

# **CONSERVATION STRATEGY FOR CROP DIVERSITY COLLECTIONS IN THE SADC REGION**

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## Disclaimer

This document has been developed by the SADC Plant Genetic resources Centre. For more information about the network, see: [//www.spgrc.org](http://www.spgrc.org). The objective of this Strategy is to provide a framework for the efficient and effective *ex situ* conservation of the most important crop diversity collections in the Southern Africa region, and to promote the availability of these plant genetic resources for food and agriculture.

The Global Crop Diversity Trust (the Trust) provided support towards this initiative and considers the document, particularly those portions pertaining directly to the Trust's mandated areas of interest, to be an important input to the Trust's own planning and work. We expect the Strategy to continue to evolve, as appropriate, and for the Network to lead this on-going process.

The Regional Strategy is the strategy of the region. The Trust does not take responsibility for its contents or for the accuracy or completeness of the information contained in the document. Please direct specific questions and comments to the regional strategy coordinator mentioned in the document.

Global Crop Diversity Trust  
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## 1. BACKGROUND

The Southern African Development Community (SADC) comprises 14 member countries. These are Angola, Botswana, Congo DR, Lesotho, Malawi, Madagascar, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe.

The objectives of SADC as stated in Article 5 of the Declaration and Treaty of SADC include to:

- Achieve development and economic growth, alleviate poverty, enhance the standard and quality of life of the people of Southern Africa and support the socially disadvantaged through regional integration;
- Achieve complementarity between national and regional strategies and programmes; and
- Achieve sustainable utilisation of natural resources and effective protection of the environment.

Agriculture is the main source of livelihoods and development in the region with small-scale farmers maintaining large numbers of landraces of different crops for most of agricultural production.

The countries that constitute the SADC region extend from a few degrees north of the equator to 35°S thus inclining the region to a wide range of agro-ecological conditions. Altitudes range from sea level to well over 5000 metres above sea level while the climate ranges from arid in the Kalahari Desert to tropical humid environment in the Congo Basin. The Southern tip of the region has temperate climate while a number of mountains have alpine conditions. The region experiences cyclic climatic extremes in some areas that result in serious losses of crops and livestock. In the last decade, a number of natural disasters were experienced, particularly droughts, floods, pests and diseases.

The region has a wide range of ethnic groups that contribute to a corresponding wide range of cultures. This cultural diversity has in turn contributed to the development of crop landraces with specific characters that suit their cultural uses.

The wide range of agro-ecological conditions and cultural diversity in the region as well as interaction with other cultures from outside the region has led to existence of numerous landraces adapted to specific environments and for specific uses in different cultural setting. Many of the exotic crops that are now very important for food security were introduced to the region during the early explorations, centuries ago. Examples of introduced crops that are now well adapted as major crops include: maize, beans, wheat, cassava, sweet potato and rice. These introductions have been selected to suit indigenous uses over time, thus creating secondary diversity in them. This secondary diversity is now very important for further development of the crop.

## 2. The SADC PLANT GENETIC RESOURCES NETWORK (SPGRC)

The SADC Plant Genetic Resources Centre and National Plant genetic Resources Centres in each member state (except DR Congo and Madagascar) make up the SADC Plant Genetic Network. While efforts are underway to establish and incorporate DR Congo in the network activities, Madagascar, though member of SADC is linked with the Eastern African Plant Genetic Resources Network (EAPGREN).

### 2.1 Objectives and Functions

In 1986, the SADC members agreed to initiate a plant genetic resources programme that led to the establishment of SADC Plant Genetic Resources Centre (SPGRC) in 1988 and subsequently National Plant Genetic Resources Centres (NPGRCs) in the member countries forming a network of genebanks. The functions of SPGRC are stated in Article VI of the Memorandum of Understanding Establishing the SADC Plant Genetic Resources Centre. The functions of the SPGRC at the regional level are to:

- hold the base collection of the SADC member states;
- maintain and manage medium to long-term storage facilities for active collections of the member states;

- arrange and provide for the regional collections to be safely duplicated at SPGRC and at the Svalbard Global Seed Vault in Norway, to ensure a safe backup;
- make available in accordance with Article 15 of the International Treaty for Plant Genetic Resources for Food and Agriculture (ITPGRFA), on all PGR collected and/or maintained at the SPGRC or anywhere in the region under the genetic resources programmes, national or regional, to all *bona fide* users, nationally, regionally or internationally;
- acquire and exchange with NPGRCs relevant plant germplasm;
- develop, maintain and manage the Regional Central Accession Database for the indigenous PGR of the member states - *ex-situ* as well as *in-situ*;
- co-ordinate the inventory, collection, characterisation, evaluation, rejuvenation and multiplication of indigenous genetic resources material of the member states;
- co-ordinate the evaluation and documentation of introduced exotic PGR material in the member states;
- maintain and manage a medium and long-term store for such introduced exotic plant genetic resources material as agreed to be of common interest for the member states;
- keep records in a Regional Central Database of such introduced exotic plant genetic material as agreed to be of common interest for the member states;
- publish a SADC Plant Genetic Resources Newsletter;
- prepare and issue catalogues of PGR available from or obtainable through the SPGRC;
- organise and conduct meetings and training activities in PGR.

The functions of the SPGRC at national level through NPGRCs by consultation or by appointment are to:

- gather, through exploitation and collecting expeditions carried out in the different ecological zones of the countries, information and material of PGR, of endemic and indigenous plants and exotic plants with a possible national evolution history, which are cultivated or used, or with a potential for cultivation or use, together with wild relatives of such species, and any species threatened with extinction;
- characterise, evaluate, rejuvenate, multiply and document indigenous and exotic plant genetic resources material;
- hold short term active collections of indigenous or exotic plant genetic resources material;
- manage the *in-situ* conservation, reserves and field genebanks;
- work in close collaboration with national plant breeding institutions for effective and sustainable use of PGR.

## **2.2. Organisational Structure**

NPGRCs are the focal centres for conservation and sustainable use of plant genetic resource in each member state. NPGRCs are linked internally with parent ministries in their respective countries as well as the SPGRC Board, whose members include chairpersons of the National Plant Genetic Resources Committees (NPGRCComs). The NPGRCs also have access to the SADC National Committees in their respective countries. NPGRCComs are made up of scientists from National Agricultural Research Systems (NARS), educational institutions, parastatal bodies, non-governmental organisations (NGOs) and farmers. The main roles of the NPGRCComs are to ensure that PGR activities at national level are inclusive and coordinated and linked up with SPGRC activities. This set up provides ample opportunity for integrating local and regional agenda into the network programme and to be visible in the region.

The SPGRC is an organisation under the Directorate of Food Agriculture and Natural Resources (FANR) of the Secretariat of SADC. The SPGRC has a Board whose functions include:

- developing general policy aspects of PGR in SADC;
- ensuring high scientific and technical level of work in the SPGRC network;
- advising and supporting SPGRC in scientific, technical and administrative matters connected with genebank operations;
- approving and recommend annual work plans and budgets to the SADC secretariat;

The network has Regional Crop Working Groups established in collaboration with a wide range of institutions from the region to assist SPGRC in formulating strategies, priorities for *ex-situ* and *in-situ* (including on-farm) conservation and setting up standards for handling of plant genetic

resources. Members of these working groups consist of scientists selected from within the SADC region. The following RCWGs have been established:

1. Cereals and Grain Legumes
2. Forage and Fodder
3. *In-Situ* and Under-utilised Plants
4. Vegetables
5. Vegetatively Propagated Crops
6. Fruit and Nut Trees
7. Oil Producing Plants

Two more RCWGs for Ornamental Plants and Medicinal Plants are due to be formulated in 2007/08.

SADC is organised around institutions that include:

- *The Secretariat* – this is the principal executive institution of SADC, which is responsible for strategic planning, co-ordination and management of SADC programmes. The Food Agriculture and Natural Resources Directorate (one of the four at SADC Secretariat) is responsible for activities of the SPGRC network.
- *SADC National Committees* - these Committees are composed of key stakeholders from government, private sector and civil society in Member States to provide inputs at the national level into the formulation of regional policies, strategies and can initiate projects.
- *Standing Committee of Officials* - consists of one Permanent/Principal Secretary per member state and is the technical advisory committee to Council.
- *The Council of Ministers* - consists of Ministers from each Member State and is responsible for overseeing the functioning and development of SADC and ensuring that policies are properly implemented.
- *The Summit* - made up of Heads of State and/or Government as the ultimate policy-making institution.

### 2.3 Funding

A 20-year programme was initiated in 1989 with donor funding from the Nordic countries (Denmark, Finland, Iceland, Norway and Sweden) and SADC member countries. Initially, it was agreed that donor funding would be decreased gradually from the 11<sup>th</sup> year so that after 20 years, SADC would fully fund the programme. However, following changes in the contribution from Nordic donors, SADC member states started contributing to the programme from the 6<sup>th</sup> year of the project. Currently, SADC is providing 90% of the annual budget and will fully fund it by 2009. The Nordic Gene Bank (NGB) was appointed as a consulting partner to the project. NGB has also been involved in capacity building and providing advice on a wide range of issues affecting the network.

The NPGRCs are funded by their respective national governments and bilateral funds from donors and for a few activities funding is made available from the SPGRC regional budget. Apart from national governments contributing to the annual operation budget of these centres they also meet the cost of salaries, statutory allowances, overheads such as water, electricity, security, social services, maintenance of buildings and equipments. Countries differ in their level of support given to NPGRC from their local resources (Table 1).

