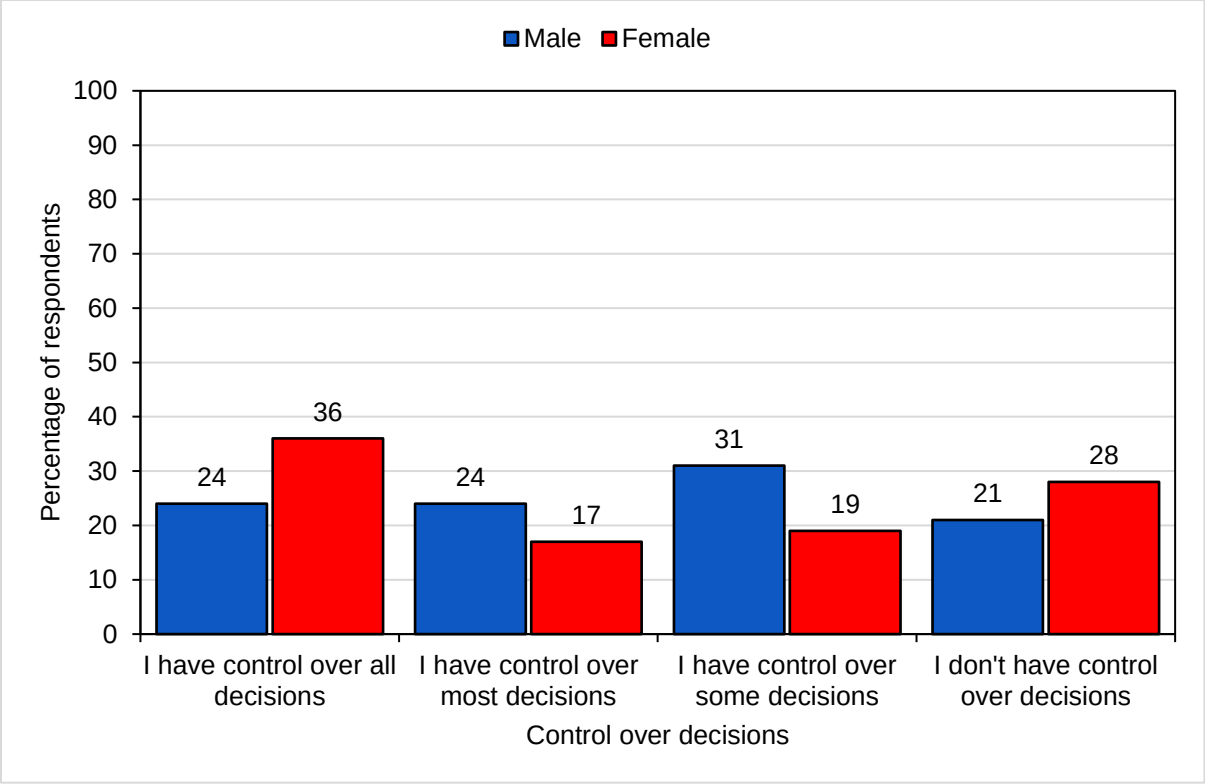


Figure 43 Control over decisions affecting everyday life

More than half of both male (62%) and female respondents (52%) say that they feel hopeful that they "will be able to do something", and, although it is a significant percentage, less than half (32%) of males and females (42%) say that they do not feel hopeful that things will get better. More than half of the respondents (68% of male and 56% of female) say that they are hopeful that things will get better.

