

Assessment Report for a Sustainable Smallholder Agriculture and Food Security Project in Matobo District, Zimbabwe



Climate and Disaster Risks Project Analysis

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Bread for all, November 2010

HEKS  **EPER**
Hilfswerk der Evangelischen Kirchen Schweiz
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Text

Marion Künzler, climate expert, *Bread for all*

Picture

Marion Künzler, climate expert, *Bread for all*

Front page: This women stands in her small garden cultivated in a semi-arid area to diversify its family nutrition in Matobo District in Zimbabwe.

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.

HEKS/EPER (Hilfswerk der Evangelischen Kirchen Schweiz, Entraide Protestante Suisse), campaigns for a more humane and more equitable world. HEKS gives humanitarian and emergency aid and fights the causes of hunger, injustice and social deprivation. The focus of its commitment on behalf of socially disadvantaged sections of the population is the dignity of every individual. HEKS/EPER bases its support on the resources and needs of the people concerned and works with them on the practical aspects of its projects. HEKS/EPER has a policy of working exclusively with local partner organizations and does not send Swiss people abroad. As a matter of principle, local workers are recruited to staff the coordination offices.

I. Executive Summary

Climate change affects poor people in particular, because of their weak adaptive capacities. Development projects of all kinds can strengthen or weaken those capacities. At the same time, they can influence greenhouse gas emissions, the main cause of climate change, positively or negatively. Therefore it is important to evaluate the impacts of development projects on adaptive capacities and climate change mitigation, in order to find measures to improve projects in the face of climate change.

This Assessment Report presents the results and the lessons learned from the climate and disaster risk analysis of a project to integrate permaculture and market access for resource poor, small holder organic farmers in the district of Matobo in Zimbabwe. The analysis was conducted with the “Participatory Tool on Climate and Disaster Risks (CliDR)” from HEKS and Bread for All. The analysed project is run by the local NGO Fambidzanai Permaculture Center, and partly financed by Hilfswerk der Evangelischen Kirchen Schweiz, Entraide Protestante (HEKS/EPER).

The evaluation shows that project beneficiaries suffer mainly from drought, HIV/Aids, pest, diseases and changing rainfall patterns. The increased frequency and intensity of drought, increase of pest and diseases as well as changing rainfall patterns are a consequence of climate change. Rising temperatures seem to be under evaluated by the participants. Reasons might be that it is as a slowly increasing risk, and hard to link with drought. Finally not all identified hazards are due to climate change: some of them are due to human degradation or pollution (e.g. deforestation), other reasons (e.g. legislation) and some might be impacted indirectly (HIV/Aids).

Future global warming will even increase these risks further, and add hazards that have been less important in the past, such as the increased occurrence of malaria, tuberculosis, water borne diseases, frost or wild fires. The local population has many functioning coping strategies, but they cannot reduce their vulnerability sufficiently, particularly with a view to ongoing climate change.

Most of the screened project activities have a positive impact on those livelihood resources endangered by climatic risks. Yet more actions need to be taken to strengthen the livelihood resources and adaptive capacities of the population. Among others, natural resources should be strengthened e.g. climate change resistant crop varieties, financial resources need to be improved and diversified, and human health protected, among other things. Especially the aspect of a balanced living of human beings with the highly vulnerable environment should be considered while promoting livestock or nutrition gardens with irrigation. Thus, promotion for these additional income sources should be linked with awareness rising to strengthen it further.

Fambidzanai’s activities contribute to reducing greenhouse gases in the atmosphere, through permaculture practices (organic fertilizer and pest management), conservation farming, life tree fencing as well as the use of windmills or hand pumps for watering. These activities all have synergies with adaptation and should be considered.

Further lessons were learned during this sixth application of CliDR. The suitability of the guide in different environments was confirmed. It paid off to investigate in participative stakeholder consultations. The introduced exercises for these consultations allowed participants to engage in a learning process themselves. Coordinators as well as the farmers of the screened project said they had learned a lot, too.

II. Acknowledgements

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- The project beneficiaries for participating actively in the workshops, which allowed most of the information in this report to be gathered.
- The developers of CRiSTAL, a tool which forms the basis of the HEKS and Bread for All Climate Analysing Tool, and the CARE Climate Vulnerability and Capacity Analysis (CVCA) Handbook, from which many of the exercises used in stakeholder consultations were drawn.

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1 Introduction

Climate change and development 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 their beneficiaries' capacities to confront climate change. It is also important to make sure that the same projects do not lead to excessive emissions of greenhouse gases.

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

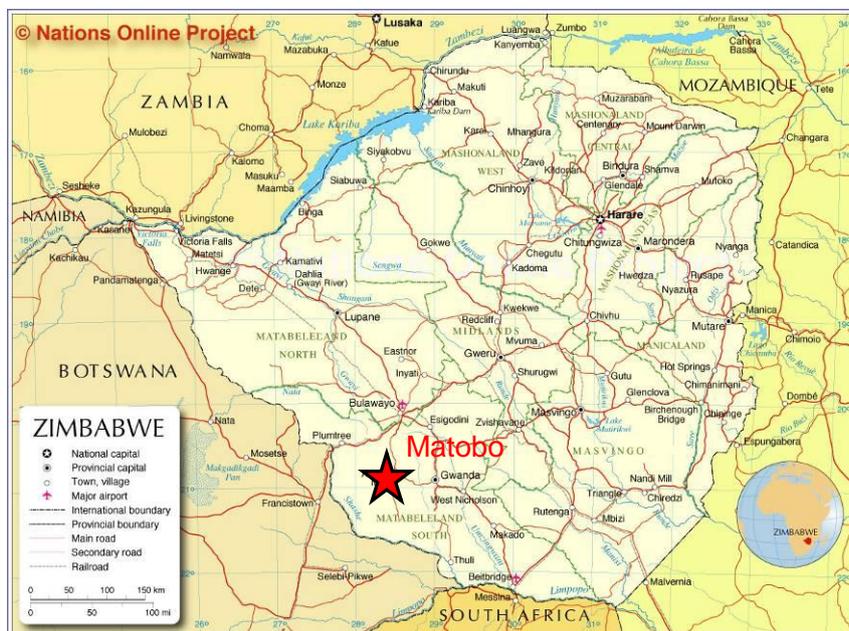


Figure 1: Map of Zimbabwe and the project region marked in Matobo district (Source: Nations Online Project)

Marion Künzler, a climate change expert of *Bread for All*, carried out the fifth climate and disaster analysis in a local project supported by HEKS/EPER. In October 2010, she visited Zimbabwe and evaluated a development project which aims to improve food security and the socio-economic standards of living for men and women practicing sustainable agriculture in Matobo district, in the province of Matabeleland (see Figure 1). The assessment shows that their beneficiaries are very vulnerable to climate change.

The analysis was executed with the HEKS/EPER and *Bread for All* "Participatory Tool on Climate and Disaster Risks (CliDR)", which is based on CRiSTAL¹.

This report was organised as follows. First, the project and its context was briefly described. Then, the climate context in Zimbabwe was discussed. Third, the assessment results for the project will be presented, following the structure of CliDR. The last section discussed some lessons learned from the application CliDR.

¹ CRiSTAL is a tool jointly developed by the International Institute for Sustainable Development (IISD), Intercooperation, the International Union for the Conservation of Nature (IUCN), and the Stockholm Environment Institute (SEI).

2 The Project and its Context (Module 1 of CiDR)

Background

After 8 consecutive years of negative **economic** growth characterized by unemployment rate of at least 90% of the total labour force and where 80% of the population lives below the poverty datum line, Zimbabwe is said to be on the road to slow recovery which has been ushered in by the Inclusive Government. Inflation has been tamed to 5.3% in June 2010 from the astronomical nine digit figures. But the lack of foreign direct investment and liquidity shortages may continue owing to some political uncertainties (HEKS/EPER 2010).

The **Health sector** is not spared from deteriorating infrastructure, exodus of qualified medical personnel and under funding (1 doctor for every 12 000 people). Life expectancy of the adult male population is 42.6 years while that of women is 43.6 years. The adult prevalence rate of HIV and Aids in adults fell from 16.1% in 2007 to 14.3% in 2010 due to adequate response to HIV/Aids from the Zimbabwean Government (HEKS/EPER 2010). Migration to neighbouring countries has increased the spread of HIV/AIDS infection through multiple partners and this has resulted in very high cases of related illnesses and deaths. Contributing to this is the proximity of the district to the borders of South Africa and Botswana where sex work is rife.

There is a generally low **status of women** with respect to access, control and ownership of economic resources and positions in decision making processes in Zimbabwe. The government has enacted a plethora of positive legislation that enhances women's status. However, the main challenge is in the implementation and consistent monitoring as both women and men are still stuck up in some cultural practices that mainly place women in subordinate roles (HEKS/EPER 2010).

Zimbabwe has **politically** experienced a decade of crisis whose beginning was marked by the defeat of the constitutional referendum of February 2000. Since 2000, politics in Zimbabwe has been marked by slow regression away from many of the norms of Democratic Governance. These include democratic elections; independence of the judiciary; rule of law; freedom from racial discrimination; the existence of independent media; civil society and the academia (HEKS/EPER 2010).

