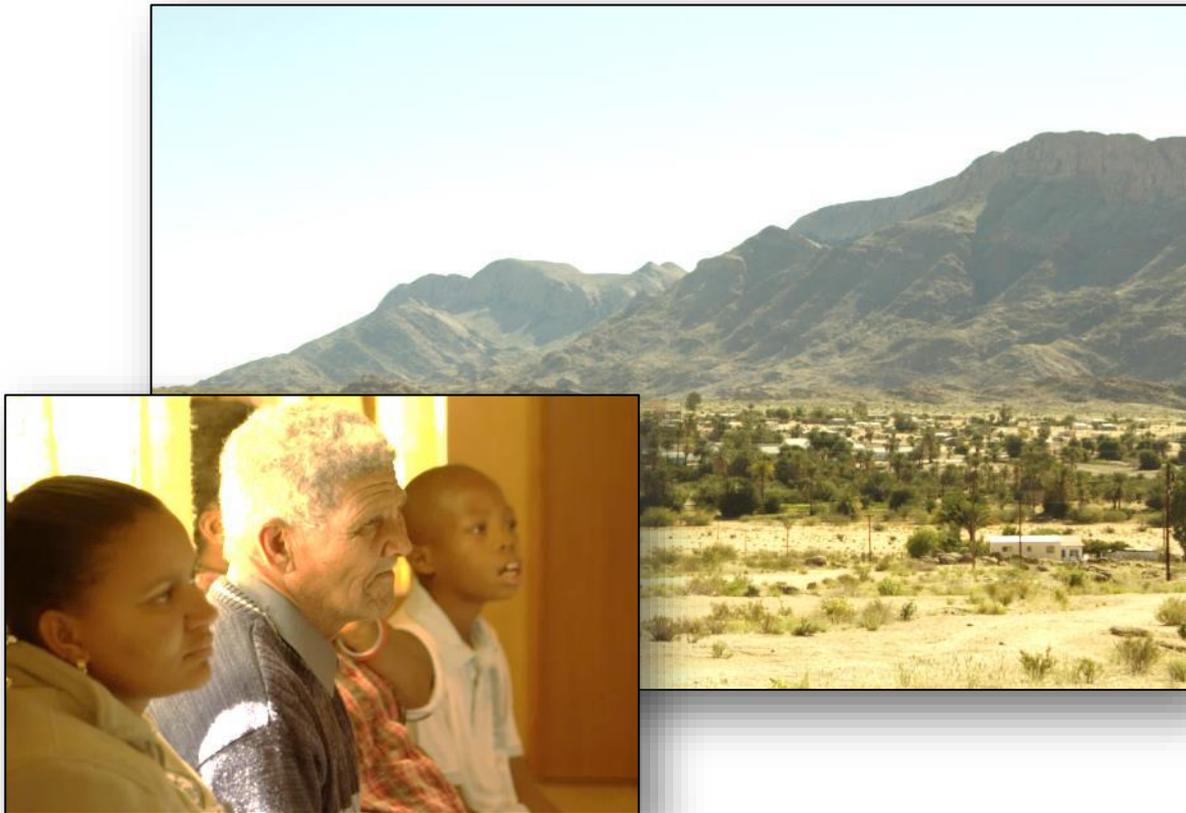


PARTICIPATORY ASSESSMENT OF CLIMATE AND DISASTER RISKS in PELLA / NORTHERN CAPE, SOUTH AFRICA



PROJECT ANALYSIS REPORT

Gottfried Horneber, FAKT
June 2014

 FASTENOPFER


SURPLUS
PEOPLE
PROJECT

 BREAD FOR ALL

Publisher

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Front page: Village of Pella and some participants of the workshop

Bread for All is the development organization of the Swiss Protestant Community of Churches. The organization supports 400 development projects and programs in 57 countries in Africa, Asia, and Latin America. In addition, its development policy has the goal of creating fairer international socioeconomic structures, maintaining creation, and bringing peace.

Fastenopfer

Making an impact: Fastenopfer is a Catholic aid agency in Switzerland. The slogan 'We share' describes our involvement in disadvantaged countries in the South and in Switzerland.

Impact in the South: Fastenopfer supports people who take responsibility for their future. Promoting self-empowerment! Experience has shown us that a project only becomes sustainable if the community is involved and supports it. That's why Fastenopfer focuses on strengthening local village structures and other groupings in which people are involved.

Raising awareness in Switzerland: Our public information work is intended to motivate people in Switzerland to think about living conditions in the disadvantaged countries in the South. We inquire into the causes of poverty that affects large sections of the population, and see ourselves as a voice for the people in the South, including at the political level.

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Executive Summary

Climate change is one of the largest problems humanity faces today. Communities in South Africa suffer now and in the future from the impacts of this global phenomenon. Poor communities are more affected because of their vulnerability and their limited coping strategies. Development projects should empower these communities to better cope and adapt to these inevitable changes. Hence, it is important to assess climate changes and their negative impacts in given communities in order to develop in a participatory way appropriate adaptation and GHG mitigation strategies. The PACDR tool can be of great value in this process.

This report provides the results and conclusions of a PACDR analysis workshop carried out in the small village of Pella in Northern Cape/RSA. With the help of SPP, a Fastenopfer and Bread for the World partner, the workshop was held from May 5th to 9th, 2014. The analysis team was composed of the facilitator and trainer Gottfried Horneber of FAKT, Julia Jawtuschk and Pascale Schnyder of Bread for All, Harry May and Leanne Schmidt of SPP and Ronald van Wyk of NAMKO. 14 women and 8 men from Pella took part in the workshop.

With the help of the participatory PACDR exercises (hazard map, seasonal calendar, vulnerability matrix, hazard-impact-coping strategies table and adaptation strategies) the participants had been able to identify and understand the most important natural/climatic hazards, the most vulnerable livelihood resources, their coping strategies and the effectiveness and sustainability of them and some important adaptation strategies.

In Pella the most important hazards, according to the participants, are repeated droughts, higher temperatures, frequent dust storms and devastating floods caused by heavy rainfalls. These hazards have negative impacts on human health and on essential economic livelihoods of the population: grazing and arable land, livestock and crops. People lose livestock because of fodder shortage and diseases which is reducing income opportunities. Floods destroy gardens and crops and kill animals.

Several coping strategies are practiced, some are effective and/or sustainable. During drought, people look for pastures elsewhere, sell livestock or try to buy fodder. To avoid flood damages, early warnings by radio stations are used to conduct livestock to safer places or gardens are moved to less flood-prone areas. All participants have already lost assets and capital and hope that government and NGOs increase aid (fodder subsidies, irrigation schemes and direct donations).

The participants discussed about new adaptation strategies and found out that they need more training in agriculture and livestock management, and that irrigation and water supply has to be improved.

The workshop was an eye opener for many participants, as they understand now why climate is changing and how it is affecting their lives. The participatory exercises of PACDR were much appreciated as well as the facilitation of the analysis team. It became clear that the process has to continue to better adapt to climate change effects and that it is the responsibility of the community to organise and look for assistance. SPP will continue discussions with stakeholders and provide more information on climate change and adaptation strategies. However it was also obvious for the participants that the municipality of Pella should play a more prominent role in the process.

1. Introduction

Climate change and development work are highly intertwined: the risks of global warming could jeopardise decades of development efforts, particularly in the poorest regions of our planet. It is therefore vital to ensure that development projects strengthen the beneficiaries' capacities to cope with and adapt to climate change. It is also important to make sure that the same projects do not lead to excessive emissions of greenhouse gases but on the contrary reduce emissions and increase carbon sinks.

Fastenopfer supports community-level projects in rural areas in poor countries across the planet. Many of the beneficiaries are heavily threatened by climatic and disaster risks, mainly because of their high economic, social and environmental vulnerabilities. Even though Fastenopfer does not engage in specific climate change projects, it has grasped the need to consider those threats and the related vulnerabilities.

The climate proofing tool PACDR, developed by Bread for All, HEKS and Bread for the World, offers a relevant and participatory analysis method to identify and understand climate changes and coping strategies in communities and to look for more effective adaptation strategies.

Gottfried Horneber, a FAKT consultant and trainer of PACDR, facilitated the analysis workshop from May 5th to 9th, 2014 in a project region of SPP in Pella, Northern Cape, close to the Orange River. Surplus People Project (SPP) is a Fastenopfer and Bread for the World partner since many years.

Two employees of SPP (Harry May, Research, Information and Advocacy Manager and Leanne Schmidt, Intern/Trainee) one from NAMKO (Ronald van Wyk, Project Manager) were trained on the job. Gottfried Horneber was assisted by Julia Jawtusch, a new staff member of Bread for All who did this PACDR workshop for the first time. Pascale Schnyder, communication and PR staff of Bread for All participated as an active observer and journalist.

