

Focus on Climate Change – Zimbabwe

April 2013

Introduction

The Republic of Zimbabwe is a country in Southern Africa. About 70% of the Zimbabwe population lives in rural areas where they exploit natural resources including water bodies for food, fuel and other basic needs. Such exploitation leads to environmental degradation and loss of biodiversity.

The national development priorities focus on: the reduction of extreme poverty through improved agricultural production and productivity; food and nutrition security at household levels; increased environmental awareness and sustainable use and management of natural resources; and improved rural livelihoods. The UNDP Zimbabwe country office is working with the government of Zimbabwe and other partners to address climate change.

Coping with Drought and Climate Change pilot project in Chiredzi District, Zimbabwe

The sustainability of the socio-economic development in Zimbabwe is perceived to be threatened by the consequences of climate change and variability. Already, persistent droughts, deforestation and biodiversity loss have negatively impacted the agriculture sector in areas like Chiredzi, where 70% of the population lives off the land. In this area the

majority of the population practice rain fed agriculture and keep livestock.

The “Coping with drought and climate change pilot project” is a five year (2008 - 2012) initiative implemented in Chiredzi District, Zimbabwe and funded by the Global Environment Fund (GEF) Special Climate Change Fund. The project is implemented by the Environment Management Agency (EMA) of the Government of Zimbabwe, in collaboration with UNDP. The primary goal of the project is to enhance the capacity for adaptation to climate change amongst Chiredzi residents. A range of long-term adaptation measures in the agricultural sector were developed and implemented across the district with the aim of reducing vulnerability of small holder farmers and pastoralists in Chiredzi. The project implemented the following activities:

1. Dissemination of information to expand the knowledge base for climate change adaptation;
2. Establishment of climate early warning systems;
3. Introduction of new irrigation projects and alternative livelihoods initiatives to reduce dependence on rain fed agriculture ; and
4. Implementation of six pilot projects on sustainable livelihood activities
 - i. Installation of eight village level agro-meteorological observation stations.

- ii. Optimizing rain-fed crop production through introduction of drought tolerant crops, improved seed varieties and soil moisture conservation.
- iii. Introducing aquaculture as an alternative livelihood activity.
- iv. Optimizing livestock production by promoting utilization and conservation of locally available feed sources.
- v. Captive crocodile breeding as a source of livelihood.
- vi. Promoting natural resources management as a climate change adaptive strategy.



Cassava is one of the drought tolerant crops

During stakeholder consultations, community leaders were implored to ensure women’s participation. Likewise, during focus group discussions, participatory risk assessment, and identification and ranking of adaptive strategies, men and women were separated. The outcomes of these processes clearly showed differences in needs and priorities across the two groups. For example, women prioritized enhancing productivity of rain-fed crop production for adaptive strategies, whereas men supported bigger projects such as irrigation, livestock, and rural electrification. By

getting women to participate in problem analysis and selection of adaptive strategies, women focused on practical and feasible activities which stand a good chance of succeeding in the given context.

Results

This project has achieved many positive results. A summary of achievements includes:

1. Crop yields improved by more than 100% for drought conditions because of project interventions such as drought tolerant crops (e.g. cassava and sorghum), improved seed varieties and soil moisture conservation.
2. Livelihood activities such as fish and crocodile farming have been implemented for the benefit of about 300 households.
3. A group of 28 farmers made up of 19 men and 9 women were trained in breeding, financial management, and marketing of captive crocodiles.
4. 120 households have embarked on natural resource management as a source of income and 58 households have been introduced to aquaculture as an alternative livelihood activity.
5. A 100% increase in access to climate information was achieved through improved information dissemination by the project and the agricultural extension workers in the pilot sites.
6. There was no livestock mortality during the drought of the 2009-2011 seasons.
7. Eleven agricultural extension workers and two agronomists from pilot sites were trained in interpretation and use of seasonal climate forecast products.
8. The project has excelled in terms of generating a wealth of knowledge

products in the form of reports and publications with the participation of local institutions in the pilot district.

9. The project is working with extension workers and farmers to build a village level climate information system to support crop and livestock decision making.
10. 78 households have been supported to establish a 5 hectare small scale partially irrigated garden to grow cassava, mangoes and a range of vegetables as an adaptive strategy.



