SPGRC Network News
A Publication of the SADC Plant Genetic Resources Network
January - June 2008

# Regional Project Proposal for Enhancement of Capabilities in Conservation and Utilisation of PGRs

The SANBio has identified genebanking as one of the priorirty areas for the SADC region aimed at ensuring sustainable food security and socioeconomic development of the people of the region. THe SPGRC has been identified as a regional centre strategically placed to coordinate this activity. To start with, SANBio formed a Task Force to advise the network in the development of a five-year regional project entitled "enhancement of capabilities for conservation and utilisation of plant genetic resources in the SADC region for food security". Based on the NEPAD principle of African ownership and leadership, the Task Force drwas its membership from African scientists with solid experience in the conservation of plant genetic resources.

*Task Force Meeting in Durban at UKZN, June 2008*

The first meeting of the Task Force was held on 2-3 June 2008 in the School of Biological and Conservation Sciences (SBCS) at the University of KwaZulu-KNatal (UKZN) in Durban, South Africa.

The second meeting of the Task Force is due early September 2008 and the saleable project document will be ready by October 2008.

| SPGRC Calendar of Events<br>January - June 2008 | |
|---|---|
| Date | Event |
| 28 June - 8 August 2008 | NGB Short Course in PGR Management, Sweden |
| 18 July 2008 | Visit to SPGRC by Hon. Dr Levy Mwanawas, President of the Republic of Zambia, Chairman - SADC |
| 1 - 8 August 2008 | Zambian Agricultural and Commercial Show, Lusaka |
| 14 August 2008 | Seed/Food Crop Diversity Fair |
| 28 August 2008 | SANBio Proposal writing meeting, Lusaka |
| 15-17 Sept. 2008 | Annual Technical Review and Planning meeting, Lusaka |
| 18 Sept 2008 | ITPGRFA sensitisation seminar |
| 19-20 Sept 2008 | SPGRC Ordinary Board meeting, Lusaka |
| 9-18 October 2008 | SADC Summit meeting, Johannesburg |

## Training Course in Plant Breeding and Applications of Biotechnology Held in Angola

António Alcochete and Elizabeth Matos

In 2003, after 12 years of collecting, conserving and partial field characterisation of local varieties of crop plants, the Angolan NPGRC expressed its concern over the relatively little use made of rich genetic resources (now over 3,000 accessions) held in the Centre's gene bank.


*Breeders' hands-on practical*

Following a survey of the number of Angolan plant breeders and associated biotechnology capacity, it was clear that meaningful utilization of the conserved accessions will only be possible following a significant increase in conventional plant breeding capacity and related biotechniques.

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In 2005, with support from the Norwegian Government, through FAO, a first three-week long course in plant breeding was held in Luanda, for 6 Mozambican and 12 Angolan agronomists working in crop improvement programmes.

*Theory complemented with laboratory practices*

In 2008, the Angolan NPGRCentre organised a month long training course on plant breeding and applications of biotechnology on cereals, legumes, roots and tubers. The course is part of an 18 month FAO Project TCP/ANG/3012(D) with the following aims:

1. To improve the ability of local agronomists to evaluate and select breeding materials appropriate for targeting national varietal development priorities and so contribute to the development of national plant breeding (breeding programmes).

2. To forge links between conventional breeding methods and modern biotechnologies through strengthening the local capacity to use modern tools that already exist at the initial stages of development at the NPGRCentre, to improve the local capacity to develop better varieties.

3. To improve Angolan agronomists capacity to better understand the genetic variability held in the national gene bank through techniques for morphological and agronomic characterization, so as to be able to better identify breeding materials for plant breeding programmes.

4. To facilitate plant breeding training of Angolan agronomists through the development and dissemination of training material in Portuguese.

The training course ran from the 4th to 28th June 2008. The five trainers involved are experts from Embrapa, Brazil (breeders of maize, beans, sorghum and cassava, and a biotechnologist). All five specialist plant breeders emphasized the need concentrate first on the conservation, utilization and pre-breeding characterization of local varieties.