In the workshop 14 women and 8 men from Pella participated in the workshop.

Some program modifications had been necessary due to the general elections on Wednesday May 7th 2014.

The (former) SPP project manager of Springbok, Ronald, left the organisation two weeks before the analysis workshop. The two members of SPP did not have comprehensive knowledge of Pella and the SPP project there which lead to lack of information especially for modules 1 and 6.

2. The project of SPP and its context (Module 1)

As mentioned above, the SPP key person Roland was absent. Harry and Leanne could only give some general information about the project activities of SPP in Pella. Therefore Module 1 (Project and Context) was not done.

Nevertheless, some information is presented here to get a general idea of the climatic situation.

Pella is situated in Namaqualand in the Northern Cape Province about 160 km east of Springbok in the arid zone. In 2011 it had a total population of 2.470.

Annual rainfall varies around 70 to 80 mm. Summer months are from December to February, coldest months are June and July.

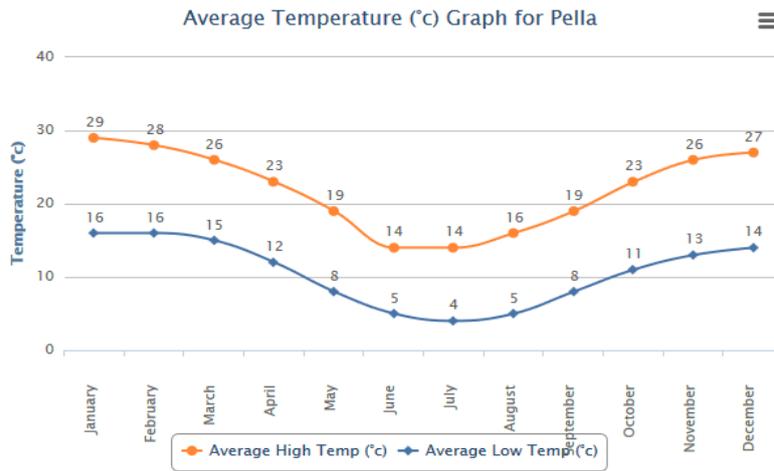


Figure 1: Average Temperature in Pella¹



Figure 3: Profile of Pella (Wikipedia)

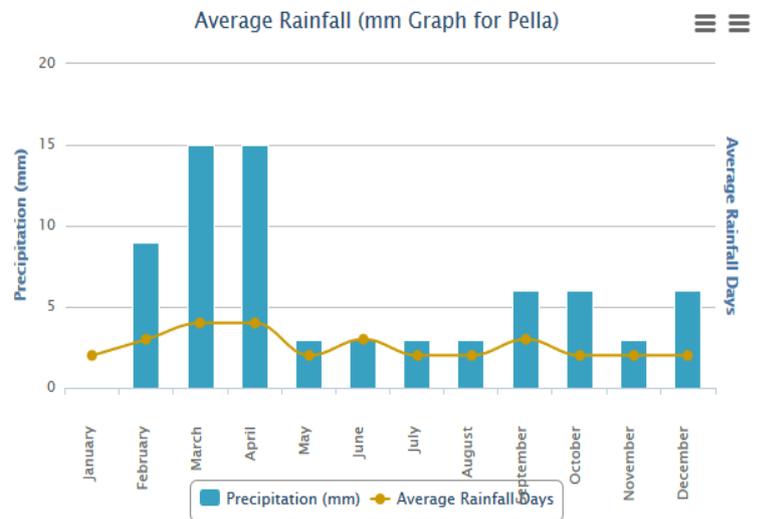


Figure 2: Average Rainfall in Pella



Orange River near Pella

¹ <http://www.worldweatheronline.com/Pella-weather-averages/Northern-Cape/ZA.aspx>

The **Surplus People Project (SPP)** is a Section 21 company or Not for Profit Organisation (NPO). It started in 1985 as a voluntary organisation and got its NPO status in 1995.

SPP is working in the field of Agrarian transformation for Food sovereignty and follows an Agro-ecological approach. Intervention areas are Northern Cape, West Coast, Boland and Cape Town Metro.

Target groups are landless people, farmworkers/dwellers, small scale farmers, rural women, men and youth, forestry communities, churchland communities and Act 9 communities.

The major activities entail agro-ecological trainings, social mobilisation, policy interventions, organisational building, land access, institutional development, gender work and networking.

In Pella, SPP is carrying out agro-ecological trainings, seed distribution and livestock dispersals ("pass on a gift"), institutional development ("Pella Forum") and information campaigns. The work in SPP is part of a larger project comprising several villages in the Namaqua district. The goals of the project are:

- Facilitating access to land, water and development resources
- Facilitate security of tenure
- Strengthening of emerging farmer groups and the development of technical capacities around agro-ecology
- Building capacity of organisations in the region with regard to land and agrarian reform and food sovereignty (where applicable)

(Source: SPP Dedavaco Proposal 2013)

Project work has already started in 1994 and the results already achieved include: Communities and individuals in the Namaqua District have accessed more than 500 000 ha of land for productive purposes. Substantial progress has been made in acquiring infrastructure and other resources. Most of the farmers we work with use agro-ecology. Regional and municipal organisational structures ahas been build, and in some cases require more support. We have not made subatantial progress on the marketing front, although there has been a focus on local marketting and pocessing, Some of the key political –economic challenges in the district are the decline in mining (in particularly in Namaqualand), unwillingness of farmers in the Hantam-Karoo to make land available for land reform, increased migration of people from the District and the weakness of local authorities and general weak civil society.

The pictures below show Pella`s community garden, which has been supported by SPP and NAMKO, trainers and participants of the workshop.



3. Scientific information about Climate Change and Disaster Risks in South Africa²

3.1. Climate Change in South Africa

A. Past Trends of Climate Change and Disaster Risks in South Africa

Temperature change

Between 1960 and 2006, the mean annual temperature averaged over South Africa has increased by around 0.6 °C at an average rate of 0.14°C per decade. Observations of daily temperatures show significantly increasing trends in daily temperature extremes. The average number of "hot" days per year in South Africa has increased by 19 (an additional 5% of days) between 1960 and 2003, while the average number of "hot" nights per year has increased by 16 (an additional 4.3% of nights). (McSweeney et al, 2010). In contrast, days with cooler temperatures and extremely cold days have decreased in frequency (DEA, 2011).

Rainfall change

Since 1960, mean rainfall over South Africa has decreased by 1.5mm per month (3.7%) per decade, on average. There are indications that the number of daily rainfall extremes has increased (McSweeney et al, 2010). This means that the rain falls in shorter periods of time and has a tendency to be very heavy. Such increases in the intensity of extreme rainfall events are identified over about 70% of the country. The intensity of the 10-year high rainfall events has increased by over 10% over large areas of the country, except in parts of the north-east, north-west and in the winter rainfall region of the south-west. The increases in the intensity of high rainfall events are largest for the most extreme events. (Mason et al, 1999). Also, the rainfall variability between one year to the next has increased (DEA, 2011).

Wind pattern change

Windiness has declined significantly in the Western Cape, in contrast to a positive linear trend in surface wind speeds observed in South Africa's southern coastal regions for the last three decades (DEA, 2011).

Oceanic and sea level trends

The Indian Ocean (East coast) has warmed up since the mid-1970s.

The Agulhas Current which flows along the east coast of South Africa has warmed significantly (+1.5°C) during the last three decades. This also led to higher evaporation rates and a 50% increase in the transfer of warm Agulhas Current water into the colder southern Atlantic Ocean. For the western coast, a negative sea surface temperature trend has been observed between 1989 and 2009 of up to 0.5°C per decade from January to August (REA, 2011).

The Sea-level has been rising around the South African coast, with regional differences:

- On the west coast, the sea level is rising by 1.87mm per year;
- On the south coast by 1.47mm per year;
- On the east coast by 2.74mm per year (DEA, 2011).

² Most Information taken from the Climate Change and Disaster Risk Guide by Julia Jawtusich, BfA, April 2014

Disaster risks

Extreme events have increased in the last decades in South Africa, related to the observed climate change trends. For instance, there has been a notable increase in fire frequency, in the extent and intensity of drought events as well as floods (DEA, 2011).

