SPGRC

SADC PLANT GENETIC RESOURCES CENTRE

Annual Technical Review and Planning Meeting Report

SPGRC

September, 2009

Acronyms

ARC	Agricultural Research Council, South Africa
BCH	Biosafety Clearing House
BioFISA	Fiinish-Southern African Partnership Programme (to strengthen Biosciences)
CEPA	Centre for Environmental Policy and Advocacy, Malawi
CGIAR	Consultative Group on International Agricultural Research
CNRF	Centro Nacional de Recursos Fitogeneticos
COSPE	Cooperazione per lo Sviluppo dei Paesi Emergenti (Cooperation for the Development of Emerging Countries), Italy
CTDT	Community Technology Development Trust, Zimbabwe
CWR	Crop Wild Relative
DANIDA	Danish International Development Agency
DAR	Department of Agricultural Research
DEO	District Extension Officer
DRC	Democratic Republic of Congo
EPA	Extension Planning Area
FAO	Food and Agriculture Organisation
GCDT	Global Crop Diversity Trust
GIS	Geographic Information System
GMO	Genetically Modified Organism
GPA	Global Plan of Action
GPS	Global Positioning System
IAB	Agrarian Institute of Boane
IBPC	Interrim Bio-prospecting Committee
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IIA	Agricultural Research Institute (Angola)
IIAM	Instituto de Investigação Agrária de Moçambique (Agricultural Research Institute of Mozambique)
INERA	Institut National pour l'Etude et la Recherche Agronomique (National Agricultural Research Institute), DRC
IPGRI	International Plant Genetic Resources Institute (now Bioversity)
ITF	International Trade Fair, Swaziland
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
IUCN	International Union for Conservation of Nature (and Natural Resources)
LAN	Local Area Network
LUSIP	Lower Usuthu Small-holder Irrigation Project
MRS	Malkerns Research Station
MSBP	Millenium Seed Bank Project
NBRI	National Botanical Research Institute, Namibia
NEPAD	New Partnership for Africa's Development
NGO	Non Governmental Organisation
NordGen	Nordic Gene Bank
NPGRC	National Plant Genetic Resources Centre
NPGRCom	National Plant Genetic Resources Committee
PGR	Plant Genetic Resources
PGRFA	Plant Genetic Resources for Food and Agriculture
PGRU	Plant Genetic Resources Unit, Mauritius
RBG	Royal Botanical Garden, Kew (UK)
SADC	Southern African Development Community
SANBio	Southern African Network for BioSciences
SCCI	Seed Control and Certification Institute, Zambia
SDIS	SPGRC Documentation and Information System
SPGRC	SADC Plant Genetic Resources Centre
TAS	Technology Assessment Site
TCP	Technical Cooperation Project
UEM	Eduardo Mondlane University
VSAT	Very Small Aperture Terminal (Communication Satellite)
WVL	World Vision Lesotho
UPS	Uninterruptible Power Supply

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Report of SPGRC/NPGRCs Technical Review and Planning Meeting, 07 – 09 September 2009, Lusaka, Zambia

1. Objectives

As it has been the tradion, the objectives for holding the SPGRC/NPGRCs Annual Technical Review and Planning meeting were:

- To review the implementation of the technical activities for 2008/2009 cropping season;
- To evaluate the technical and budgetary plans for the 2009/2010 cropping season; and
- To facilitate information sharing on any other technical and networking issues.

2. Attendance

Forty (40) participants from NPGRCs, SPGRC, NordGen, Sida, Global Crop Diversity Trust (The Trust), attended the meeting. See Appendix 2 for a full list of participants.

3. Programme

The meeting was held at the Protea Hotel – Cairo Road, Lusaka from 7th to 9th September 2009 and on the last day of the planning meeting, i.e. 9th September 2009, participants had the opportunity to visit and acquaint with SPGRC premises and activities.

The meeting agenda included the following major items:

i) Welcome remarks
ii) Issues and matters arising from the last (2008) meeting
iii) NPGRC Reports
   - General progress reports;
   - *Ex-situ* conservation progress (2008/09) and proposals for 2009/10;
   - *In-situ*/On-farm conservation progress (2008/09) and proposals for 2009/10;
   - Documentation & Information progress (2008/09) and proposals for 2009/10;
   - MSc Theses presentations

iv) Project Reports
   - Regeneration (Trust)
   - Assessment of community seed genebanks
   - SANBio policy review project
v) General Issues: Summary of Presentations (Technical Sections)
vi) Closing Remarks

The detailed Programme is given in Appendix 1.

