



Guidelines on the Establishment and Management of Community Genebanks



Southern African Development Community

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- ◆ **Implementation of the decisions** of the Summit and council;
- ◆ **Organisation and management** of SADC Meetings;
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- ◆ Courtesy;
- ◆ Equality of opportunity; and
- ◆ Transparency and frankness.

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FOREWORD

Conservation of plant genetic resources (PGR) is a discipline that has grown over the years to become an indispensable pillar of agriculture. Since the idea to conserve plant genetic resources was mooted and popularised beginning in the 1950s, conservation of plant genetic resources which was driven by scientists focussed mainly on the collection of crop species of agricultural importance and storing them centrally in global centres where they could be accessed mainly by the same scientists for use in research related programmes. With time, governments came on board and established national PGR conservation programmes through conserving orthodox seeds of popular crops among farmers in facilities commonly known as national genebanks. From the 2000s, there was a direct involvement and increased participation of farmers in the ex situ conservation of plant genetic resources. This period also coincided with the global realisation and acknowledgement of the farmers' key roles in the conservation of plant genetic resources for food and agriculture. Apart from the traditional ways of conservation of plant genetic resources in the field as farmers participated in their agricultural activities, now farmers are working together in communal groups managing localised PGR conservation schemes called Community Genebanks. The genebanks come in the form of physical housing structures where seeds of crops occurring in the communities are stored and field plots where farmers collectively manage different accessions of especially the vegetatively propagated species occurring in their own and neighbouring communities. The concept of community genebanks is very important because it not only helps in the conservation of plant genetic resources but also ensures that communities are seed self-reliant for landrace varieties which are adapted to their local conditions. Because the concept of community genebanks is new to the SADC region, not many countries have adopted this method of PGR conservation. However, as a region community gene banks are regarded as an important component of PGR conservation and guarantor of seed and food and nutrition security in local communities. These guidelines have been developed to help Member States establish and manage their community genebanks for the benefit of communities. Approaches to be used are not cast in stone as they are dependent on each Member State's situation and cultural values as these determine how communities work together. We have attempted make our recommendations simple and easily adaptable to even the less privileged communities. We wish you the best in your PGR conservation efforts.

SADC Plant Genetic Resources Centre

CHAPTER ONE

Introduction

The Southern African Development Community (SADC) is an agriculture dependent region with the majority of its population relying on agriculture and agriculture related activities to earn a living. Most of the inhabitants of the region who depend on farming for survival are small land holders practising subsistence farming and a large proportion of these mostly rural and peri-urban farmers use retained seed of various crop species in their farming ventures. These communities have, over the years, played a critical role of ensuring food and nutrition security as the custodians of crop diversity in the SADC region. Because of forces that are both natural and man-made, communities in the region have been gradually losing their capacity to keep on maintaining the crop diversity that is useful to mankind. The SADC Member States government realise the importance of these plant genetic resources and have therefore supported the plant genetic resources conservation and came up with government initiated programmes to conserve the plant genetic resources for food and agriculture. Guided by the Second Global Plan of Action on the Conservation of Plant Genetic resources for food and Agriculture, SADC Member States have come up with many approaches that ensure continuous conservation of plant genetic resources for food and agriculture. In all the Member States, a national gene bank has been established and there is a centrally coordinated programme to ensure that plant genetic resources are kept for the benefit of mainly crop improvement experts resulting in the development of new improvement crop varieties.

There is, however, a new approach to conservation of plant genetic resources where communities actively take part in conservation of plant genetic resources occurring in their localities commonly referred globally as Community Genebanks. Community Genebanks can be field genebanks catering for vegetatively propagated species or seed genebanks where crop species producing orthodox seeds can be collectively conserved. The common and very important feature of community genebanks is that there is collective management of the scheme and that communities' members benefit directly from the schemes as direct sources of seed for establishing their own crops in the communities. These schemes have been shown to be quite educative to local communities about the importance of plant genetic resources and have also thrust ownership of conserved plant genetic resources occurring in a community go to the membership of a community itself. Often, community members have interacted well and shared germplasm amongst themselves through events such as seed fairs and agricultural shows thus promoting the utilisation of conserved plant genetic resources.