Table 1: Annual gross expenditure from internal funds in NPGRCs in US\$

Country	Annual gross expenditure in US\$				
	2001	2002	2003	2004	2005
Angola	NA	NA	NA	NA	
Botswana	32129	34824	19046	21535	46000
Congo DR	NA	NA	NA	NA	
Lesotho	24543	30488	34417	43139	50541
Malawi	23755	23855	23016	24877	29146
Mauritius	NA	NA	NA	NA	
Mozambique	NA	NA	NA	NA	

Namibia	78496	83766	92133	91757	92199
South Africa	NA	NA	NA	NA	
Swaziland	31050	33570	39000	43000	48000
Tanzania	23106	33644	74891	85206	99656
Zambia	27310	13100	18391	19027	21723
Zimbabwe	14525	5000	3750	828	14568

**Note:** NA = Not Available or Inaccessible

Funds for running the SGPRC as a regional centre are currently obtained from contributions made to SADC by member States and from donors but the latter's contributions will end in 2009 and all running costs will be borne by SADC Member States. The major donors for the network are the Nordic countries (Finland, Iceland, Norway and Sweden contributing directly to the regional programme while Denmark supports the programme indirectly through contributions to agricultural research in Mozambique and Tanzania). A number of small grants have also been obtained from other donors for specific projects. A large part of the SPGRC recurrent budget is so far directed to maintaining the base collection, documentation and capacity building.

#### **2.4 Management of Collections**

The collections held by SPGRC are for long-term conservation while those held by NPGRCs are maintained under medium to long-term conditions depending on the kind of facilities installed. The network uses internationally preferred standards (Bioversity Genebank Standards). Materials are dried to moisture contents below 7% at temperatures between 15 – 20°C and relative humidity of around 15%. Most NPGRCs use cabinet or chest freezers for seed storage at sub-zero temperatures. Heat-sealed aluminium foil packets are used for packing seed. Custom made seed driers are used by the network.

Materials without sufficient seed for active and base collection are multiplied in the country at selected sites that have environmental conditions close to where they were collected. Some multiplication is also done at SPGRC (where there are irrigation facilities to supplement water requirements in cases of droughts) for NPGRCs. The viability of the seeds kept in the collections is constantly monitored through germination tests and regeneration done appropriately. There is a constant effort to characterise all materials in the collection morphologically. For some crops about 30-40% of the accessions have morphological characterisation data. There are however some species that have not been characterised at all due to limited expertise and capacity. In a few cases, molecular markers have been used. Efforts to acquire the capability to do more morphological characterisation work are being stepped up in the network.

The network has standardised documentation and information handling through the development of the SPGRC Documentation and Information System (SDIS), which has been installed at all the NPGRCs (except DRC and Madagascar) and regular updates are sent to SPGRC. The SPGRC website <http://www.spgrc.org> provides information on the network. Efforts are being made to upgrade the SDIS into being web-based, and to enable 'real-time' updating and access. But this will have to go hand-in-hand with provision of access to Internet for the NPGRCs that are not yet connected.

Distribution of materials takes place in the NPGRCs but materials can also be requested through SPGRC.

A number of NPGRCs maintain field collections of plant species that are vegetatively propagated or are more conveniently managed as live plants rather than seed. Many of the field genebanks are established on adequate and suitable land in stations where plant breeders have access to the materials on regular basis and in a few cases, share responsibilities in the day to day to management. Diversity of most of such collections has not been assessed. .

Funding is a major limitation in the maintenance of these genebanks due to the competition with research projects that have immediate impact. The major concern is the maintenance of healthy accessions and ability to respond to requests for materials from the collections in a reasonable time. Some genebanks need improvement of infrastructure, particularly irrigation facilities and fencing against animals.

## **2.5. Achievement and Challenges of the Network**

The network has made a number of achievements over the 18 years of existence and faces many challenges ahead. The network has political and financial support from the member states making it possible to make long term plans as well as being able to work together coherently.

### 2.5.1. Global Policy Awareness

The SPGRC programme made it possible for the region to recognise the role of global policy instruments affecting plant genetic resources and to facilitate the effective participation of the SADC region at international fora. Examples include the revision of the FAO International Undertaking on Plant Genetic Resources, which has now culminated in the adoption of the International Treaty on Plant Genetic Resources for Food and Agriculture. Currently, 10 countries (Angola, DR Congo, Lesotho, Madagascar, Malawi, Mauritius, Namibia, Tanzania, Zambia and Zimbabwe) have ratified or acceded to the Treaty while the remaining are Botswana, Mozambique and South Africa.

The network has taken additional effort to analyse the implications of the Standard Material Transfer Agreement (SMTA), which is under the development by the Commission on Genetic Resources for Food and Agriculture. The analysis has revealed that whatever the outcome of the current consultations, genebank managers will find themselves involved in one way or another in the process of making the SMTA effective. Therefore, genebank managers have to be aware of the country's status with respect to the Treaty and recognise that materials of crops listed in Annex 1 are under the multilateral system if the country is Party to the Treaty. The central role of genebanks as holders of materials implies that they could be recognised as the official providers as well as recipients of materials in the multilateral system. To this end, the genebank managers need clear understanding of the obligations of the provider and recipient, an area that needs further capacity building for all NPGRCs.

Furthermore, the network through SPGRC has been actively involved in the discussions of various issues arising out of the Convention of Biological Diversity and the Trade-Related Aspects of Intellectual Property Rights (TRIPS) of the WTO by SADC member states, so that they could appreciate the obligations and implications of these instruments for conservation and utilisation of plant genetic resources in relation to agricultural development in the region. The major challenge is that a number of member states still don't have a strong legal framework due to limited capability to deal with such issues owing to low awareness among policy makers and within the scientific community as a whole, who would benefit by accessing funding and training opportunities from outside the region.

### 2.5.2. Coordination of Plant Genetic Resources Activities

The network has developed strong internal coordination mechanism with National Plant Genetic Resources Committees providing the lead at national level and the SPGRC Board providing the lead at the regional level. The diverse composition National Plant Genetic Resources Committees provides an opportunity for the NPGRCs to link well with other scientists and institutions in the country. The NPGRCs are linked to the National Agricultural Research Systems in their respective countries giving them wide opportunities for collaboration in all thematic fields. This form of collaboration is, however, hampered by limited communication facilities leading to limited exchange of information. In this era of globalisation, the demand for data and information is growing geometrically. It is therefore a big challenge for the network to find better and faster ways of making available the big volumes of information generated or received. Currently, there are efforts to connect NPGRCs to the Internet, which will enable timely and reliable access and updating of the SDIS that is due to be transformed to a web-based system against the current standalone.

### 2.5.3. Acquisition of Basic Facilities

Basic facilities have been acquired for the network as a whole such that it has been possible to maintain an acceptable minimum standard. Nordic countries are especially acknowledged for providing basic facilities that include SPGRC infrastructure and facilities for germplasm maintenance for NPGRCs. The network adopted the Bioversity International's (Bioversity) recommended standards of seed storage for the base collection and similar standards are being applied for the active collection under NPGRCs. However, maintenance of these standards requires constant review of the available information for crops that have no standard protocols and monitoring of

new technologies as they become available. This has been a challenge to the network, particularly because of inadequate laboratory facilities and inadequate funding for performing additional studies on the management of such materials.

#### 2.5.4. Training

The network has benefited from a training agenda that has resulted in building a team of competent and committed staff. An average of three people per country has been trained at the MSc. degree level in plant genetic resources management, mostly at the University of Birmingham through NGB scholarships. Others have been trained at other universities and colleges abroad and in the region. A number of these graduates are now working at the NPGRCs in their countries and others have been absorbed into the National Agricultural Research and Extension System. Many more people have also attended various short hands-on courses on plant genetic resources, most facilitated by NGB. Short practical courses have been carried out in various countries in partnership with local and international institutions. Specific courses have also been conducted targeting activities like regenerating cross-pollinated species like pearl millet and cucurbits, and management of traditional vegetables. Two short courses sponsored by NGB have been conducted to give an insight on data analysis which has proved to add value to conserved PGR materials. Despite all these achievements the network is challenged by a demand for a wider range of thematic specialists and high staff turnover at some NPGRCs due to increasing demand for their broad exposure to issues relating to biodiversity and livelihoods.

#### 2.5.5. Promotion of Indigenous Knowledge Documentation

The network has been promoting collection and documentation of indigenous and traditional knowledge, innovations and practices of local and indigenous communities that are relevant to the conservation and sustainable use of plant genetic resources. This knowledge is of tremendous value but is being lost rapidly. Through the NPGRCs, and the willingness of farmers, access to on-farm diversity and associated indigenous knowledge has been and will continue to be possible. SPGRC has also contributed significantly to the development of the African Model Legislation for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources and to its dissemination. The network still has to find ways of ensuring that the documented IK benefits the region while protecting the rights of those who developed and provided the knowledge.

#### 2.5.6. Awareness on Conservation of Plant Genetic Resources

The network has created awareness throughout the SADC region on the importance of, and the need to conserve plant genetic resources not just for immediate use but for future generations through various means, including national and regional workshops, calendars and Christmas cards, participation in shows and exhibitions and a regional newsletter, and currently a short video clip showing SPGRC activities is being prepared. Yet, there is need to address new issues all the time such as the effect of environmental disasters, economic constraints and the risks posed to *in-situ* resources by large scale introduction of exotic germplasm.

#### 2.5.7. Outlook

The development of the network has placed SPGRC in a good position to grow into a centre of excellence for broad areas of plant biodiversity and biotechnology, and in particular, plant genetic resources conservation and use. To this end, SPGRC will need to have access to qualified and experienced experts in various disciplines such as: botany, plant taxonomy and biosystematics, natural resources management, biotechnology, information systems, and bio-informatics. In addition to qualified personnel, SPGRC will have to ensure availability of a biotechnology laboratory and the necessary equipment (and field facilities), reliable communication and data analysis hardware and software, and a training facility. This approach will open a window for the network to use current methodologies for adding value to the information provided on the materials in the network as well as to have sufficient capacity to tap on the outputs of International Agricultural Centres and others.