Wide spread violations of human rights have been experienced in the last 10 years. Subsequent elections have been marked by political violence and intimidation along with the politicisation of the judiciary; military; police force and public servants. Prior to the signing of the Global Political Agreement (GPA) on 15 September 2008 statements by the President and government politicians referred this decade to a state of war or Chimurenga, against opposition political parties, in particular the Movement for Democratic Change – Tsvangirai (MDC-T) (HEKS/EPER 2010).

The analysed project "Integration of permaculture² and market access for resource poor, small holder organic farmers" aims to improve food security and the socio-economic standards of living for men and women practicing sustainable agriculture in Matobo district of Zimbabwe.

Fambidzanai Permaculture Centre is a training centre that was established in 1988 and its institute is located close to Harare city. The centre has fostered the creation of four other

² Definition of permaculture: the practice of producing food, energy, etc, using ways that do not deplete the earth's natural resources [coined by Bill Mollison (born 1928), Australian ecologist, from *perma* (*nent agri*) *culture*]

development institutions namely the Natural Farming network (NFN), the Schools and Colleges Permaculture (SCOPE), (AFFOREST), and Permaculture and Ecological Land use management (PELUM). Since its inception the centre has paved the path for food security through sustainable Land use Management. Fambidzanai's development intervention is characterized by skills training; demonstrations, participatory rural appraisal, and creating marketing opportunities for organic produce.

HEKS/EPER participates to the core budget of the Matobo region project.

Project area

Fambidzanai works in Matobo district, especially in Dema and Madwaleni ward. Madwaleni and Dema wards have around 12.000 households with an average of 5-6 members per household. The population relies mainly on agricultural farming, gold mining and male migration to South Africa or Botswana. Demographic growth stands currently at around 1.4%³ per year in Zimbabwe (HDR 2009). Life expectancy in this region is lower than the Zimbabwean average especially for woman with 39 years, for men it is 49 years.

Project activities

The project has a three year plan from 2008 to 2010. The next phase is currently in revision. The annual budget is about 80'000 Swiss Francs annually come from HEKS/EPER). Fambidzanai works in Matobo district with poor smallholder farmer families from Dema and Madwaleni wards.

So far 13 nutrition gardens and 57 bee hives established (thereof 13 are colonized) and 64 goats distributed (thereof 56 have kidded (half female, half male) and four female passed on). 100 farmer families received 325 kg seed (maize, sorghum, millet) for organic conservation farming and seed multiplication. Also the resource center is under construction (around 50 (mainly female) farmers are evolved).

The project is active mainly in four areas:

- It offers low input farming methods and a diversification of income to resource poor farmers in Matobo district with a bid to improve their general livelihood, e.g. pass on goats, nutrition gardens, bee keeping selling honey and seed multiplication and conservation farming.
- It addresses HIV and AIDS by including knowledge about herbs and their medicinal functions and other natural remedies that can be used by the affected and infected. Additionally it creates awareness of gender and environmental issues.
- It moves from basic training on permaculture towards consolidating organic principles and strengthening the sustainable production of food for household food security while enhancing their income earning opportunities. Project participants in Matobo district are trained in sustainable agriculture and organic agro-entrepreneurship skills, e.g. participatory group production, product quality improvement, processing and produce packaging. Training is availed through various activities such as on and off -site demonstrations, exchange visits to areas of interest as well as information distribution.

³) other indicators: migration -0.3%, total fertility rate 3.5% and life expectancy at birth is 39 years, HDR 2009

- A resource center as resource and market center is under construction.

Primary beneficiaries

Around 500 women, men and youths from Dema and Madwaleni wards are the beneficiaries of the project. However the project pays primary attention to old aged farmers who have very little socio-economic viability and live mainly on subsistence farming and may have families who have left them in the rural areas, seeking for 'greener pastures'. The project focuses on middle-aged farmers comprising of mostly women farmers who try hard to fend for their families by living off subsistence farming.

Project context

A. Local and external groups/institutions/organizations

Christian Care implements an Integrated Rural Development Programme and an Advocacy Programme in the same region. The two organizations are complementing each other thereby scaling up the impact of HEKS/EPER support in Matobo District.

Dabane Trust also helps Fambidzanai with courses in water and sanitation management. Another organization is Hlakweni, which assists in the training of practical skills in sewing, woodwork and metalwork. JPV works along with Fambidzanai to help in the training of business management and goat keeping. World Vision helps the farmers with food aid and seed distribution. UNDP helps to provide the fencing material for some nutrition gardens that Fambidzanai has established. The social service project committee is organized by rural district council to coordinate the activities of all NGOs in this district.

In carrying out the projects effectively in the area, Fambidzanai involves also governmental stakeholders such as

- Agricultural extension (AREX) for up to date information about crop, weather etc.
- Department of veterinary services as a livestock specialist and also for bee keeping activities
- Natural resources management board, Forestry commission and the Ministry of Youth, Gender and Employment creation help to coordinate the activities between the organization and the government.
- Local leaders such as the District Administrator, Chief executive, Councillors etc. held to coordinate with the local population,
- Police to report for fires, steeling etc.

B. Climatic conditions

Zimbabwe lies in a semi-arid and arid region in which rainfall is variable and unreliable, impacting on rain-fed agriculture and other sectors of the economy. Rainfall totals on average decrease from north to south. Apart from the general effects of global climate change and several local factors, rainfall over Zimbabwe is also influenced by El Nino – Southern Oscillation (ENSO). The climate of Zimbabwe is characterized by a cool season (mid May to August), hot season (September to mid-November), main rain season (mid-November to mid-March) and post –rainy season (mid – March to mid – May).

Zimbabwe is divided into five agro-ecological regions, known as natural regions on the basis of the rainfall regime, soil quality and vegetation among other factors. The quality of the land resource declines from Natural Region (NR) I through to NR V. Matobo district falls into NR

IV and V characterized by less than 650mm rainfall with subject to frequent seasonal droughts and severe dry spells during the rainy season. The region IV is suitable for a semi-extensive farm system based on livestock and resistant fodder crops, region V is suitable for an extensive farm system based on cattle ranching.

C. Current risks

The main risks to Matobo's natural resources are due to a drought prone area as food insecurity or bush and wild fires. Political and economical crisis intensify the social problems as high migration of men and youth, alcoholism of youths, gender balanced violence's or depth of livestock. Additionally, health and pest problems as a high incidence of HIV and Aids, tuberculosis, water borne diseases (bilharzias), anthrax (cattle disease), army worm and quelea (attacks small grain) aggravate the situation. Illegal mining activities have consequences on human and animal health due to fine dust and contaminate water and soil. In addition, the use of chemical sprays for agricultural plantations and deforestation by human beings and goats deplete the environment. A newer risk is climate change which has already wide spread impacts in the region.

D. Prevention and preparedness systems

The known prevention or preparedness systems respectively their organisations in Matobo district are the following:

- Civil protection unit is responsible for first aid (humanitarian response) and maintaining an early warning system.
- several meteorological stations
- Civil society organizations as churches, NGOs etc. supporting humanitarian response, awareness rising on HIV and gender violation (legislation to protect men, women and children).
- Ministry of health and red cross educating on diseases
- Forest commission, Environmental Management Agency (EMA) doing hazard maps for wild fire.
- Veterinary services rising awareness
- Government organising national tree planting days,
- Forestry commission implementing legislation to discourage deforestation
- Mining legislation supporting indigenous mining activities.

3 Scientific information about Climate Change and Disaster Risks in Zimbabwe (Module 2 of CliDR)

3.1 The Impacts of Climate Change and Disasters in Zimbabwe

Climate change is already taking place now, thus past and present changes help to indicate possible future changes.

Over the last decades, the temperature in Zimbabwe increased, annual rainfall amounts decreased and extreme weather events increased as well. It is important to notice that these large-scale trends do not necessarily reflect local conditions in Matobo district.

The projected climate change scenarios made by Hulme and Sheard (1999) using the median climate response to increased greenhouse gas concentrations from ten global climate models show:

- **Temperature** over Zimbabwe warm by 0.15° C/decade (low emissions scenario) and 0.55° C/decade (high emissions scenario) by 2080.
- **Rainfall** model experiments suggest annual rainfall decreases across the country particularly during the early and late summer months. By the 2080s rainfall decreases by about 5% (low emissions scenario) and about 18% (high emissions scenario) below the 1961-90 average. For comparison, the 1986-95 decade was 15% drier than the 1961-90 baselines in Zimbabwe.
- **Extreme events:** Increased incidence of drought is expected to be a particular problem. Other potential changes include localised floods and decreased/varying river flow (GSDRC 2009).

Detrimental and beneficial impacts of the ongoing and projected climate change and variability are widespread in both socio-economic and natural systems. These impacts include (no regional breakdown):

Agriculture and food security: Around 80% of Zimbabwean's population relies directly or indirectly on agriculture which is critical with the changing weather patterns especially for food security (Levina 2006). More frequent and prolonged droughts and increases in temperature can seriously reduce crop yield and income, especially for maize, which is a staple crop in Zimbabwe. Research has shown that net farm revenues are affected negatively by increases in temperature and positively by increases in precipitation. Especially dryland farmers will be affected strongly with changes in net revenue compared to farms with irrigation. IPCC (2007b) calculated a loss of 0.4% to 1.3% GDP as a result of negative changes to agriculture. As a consequence, also downstream agriculture-based manufacturing industries will be affected which poses a particular challenge for food production (GSDRC 2009, Mano and Nhemachena 2007).