4. Opening Ceremony

The meeting was called to order by the Chair Mr. L. Qhobela at around 09:30 on 7th September 2009. Mr Qhobela requested for self introductions and then welcomed international collaborating partners that included the Trust, NordGen and Sida.

4.1 Welcome Address by Head of SPGRC

The Head welcomed the Technical Team and cautioned that with the coming to an end of the SPGRC network project, and that financial crisis has also negatively affected operations of SPGRC, some NPGRCs and funding for planned studies may be affected as SPGRC is still looking for alternative financial sources to complement the SADC contributions. He told participants that in order to address the financial sustainability, a consultancy has been engaged and already a draft report has been submitted to SPGRC.

The Head mentioned that despite shortfalls, opportunities exist in the areas of climate change where advantage could be taken for our network to make contributions in redressing this; in biofuels where our rescue missions are a necessity as well as where there are infrastructure developments.

He encouraged all to keep finding ways for enhancing partnerships with such donor organisations like NordGen, Nordic, the Trust, etc. He informed the participants that SPGRC was currently working with the Community Technology Development Trust (CTDT) of Zimbabwe and CEPA of Malawi, SANBio, and the Trust to develop collaborative programmes on climate change, bio fuels, databases, etc.

He also mentioned that the process is under way to start constructing a Biotech Laboratory (Tenders have been floated) but funds are not yet made available.

Lastly, he welcomed Seychelles which had recently rejoined SADC, and a representative was attending this meeting.

4.2 Welcome Remarks by Project Technical Advisor

On his remarks, the Project Technical Advisor, Dr M. Fatih reminded participants that the Network has already crossed the line of donor funding and has grown so strong over the years enough not to be ignored anymore.

He called for open discussions as well as good constructive conclusions throughout the meeting sessions that will help sustain and pave way for better avenues of doing work and sourcing funding for technical and other activities.

He hoped that this meeting was going to be the measuring yardstick over agreed multiplication and regeneration targets agreed upon in Pretoria in 2007.

4.3 Welcome Remarks by Representative of Global Crop Diversity Trust

Mr. G. Mwila, a Programme Officer with the Trust on his own and colleague's behalf (Ms Kijo Waruhiu) expressed gratitude for being invited and elaborated the roles played by the two so that the network can appropriately link up with the Trust for support and exchange.

He expressed the Trust's recognition and appreciation for the strengths that the network has accumulated over the years which are incomparable and can be emulated by such regional organisations.

He reiterated to the Trust's contributions in such projects as enhancing seed drying capacity, regeneration and said with good use of resources, the network stands to benefit more from the Trust.

4.4 Programme and Logistics Announcements

Mr L Qhobela briefly read through the programme of the meeting and a few changes were made, it was thereafter adopted. He also announced logistical announcements with regard to the filling-in of Claim forms as well as registration forms.

5. Matters Arising from the Last (2008) Meeting

5.1 Community Seedbanks

SPGRC was asked to assess impacts of community seed banks. It was recommended that community seed banks supported by CTDT in Zimbabwe, the locally established community seed banks in South Africa, and Swaziland be visited and come up with a position.

Action: Assessment ongoing. Three out of six countries visited.

5.2 Types of Pollination Bags

There were reports of birds eating through brown pollination bags and called for investigations. While the investigations go on, participants were asked to use alternative methods to lure away birds such as use of catch crops or physically scaring them away.

Action: No new sources of pollination bags found but Ms K. Waruhiu of the Trust reported that they have sourced bird-resistant pollination bags from Sudan for use in Kenya. She promised to provide source contacts.

5.3 Field Genebanks

Since the SPGRC position is not to support maintenance of field genebanks and that for existing genebanks, a strong justification must be provided for it to get funding from SPGRC for its maintenance. It was urged that cryopreservation should make an alternative to field genebanks.

Action: Noted by participants.

5.4 Rescue Missions on Areas under Development

Companies on infrastructural development are noted not to consider loss of PGR in their respective areas of operations. The meeting is aware that the Environmental Impact Assessment (EIA) teams do not even involve NPGRCs. NPGRCs were urged to sensitize legislators in their respective countries to ensure that any development programmes are accountable for the loss on PGR and thus, among others, take to compensate for or save or re-establish PGRs in danger.