As the end of the 20-year period approaches in 2009, SPGRC is compelled to find ways of sustaining and developing further the centre and the network activities. Therefore, an overall sustainability strategy has been developed and reviewed by the Board in which it is proposed to strengthen the links with FANR in the SADC secretariat and funding options are proposed to include outsourcing of supplementary funds such as competitive grants for both the Regional Centre and

the National PGR Centres. In the bid to get supplementary funds, the strategy proposes to work with both traditional and new donors. Mandates and roles of the regional centre as well as the national centres are also defined. The target is to allow SPGRC to gradually grow to the level where it will become a semi-autonomous institution within the SADC structure. The mandates for SPGRC as a regional centre will include maintenance of base collections for the region as well as play an advisory role on PGR policy development and harmonisation. The Board has also approved establishment of a regional Biotechnology laboratory at SPGRC that will be mandated to do molecular characterisation and training. National PGR Centres in the network will maintain active collections of materials collected from their countries and coordinate all in-country activities relating to PGR. This regional strategy for long term conservation of *ex-situ* collections focussing on activities that support crops in Annex 1 of the international Treaty on Plant Genetic Resources for Food and Agriculture, forms part of the overall sustainability of the network.

### 3. PROCESS FOR DEVELOPPING THE REGIONAL CONSERVATION STRATEGY

The development of the regional conservation strategy for the *ex situ* collections in the SADC region is coordinated by SPGRC. The first consultation with the network members was done at the SPGRC during Annual Technical Review and Planning Meeting in September 2004 and a second consultation took place at the technical meeting in September 2005.

#### 3.1 Coordination, people, countries and crops involved

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Regional Scientists at the Focal Organisation (SPGRC):

- Barnabas W Kapange, Senior Programme Manager (Documentation & Information)
- Thandie J Lupupa, Senior Programme Manager (*In-situ* Conservation)
- Lerothli L Qhobela, Senior Programme Manager (*Ex-situ* Conservation)

People consulted in the process: See Appendix 4

Countries involved (13): Angola, Botswana, Democratic Republic of Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe

Crops/species involved: Banana / Plantain, Beans, Brassica complex, Cassava, Chickpea, Citrus, Coconut, Cowpea, Eggplant, Finger Millet, Maize, Major Aroids, Pearl Millet, Pigeon Pea, Rice, Sorghum, Sunflower, Sweet Potato, Wheat, Yams and five Forages (*Trifolium rueppellianum*, *Trifolium semipilosum*, *Medicago sativa*, *Lolium multiflorum*, *Lolium perenne*, *Festuca arundinacea*, and *Andropogon gayanus*).

#### 3.2 Objectives of the conservation strategy

- i. To ensure safe and sustainable conservation of existing diversity of priority regional crops in the region
- ii. To make regional diversity available to farmers, crop improvement scientists and other users
- iii. To study genetic diversity in regional gene-pools to contribute to germplasm enhancement and rationalization of conservation approaches
- iv. To enhance regional partnerships in *ex-situ* conservation of PGRFA and ensure continuity of the programme activities in the region

### 3.3 Expected Outputs

- i. Diversity of regional priority crops conserved safely on a long-term basis
- ii. Genetic diversity of priority crops characterised, documented and used
- iii. Management of ex situ collections of priority crops improved
- iv. Capacity of the network to manage and optimise use of priority crop collections strengthened

## 4. OUTCOME OF THE CONSULTATION PROCESS

Based on the sustainability strategy, information was collated by SPGRC of existing collections of crops of Annex 1 of the ITPGRFA maintained in the region, with support from Bioversity International (Regional Office for SSA). Consultations with network members took place and country visits were done to clarify the process and collect additional information from Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, and Zambia.

During the Technical meeting in September 2005 the network members discussed and identified:

- Annex 1 - crops of greatest importance for the region and/or for specific countries
- important crops that have the region as primary or secondary centre of diversity
- the “most important” (size, extent/scope of diversity, wild relatives and other measurements as defined by network members)
- collections that meet the Global Crop Diversity Trust’s eligibility principles
- existing areas of collaboration that need to be strengthened and new areas that will improve collaboration in the region
- broad areas for upgrading and capacity building.

### 4.1 Crops of Greatest Importance to the Region

The SADC Plant Genetic Resources network has a broad mandate to maintain plant genetic resources of the region. To streamline the network activities, an approved list of mandate species that are of greatest importance to the region is used. The mandate species are further grouped and prioritized into use groups such as cereals and grain legumes, forage and fodder, *in-situ* and under-utilised plants, vegetables, vegetatively propagated crops, fruit and nut trees, oil producing plants, ornamental and medicinal plants; placing emphasis on the indigenous species and those that have developed secondary diversity in the region. The network therefore maintains materials of a wide range of species, particularly those important to agriculture and food security, rare and endangered species. The mandate list has over 3000 species out of which 27 are included in the Annex 1 of the ITPGRFA as shown in *Appendix 1a*.

### 4.2 Criteria and Factors considered for Importance and priority

The crops listed in Annex 1 of the ITPGRFA were scored on the basis of the criteria below to derive a priority list:

- Primary or secondary centre of diversity (or unique diversity originating in your country)
- Food security (nutritional security)
- Agricultural development (diversification/income generation)
- Threats to the crop *in-situ* (or on-farm)

One or more of the following additional factors were used independently by different countries:

- Grown in home gardens
- Replaced by modern varieties
- Distribution restrictions
- Low use
- Wild relatives threatened
- Potential cash crop
- Under researched
- Livestock improvement
- Horticultural development
- Not well known (underutilized?)
- Used as fertilizer
- Cultural value
- Nutritional value (micro nutrients)
- Raising popularity
- Cover crop
- Diversification

The crops were first assessed by national priority during the Planning Meeting in September 2005 then followed by verification at home. The agreed regional crop priorities are presented in 3 main groups for crops and 2 groups for forages as shown in Tables 2 and 3.

Table 2: Priority Grouping of Annex 1 Crops in SADC Region  
(Within a group the crops are listed alphabetically)

Regional mandate crops		Non-mandate crops	
Important at regional level	Important to specific countries		
1. Beans	1. Banana/Plantain	1. Apple	
2. Brassica complex	2. Barley	2. Lentil	
3. Cassava	3. Chickpea	3. Pea	
4. Cowpea	4. Citrus	4. Potato	
5. Finger Millet	5. Coconut		
6. Maize	6. Eggplant		
7. Pearl Millet	7. Major aroids		
8. Pigeon Pea	8. Wheat		
9. Rice	9. Yams		
10. Sorghum			
11. Sunflower			
12. Sweet Potato			

Note: Crops listed as mandate crops are priority crops as they are major food crops with a wide range of farmers' varieties.

Table 3: Priority Grouping of Annex 1 Forage Species in SADC Region

Regional Mandate Species	
Important to specific countries	Low priority species
1. <i>Trifolium rueppellianum</i>	1. <i>Andropogon gayanus</i>
2. <i>Trifolium semipilosum</i>	2. <i>Phleum pratense</i>
3. <i>Medicago sativa</i>	3. <i>Canavalia ensiformis</i>
4. <i>Lolium multiflorum</i>	4. <i>Vicia</i> (Faba bean/Vertch)
5. <i>Lolium perenne</i>	
6. <i>Festuca arundinacea</i>	

#### 4.3 Collections of Greatest Importance

The number of accessions of different crops maintained in the network collections by each NPGRC varies from country to country. The current status of national collections of Annex 1 crops is listed in Appendix 2. Collecting history in the region suggests that most of the collecting missions targeted important diversity in the respective countries. Appendix 2 therefore generally reflects the priorities given by countries to these crops. However, there has also been an effort to encourage synchronized collection of certain crops that were considered important in the region. In a few cases, the collections have been enriched by targeted academic studies that required gene pools of specific crops. Generally, vegetatively propagated species are under-represented in most NPGRCs partly due to the difficulty of maintaining them and the initial emphasis placed on orthodox seed crops. These orthodox seed collections are the ones used for distribution. It is the policy of the network to ensure that the same materials of orthodox seed crops are sent to the base collection at SPGRC as soon as possible after collection; however, there is usually a lag due to materials not having sufficient seed for subdivision at the time of collecting.

Crops maintained in field genebanks in various NPGRCs include:

- Major aroids:** maintained in Malawi, South Africa and Swaziland at major research stations
- Bananas:** maintained in Malawi, Mauritius and Tanzania at major research stations
- Cassava:** large collections maintained in Malawi, Zambia, Zambia, and Tanzania, while Mauritius, and Swaziland have only a few accessions
- Coconut:** the only major collection is maintained in Tanzania as part of global collection
- Citrus:** collections are maintained in South Africa and Malawi
- Sweet potato:** collections are in Mauritius, Zambia, Zambia, Zambia, Swaziland, Tanzania
- Yams:** there are no significant collections in the region although Malawi maintains a few accessions. However, the region has a significant number of wild relatives in Tanzania and DR Congo that have not been collected
- Apples:** collections are maintained in Malawi and South Africa.

The SPGRC has not yet developed the capacity for maintaining a base collection of vegetatively propagated crops.

#### **4.4 Collaboration for Effective and Efficient Conservation in the Region**

The network reaffirmed that collaboration among NPGRCs and with a wide range of partners is an important way of achieving effective and efficient conservation of PGR in the region. It was noted that there are numerous partners that collaborate with the network. The sustainability strategy proposes that SPGRC endeavours to develop a partnership model in which different organisations can be involved to achieve common objectives. The proposed new collaborations will take account of this approach.

There are many areas where the network needs strengthening. Through better linkages with relevant institutions and crop working groups, it will be possible to address issues of capacity building, harmonisation of methodologies, information exchange and policies; support for improved management of collections genebanks. For key thematic areas and key crops identified as priority, a national programme could be identified to take a lead in specific areas where they have comparative advantage and capacity to complement the leadership of SPGRC, such as: *in-situ* conservation of crop wild relatives, taxonomy, *in vitro* conservation, biotechnology, policy, data analysis and GIS. Specific areas are briefly described below:

##### 4.4.1 Germplasm Collection

The NPGRCs plan and do most of the collecting work in collaboration with NARS, extension and NGOs usually without formal agreements. On a number of occasions the NPGRCs collaborate with international organisations such as the Millennium Seed Bank in the UK and the Consultative Group on International Agricultural Research (CGIAR) Centres under formal or informal agreements.

Links with Crop Working Groups at national and regional level need to be strengthened to increase the opportunities of objective decisions regarding rescue missions, gap-filling and where to collect.