Water resources: Various studies indicate an increased water demand for irrigation due to increased evapotranspiration, a decrease by approximately 30–40 per cent in water yield per dam and worsening water supply/demand for both industrial and agricultural purposes– and this is likely to be accentuated under climate change (MOMET 1998). Reduced water runoff is not only expected to affect the quality and quantity of water available but also to limit hydropower production, most significantly at Kariba hydropower station. As 80% of Zimbabwe's

electricity supply comes from the Lake Kariba dam and makes especially agriculture and electricity supply reliant on sufficient water for domestic and industrial use (GSDRC 2009, Levina 2006, IPCC 2007b).

Human health: Zimbabwe's statistical indicators for health and education were once among the best in Africa. Between 1990 and 2003 the poverty rate rose from 25 % to 63 % (FAO, 2010). Political and economic crisis brought rising poverty and social decline. In addition Zimbabwe is also vulnerable to having a perennially high number of malaria cases (Chigwada 2005). Nevertheless the effect of climate change on human health continues to be a matter of scientific debate. Most of Zimbabwe could have near-complete climate suitability for stable malaria transmission by 2050 under the scenario showing the greatest change (4.5 °C warming). However it is noted that non-climatic factors will influence the future geographic distribution of malaria (GSDRC 2009, Ebi et al 2005). Climate variability may also interact with other vulnerabilities such as populations affected by HIV/AIDS and conflict in the future, resulting in increased susceptibility and risk of other infectious diseases (e.g., cholera) and malnutrition. The potential for climate change to intensify or alter flood patterns may become a major additional driver of future health risks from flooding as well (IPCC 2007b).

Social groups: Very little work has been carried out specifically on the vulnerability of different social groups to climate change in Zimbabwe. A recent study in the rural district of Chiredzi found that the most vulnerable households included female headed households, households with no access to irrigation, and poor households. Furthermore, many rural areas have experienced significant exodus of younger people to urban areas or neighbouring countries in recent years, leaving agricultural activities to the older people and the very young who may not be able to maximise the use of land. As well the urban poor in Zimbabwe have become increasingly vulnerable over the past few years as urban planning and sanitation systems have become weaker.

Terrestrial Ecosystems: The impacts of global climate change on forest distribution were evaluated with scenarios. Across Zimbabwe, 17 to 18% of the total land area is projected to shift from subtropical thorn woodland and subtropical dry forest to tropical very dry forest. The projected shift in forest distribution is attributable to a future decline in precipitation patterns and an increase in ambient temperature (Matarira and Mwamuka 1996). Along with this goes decreasing biodiversity.

Infrastructure: The recent years show a sharp increase in severe climatic and weather conditions. Flood induced disasters caused by Cyclones in 2000 and 2002/03 which left a trail of destruction in some parts of the country. The Cyclones disaster affected during the period from 1980 to 2008 over 300'000 people. Particularly the old and young groups comprised to be highly vulnerable. Their personal and collective losses ranged from death of immediate family members, loss of livestock and damage to households. Bridges, dams, houses and other civil works were destroyed. The cost of damages were estimated at over 3 Million US (Civil Protection Department 2007).

It is important to notice, however, that other factors threaten the livelihoods of Zimbabwe communities as well, e.g. resource degradation and the overexploitation of natural resources in association with the environmental decline.

3.2 Zimbabwe's Contribution to Climate Change

The total GHG emissions without Land use Change and Forestry (LUCF) were 27,594.2 Giga tons in the year 1994. The per capita CO₂ emission in thousand metric tons of CO₂ was 1.2 compared to the world average of 4.1 in the year 1998 (WRI 2003).

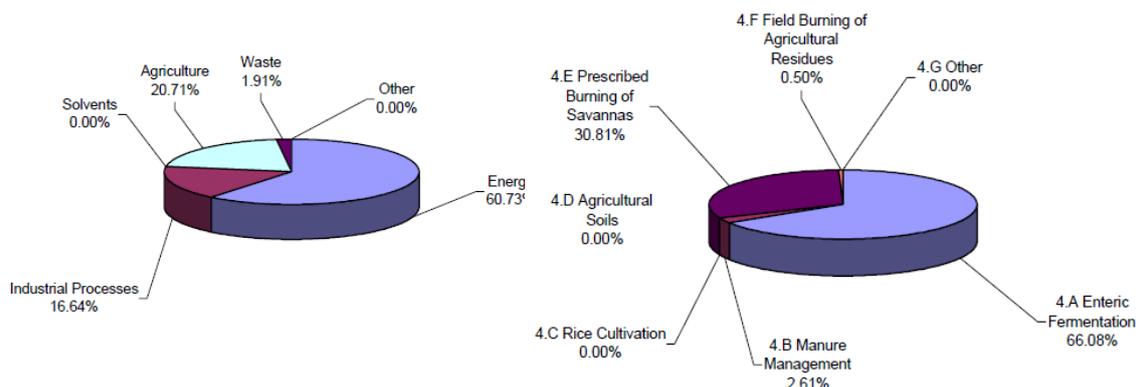


Figure 6 (left) : GHG emissions (without LUCF) by sector in 1994 (MOMET 2008)

Figure 7 (right): Breakdown of GHG emissions in the agricultural sector in 1994 (MOMET 2008)

Sector wise, Zimbabwe' GHG emissions are dominated by energy (60.73%), agriculture (20.71%) and the industry sector (16.64%) in 1994 of the total GHG emissions (refer to figure 6).

The energy sector contributes mainly because of the highly carbon-based fuels, especially coal. 96% of the total energy supply is from carbon-based fuels, and only 4% are from hydro-electricity and other renewable energy as solar. Most of the energy is used in industry with the majority of the population having poor access to modern energy. Energy demand growth continues to be positive even though there is a slow down in terms of economic activity (MET 2004).

Zimbabwe Agriculture sectors GHG emission contribution is high mainly because of enteric fermentation (66.08%) of livestock and annually burning of Savannas (30.81%) (refer to figure 6).

The industry sector is dominated by mineral and metal products. The metal products are mainly iron, steel and ferroalloys production.

The Land use and forestry sector reduces greenhouse gas emissions with 62,239.5 Ggt CO₂e. Thus it is a significant carbon sink. Therefore the total GHG emissions with Land use Change and Forestry (LUCF) are negative with -34,645.2 GGt of carbon dioxide equivalents (CO₂e) in the year 1994.

Newer official data, projections or even different provinces in Zimbabwe are not available.

4 Participative Assessment of Project Activities in Matobo District⁴

This chapter presents the results of the stakeholder consultations for the analysis on climate change conducted in September 2010.

The information on climate and disaster risks, their impacts and the current coping strategies was collected during two one-day gender specific workshops with the local population. As the poor farmer families are the main project beneficiaries of Fambidzanai, one workshop took place with women (w) and another with men (m) in October 2010.

The structure of this chapter follows the structure of CliDR which was used for the analysis. First, the project specific climate and disaster risks, their impacts and current coping strategies are identified. Secondly, the most important livelihood resources and their vulnerability are analysed in the context of climate and disaster risks. Then, the project's impact on adaptive capacities and on greenhouse gas emissions is evaluated. The last section looks at possible project revisions.

4.1 Climate and Disaster Risks, their Impacts and Coping Strategies in Matobo District (Module 3 of CliDR)

Chapter 3 has already dealt with the impacts of climate change and disasters on national level. Scientific information on a more local level is not available. Therefore, the results of consultations with project representatives and beneficiaries help to identify the consequences of climate change and disasters on a local scale.

Identifying Natural Risks (Module 3, Part A)

Hazards mentioned by participants of Madwaleni ward:

- (m, w) Drought affects the whole ward

Affecting human resources:

- (w) Scabies due to bad hygienic conditions and water quality affect especially children.
- (w) Tuberculosis and Malaria
- (w) Unprotected water sources intensify water borne diseases caused by not functioning boreholes.
- (w) Road accidents caused by pedestrians and animals
- (m, w) HIV/Aids
- (m, w) Floods due to over flooding dams cause loss of animals and children

⁴ Corresponds to module 3-7 of CliDR

Affecting physical resources:

- (w, m) Cyclones affected homesteads but are rare.

Affecting natural resources:

- (m, w) Quelea birds attack crop fields
- (m, w) Pests attack nutrition gardens.
- (m, w) Animal diseases e.g. rabies or lumpy skin affect dogs and cattle's
- (m) Frost attacks nutrition gardens
- (m) Wild animals
- (m) Black leg and ticks affect cattle's and goats
- (m) Stock theft
- (m) A legislation limited the available pasture land in their ward
- (m) Human degradation and pollution of environment
- (m) Deforestation by human beings
- (m) Soil erosion

Hazards mentioned by participants of Dema ward:

- (w, m) Drought occurs all over the ward
- (w, m) Floods occur in the villages Silungudzi and Dewe next to the river Ovi, often after drought.
- (m) Storm and cyclones affected partly the ward
- (m) Stealing/depth

Affecting human resources:

- (m) HIV/Aids affects the whole ward
- (w) Tuberculosis
- (w) Malaria occurs only in the village Mahusumani because of nearby swampy area

Affecting natural resources:

- (w, m) Wild fires and wild animals affect the whole ward coming from the northern national park. Fires are mainly caused by smoking visitors of the park, animals destroy their nutrition gardens.
- (m) Pest affect crop and gardens in the whole ward
- (m) Frost is locally affecting nutrition gardens.
- (m) Various cattle diseases affect the whole wards
- (m) Wild sick animals of the national park transmit their infection via the river to the animals and human beings.