Action: This is a long-term plan and results will gradually come from countries

5.5 Budget Layout in Reporting

Member States were reminded to include government expenditure or any other funding when reporting for progress and proposals. Participants were urged to make a follow-up from guidelines for reporting that were circulated last year. It was however cautioned that these serve as guidelines only and not mandatory.

Action: As recommended last year, reporting format re-circulated through Curators

5.6 Global Climate with Regard to Plant Genetic Resources

The meeting was informed of the need to carry out a study to find out how climate change affects plant genetic resources and come up with means for mitigating the climate change impacts.

Action: SPGRC teaming up with CTDT (Zimbabwe) and CEPA (Malawi) to develop proposals for addressing this and countries were urged to follow suit.

5.7 Standard Quantities of Seed Sent to SPGRC

This came as a reminder to Member States that they should send samples to SPGRC for long term storage in adequate quantities. In turn, SPGRC was asked to send reminder notes to NPGRCs on the standard quantities expected for base collection.

Action: SPM – Ex-situ Conservation, Mr L. Qhobela with the assistance of Mr B. Kapange should find this information from previous planning meeting records.

5.8 Equipment and Facilities

The meeting left the issue of facilities for DRC to be discussed between SPGRC management and the DRC representatives. Transport problems for Mozambique and Tanzania were recommended for forwarding to the Board.

Actions: Money for freezers and a server and communication radio sent to Tanzania, the latter two through the Ministry of Agriculture. Transport problems not discussed at the Board.

5.9 General Issues from Session 1: Collection

Upon Malawi's presentation of a proposal on collection of wild cowpeas, it was urged to do a more thorough literature review for the proposal and if still considered an emergency rescue it will be funded with funds for emergency collections.

It was urged that in order to fill the discrepancy gap between what is in storage at SPGRC and NPGRCs, let the network concentrate more on the multiplication and characterisation than collections. But collections in Angola and Mozambique can still continue given their previous war situations that deterred collections then.

Action: Trust announced it can fund proposals for targeted collections provided the gaps thoroughly quantified using such technologies as GIS.

5.10 General Issues from Session 4: Multiplication and Characterisation

5.10.1 Start-up Activities in DRC

After presentations by DRC who sought to engage on multiplications next season, it was advised that it better holds the national stakeholders' workshop before embarking on any other activity. It is here that they will determine what capacity they have and of what they need.

Action: SPM – in-situ and Project Technical Advisor visited DRC

5.10.2 Narrowing of Gap in Accessions Holdings

The Malawian NPGRC was highly commended for its efforts in multiplying seeds for its own and for safety duplication to SPGRC, as a result has tremendously reduced the gap of number of accessions held at NPGRC and those submitted to SPGRC for long-term conservation. Countries failing to meet target numbers for multiplication and characterisation as agreed in Pretoria in 2007 were advised to communicate and give figures to SPGRC for possible assistance.

Action: No such requests for assistance received by SPGRC.

5.10.3 Money for Multiplication/Characterisation in Mozambique

It was reported that money that was last year sent to Mozambique for multiplication and characterization seem not to have been received by NPGRC. This was due to the fact that the account to which money was sent was closed and so money went on hanging. Mozambican delegates were asked to follow up and ensure that money is recovered and utilized.

Action: Money not yet recovered and Dr Fatih promised to avail details of the sent money to Mozambique for follow up.

5.11 General Issues: Documentation and Information

5.11.1 Recognition of Participating Farmers in Germplasm Conservation

In dedication to the farmers and organisations that complement SPGRC network efforts in conservation and utilisation of plant genetic resources in SADC region, the meeting agreed that the December 2008 SPGRC Newsletter should run articles with names and details of those individuals and groups who have and are helping in PGRC conservation in the region. Countries were asked to submit such details to SPGRC for publication.

Action: SPGRC did not receive a single response.

5.11.2 Technical Support to Botswana and South African NPGRCs

As expressed by Curators of Botswana and South Africa, it was recommended that Documentation staffs from SPGRC are despatched as soon as possible to go and resolve existing problems in the use and maintenance of SDIS, including training and helping strategising on data entry.