##### 4.4.2 Storage and Maintenance (seed, *in-vitro*, field)

NPGRCs store active collections of seed materials as well as field genebanks. The SPGRC maintains base collections of seed materials. In a few cases, materials are also shared with other organisations such as the Millennium Seed Bank, and CGIAR Centres or are sent to Svalbard as safety duplications.

The current arrangements for maintenance of field genebanks are weak. There is urgent need to support to maintenance and further development of field genebanks to ensure adequate availability of active collections in the region. Strengthening links with Crop Working Groups will allow regular reviews on how to improve on activities related to germplasm storage and maintenance.

Currently, most of the major purchases of equipment and supplies are imported into the region. As the network expands its activities, it will be important to improve efficiency in procurement of necessary equipment in the most cost effective and timely manner through use of local suppliers and agents whenever possible.

New areas of collaboration could include sharing facilities for storage and responsibilities to support field genebanks including exploring the possibility of national programmes taking leadership role for particular crops, creation of base collections of clonal material *in vitro*; links with botanic gardens for wild species and horticultural crops studies and management. Safety duplication of the base collections of *in vitro* material can be done by arranging with appropriate centres in NARS, CGIAR centres and other regional/international institutes.

#### 4.4.3 Regeneration/Multiplication

Normally, NPGRCs arrange for the regeneration/multiplication of materials in areas with conditions close to where they were collected and collaborate with other national organisations, particularly research institutes, in most cases informally.

The capacity of NPGRCs to regenerate and multiply materials in good time to have samples for distribution and for base and safety collections needs improvement through additional funding and collaboration with relevant institutions. Crop Working Groups should also be involved in analysing and providing information on methods and available technology.

New areas of collaboration could focus on wild species and poorly-researched species regeneration and multiplication protocols with Universities and research institutes. SPGRC can assist in regeneration when appropriate while some NPGRCs could assist others when facilities and environmental conditions permit.

#### 4.4.4 Characterisation/Evaluation

Most of the work on characterisation and evaluation is done by NPGRCs with occasional collaboration with research institutes and Universities. Involvement of universities in the characterisation and evaluation of materials is currently at low level. It is important to strengthen collaboration with universities to take advantage of the number and diversity of experts available in universities and the possibility of involving students in data collection and analysis.

So far, the capacity for molecular characterisation in the region is low. Strengthening this area will increase the opportunities for managing the materials rationally, and to provide appealing information to users. This will also substantially reduce duplication thus saving on resources.

In order to accommodate the needs of different users during evaluation of genebank materials, the network will benefit by encouraging and strengthening the use of Participatory Approaches and Methods.

A new area of collaboration could be on the analysis of data for development of core collections with involvement of Universities and research institutes. They can also be used to develop methodologies and formats for crops with no standard descriptor lists.

#### 4.4.5 Documentation/Information Sharing

The NGB has been a strong collaborator in the process of acquiring capacity in documentation and information management; development of the SPGRC Documentation and Information System for plant genetic resources as well as temporarily hosting the SPGRC website. The NGB role should be strengthened and could involve tapping on 'real time' information exchange opportunities, and to have state-of-the-art technology in the network as well as improving capacity in web publishing, network management and administration, *etc.*

Currently, electronic connectivity of the network members is generally weak. Strengthening connectivity and providing opportunities for 'real time' information exchange will greatly increase the visibility of the network activities and materials. This will also require a certain level of standardisation for information exchange protocols. Improved connectivity is, in fact, a pre-requisite to the improved web-based SDIS that will be launched in the future.

Biodiversity collaborates with NPGRCs and SPGRC and others by providing crop descriptors which are used as standards whenever available. It has also supported SPGRC in building capacity in information management through training, workshops and provision of publications. Other

collaborators in this area include the International Centre for Underutilized Crops (ICUC) on documentation of underutilized crops

New areas of collaboration could be forged with the System-wide Information Network for Genetic Resources (SINGER) and other international initiatives in the management of databases, linkages (including internet connectivity) between NPGRCs and the global community, and with Bioversity in the development of descriptor lists and analysis of data including use of GIS. Establishment of a Thematic Working Group on documentation and information would greatly enhance the use of available information which is possible through an active discussion forum on the SPGRC portal.

#### 4.4.6 Indigenous Knowledge

While farmers collaborate freely in the provision of Indigenous Knowledge (IK), it has generally been observed that information on some species is difficult to access particularly when it is held by traditional healers. Ways must be sought to strengthen information exchange with traditional healers as well as other holders of Indigenous Knowledge so as to increase the value of genebank materials. Linking with other initiatives that address the issue of IK may be one way to improve collaboration, whereas NGOs may provide support by providing leads and link between farmers and researchers.

#### 4.4.7 Health of Germplasm

So far, the network members adhere to international standards in relation to movement of materials but it is still important to improve efficiency through harmonisation of methods and regulations.

New collaborations can be achieved through sharing protocols and facilities for specific activities, such as virus indexing of clonal materials. Collaborations can also be initiated with FAO and Bioversity on development and use of guidelines on safe movement of germplasm.

#### 4.4.8 Distribution/Links to Users

Linkage to users of material and information is achieved through the collaboration of NPGRCs with breeders in NARS and NGOs with farmers. Similarly, SPGRC disseminates information widely from the network to regional and international organisations.

NGOs have proved to be a good link to farmers who need genebank materials. NPGRCs should, therefore, improve their capacity to distribute materials to farmers and other users by strengthening their linkage with NGOs and farmer organisations. Strengthening the use of participatory approaches/methods in plant breeding will increase the opportunities to access the right materials by users.

SPGRC and NPGRCs also need to improve the availability and accessibility of information to a wide range of potential users by presenting relevant information in different formats.

Strong collaboration will continue to be needed between this network and sister networks as well as international bodies to ensure that the Standard Material Transfer Agreement (SMTA) of the ITPGRFA is well understood and used appropriately.

New area of collaboration can be forged through links with intermediary groups such as NGOs, and farmer groups for fast multiplication and distribution for seed restoration. The network can also link with the private sector on new product development using materials and information from the network. Furthermore, strong collaboration with FAO is needed for ratification or accession of the ITPGRFA and to assist member states to develop internal mechanisms for implementing the Treaty.

#### 4.4.9 Research

The network is well linked with the NARS and parastatal organisations in the region but the linkage with Universities is weak. There are a number of Universities in the region that have capacity to contribute to the development of thematic areas in plant genetic resources conservation and use. There is also the need to encourage more use of genebank materials and data generated during collection, characterisation and evaluation by universities to develop new approaches and techniques for data analysis and interpretation.

New areas of collaboration include the use of discussion papers and web-based discussion groups to analyse key issues, joint research projects among countries, involvement of the private sector and NGOs in research projects. The network could also establish strategic linkages with other relevant regional, crop and thematic networks in specific areas. For example, conservation of root and tuber crops with the Pacific Agricultural Genetic Resources Network (PAPGREN), documentation with the European Cooperative Programme for Plant Genetic Resources (ECP/GR), policy with the Andean Plant Genetic Resources Network (REDARFIT), etc.

#### 4.4.10 Training

The current training arrangements heavily depend on external institutions to do capacity building for the region through short and long courses with the University of Birmingham, UK, Swedish Universities, NGB, Bioversity and other CGIAR centres. There is a need to strengthen the national capacity for technical training so as to develop a critical mass of people aware of plant genetic resources needs as well as able to adapt their skills to support genebank activities.

Collaboration arrangements may also be developed with universities in the region such as the University of Zambia which already has capacity to provide training in plant genetic resources. Further capacity can be achieved through distance learning and training of trainers at national level.

#### 4.4.11 Policy

The network collaborates with FAO, Bioversity, the SADC Secretariat and other African countries (Africa Group) to develop understanding and consensus on policy issues. It heavily depends on the ability of curators to interpret and influence policy issues in their respective countries as well as in the region. There is a need to strengthen the capacity of curators to build awareness to key stakeholders (policy makers, customs, etc.) in national systems and to play a role in the policy development.

At the regional level, the capacity to analyse the policy issues needs to be further enhanced through sharing of information and experiences between NPGRCs as well as between sister networks. The links with the Genetic Resources Policy Initiative (GRPI) and its results should also be strengthened.

New collaborative arrangements could be developed by the establishment of a Thematic Working Group on Policy; increasing the dissemination of information, particularly on the web and in meetings; and involving NGOs in issues relating to indigenous knowledge and Intellectual Property Rights (IPRs). The network could also make more intensive use of the Bioversity/GTZ (German Technical Assistance) Law and policy training module for training trainers.

#### 4.4.12 In-situ/On-farm conservation

The work relating to on-farm conservation and *in-situ* conservation in general needs stronger linkage with the extension system. There is also a need to have more involvement of the Regional Working Group in directing approaches as well as the need for inclusion of more countries from the region in the global and regional initiatives. The role of Botanical gardens on *in-situ* conservation needs more visibility and support.

A new area of collaboration could be based on the recognition of a centre of excellence on the *in-situ* conservation of wild crop relatives in the region in order to allow others to emulate some of the success stories in their own environment.

## **5. CAPACITY BUILDING AND UPGRADING PRIORITIES**

The network requires support in a number of areas to ensure development of the appropriate capacity for long-term conservation of PGR.

In 2004, SPGRC identified seed drying as one of the major bottlenecks in a number of NPGRCs. Following discussions in the Planning meeting it was agreed that support for drying facilities should be sought from the Trust as follows:

- New driers were acquired for Angola (cabinet dryer) and Tanzania (walk-in dryer)

- While repair and servicing of driers was done in Mozambique and Zimbabwe, Namibia acquired a new drier; and Lesotho and Swaziland await for their driers to be repaired;

Subsequently, a proposal was developed and accepted for funding as part of the fast track process of the Trust.

### **5.1 Priority Areas for Upgrading and Capacity Building**

Table 4 summarizes new areas that will require support in order to upgrade and build up capacity for long-term conservation of *ex-situ* collections in the region.

Meanwhile, a consultant for training on basic servicing of driers has been identified and training for Curators and NPGRC staff is planned for second quarter of 2008. The Consultant will visit each of the NPGRC to conduct on-site training.