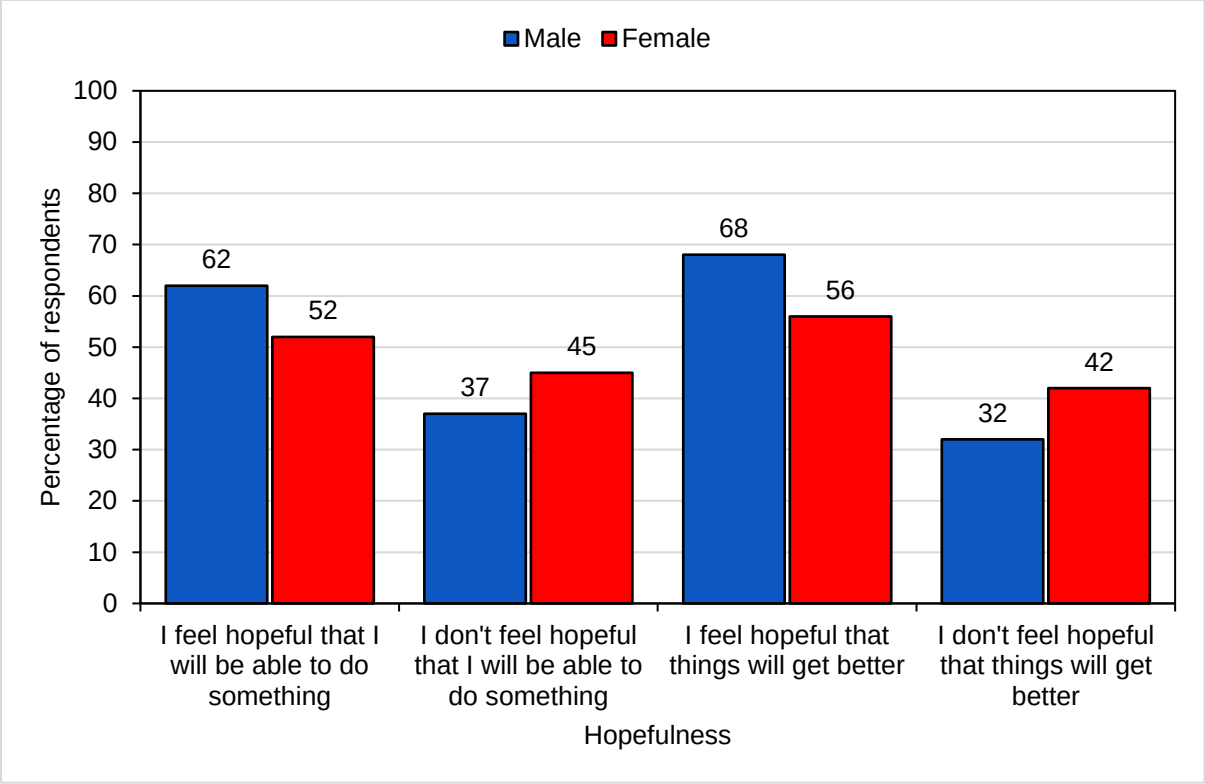


Figure 44 Feelings of hopelessness

When asked whether or not they were coping with extreme events the following evidence is pertinent. Forty-four percent of females and 32% of males say that they are not doing well at all, 46% percent of males and more or less the same percentage (45%) of females say that they are doing well whilst 22% of men and only 10% of females do not know whether or not they are coping (Figure 45)

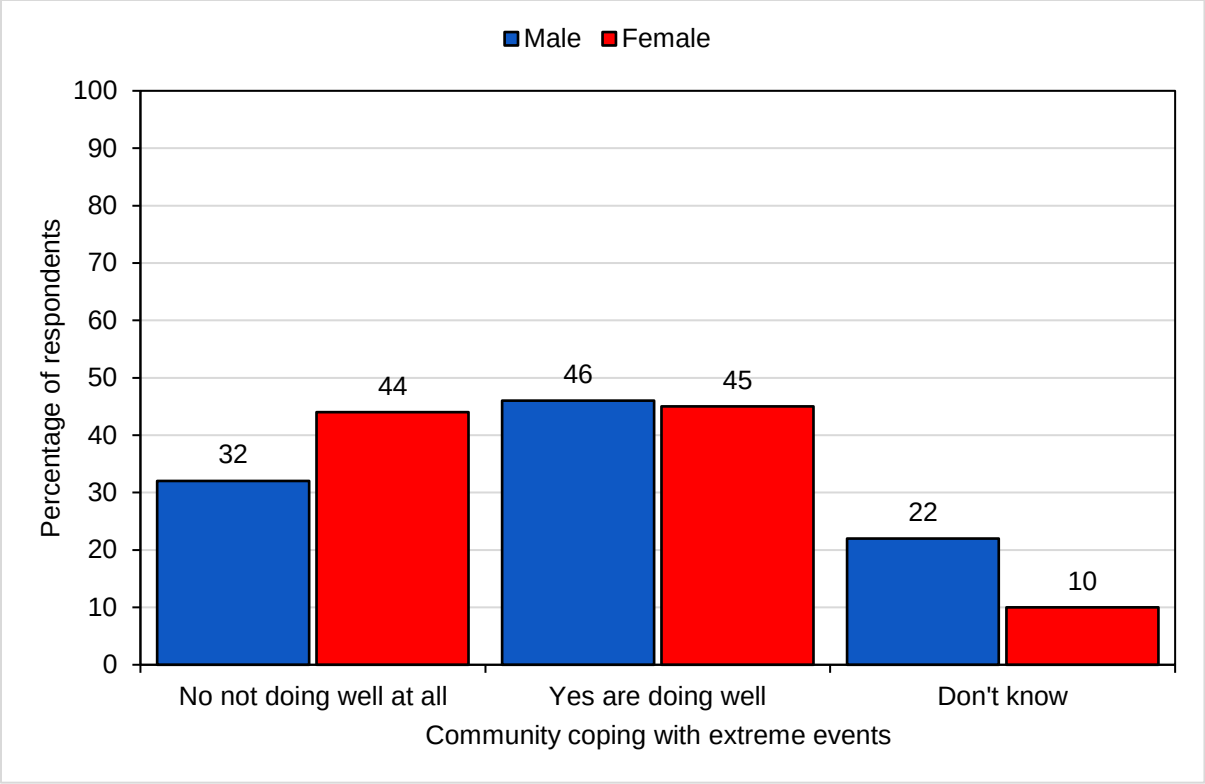


Figure 45 Perceptions on coping with extreme events

A general question was asked about life satisfaction and 56% of men and 42% of women are not very satisfied with their lives overall. Although the percentages are quite small, 21% of women feel very satisfied whilst only 10% of men do (Figure 46).