Action: Technical backstopping done to both countries

5.11.3 SDIS Matters

With regard to SDIS, the SPM – Documentation & Information urged all participants to continue inputting data into the system because even though it will change to become web-based, the database structure will not change. They were therefore urged to keep on updating the current system that they have.

Action: Development of web-based system in progress and demonstrated.

5.11.4 SPGRC Terminology Booklet

It was also announced that an SPGRC Terminology Booklet is being prepared and will be circulated shortly for inputs and recommendation by stakeholders, mainly scientists. This will serve as guide for standard terminology used throughout the network.

Action: Completed and sent to stakeholders .

6. NPGRC PROGRESS REPORTS

ANGOLA

General

(i) Introduction

In the period under review, the Angolan NPGRC has been working with considerably reduced staff. It also suffered a serious setback when the Experimental Field just 5km from NPGRC that has been used for 17 years for characterisation, regeneration and multiplication of accessions, had to be returned in March 2009 to the owner of the land for the expansion of its own activities.

NPGRC has been actively searching for a new field throughout 2009 and so far has found six alternative possible sites. However, all of them are considerably far (35 to 95 km from NPGRC) and considering the bad traffic congestion in the whole of Luanda and surrounding areas, working in any of these sites would result in average return journey times of between 3 or 4 hours. Also the soil in most areas closer to Luanda is very dry and sandy, with very few small areas with the type of good soil the Centre had in the previous experimental field.

The Centre has carried out various activities related with the conservation of the germplasm, including collecting, conservation, characterisation and utilisation of these resources, as well as some training activities.

During the period under review the Angolan NPGRC staff made a collection mission in a South Eastern province of Angola, Kuando Kubango and the Chitembo area of Bié province. A total of 211 accessions were collected, bringing the total in active and base collection to 3,387 accessions of local varieties of food crops.

(ii) Staffing

The NPGRC has had a serious staffing shortfall during the period since the last 2008 Planning Meeting. The Curator, Mr Pedro Moçambique, has been on study leave for the past 3 years but is now close to completing (early 2010) his PhD studies in Brazil. Dr António Alcochete, Head of the NPGRC's Molecular Characterization Laboratory for the past 2 years, has been transferred to the Ministry of Science and Technology, to the post of Director of National Centre of Science and Technology, since November 2008. He continues to lecture one course at the Science Faculty and to give reduced part-time training guidance in the Centre's Molecular Characterisation Laboratory. The Centre's Documentation Officer, Ms Evaldina Pedro, returned in July 2009 after an absence of 5 months maternity leave.

(iii) National Plant Genetic Resources Committee (NPGRCom)

The Angolan NPGRCom held one meeting during this period, on 26th May 2009, to discuss issues that were to be raised at the Third Session of the International Treaty on PGRFA in Tunis. There is no change in the institutions that are members of Angolan NPGRCom. These include ADRA (Agricultural Development NGO), Angolan NPGRC (CNRF), Extension Service (IDA) and Seed Service (SENSE) and of course, Agricultural Research Institute (IIA) itself.

A new attempt is being undertaken at present to develop legislation on access to genetic

resources, with the help of natural resources lawyer Dr Antonieta Coelho.

(iv) Training, Workshops and Meetings

FAO Project TCP/ANG/3102

This FAO project came to the end of its 20 months period in April 2009, with a one-day seminar for the TCP's four training courses' participants held since October 2007 covering plant breeding, pre-breeding characterization and use of molecular markers. A new FAO training project in plant breeding, concentrating on the use of local germplasm is being proposed by Angola, in collaboration with Viçosa University, Brazil.

Fig. 1: Training in plant breeding

An important outcome of the TCP, and constant message from the four Brazilian plant breeders to the 25 participating agronomists, was the recognition of the importance of first researching the qualities of local Angolan material.

- Mr. Pedro Moçambique is still on study leave for his PhD degree in Brazil;

- Ms. Isabel Daniel, from the NPGRC MCLab., attended the PGR Management course in Sweden;

- Ms. Claudia Manuel, biology student from Science Faculty; Mr Miapea from Agriculture Faculty in Huambo and 2 agronomists from IIA Huambo went to Brazil for one-week study visit as part of the Plant Breeding and Characterization project of FAO;

- At the request of the Ministry of Agriculture NPGRC organized a short course on basic seed testing, specifically for 17 staff of IIA, Seed Services, and Cereal Institute. Ms. Domingas Tomás, head of Seed Laboratory coordinated the Workshop held at NPGRC from 29th March to 9th April 2009. Following this workshop 6 basic provincial seed testing laboratories are being set up in 4 IIA experimental stations;

Fig. 2: Short course on basic seed testing

- Ms. Elizabeth Matos, together with Kenyan representative, attended the *Ad Hoc* Committee on Funding Strategy of the IT in Geneva in March 2009. She also participated in the Third Meeting of the Governing Body of the ITPGRFA in Tunis in June 2009.

