

Farmers' responses to reduce the risks of drought

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Drought is a common phenomenon in the Southern region of the African continent and **Zimbabwe** is no exception. The annual average rainfall of Zimbabwe is about 600mm, but is markedly variable, particularly in drier regions. Since rainfall is the main climatic constraint to dryland agriculture, the country is divided into 5 natural regions for agro-ecological planning. Region I receives the highest rainfall while region V records the least annual precipitation. Farming systems range from intensive livestock and crop production in Region I to extensive beef production (ranching) in region V. However, some drought tolerant cash crops are grown in region IV and V. The lack of rain coupled with exceptionally high temperatures has been the cause of many droughts causing widespread disruption to many farming communities with the loss of crops and livestock.

Based in Zimbabwe, SAFIRE - The Southern Alliance for Indigenous Resources - is a collaborative initiative of several local and international NGOs, grassroots development agencies, government institutions, international organisations and individuals that assists rural communities in managing their natural resource base. Apart from its many activities, SAFIRE plays a pivotal role in the implementation of drought mitigation and preparedness initiatives in Southern Africa.

Recurrent droughts

Since 1901 Zimbabwe has suffered recurrent droughts. According to literature, the worst years with below average rainfall are 1911/12, 1923/24, 1946/47, 1972/73, 1981/82, 1982/83, 1986/87 and 1991/92. In a survey conducted by SAFIRE across nine districts in Zimbabwe, farmers recalled 6 – 16 (on average 10) drought years from 1918 to 1997 (see Table 1). Farmers' definitions of drought were diverse, including agricultural, hydrological, economic and meteorological aspects. According to the farmers, droughts seriously affected them both in the normally wet and dry seasons.

Table 1: No. of drought years remembered by farmers across nine districts of Zimbabwe 1918-1997

Rushinga	10	Mudzi	16
Nyanga	15	Chipinge	10
Mhondoro	10	Goromonzi	6
Chivi	10	Gwanda	9
Tsholotsho	10		

Impacts of drought

The 1991/92 drought had the most crippling effect in Zimbabwe and over much of the sub-region with many countries in the region having seasonal deficits of up to 80% of normal rainfall. There were unprecedented crop failures. The subcontinent, usually a food exporter, had to import 11.6 million tonnes of food worth over US\$4 billion. Regional grain production fell some 60% short of expected levels. The droughts led to widespread suffering with loss of cattle and crops.

Farmers in the nine districts above summarised the major effects of these droughts as follows:

- Partial or complete crop failure (because of low soil moisture content and disease outbreaks)
- Livestock deaths
- Trees drying and dying
- Boreholes, rivers, springs and other water points drying and causing a scarcity of both livestock and human water supplies
- Shortage of basic commodities on the local markets
- Price hikes across all sectors
- High government expenditure because of food imports, especially yellow maize from Kenya
- Malnutrition, especially in children.
- Unemployment, coupled with rampant crime and robbery.

Farmers' coping strategies

Farmers' responses to the effects of drought have been varied. Below are some of the actions being undertaken to mitigate drought, especially by women in Nyanga, Chipinge, Mudzi, Chivi and Gwanda districts.

- **Permaculture** All the farmers interviewed stated that they were learning permaculture and practising it, both in their gardens and fields. Permaculture helps them prepare for drought through land use designs that enhance water conservation and bio-diversity.

- **Water harvesting** Farmers are harvesting water from rooftops and diverting water from natural springs into tanks. This ensures that they have a substantial amount of water stored up. In case of a drought the stored water will be able to sustain them for about five months depending on the volume of the tank. The water is also used for supplementary irrigation of vegetables and crops.

- **Infiltration pits** Some farmers are digging infiltration pits along contours. Water collects in the pits during the rainy period. When the weather becomes dry, as in the case of early stoppage of rains, the water spreads underground and is used by the plants. Crops can grow up to maturity by using this conserved moisture. The farmers in Nyanga and Chivi stated that even if there are only 5 days with rain in the whole rainy season, the crops will reach maturity using conserved and harvested water in the pits.

- **Granaries** A majority of the farmers interviewed store food to be used in case of a drought. They have a specific granary stocked with grain (sorghum, millets, and maize for a shorter period of time), especially those resistant to post harvest pests. This granary is kept untouched and out of bounds for children. Only the head of the household is allowed into it.

- **Savings** A fifth of the farmers across the nine districts save some money in order to purchase food in times of drought. These are the affluent farmers with flourishing business enterprises who can set aside enough money to buy food for a whole year if the rains fail.

- **Drought tolerant crops** Some farmers are slowly discarding the idea of growing maize as the main crop. They are shifting to the use of traditional crops e.g. small grains, i.e. millets, sorghums. These crops are drought resistant and therefore give a good yield even with very little rain.

Farmers are also looking for indigenous maize varieties (i.e. *Kalahari*) that are short season, high yielding, drought tolerant and post-harvest pest resistant. An indigenous finger millet variety, *chiraufe*, is also planted in drought years. *Nyamunhororo*, a cucurbit, is popular as the small pumpkin ripens fast and saves people from possible starvation. It is not only drought resistant but can survive in poor soils. The early maturing cowpea variety *Vigna unguiculata* is also planted in drought seasons.