Farmers in Tamuwanyika tend their mango plants

The participation of women also helped the project to focus on strategic issues that highlight household vulnerability to impacts of climate variability and change, such as limited access to knowledge, technology, and climate information as well as poor agronomic practices. For these reasons, the pilot projects that were suggested by women were prioritized and also ensured women's participation in captive wildlife breeding, aquaculture, and natural resource management activities. The initial needs assessment was crucial in determining the gender-sensitive adaptation approaches that the project implemented.

1. The initial needs assessment created a crucial entry-point for gender mainstreaming within this climate change adaptation project.
2. Gender-sensitive and gender segregated focus group discussions, participatory risk assessments, and identification and ranking of adaptive strategies showed the different vulnerabilities, needs, and capacities of men and women in regard to climate change adaptation and drought resilience.
3. Preference was given to those projects that were prioritized by women.
4. Community education and awareness programmes on climate risk management were tailored for women.
5. Involving women in training on natural resources management ensured that knowledge on the value of natural capital was shared equally between men and women in the pilot sites.
6. Women farmers were empowered because as they could choose agricultural adaptation techniques and options based on their own needs.
7. Nine women were trained in breeding, financial management, and marketing of captive crocodile.

Sustainability

Sustainability of the project is something that is catered for institutionally. The Project Steering Committee is co-chaired by the Ministry of Environment and Natural Resources Management through EMA and UNDP. The committee comprises of the project manager and representatives from: UNDP, government ministries (Finance, Agriculture, Water and Irrigation Development, National Parks and Wildlife Authority, Zimbabwe National Water

Authority, Meteorological Services), local government, and NGOs (CAMPFIRE, SAFIRE, GEF-SGP, and Practical Action). The Project Steering Committee provided policy guidance, reviewed and approved work plans and assisted in mainstreaming climate change risks into key economic sectors. The project partnered with NGOs and government departments to raise awareness among local communities, particularly women and children, through advocacy, information kits, educational materials, training workshops and in-depth analysis of drought risks and impacts on socio-economic development.



Village level monitoring project site in Tamuwanyika

One of the principal challenges to gender mainstreaming and sustainability was the low level of literacy among women due to cultural beliefs in most areas of the project that limit women to basic primary education. To overcome this challenge and enhance sustainability, the project adopted the Farmer Field Schools model of training, which is a group extension method in which all learning is done in the field, where farmers “learn by doing”.

The following is a description of five out of the six pilot projects under the coping with drought and climate change project.

Enhancing village level monitoring and use of climate information

Small scale farmers in Chiredzi district have previously faced recurrent food insecurity caused by low and erratic rainfall. In addition, they lacked capacity on timing the planting periods for different kinds of crops and using conservation technologies like soil moisture conservation. One of the areas of intervention identified by the Climate Change pilot project was through weather monitoring and use of climate information to guide decision making by farmers. Consequently, this information helped farmers capture opportunities presented by favorable rainfall seasons and minimized the impacts of adverse climatic conditions.

The project installed weather stations in strategic areas around the district with the following objectives:

- To provide hands-on experience in weather data recording and analysis to extension workers and the farming communities in Chiredzi district;
- To improve the understanding of local climate through local data collection and interpretation;
- To train and equip a few members of the community to eventually become champion “Climate Risk Managers;” and
- To plan climate or weather based agricultural activities using appropriate data, consequently enhancing adaptability by the small scale farmers.

Chikombezi in Ward 11, of Chiredzi district is one of the areas that gets the lowest rainfall in Zimbabwe (less than 450 mm per annum). In this ward 23 farmers have committed to improving crop production by using climate information. Farmers are slowly adopting

drought resistant crops like cowpeas, pearl millet, sorghum, and cassava. They have been recording climate data using the equipment at the weather station and have since depended on weather data to inform decisions about proper timing of agronomic decisions during the planting season. Extension workers are also now able to monitor the weather and learn about prevailing global weather using solar powered laptops provided by the project.

- The farmers would like to take part in study visits to other countries where climate change adaptation strategies have worked. This will enhance knowledge sharing and replication of sustainable practices.