B. Projected Trends of Climate Change and Disaster Risks in South Africa

Temperature forecast for South Africa and its regions

A warming of between 1°C and 3°C (yearly average) is expected for South Africa within the next 50 years (Masego, 2010) and between 1 and 6°C for the next 100 years (UNDP). Even the most modest forecasts expect an overall warming. In addition and maybe even more challenging, the number and severity of extreme events, such as extremely hot days, is likely to increase throughout the country. The number of cold nights and days, in contrast, is fore-casted to decrease, but to a lesser degree (DEA, 2011).

With regard to regional differences, future warming is projected to be greatest in the interior of South Africa and least along the coast. There, the influence from the oceans has a cooling and balancing effect. In the western half of the country, increased daily maximum temperatures are expected particularly in summer and autumn. After 2050, under emissions scenarios that represent little international mitigation effort, the level of warming is projected to reach around 3 to 4°C along the coast, and 6 to 7°C in the interior.

Precipitation forecast for South Africa and its regions

The forecast for changes in rainfall patterns for South Africa indicates a potential reduction of approximately 5 to 10% of current rainfall, on average. This might seem like a rather small figure, however, in an already dry country, this has enormous impacts. The rainfall is predicted to occur less, more intense rainfall events on fewer days. Additionally, the rainfall patterns during the year are likely to change and become more unpredictable, with both an increase of flood and drought incidences (Masego, 2010). Figure 8 shows how changes in rainfall differ between the seasons: Much less rain will fall between March and April, as compared to today.

Extreme events

The described projections are extremely alarming: It is certain that temperatures are globally on the rise, with unimaginably severe consequences. For instance, the number of consecutive days without rain (=drought) are forecasted to further increase in South Africa. Figure 9 shows a forecast for consecutive dry days in about 80 to 100 years from now, showing for South Africa that the number of consecutive dry days is likely to increase by 5 to 25, depending on the region. The western regions of South Africa, which are already marked by aridity nowadays, will be hardest hit in the future, according to the forecasts.

Climate projections for 2050 indicate an increased frequency and intensity of extreme events such as extreme temperatures (heat), drought, water stress, but also more frequent storms, floods, hail, and fire events across all regions of South Africa (DEA, 2011). The increased flooding risk is related to the more extreme rainfall events described before.

Drought frequency and severity, which are likely to be the key extreme event South Africa will have to struggle with in the future, particularly increase for the already arid

regions more to the west of the country. A predicted alteration of the El Niño-Southern Oscillation (ENSO) will add to the problem of dry conditions.

C. Impacts of Climate Change and Disaster Risks

The projected and ongoing changes of South Africa's climate have started to have severe adverse impacts on different environmental and social resources and sectors. These impacts will increase in the future, as climate change worsens. The following sectors have been identified as most vulnerable: Health, agriculture, biodiversity, water resources, rangelands, energy and mining (Masego, 2010).

Water resources

Changes in climate are expected to affect the hydrological systems and water resources in South Africa and water scarcity will be a major issue. 80% of South Africa consists of semi-arid and arid regions, and 98% of the national water resources are already overcommitted. In addition, many water resources are contaminated with pollutants from the mining industry and from major cities. The country is faced with both a water shortage and a water quality problem that are very likely to worsen due to climate change impacts.

Agriculture and Food Security

The predicted shortages of water will have devastating effects on the agricultural sector (which is by far the largest water user accounting for 62% of the national water allocation for irrigation), which will be the hardest hit (Masego, 2010).

Impacts facing the agricultural sector include (Masego, 2010):

- A reduction in the amount of land suitable for both arable and pastoral agriculture;
- A shortening of the growing season
- A decrease in yields particularly along the margins of semi-arid and arid areas.

These impacts on the agricultural sector have implications for the national and household food security, and additionally on the national economy (Masego, 2010). Not only the lack of water, but also the impacts of more heavy rainfall events can have devastating effects on agriculture.

Biodiversity and ecosystem services

The predicted warming and aridification will shrink the country's biomes by 38 -55% of their current coverage. This will result in:

- A displacement and loss of wildlife species and biodiversity of significant global value
- Up to 30% of endemic species at an increasingly high risk of extinction

Some impacts on species are already observable, including a notable increase in fire frequency that affects fauna and flora. Likewise, change in South Africa's marine and coastal environment is already being detected in a number of ecosystems to differing degrees (DEA, 2011).

The most adverse effects of projected climate change on endemic species are projected in the winter rainfall biomes—the fynbos and succulent Karoo—with between 20 and 40% of the areas exposed to novel climatic conditions by 2050. These changes also have impacts on local livelihoods (DEA, 2011).

Another adverse impact on biodiversity which is aggravated by climate change is the invasion of alien species (plants and animals) in the terrestrial, freshwater, and marine environments. Changes in the frequency and intensity of extreme events such as

storms, droughts, and floods have the potential to alter the susceptibility of ecosystems to invasion. In fact, adverse impacts e.g. on the economy are so immense that the prevention and management of invasive alien species form integral parts of South African policy, legislation, and government action (REA, 2011).

Human health

Climate change also has adverse impacts on human health due to various reasons. Climate-relevant health concerns include:

- Lack of potable drinking water and water quality problems due to increased water scarcity;
- The geographical spread of vector and water-borne diseases;
- Reduced air quality in major urban centres.

The largest of these problems is probably that of water lack. An increase in flooding and drought events will exacerbate water-related health challenges, by further reducing access to drinkable water.

Malaria and schistosomiasis are the two main vector-borne diseases in South Africa. Both are likely to increase with climate change. It is believed that 90% of malaria cases occur in sub-Saharan Africa, and most affected are children below the age of five. In the late 1920's and early 1930's, malaria in South Africa was intensely endemic: in Northern Province for instance 86% of 2-3 year old children and 20-40% of adults were infected at one point in time. Even under present climatic conditions, if the control operations were to collapse, malaria could spread again to its former level. It is estimated that between 3 and 4 million people are infected with one or more species of schistosome in South Africa.

Social vulnerability

Climate change vulnerability also has a social vulnerability aspect. Already, current climatic shocks and stresses have devastating impacts on the vulnerability of the poor. The reason why the poor are particularly affected is because there are limits to their choice of coping strategies. Generally, the poor have a limited number of coping strategies upon which to draw from in times of stress. In South Africa, taking into consideration its history, this is particularly relevant because here, the poor have suffered a long time from marginalisation and dispossession.

According to the South Africa's last national communication to the UNFCCC, at least 30% of South Africa's population is highly vulnerable to both sudden and harmful climatic shocks, with low levels of endogenous resilience, adaptation and coping skills.

The characteristics of this population include:

- High disease burden (including the highest global infection levels of human immunodeficiency virus (HIV) and tuberculosis (TB))
- High mobility
- A subsistence-level existence
- Informal settlement housing.
- Poor sanitation
- Water-borne disease
- Malnutrition (DEA, 2011)

The majority of the poor in South Africa are rural dwellers (59%), which are often overcrowded by commercial farmers and have to withdraw to severely degraded former homelands. These communities often live in poverty and isolation from economic opportunities.

The majority of households facing such hardships are female headed. This means that in fact, women and children are the most vulnerable towards climate change, with limited capacities to adapt to the changing climate. Impacts arising from such social inequalities, aggravated by climate change, include differences in property rights, access to information, lack of employment, low literacy levels and unequal access to resources (Masego, 2010)

3.2. South Africa's contributions to climate change

According to the latest national communication by South Africa under the UNFCCC, the last greenhouse gas (GHG) inventory for South Africa was conducted in 2006 for the year 2000. South Africa's total emissions in 2000 were estimated to be 461 million tonnes CO₂eq (DEA, 2011), putting it at a high 12th place of all countries. The per capita emissions are above global average (9,5 t/per capita, World: 4,6 t/pc).

The national communication report from 2011 by South Africa's Department of Environmental Affairs (DEA) distinguishes GHG emissions by sector, but exclude emissions from land use, land use change and forestry. This is because, as argued, this sector provides a net sink, because carbon sequestration by forest areas exceeds emissions. For the other sectors, emission contributions are 83% from energy supply and consumption, 7% from industrial processes, 8% from agriculture and 2 % from waste.