- (m) Deforestation

Observed changes by men (m) and women (w) over the last 10 years:

- (w, m) Drought is now occurring every year.
- (w) Floods occurred only 2010 and are generally decreasing.
- (w, m) Start of raining season gets unpredictable. Therefore sometimes the farmers start to prepare their fields and it dries again, the plants are dying. So they need to restart everything.
- (m) Regularity of rainfall during rainy season is also unstable. *“Sometimes you start to prepare the field, it gets dry and the plants are dying. So you need to restart to plant.”*
- (w, m) Dry and hot season has intensified and lead to unstable cultivation seasons.

Affecting human resources:

- (w) Scabies is a new phenomenon in the ward Madwaleni.
- (w, m) HIV/Aids: Women mentioned that raised awareness on HIV/Aids has contributed to decreased incidences, in contrast men mentioned that HIV/Aids has intensified.
- (w) Road accidents increased along the main road.
- (w) Changes of malaria were unclear: One participant indicated that the rate of malaria decreased due to reduced water bodies linked to stronger droughts. Another participant identified malaria as a new problem.
- (w) Tuberculosis is increasing in Dema ward.

Affecting natural resources:

- (w, m) Harvest season changed and the amount decreased: It is difficult to harvest anything without irrigation. The harvest season starts earlier around March/April, sometimes even in January because drought is coming earlier and forces them to harvest.
- (w) Quelea birds have increased (occur only in Madwaleni ward) because less people use traditional practices to grow small grains.
- (m) Baboon attacks have increased
- (w, m) Pest attacks on gardens have intensified because of the increased heat and prolonged periods without rains and because of the increased use of chemicals and their resistance.
- (m, w) Frost season has changed: In Dema ward frost season has lengthened from June/July to a period from May until August. In Madwaleni ward frost has shortened to May/June because of decreasing rain.
- (w) Rabies cases have increased.
- (w) Use of inputs is changing. Farmers did not need to buy seeds but as they are suddenly losing everything due to unpredictable weather changes, new inputs are bought.

The main natural hazards identified in the workshops were drought (men = m, women = w), HIV/Aids (w, m), crops pests (w, m) and livestock diseases (m).

Women mentioned more hazards (e.g. malaria, tuberculosis, road accidents etc.) affecting human beings, men more hazards (e.g. frost, pest and diseases etc.) affecting their natural resources (livestock and food supply). Overall, however, the results were largely overlapping. Nevertheless, the observations for long term changes of HIV/Aids and frost by women and men are contradictory, so the trend is unclear.

Generally most of the observed climate changes by the farmers are consistent with scientific assessments on the impacts of climate change in Zimbabwe: e.g. increased occurrence and intensity of drought and changing rainfall patterns. Droughts can be associated with increasing temperature and consequential higher evaporation rates. Predictions of future temperatures rise and decreasing rainfall mean that both droughts and rainfalls will probably become more pronounced in the coming decades. Rising temperatures seems to be under evaluated by the participants. Reasons might be that it is as a slowly increasing risk, and hard to link with drought. Also the observed changes for malaria and tuberculosis cases are likely due to climate change. Finally it should be mentioned that not all mentioned hazards are related to climate change. Some of them are due to human degradation or pollution (e.g. deforestation) or other reasons (e.g. legislation) and some might be impacted indirectly (e.g. attacks of nutrition gardens by wild animals due to intensified drought periods and less feed).

Thus, it is worth considering these risks in future project work to strengthen the adaptive capacities of the population to climate change and reduce its vulnerability to natural and climatic risks.

Impacts and Current Coping Strategies in Matobo (Module 3, Part B and C)

In an exercise on the impacts of hazards and their coping strategies, participants identified the following consequences and strategies.

Risk	Impact	Coping strategies
Drought (w)	<p>Natural resources</p> <ul style="list-style-type: none"> ○ (w, m) Shortage of water ○ (w, m) High livestock mortality ○ (w) Loss of fruit tree productivity, loss of graze for livestock and increased land degradation ○ (m) Loss of indigenous seeds ○ (w) decrease of food availability ○ (w) Income shortages <p>Human resources</p> <ul style="list-style-type: none"> ○ (w, m) Diminished food availability for humans ○ (m) hunger ○ (w) Decreased health and nutrition ○ (m) High incident of diseases ○ (m) Increase of death human beings <p>Social resources</p> <ul style="list-style-type: none"> ○ (w) Loss of social values, lack of respect, increased jealousy ○ (w) Increase domestic violence and conflicts ○ (w) Increased criminality 	<p>Natural resources</p> <ul style="list-style-type: none"> ○ (w) Planting drought tolerant crops ○ (w, m) Conservation farming ○ (w) Shift from crop fields to nutrition gardens ○ (w) Mulching gardens ○ (w) Drying vegetables ○ (w) Store grain/food ○ (w) Eating wild roots and fruits ○ (m) Seed multiplication ○ (m) Contour ridges ○ (m) NGO support for O.P.V and diseases <p>Physical resources</p> <ul style="list-style-type: none"> ○ (m) Dug boreholes/dams <p>Financial resources</p> <ul style="list-style-type: none"> ○ (w) Stealing ○ (w, m) Selling livestock and household properties ○ (m) Diversification of income with e.g. bee keeping; ○ (w) Casual work for money and food ○ (w) Increased commercial sex work ○ (m, w) migration <p>Human resources</p> <ul style="list-style-type: none"> ○ (m) Use of traditional medicine and exotic herbs

Risk	Impact	Coping strategies
HIV/AIDS (w)	Natural resources ○ (m) decreased number of livestock for social obligations Financial resources ○ (w) Lower income Human resources ○ (w) Increased school drop outs ○ (w, m) Disruption of skill and knowledge transfer ○ (m) high death rate ○ (m) lower life expectancy ○ (w, m) Increased number of orphans ○ (m) Increase of handicapped children ○ (w) Impact on development ○ (m) Increasing poverty ○ (w) Less productive because of weaker health	Financial resources ○ (m) selling of assets Human resources ○ (w, m) Awareness raising on HIV prevention ○ (w) Prioritizing orphans on any government and NGO assistance ○ (m) Spreading knowledge on different levels Social resources ○ (w) HIV/AIDS support groups ○ (m) Governmental and NGO support for food and school fees ○ (w) Positive living

Generally, men and women mentioned quiet similar impacts on natural, financial, human and social resources. No impacts on physical resources were mentioned. Nevertheless women mentioned solely impacts on social resources e.g. loss of social values, increase of conflicts petty jealous domestic violence or increased criminality.

Also, men and women mentioned quiet similar adaptation strategies e.g. sell of livestock or household items. However, the strategies named were strongly gender related due to their daily work and duties: Women mentioned adaptation strategies in correlation with their nutrition gardens, while men mentioned adaptation strategies linked to agricultural products and construction work.

Overall, men an woman listed very similar impacts and strategies and none of the answers are contradicting.

Efficiency and sustainability of coping strategies

A discussion in the workshop with men and project staff highlighted the following results for the efficiency and sustainability of the currently used coping strategies:

- Irrigations systems are very effective, but the sustainability in long term is questionable. Most of the farmers are not using the available water efficiently as there are many open water resources with high evapotranspiration or flooding systems instead of targeted irrigation.
- (m) Most of the strategies are short term strategies, so efficient long term strategies are missing.
- (m) Harvesting of rain water would be effective but is not applied yet.
- (m) Most of the activities are depending on rain, so if drought is getting stronger all activities will be endangered.

Farmers in Matobo district employ a wide array of negative and positive coping strategies currently. The strategies are a mix of preventive (e.g. drying vegetables or storing grain for food) and reactive (e.g. selling assets or stealing) measures. Most of them are in short term effective (e.g. selling assets, increased commercial sex work or migration) but not very sustainable in the long-term. And some are in long-term effective and also sustainable (e.g. seed multiplication, conservation farming or awareness rising on HIV prevention). Nevertheless, the population lacks still sufficient long-term adaptation strategies, particularly when considering the worsening climate outlooks. This combination of climate change with a high dependence on water, agriculture and livestock, renders the population highly vulnerable.

4.2 Livelihood Resources and their Vulnerability (Module 4 of CiDR)

This section first presents the most important resources for the local populations' livelihoods. In a second step, the impact of natural hazards and climatic stimuli on those resources are analysed, and in a third step, their importance for the current coping strategies is evaluated. The results of this section were identified by project beneficiaries in the workshops mentioned above.