(v) Equipment, Supplies and Facilities

Motor Vehicles in Use at NPGRC

One Toyota Hilux, in excellent working order and used only for collecting missions, and 1 Nissan Terrano II also in reasonable working order for use in town.

Deep freezers: all 37 vertical freezers are functioning properly.

Computing facilities: Five desktops computers, five notebooks, five printers, and a photocopier are functioning properly. NPGRC just received a database server from Nordgen.

Driers: The first drier "Termaks" received from SPGRC is not working. The second drier received from SPGRC (Termaks) is not working properly and its temperature remains too high. They probably need to have their filters changed. The third drier, received from the Trust (Termo Kyl) is functioning properly.

Sealers: The sealer (1) is still working but needs to be replaced.

Germinator: A Snijders scientific germinator is functioning very well.

Requirements
The genebank is in need of one (1) sealer, laminated foil bags – 500 large, 1000 medium, and 2000 small. It also needs a set of cleaning sieves and 100 seed test planter.

(vi) Constraints

The over-riding constraints during 2009 have been the lack of an experimental field for multiplication, regeneration and the characterisation activities, and the absence of senior staff. There is also need more physical space for the conservation activities.

Technical Progress Reports

(i) *Ex-Situ* Conservation

Conservation
This year, 211 accessions were collected, raising the current holding of accessions in the active collection to 3,387.

Regeneration and Multiplication
During the year, a total of 52 (maize and groundnuts) accessions were multiplied and 82 (maize, common beans and sorghum) accessions characterized. Of the 52 accessions that were multiplied, only 10 produced some seed because of cuts in the water supply, and there is a need to multiply again these accessions.

Molecular Characterization
As a result of support from the FAO TCP the molecular characterisation of 75 maize accessions and 70 common bean accessions were carried out in 2008/09. This work will continue in 2009/10 on 50 maize, 50 common bean and 50 cowpea accessions.

(ii) Field Genebank Maintenance

There are field banks in some Agricultural Research Stations, roots and tubers in Malange and Mazozo, some fruits including mango and banana in Benguela and *robusta* coffee in Huambo and in National Coffee research stations in Kwanza Sul and Uige provinces.

(iii) Utilisation of Plant Genetic Resources

NPGRC distributes germplasm in small quantities (50-100 seeds) for characterisation and plant

breeding programmes. The principal requests of this material, in the reported period was the Science Faculty (FC) which requested 50 accessions of common bean and 50 accessions of maize, both for molecular characterisation purpose of a final thesis of two students. Twenty accessions of cowpea have been requested by IIA.

(iv) *In-Situ* / On-farm

In order stimulate the farmer that still growing and conserving local varieties in the Kuando Kubango province, the Angola NPGRC awarded collection Certificates to the farmers in the province

(v) Germplasm Collection

The Angolan genebank has now 3,387 accessions of local varieties, collected in most of Angola's provinces. 79% of Angola's municipalities now have at least some representative accessions in the genebank. The main areas that are still not represented are the north-western province of Zaire and the eastern provinces of North and South Lunda, as well as the municipalities along the Zambian border in the provinces of Kuando Kubango and Moxico.

During the reporting period, a collecting mission was made to Kuando Kubango province and a municipality of Bié province that had not been visited previously and 211 accessions of different crops (maize, cowpeas, pearl millet, sorghum, bambara nuts, sesame, common bean, groundnut, finger millet, pumpkin and rice) were collected.

During the period under review, the NPGRC did germination tests of 199 accessions of different species, as well as 120 accessions have been placed in long term storage.

(vi) Documentation and Information

SDIS

The SDIS programme is working well. The data entering process has continued with the new accessions received and the backup has been made every three months. DIVA GIS is being used and is very useful for producing the maps of collection sites all over the country.