Building on farmers' initiatives

It is evident that farmers are proactively doing something for their survival in times of disasters such as drought. The array of initiatives shows that community livelihoods are dependent on a number of activities, capabilities and assets including both material and social resources. Rural community livelihoods would be sustainable when they can cope with and recover from stresses and shocks such as drought, floods or even HIV/AIDS, and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base.

The main challenge for researchers, development practitioners and policy makers, therefore, is to facilitate this process and to build on what farmers are currently involved in. The main long term focus and goals of all drought mitigation projects implemented by SAFIRE and other partner NGOs such as ENDA - Zimbabwe, CARE Zimbabwe, Zimbabwe Freedom from Hunger Campaigns (ZFFHC) and ORAP have been to strengthen community livelihoods. The

livelihood conceptual framework illustrated below has been the guiding principle in most initiatives.

Adaptive strategies

In its community drought mitigation initiatives in Zimbabwe, SAFIRE has sought to build on and promote the following community adaptive strategies:

- Multi-cropping to hedge against crop failure.
- Soil and water conservation (infiltration pits, tied ridges, water harvesting tanks and permaculture kitchen garden designs in general)
- Storage of a two year supply of indigenous maize and other drought tolerant varieties such as millet and sorghum.
- Income diversification (organic vegetable sales, organic cotton growing esp. with refugees in Zimbabwe, craft making, jam making and sales, soap making from *Jatropha curcas* oil, etc.)
- Community regulations and bylaws which control the conservation of certain trees and wooded areas.

Contemporary knowledge

The following new knowledge is introduced:

- Participatory ecological resource assessments conducted together with the communities in project areas.
- Oil extraction technologies either developed or sourced for the communities.
- Simple irrigation techniques such as bottle watering and low cost drip irrigation promoted in project areas.

Policy issues

The main responsibility of the government is to create an enabling policy environment, which will ultimately enhance the livelihoods of at-risk communities. Examples within the Zimbabwean context are:

- Land use/tenure: state vs community; agricultural modernisation: monocultures and cash at the expense of food security i.e. maize vs sorghum/millet.
- Marketing policies per se
- Livestock production and sale
- Promotion and legitimisation of indigenous knowledge by both government and researchers, especially in climate forecasting.

ENDA-Zimbabwe and the International Institute for Sustainable Development (IISD) have been in the forefront of analysing policies that impact livelihoods of rural people at-risk.

Achieving food security

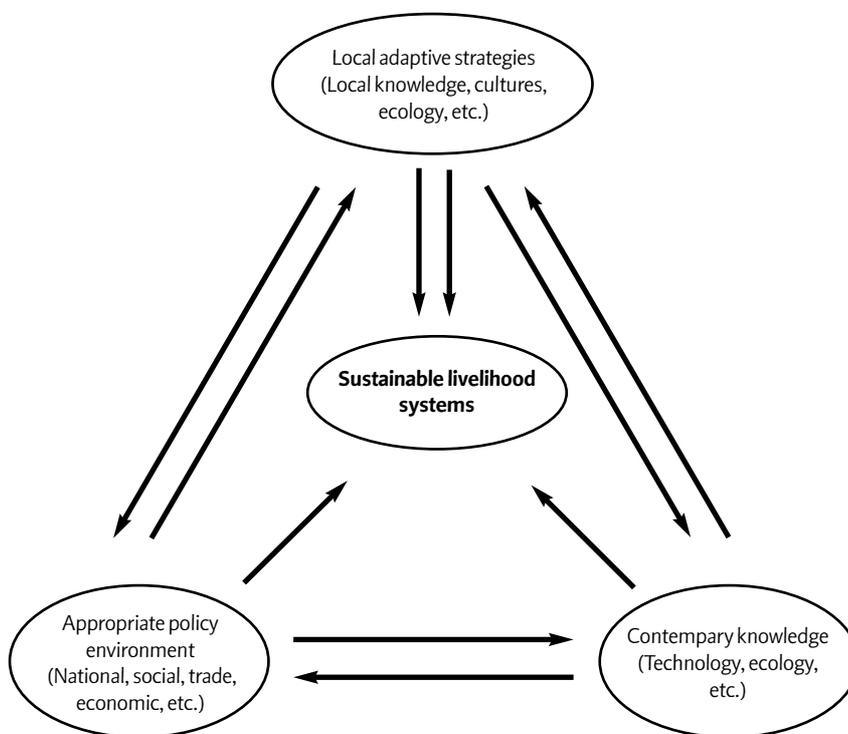
Apart from effective networking, NGOs and governments need to work together towards fulfilling the concept of sustainable livelihoods systems, as elaborated above. This way, food security and community resilience to drought can be achieved in Zimbabwe and in Africa as a whole.

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Figure 1: Towards sustainable livelihoods and food security



This figure represents the three main systems leading to sustainable livelihoods in Africa's semi arid lands. Sustainable livelihoods draw most from the adaptive strategies that people and nature have evolved together, but they will also require an appropriate environment of social and policy conditions and will draw on contemporary knowledge systems.

Source: Rennie and Singh (1995)