Table 4: Priority Areas for Upgrading/Capacity building

<b>Priorit y</b>	<b>Upgrading/capacity building activity</b>
1.	Support to field genebanks for crops such as: sweet potato, cassava, banana, potato, yams, aroids, coconut.
2.	Support to <i>in vitro</i> base collection of the priority field crops mentioned above
3.	Establishment of molecular biology facilities for characterisation of priority crops
4.	Upgrading conservation facilities of priority crop seed collections
5.	Training at PhD and MSc level in relevant fields
6.	Technical training to enhance skills in appropriate fields in: <ul style="list-style-type: none"> <li>▪ general genebank management (including field genebanks and nurseries)</li> <li>▪ monitoring of genebank management equipments</li> <li>▪ biotechnology laboratory skills</li> <li>▪ management of clonally propagated materials</li> <li>▪ on-the-job training on managing databases</li> </ul>
7.	Internet connectivity: <ul style="list-style-type: none"> <li>▪ NPGRCs: PC and server, with the necessary hardware components. Wireless broadband connection or Digital Subscriber Line (DSL) modem.</li> <li>▪ SPGRC: Web Server and the base facilities</li> </ul>
8.	Strengthening links with users through increased availability and accessibility of information on the collections in the NPGRCs and at SPGRC
9.	Activity on assessing the potential rationalisation of collections and development of core collection through data analysis
10.	Urgent support to DRC to initiate coordinated PGR activities and acquire basic facilities for conservation

### **5.2 Additional Areas for Capacity Building and Upgrading**

#### **5.2.1 Molecular Biology and *in-vitro* Culture Facilities**

The development of molecular markers has reached a stage where they have become an essential tool for use in germplasm characterisation, evaluation, tracing identification and plant breeding. It is a tool that can be used with confidence in rationalization of collections elimination of duplicates and encouraging plant breeders to use genebank materials.

Similarly, tissue culture and cryopreservation have become standard methods for conservation of some species. SPGRC intends to develop capacity in these areas for the purpose of conservation, training network members as well as providing referral service to complement agronomic and morphological characterisation.

Further, genetic engineering and its products of GMOs have created a new unforeseen impact on conservation. SPGRC and NPGRCs have to appreciate the possibilities of unintentional collecting of germplasm that may have crossed with GMO materials. The network has limited capacity to deal

with problems arising from GMOs. In addressing these problems at a wider level, SADC has established an advisory committee on biotechnology and biosafety in which SPGRC is a member. The network will be greatly strengthened when the region develops the capacity to provide objective answers to questions relating to these issues. To this end, the network will collaborate with national and regional institutions to share resources and expertise and through SPGRC work towards becoming centres of excellence for the region. A logical location for such facilities is the SPGRC.

#### 5.2.2 Data Management and Exchange Facilities

Information in the network is stored in the SPGRC Documentation and Information System (SDIS). Part of this database is available on the Internet through the SPGRC web site. SDIS itself cannot be accessed through the Internet and so file backups are sent to SPGRC on disks. The NPGRCs thus do not have adequate connectivity to keep up with the network activities like searching the database at relatively fast speed, searching literature and accessing GIS information. Very few NPGRCs can operate real time software on the web due to the limitations of the networks in which they are connected (some of them in dial-up mode). This has resulted in uncoordinated backups, which sometimes take as long as a year to update. Even if SDIS were to be accessed from the web, very few NPGRCs would be able to connect because they do not have the appropriate connectivity on site. Some NPGRCs depend on a central computer shared by the whole station. Information sharing can be in two forms:

- The first is the web site meant for information dissemination with the outside world. For this type, only information relevant to the web will be required. This means that SPGRC will still have to provide the services of a web master.
- The second is for information flow within the network itself. This is specifically for facilitating information flow within the network by ensuring that SDIS receives updated files at all times.

Lack of up to date backups has been a big limitation where information sharing in the network is concerned. Backups have taken long to come to SPGRC resulting in the database being distributed within the network with different levels of updating. As a network, information sharing can be done using the File Transfer Protocol (FTP). An FTP package allows files to be uploaded. Most of the modern FTP packages are very simple to use. It involves launching the programme, entering some basic information (such as the site address, account name and password) and connecting. Once connected, one can usually just drag and drop files from one's own hard drive to the server and *vice versa*. The advantages of using FTP are as follows:

- FTP is fast and efficient - FTP is actually one of the most efficient ways to transfer large amounts of data on the entire Internet.
- FTP enables an automatic backup - FTP enables editing files locally on one's own computer. As changes are made, files are copied to the host's computer. This means no matter what happens to the host, even if their computer is totally destroyed, one has got a copy of the site on own disk. The reverse is also true.

This mode of information sharing is the most suitable for the network.

#### 5.2.3 Improved Management of Field Genebanks

- Support to field genebanks for crops such as: sweet potato, cassava, banana, yams, aroids, and coconut. In the current arrangements management of field genebanks has been a preoccupation of NPGRCs with hardly any support from other institutions or donors. This arrangement has resulted in the species concerned to be under-collected and understudied. There is a need to do characterisation and evaluation so that the information is used to promote of the lesser-known crops. There is also the need for development of duplicate sites, improving irrigation facilities, securing the sites and ensuring the materials are disease free.
- Support to establish *in vitro* base collections of the priority field crops at SPGRC. As a back up to field genebanks, it is proposed to keep materials under *in vitro* conservation at SPGRC to take advantage of the regional facilities as well as the proposed biotechnology laboratories.

#### 5.2.4 Upgrading Conservation Facilities of Priority Crop Seed Collections

Support will be needed to ensure that the collections continue to be managed at the required standards through the use of appropriate technology and state-of-the-art equipment. It will also be necessary to match capacities of different equipments used in the genebanks so as to remove

bottlenecks. The network may need equipment like germinators, seed counters, clean power facilities, standby generators, standard colour charts, moisture metres, additional freezers etc.

#### 5.2.5 Academic Training at PhD and MSc levels in Relevant Fields

Training at degree levels will take account of the different fields needed as well as consideration of staff turnover due to retirements, resignations and other causes. This will link up with the wider sustainability strategy in which training also aims to develop a critical mass of people in the region who are knowledgeable on plant genetic resources conservation and use.

#### 5.2.6 Technical Training

Technical training will be needed to enhance skills in appropriate fields such as:

- general genebank management (including field genebanks and nurseries)
- maintenance of genebank equipments
- biotechnology laboratory skills
- management of clonally propagated materials
- on-the-job training on managing databases
- information and communication technology

#### 5.2.7 Enhancement of Data Analysis to Assist Potential Rationalisation of Collections

The routine genebank activities generate a lot of data that in many cases are only partially analysed and partially used due to limitation of facilities and skills. The network will benefit by introduction and use of new software and concepts such as GIS, interpretation of statistical data, etc.

#### 5.2.8 Urgent support to DR Congo to initiate coordinated PGR activities and acquisition of basic facilities for conservation

The Democratic Republic of Congo has only recently joined the network. In order to integrate this new member it is necessary to provide urgent support for organising their internal PGR programme and to enable them to operate at the same level as the other network members. Initial activities will include:

- Forming and holding meetings of the National Plant Genetic Resources Committee;
- Organising a national stakeholders meeting;
- Acquiring initial basic facilities for the designated central facility;
- Conducting an inventory of available resources and conservation capacity.

## 6. APPENDICES

### Appendix 1a: List of the crops in Annex 1 of the International Treaty for Plant Genetic Resources (ITPGRFA) and SADC Mandate

	Crop	Genus	Observations	SADC mandate
1.	Banana / Plantain	<i>Musa</i>	Except <i>Musa textilis</i>	Yes
2.	Beans	<i>Phaseolus</i>	Except <i>Phaseolus polyanthus</i>	Yes
3.	Brassica complex	<i>Brassica</i> et al.	Genera included are: <i>Brassica</i> , <i>Armoracia</i> , <i>Barbarea</i> , <i>Camelina</i> , <i>Crambe</i> , <i>Diplotaxis</i> , <i>Eruca</i> , <i>Isatis</i> , <i>Lepidium</i> , <i>Raphanobrassica</i> , <i>Raphanus</i> , <i>Rorippa</i> , and <i>Sinapis</i> . This comprises oilseed and vegetable crops such as cabbage, rapeseed, mustard, cress, rocket, radish, and turnip. The species <i>Lepidium meyenii</i> (maca) is excluded	Yes
4.	Cassava	<i>Manihot</i>	<i>Manihot esculenta</i> only	Yes
5.	Chickpea	<i>Cicer</i>		Yes
6.	Citrus	<i>Citrus</i>	Genera <i>Poncirus</i> and <i>Fortunella</i> are included as root stock	Yes
7.	Coconut	<i>Cocos</i>		Yes
8.	Cowpea et al.	<i>Vigna</i>		Yes
9.	Eggplant	<i>Solanum</i>	Section <i>melongena</i> included	Yes
10.	Finger Millet	<i>Eleusine</i>		Yes
11.	Maize	<i>Zea</i>	Excluding <i>Zea perennis</i> , <i>Zea diploperennis</i> , and <i>Zea luxurians</i> .	Yes
12.	Major aroids	<i>Colocasia</i> , <i>Xanthosoma</i>	Major aroids include taro, cocoyam, dasheen and tannia	Yes
13.	Pearl Millet	<i>Pennisetum</i>		Yes
14.	Pigeon Pea	<i>Cajanus</i>		Yes
15.	Rice	<i>Oryza</i>		Yes
16.	Sorghum	<i>Sorghum</i>		Yes
17.	Sunflower	<i>Helianthus</i>		Yes
18.	Sweet Potato	<i>Ipomoea</i>		Yes
19.	Wheat	<i>Triticum</i> et al.	Including <i>Agropyron</i> , <i>Elymus</i> , and <i>Secale</i>	Yes
20.	Yams	<i>Dioscorea</i>		Yes
21.	Apple	<i>Malus</i>		No
22.	Asparagus	<i>Asparagus</i>		No
23.	Barley	<i>Hordeum</i>		No
24.	Beet	<i>Beta</i>		No
25.	Breadfruit	<i>Artocarpus</i>	Breadfruit only	No
26.	Carrot	<i>Daucus</i>		No
27.	Faba Bean/Vetch	<i>Vicia</i>		No
28.	Grass pea	<i>Lathyrus</i>		No
29.	Lentil	<i>Lens</i>		No
30.	Oat	<i>Avena</i>		No
31.	Pea	<i>Pisum</i>		No
32.	Potato	<i>Solanum</i>	Section <i>tuberosa</i> included, except <i>Solanum phureja</i>	No
33.	Rye	<i>Secale</i>		No
34.	Strawberry	<i>Fragaria</i>		No
35.	Triticale	<i>Triticosecale</i>		No