Internet Access

Angola NPGRC has two Internet links – one accessed through the NPGRC landline which often has signal interruptions. The other link is a WIFI local internal server which is linked to 6 NPGRC staff computers. It normally works efficiently, although there are occasional breaks in service or poor reception for some computers. NPGRC received a new server in August 2009.

BOTSWANA

General

(i) Introduction

During the review period, the overall activities of the NPGRC went smoothly. Generally the rainfall was evenly distributed, resulting in implementation of the planned activities. The visit by the SPGRC Documentation and Information staff was highly appreciated as it helped with the reorganisation of the gene bank and updating of the SDIS.

(ii) Staffing

The staffing for the NPGRC has changed from what was reported last year, due to transfers. Mr Thuso Phorabaeng was transferred to Oil Seed and Grain Legume programme. Mrs Osego Seitshiro, who joined the unit recently October 2008, was also transferred to Animal Breeding to take care of new Animal Genetic Resources Laboratory.

(iii) National Plant Genetic Resources Committee (NPGRCom)

Ms Mary Molefe and Mr Chiyapo Gwafila were appointed as new Chairperson and Secretary respectively. The Committee held one meeting in March 2009 with the aim of reviving it. Unfortunately some committee members failed to attend which led to poor attendance. Among other things, the meeting discussed long term and short training, development of the Plant Genetic Resource Policy, and Millennium Seed Bank project issues. It is hoped that the situation will improve in the coming season, due the fact that both the chairperson and the secretary are in the same unit.

Discussions: Generally, most NPGRCom of almost all the NPGRCs in the network are not functional. However, the NPGRCom is important for policy direction while the technical advice is sought from crop working groups. The arrangement of the NPGRCom is perculiar and probably could be an effective arrangement and possibly a case for lessons.

(iv) Training, Workshops, Courses and Meetings

Members of staff for the NPGRC have participated in at least a course or workshop as reflected below:

- Mr Chiyapo Gwafila attended SDIS training workshop in November 2008, Gaborone; grass identification course in May 2009, in Maun; and Brahms data training workshop in July 2009, in Gaborone.

- Ms Mary Molefe attended an SDIS training workshop in November 2008, in Gaborone; and PGR management course in August, in Sweden.

- Ms Luciah Machuka, Ms Elizabeth Molaodi, Mr Thuso Phorabaeng, and Osego Seitshiro attended an SDIS training workshop in November 2008, in Gaborone.

(v) Equipment, Supplies and Facilities

Transport

The NPGRC has one vehicle obtained from the project. This vehicle has been put into the government pool, as is the procedure with the Botswana government. This however does not deny the NPGRC access to the vehicle. The transport officer for the department reported that it is still in good conditions.

Cold Room, Freezers
The NPGRC has 10 upright freezers all in good working conditions. The cold room is also doing well.

Computer
The desktop is not in good conditions and the Government IT Unit has declared it unserviceable. This was reported to the IT office of the Department and they had recommended replacement. Also the SPGRC documentation and IT officers inspected the desktop during their visit to NPGRC and in their report they also recommended replacement before it can crash with the data. The fax, printers and photocopiers in the Department are centralised but everybody including the NPGRC has unlimited access to use them.

Drier
The drier room is functioning well. The limitation in the drier room is lack of shelving. However, this will be taken care of.

Sealer
The NPGRC has acquired a new sealer through the network and is doing well. The old sealer technically is in good working condition, except the heating element which at times burns the aluminium foil bags instead of sealing because its cover is worn out.

Growth Chamber
The growth chamber is still in good working condition.

(vi) Requirements

The NPGRC is in need of 1,000 medium size aluminium foil bags, 500 wax-coated carton boxes, 2 RHS colour charts, 4,000 medium size germination papers, and 20 medium size germination trays.

(vii) Constraints

Gap filling of Data
This item cannot be accomplished immediately as most of the accessions have not been characterised. All efforts are being directed to speeding up characterisation.

Technical Activities

(i) Conservation

The total number of landrace accessions at the NPGRC increased from 3082 in 2008 to 3185 this year as result of registering accessions which were unregistered and were discovered during the rearrangement of the cold room and there were also new collections. In addition, there are 621 wild plant species which were collected through Millennium Seed Bank Project though they are not yet registered in the SDIS. These accessions are held separately and are registered in

Brahms data base which is also used for storing herbarium specimen information.