Identifying Livelihood Resources (Module 4, Part A)

Participants of the two workshops identified the following resources as their most important livelihoods. The categorization into five different types was undertaken during the workshops:

- Natural resources: water (w, m), soil (w, m), trees/forest (w, m), crops (w, m), livestock (w, m), graze for crafting (w), thatching graze for roofs (m), fish (m)
- Physical resources: schools (w, m), clinics (w, m), dams and boreholes (w, m), roads (w, m), irrigation systems (w), business centre (w, m), churches (m)
- Financial resources: selling of livestock (w, m), crops/grains/vegetables (w, m), crafts (w, m), fire wood (w), thatching graze for roofs (w) and honey (m). Additionally casual work (m) and remittances from Diaspora e.g. South Africa (w, m) are part of the income.
- Human resources: knowledge and skills (w, m), good health (w, m),
- Social resources: family (w, m), church group (w, m), project groups (w, m), burial societies (m)

Men and women mentioned mainly the same livelihood resources. However, they were strongly gender related due to their daily work and duties: women mentioned graze for crafting, irrigation systems, fire wood and thatching graze for roofs, while men mentioned fish, honey and casual works, all resources strongly linked to their daily duties and work.

Vulnerability of livelihood resources (Module 4, Part B)

Basically the following resources are affected (at least 5 points in a sum for the risks drought and HIV/Aids for women and men. At least a high impact (=3 points) for the risk pest by women):

- Natural resources: crops (w, m), livestock (w, m), crafts (w), gardens (w)
- Financial resources: selling crops/grains/vegetables (w, m) or livestock (m, w) and fire wood (w). Doing casual works (m).
- Human resources: good health (w, m),
- Social resources: family (w), church groups (w, m), project groups (w,m) and burial societies (m)

First rank had drought (w, m) with the highest impact. Secondly HIV/Aids (w, m) was also rated by both parties. Third rank had pests (w) on crops, only evaluated by women group. Mainly natural (w, m), financial (w, m), and social resources (w, m) are affected by drought. Whereas HIV/Aids affects mainly financial (m), human (w, m) and social resources (w, m), affects pest only crops (w).

Overall, the risks experienced by the people in Matobo district are reinforced by ongoing climate change. Men and women rated mainly the same livelihood resources vulnerable for the different risks. Physical resources have a very low vulnerability as the hazards are not affecting them. Most of the financial resources depend on natural resources. Human and social resources are also quite important resources and highly vulnerable. Therefore adaptation will become ever more important.

A protocol of the stakeholder consultations including more detailed information can be found in the annex to this report.

Importance of livelihood resources for Coping Strategies (Module 4, Part C and D)

The importance of resources for coping strategies was not evaluated in the stakeholder consultations but can be induced from the previous results.

- All *Natural resources* are important for many coping strategies, such as income diversification with nutrition gardens, bee keeping and crop fields, water for irrigation or drinking.
- *Physical resources* were not only once explicitly mentioned to dug boreholes and construct dams. Nevertheless especially clinics, schools and water supply system are important for some strategies. Clinics and pharmacies, for instance, to deal with injured or ill persons e.g. HIV/aids and malaria. Schools are useful to educate people. Water supply systems are important to counter droughts and to protect from water-borne diseases.
- *Financial resources* are also necessary for trade, construction of physical resources, school fees and medicine.
- *Human resources* are needed for almost every coping strategy.
- *Social resources* were especially mentioned for the coping strategies to deal with HIV/Aids. But they are also important to deal with impacts of other hazards, as they facilitate many strategies that are applied in groups.

In short, almost all resources are needed to deal with the impacts of climate change and other risks.

4.3 The Project and Adaptive Capacities (Module 5 of CliDR)

This section analyses the impact of the project on livelihood resources that are considered either heavily affected by natural risks or very important for current coping strategies, in order to evaluate the project's influence on adaptive capacity of its beneficiaries. In the present case, all resources were considered to be relevant. The analysis was conducted in a meeting with project staff of Fambidzanai and HEKS/EPER.

Impact on Activities

Natural resources are strengthened through Fambidzanai's focus on sustainable use of natural resources (e.g. crops, bee keeping, nutrition garden etc.) with sustainable technologies (e.g. mulching, conservation farming, water efficient irrigation, organic farming etc.) and organic inputs (e.g. organic fertilizer and pesticides).

Financial resources are strengthened through diversification of income e.g. bee keeping, goats, crop diversification, O.P.V crops, garden products. Processing of products adds value to the products (e.g. honey of bee keeping or dry vegetables of garden products).

Physical resources are strengthened through constructing A) a resource centre as a local marketing place and exposition of products; B) water infrastructures (e.g. boreholes, water pumps, irrigation systems etc.) or C) fencing of pasture land with wire.

Human resources are strengthened through various trainings and capacity building measures e.g. the use of herbs, livestock management, conservation farming, leadership skills and agro business, sustainable water management, natural pest and disease management, awareness raising for HIV/Aids and gender, constitution of association building etc.

Social resources are benefiting through supporting association building, establishing community gardens, training facilitators for HIV/Aids and gender in each village and fostering gender balance.

Evaluation of the Overall Impact on Adaptation

The analysis shows that all resources are positively affected by Fambidzanai's activities. For some of the activities the environmental balance must be kept in mind to not degrade it, e.g. fostering livestock requests fencing (which is often done with deforested trees) and a balanced graze management. There is, however, a lot of room for further strengthening, especially to take into account the impacts of climate change for implementing activities of Fambidzanai.

4.4 The Project and Mitigation (Module 6 of CliDR)

This section deals with the project's impact on greenhouse gas emissions, and essentially consists of looking at some potential sources or sinks for greenhouse gases (GHG), and

analysing what the project's impact on those sources is. The evaluation is purely qualitative, as no emissions or sink measurements have been conducted. The analysis has been conducted through a meeting with the project staff of Fambidzanai.

The project appears to be influencing the greenhouse gas balance of the zone as follows:

- *Use of Energy:* Indirect positive impacts are reported due to the use of windmills and hand pumps for water irrigation (instead of diesel or electric pumps) and no use of tractors in agriculture. Indirect, because it is not due to an active decision but a question of costs. A motorcycle used by the project officer to visit the farmers emits some CO₂ from gasoline combustion.
- *Agriculture:* Conservation farming, organic farming instead of conventional farming, no use of chemical fertilizer and chemicals, using livestock and compost as manure reduce GHG emissions.
- *Forests:* Promotion of not doing deforestation, of life tree fencing and of permaculture reduces greenhouse gas emission in storing carbon dioxide. The probable deforestation by goats as well as the use of wood to cook meals with open fires emit some CO₂.
- *Livestock:* Herds of cattle's re releasing methane gases and thus increasing GHG emissions. The use of livestock manure instead of chemical manure is reducing GHG emissions.
- *Waste:* The use of compost as organic fertilizer and use of manure of livestock reduces GHG emissions.

The project does not have a large scale impact on the use of energy, biomass, animals, or agriculture. In sum, the project might have a slight negative impact on GHG emissions which is unavoidable but negligible. Yet it is important to take those effects into account, particularly in view of a possible extension of some activities that are beneficial to mitigation, such as reforestation, life tree fencing or graze management measures.

The assessment of project emissions does not reflect the national emission balance with around 61% due to energy, 17% industry and 21% agriculture. The part due to energy seems to be much lower in Matobo district. But the local situation shows as well that there exist mitigation opportunities regarding the improvement of natural carbon sink and that Fambidzanai is already supporting these actively.

4.5 Project Revision (Module 7 of CliDR)

Based on the previous two sections on the project's impact on adaptive capacities and mitigation, this section seeks to identify areas where this impact could be improved by means of project revisions or the design of new activities. The analysis according to the project revision cycle provided in the CliDR is not discussed here, as it has been left to the project managers to decide how to move on regarding new or revised activities.

Suggestions for Improvements Regarding Adaptive Capacities

In spite of the above mentioned positive effects on adaptive capacities, a lot more can be done to render populations more resilient against natural risks. The following list proposes a number of activities which could reinforce those capacities.

Generally the population lack sufficient long-term adaptation strategies and relies strongly on natural resources as well as on governmental or NGO support for e.g. distribution of food and water. Therefore more long-term strategies are essential for sustainable, effective and independent adaptation.

Natural resources

- Natural resources are the main focus of the screened project, yet to render people resilient they need further protection, particularly in the light of ongoing climate change, which is likely to bring more droughts and less rainfall.
- *Diversification of drought resilient crop, fruit and vegetable varieties:* some of the planted vegetables e.g. tomato or fruits e.g. banana need regular irrigation. More drought resilient crop, small grain, fruit and vegetable varieties as well as O.P.V. seed banks could strengthen natural resources and guarantee a minimum yield in long term.
- *Training on grazing management for livestock:* currently, there is no sustainable management of livestock grazing as livestock walks and grazes just everywhere destroying soil, grazing areas and trees. A training to sensitize farmers on the environmental balance and teaching of different grazing systems could strengthen a sustainable grazing management for goats and cattle's.
- *Applying efficient water irrigation methods:* several farmers are applying inefficient methods for irrigation e.g. flooding of fields, no conservation farming or not mulching their fields. Measures to improve the efficient water use could be recycling plastic bottles or clay pots to irrigate, rain water harvesting from roofs and further trainings on efficient irrigation methods (e.g. mulching, conservation farming, time of irrigation etc.).
- *Exchange on different pest and disease managements:* A strategic collection of different pest and disease management strategies could be published as a manual in local language to foster the exchange and application of sustainable adaptation strategies.
- *Cropping pattern adjustment using climate information:* Ensure Exchange with extension information services to receive up-to-date information about rainfall patterns in the forthcoming season. Support farmers to take well-informed decisions on their planting dates and adjust cropping patterns, e.g. timing of planting and harvesting

Financial resources

- Financial resources are strongly affected because they depend almost entirely on natural resources.
- *Fostering balanced gender responsibility for income and expenditures:* Currently, the daily roles and responsibilities of the farmers are quiet gender related. Trainings to sensitize farmers on gender based roles and responsibilities for income and expenditures could foster a balanced responsibility.
- *Promoting additional value of livestock to diversify income:* Currently livestock is seen as a saving opportunity and only sold in extreme situation; even milk of goats or cattle's is not used or further processed. Thus the benefit of income diversification is suboptimal and endangers the degradation of environment. Therefore measures as promoting to process milk products, linkages to national markets as well as sensitize for equilibrium between environment and human beings could improve the situation.