*Field learning class*

15 of the 20 participants are agronomists selected from the Agricultural Research Institutes (IIA). This course has been organized by the Angolan NPGRC which provides technical facilities and biological material as well as its technical staff. Dr Antonio Alcochete and Mr José Pedro are national counterparts to support biotechnological and morphological-agronomic characterization aspects of the TCP.

**Expected Outputs**

Project activities are expected to directly contribute to the plant breeding capacity of agronomists working in the principal agriculture research institute (IIA) in Huambo province. The government has a major programme for the re-launching of the important agricultural production area of Huambo and Bié provinces. The majority of those on the training courses have come from IIA stations in Huambo, Malange, Huila, Kwanza Sul, Namibe and Bengo provinces.

# Germplasm Contribution to Food Security

Barnabas Kapange

## Introduction

To feed an ever-growing world population, with more than 90% of them in developing countries, will require an astonishing increase in food production with consideration of genetic diversity being critical to the success of breeding programmes. The global effort to assemble, document, and utilize these resources is enormous, and the genetic diversity in the collections is critical to the world's fight against hunger.

Shrinking numbers of crop wild relatives from the diversity represent an untapped genetic resource for abiotic and biotic stress resistance and for such traits that could provide developing world farmers access to hybrid technology.

Huge requirements for food bulged due to the fact that area available for food production has, essentially, remained constant since 1960 (Hoisington, 1999) and that despite some new land being brought into cultivation,

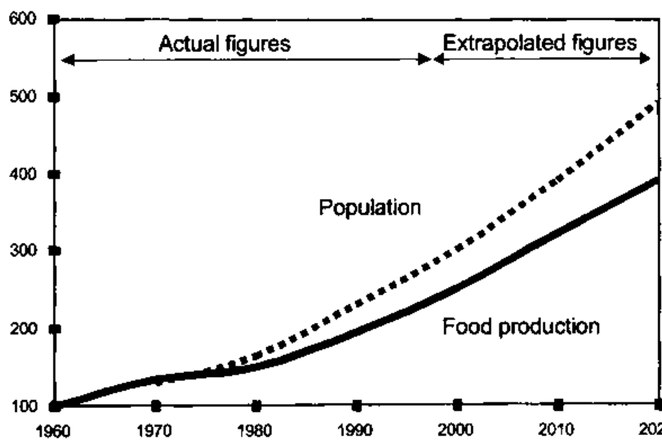


***Figure 1: Population and food production indices for SS-Africa (FAO, IFPRI data)***

soil erosion and urbanization pull back increase in production yields. In addition, less human and financial resources are being devoted to overcoming major production constraints and yet, financial support for agricultural research has decreased for the last several years as donors focus on domestic issues rather than addressing the multitude of problems facing the world's developing nations.

## Rationale for Genebanking

Loss of important genetic diversity may reduce a species' genetic diversity, making it more vulnerable to pests, diseases, and environmental change. The key to protecting against the total loss of these important genetic traits lies in the preservation of their wild relatives through genebanking. Genebanking is an important ex situ conservation strategy that contributes to the dynamic process of maintaining and retaining native plant germplasm. It is complemented by in situ conservation, together with public education, propagation research, restoration activities, and other important activities that are critical to long-term conservation.

Impacts of Germplasm in Intervening Food Insecurity Despite the fact that industrial revolution and work by plant geneticists brought dramatic increases in agricultural productivity these negatively affected landraces and traditional varieties have been replaced by less diverse modern cultivars and hybrids leading to a decline in the genetic diversity of the crops in many farmers' fields.

***Photo: Wheat farms in South Africa***

Genetic resources stored in gene banks around the world are fundamental to global efforts to improve agricultural productivity. They reserve an assortment of alleles needed for resistance and tolerance to the diseases, pests, and harsh environments found in their natural habitats.

For genetic resources to be a major factor in plant improvement, new methods must be directed to their analysis and transfer into improved varieties. Fortunately, some promising new approaches are becoming available. Physiological measures of various plant parameters are becoming more exact, rapid, and applicable to large populations. Such advances should allow the more accurate determination of new sources of useful characteristics.

***Indigenous seeds multiplication***

Biotechnology will hopefully soon overcome the constraints related to the actual transfer of desired genes into their respective hosts. Molecular genetics can provide higher resolution of the genome of any species, allowing precise gene identification before attempted transfers. The subsequent use of the associated markers then provides an indirect, but highly heritable, selectable marker for the trait.