Figure 1.1: Sweet potato (a) cassava (b) and banana (c) field genebanks in Seychelles, Madagascar and Comoros, respectively

Central, government managed national genebanks have often found it easy to conduct collection missions in areas where there are community genebanks because in most cases the accessions occurring in these areas would have been collected and placed centrally in community genebanks by the community members themselves.

In Southern Africa, community genebanks have been promoted mainly through partnerships between governments, through their national genebanks, and the non-governmental organizations working with communities to ensure seed security for various crops and ultimately resulting in improved food and nutrition security for many in especially disadvantaged communities. In the most successful situations, seed production for marketing purposes has resulted from these well managed community plant genetic resources conservation schemes. This has resulted in some form of financial stability among the participating members in addition to the seed security benefits associated with these community genebank schemes.

The management of community genebanks among SADC Member States is not uniform and standardised with each Member States following approaches suiting their own situations. Except for instances where a non-governmental organisation like the CTDI which operates across three or more Member States, the approaches used in management of the community plant genetic resources have varied from country to country and from community to community within the countries. However, SADC plant genetic resources programmes wish to operate under the principles of standard procedures to ensure regional synchrony in agricultural development. The SPGRC works to ensure that there are common procedures used by all Member States in the management of community genebanks for the benefit of the region's community of researchers, farmers and other users of the same resources. These guidelines are the first step in ensuring that the SADC region have common guiding procedures in the community management of plant genetic resources for food and agriculture for economic development and for the benefit of all.

The guidelines are premised on the principle that the central governments are the custodians of all plant genetic resources of a country. This means that all plant genetic resources conservation undertaken by any organization in a Member State are conducted in partnership with the National Plant Genetic Resources Centres (NPGRCs) who are the focal points in the areas of plant genetic resources conservation in all the SADC Member States. It is hoped that these guidelines will also help in ensuring that the National Plant Genetic Resources Centres will help by ensuring that all the community based plant genetic resources conservation programmes conform to the national, regional and the global frameworks guiding the implementation of such programmes. The driving goal here is to ensure that the communities derive maximum benefit from the resources they conserve and also that the same resources are available to researchers so that they contribute towards plant breeding and hence improved national, regional and global food productivity for the betterment of the world population.

CHAPTER TWO

Plant Genetic Resources Conservation and Utilization Governance in SADC

2.1 Regional Coordination of Plant Genetic Resources conservation

The Southern African Development Community (SADC) regards agriculture as the main economic undertaking of the people of the region and a key enabler of economic development. SADC therefore supports all programmes within the agriculture value chains resulting in improved crop productivity and food and nutrition security for the region. Plant genetic resources conservation is recognised as the foundation of crop improvement in the food production value chain and is coordinated by the Food and Agriculture and Natural Resources (FANR) directorate through its institution, the SADC Plant Genetic Resources Centre (SPGRC). The SPGRC coordinates the promotion of conservation and sustainable utilization of plant genetic resources in all the SADC Member States. The point of entry or focal point into the SADC Member States for the SPGRC are the National Plant Genetic Resources Centres (NPGRCs) found in each of the SADC Member States. NPGRCs are also referred as National Gene Banks. National Plant Genetic Resources Centres, in most Member States fall under the ministry responsible for agriculture and food security although this may be different in one or two Member States.

2.2 The role NPGRCs in plant genetic resources conservation at Member State Level

The role of the NPGRCs in the Member States is to coordinate all the conservation and utilisation of plant genetic resources for food and agriculture. The NPGRC which is headed by a curator manages the National Gene Bank which is the Member State's national repository for all crop accessions occurring in the Member State and others from other regions of the world imported into the country for different research and strategic reasons. Most national genebanks in SADC Member States keep orthodox seeds of the main food crops of the country *ex situ* under low temperature conditions for long periods of times. There are other Member States that keep crop accessions as living clones in fields known as field genebanks or *in vitro* using tissue culture. This is so for vegetatively propagated crop species such as bananas, yam, sweet potato and ginger among other crop species.