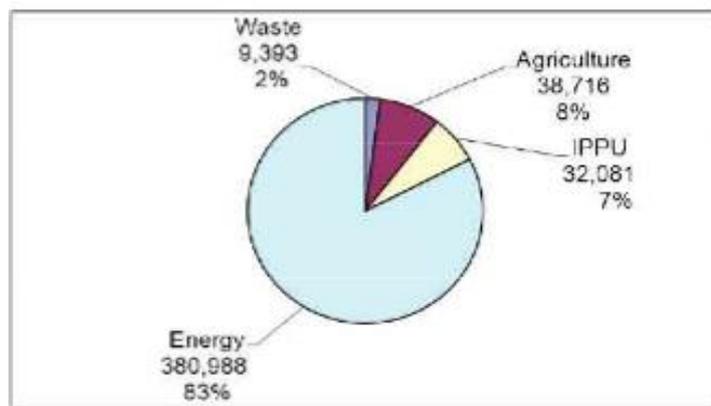


Figure 4: Total GHG emissions by sector in in 2000

CO₂ emissions stem mostly from energy production and energy use in industrial processes. South Africa's economy relies heavily on mining and heavy industry. Energy consumption in the industrial and buildings sectors relies largely on electricity as an energy source, which is produced with high carbon intensity using domestic coal. A large share of industrial-process emissions is due to coal use and a high share of transport fuels are domestically produced by coal-to-liquid processes. Overall, it is estimated that 75% of South Africa's emissions result from coal use.

The methane emitted in South Africa stems from both energy production and agriculture. Agriculture emits methane because of the digestion processes of ruminants (cows) which produce this gas. The N₂O emissions also stem mostly from agriculture, caused mainly by agricultural soils fertilized with nitrogen and/or livestock manure, but also partly by biomass burning.

South Africa's emissions are predicted to rise enormously in the future if the current trends and emission sources are not changed. With a continuation of business-as-usual, projections are estimated to lead to an emission level of 596 to 864 MtCO₂e in 2020. (<http://climateactiontracker.org/countries/southafrica>). This means that South Africa's role as a causer of climate change will increase unless energy consumption and fossil fuel (coal) use will be very much reduced and substituted.

4. Participatory assessment of climate and disaster risks in Pella

This chapter covers the outputs and results of the participatory assessment with a group of citizens of Pella in May 2014.

All facts and information as to context, hazards, impacts of climate change, coping strategies and adaptation strategies have been gathered and discussed with citizens of Pella during the four days of the analysis workshop. The workshop program can be found in [Appendix A](#), minutes of discussions and daily team feedbacks in [Appendix C](#).

At the first day (Monday) and the last day (Friday), about 20 men and women from Pella participated at the workshop. Tuesday was women's day (12 women); Thursday was men's day (6 men) in order to get gender-specific information on climate change. Wednesday was National Election Day in South Africa, so no workshop activities had been scheduled. Due to the long election party on Wednesday, only few men came to the workshop on Thursday and they came pretty late.

The workshop was mainly facilitated by Gottfried Horneber (FAKT consultant and PACDR trainer). Harry May and sometimes Ronny van Wyk translated the workshop (Afrikaans – English – Afrikaans) as many participants certainly understood English but preferred translation. Several sessions and exercises were facilitated by Julia Jawtuschk, Harry May, Leanne Schmidt (SPP intern) and Ronny van Wyk, which helped them to get familiar with the tool and gain practical skills.

During the first day, the participants discussed in a general manner the hazards and impacts of climate change in the region.

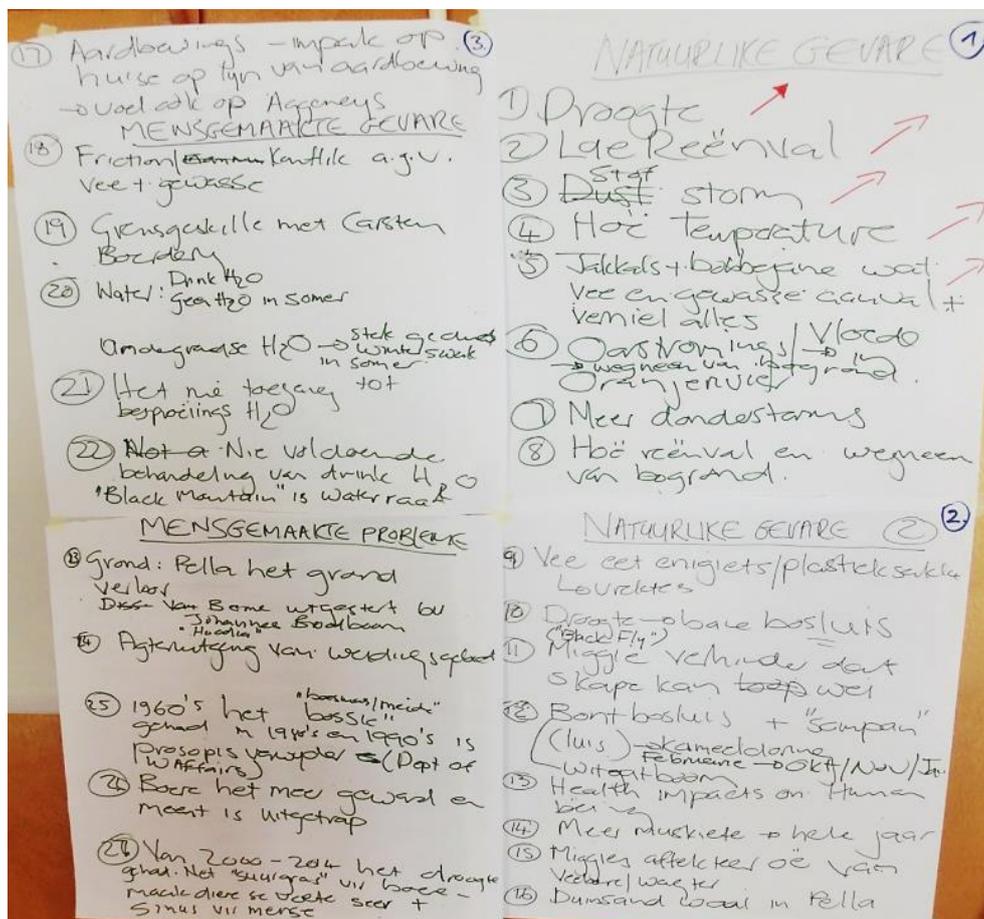


Figure 5: Hazards and impacts of climate change in Pella

Translation of Figure 5:

Natural hazards (*gevare*)

- Low rainfall, drought
- Wind/ wind storms
- High temperatures – 49°C max.
- Drought locking baboons and jackals
- Flooding from Oranje River
- Thunderstorms increase
- Water does not penetrate soil, washes away: Erosion of fertile soil
- Lack of water in summer
- Disappearance of indigenous trees: Xhoba, Johannesbrotbaum
- This year: very hot in Nov./Dec. so plants died – soil so hot that it burns the roots
- Mosquitos: Whole year

Impacts of drought e.g. on livestock

- Drought makes livestock eat anything, including plastic bags
- Drought brings ticks to livestock
- “Miggie” (“black flies”) impact on livestock
- Low quality of water because of flooding causing health issues
- No access to irrigation water for crop farmers

Human-made hazards

- Goats entering premises and eating crops
- Boundary issues with Carsten Boerdery (big fruit farmer)

Observed changes (past – now)

- 1950-1960 there were much more pastures/ richer grazing areas
- 1980 – 1990: More Prosopis trees removed because of health issues which caused fewer pastures. More famers mean even less pastures.
- 2000-2014: drought was a big problem
- Only sourgrass grew which has no nutritional value for animals. Sourgrass also damages sheep's feet.
- Sourgrass grows after rainfall.
- Sourgrass became more after the removal of the prosopis trees.
- The department of water affairs removed the prosopis trees because they use a lot of water.
- Mosquitos increased
- 50 yrs ago there were no problems with drought – it has increased.
- Some trees which people used for food do not exist anymore
- Increase in population
- Health issues increased, e.g. TB because of drought
- The planting season has changed: Usually they planted in Jul/August but now you can plant at any time.
- Is there anything which became BETTER: No, everything worsened!

The red arrows in figure 5 show, which hazards are increasing according to the participants: Drought, low rainfall, dust storms and high temperatures. Many impacts are related to livestock a major source of income for the people here.

4.1. Climate change and Hazard Analysis (Module 2, Exc. 3 and 4)

The information on climate and climate change in South Africa (chapter 3) give a general picture of the climatic situation in the country. No specific data for Pella had been available.

The participatory assessment of hazards in gender specific groups provided information on felt climate changes in the region.

The women divided in two groups produced a seasonal calendar and a hazard map of Pella. Concerning the men, the team had to adapt to the late-coming of only 6 men and decided to do only the seasonal calendar.