A variety's yield can be considered the final response of a plant's genome to the environment in which it is grown. In this manner, the addition of enhanced stress resistances leads to improved yields. For many developing countries, even slight improvements in stress tolerances would significantly increase yields. Given the shortcomings in policy, infrastructure, and even civil stability in some developing countries, having the farmer (often the net consumer) produce additional food in his or her own fields may be the surest and quickest way to increase food security in these countries

***The genetic diversity represented in these landraces remains a vital resource for global food security and economic stability. Both landraces and crop wild relatives serve as the world's repositories of crop genetic diversity and represent a vital source of genes that can ensure future food security.***

### Why are genebanks so important?

The reason why crop diversity is conserved in genebanks is that crops are under threat elsewhere. Habitats continue to be destroyed by unsustainable human activity, and along with the habitats go the plants. One of the threats to diversity is advanced agriculture. As new varieties become available, and are taken up by farmers because they offer genuine benefits, they may displace the diversity that was there before. This is especially ironic because all advanced breeding is built on existing diversity, which makes it imperative that this diversity be conserved and remains available somewhere.

Globally, genebanks maintain millions of plant samples. Today, the Food and Agriculture Organization of the United Nations' (FAO) World Information and Early Warning System on Plant Genetic Resources (WIEWS) lists about 1,460 genebanks worldwide which maintain more than 5.4 million samples -- although many are duplicates, so the total of genuinely distinct accessions is considerably lower.

Offered by genebank resources, plant breeding depends on the correct combination of specific alleles at the 50-60,000 genetic loci present in a plant's genome. The knowledge of where these alleles are best found and the combination and evaluation of these into a single species can be considered the "art" of breeding.

***Nutritious fruit juices from indigenous trees***

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# Rescue Collection of Crop Genetic Resources in Flood and Drought Prone Areas of Lower Zambezi River, Zambia

Dickson Ng'uni

## Introduction

Sorghum is fifth in acreage among the world's cereals (Doggett, 1988). It consists of cultivated and wild species. Sorghum bicolor subsp. bicolor (2n = 20) is the taxon that includes agronomically important grain races, that is, bicolor, caudatum, durra, guinea, and kafir and several hybrid races (Doggett, 1988). Sorghum known as Mapila in Chichewa in Eastern Province of Zambia is an important staple food especially in the semi-arid areas of the SADC region and in particular the low rainfall areas in agroecological region 1 of Zambia. It is grown for food and brewery. The stalks are used as building material.

Zambia is divided into three main agroecological regions (Figure 1) based mainly on the amount of annual rainfall received. Other determining parameters are the length of growing season, altitude and to some extent soil characteristics. These agroecological regions are Region I covering parts Western Province and Luangwa, Zambezi, Gwembe valleys, agroecological region II including the central part of Zambia including parts of Eastern, Western and Southern Provinces and agroecological zone III spanning the northern part of the country.

The vegetation type and associated farming systems change progressively as you move from the north to the southern part of the country. Agroecological region I mainly encompass the southern part of the country and is characterized by the lowest amount of annual rainfall received, prone to incidences of drought and in certain instances experiences incidences floods (collection points of water from uplands). Incidences of desertification are high in these drought prone areas.

Based on the level of external inputs and scale of production, the agricultural sector in Zambia could be described under two main scales of farming. These are the commercial farming sector on one hand and the small scale farming on the other. Small scale farmers are mainly the traditional farming communities and account for about 65% of the total national food crop production and are the custodian of the available crop genetic diversity.

Like other parts of the country, the communities along the Zambezi River are involved in farming activities. Maize, sorghum and pearl millet are the main cereal staple food crops grown in Zambezi valley. Other crops grown in the area are cassava, sweet potato, cowpea, pumpkins, Cucumis and other minor crops. Some of the farmers are also grow cash crops such as cotton, mainly as contract farmers by companies such as Dunavant.