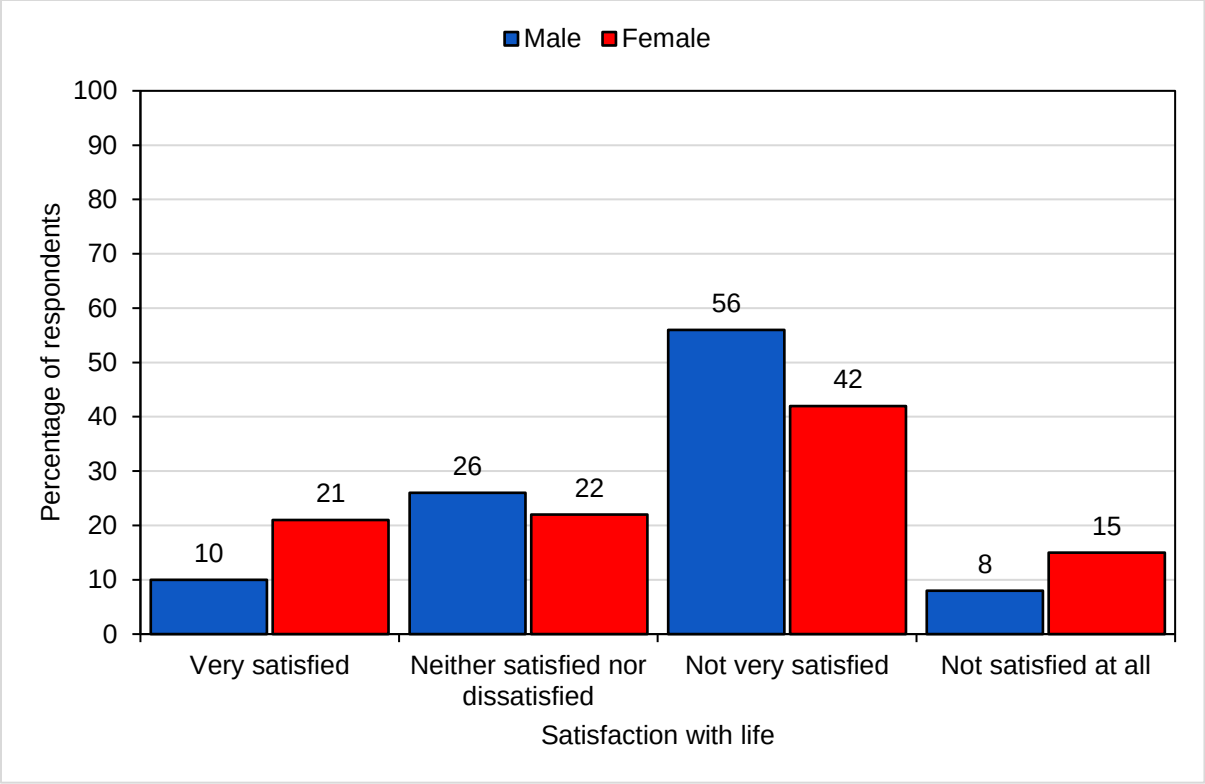


Figure 46 Overall satisfaction with life as a whole.

8 PRODUCTS AND CAPACITY BUILDING

8.1 PRODUCTS

- **Deliverable 1**: Inception report
- **Deliverable 2**: Lambani case study report on vulnerability assessment
- **Deliverable 3**: Towards the design of a gender mainstreaming framework: Literature Review on climate change and gender
- **Deliverable 4**: Barriers to access to resources for women and recommendations on how to remove these barriers with reference to policies and strategies (with respect to their gender sensitivity)
- **Deliverable 5**: Workshop Report on Knowledge Dissemination on Gender Mainstreaming Framework (and Methodology) For Women Facing Climate Change-Related Stress. Held at STIAS, Stellenbosch, on 24–26 August, 2016.
- **Deliverable 6**: Workshop Report on Knowledge Dissemination on Gender Mainstreaming Framework (and Methodology) For Women Facing Climate Change-Related Stress. Held At The Will Of God Church, Lambani Village, on 28 October, 2016.
- **Deliverable 7**: Journal article – 'Towards a gender-sensitive vulnerability assessment for climate change: Lambani, Limpopo Province, South Africa'
- **Deliverable 8**: Journal article - Towards an ethnography of climate change variability: perceptions and coping mechanisms of women and men from Lambani Village, Limpopo Province. *Human Geography*. Volume 10 Number 2. (2017)
- **Deliverable 9**: Final Report: Closure of project with full synthesis of methodology, gender mainstreaming framework, recommendations and way forward

8.2 CAPACITY BUILDING

8.2.1 External capacity building (community)

- Extension officers were taught, together with community members, how to conduct a transect walk exercise
- Community members learnt how to do participatory mapping of their resources and to identify key icons (and their significance)

- Community members participated in the Emoticons participatory tool, where they learnt how to express their emotions about climate change, food security, social networks and gender dynamics using emoticons
- The Chief of Lambani village was informed and gained knowledge around the physical and social attributes regarding climate change.