Hazard Map (M2/E3)

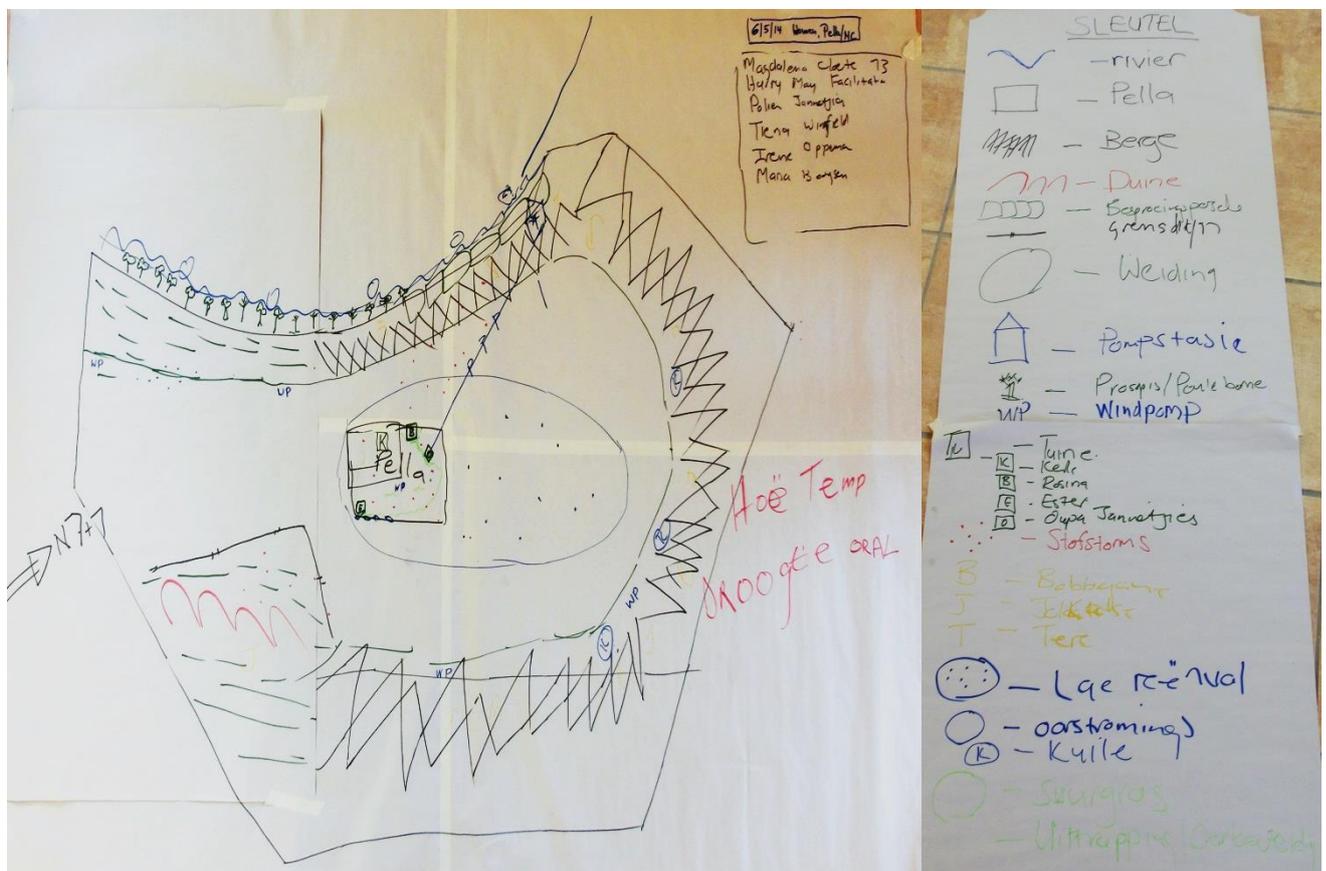


Figure 6: Hazard and resource map of Pella by the women's group

Women's reaction to: What was new to you on the map?

- The direction of the dust storm; I never knew where it came from, only speculated
- I never realized the effects the events had on us and on the whole community
- I can apply the calendar to my own project to better the work performance
- I can use the calendar to mark events that happen in the communities so that it won't be forgotten.
- I can make my own calendar for planning my own work at home.

Please note: Minutes were taken during the workshop. Unfortunately not all discussions, interesting aspects and feedbacks had been documented.

Seasonal Calendar (M2/E4)

One new idea was tried out with the seasonal calendar. In a first step, the participants produced a calendar of the current situation. In a second step, the situation 20 to 30 years ago was added. This enabled the participants to compare the lines and to discover changes over the years.

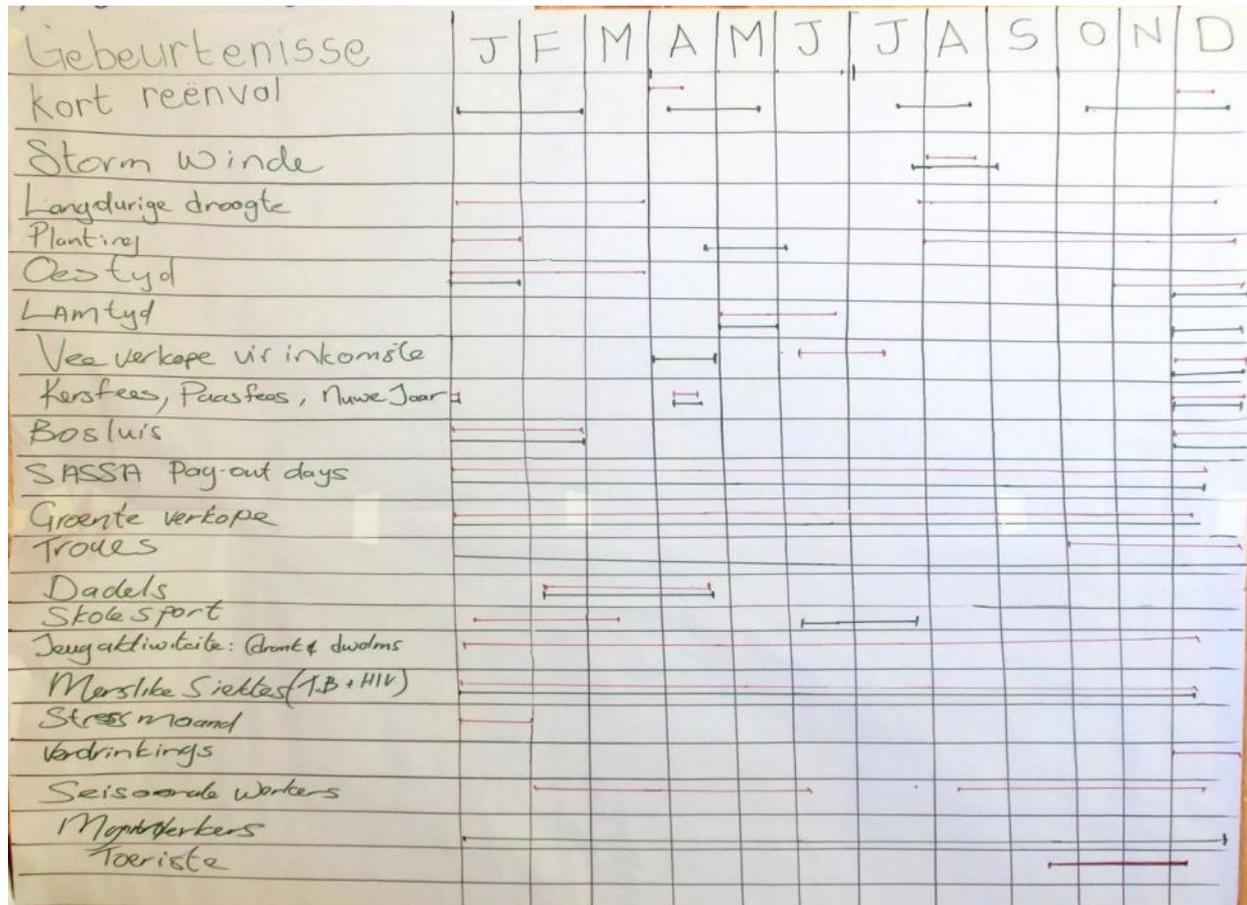


Figure 7: Seasonal calendar of women

Discussion on the Seasonal Calendar (women)

- There was no drought in the past, drought only began in the 80ies
- People died of old age in the past, they did not have any diseases
- Seasonal workers nowadays leave on Monday and come back on Friday.
- 1993 was a year with a very heavy drought – the only drought year back then, because people would always refer to that year as “the year of drought”.