In some SADC Member States, community genebanks have been established and have performed well. These programmes have been spearheaded by Non-Governmental Organizations working hand in hand with NPGRCs who are the lead government entities coordinating PGR conservation in Member States. Be they community seed genebanks or *ex situ* on farm plant genetic resources conservation, these are all implemented through the guidance and direction of the NPGRCs. This is a clear indication of the SADC Member States governments' commitment to ensuring success in plant genetic resources conservation by partnering other players in the same area.



Figure 2.1: The SADC Secretariat (SPGRC) help Member States with coordination of PGR Conservation

2.3 Possible governance approaches at community genebank level in Member States

There is variation among and within Member States with regards to the prevalent organizational arrangements existing among farmers. Although there is acknowledgement of the role urban farmers play in agriculture and resultantly, conservation of plant genetic resources, in SADC member states, most of the farming is done by rural and peri-urban farmers whose livelihood is dependent on agriculture. These farmers are settled in villages which are traditionally led by village heads and headmen. Within each village there could be different development oriented arrangements such as the village development committees (VDCo) or Ward Development Committess (WDCo) as well as District Development Committees (DDCs). This prevailing traditional arrangement which is common in member states like Zimbabwe, Zambia, Tanzania and Malawi make it easy for the organizers of community based plant genetic resources conservation programmes to superimpose on these village, ward and district based organisational structures with the village head or development chairpersons assuming the leadership role and become the key coordinators of the conservation programmes.

The other approach would be to set up new leadership arrangements for the purposes of conservation of plant genetic resources. These leadership roles can be based on different considerations but chief among them should agricultural development. There are many other agriculture development projects that take place in member states and are run collectively in many agricultural set ups. These projects are either run through the support of central governments by their development programmes under the ministries of agriculture and food security and non-governmental organizations through their various organizational arrangements in communities. Whether the programmes are run through the central government or non-governmental organization initiative, it is key to note that they are all these arrangements should include the local agriculture extension workers to help with organization and technical support at all levels. The plant genetic conservation specialists from the NPGRCs then work through the local agriculture extension workers to coordinate the plant genetic resources conservation activities taking place at community level.



Figure 2.2: NPGRCs and SPGRC staff should be involved in the set-up of community genebanks

We have summarised all these possible arrangements and give the advantages associated with each.

1. **Working through village, ward and district development committees**

These are already constituted committees with all structures in place. What is needed is only training them on the new thrust of conserving plant genetic resources and how to go about it. In most cases, these committees have land reserved for development purposes and such land can be deployed for building community genebank structures. It is usually easy to get local people buy-in and cooperation if the projects come through established development oriented structures.

2. **Working through the Village Head, Headmen and Chiefs**

In most communities, residents respect their traditional leaders who are always helping them solve their day to day social challenges. They tend to listen to the Village Head and their Headmen and traditional chiefs. In some countries, village heads, headmen and local chiefs run local food security programmes and have emergency food reserves established to support vulnerable communities in times of stress. One such scheme is the Zunderamambo scheme done in Zimbabwe and run through local chiefs. Working with traditional leaders can be very easy because the traditional leaders can easily rally their communities to a developmental project. Land in most of the SADC member states is under the custody of traditional leaders who can allocate some portions for plant genetic resources conservation programmes. Even collection of accessions can also be very easy as the local chief can ask their subjects to bring to the genebank seed samples of different crop species they are using. It can be even more of a benefit if the community genebank is established at the residency of the local traditional leader. Rosters of community members to come and work in the genebanks can also be drafted and community members rotate duties of seed processing and other genebank tasks. Local development committee members can help in the overall coordination of the project with the traditional leaders playing an oversight role. All these programmes would be run through the technical support of agriculture extension workers who are paid by the government and are based communities at ward level. The agriculture extension workers easily connect with the NPGRC officers who have the overall oversight of the all plant genetic resources conservation programmes in the member states.