8.2.2 Internal capacity building (students)

Four students have been capacitated in this project. These include:

1) Ally Lebese. MSc student at the University of the Western Cape.
   Thesis title: Using capability and resilience models to assess rural domestic water demand and use during extreme events, Lambani Area, Limpopo, South Africa.
2) Claudia Mukong. MSc student at the University of the Western Cape. Thesis title: An institutional representation of women in professorial positions at the University of the Western Cape.
3) Germaine Owen. PhD student from the University of the Western Cape. Thesis title: Opportunity for implementing reclaimed water for domestic applications in South Africa: Public perceptions and institutional engagement.
4) Qaadirah Mohammed. Honours student from the University of the Western Cape.
   Thesis title: Groundwater governance: Institutional coordination in the Berg-Olifants catchment, Western Cape South Africa

8.2.3 Internal capacity building (project team)

The project team had two parts: the technical team (from the Agricultural Research Council) and the social team (the Project Leader and students from the University of the Western Cape). The technical team was capacitated by learning social discourses and philosophical attributes regarding climate change and gender dynamics. The social team on the other hand learnt geophysical attributes of the case study around climate change. Both perspectives were merged and formed a rich, multi-faceted research around climate change, climate change impacts, gender and issues around social justice.

During the knowledge dissemination workshop, students were given the opportunity to learn and share ideas with experts on gender and climate change.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 CONCLUSIONS

There are some areas where gender matters and others where it does not. Both men and women struggle in the face of extreme events caused by climate change, although we know that women die in larger numbers as they are more vulnerable than men for diverse reasons. We also know that men far outnumber women in the arena of climate change science (Nagel, 2016). The gender imbalance in climate change is also, as Nagel (2016) asserts, not neutral because men set the research agenda with its focus on macro-scale natural and physical systems rather than on the impacts on human health and well-being. The exclusion of women in climate change science mimics business as usual in climate negotiations, policy making as well as in other areas of international and national politics. In 2015, for instance, according to Nagel (2016), only 22% of parliamentary structures in the world's national governments and 24 of the 194 countries party to the UNFCCC, are headed by women. This is reason enough to merit a study such as ours and to insist that gender matters.

A brief look at the statistics presented shows that in some instances gender matters more than in other instances. For the unemployment figures for instance, gender is very significant as 95% of the female population are unemployed whereas 66% of the male population are. Unemployment, in turn, impacts on a wide range of "intangibles" because if the women are not the earners it is unlikely that they have power and agency within the household to be making decisions. Importantly, among both males and females, it is the active working cohort (ages between 21 and 50) where we find high levels of unemployment. For example, 90% of females between the age of 21 and 30 are unemployed and all of those between the age of 31 and 40 are unemployed. It is far more likely that their male counterparts (at least those who are working) have a greater sense of agency and control over their lives. The vast majority of both males and females (96% and 99% respectively) were fearful in general and were "scared that things are changing around here." A large percentage of both men and women (78% in both cases) feel powerless and helpless and both males and females feel that things are changing because of climate change although more women (90%) than men (84%) do.

There is some variation between the genders around the question of whether or not the person is making any impact at all and here we have around 35% of males and 43% of females who feel this. More females (36%) than males (24%) feel that they have control over their lives but at the same time more or less the same percentage (28% for women and 21% for men) feel that they do not have any control over decisions that affect their lives. Despite these statistics, there is a general feeling of hope as 68% of males and 56% of females say that they are hopeful things will get better. Here too there is a gender dimension with fewer females feeling hopeful. We also asked about anger and here there is a gender skew with 81% of males and 70% of females feeling angry. The vast majority of both men (96%) and women (99%) feel scared that things are changing. Almost half

the population (46% males and 45% females) say they are doing well and here we see that the gender dimension is not significant. Women seem to feel that they are doing better than men as a higher percentage of females (44%) than males (32%) say they are not doing well. Women feel more satisfied with their lives than men as here we have 42% of females and 56% of men who do not feel satisfied. On the whole, men are angrier and less satisfied than their female counterparts.

Climate change is not just a political, scientific or environmental problem but a problem of social justice and ethics. When we conduct our own study, we see that on the ground those who are being harmed by change are not being compensated, and when we ask the question as to who – or what – is causing the problem we see that it is not the behaviour of local residents but rather 'bigger' outside causes such as the mine, pollution and so forth. Some of the identified reasons for climate change given by our respondents include: industrial combustion, environmental pollution, burning of fossils, air pollution, burning plastics, burning fires and mining, cutting down trees, burning bushes and building things.

Researchers and interest groups talk about the three e's of why it is important to bring women into the climate change arena and these are ethics, effectiveness and economy. We have, in this report, agreed on the ethics of climate change and more research around climate change and the effectiveness of women and the way in which women can impact positively on the economics of climate change. We also need more research in localities such as Lambani to show up the gendered nature of politics and to ask questions about how men and women are involved in decision-making bodies in their villages and whether women are excluded from local and higher-level policy making. We need to consider whether there are low-cost, effective technologies that would respond to women's needs and whether women – and men – in Lambani know of any of these technologies. It is also critical to address the devastation caused by erosion and topsoil washing way. Just because Lambani is a site where infrastructure is poor does not mean that it could not also be an ideal site for alternative infrastructure solutions such as solar panels or wind turbines that could generate electricity. Both men and women are farmers although the majority are women. Despite this, when it comes to decision-making around crop production, for instance, it is the men who decide whether crops will be changed and what crops will be planted.