### Appendix 1b: List of Forages in Annex 1 of the International Treaty for Plant Genetic Resources (ITPGRFA) and SADC Mandate

<b>Genera</b>	<b>Species</b>	<b>SADC mandate</b>
<i>Andropogon</i>	<i>gayanus</i>	<b>Yes</b>
<i>Festuca</i>	<i>arundinacea, gigantea, heterophylla, ovina, pratensis, rubra</i>	<b>Yes</b>
<i>Lolium</i>	<i>hybridum, multiflorum, perenne, rigidum, temulentum</i>	<b>Yes</b>
<i>Medicago</i>	<i>arborea, falcata, sativa, scutellata, rigidula, truncatula</i>	<b>Yes</b>
<i>Phleum</i>	<i>pratense</i>	<b>Yes</b>
<i>Trifolium</i>	<i>alexandrinum, alpestre, ambiguum, angustifolium, arvense, agrocicerum, hybridum, incarnatum, pratense, repens, resupinatum, rueppellianum, semipilosum, subterraneum, vesiculosum</i>	<b>Yes</b>
<i>Agropyron</i>	<i>cristatum, desertorum</i>	<b>No</b>
<i>Agrostis</i>	<i>stolonifera, tenuis</i>	<b>No</b>
<i>Alopecurus</i>	<i>pratensis</i>	<b>No</b>
<i>Arrhenatherum</i>	<i>elatus</i>	<b>No</b>
<i>Astragalus</i>	<i>chinensis, cicer, arenarius</i>	<b>No</b>
<i>Atriplex</i>	<i>halimus, nummularia</i>	<b>No</b>
<i>Canavalia</i>	<i>ensifomis</i>	<b>No</b>
<i>Coronilla</i>	<i>varia</i>	<b>No</b>
<i>Dactylis</i>	<i>glomerata</i>	<b>No</b>
<b>GRASS FORAGES</b>		<b>No</b>
<i>Hedysarum</i>	<i>coronarium</i>	<b>No</b>
<i>Lathyrus</i>	<i>cicera, ciliolatus, hirsutus, ochrus, odoratus, sativus</i>	<b>No</b>
<b>LEGUME FORAGES</b>		<b>No</b>
<i>Lespedeza</i>	<i>cuneata, striata, stipulacea</i>	<b>No</b>
<i>Lotus</i>	<i>corniculatus, subbiflorus, uliginosus</i>	<b>No</b>
<i>Lupinus</i>	<i>albus, angustifolius, luteus</i>	<b>No</b>
<i>Melilotus</i>	<i>albus, officinalis</i>	<b>No</b>
<i>Onobrychis</i>	<i>viciifolia</i>	<b>No</b>
<i>Ornithopus</i>	<i>sativus</i>	<b>No</b>
<b>OTHER FORAGES</b>		<b>No</b>
<i>Phalaris</i>	<i>aquatica, arundinacea</i>	<b>No</b>
<i>Poa</i>	<i>alpina, annua, pratensis</i>	<b>No</b>
<i>Prosopis</i>	<i>affinis, alba, chilensis, nigra, pallida</i>	<b>No</b>
<i>Pueraria</i>	<i>phaseoloides</i>	<b>No</b>
<i>Salsola</i>	<i>vemiculata</i>	<b>No</b>
<i>Tripsacum</i>	<i>laxum</i>	<b>No</b>

**Appendix 2: Number of accessions in the collections maintained by NPGRCs**

		Angola	Botswana	Lesotho	Malawi	Mauritius	Mozambique	Namibia	South Africa	Swaziland	Tanzania	Zambia	Zimbabwe	Total
	<b>Crop</b>													
1	<i>Abelmoschus esculentus</i>	25	1	0	0	11	9	0	51	1	0	218	0	316
2	<i>Allium cepa</i>	0	0	0	0	3	0	0	5	3	0	0	0	11
3	<i>Amaranthus</i> sp.	10	2	0	20	3	0	13	74	18	63	157	9	369
4	<i>Arachis hypogaea</i>	180	401	0	112	0	13	29	195	60	149	531	5	1675
5	<i>Asparagus</i> sp.	0	0	0	0	0	0	1	0	0	0	0	0	1
6	<i>Avena sativa</i>	0	0	1	0	0	0	0	0	0	0	0	0	1
7	<i>Beta vulgaris</i>	0	0	0	0	0	0	0	1	0	0	0	0	1
8	<i>Brassica</i> sp.	0	0	0	0	0	0	0	3	1	10	50	0	64
9	<i>Brassica oleracea</i>	0	0	0	0	1	0	0	0	0	0	3	0	4
10	<i>Cajanus cajan</i>	6	0	0	87	0	18	0	4	0	47	139	0	295
11	<i>Cajanus</i> sp.	0	0	0	0	0	0	0	0	0	0	2	0	2
12	<i>Capsicum</i> sp.	9	0	0	0	14	0	0	18	2	14	65	0	122
13	<i>Cenchrus ciliaris</i>	0	100	0	0	0	0	18	0	0	0	0	0	118
14	<i>Cicer arietinum</i>	2	0	0	0	0	0	0	0	0	97	0	18	117
15	<i>Citrullus</i> sp.	3	1	0	2	0	0	19	0	0	55	5	1	86
16	<i>Cleome gynandra</i>	0	11	0	2	0	0	31	20	0	6	54	7	131
17	<i>Cleome</i> sp.	0	4	0	0	0	0	4	7	0	0	0	3	18
18	<i>Coffea</i> sp.	0	0	0	0	0	0	0	0	0	0	0	2	2
19	<i>Colocasia esculenta</i>	0	0	0	1	0	0	0	29	11	0	0	0	41
20	<i>Corchorus</i> sp.	0	10	0	1	0	0	4	17	9	9	50	22	122
21	<i>Crotalaria</i> sp.	0	0	0	3	0	0	4	33	0	61	1	0	102
22	<i>Cucumis</i> sp.	0	17	0	2	0	1	60	17	10	82	49	19	257
23	<i>Cucumis melo</i>	0	0	0	0	0	0	0	9	6	27	32	0	74
24	<i>Cucumis sativus</i>	0	0	0	29	2	0	0	1	0	0	2	0	34
25	<i>Cucurbita maxima</i>	0	0	0	218	0	0	8	0	3	115	121	97	562
26	<i>Cucurbita pepo</i>	1	0	0	0	1	0	0	296	15	0	0	0	313
27	<i>Cucurbita</i> sp.	106	15	21	0	0	6	0	323	2	188	400	117	1178
28	<i>Daucus carota</i>	0	0	0	0	0	0	0	1	0	0	0	0	1
29	<i>Dioscorea</i> sp.	0	0	0	0	0	0	0	8	0	0	0	0	8
30	<i>Diospyros</i> sp.	0	0	1	3	0	0	0	10	0	0	0	0	14
31	<i>Eleusine coracana</i>	0	0	0	1	0	3	0	0	0	71	0	0	75
32	<i>Eleusine coracana</i>	0	0	0	157	0	3	0	21	0	318	380	4	883
33	<i>Eleusine indica</i>	0	0	0	0	0	0	0	0	0	4	3	0	7
34	<i>Eleusine</i> sp.	0	0	0	0	0	0	1	0	0	3	0	0	4
35	<i>Glycine max</i>	14	0	0	0	0	72	0	3	2	11	3	0	105
36	<i>Glycine</i> sp.	0	0	0	0	0	0	0	2	0	0	0	0	2
37	<i>Gossypium</i> sp.	0	0	0	0	0	0	16	0	15	79	28	0	138
38	<i>Grewia</i> sp.	0	0	0	0	0	0	11	17	0	0	0	0	28
39	<i>Helianthus annuus</i>	20	0	1	119	0	21	1	1	4	12	69	0	248
40	<i>Hibiscus</i> sp.	1	0	1	5	0	0	19	28	0	10	103	25	192
41	<i>Hordeum vulgare</i>	1	0	29	13	0	0	0	0	0	0	0	0	43
42	<i>Ipomoea batatas</i>	0	0	0	111	0	0	0	90	35	2	256	0	494
43	<i>Ipomoea</i> sp.	0	0	0	0	0	0	3	0	2	0	0	0	5
44	<i>Lagenaria</i> sp.	1	0	0	45	4	0	22	270	22	191	6	530	1091
45	<i>Lens culinaris</i>	0	0	26	0	0	0	0	0	0	0	0	0	26
46	<i>Manihot esculenta</i>	0	0	0	135	0	0	0	10	5	0	170	0	320
47	<i>Nicotiana</i> sp.	0	0	0	0	0	0	3	17	0	2	17	0	39
48	<i>Oryza sativa</i>	22	0	0	216	0	325	0	33	1	218	147	40	1002
49	<i>Oryza longistaminata</i>	0	0	0	24	0	26	15	1	0	0	58	6	130
50	<i>Oryza</i> sp.	0	0	0	45	0	5	0	0	0	6	4	3	63
51	<i>Panicum</i> sp.	0	0	1	0	0	0	9	0	0	0	0	1	11
52	<i>Pennisetum glaucum</i>	95	0	0	47	0	0	1419	47	4	12	314	71	2009
53	<i>Pennisetum</i> sp.	0	0	1	0	0	15	1	0	0	44	3	2	66