3. **Working through the NGOs**

Most of the successful community genebanks in the SADC region have been spearheaded through the efforts of non-governmental organizations. One such NGO that has works in Zambia and Zimbabwe is the Community Technology Development Trust (CTDT) which has established many viable community genebanks. Malawi, Tanzania, South Africa and Eswatini also have NGOs doing work in the same area although the projects are still growing. NGOs have the advantage that they have professionals who work directly with communities and have clearly set goals that have to be achieved within specified times. They also have resources to be used in the conservation projects. In many cases, NGOs set up committees to run the community genebanks and these committees made up of local community members work hand in hand with the government agriculture extension workers and the NPGRCs officers from the member states. Land for the establishment of the project can either be purchased by the NGOs or be donated by the government when necessary requests are made through appropriate channels in member states. Where NGOs are involved, it has also been seen that viable local seed multiplication and exchange among farmers has been undertaken.

2.4 Sharing of accessions kept in community genebanks

Where there are clearly established leadership structures managing the community genebanks, it should be relatively easy to control the movement of conserved material from one community to the other and from one member of the community to the next. Because the community genebanks have governing committees it is expected that the movement of accessions in and out of the genebanks is approved by the local committees. This is not to take away the right of community members to share their accessions among themselves but once the accessions have become part of the collective germplasm of communities, then control of its movement has to be instituted through the authority of established committees. The guiding principle should be that the communities that maintain germplasm should benefit from its use especially when it is used by the stakeholders who are not part of the communities. This is the popular principle of benefit sharing of the gains obtained from the use of the accessions that have been managed by communities from one generation to the next.

2.5 Summary

The governance approach for community genebanks is not cast in stone but depends on the situations prevailing in each member state and the type and level of organization resident among the members of community involved. It is, however, noted here that the SADC member states communities have a traditionally organised community set up that can be taken advantage of when community plant genetic resources conservation programmes are set up to gain support and commitment of members of the community. Development oriented arrangements already exist in communities of Member States and these can also be used as avenues for setting up community led plant genetic resources conservation projects to make it easy to work with community members. In addition, NGOs who have professional staff members can also partner with the local communities to set up community genebanks. All these initiatives should, however, endeavour to work with the local agricultural extension workers so that they get technical support. In addition, National Plant Genetic Resources Conservation Centres (NPGRCs) have to be part of the conservation programmes as they have the overall national coordinator role for plant genetic resources in all Member States. The NPGRCs will ensure that all the conserved plant genetic resources have to be duplicated at the national genebanks for ultimate long term conservation and documentation using modern scientific approaches.

CHAPTER THREE

Managing community genebanks

It has already been recommended that the community genebanks be run by committees involving local community members. This does not only ensure that they own the project but also empowers local communities with leadership and coordination roles. When thinking of management of community genebanks, it is important to consider the following key issues.

a) *The crop species to be considered under the community conservation programme.*

It is recommended that the species conserved be those species that from the food basket of the conserving community. These species must be commonly available in the community and should grow easily under the prevailing climatic environment. It therefore means that the species have been passed on from generation to generation and are now well adapted to the local conditions. Local farmers should be proud to be associated with the species involved and therefore should be having stories associated with these accessions to tell. These could be stories of the species introduction and even taste and common uses of the species. Also to be stored are endangered crop species that are threatened by extinction for whatever reason.

b) *Documentation of the species included in the conservation programme*

Any knowledge that is not put down in writing and preserved dies with the holder of the knowledge in his/her mind. It is, therefore, important to document all the knowledge available about every accession that is collected. The documentation should include even local names of the species and cultivars, where it came from and who brought it, conditions of perfect growth of the species as well as the nutritional value attached the species. Records of distribution and even deposits at NPGRCs should also be kept in the community genebanks as well as information about sharing of the accessions with local and international researchers if any.

c) *Intended use of the conserved crop species*

The use to which the conserved plant genetic resources will be put determines how the genebank is governed. It is generally believed that the community genebanks help the local communities as sources of seed for locally occurring landraces. The accessions kept are also expected to be shared with researchers for use in crop improvement programmes and also deposited at the National genebanks for long term storage.

d) *Available skills to coordinate the conservation work*

Although community members are able to conserve seeds of different crop for their own use, most do not know how to do conservation of these same seeds at a large scale. They also do not know how to ensure long term viability and genetic purity of the same accessions. Even matters of negotiating with other players and users of the same accessions can be a challenge hence they need guidance from professionals who are technically knowledgeable in the same area of plant genetic resources conservation. To ensure that



Figure 3.1: *Coco der mer has sentimental attachments to Seychelles communities hence its enhanced conservation*

the communities handle their projects well and their benefit, there may be need for some advisors to be available to guide the operations of the community genebanks.