9.2 RECOMMENDATIONS

Disaster identification

- ✓ Identify rural disaster areas and develop disaster management plans in collaboration with the community to mitigate future climate change impacts.
- ✓ Create a disaster management fund that is managed by the community themselves with assistance from local government, targeting primarily (but not only) women and children.

- ✓ Identify other threats that make communities that are vulnerable to climate change more vulnerable (for instance, elephants that trample fields and frighten villagers).

Water resources

- ✓ Increase water availability in rural communities through, for instance, 1) revitalisation of old boreholes; 2) installation of new boreholes; 3) roof water harvesting.
- ✓ Build capacity around water storage, water usage and water purification.

Quality of life – tangible and intangible assets

- ✓ Emphasise quality of life data to counter the focus on the biophysical.
- ✓ Assess material (tangible) and non-material (intangible) elements.
- ✓ Run tables of unemployment by gender and by age.

Development of Vulnerability Assessment Framework

- ✓ Integrate both the approach and the knowledge produced to create a gender-sensitive vulnerability assessment framework.
- ✓ Develop robust intellectual concepts as a scaffold for the vulnerability assessment framework (in this case, exposure, temporality and resources).
- ✓ Popularise the application and use of the vulnerability assessment framework as a tool to assess gender and climate change.
- ✓ Train researchers to apply the vulnerability assessment framework.
- ✓ Interrogate categories, and variables within categories.
- ✓ Take cognisance of multiple scales (macro and micro) and external and internal socio-political and environmental elements.
- ✓ Use, test and validate the newly developed vulnerability assessment framework in varied local contexts such as Lambani and others.

Climate change focus

- ✓ Documented in a new language (user-friendly) constraints experienced by women around climate change.
- ✓ Share climate smart agricultural technologies with communities such as Lambani in order to mitigate climate change impacts.

Gender

- ✓ Identify where gender matters and where it does not matter as much.
- ✓ Information that shows gender dimensions to be made available to policy makers in user-friendly language.

Government

- ✓ Encourage better communication between local government and communities so that the efforts made by the community and by local government are made visible, and collaboration and trust between the two more possible.

- ✓ Departments need to deliver on their mandate and deliver on what they say they will do. This requires capable government officials driven by commitment to basic service delivery.
- ✓ Designate which responsibilities and roles are in the domain of the community and which are in the domain of government.
- ✓ Challenges faced by rural women in the water sector, in contexts such as Lambani, to inform policy and be taken into consideration by local government and community structures.
- ✓ As the results of this study show pressure on rural women around climate change, provide support systems at local and national levels for rural women facing constraints around climate change.
- ✓ Focus on programmes in rural areas to build capacity for people to maintain roads, etc. (public works programmes).

Methodology

- ✓ Design a mixed methodology for climate change studies that triangulates findings, is participatory, and is qualitative as well as quantitative.
- ✓ Ensure knowledge is co-produced and not top-down.
- ✓ Better understand the demographics and research categories so as to better inform the communities themselves, and local and national governments, for better preparedness in the case of climate change (better data means better preparedness).
- ✓ Emphasise transect walks and ethnographic mapping as a way to tap into differences and to gauge feelings.
- ✓ Apply the methodology in different cultural contexts.

Theory

- ✓ Climate change studies should create space for theoretical frameworks that focus on ethics and social aspects of climate change.
- ✓ Document in a new language (user-friendly) constraints experienced by women around climate change.
- ✓ Carry out further case studies so that the findings from this study can be validated and improved on.

Infrastructure

- ✓ Create facilities for sports and recreation for rural adults and children.
- ✓ Over time replace mobile clinics with bricks and mortar clinics in the village.
- ✓ Create a dedicated community centre.
- ✓ Promote information on the way things are in the Lambani community to argue for investment opportunities that can improve quality of life.

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Appendix 1 Questionnaire used for data collection in Lambani

GENERAL INFORMATION:

Questionnaire #:

Name of interviewee:

Name of household head:

Village: Municipality:

Province: Date:

Time (minutes) taken to complete the questionnaire:

A. HOUSEHOLD DEMOGRAPHIC INFORMATION

A.1 What is your occupation? Circle ALL that apply. Do not read

A.1.1 Teacher	1	A.1.2 Taxi driver /owner	2	A.1.3 Spaza owner	3	A.1.4 Police man/ woman	4	A.1. 5Herdsman (shepherd)	5
A.1.6 Doctor/ Nurse	6	A.1.7 Security guard	7	A.1.8 Domestic worker	8	A.1.9 Traditional doctor	9	A.1.8 Farmer	10
A.2.9 Other (specify)									

A.2 Which languages are spoken by the by household members? *(Multiple answers possible) Circle the MAIN language*

IsiXhosa	1	IsiZulu	2	Sesotho	3	English	4	IsiNdebele	5
Afrikaans	6	Tshivenda	7	Shangaan	8	Setswana	9	Other (specify)	10

B. HOUSEHOLD INCOME

B.1 Do you or any member of the household receive any social-grant?

Yes	1	No	2

B.2 If 'Yes' in B.1, what type of social-grant are you receiving? *(Multiple responses possible)*

Old age pension	1	Child support grant	2	Foster care grant	3	Disability grant	4
Other *(specify)*			5				

B.3 If 'Yes' to B.2, what is the total amount of the grant that your household receives monthly?