Discussion on seasonal calendar (men)

- Cloudburst not so common, but has happened a couple of times over the last few years, not every time exactly at the same time
- Summer rainfall usually in Dec, Feb., April
- Difficult to describe – because sometimes you can get rain in one month and then nothing for the next few years in the same month

- Rainfall season changed used to be winter rainfall and now summer rainfall
- Ticks depend on rainfall

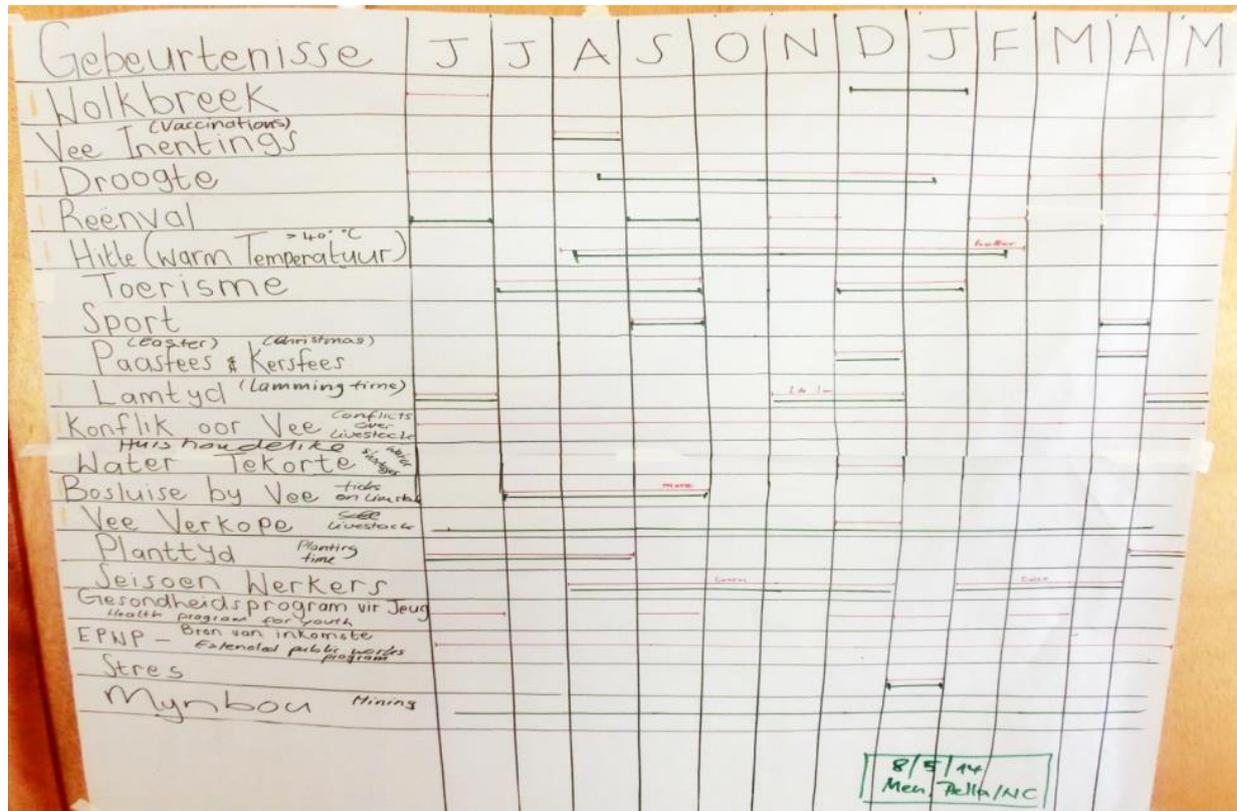


Figure 8: Seasonal calendar of men

When the two calendars were discussed on Friday, women and men came to a clear decision that there was drought even in the past, e.g. in late 50ies.

When comparing the two calendars, it is obvious that the main events are quite similar. Sometimes an event is a bit longer or shorter for women or men depending on the reference period and experiences.

The events match with major scientific observations and scenarios: higher temperatures, more droughts, more extreme weather events.

4.2. Vulnerability and Capacity Analysis (Module 3, Exc. 1 and 2)

Vulnerability matrix and livelihood resources (M3/E1)

For this exercise the groups had to choose the three most important natural hazards in Pella and important natural, physical, economical/financial, social and human livelihood resources. As to hazards, the women decided to take drought, high temperatures and dust storms; the men took drought, high temperatures and floods.

The result after adding the points showed that for women the most important hazard was drought (20 points) followed by high temperatures and dust storms (13 each); for men it was floods (21), high temperatures (16) and drought (14).

As to livelihood resources the most threatened resources for women are grazing land (9), livestock (6) and health (6); for men it was wetlands (9), gardening (9), livestock (9) and health (8). With regard to financial resources, the selling of livestock and gar-

den products are affected. On the other hand, the governmental support and the income source “mining” are not affected by climate change.

For women drought is more important as it threatens their livestock system; for men floods are most threatening to crops and livestock. It is interesting that health was such an important asset to men.

It became obvious to the participants that natural hazards and climate change are more and more threatening their livelihood assets making life more difficult.

Livelihoods	1. Droogte	2. Hoe Temp.	3. Stof Storms	
Natural (fontein)	3	0	2	5
- Water Weiveld	3	3	3	9
Physical/Fisiese	0	3	0	3
- Irrigation infra	0	0	1	1
- Clinics School Church	0	0	1	1
- Houses Huise	0	0	1	1
- Ekensiteit	0	0	1	1
Ekonomiese/Finansieel	3	2	1	6
- Verkoopery	3	2	1	6
- Veehandel	3	2	1	6
- Tuinbou	3	2	1	6
- Klein besittings	3	2	1	6
- Soos (Gemeenskap)	3	2	1	6
- Omsorg + salidant	1	0	+2	3
- Organisasie	0	0	0	0
- Vreë	0	0	0	0
- Education	2	0	0	2
Menslik (Advante)	2	0	0	2
- Gesondheid	2	2	2	6
- Vaardighe	0	0	0	0
- Opleiding	2	1	0	3
	20	13	13	

Figure 9: Vulnerability matrix of women

Bronne		Droogte	Hoe Temperatuur	Vloede	Som
Natuurlik	- Minerale	0	0	1	1
	- Son	0	0	0	0
	- Vleilande (Wetlands)	3	3	3	9
Finansies	- Rivier	1	1	3	5
	- Community Work Program: CHP	0	1	+1	1
	- Vee Verkoop (Sell livestock)	3	3	3	9
Menslik	- Tuinmaak (Gardening)	3	3	3	9
	- Gesondheid	2	3	3	8
	- Ambisie (Ambitions)	1	1	2	4
Sosiaal	- Vaardigheid (Skills)	0	0	0	0
	- Nama Kultuur	1	0	1	2
	- kerk (Church)	+2	0	1	1
Fisies	- Opleiding (Education)	0	1	1	2
	- kerkgebou	0	0	0	0
	- Kliniek	0	0	0	0
	- Skool	0	0	0	0
Totaal		14	16	21	
Rank		3	2	1	

Figure 10: Vulnerability matrix of men

Discussion on the vulnerability matrix (women)

- Older farmers handle drought much better than young farmers
- Drought has an impact on education: No livestock = no money for schools
- High temperatures burn the grass on the pastures
- The municipality does not do any repair work on the irrigation systems
- Sun burns the vegetables
- Old people with illnesses suffer very hard when it is hot
- Dust storms can destroy people's rooftops
- Dust storms hurt people's eyes

Discussion on the vulnerability matrix (men)

- Windstorms affect the whole community and floods affect only livestock farmers

Hazard, Impacts and Coping strategies (M3/E2)

This exercise reveals the negative impacts of hazards in the community and should also show to the participants that they are not helpless as to threatening hazards. They have coping capacities even if they might not always be very effective or sustainable.

Especially for the women this exercise was challenging as it was late in the afternoon and they had to cope with tiredness and thoughts about family duties. Therefore the team decided to shorten the exercise with the women and discuss only one hazard (drought) and two impacts (loss of livestock and loss of grazing land). During the exercise it became obvious that it is important for facilitators to know about the impact chain of hazards: what is impacting on what? Loss of livestock is an impact of loss of grazing land (= cause) and should be treated after discussing the cause of that. In the exercise, loss of livestock was discussed first and led to some confusion when discussing coping strategies of loss of grazing land. In the evening, the team discussed about the impact chain in order to avoid this problem with the men's group. It was very helpful to discuss about effectiveness and sustainability to better understand the relevance of a coping strategy for households or communities.