After consideration of the above scenarios it is recommended that the committees should include advisor(s) who can be from the NPGRC, Government Extension Officer or an expert from the NGO coordinating the plant genetic resources conservation works in addition to community members. This is how the Community PGR Conservation committee composition can be considered to be like but not limited to this proposition.

1. PGR Conservation and Utilization Advisor

Most communities lack in the knowledge of PGR conservation and require expert guidance on how to handle the project. There is therefore for a qualified advisor to be providing overall advice on the activities of the community genebanks. This person can be from the NPGRCs or Government Agriculture Extension Department or the NGOs supporting the initiative. The three can be included in the committee so that matters can be effectively handled from different perspectives for the benefit of communities.

2. Chairperson – Chairing meetings and guiding activities

This is the overall community team leader for the project. Where the approach is to use traditional arrangements already in existence, then the village head or headman or chief can be the chairperson. The chairperson can be elected where other approaches are chosen but the person should be able to direct activities.

3. Member Responsible for Collections

Collection of plant genetic resources from the community members can be one of the very tedious tasks to be done. There is therefore need for a member who does coordination of the collection process to ensure that the genebank ends up with accessions that truly represent the food crops occurring in the community. The accessions have to be in sufficient quantities as is required by the genebank rules set by the community and also for duplication to the national genebank.

4. Member responsible for seed processing and multiplication

Once accessions have been collected and brought to the community genebank, they have to be processed following the seed processing guidelines. There must be a member who is responsible for coordinating these activities. Some accessions also come in small quantities needing multiplication. The same member should be able to work with community members in the multiplication of the accessions with low seed quantities and those that would be losing viability due to long term storage and other reasons.

5. Member Responsible for documentation

Maintaining records of accessions kept is not an easy task but it has to be done. There must be a member who is trained on how to document the accessions and eventually ensure that all the accessions collected are properly documented with required information of where the accessions can from, the name of the supplying farmer, species, use of the accessions and other beneficial characteristics of the accession. Even accessions that are exchanged with other communities also have to be recorded as well as the seed borrowed by farmers for personal use.

6. Member responsible for marketing and distribution

There is the adage that “genebanks are not museums”. Stored accessions have to be used for the benefit of all communities, so accessions will be shared with various stakeholders. The member responsible for marketing the works of the genebank can also act as the spokesperson of the project. The person should be able to recruit other members to join the project by communicating effectively about its benefits. Farmers should be able to get seeds of land race varieties easily from the communities under different arrangements so that they see the benefits of the facility.

CHAPTER FOUR

General technical considerations when handling accessions in seed genebanks.

Seeds are living organisms requiring delicate handling to ensure that they remain viable and useful to mankind. For seeds to remain viable, consideration must be made for the environment where the seeds are stored and also the state at which the seeds are handled from the time they are managed in the field to the time they are catalogued in the genebank. These are the key technical considerations to be factored when conserving plant genetic resources:

1. *Seed purity*

Seed kept in the genebank has to be physically a genetically pure as a standard rule. Physical purity simple means freedom from extraneous material such as seeds of grass, stones of any other dead matter. Genetic purity mean that the seed has to be relatively uniform when planted in the field notwithstanding the knowledge that the accessions being handled are landraces that may not be completely uniform and stable.

2. *Freedom from pests and diseases*

Pests and diseases compromise the quality of seeds and shorten their lifespan by reducing their viability. All accessions to be stored in the genebank must be free from diseases and pests. At least common diseases and pests that can be scanned by the naked eye and screened using basic methods that can be conducted at the local genebank should be screened against.