R 220 – R 440	1	R 441 – R 800	2
R 801 – R 1500	3	> R 1500	4

B.4 Apart from the social-grants, does your household have any other sources of income?

Yes	1	No	2

B.5 If 'Yes' to B.4, what are the other sources of monthly household income and how much do you earn from each of these sources?

Source	Amount			
	R1 - R500 [1]	R500 - R1500 [2]	R1500 - R3000 [3]	>R 3000 [4]
B.5.1 Family business (specify)				
B.5.2 Spaza shop				
B.5.3 Part-time job				
B.5.4 Full-time job				
B.5.5 Seasonal work on farms in the area				
B.5.6 Seasonal work on farms outside the area				
B.5.7 Sell goods on the side of the road				
B.5.8 Other *(specify)*				

B.6 How much is the approximate total monthly income of the household?

R 1 – R 1500	1	R 1501 – R 2500	2	R 2501 – R3500	3
R 3501 – R 5500	4	R 5501 – R7000	5	>R 7000	6

C. Household demographics

C.1 Codes for C. *12 1 = No educational training; 2 = Standard 5 or less; 3 = Std. 6-8; 4 = Std. 9 - Matric; 5 = Post matric; 6 = Diploma*

1	2	3	4	5	6	7	8	9	10	11	12
List all household members (name them)	***Their relationship to household head*** Head = 1 Spouse = 2 Son = 3 Daughter = 4 Grandchild = 5 Relative = 6 Lodger = 7 Other (specify) = 8	***Sex*** *Male = 1 Female = 2*	***Age*** *0-10 = 1 11-20 = 2 21-30 = 3 31-40 = 4 41-50 = 5 51-60 = 6 > 60 = 7*	***Marital status*** *1=single; 2=married; 3=widow/ widower; 4=divorced : 5=living together 6=Other (specify)*	***Physical health status*** *Good = 1 Poor= 2*	***Mental health status*** *Good = 1 Poor = 2*	***Children at school*** *(aged btw. 6 - 18) Yes = 1 No = 2*	***If No, why not?***	***Does s/he look after crops or livestock*** *Yes = 1 No = 2*	***Does s/he contribute to the h/h monthly income?*** *Yes = 1 No = 2*	***Educational level or background (see codes above)***
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											

D. HOUSEHOLD EXPENDITURE

D.1 What is the working status of the household members?

Name as per the grid above	*D.1.1 Yes (working)*	*D.1.2 No (not working) specify if disabled (mentally or physically)*	*D.1.3 Not working but yes studying*	*D.1.4 Not working but not studying*
Member 1				
Member 2				
Member 3				
Member 4				
Member 5				
Member 6				
Member 7				
Member 8				
Member 9				
Member 10				
Member 11				

D.2 Are there members of the household who are not living here and who send remittances for the household?

Yes	1	No	2

E. FOOD SECURITY

E.1 Does your household always have sufficient food to eat?

Yes always	1	Yes sometimes	2	No never	3

E.2 If 'NO' to E.1, during what time of the year does you experience food shortages?

Jan-Mar	1	Apr-Jun	2	Jul-Sep	3	Oct-Dec	4	Other (specify)	5

E.3 Are there adults in this household who go to bed hungry at night?

Yes always	1	Yes sometimes	2	No never	3

E.4 Are there children in this household who go to bed hungry at night?

Yes always	1	Yes sometimes	2	No never	3

E.5 Does your household always have sufficient income for clothing?

Yes always	1	Yes sometimes	2	No never	3

E.6 Thinking about your village or community, do you think they are?

Very poor	1	Moderately poor	2	Not too poor at all	3	I don't know	4

E.7 Thinking about your own household, do you think they are?

Poorer than most in this community	1	The same as most in this community	2	A bit better off than most in this community	3	I don't know	4
5. Why do you say this?							

F. HOUSEHOLD ASSETS

F.1 Does your household have any of the following assets? *(Multiple responses possible)*

Type	*Yes [1]*	*No [2]*	*How many?*	*Who has access to it?*	*Who makes decisions about use?*
F.1.1 Colour television					
F.1.2 Television					
F.1.3 Radio					
F.1.4 Car or bakkie					
F.1.5 Bicycle					
F.1.6 Tractor					
F.1.7 Cows					
F.1.8 Horses					
F.1.9 Donkeys					
F.1.10 Pigs					
F.1.11 Chickens					
F.1.12 Goat					
F.1.13 Other *(specify)*					

F2. Does you household have any of the following?