Hazard Gevaar	Impacts Impak	Coping Strategies	Effectiveness	Sustainable
Droogte	Vee snyltes (Diene)	<ul style="list-style-type: none"> → Verkoop Vee → (de) Koop Vee → Trek na better weiveld (River of Berg) → Huur kampe by kommersiële boere → Dokter vee → Droogte hulp van staat 	<ul style="list-style-type: none"> 3 2 1 3 3 3 	<ul style="list-style-type: none"> 1 3 3 1
	Weiveld verdroog/verval	<ul style="list-style-type: none"> → Plant vee → Aankoop van Vee → Bid for the rain ? Weidingstelsel → Bestuur 	<ul style="list-style-type: none"> 3 3 ? 	<ul style="list-style-type: none"> 3 ?

Figure 11: Impacts, coping strategies, effectiveness, sustainability of women

Discussion on "Hazard, impacts, coping strategies" (women)

- Loss of livestock – people would rather sell their livestock than loose it to drought. But in only works for a short time – not a sustainable solution.
- People won't have enough money to buy feed every time during drought.
- The majority of existing coping strategies is effective (3) but little sustainable (1).

- The only one which was rated as both sustainable and effective was to take the animals to the veterinary and give them medicine.
- The second coping strategy that was rated sustainable (3) was at the same time rated as little effective (1). That is, to look for better pasturing land further away, when there is drought.

GEVARE	Impak	Strategie om te reageer op impak te	Effectiviteit	Volhoubaarheid	Koste Effectiviteit
Vloede	Veeverliese	Strategie om te reageer op impak te - besparing te water reageer op waark uwing's + verkuff vee - lig mekaar in van ge vare. - "lees" weer en verkuff vee	2	3	
	Gewasverliese				
	Weegpood van boogrand (alles in rivier)	- Gebruik areas wat meer bloot hestel is (ver va rivier)	2	2	
	Afgesny van buite wêreld	- Gebruik greek wat minder blootgestel is (naby rivier)	0	0	
	toespreklikeheid	- Stotting to ess both loag suer met houtpeal. - kano's + bootjies	3	3	
	Verlies aan menselêre Gesondheidsrisikos	- vroeë waarskuwing's	2	2	
		- om nie H ₂ O te drink nie - kook H ₂ O - Neen H ₂ O van Pella - blanching H ₂ O with Chlorine	1 3 3 3	1 1 1 3	
Droogte	Vee verlies nie genoeg weiding (Lae Pannal)	→ Trek na in ander veld (groen)	2	2	③
		→ Koop voer aan	3	0	
		→ Vee verminder	3	1	
		→ Verkoop of slag			

8/5/14
Men. Pella/NC

Figure 12: Impacts, coping strategies, effectiveness, sustainability of men

The men worked on floods and drought and mentioned quite a lot of effective and sustainable coping strategies. It became clear that they rely much on government aid (fodder aid, disaster aid).

On Friday, both women and men came together to first present their works of Tuesday and Thursday, to compare the results and to discuss similarities and differences. In general men and women shared the same ideas and findings on hazards, impacts and coping strategies. Some minor differences had been found in the seasonal calendars.

After wrapping up the day by the facilitator, the groups had the occasion to give some feedbacks on what they learnt or what was important to them. Here are some answers:

- Interesting
- Refreshed memories
- I learned a lot
- Unfortunately that we will be leaving – they would need more assistance from us in the future

- Education is good, I will not forget what I have learnt
- I will tell everybody who want present/ share the information
- It was a lot to take in just one day / too much work in a very little time – especially for the eldest (73 yrs old)

During the daily team feedback meetings at the end of the day the team members mentioned the following points:

- Participants were not representative for the village
- People were shy at the beginning, and then started more and more; more answers came
- Participants were attentive, creative, interested etc.
- Afternoon: People were tired and lost interest. Usually women are less attentive in the afternoon, they are not used to such long workshops
- In the smaller group more people understood and participated
- Aunty Anna made good inputs - the younger ones learned from her
- Workshop creates a lot of hope and expectations but does not give so much solutions
- Problems are raised but much less focus on solutions – very easy practical “first steps”
- Should be done over a longer period of time
- Participants said that they can apply the tools in their own life/own business – the way of categorizing/classifying/ doing a table (systematic thinking)
- Team members also learned a lot about the tool and how it works

Concerning the facilitation:

- The participants should realize by themselves the effects of climate change – we only facilitate the process – so that THEY own the solutions
- Not to write down too fast what they are saying. Too rapid acceptance of a response – ask why, let them explain, dig deeper, don't just accept the answers they give
- Summarizing is very important – show them main conclusions – point out (again) the main points

4.3. Adaptation strategies (Module 4)

This exercise was done with both women (14) and men (6).

First, the trainer explained the differences between coping and adaptation strategies.

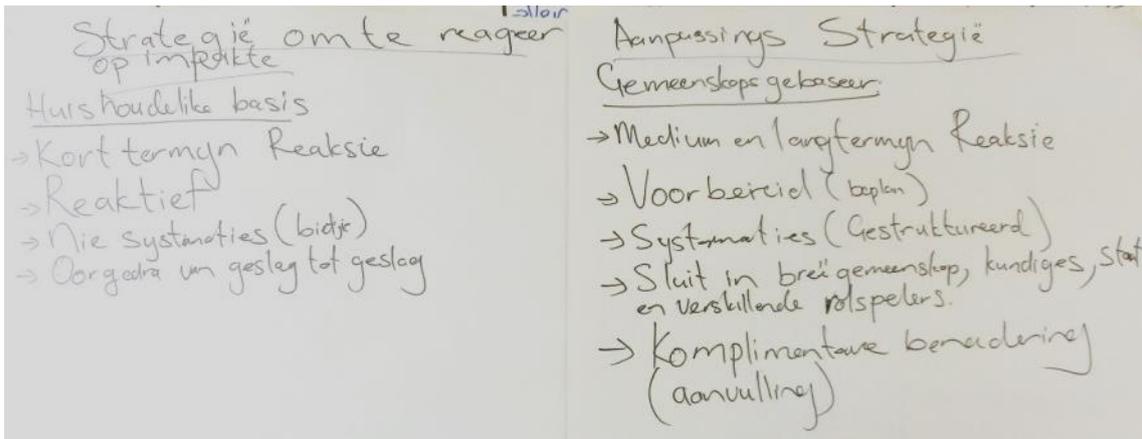


Figure 13: Characteristics of Coping and Adaptation strategies

Coping strategies are more:

- Household based
- Passed on from generation to generation
- Short term responses
- Reactive
- Less systematic

Adaptation strategies are more:

- Medium/long term oriented
- Planned, proactive
- Systematic
- Including all stakeholders
- Community based
- Complementary

Because of time constraints the discussion on furthering and hindering factors for coping and adaptation strategies had been skipped.

Before doing the last exercise on adaptation strategies, a map of major stakeholders/role players (*rolspelers*) had been developed with the participants.



Figure 14: Stakeholders in Pella

These stakeholders should participate when doing this exercise in a real life assessment because a community based approach and medium/long term strategies need the contributions and engagements of all groups, institutions and people concerned.

For this exercise the participants were divided into four groups. Each group should find four important adaptation strategies which should be relevant for the hazards and impacts in Pella. After the group work, the metacards were presented to the plenary and then clustered.

Each person then got three stickers to secretly vote for the most important strategies for her/him. The women got red stickers, the men orange ones but without telling them before. This allowed a gender disaggregated analysis of the result.

The results for the five themes are:

	Women	Men	Total
1. Training	13	8	21
2. Water supply and agriculture	8	5	13
3. Livestock management	6	2	8
4. Job creation	6	0	6
5. Information	3	2	5