Figure 4.1: Seeds with severe insert attack should not be kept in the genebank

3. *Seed should be viable and be able to germinate easily*

Viability of seed is negatively affected by a number of factors which include prior storage conditions of temperature and moisture, age of the seed at harvest, moisture content at the time of storage, the level of pest and disease infestation among other factors. Seeds kept in the community genebanks must also be viable and basic tests to ensure viability must be conducted.

4. *Availability of information accompanying the accessions*

It is encouraged that information about accession be collected as accessions are collected for conservation in genebanks. Information like name of cultivar, the species, location of collection, name of farmer from which it was collected, year of collection, soil conditions from which it has been grown, nutritional value, pest and disease resistance as well as the use to which the accession is placed in the community needs to be included. In addition, information about any cultural attachments communities attach the accessions has to be documented as well as it forms part of the indigenous knowledge systems attached to the variety. Information is very important as it guides the future use of the accessions in solving challenges faced by mankind.

CHAPTER FIVE

Collection of accessions to keep in the community genebank

5.1 Sources of accessions for keeping in the genebank

Community members have to ensure that accessions occurring in their community are well represented in the community genebank. Since the genebank is a community project, leaders have to make effort to educate the communities members on the need for them to bring accessions to deposit in the genebank. Under community genebank management, accessions can be collected in the following way:

a) *Voluntary farmer deposits*

Local farmers can do walk in deposits if they are educated on the importance of conserving their germplasm and trained on how to collect seed samples of accessions they intend to deposit at the community genebank.

b) *Conducting collection missions*

The committee member tasked with the responsibility to collect accessions can partner with other members of the community and conduct local collection missions. This usually is done towards the end of the cropping season when crops are still in the field. Or when harvesting is just beginning. Collectors can visit the community members' homesteads to collect whatever accessions they find and record all information available about the accessions. Agricultural extension workers and the NPGRC officers can be part of the collection missions especially during the early stages of the establishment of the genebanks.

c) *Collections at seed fairs, agricultural shows and field days*

Accessions can be located and collected at community gatherings such as field days, seed fairs and agricultural shows where farmers display different cultivars of crops they grow in the communities. These events can also be good platforms to gather information about the different cultivars occurring in the farming communities.

d) *Deposits by other stakeholders*

This is when some stakeholders who visit the communities for different reasons decide to share their plant genetic resources with local communities. The accessions shared can be having all the required information but in many cases the information about this material is scanty. Such accessions can still be accepted in the genebank as they add to the crop genetic resources wealth of the community.

5.2 How to take samples for deposit in the community genebanks

It has been recommended earlier on that the collecting team be made up of members from the NPGRC or the Agriculture Extension Officers or both especially during the initial stages of the community genebank establishment so that they equip the community genebank members with skills to conduct future collections. However, the composition of the collecting team depends on the available resources to support the collectors and the skills and knowledge needed during the collection expedition although collection in local community set-ups may be relatively cheap as local players may not need any stipends when undertaking collection missions. A maximum of four members should be enough for undertaking collection missions. The key factors to consider are that the seeds collected must exhibit vigour, free from pests and diseases and be in sufficient quantities as to allow for storage at the community genebank and duplication at the NPGRC.

While it may be difficult to see seed pathogens by the naked eye, with experience, collectors end up being able to select the healthy seed samples from the farmers' collections. It is, therefore, very important to consider the health of the accessions that are being collected. Selected plants must be generally showing vigour and freedom from common pests and diseases. It may be very difficult to employ scientific sampling methods when working with farmers because the seed involved is usually in small quantities but when taking samples, collectors must consider random sampling across the field. In most cases, it is the farmers who decide what quantities they are prepared to give out to collectors as they may also be not having enough for their home use. Samples from granaries should be as representative as possible by using simple sampling tools and techniques. Plants close to the pathways, roads and frequently visited areas must be avoided and a number of seeds, plants, panicles and fruits must be collected.