To a large extent, the farming communities in the Zambezi valley in which certain areas were covered rescue collection mission are largely of small scale nature. These farmers mainly grow their crops such as maize, sorghum, cowpea, groundnuts and cowpea along river basin because of the natural soil fertility associated with these alluvial (dambo) soils from which relative higher yields are realized without use of external mineral fertilizers. These low lying lands of these areas experience some floods that arise from the rainfall in the highlands. These floods could sometimes lead to the total crop loss of crops. Some of these crops are also grown on the upland and mineral fertilizers are rarely or not used. The other major economic activity especially in Kazungula, Sinazongwe and parts of Sesheke is fishing on the Zambezi River.

This report outlines in brief the collection mission undertaken targeting collection of sorghum germplasm in lowlying areas of Zambezi River covering parts of Sesheke district in Western province, Kazungula and Sinazongwe districts of Southern province. Mention has been made on the collected samples, description of the variation captured and notable factors contributing to the genetic erosion of the local sorghum diversity.

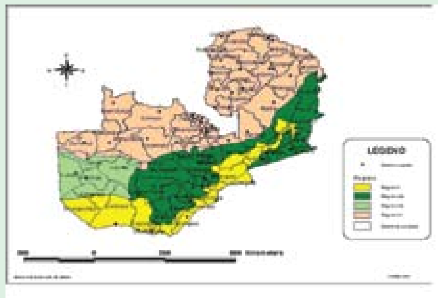

*Figure 1: Agro-ecological regions of Zambia*

## Justification of the undertaking

The lowland areas such as the Zambezi basin of Zambia are endowed with some unique traditional crop varieties including those of sorghum. At the same time too, these areas are vulnerable to incidences of floods and drought which are important factors that threaten the perpetuation of available crop genetic diversity. Drought and floods have been identified as important factors causing loss of crop genetic diversity (Ng'uni and Nkonde, 1999).

During the past two growing seasons, the Zambezi valley has been affected by incidents of serious floods. The findings of national survey by the Zambia Vulnerability Assessment Committee (ZVAC) of the Disaster Management and Mitigation Unit (DMMU) under the Office of the Vice President on the effects and extent of the floods in part on infrastructure, crops, livestock and food access in forty-one (41) districts during the last rainy season singled out Kazungula and Sesheke as having adversely affected by the floods. This was because most of the crops in these areas were washed away and/or substantial infrastructure submerged.

Some of the crops and in particular early maturing traditional varieties of sorghum have tended to escape these incidences of floods. The persisting traditional crop varieties of locally grown crops may possess unique genes that may be valuable for varietal improvement or development. It is for this reason that the collected local sorghum diversity will constitute part of the materials for research on genetic diversity and phylogenetic relationships in the genus sorghum. The information associated with the sorghum collections will complement molecular techniques in investigating the extent of diversity and the phylogenetic relationships in the genus Sorghum collected. Assessment of the genetic variability within cultivated crops has a strong impact on plant breeding strategies and conservation of genetic resources.

Ollitrault et.al., (1989) studying the isozyme polymorphism in races of sorghum found out that diversity continuum was organized around geographical groups with guinea, kafir and durra-caudatum and bicolor races falling in the Southern Africa group. Several of such races are also found in Zambia. During this mission, this diversity will be sampled, farmers' traditional practices and indigenous knowledge will also be documented.

## Objectives

The proposed collection mission aims to rescue sorghum and other vulnerable local crops in lowland of Zambezi basin. The overall objective of mission is to collect wide diversity of cultivated sorghum landraces and their wild relatives, passport data and indigenous knowledge taking into account ethnic diversity that will consequently form research material in the genetic diversity study in genus Sorghum. In addition, other vulnerable crop species will be rescued collected documented.

### Specific objectives

1. To collect germplasm of local sorghum landraces and other vulnerable crops in the traditional sorghum growing areas;
2. To collect and document passport data, local indigenous knowledge and ethnic-socio-cultural systems associated with collected germplasm;
3. To determine the infraspecific classification (races) of the sorghum collections.

## Methodology

The collection mission target at least 3-4 sites of lower Sesheke, Kazungula and Sinazongwe districts. Primarily, in the proposed collection strategy farmers' fields were targeted for collecting the available local sorghum varieties. However, at the time of the mission almost all the farmers in these low lying areas had already harvested most of their cereal crops including their sorghum crop. Consequently, the sorghum samples were largely collected from the drying bays and grain stores.