Type	*Yes [1]*	*No [2]*	*How big?*	*Who has access to it?*	*Who makes decisions about the produce that comes from it?*
F.2.1 Back yard garden					
F.2.2 Community garden					
F.2.3 Plot1					
F.2.4 Plot2					
F.2.5 Plot3					
F.2.13 Other *(specify)*					

G. ACCESSS TO WATER, ELECTRICITY & HEALTH FACILITIES

G.1 What are all the sources of drinking water for your household? And which is the MAIN source for drinking water. Circle the MAIN source

G.1.1 Piped water in the house	1
G.1.2 Piped water in the Yard	2
G.1.3 Community tap less than 200 s from the dwelling	3
G.1.4 Community tap more than 200 metres from the dwelling	4

G.1.5 River	5
G.1.6 Spring	6
G.1.7 Dam	7
G.1.8 Other (specify)	8

G.2 What are the sources of water for your livestock and crops? Circle MAIN source

G.2.1 Rivers	1
G.2.2 Groundwater	2
G.2.3 Springs	3
G.2.4 Lakes	4
G.2.5 Dams	5
G.2.6 Rainwater	6
G.2.7 Other (specify)	7

G.3. Is there a clinic or health facility in your village or community?

Yes	1	No	2

G.4 If Yes to G.3, how far is it from your household?

1 - 10 km	1	11 - 20 km	2	21 - 30	3	>30 km	4

G.5 Are you satisfied with your water and health facilities?

Yes very satisfied	1	No not very satisfied	2	No not satisfied at all	3

G.5.1 If you are NOT satisfied why are you not satisfied?

H. SOURCES OF WATER AND USES

H.1 What are the different water sources in this community?

H.1.1 Rivers	1
H.1.2 Borehole	2
H.1.3 Springs	3
H.1.4 Lakes	4
H.1.5 Dams	5
H.1.6 Rainwater	6
H.1.7 Other (specify)	7

H.2 Can you name the river/s or streams that flow near your village?

H.3 Does the main river flow throughout the year?

Yes	1	No	2

H.4 If no to H.3, for how long does the river dry up?

1 – 3 months	1
3 – 6 months	2
6 – 9 months	3
9 – 12 months	4
Don't know	5

H.5 I am going to read you a few statements. Which of the following statements are true

H.5.1 Yes there have been changes in the river over the past 1 or two years	1
H.5.2 Yes there have been changes in the river over the past two to five years	2
H.5.3 Yes there have been changes in the river over the past five to ten years	3
H.5.4 No there haven't been any changes that I have noticed in the river/s	4

H.6 If yes, what kind of changes have you noticed?

H.7 And what do you think has caused these changes?

H.8 If drinking water is from a river or stream, do you boil it before drinking?

Yes	1	No	2

H.9 Do you get water throughout the year for your household needs?

Yes	1	No	2

H.10 If not, for how many months of the year is there water for your everyday needs?

Only for 1 – 3 months	1
Ony for 3 – 6 months	2
Only for 6 – 9 months	3
For 9 – 12 months	4

H.11 Do you have irrigation facilities?

Yes	1	No	2

H.12. If "YES" to H11, What crops do you grow, how much area do the crops and if you know how much water is given to those crops tell me that also

Crop	Area planted (metres^2)	Water applied (litres)

H.13 Thinking of a normal day, who usually collects the water for the household?

H.13.1 And now thinking of those times when there are heavy floods or drought, who collects the water for the household? If not the same person, why not the same person?

H.14 During a normal day, how often is water collected for your household?

Day(times)	**1-2**	1	**3-4**	2	**5-6**	3	**7-8**	4

H.15 Do you treat or purify the water before drinking it?

Yes always	1	Yes sometimes	2	No never	3

H.16 And, if yes, how do you treat/purify the water

I. CLIMATIC CONSTRAINTS (*thoughts about climate change*)

I.1 Have you heard of 'climate change'

Yes	1	No	2

I.2 What do you think is 'climate change'?

I.3 What words does your community use to describe this 'climate change'?

I.4 Are these new words in your community, or have your people always been talking about these 'climate change' things?

Yes	1	No	2

I.5 In your opinion, are there things changing around here because of climate change?

Yes	1	No	2

I.5.1 If yes, what do you think is changing around here? Tell me everything you can think of

I.6 And what, in the future, do you think is going to happen around here because of climate change? DO NOT PROMPT. But if no answered then PROMPT. Please indicate clearly IF YOU HAVE PROMPTED (MARK WITH A P)

	Yes [1]	No [2]	I don't know [3]
I.6.1 More storms			
I.6.2 More rain			
I.6.3 More disease			
I.6.4 Trees dying			
I.6.5 Greater heat and greater cold			
I.6.6 Government public utilities possibly getting damaged e.g. roads, causeways, port, airports			
I.6.7 Private property and dwellings may get damaged			
I.6.8 Other			

I.7 What do you think are the causes of climate change?

J. ADAPTATIONS/RESILIENCE AND VULNERABILITY

In this section I want to know about the coping mechanisms of people around here. I would like to know about how the changing climate affects people. Or how extreme events – such as floods, droughts or extreme heat or cold affect you and your community.

J.1 What are the kind of things that affect you when you have droughts and floods? What do you do to overcome it?

J.2 What are the kind of things that affect you when it becomes very hot and cold? What do you do to overcome it ?

J.3 In general do you think your community are coping well with these extreme events?

Yes they are doing well [1]	No they are not doing well at all [2]	Don't know [3]

J.4 Why do you say this? Give me some examples of coping or not coping

J.5 There were severe floods and droughts in your region over the past ten years. What effects did these events leave in your region?

J.6. Just want to ask you again. do you think your **community** was able to cope with the effects of the floods and droughts?