Weather monitoring site in Ward 11

The farmers have seen an increase in pearl millet yields (from 0.6 to 1.2 t/ha) and this has improved the food security of their households. While there is great potential in Chikombezi, the farmers have identified the following areas where they require further assistance:

- The farmers are interested in large scale farming and there is plenty of land in Chiredzi. However, only mechanization of farming operations can unlock the apparent potential.
- There are no ready markets for their produce. The most common system of trade is barter trade. They would like to be able to sell the surplus so as to be able to purchase other household goods.

Optimizing crop mixes and varieties as a climate change adaptation strategy in Chiredzi District

Small-holder farmers comprising 90 men and 35 women from 4 wards in the district were engaged in focus group discussions from 29 May to 1 June 2009 to identify priority adaptation measures. Enhancing crop diversity and local availability of drought tolerant seed varieties was identified by the farmers as one of the priority adaptation measures for the arid to semi-arid lands in Chiredzi district. The project sought to demonstrate the following policy oriented long-term climate change adaptation measures:

- Optimizing local food crops by increasing the range of drought tolerant crops grown.
- Developing capacity for selection, local multiplication, conservation and introduction of new crop varieties as a climate change adaptation technique.
- Improving soil and nutrient management.
- Encouraging the use of local seeds for adaptation.



Sorghum harvest

Mean yields for the 1990 – 2000 period for Chiredzi were at maize: 0.55t/ha; sorghum: 0.52t/ha; millet: 0.60t/ha; cotton: 0.41t/ha; sunflower 0.31 t/ha; and groundnuts: (0.28t/ha. Table 1 shows the average yield performance of improved maize, sorghum and pearl millet varieties among the six lead farmers during the pilot project demonstration period of 2009/10 to 2011/12. Rainfall received during the same seasons is also shown.

Year	Rainfall mm	Maize t/ha	Sorghum t/ha	Pearl Millet t/ha
Baseline	363	0.55	0.52	0.60
World avg		2.8	1.8	0.73
2009/10	447	0.3	0.55	1.05
2010/11	468	0.65	1.15	1.2
2011/12	242	0	0.4	0.75

The project introduced new crop varieties of sorghum, pearl millet, open pollinated maize, cowpeas, groundnuts and cassava that are drought resistant. It also increased the capacity of local farmers to select, conserve, produce, store and market drought tolerant sorghum, pearl millet and open pollinated maize varieties. Another area of intervention was to strengthen public and private sector institutional linkages with farmers in pilot sites for continued technical/ extension support and market access to improve sustainability of project outputs.



Maize crop under cultivation

Gezani Mashopani, a 52 year old father of nine, has been practicing moisture conservation techniques in his farm for 3 years. He is also a “mother farmer” in practicing sustainable agriculture. As a mother, he mentors four other farmer “children” who visit his farm to learn and then replicate what they learn in their own farms. Through the integration of the new farming methods, there has been increase in crop yields in his farm. Initially he harvested 0.5 tons of sorghum from 1 hectare but in 2011 his harvest was 2 tons from the same piece of land. The food is used to feed his family, but he also sells the surplus to buy household commodities.

In 2011 he sold 27 bags of red sorghum at US\$ 15 per bag. He also started growing pearl millet because it takes 60 days to mature, which is short growth period compared to other crops. He harvested 12 bags from 1 hectare which he intends to sell as seed to other farmers. He attributes his success to knowledge about soil moisture conservation and knowing which crops are suitable for his farm. He has also gained better understanding of the rainfall patterns. He has faced challenges such as: lack of good equipment/machinery, and poor markets for his produce.

Mama Musa Baloi is a 40 year old widow and mother of 2. She grows maize, sorghum and groundnuts. “Before the project started, we

were growing mostly red sorghum. The project introduced white sorghum that matures more quickly.” She said. White sorghum is an improved variety that has a higher yield than red sorghum. In 2011, she harvested 1 ton of white sorghum per hectare.

Another farmer, Mama Mhlaba Matsilele was born in 1947 and is a mother of 6 children. She also had a bountiful white sorghum harvest in 2011. “I can exchange my sorghum for goats, chicken and other household products.” She said. Other crops that have done well in the region include groundnuts and butternuts. She attributes the increase in yields to the tillage practices such as soil moisture conservation methods they have adopted.