Based on the available morphotypes and the farmers' knowledge as much diversity as possible was assembled. The proposed systematic sampling strategy of covering at least 20-30 km between collection sites and in each site targeting one sorghum population from one farmer. Site passport data and indigenous knowledge data and information related to available diversity, cultural practices, sources of seed, nearby markets and utilization will also be documented during the mission. Passport data will include distance to the nearest identifiable feature, longitude, latitude and altitude at points of collection.

The collection team aimed to collect full heads of sorghum from the farmers to allow for race determination prior to processing. Based on Harlan and De Wet (1972) classification (of cultivated sorghum into races according to the characteristics of grain, glume and spikelet.), an attempt was made to classify the sorghum materials collected during this mission.

## Work Programme

The collection mission was undertaken in June 2008. The mission collected seed samples in Sesheke, Kazungula and Sinazongwe districts. Starting off from 16th June 2008, the Team visited Sesheke, Kazungula, and Sinanzongwe districts until 24th June 2008.

## Germplasm collected

During the collection mission and based on inflorescence characteristic differences and local knowledge mobilization of diversity within the genus sorghum was an important consideration. The collection mission in the three districts yielded a total of twenty six (26) cultivated sorghum samples and one (1) wild relative of sorghum (Table 1).

*Photo: Interviewing for information during the mission*

The collected cultivated sorghum samples exhibited some variation in terms of panicle shape, glume and grain size and colour. The collected samples germplasm collections included those of early and late maturing categories, also ranged from the pendulous or lax to semi compact or compact headed sorghum, white and brown grain sorghum types. In some cases, the farmers possessed the sorghum that had dual utility i.e. grain as staple food and sweet stalk for cane.

Different local sorghum varieties were named differently depending on the ethnic grouping obtaining in a particular area. In certain other cases farmers expressed ignorance about the sorghum variety name(s) of the sorghum germplasm they had in their possession. This in itself was an indication that knowledge gap existed. Thus even if a particular farmer might be maintaining a variation within the sorghum, they lacked information associated with the available local sorghum varieties.