CHAPTER SIX

Choice of crop species or varieties for keeping in genebanks

Community genebanks are created mainly to conserve germplasm occurring within a specific community or area. The area involved can be a village, ward, district, province or prefecture depending on the area covered by the genebank established. It is generally assumed that community members know the crop species that are important for their survival and are thus able to prioritise crops to be conserved for the benefit of their communities. Selection of crops to be conserved in community genebanks should therefore be left to the members of the communities in which the genebanks are established through the coordination of their local leadership although the experts can give advice whenever there is need especially when the community members want to handle species they are not conversant with.



Figure 6.1: Breadfruit saved the Seychelles community during the second world war. Each household is encouraged to have a breadfruit tree.

In identifying and choosing accession species to handle, communities must also consider such important factors as the rescuing of crop species that are in danger of extinction. Sesame is a very nutritious crop in many parts of Southern Africa but it has disappeared from many communities. Those who want to re-establish it find it difficult to find seeds for sesame. Such crop species need to be restored and also kept in community seed genebanks for the benefit of local communities. Crops of cultural value also need to be considered for storage. These are crops of cultural and sentimental value to communities. One example of a very important plant in Seychelles is the Coco der mer. In mainland Southern Africa, Sorghum is very important in Botswana and some parts of Zimbabwe and Zambia for example. There are many crop species falling in this category that can be conserved.

Under any basis of conservation, seed of the crop species must be easy to find and easy to maintain under local conditions. The seeds should also be easy to keep for long periods of time without losing viability.

CHAPTER SEVEN

Documentation of stored germplasm

7.1 Nature of information to be collected and recorded

Any information that is not put down on paper dies with the person holding it in their mind. It is, therefore, encouraged that all the accessions collected and stored in community genebanks be well documented. The general principle is that all the information known about the accessions held should be put down on paper from scientific knowledge to the indigenous knowledge systems. Common books can be used to store the information or forms can be designed where all the important parameters about the accession can be recorded. Information collected must generally synchronise with that which is also collected at the NPGRC level. Here are some parameters which may be recorded:

1. Local name of the variety.
2. Farmer who provided the accessions.
3. Name of the area of collection.
4. History of the accessions cultivation in the area.
5. Scientific name of the variety.
6. Agro-ecology.
7. Use of the variety in the community.
8. Current availability status (available or extinct).
9. General characteristics (Morphological).
10. Cultivation method and times (field crop grown in summer or winter).
11. Extent of cultivation in the area (i.e. crop distribution).
12. Drought tolerance score.
13. Pest and disease tolerance status if known.
14. Nutritional value.
15. Cultural or religious value.

This list is not exhaustive. Any information that the community members think is important can be included to make the data set as concise and exhaustive as possible.

7.2 Community on-farm characterization and assessment of accessions

The beneficial characteristics of accessions occurring in a community and stored in community genebanks are supposed to be known. Common features are easily given by the community members themselves having worked with the accessions over time. Botanical characteristics are usually not known in these communities as there are of no interest to the communal farmers hence require the intervention of trained specialists. The NPGRC members of staff and the Government Agricultural extension officers can intervene as specialists with knowledge of how to conduct the characterization process. The initial approach can be to include the local community genebank leaders and train them on what information is to be recorded. Data collection sheets have to be prepared in a very simple format and with simple terminology for use at community genebank level. It is recommended that the forms be completed mainly through the tick box approach rather than writing to make it easy for the less educated members to understand it. Inserting diagrammatic

illustrations of what is wanted and/or pictures can make it very easy for the inexperienced members to follow. Unless the species involved is not covered, it is recommended that the botanical crop characterization be based on the Bioversity descriptors to make the data obtained uniform and standard across the region.



Figure 7.1: Community PGR conservation programmes empowers members with seed security

Basic field assessments of the performance of crops can be done in farmers' fields to establish potential yields of different accessions under local growing conditions. The assessment should be simple and non-complicated only meant to get an idea of performance. Such information can however be found through some farmers who might have done the assessments at an early stage. All the recorded information should be safely kept and duplicated at the NPGRC. It is highly recommended that pictures be inserted to illustrate points where it is possible.