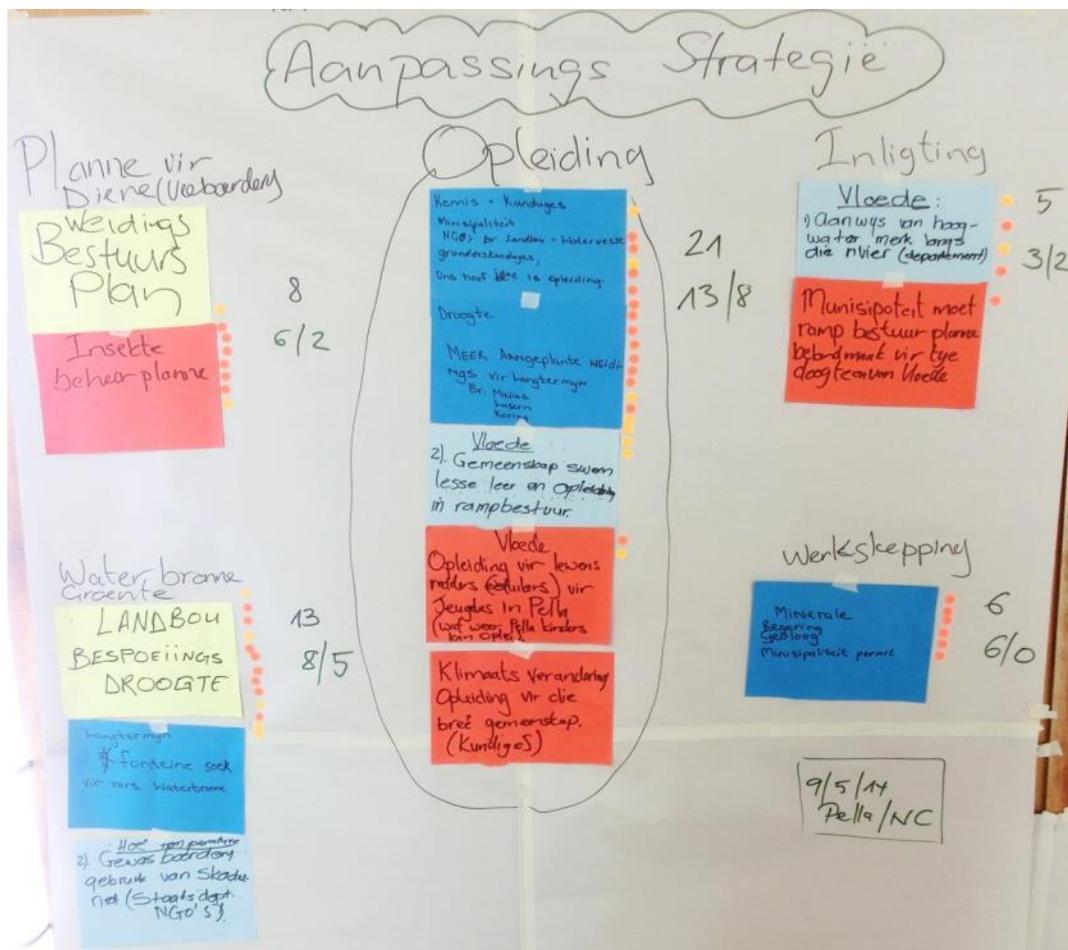


Figure 15: Adaptation strategies

This exercise was rather difficult for the participants as thinking out of the box, without any new inputs from other stakeholders and with a limited vision about the community was challenging and even too demanding. This shows the importance of in-

cluding different stakeholders in discussing and finding new adaptation strategies which go beyond the coping strategies.

Training, which was selected as number one priority by most participant, included the following specific cards:

- Gain knowledge (also through experts) on agriculture and use of water in agriculture (“this is our hope”)
- Gain knowledge on locally adapted cultivation of fodder plants (mais, Lucerne, etc.)
- Gain knowledge on how to determine pasturing intensities (animals per ha)
- Teach children /youth how to swim in case of floods
- Education on climate change for the whole community of Pella

Feedback at the end of the workshop

- I can see where our main focus areas as a community lie
- We will talk to stakeholders – tell them our needs
- Information can't stay at workshop, has to go to municipality/ stakeholders
- Establish community to take results forward or maybe Pella forum can step in and talk to stakeholders
- I learned about CC, I never thought about it further than that the weather patterns have changed
- We worked very well together
- You are never too old to learn something new – I can tell the children and also everybody else
- My perceptions changed, it was an eye opener for me.

4.4. GHG Mitigation strategies (Module 5)

This exercise was done without the people of Pella. As mentioned earlier, the team was composed of two employees of SPP and one of NAMKO. It was not possible to focus much on Pella as detailed information about the project was lacking. So, the exercise consisted of discussing mitigation in a broader way.

After an introduction to the module 5 and the list of potential emission sources and carbon sinks, the team worked on the different project activities of SPP and NAMKO and their effects on GHG emissions.

Most of the project activities are increasing GHG emissions as the two organisations focus on trainings, campaigns and meetings. The distribution of seeds and seedlings, tree planting events and replacing mineral fertilizers by organic fertilizers are reducing emissions or are carbon sinks.

Area	Project Activities	GHG Emission	Mitigation Strategies
Organisation	- Transport (vehicles, airplanes)	↑	<p>Mitigation Strategies</p> <ul style="list-style-type: none"> * Skype Conferences * Reuse/Recycle Paper * Reduce Air Con Use * Green Architecture * Car Sharing * Public Transport * Mini Bus Taxis * Information on Energy Effectiveness Efficiency * Use of Solar Energy
	- Office: Air-Con, Paper	↑	
Projects	- Trainings	→	
	- Distribution of Livestock	→	
	- Distribution of Seeds, Seedling Tree planting Events	↓	
	- Organic fertilizers Composting	↓	
	- Advocacy, Campaigns	→	
	- Annual Gatherings	→	

Figure 16: GHG emissions and mitigation potentials

GHG mitigation potentials of the organisation lie in reducing travel (Skype conferences, car sharing, public transport, mini bus taxis) and reduced/improved energy use (reduction of air con use, recycled paper, green architecture, solar energy).

There is still a lot of discussion and information needed on the organisations' level to make full use of mitigation potentials on organisational and project level.

4.5. Project Revision (Module6)

This module was not done as data for the project was missing. Nevertheless, SPP and NAMKO are committed to continue the process of assessing climate change impacts and identifying adaptation strategies with the community of Pella.

5. Findings, Conclusions and Recommendations

On the preparation of the analysis

- The choice to do the analysis in Pella was relevant but the fact that the project manager Roland left the organisation some weeks before the workshop started did not allow an in-depth work on the project of SPP. Facts and figures about Pella were missing. Therefore module 1 and 6 had not been done sufficiently or at all.
- Only two members of SPP participated. The third person came from another organisation (NAMKO). This made it also impossible to work on a concrete SPP project.
- Not all participants had been project beneficiaries. Several participants had been just citizens of Pella. It was obviously not easy to mobilise men for the workshop (14 women, 8 men).

- Venue, logistics and accommodations had been well organised.

On the analysis process

- Translation was well done by Harry and Ronny. Yet some specific terms were difficult to translate into Afrikaans. This needs preparation and knowledge.
- The analysis team was dedicated (work until late in the evenings), eager to learn and practice, in touch with the participants and open to criticism and self-criticism.
- The participants had been satisfied with the workshop: It was interesting, revealing, well facilitated, understandable, simple, participatory and eye-opening. The majority of the participants contributed actively to the workshop and created a good working atmosphere. Young and old and very old (74) worked well together.
- Some exercises were demanding like the coping strategies and especially the adaptation strategies. This needed a lot of explanations and support. So sometimes time was too short for an exercise.
- Strange theories about causes of climate changes like hotter temperatures could be discussed and rejected. Perceptions changed. Example: "Do the minerals in the ground have an effect on the heat?"
- It is always revealing and fun to compare the work of women and men as it leads to lively discussions and insights.
- SPP and NAMKO have now a good data basis for further work in Pella. They made it very clear to the participants that the process is depending on the commitment and interest of the community. They will support if there are initiatives.
- SPP is quite interested in the policy dimension and would like to talk to the municipality and see if they have anything on climate change.

On climate change in Pella

- Climate change is a reality in Pella. People are suffering from higher temperatures, disturbed rainfall patterns, drought, floods, dust storms and the negative impacts of these hazards.
- The most important economic livelihood assets in Pella are threatened the most by climate change: grazing land, arable land, livestock and crops. This decreases income and makes the population even more vulnerable to climate change.
- Several coping strategies are effective and sustainable; however as climate change will continue these strategies will not be sufficient and need a broader response.
- There is a great need for more training (agriculture, veterinary skills, climate change adaptation) and improved agricultural infrastructures.
- The people of Pella are used to government and NGO interventions. This is useful for the community but it turns out to be also a hindering factor for self-help initiatives and people's commitment.
- Pella has the advantage of being situated not far from the Orange River. Irrigation agriculture is possible next to the river. Drinking water supply is assured.

Recommendations

- It should be assured that well informed and sufficient staff members take part in the analysis.
- A detailed profile of the chosen community and the project is needed beforehand.
- Participants of the workshop should be more representative (young, old, men, women, social position, activities, etc.)
- Key terms have to be translated before the workshop.

- For the development of adaptation strategies, different stakeholder should be present.
- It would have been better to include also employees of the municipality and local politicians/representatives to increase the impact of the workshop.
- With regards to administration: it needs to be in the “integrated development plans” of the municipalities – only then it can be funded with public funds.
 - So these stakeholders need to be involved
 - When you do a real analysis, politicians/ other stakeholders should see the outcome, e.g. present to them.



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