Physical resources

- Measure to improve could be the installation of more water pumps (e.g. solar pumps or small wind mills) and promotion of efficient irrigation systems e.g. siphon systems close to a dam.

Human resources

- Human resources are strengthened with some of the trainings measures mentioned above e.g. efficient water irrigation, processing of milk products, grazing management etc.
- Additionally, measures to strengthen human resources could be A) on going reinforcement of farmer association for lobbying B) raise awareness on impacts of climate change as well as to promote adaptation and mitigation strategies C) raise awareness for climate change campaigns D) raise awareness on HIV/Aids to decrease affected population to ensure a better knowledge transfer E) reinforce use of organic fertilizers and clarify impacts of chemical fertilizer on health and ecosystem and F) teach traditional treatments for malaria, cholera and water borne diseases.

Social resources

- Social resources need probably less strengthening, as Fambidzanai is already supporting this and the population seems to have established a number of good self-help mechanisms. Still, some strengthening might be required when implementing some of the measures mentioned above, especially to harmonise the practices between the implementing organisations in Matobo district, e.g. so that AREX officers and other institutions do not promote chemical fertilizers.

Gender aspects are already strongly considered in the project and women are well integrated. The analysis showed that women place more emphasis on social issues. How this translates into differences in vulnerabilities is, however, not clear from this report.

Note that measures should as far as possible build on existing local coping strategies, as the population seems to be quite proactive concerning such measures.

Also note that these suggestions can be used for advocacy work. The government can be asked to offer some of the services, as it has a duty to protect its citizens from the effects of climate change and other risks.

Finally, an up scaling of Fambidzanai's services to further farmers would have significant adaptation benefits in general.

Suggestions for Improvements Regarding Mitigation

The reduction of greenhouse gas emissions or the improvement of sinks is not the primary concern of the framers, as they are only minor emitters of greenhouse gases. Yet it is still worth considering emissions reducing or sinks improving measures. Mitigation and adaptation measures often have high synergies as e.g. reforestation does not only serve as a carbon sink but also as a coping strategy against soil erosion and quality.

Some minor mitigation improvements in the project activities of Fambidzanai could include

- *Promoting energy efficient cooking stoves:* The current use of open fires could be improved with energy efficient cooking stoves. This would reduce the use of fire wood and CO2 emission and enhance carbon sinks.
- *Supporting reforestation and avoiding deforestation:* The promotion of agro forestry in nutrition gardens, of life tree fencing or of reforestation of fast growing trees to serve as fire wood could preserve and enhance carbon sinks.
- *Training on grazing management for livestock:* A training to sensitize farmers on the environmental balance and teaching of different grazing systems could strengthen a sustainable grazing management for goats and cattle's and preserves soil quality as well as carbon sinks.

4.6 Conclusions

The analysis of a project run by Fambidzanai in the district Matobo in the Zimbabwe showed that the population is highly vulnerable to a number of risks, the most important being drought, HIV/Aids, pest, diseases and changing rainfall patterns. Except HIV/Aids, all risks can to varying extents be associated with climate change, most prominently the increased frequency and intensity of droughts.

The local population has a number of positive or negative coping strategies, yet considering their heavy dependence on natural resources, they lack sufficient adaptive capacities and especially long-term strategies. The project's activities undoubtedly strengthen those capacities, yet further measures are needed, particularly considering the on-going climate change, which will tend to increase existing risks and bring up risks that were less important so far, such as droughts, changing rainfall patterns or frost. Further measures should improve the protection and boost natural resources e.g. climate change resistant crop varieties, improve and diversify financial resources, and protect human health, among other things. Especially the aspect of a balanced living of human beings with the highly vulnerable environment should be considered while promoting livestock or nutrition gardens with irrigation. Thus, promotion for these additional income sources should be linked with awareness rising to strengthen it further.

Mitigation activities aiming at reforestation, avoiding deforestation and sustainable grazing management of livestock would have strong synergies on adaptation. Also, energy efficient cooking stoves could further reduce GHG emissions.

Finally, an up scaling of Fambidzanai's services to further farmer families would have significant adaptation benefits in general.

The analysis of climate risks, vulnerability and adaptive capacities in the district Matobo in the Zimbabwe shows that natural hazards can and must be confronted. Climate Change will increase risks, but if intelligent and locally adapted measures are taken to make the population more resilient, their impact can be lessened.

5 Lessons Learned from the Application of the Tool

The climate change analysis presented in this report is the sixth one conducted with the HEKS and Bread for All “Participatory Tool on Climate and Disaster Risks”. Besides evaluating a specific project, the application of the tool also aimed at testing and improving it. The following lessons were drawn:

- The experience in the sixth country worldwide and in the third one on the African continent confirms the suitability of the tool in very different environments.
- The applied concept of using one day for project visit, two days for workshops with farmers and one final day for the presentation of results and project revision was appropriate.
- In particular, it was helpful to have an entire day for the consultations with each group of beneficiaries, namely men and women. This allows people to discuss answers with less stress, and helps them to voice their opinions. This strengthens not only the results of the analysis, but also the self-learning process among participants. The exercises hazard maps, seasonal calendars, vulnerability matrix as well as impact/cooping strategies was very productive and supported the output of the project analysis. Nevertheless, the amount of exercises with farmers was overloaded. Based on a longer collection of information than expected, the discussion with farmers needed to be shortened.
- A challenge was to make the different exercises with farmers living in a completely different culture and mindset than the climate change expert. It could be helpful to adapt the exercises to different cultures.
- The workshop participants were very interested in learning and understanding climate change. The challenge is to collect information of farmers and at the same time giving a feedback. Also the way forward after the workshop and which aspects Fambidzanai will take up in their future project work need to be considered. Thus, another workshop implemented by Fambidzanai with farmers was proposed to give an appropriate feedback to them. Another solution could be to strengthen the project analysis up to five days and have a communal workshop on the fifth day with project staff and beneficiaries.
- The integration and participation of local project staff could be improved. Instead of listening to the workshop, a short introduction into the tool beforehand could allow to get them on board. Thus engaging them as moderator for exercises with farmers while the climate change expert could influence and support them. This option assumes that project staff is familiar with some of the participatory exercises as hazard maps.
- The concept of two separate workshops for men and women works well. Once again the results were strongly overlapping between genders but not equal. Thus it should be pursued in other assessments if possible.
- Coordinators were very happy with the process, too, and looked at it as capacity building for themselves. They thought it will help them to stimulate future project developments. Some of the suggested improvements to enhance mitigation and adaptation capacities were already taken up in a project proposal supported by the climate fund of Bread for all and Swiss Catholic Lenten Fund.

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V. Annex: Minutes from Workshop in Mapisha, Matobo District

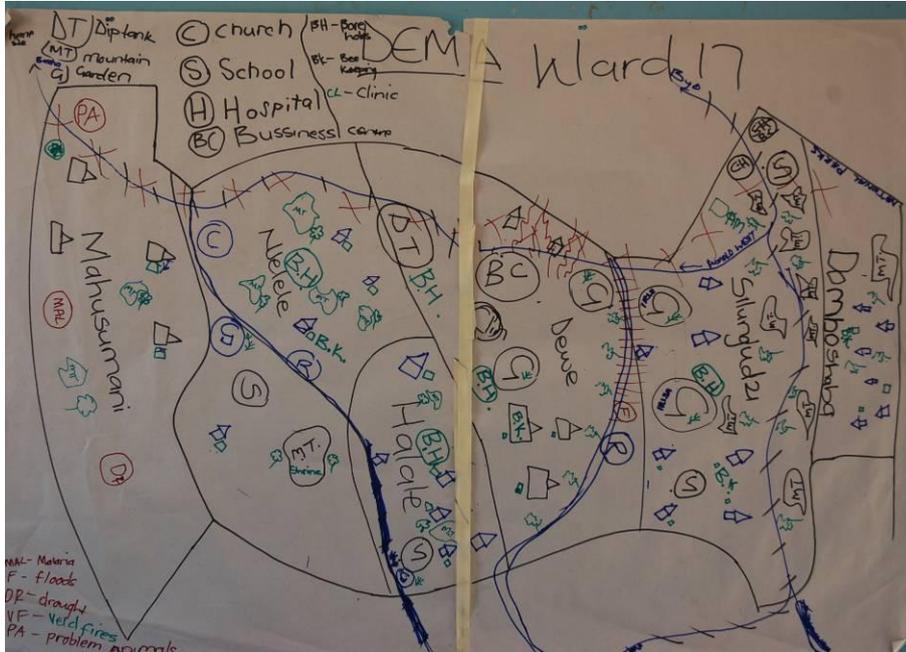
Day 2, October 2, 2010, Women's group

Participants of workshop:



There participated 11 farmers of the two wards Dema (17) and Madwaleni (14) :

Exercise 1: Hazard Map



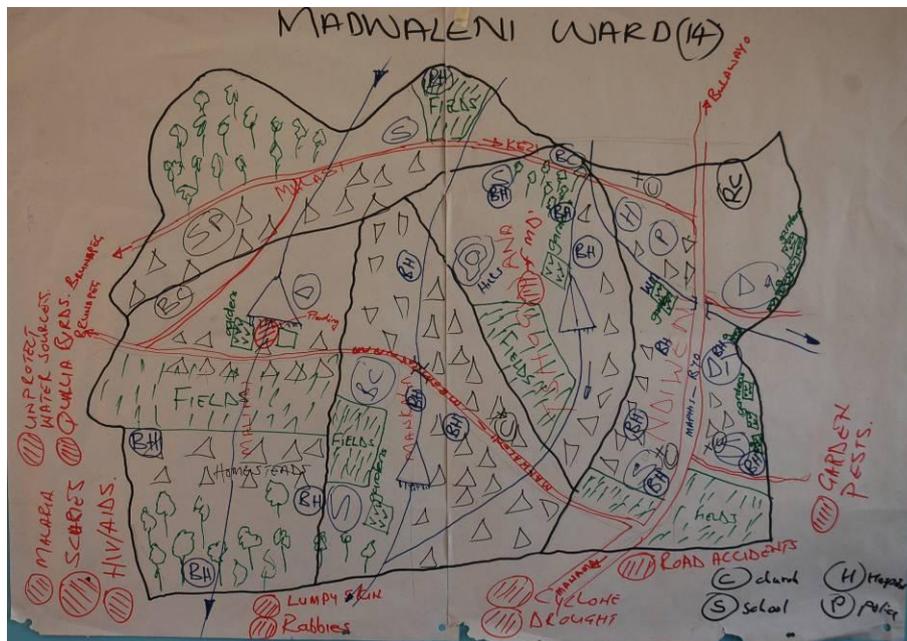
Map of Dema ward in Matobo district

Notes:

- North of Dema ward is the national Matobo park

Hazards in Dema ward:

- Wild fires and wild animals (baboons, rhinos, elephants and snakes) destroy every year nutrition gardens, coming from the northern national park.
- Drought occurs all over the ward
- Tuberculosis is a bacillus and caused by bad hygienic conditions.
- Malaria is only in the village Mahusumani because of swampy areas,
- Floods occur in the villages Silungudzi and Dewe next to the river Ovi.



Map of Madwaleni ward

Notes for Madwaleni ward:

- Madwaleni ward has boreholes in every village but not all are functioning; two rivers with three dams (two are functioning and one not); and two dip tanks at Malindi gardens in Ndiweni, Malindi and Mankara village
- The arable land and grazing areas are close to their homes

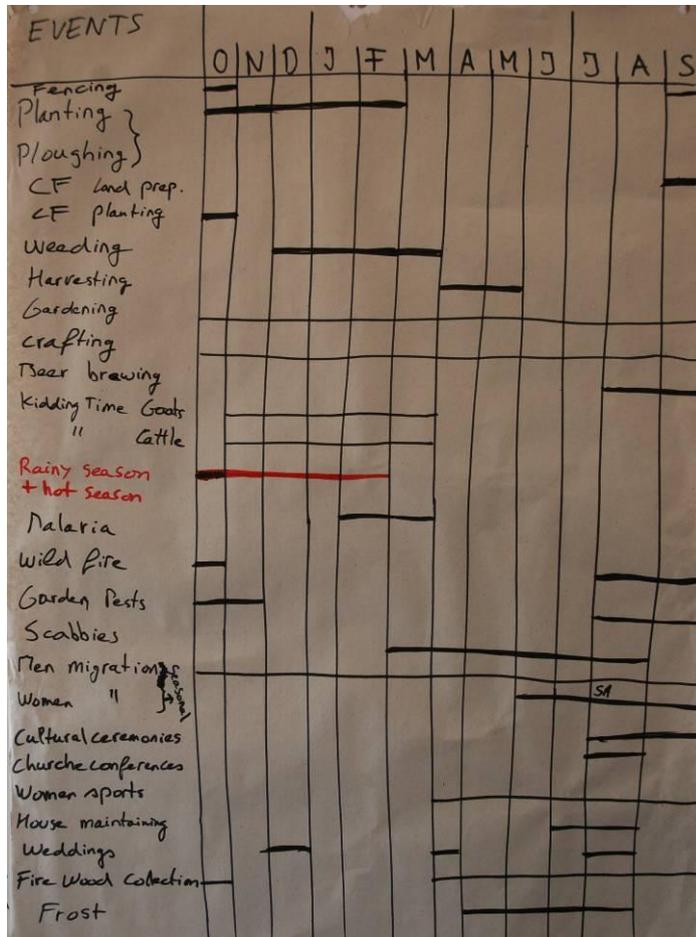
Hazards in Madwaleni ward:

- Scabies are caused by bad hygienic conditions and water quality and affect especially children.
- Tuberculosis is a bacillus and caused by bad hygienic conditions
- Malaria
- Dysfunctional dam causes drowning of children.
- Pests attack the nutrition gardens.
- Drought affects the whole ward.
- Lumpy skin disease affects cattle's especially during rainy season.
- Rabies affects cattles and dogs.
- HIV/AIDS affect the whole ward.
- Unprotected water sources are used due to not functioning boreholes and intensify water borne diseases.
- Quelea birds attack crop.
- Road accidents caused by pedestrians and animals
- Cyclones affected homesteads but are rare.

Changes of hazards over the last 10 years in frequency and/or intensity for both wards:

- Incidence of malaria decreased because due to less water bodies as drought is getting stronger.
- Drought is now occurring every year.
- Start of raining season gets unpredictable. Sometimes it comes early and sometimes late making it difficult to plan for the farmers
- Better awareness on HIV/AIDS led to decreased incidences.
- Quilla birds, occurring only in Madwaleni ward, increased because less people use traditional practices e.g. grow of small grains.
- Pest attacks on nutrition gardens intensified due to stronger heat and prolonged periods without rains.
- Changes for the lumpy skin are unknown.
- Rabies cases increased.
- Road accidents increased along the main road.
- Floods occurred only 2010 and are generally decreasing.
- Tuberculosis is increasing in Dema ward.

Exercise 2: Seasonal Calendar



Notes:

- Planting depends on start of rainy season for conservative and conventional farming
- Women migrate between June to September to visit their husbands in South Africa. They are coming back for the planting season.
- Men migrate the whole year around.

Seasonal changes in the last 10 years:

- Rainy season is getting shorter and occurs now from November to January instead of starting in October. And the start of rainy season is getting unpredictable and leads to unpredictable planting season too.
- The hot season prolonged.
- Frost season is now from May to August: In Dema ward frost has increased from June/July to a period from May to August. In Madwaleni ward frost has decreased to May/June because of the decreasing rain.
- The Harvest season changed and the amount decreased. It is difficult to harvest anything without irrigation. The harvest time is now earlier around March/April, sometimes even already in January because the drought is coming earlier and they are forced to harvest.
- Malaria is a new problem. Malaria is transferred from one place to another via transport.
- Scabies is a new phenomenon in the ward Madwaleni. It is not seasonal, it is all the year around explains another participant.

Exercise 4: Vulnerability Matrix

LIVELIHOODS	DROUGHT	HIV/AIDS	PEST
Water	3	0	0
Soil	3	0	0
Trees /Forest	3	0	1
Crops/Gardens	3	2	3
Live stock	3	2	0
Crafts(grass etc.)	3	2	0
Schools	1	2	0
Hospitals	1	2	0
Behol/Dam	2	1	0
Roads	2	2	0
Irrigation system	1	1	0
Business centers	2	1	1
Caws/Livestock	3	2	0
Crops (grain/vegetable)	3	2	0
Crafts	3	1	0
Fire wood	3	2	0
Grass f. roofs	3	2	0
remittances SA	0	2	0
knowledge (agri/for)	1	2	0
skills	1	2	0
health	3	3	0
Family	3	3	0
Church groups	3	3	0
Project groups	3	3	0

0 = no impact
 1 = low impact
 2 = medium impact
 3 = high impact

Notes

- HIV/Aids impacts all livelihood resources. If family members are affected, the burden of the rest of the family increases. The affected family member can only work irregularly and needs support in its life. In urgent cases livestock needs to be sold to get medical treatment and buy food for the affected family member.
- HIV/Aids impacts physical resources because the affected person can not construct buildings.
- Drought impacts physical resources thus to water shortages and a lack to construct buildings work.