CHAPTER EIGHT

Regeneration and multiplication of seeds in community seed genebanks

Over time, stored seeds lose viability and need to be rejuvenated for them to remain useful to mankind. We have also indicated earlier that in most cases during collection, the collectors are given seeds of accessions in very small quantities by farmers requiring multiplication for them to be put to other uses. Seeds that are threatened by loss of viability require that they be rejuvenated to restore their viability and those in smaller quantities need to be multiplied for them to be duplicated to the other storage facilities like the NPGRCs or for them to be shared with potential users. Rejuvenation and multiplication of accessions can be done at the same time as they can be said to be one and the same activity. The difference only comes based on the reason either of the activity is being done.



Figure 8.1: Seed multiplication is an important activity at a genebank. This is a layout of multiplication taken at the Eswatini NPGRC.

Where the community genebank has land, regeneration and multiplication of accessions can be done at the genebank through the guidance of the managing committee. The other approach is to engage the farmers who are members of the community genebanks to do the multiplication and regeneration. Whichever option is chosen, those participating in the exercise should be thoroughly trained on what is done to avoid mixing accessions or contaminating them through pollen admixtures or cross pollinations. It is, therefore, recommended that the experienced officers from the NPGRCs, NGOs, or agricultural extension officers get involved during the early stages of the regeneration and multiplication processes to equip the community members with the skills and knowledge of how to go about the business. SPGRC developed guidelines for regeneration and multiplication of accessions which can be used as a guide on how to technically carry out the processes.

CHAPTER NINE

Community seed genebank structures and seed packaging facilities guide

9.1 Genebank structures

A lot of questions have been raised about the ideal building or storage structure to use as a community genebank. Some people have suggested modern structures with electricity and the ability to support fridges for storing seeds for relatively longer periods of time. Our recommendation on the best structure to use as a community genebank is that the building is that the used structure varies from community to community and from country to country depending on the level of development of the concerned community. What we have found out from our experience is that most communities lack resources to build modern structures to use as community genebanks. That should not stop the communities to build their own locally conducive building for storing their seeds using locally available material and resources. The structures should never be complicated to deter their erection. Pole and dagga round huts thatched with grass; simple grass thatched brick and mortar huts, or the zinc thatched simple buildings can still be used as community genebanks depending on the resource capabilities of the concerned communities.

We have, however, come across modern structures built through support from NGOs and other donors in some Member States. This is commendable but we encourage communities not to be deterred by a desire to have modern structures as community seed genebanks. Simple shelving can be done inside the buildings to hold seed packages. The shelves can be done using metal, wood or can just be moulded along the walls using brick and mortar and plastered with clay.



Figure 9.1: Community genebanks can be constructed using simple and readily available resources. This genebank in Shewula, Lubombo District, Eswatini was erected using stones

9.1 Seed packaging for storage in community seed genebanks

Seed storage in communities has been an undertaking of many families over time. Different utensils have been used again depending on the modernization of the involved families and communities. Seeds have been found stored in calabashes, gourds, clay pots or wooden containers. Some seeds have been preserved using ash of specific trees or grass and it has helped preserve the seeds for long periods of times to the benefit of communities. With the advent of grass and plastic, we have also seen seeds stored in plastic, and glass containers, plastic bags as well as metal containers. We do not prescribe the storage packets for use in community genebanks but recommend the use of cost effective and affordable material that does not increase the cost of running the community genebank to levels unaffordable. Where aluminium foil packets are found they can still be used.



Figure 9.2: Simple packaging material can also be used to keep seed in community genebanks

CHAPTER TEN

Conclusion

Community genebanks are an important component of the national plant genetic resources conservation programme. They are important because their management is inclusive of the communities that look after plant germplasm and hence know the beneficial characteristic of the germplasm found in their locality. Community genebanks can be managed by the local communities guided by the NPGRCs, and supporting NGOs. There are a number of technical considerations when community genebanks are established but the key point to consider is that the seeds stored in community gene banks should be viable and used to benefit the communities in which the genebank is established to serve. It is advisable that the accessions stored in community genebanks be duplicated at the national genebanks for even longer term storage. Community genebanks are a form of community or rural farmer empowerment hence should be promoted in Member States.



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