Mama Matsilele displays her white sorghum

Harriet Mapanda, a 51 year old mother of six, attributes the good harvest to the quality of the seeds. She planted improved seed varieties (maize) and from 1 hectare she got 2 tons of produce. She also has a kitchen garden that is an income generating project. From the garden, she gets US\$ 30 per week from the sale of tomatoes. Her greatest challenge is lack of machinery and proper farming equipment.

Tamuwanyika community small scale irrigation

The project was started in 2009 by 78 farmers after persistent crop failure from their rain fed agriculture. They acquired support from the Pilot Climate Change project to fence a 5 hectare piece of land, rehabilitate a borehole and old well for irrigation purposes. The project also assisted the farmers to acquire and plant 1500 mango seedlings in one hectare and cassava cuttings in another one hectare. They also planted vegetables such as spinach, sweet cabbage, onions, and tomatoes for household use. Each household owns 15 mango trees and is allocated a portion to grow their vegetables. Some of the produce is sold and each household contributes a small fee to a common fund. In November 2012, the group had US\$ 300 in savings.

Nengi Nyuni, a 42 year old mother of five is very happy with the project. “Fencing this farm made it possible for us to have vegetables for household use. Before the land was fenced, our vegetables were destroyed by goats” She said. The youth have also been able to be proactively engaged with the project.

Another member of the group, Margaret Mupunduri, a 30 year mother of five had this to say: “I am grateful to this project because I never knew we could grow mangoes in this area. Now that I can see fruits on the trees, I am assured of a harvest.”

Capture fisheries pilot project

The fish project is envisioned to benefit about 600 households around Masukwe dam through additional protein and income from fish production and sustainable utilization of the water resource. Fish breeding experts and potential project beneficiaries were consulted in August 2010 to identify priority long-term climate change adaptation measures for the area using their own knowledge base and lessons from past interventions. Natural resources management and expanding community benefits from ecosystem services and revenue were identified by stakeholders as the priority adaptation options. The main objective of this project was to provide alternative livelihood options.



Fishing demonstration at Masukwe dam

The Masukwe Dam fishing project is modeled around the CAMPFIRE incentive-based conservation philosophy that links conservation of natural resources with rural development and improved rural livelihoods. The basic hypothesis is that for a community to manage its natural resource base sustainably it must receive direct benefits arising from its use. These benefits must exceed the perceived costs of managing the resources. This hypothesis has three conceptual foundations:

1. Economic value: giving a resource such as wildlife, a pre-determined value that can be realized by the community or land owner.
2. Devolution: emphasizing the need to devolve management decisions from the government to the community or local land users in order to create positive conditions for sustainable wildlife management.
3. Collective proprietorship: whereby a group of people are jointly given use rights over resources, which they are then able to manage according to their own rules and strategies.

According to John Mapimele a member of the fish group, the Masukwe dam benefits the community. They see it as an opportunity for alleviating poverty. The department of National Parks with support from the Coping with Drought project provided 50kgs of fingerlings consisting of 3 -4 fish types that were introduced in Masukwe dam. Fifteen (15) group members were trained on how to use a boat, how to lay the nets and how to process the fish. These fifteen were then constituted into a registered and licensed fishing group for Masukwe Dam. Other community members buy fish from this core group.



Dr Unganai (right) and Mr Peter Mugondi (left) of EMA show some of the day's catch.

There is a constitution on how to guide the activities of the group. The constitution emphasizes on the responsibility of everyone in the community to help protect the resource from poachers. This project is mainly benefiting young people and young families who have no other source of income.

Ruth Chiteve, a 37 year old and member of the fishing group committee had this to say about their group. "We have been working well as a group. We have been working in collaboration with the local administration including the councilor, the chief and the police". There are 15 members of the committee comprising of 11 women and 4 men.

Livestock and rural livelihoods support as a climate change adaptation strategy in the arid and semi-arid lands

The project is working with small scale farmers in wards 7, 9, 10 and 11 of Chiredzi district to enhance and optimize livestock production for draught power and a means of income generation. These wards were selected based on the level of poverty, vulnerability to drought and potential for success and impact.



Mr. Njanji preparing feed for his livestock

The population density in the project area ranges from 14 to 35 people per square kilometer. A prominent feature of the ecosystem is the low and variable rainfall, which rarely exceeds 600 mm per annum. Water resources are scarce and in most cases saline. Access to social services is very poor coupled with the low per capita infrastructure network. Viable economic alternatives are limited. However, the people of these semi-arid lands are known to be knowledgeable and skillful, and have demonstrated tremendous experience in livestock farming.