54	<i>Phaseolus sp.</i>	2	4	0	31	0	0	0	141	0	15	4	0	197
55	<i>Phaseolus vulgaris</i>	517	0	57	116	1	15	0	326	54	410	164	0	1660
56	<i>Pisum sativum</i>	21	0	42	5	0	0	0	14	0	20	14	0	116
57	<i>Plectranthus barbatus</i>	0	0	0	0	0	0	0	2	0	0	0	0	2
58	<i>Plectranthus esculentus</i>	0	0	0	0	0	0	0	0	1	0	64	0	65
59	<i>Ricinus communis</i>	1	0	0	1	1	0	2	0	0	6	65	0	76
60	<i>Saccharum officinarum</i>	0	0	0	43	0	0	0	7	0	0	0	0	50
61	<i>Secale cereale</i>	0	0	5	0	0	0	0	0	0	0	0	0	5
62	<i>Sesamum sp.</i>	71	7	0	7	0	1	44	37	10	49	61	1	288
63	<i>Sesbania sp.</i>	0	0	0	32	0	0	39	13	8	6	18	0	116
64	<i>Solanum sp.</i>	0	0	1	2	12	0	14	20	2	16	13	1	81
65	<i>Sorghum bicolor</i>	176	334	9	391	0	185	135	381	78	808	797	483	3777
66	<i>Sorghum sp.</i>	7	0	0	0	0	0	2	0	5	4	9	20	47
67	<i>Tephrosia sp.</i>	0	0	0	24	0	2	2	23	0	0	16	0	67
68	<i>Triticum aestivum</i>	14	0	71	0	0	0	0	19	0	5	17	0	126
69	<i>Triticum sp.</i>	0	0	0	0	0	2	0	0	0	0	0	0	2
70	<i>Tylosema esculentum</i>	0	0	0	0	0	0	6	2	0	0	0	0	8
71	<i>Vicia sp.</i>	7	0	0	0	0	1	0	1	1	0	0	0	10
72	<i>Vigna luteola</i>	0	2	0	0	0	0	0	0	0	0	0	0	2
73	<i>Vigna mungo</i>	0	0	0	0	1	0	0	0	0	1	0	0	2
74	<i>Vigna radiata</i>	0	25	0	12	0	16	0	32	15	1	2	0	103
75	<i>Vigna reticulata</i>	0	0	0	0	0	0	0	0	0	0	17	0	17
76	<i>Vigna sp.</i>	4	4	0	0	0	0	6	1	0	54	16	2	87
77	<i>Vigna subterranea</i>	40	338	0	80	0	25	55	140	36	283	183	0	1180
78	<i>Vigna unguiculata</i>	216	1400	3	161	3	116	58	296	49	181	473	147	3103
79	<i>Zea mays</i>	632	13	139	214	5	274	11	873	175	371	422	29	3158
80	Unknown species	13	82	102	71	0	1	244	37	19	119	4	86	778
	<b>TOTAL</b>	<b>2217</b>	<b>2771</b>	<b>511</b>	<b>2588</b>	<b>62</b>	<b>1155</b>	<b>2329</b>	<b>4027</b>	<b>684</b>	<b>4255</b>	<b>5799</b>	<b>1751</b>	<b>28143</b>

### Appendix 3: Addresses of Network Centres

	Country	Address
	Regional	SADC Plant Genetic Resources Centre, P/Bag CH6, Lusaka, <u>Zambia</u> Tel: 260 1 233815; 213816; 233391; 233392, Fax: 260 1 233746 Email <a href="mailto:spgrc@zamnet.zm">spgrc@zamnet.zm</a>
1.	Angola	Centro Nacional De Recursos Fitogeneticos, Avenida Revolução de Outubro, C P 10043, LUANDA, <u>Angola</u> Tel:244-2-325673 Email: <a href="mailto:fitogen@ebonet.net">fitogen@ebonet.net</a>
2.	Botswana	Department of Agricultural Research, Private Bag 0033, GABORONE, <u>Botswana</u> Tel:267 3668100, Fax: 267 928965 Email: <a href="mailto:tofentse@gov.bw">tofentse@gov.bw</a>
3.	Lesotho	Department of Agricultural Research P O Box 829, MASERU, <u>Lesotho</u> Tel:266 22 312395/326042, Fax:266 22 310362 Email: <a href="mailto:agricres@leo.co.ls">agricres@leo.co.ls</a> or <a href="mailto:maleoacm@yahoo.co.uk">maleoacm@yahoo.co.uk</a>
4.	Malawi	Chitedze Research Station P O Box 158, LILONGWE, <u>Malawi</u> Tel:265 1 707222, Fax: 265 1 707041 Email: <a href="mailto:genebank@malawi.net">genebank@malawi.net</a>
5.	Mauritius	Ministry of Agriculture & Food Technology Horticulture Division, REDUIT, <u>Mauritius</u> Tel:230 4644857, Fax:230 4644857,46448749 Email: <a href="mailto:myboodoo@mail.gov.mu">myboodoo@mail.gov.mu</a>
6.	Mozambique	Instituto Nacional de Investigacao Agronomica (INIA), P O Box 3658, MAPUTO, <u>Mozambique</u> Tel:258 1 460255, Fax:258 1 460074/460255 Email: <a href="mailto:iniagef@teledata.mz">iniagef@teledata.mz</a>
7.	Namibia	National Botanical Research Institute Private Bag 13184, WINDHOEK, <u>Namibia</u> Tel:264 61 2022010, Fax:264 61 258153 Email: <a href="mailto:sonja.loots@nbri.org.na">sonja.loots@nbri.org.na</a>
8.	South Africa	RSA Plant Genetic Resources Centre Private Bag X973, PRETORIA 0001, <u>South Africa</u> Tel:27 12 808 5387/9, Fax: 27 12 808 5383 Email: <a href="mailto:pgrc@nda.agric.za">pgrc@nda.agric.za</a>
9.	Swaziland	Malkerns Research Station P O Box 4, MALKERNS, <u>Swaziland</u> Tel: 268-52-83178, Fax: 268-52-83360/490 Email: <a href="mailto:mrs@realnet.co.sz">mrs@realnet.co.sz</a>
10.	Tanzania	TPRI, National Plant Genetic Resources Centre P O Box 3024, ARUSHA, <u>Tanzania</u> Tel:255 27 250 9674, Fax:255 027 250 9674 Email: <a href="mailto:genetics@habari.co.tz">genetics@habari.co.tz</a>
11.	Zambia	Mt. Makulu Research Centre, Private Bag 7, CHILANGA, <u>Zambia</u> Tel:260 1 278380 / 278095, Fax:260-1-278130 Email: <a href="mailto:mtmakulu@zamnet.zm">mtmakulu@zamnet.zm</a>
12.	Zimbabwe	NPGRC of Zimbabwe P O Box CY 550, Causeway, HARARE, <u>Zimbabwe</u> Tel:263 4 702519, Fax: 263 4 731133 Email: <a href="mailto:ngbz@mweb.co.zw">ngbz@mweb.co.zw</a>

*NOTE: While concrete contacts for DR Congo are yet to be established so as to incorporate it in network activities, Madagascar, though a SADC member, is attached to EAPGREN*

## Appendix 4: People Contacted in the Strategy Development Process

	Country	Name (first and second)	Contact details including emails	Notes
1.	Angola	Elizabeth Matos	Centro Nacional de Recursos Fitogeneticos (NPGRC) Av. Revolucao de Outubro, P O Box 10043 (BG), LUANDA Tel: 244-2-325673/321688 Email: fitogen@ebonet.net / cnrf@ebonet.net	National Chair & SPGRC Board Member
2.	Angola	Pedro Antonio Moçambique	Curator Centro Nacional De Recursos Fitogeneticos Avenida Revolucao de Outubro C P 10212, LUANDA Tel: 244 2 325673 or 335072, Cell:244 91 218865 Email: cnrf@ebonet.net / pedromocamb@hotmail.com	Participated in Planning Meeting 12-16 September 2005
3.	Botswana	Stephen M Chite	Regional Agricultural Research Officer Department of Agricultural Research P Box 151, MAUN Tel: 267 6860327, Cell: 267 7156303, Fax: 267 6863761 Email: schite@gov.bw	SPGRC Board Member
4.	Botswana	Boipelo Freude	Agric. Research Officer, Dept. of Agric. Research P O Box 0033, GABORONE Tel: 267 3668169, Fax: 267 3928965 Email: bfreude@gov.bw	Participated in Planning Meeting 12-16 September 2005
5.	Botswana	Mmaseru Manthe-Tsuaneng	Deputy Director, Dept of Agric Research Private Bag 0033, Gaborone Tel: +267 3668172, Fax +267 3928965 Email: mmanthe-tsuaneng@gov.bw	
6.	Botswana	G.S Maphanyane	Director Dept of Agric Research Private Bag 0033 Gaborone Tel: +267 3668172 Fax +267 3928965	
7.	Botswana	P.O.P. Mosupi	Dept of Agricultural Research Private Bag 0033 Gaborone Tel: +267 3668100 Fax +267 3928965 Email: pmosupi@gov.bw	
8.	Botswana	Margaret Nyirenda	FANR Director SADC Secretariat Private Bag 0095 Gaborone Tel: 00 267 3951863 Fax: 00 267 3972848 / 3181070 Email: mnyirenda@sadc.int	SPGRC Board Member
9.	Botswana	Tlhaloganyo O Ofentse	Research Officer/ Curator DAR Private Bag 0033 GABORONE Tel: 267 3668180 Cell: 267 72 266122 Fax: 267 3928965 Email: tofentse@gov.bw	Participated in Planning Meeting 12-16 September 2005
10.	Congo DR	Theodore Munyuli	Senior Research Officer National Centre for Research in Natural Sciences CRSN-LWIRO D S BUKAVU, KIVU Cell: +243 57704878 Email: tmunyuli@yahoo.com	Participated in Planning Meeting 12-16 September 2005 Will attend SPGRC Board Meeting 2-4 Nov. 2005
11.	D R Congo	M G Bwinja	Scientist C/o Dr T Munyuli National Centre for Research in Natural Sciences CRSN-LWIRO, D S BUKAVU, KIVU	Participated in Planning Meeting 12-16 September 2005
12.	DR Congo	Vincent Kasulu	Ministry of Environment, KINSHASA	SPGRC Board Member
13.	Fiji	Luigi Guarino	PGR Adviser Secretariat of the Pacific Community (SPC) Private Mail Bag SUVA Tel: 679 337 0733 X 230 Cell: 679 9314423 Email: luigiG@spc.int	Participated in Planning Meeting 12-16 September 2005
14.	Italy	Kwesi Atta-Krah	International Plant Genetic Resources Institute Via dei Tre Denari, 472/a Maccarese (Fiumicino) ROME 00057 Tel: +39-06-611-8272 Fax: +39-06-619-79661 Email: K.Atta-Krah@cgiar.org	SPGRC Board Member
15.	Italy	Cary Fowler	Executive Secretary Global Crop Diversity Trust C/o FAO Viale Delle Terme Di Caracalla 00100 ROME Tel: +39 6 57053841 Cell: +39 3387980303 Email: cary.fowler@cropstrut.org	
16.	Italy	Brigitte Laliberté	Scientist, Global Crop Diversity Trust International Plant Genetic Resources Institute Via dei Tre Denari, 472/a Maccarese (Fiumicino) ROME 00057 Tel: +39 06 611 8272 Fax: +39 06 619 79661 Email: b.laliberte@cgiar.org	Participated in Planning Meeting 12-16 September 2005
17.	Lesotho	Maleoa Mohloboli	Curator Department of Agricultural Research P O Box 829 MASERU Tel: 266 22 312395/326042 Cell: 266 58 857203 Email: maleoacm@yahoo.co.uk	Participated in Planning Meeting 12-16 September 2005
18.	Lesotho	Sebili J Naha	In Situ Officer Department of Agricultural Research P O Box 829 MASERU 100 Tel: +266 22 312395 Cell: +266 58778411 Email: cbd19662002@yahoo.co.uk	Participated in Planning Meeting 12-16 September 2005
19.	Lesotho	Matla Ranthamane	Director Department of Agric. Research	National Chair & SPGRC