Accessions Deposited at SPGRC
The Botswana NPGRC was one of the countries which had not addressed the backlog of 2007 where each country was supposed to have deposited given number of accessions to SPGRC to clear the backlog. Beginning of 2009, Botswana NPGRC deposited 157 accessions of sorghum and millet.

(ii) Regeneration and multiplication

Three crops species were multiplied as follows: tepary – 10 accessions, pumpkins – 5 accessions, bottle gourd (calabash) – 5 accessions, and watermelons – 10 accessions. These were planted and harvested successfully. Seed processing is ongoing as some long maturing accessions are still drying.

(iii) Characterisation of Groundnut and Bambara Nuts

The Field
A field was identified at the Department of Agricultural Research (DAR) station in Sebele, about 8km north from the Gaborone city centre along the Gaborone-Francistown road.

Data collection
The observations were recorded following the preliminary IPGRI descriptors. The data were recorded both quantitative and qualitative vegetative and reproductive characters randomly from 10 plants.

Results/Discussion

Groundnuts (*Arachis hypogeae*)
Cluster Analysis
The cluster analysis was performed basing on 13 quantitative characters and results show that the accessions grouped into 5 distinct clusters at approximately 21% dissimilarity. Material from the same seed sample did not cluster together.

The fact that there were some mixed accessions as collected from farmers complicated clustering. Based on the way the accessions grouped themselves indicated that certain clusters are under represented in the collection. These groups include Cluster 1, 2, 3, and 4. Cluster 5 consists of accessions that differ with less that 15% dissimilarity. This supports the possible formation of core collections within such group. Still in cluster 5 there are 7 distinct small clusters at approximately 10% dissimilarity.

Bambara Nuts (*Vigna subterranean*)
Hundred and forty (140) bambara nuts accessions were planted for multiplication and characterisation. 124 accessions germinated, whereas 16 failed to germinate. The trial started well but later in the physiological stages some of the accessions dried and eventually died before all the characters were reported. The characters affected were those recorded at maturity or after. The collected data will be entered in the data base and analysed after completion of processing.

(iv) Utilisation of Plant Genetic Resources

Inn the year, there was a lot of requests for the germplasm maintained by the NPGRC. As has been the norm, most of the requests were from the DAR crop improvement programmes, followed by the academic institutions.

A total of 275 accessions were requested most of which came from the DAR Cereal Improvement Programme (200), followed by DAR Legume Improvement Programme (62), DAR Range and Pasture (8), University of Botswana (4), and lastly, Botswana College of Agriculture (1).

(v) NPGRC collections

Collections were made during the Agricultural Show on farmers' exhibits. Collected seeds were from maize, finger millet, cowpeas, tepary, haricot beans, sunflower, bambara nuts, and mung beans.

Under the Millenium Seed Bank Project the following were collected wild crop relatives (cowpeas, cotton), cucumis, Amaranthus, cleome, and corchorus.

(vi) Documentation and Information

The NPGRC has made a tremendous progress in updating the SDIS so far 3185 accessions had registered from 3082. Already, 458 accessions had been registered in active collection. This exercise was successful largely due to the training received from the SPGRC documentation and IT officers. The exercise is on going and it needs more time and in the next cropping season more time will be allocated to data entry compared to other activities.

DEMOCRATIC REPUBLIC OF CONGO (DRC)

General

(i) Introduction

The National Research Institute for Study and Agronomic Research (INERA) has the national mandate of implementing the National Plant Genetic Resources Programme that deals with different species and varieties of food crops, perennial crops, and forestry.

Major food crops include cassava, legumes, cereals, roots and tubers, fruits trees; and major commercial crops are palm oil, rubber, cotton, coffee, the quinine, medicine plants, jatropha, *etc*.

INERA covers six different agro-ecological zones with its five centers and stations spread through the whole country. The NPGR programme operates in five main Centres (M'Vuazi, Mulungu, Gandajika and Yangambi) and also in the research stations of Bambesa, Boketa,

Bongabo, Kipopo, Kiyaka, Luki and N'Dihira.

Fig. 3: Six agro-ecological zones, DRC

(ii) National Plant Genetic Resources Committee (NPGRCom)

The NPGRCom was institutionalized during the meeting held in November 2008. It is composed of participants from three Ministries: Ministry of Agriculture (Chair), Ministry of Research (Implementation), and Ministry of Environment and Tourism.