Results

- Drought is the hazard with the highest impact on farmer's livelihoods. HIV/AIDS is second and Pest third.
- The following resources are affected (at least 5 points in a sum for the risks drought and HIV/Aids and at least a high impact (=3 points) for the risk pest):
 - Natural resources: gardens/crops, livestock, crafts (graze),
 - Financial resources: selling of livestock, crops and vegetables and fire wood
 - Human resources: health
 - Social resources: family, church groups and social groups
- The most vulnerable resources are natural, financial and social resources.

Exercise 5: Risks, Impacts and Coping Strategies

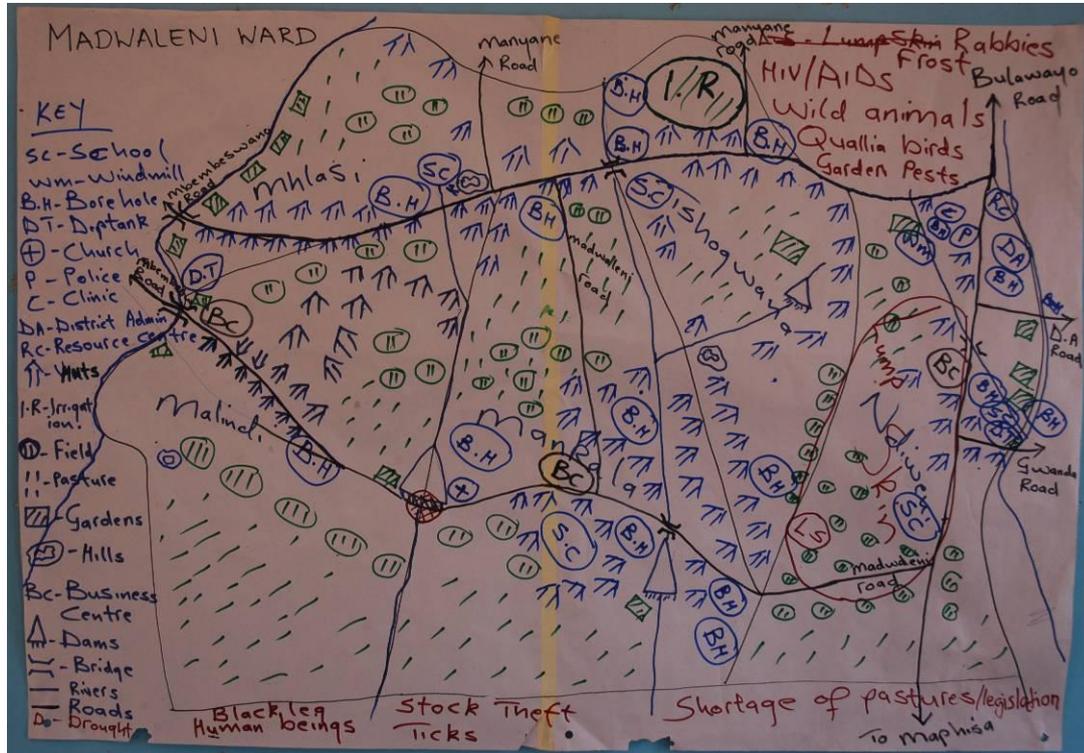
RISK	IMPACTS	COPING STRATEGIES
DROUGHT	<ul style="list-style-type: none"> • shortage of water • food availability decreases • high livestock mortality • decreased health & nutrition • increased criminality • lack of respect • loss of social values • decrease of income • increased ^{domestic} violence & conflicts • increased jealousy • loss of fruit tree productivity 	<ul style="list-style-type: none"> • increasing prostitution • dep criminalities • eating wild roots & fruits • migration • selling livestock • " household properties • casual work for food/money • planting draught-resistant grains • conservation farming • shift from crop to garden work • mulching • drying red vegetables • food/grain storage
HIV/AIDS	<ul style="list-style-type: none"> • loss of grass f. livestock trees • less productive (health) & income • increasing number of orphans • disruption of knowledge transfer • increased school dropouts • impact on development 	<ul style="list-style-type: none"> • awareness raising • prioritising orphans on gov. and NGO assitant programs • HIV/AIDS sting support groups • positive leaving living

Day 3, October 3, Men's group

Participants of Workshop:



Madwaleni ward



Notes:

- Madwaleni has 16 boreholes, two tip tanks, three dams, five rivers and one windmill to pump up groundwater
- Buildings: district administration, business center
- Resources: nutrition gardens, fields, pasture land

Hazards:

- Frost attacks nutrition gardens
- Wild animals affect the whole wards
- Quallia birds eat field crops
- Pests attack the nutrition gardens.
- HIV/Aids
- Lump skin affects Ndiweni village
- One Dam is over flooding and sweeps away animals
- Drought affects the whole ward
- Black leg affects cattle in the whole ward
- Stock theft
- Ticks affect the goats and cattle's
- Rabies affect dogs and cattle's
- Cutting trees or deforestation by human beings
- Soil erosion
- Degradation and pollution of environment
- Because of a legislation they have a shortage of pasture in their ward

Observed disaster or climate changes in the last 10 year:

- Drought is now occurring every year.
- Raining season is getting unpredictable.
- HIV/Aids has intensified.
- Baboon attacks have increased
- Pest attacks on gardens have intensified because of the increased use of chemicals and the rising resistance.
- (m) Frost season has changed and attacked tomatoes this year.

Exercise 2: Seasonal Calendar



Observed changes in season over the last 10 years:

- Start of rainy season is getting unpredictable. Thus the period for land preparation and planting is unstable, sometimes they already start to prepare their land in June (earlier than usual).
- Regularity of rainfall during rainy season is unstable. Therefore sometimes the farmers start to prepare their fields and it dries again, the plants are dying. So they need to restart everything.
- Harvest season changed from April to May or sometimes even late June. Of course this is due to the changing end of rainy season and its unpredictability.
- Use of inputs is changing. It did not use to be necessary to buy seeds. But as farmers are suddenly losing everything due to changing season, they need to buy new inputs. Sometimes were are also advised to buy GMO seeds

Probably endangered activities in future:

- Start of rainy season already changed and will continue to change. Thus if there are not projects and no other support, they might need to migrate.
- Currently trees are cut for fencing. But if drought intensifies, people will need to cut more trees to earn some income from selling fire wood.
- Most of the activities are depending on rain, so if drought is getting stronger all activities will be endangered.

Exercise 3: Vulnerability Matrix

LIVELIHOODS	Drought	HIV/Aids ↳ human beings	Pest/→ Diseases ↳ Crop /Livestock ↳ Cattle	
Water	3	0		3
Trees	2	0		2
Thatching grass	2	0		2
fish	3	0		3
soil/crops	2	0		2
livestock	3	0		3
crops		2		2
Schools	1	2		3
Clinics	1	2		3
Dams/Boreholes	1	2		3
Roads	1	2		3
Business Centers	1	2		3
Churches	1	2		3
Selling garden products	3	2		5
Sell honey	2	2		4
Sell Chicken/livestock	3	2		5
casual work	2	3		5
sell crafts	1	2		3
remittances	0	2		2
knowledge & skills	0	3		3
good health	2	3		5
family	2	2		4
project groups	3	2		5
church groups	1	2		3
burial societies	3	3		6

0 = no impact
 1 = low impact
 2 = medium impact
 3 = high impact

Discussion during the scoring:

- HIV/Aids impacts natural resources. If family members are affected, the burden of the rest of the family increases. The affected family member can only work irregularly or even do no work, it also needs support. In urgent cases livestock needs to be sold to get medical treatment and buy food for the affected family member.

- Drought impacts physical resource construction because human beings

are hungry and not able to do construction work. It impacts as well financial resources as livestock gets thinner and the price of it is decreasing.

Results

- Drought is the hazard with the highest impact on farmer's livelihoods. HIV/AIDS is second and Pest third.
- The following resources are affected (at least 5 points in a sum for the risks drought and HIV/Aids):
 - Natural resources: crops, livestock
 - Financial resources: selling garden products, selling livestock, casual work
 - Human resources: health
 - Social resources: project groups and burial societies
- The most vulnerable resources are natural, financial and social resources.

Exercise 4: Risks, Impacts and Coping Strategies

RISK	IMPACTS	COPING STRATEGIES
DROUGHT	<ul style="list-style-type: none"> • increased livestock mortality • hunger • water scarcity • increase of dying human beings • high incident of diseases • low productivity in nutrition gardens • loss of indigenous seeds 	<ul style="list-style-type: none"> • selling assets • dug boreholes/dams • bee-keeping/diversification of income • migration • NGO support for O.P.V & diseases • use of traditional medicine & exotic herbs • Conservation farming • seed multiplication • contour & ridges
HIV/AIDS	<ul style="list-style-type: none"> • increasing orphans • increase of handicapped children • loss of knowledge & skills • increasing poverty • high death rates • lower life expectancy • decreased number of livestock for social obligations 	<ul style="list-style-type: none"> • selling of assets • awareness raising on HIV prevention • gov & NGO support (food, school fees) • spreading knowledge on different levels

Efficiency and sustainability of coping strategies as well as necessary improvements:

- Most of the strategies are short term strategies, so efficient long term strategies are missing.
- Harvesting of rain water would be effective but is not applied yet.