During recent droughts, local farmers have discovered a low cost, locally available drought fodder (*zhombwe*) which they have successfully used to sustain their cattle through periods of

extreme drought on zero grazing. Because of these evolving indigenous knowledge systems of livestock management, cattle deaths associated with extreme droughts have declined from about 75% (1982-84), to 40% (1991-92) and less than 20% in 2001-2002. Households that participated in project demonstrated interventions such as use of urea treated crop stover, molasses, sugar cane tops, and bana grass, have experienced no livestock losses during drought periods occurring after the project, whereas non-adopting households experienced livestock deaths in excess of 20%.

The specific objectives of the pilot livestock project are:

1. To promote livestock production as an adaptive strategy that leads to sustainable livelihoods among small-holder farmers in the semi-arid lands in Chiredzi district.
2. To “climate proof” livestock production among small-holder farmers in some communal lands.
3. To strengthen public and private sector institutional linkages with farmers in pilot sites for continued technical/extension support and enhance market access to improve sustainability of the project.
4. To promote replication of successful drought coping practices.

The farmers received training in livestock husbandry and management, breed improvement, making hay and marketing.

Matsilele Njanji, a livestock farmer from ward 7 is 42 years old and a father of 4. He has been practicing livestock farming since 2000 and has 33 cattle, 14 goats, 12 sheep, and 3 donkeys. He is one of the beneficiaries of the livestock pilot

project and has been conserving and making value added feed rations for his livestock using knowledge gained from the project. Mr. Njanji stated that “The project taught us how to harvest maize stover, store it in a rack, process it in the treatment pit using urea and then store it in a cool dry place.” The project also provided veterinary equipment for deworming, castration, and dehorning. During the July-November dry spell, he has been feeding his livestock with the treated feeds and he did not lose any to the drought. He feeds 3 kgs of the treated feed per animal, per day and adds molasses to the feed to increase the nutrients. His farm has been used as a demonstration site for other farmers in the ward. In March 2012, they had a field day at his farm which was attended by 200 farmers.

the market while a goat and sheep are sold for USD 35 and USD 70 respectively.



Livestock at Mr. Njanji's farm

His cattle graze close to his home, consequently adding more weight. He spends less on vaccination since he has clean water from the borehole in his compound. Farmers are also planting bana grass and leucaena seeds to use as substitute feeds. His oxen are strong and are used as a source of draught power which he sometimes hires out to farmers with animals too weak to pull the plough during planting season. He is able to make USD 100 per hectare from the ploughing. A cow is sold at USD 500 at

Captive crocodile breeding

The project is working with small scale farmers to demonstrate the potential of crocodile breeding as an alternative source of income generation and conservation. The initiative aims at managing the crocodile populations that had been terrorizing villagers and attacking livestock. Under the guidance of the Parks and Wildlife Management Authority of Zimbabwe (Crocodile Division), farmers pick eggs from the nearby crocodile infested Runde River.

Each nest can have 30 to 60 eggs. The eggs are carefully transferred to incubators that have been established in the crocodile breeding area. Humidity and temperatures are carefully monitored during the incubation period of about 80 to 85 days.



Some of the crocodiles are ready for harvest

One of the members of the crocodile breeding group is 42 year old Edison Chauke, who has two wives and 7 children. He said that out of the 28 members of the group, 9 are women. Their activities started in 2009 and their first hatch had 342 crocodiles and the second one had 600 crocodiles. The crocodiles eat any kind of meat and the group has been able to purchase cows, donkeys, sheep and chicken. By the end of 2012, 200 of the crocodiles were ready for the market. The market demands

mostly skins from crocodiles with a 38-40 cm belly size and in first grade quality. Current prices are around USD 8 per centimeter for first grade skins. According to Mr. Chauke, the group has not yet identified markets for their produce; consequently, they have to sell the crocodile skins through a broker. They also have a strategic partnership with Chiredzi Council who will ferry the crocodiles to the market.

Since this is a new venture, they have to learn about crocodile farming as the project progresses. Their target is to produce and sell at least 1000 crocodile skins every year and minimize their dependence on rainfed agriculture in this drought prone district.