**Table 1: Collection sites and characteristics of sorghum germplasm collected**

| Coll. No. | Local Name | Village | District | Characteristics | | | |
|---|---|---|---|---|---|---|---|
| | | | | Inflorescence | Glume | Grain | Possible Race or Intermediate |
| NKM001 | Sindiketi | Malembutuka | Sesheke | Semi-compact to compact, medium in length | Dark brown to black, as long as or shorter than grain | Brown, corneous and hard | Kafir or Caudatum-kafir |
| NKM002 | Mapupe | Malembutuka | Sesheke | Semi-compact to compact, short in length | Clasping, variable length | Spherical, white | Kafir or Caudatum-kafir |
| NKM003 | Kankota | Ilwemdo | Sesheke | Compact | Broad but shorter than grain | Spherical, slightly wedged at base | Durra |
| NKM004 | Kankota | Koobya | Sesheke | Compact | Wide, shorter than grain | rounded obovate | Durra |
| NKM005 | Unknown | Koobya | Sesheke | Compact to open | shorter than grain | turtle-backed, exposed | Caudatum |
| NKM006 | Unknown | Koobya | Sesheke | Compact, short | dark brown, as long as grain | Loosely held by glumes, hard, white | Caudatum or caudatum-guinea |
| NKM007 | Fulampheyo | Sing'endende | Kazungula | Open or contracted panicle | Clasping, as long as grain or longer than grain | slightly obovate, exposed as much as quarter of its length at tip | Bicolor or bicolor-kafir |
| NKM008 | Sipulasamayiba | Sing'endende | Kazungula | Compact to open | Brown, shorter than grain | Turtle-backed, brown, exposed | Caudatum or caudatum-kafir |
| NKM009 | Wild | Sing'endende | Kazungula | Highly pendolous | brown to black | completely covered by glume | Sorghum halepense/ Johnsongrass |
| NKM010 | Unknown | Bbilibisi | Kazungula | Semi to full compact | Brown, shorter than grain | Ovoid, brown, hard, exposed | Kafir |
| NKM011 | Chilimangomwa | Sianamonga | Sinazongwe | Semi-compact to compact | Brown, shorter than grain | almost spherical | Kafir |
| NKM012 | Kapila | Sinzala | Sinazongwe | Very loose, pendolous | Clasping, as long as grain, dark bown-black | White, spherical | Guinea or Caudatum-guinea |
| NKM013 | Dekenya | Kabyolo | Sinazongwe | Very loose, pendolous | Gaping, as long as or longer than grain | Hard, corneous, twisted at maturity | Guinea or Caudatum-guinea |
| NKM014 | Chinechamuwa | Kabyolo | Sinazongwe | Semi-compact to compact | black, as long as grain | Brown, conical, obovate | Caudatum |
| NKM015 | Zibaiba | Kabyolo | Sinazongwe | Semi-compact to compact | As long as or longer than grain | Elongated | Kafir or Caudatum-kafir |
| NKM016 | Nkholwe | Kabyolo | Sinazongwe | Semi-compact to compact | Clasping and variable in length | almost spherical | Kafir or Caudatum-kafir |
| NKM017 | Kasili | | Sinazongwe | Semi-compact | Clasping and variable in length | almost spherical | Kafir or Caudatum-kafir |
| NKM018 | Mayalukumba | Siankhuku | Sinazongwe | Semi-compact to open | Black, narrow as long as grain | White, spherical | Kafir or Caudatum-kafir |
| NKM019 | Mbwende | Siankhuku | Sinazongwe | Open or contracted panicle, long | As long as grain, almost covering grain except for grain tip | slightly obovate | Bicolor or bicolor-kafir |
| NKM020 | Unknown | Siankhuku | Sinazongwe | Semi compact to open | Highly evolved, gaping and as long as or longer than grain | Small, spherical | Guinea |
| NKM021 | Unknown | Siankhuku | Sinazongwe | Semi compact to loose | As long as grain, brown to black | flattened dorsoventrically | Guinea |
| NKM022 | Unknown | Siankhuku | Sinazongwe | Loose to laxed | Dark brown to black, broad, as long as grain, expose grain | Spherical | Kafir |
| NKM023 | Unknown | Siankhuku | Sinazongwe | Semi-compact to open | As long as or longer than grain, well developed | White, small | Guinea or Caudatum-guinea |
| NKM024 | Unknown | Siankhuku | Sinazongwe | Semi-compact to compact | Clasping and variable in length | Spherical, symmetrical | Kafir or Caudatum-kafir |
| NKM025 | Unknown | Siankhuku | Sinazongwe | Semi-compact to open | Not well defined, shorter than grain | dark brown | Kafir or Caudatum-kafir |
| NKM026 | Unknown | Siankhuku | Sinazongwe | Open shape | Slightly shorter than grain, dark-brown to black | Brown, slightly spherical to turtle-backed | Caudatum or Caudatum-Kafir |
| NKM027 | Dekenya | Siankhuku | Sinazongwe | Open pendolous 'primitive' | Gaping, as long as or longer than grain | hard, corneous | Guinea or Caudatum-guinea |

## Variation in Sorghum collected

Two types of sorghum based on use are found in the area. These are the dual utilisation types whose grain and stalk are consumable parts and those in which only the grain is edible. The sorghum type with compact head and white grain is the dominant variety type found in the area and is said to be vulnerable to bird attack. However, the red type which is less susceptible to bird attack is largely grown for local brewery.

*Photo: Sampled crop landraces*

However, phenotypic variation may not reliably reflect genetic variation because of the role of environmental interaction in determining the phenotype (Smith and Smith, 1989; Smith et al., 1991).

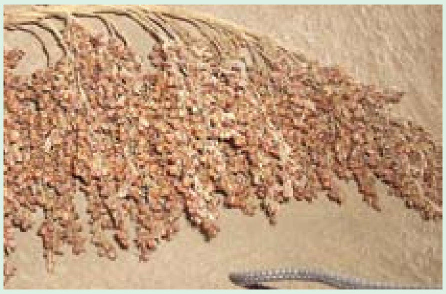

*Photo: Sampled crop landrace*

## Factors contributing to genetic erosion

It was clear from the information gathered during the collection that genetic erosion has taken place through the loss of certain local sorghum varieties. Loss of genetic diversity of traditional sorghum varieties could be attributed to natural and anthropogenic factors. Pertinent factors contributing to loss of some traditional varieties of sorghum include labour constraints as demanded during bird scaring, lack of readily market and promotion of maize crops even in unsuitable growing areas.