			P O Box 829 MASERU 100 Tel: + 266 22 323765 / +266 22 324827 Cell: +266 58883572 Fax: +266 22 310362 Email: <a href="mailto:agricres@lesoff.co.za">agricres@lesoff.co.za</a> / <a href="mailto:agricres@leo.co.ls">agricres@leo.co.ls</a>	Board Member
20.	Malawi	A P Mtukuso	Director Dept. of Agricultural Research Services P O Box 30779 LILONGWE 3 Tel: 00 265 1 788696 / 788697 / 789033 Cell: 00 265 09 208 877 Fax: 00 265 1 788801 Email: <a href="mailto:agric-research@sdpn.org.mw">agric-research@sdpn.org.mw</a>	National Chair & SPGRC Board Member
21.	Malawi	Lucius Nsapato	Curator Chitedze Research Station P O Box 158 LILONGWE Tel: 265 1 707222 Fax: 265 1 707041 or 707374 Email: <a href="mailto:genebank@malawi.net">genebank@malawi.net</a> / <a href="mailto:maizeagronomy@malawi.net">maizeagronomy@malawi.net</a>	Participated in Planning Meeting 12-16 September 2005
22.	Mauritius	Yusuff Boodoo	Acting Principal Research and Development Officer Horticulture Division Ministry of Agro-Industry and Fisheries REDUIT Tel: 464 4857 Fax: 464 4857 Email: <a href="mailto:myboodoo@mail.gov.mu">myboodoo@mail.gov.mu</a>	SPGRC Board Member
23.	Mauritius	Ajitsingh Hardowar	Technical Assistant PGRU Ministry of Agriculture & Food Technology Horticulture Division REDUIT Tel: 230 4644857 Cell: 230 7603041 Fax: 230 4644857 Email: <a href="mailto:myboodoo@mail.gov.mu">myboodoo@mail.gov.mu</a>	Participated in Planning Meeting 12-16 September 2005
24.	Mauritius	Ramdarshan Mohabeer	Agric. Superintendent Plant Genetic Resources Unit Div. of Horticulture Ministry of Agro-Industry & Fisheries, REDUIT Tel: 230 4332999 Cell: 230 2571920 Fax: 230 4644857 Email: <a href="mailto:Myboodoo@mail.gov.mu">Myboodoo@mail.gov.mu</a>	Participated in Planning Meeting 12-16 September 2005
25.	Mozambique	Mauricio Francisco	Characterisation & Multiplication Officer IIAM - Instituto Nacional de Investigacao Agraria de Mozambique P O Box 3658 MAPUTO Tel: 258 1 460130 or 460097 Fax: 258 1 460074 Email: <a href="mailto:iniagef@teledata.mz">iniagef@teledata.mz</a>	Participated in Planning Meeting 12-16 September 2005
26.	Mozambique	Paulino Munisse	National Institute of Agricultural Research (IIAM) P O Box 3658 MAPUTO Tel: 258 1 460255/460130, Cell: 258 82 320979 Email: <a href="mailto:iniagef@teledata.mz">iniagef@teledata.mz</a>	National Chair & SPGRC Board Member
27.	Mozambique	Francisco Reis	Technician IIAM - Instituto de Investigacao Agraria de Mozambique P O Box 3658 MAPUTO Tel: 258 1 460130 or 460097 Cell: 258 828679450 Email: <a href="mailto:iniagef@teledata.mz">iniagef@teledata.mz</a>	Participated in Planning Meeting 12-16 September 2005
28.	Mozambique	Carla do Vale	Documentation Officer Investigacao Agraria de Mozambique P O Box 3658 MAPUTO Tel: 258 21 460130 or 460097 Cell: 258 82885687 Email: <a href="mailto:iniagef@teledata.mz">iniagef@teledata.mz</a> or <a href="mailto:cdovale@yahoo.com">cdovale@yahoo.com</a>	Participated in Planning Meeting 12-16 September 2005
29.	Namibia	Sonja Loots	Curator by Default National Botanical Research Institute Private Bag 13184 WINDHOEK Tel: 264 61 2022013 Fax: 264 61 2775222 Email: <a href="mailto:sonja.loots@nbri.org.na">sonja.loots@nbri.org.na</a>	Participated in Planning Meeting 12-16 September 2005
30.	Namibia	Gillian Maggs-Kölling	Chief Agric. Researcher National Botanical Research Institute Private Bag 13184 WINDHOEK Tel: 264 61 2022020 Fax: 264 61 258153 Email: <a href="mailto:gmk@mweb.com.na">gmk@mweb.com.na</a>	National Chair & SPGRC Board Member
31.	South Africa	Julian B Jaftha	Senior Manager – Genetic Resources Management Department of Agriculture, Private Bag X973 PRETORIA 0001 Tel: 00 27 12 3196024 / 3196506 Fax: 00 27 12 3196329 Email: <a href="mailto:smgrm@nda.agric.za">smgrm@nda.agric.za</a>	SPGRC Board Member
32.	South Africa	Andre Lezar	Curator RSA Plant Genetic Resources Centre Private Bag X973 PRETORIA 0001 Tel: 27 12 808 5387/9 Cell: 27 82 4194452 Email: <a href="mailto:pgrc@nda.agric.za">pgrc@nda.agric.za</a>	Participated in Planning Meeting 12-16 September 2005
33.	Swaziland	Lupupa Lupupa	Curator Malkerns Research Station P O Box 4 MALKERNS Tel: 268 52 83017 Cell: 268 60 38742 Fax: 268 52 83360 Email: <a href="mailto:mrs@realnet.co.sz">mrs@realnet.co.sz</a>	Participated in Planning Meeting 12-16 September 2005
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**Appendix 5: Map showing SADC States**



## **Acronyms**

<b>Bioversity</b>	Bioversity International (formerly IPGRI-Int'l Plant Genetic Resources Institute)
<b>CBD</b>	Convention of Biological Diversity
<b>CGIAR</b>	Consultative Group on International Agricultural Research
<b>DRC</b>	Democratic Republic of Congo
<b>ECP/GR</b>	European Cooperative Programme for Plant Genetic Resources
<b>FANR</b>	Food, Agriculture and Natural Resources
<b>FAO</b>	Food and Agriculture Organisation (UN)
<b>FTP</b>	File Transfer Protocol
<b>GIS</b>	Geographic Information System
<b>GMO</b>	Genetically Modified Organism
<b>GRPI</b>	Genetic Resources Policy Initiative
<b>GTZ</b>	German Technical Assistance
<b>IK</b>	Indigenous Knowledge
<b>IPR</b>	Intellectual Property Right
<b>ITPGRFA</b>	International Treaty on Plant Genetic Resources for Food and Agriculture
<b>MOU</b>	Memorandum of Understanding
<b>NARS</b>	National Agricultural Research System
<b>NGB</b>	Nordic Gene Bank
<b>NGO</b>	Non Governmental Organisation
<b>NPGRC</b>	National Plant Genetic Resources Centre
<b>NPGRCCom</b>	National Plant Genetic Resources Committee
<b>PAPGREN</b>	Pacific Agricultural Genetic Resources Network
<b>PGR</b>	Plant Genetic Resources
<b>RCWG</b>	Regional Crop Working Group
<b>REDARFIT</b>	Andean Plant Genetic Resources Network ( <i>la Red Andina de Recursos Fitogenéticos</i> )
<b>SADC</b>	Southern African Development Community
<b>SDIS</b>	SPGRC Documentation and Information System
<b>SINGER</b>	System-wide Information Network for Genetic Resources
<b>SMTA</b>	Standard Material Transfer Agreement
<b>SPGRC</b>	SADC Plant Genetic Resources Centre
<b>SSA</b>	Sub-Saharan Africa
<b>TAG</b>	Technical Advisory Group
<b>TRIPS</b>	Trade-Related Intellectual Property Rights
<b>UNEP</b>	United Nations Environment Programme
<b>WTO</b>	World Trade Organisation