Yes	1	No	2

J.6.1 And do you think you yourself were/are able to cope with the effects of the floods and droughts?

Yes	1	No	2

J.6.2 Why do you say this?

J.7 Do you think there are particular challenges for women that are different from the challenges of men in your community?

Yes	1	No	2

J.8 Can you tell me a bit about the different experiences or challenges of men and of women

J.9 In general, would you say that there are people in your community who are more affected than others by these changes in the weather?

J. 9.1 Can you list these people (DO NOT PROMPT unless necessary)
Do you think these people are the ones who are more affected than others? Mark with P if prompted

Yes the sick people	1
Yes the old people	2
Yes women	3
Yes the children	4

J.10 Do you think being married or being single makes any difference in these cases?

Yes	1	No	2

J.10.1 Some people in the community are caring for sick people. Do you care for sick people?

Yes	1	No	2

J.10.2 Who are these sick people; people in your household or other people in the

community? List all that apply

J .10.3 Are you yourself sick?

Yes	1	No	2

J.11 Do you think that certain people cope better than others?

Yes	1	No	2

J.11.1 And why do you say this? Which people do you think cope better? List ALL that apply. Interviewer read the list

	Yes	No	Don't know
Older women			
Younger women			
Older men			
Younger men			
Children			
People with farms			
People who don't have livestock			
People who work in town			
Everyone copes alright			
No-one copes alright			
Who else would you like to mention			

J.11.2 And which people cope the worst

	Yes	No	Don't know
Older women			
Younger women			
Older men			
Younger men			
Children			
People with farms			
People who don't have livestock			
People who work in town			
Everyone copes alright			
No-one copes alright			
Who else would you like to mention			

J.11.3 Why do you say this?

J.12 Do you think it is more difficult for women and men who are not born in this area to cope when there are extreme events such as droughts or/and floods?

Yes	1	No	2

J.12.1 Why do you say this?

J.13 And do you think that the government is doing enough to assist people like yourself in the village when there are extreme events such as droughts or floods or severe heat or cold?

K. SOCIAL CAPITAL AND EMPOWERMENT

Now I just want to ask you a few questions about your life in this village

K1. Do you belong to any of the following organisations?

K.1.1 Church	Yes	1	No	2
K.1.2 Choir	Yes	3	No	4
K.1.3 Community base organization	Yes	5	No	6
K.1.4 Sports association	Yes	7	No	8
K.1.5 Stokvel or savings club	Yes	9	No	10
K.1.6 Burial society	Yes	11	No	12
K.1.7 Other (specify)	14			

K.2 In your opinion, do you think that people around here help each other?

Yes	1	No	2

K.3 How strong a feeling of togetherness or closeness do you have with others in your neighbourhood?

We are all very close	1
We are somewhat close	2
We are not very close at all	3

K.4 Overall, how much impact do you think you have in making your neighbourhood a better place to live?

I make a big impact on my community	1
I make a small impact on my community	2
I don't think I make any impact at all on my community	3

K.5 Do you feel you are valued by your family and friends?

Yes, very much	1	No, not much	2

K.6 Do you feel you are valued by your community?

Yes, very much	1	No, not much	2

K.7 Do you feel that people like yourself can generally change things in your community if they want to?

Yes a lot	1	Yes a little	2	Not at all	3

L. EMOTIONS AND ASPIRATIONS

L.1 How do you feel when there are extreme weather events around here such as extreme heat, extreme cold, or droughts and floods? Do NOT prompt

	Yes= [1]	No=2	D/K=[3]
L.1.1 I feel fearful/afraid			
L.1.2 I just can't believe what is happening			
L.1.3 I am confused			
L.1.4 I feel angry			
L.1.5 I feel helpless/powerless			
L.1.6 I feel hopeful that I will be able do something			
L.1.7 I am scared that things are changing too much around here			
L.1.8 I am worried that we might lose our land			
L.1.9 I am worried that we might lose our culture			
L.1.10 I feel proud that I can make a difference and I can do something at these times			
L.1.11 I don't know how I feel			
L.1.12 I feel hopeful that things will get better			
L.1.13 Other			

L.2 Taking all things together, how satisfied are you with your life as a whole these days? Generally speaking would you say you are.

Very satisfied	1
Neither satisfied nor dissatisfied	2
Not very satisfied	3
Not satisfied at all?	4

L.3 How much control do you feel you have in making decisions that affect your everyday activities?

I have control over all decisions	1
I have control over most decisions	2
I have control over some decisions	3
I have control over very few decisions	4

M. MATTERS ARISING AND GENERAL PROBLEMS

M.1 Thinking of all these questions that I have been asking you, is there anything you would like to add or tell me about matters such as floods and droughts that occur around here?

Interviewer details

N.1 The respondent was co-operative?

Yes	1	No	2

N.2 The respondent understood the questions?

Yes	1	No	2

N.3 The respondent was sad?

Yes	1	No	2

N.4 The respondent really enjoyed the interview?

Yes	1	No	2

N.5 I felt embarrassed asking some of the questions?

Yes	1	No	2

N.6 The interview was interrupted?

Yes	1	No	2

N.7 The respondent was alone?

Yes	1	No	2

N.8 The respondent seemed embarrassed and shy?

Yes	1	No	2