Incidence of floods per se may not be a cause factor for loss of local sorghum varieties since mostly this crop is grown in the upland. It is rather excessive rainfall received in the particular area as the case was during 2007/08 growing season in the collection area. Rainfall above normal seem to have a tendency of 'choking' the crop to death and this way as indicated by most of the farmer has in some cases led to complete loss of the crop.

*Photo: A sorghum wild crop relative*

The other contributing factor to genetic erosion is the promotion of improved sorghum varieties such as Sima and Kuyuma as the case was for certain areas of Kazungula where farmers have completely abandoned the traditional sorghum varieties opting for the improved ones. The main reason farmers gave for this situation was that the local varieties they had were very tall and took longer days to attain maturity. On the other hand the improved sorghum varieties were dwarf types and since they were early maturing types provided them with food much earlier in the season. The other equally important factor contributing to genetic erosion of diversity is the promotion of cash crops such as cotton among small-scale farmers. This crop is highly labour intensive throughout the cropping season and as such provides less or no opportunity for the farmer to grown many other crops.

## Conclusion

The collection mission was a success despite having undertaken it when the crop had already been harvested and moved from the field. It was noted during this mission that for the areas reached, only a few farmers are maintaining the local sorghum varieties.

This poses a challenge as farmers play an enormous role in the perpetuation of the genetic diversity.

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## Germplasm Contribution to Food Security

**Continued from page 3**

Genebanks are also increasingly fulfilling additional roles of providing resources in in the aftermath of disaster, natural and human, as repositories not only of the seeds farmers need, but also of essential skills and knowledge

Diversity is one of farmers' great strategies for survival. Farmers who grow a diversity of species buffer themselves against a disaster that destroys one species. And a diversity of varieties of a single species makes better use of different environmental conditions. Having sometimes lost their local varieties, for example after adopting new and improved crops, farmers can turn to genebanks for new material to try.

### Conclusion

Countries need to unite to ensure that genebanks remain a solid insurance policy for the future of agriculture. World's most important agricultural asset is nowhere as secure as it should be. The work needed to conserve plant diversity must be given assured and unassailable financial underpinning forever. Unfortunately, this has proven politically difficult. Support for long-term caretaker activities can be precarious and difficult to justify, especially from a narrow-minded and short-term economic standpoint.

For plant genetic resources to contribute to future agricultural development, they must be used as well as conserved. Plant genetic resources need to be conserved now in order that they can be used in the future. As raw materials for agriculture, these resources are integral to the sustainability of production systems and hence are key to development.

## Obituary

The SPGRC Network regrets to announce the death of ***Mr Tlhaloganyo Ounce OFENTSE*** which occurred on 6th April 2008 in Gaborone, Botswana after succumbing from cancer attack. He was buried at his home village on 12th April 2008.

Until his death, Mr Ofentse was the Curator for the Botswana NPGRC, a position he assumed since 1997.

Born on 12th October 1971, Mr Ofentse did his primary and secondary education respectively in Mmadinare and Babonong, Botswana between 1979 and 1990. He thereafter, proceeded to do his BSc (Agriculture) studies at the University of Botswana from 1992 to 1996 before pursuing an MSc in Conservation and Utilization of PGR at the University of Birmingham between 2000 and 2001.

Besides being a Curator, he was also a representative of The Botswana Department of Agricultural Research in the national steering committee of the Desert Margins Project of GEF and in the Advisory Board of the Department of crop science and production of the Botswana College of Agriculture. He was also part of the national technical team of the Millennium Seed Bank Project (MSBP).

Mr Ofentse will be remembered for his dedicated intellectual and physical involvement in the establishment and enhancement of PGR work for Botswana and SADC region. He will be largely missed by the SPGRC network.

***May His Soul Rest in Eternal Peace***

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