Combating land degradation and mitigating climate change in Goromonzi and Nswazi Districts

Goromonzi and Nswazi Districts in Zimbabwe have experienced massive land degradation due to deforestation by villagers. Jekesa Pfungwa Vulingqondo (JPV), a local NGO for social and economic empowerment of women, carried out a survey in the two districts. From the findings, they concluded that most of its members lacked awareness on how to care for the environment and knowledge on how to maintain and improve the environment.



A tree nursery in Goromonzi

The project, “Combating land degradation and mitigating climate change in Goromonzi and Nswazi” was started to address the environment needs through establishing woodlots and construction of Chingwa stoves. Chingwa (which means bread) is an energy saving stove which consumes less wood, and is used for both cooking and baking. The stove also keeps food warm for a long time and does not cause indoor air pollution.

The objectives of the climate change project are:

- To raise awareness and educate community members on the Chingwa stove and introduce conservation

measures that solve the problem of desertification, deforestation and wood fuel shortages.

- To build capacity of women, men and youth and their leadership to participate and make decisions on how they manage their environment.
- To promote local innovations for sustainable land use and environmental management for enhancing household food security and improving livelihoods.

JPV implemented this project in Goromonzi in 5 villages namely, Takawira, Chihoro, Nyamuchengwa, Choruwa and Gosha. Each of the participating villages implemented the project’s activities at the village level. The project’s major activities included:

- Raising awareness on land degradation and climate change;
- Training and workshops on land degradation, climate change combating strategies, tree planting and stove construction;
- Stove construction;
- Planting trees; and
- Documentation of lessons learnt.



One of the kitchens built by JPV

JPV provided material for the construction of the Chingwa wood saving stoves during the initial stages of the project implementation. The community has accepted this new technology with women highlighting the numerous benefits which include:

1. The stoves use very little firewood as well as smaller pieces of firewood as compared to the traditional open fires. This significantly reduces the need for constantly cutting down trees for firewood and thus reduces the time women spend searching for firewood.
2. Improved respiratory health (elaborate on this benefit)
3. The Chingwa stove has several other functions and allows one to cook several dishes at the same time. The common design allows one to have 3 pots cooking on the stove and an oven.
4. Men are eager to cook since they can do so while standing as opposed to bending while cooking using the traditional fireplace.
5. Introduction of the Chingwa stoves has led to household improvement since it requires refurbishment of the kitchen and a washing area.
6. Trained stove builders are able to earn an income from the ongoing construction.



A woman prepares food on the chingwa stove

Results

1. The project established a woodlot in Takawira village, where they planted 400 indigenous trees. However, since the area was not fenced, the trees were destroyed by animals. The community has since decided to plant trees in their farms, so that they can take care of them alongside other crops.
2. All participating villages identified degraded areas and roads that needed urgent intervention. They used locally available materials such as bricks, sisal, vertivar grass and star grass to arrest emerging gullies and reclaim eroded roads. Takawira village rehabilitated 7 roads and dug drainage lines along the roads. Chihoro village reclaimed 2 gullies and 1 road, Choruwa village claimed 5 gullies, 1 road and 1 borehole while Gosha village reclaimed 3 roads.
3. The communities have also adopted conservation farming. Farmers are practicing mulching, zero tillage as well as composting in their farming activities.
4. To address climate change mitigation, a total of 61 stoves were built in the

communities. In Takawira village, all the 34 households are using the Chingwa stove. Ten stoves were constructed in Nyamuchengwa, while Choruwa has 5 stoves and Gosha village had more than 23 stoves constructed.

Sustainability

To ensure sustainability of this initiative, several women were trained on constructing the Chingwa stoves, and the women are currently involved in the construction of stoves in the neighboring villages. All the project beneficiaries, approximately 210 farmers, are practicing conservation agriculture and are growing orchards to complement their income.



Orange trees in one of the farms

This bulletin is produced by the UNDP Regional Environment Project (REP). It highlights selected good practices from Zimbabwe, showcasing UNDP work on climate change. The initiatives were documented by Elizabeth Mwaniki (REP) in collaboration with Energy & Environment practice, UNDP Zimbabwe. The documentation exercise was coordinated by Daisy Mukarakate (UNDP Zimbabwe) and Dr. Leonard Unganai (EMA Zimbabwe).

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