(iii) Staffing

Since thee NPGR programme in DRC is cross-cutting, staffs belong to each decentralized Research Centre or Station and each work in one or more thematic research programmes (food crops, industrial crops and forestry) encompassed in the activities of the NPGRC. All agro-ecological zones have their own gene banks.

(iv) Training, Workshops, Meetings

Some of trainings, workshops and meetings regarding species have been conducted in the specific thematic programmes.

A staff of the NPGRC at Head Office in Kinshasa Participated in a PGR Management short course in Sweden in July and August 2009.

(v) Facilities and Equipment

Due to political situation, the DR Congo was not on board network when the activities of SPGRC started, but the NPGRCom meeting has given the opportunity of claiming what remains in the pipeline for DRC.

The inventories will be undertaken to get realistic figures of each experimentation site to get the insights and plan way forward for proper establishment and conduct of activities in the DRC.

(vi) Constraints

Having not participated in SPGRC network activities has kept DRC with insufficient funding and without reliable communication, transportation as well as Internet access between centres/stations, Head office and other SADC network members, i.e. NPGRCs.

The DRC designated NPGRC is also in need to rehabilitate its infrastructure and have its documentation and information system installed and used after some initial training.

LESOTHO

General

(i) Introduction

The year under review was comparatively successful with less climatic hazards hence all field activities were carried out as planned.

(ii) NPGRC Staff

There are no changes in terms of staffing

(iii) National Plant Genetic Resources Committee (NPGRCom)

The NPGRCom membership has remained unchanged with the exception of one member retirement who was representing the traditional medical practitioners. Frequent meetings were convened in preparation for the National workshop on ITPGRFA sensitization and domestication.

(iv) Training, Workshops, Meetings

The Research Technical officer attended a six weeks' training course on PGR held at Alnarp, Sweden on June 22nd to 31st July 2009. The need for training in tissue culture and molecular markers still stands.

(v) Meetings/Workshops

Local

- The *In-situ* Officer participated in a seed fair and central agricultural show invited as a judge in both events.
- The Documentation Officer attended two workshops on Farmer Participatory Research and Metolong integrated Catchment Management.
- All the NPGRC technical staff participated in the national workshop on ITPGRFA held in July 29th to 31st, 2009
- The NPGRC actively participated in district and National Agricultural Shows, field days and world food day.

International

- The Curator attended a one week training workshop on scientific and proposal writing in Tanzania

(vi) Equipment and Facilities

Facilities

The NPGRC building has a drying room, storage room, receiving room, two offices and three additional rooms that are still under construction.

Equipment

The equipment at NPGRC includes 12 freezers, one seed drier, one each for precision weighing balance, aluminium bag sealer, moisture analyser, seed grinder, a desktop computer, altimeter,

camping equipment, GPS, photocopier and a motor vehicle.

The NPGRC received funding to extend the seed storage room and the office space hence construction of three additional offices is nearing completion. It also received one drier, printer for labels and a server.

Facilities and Equipment required
Boxes, Pollination bags (maize, sunflower) and labels

Technical Activities

(i) ***Ex-situ* Conservation**

Exactly 2,329 accessions of cultivated species are to date manually registered in the seed gene bank. These include the following crop species hence accessions in active collection have increased by 22 % from last year.

Over the past two years accessions at the gene bank have increased by 31 % and 22% in 2008 and 2009 respectively.

(ii) **Multiplication and Characterization**

Out of 524 accessions, 444 were multiplied and characterized at Thaba Tseka Reginal Research Station. These include 19 peas, 127 Beans, 21 Lentils, 9 sunflower, 41 wheat, 7 Barley and 220 maize accessions. 84 accessions of sorghum were multiplied and characterized at Machache Regional Research Station.

The continuous wet weather resulted in high weed competition hence low yield for crops such as lentils and peas. On the other hand, barley and wheat yielded lower due to bird damage.

(iii) **Accessions for Sending to SPGRC Base Collection**

Out of a total of 524 accessions planted during 2008/09, about 386 accessions will be sent to SPGRC. The difference includes accessions that are already at the base collection and those that do not have adequate seed.

(iv) **Field Gene Bank Maintenance**

One field gene bank of wild species (medicinal plants of economic importance, threatened and endemic) is established at the main research station in Maseru. Major activities include collection of plants to replace plants that failed to establish.

(v) ***In-situ*/On farm**

***In situ* conservation**
Awareness campaigns through public gatherings were conducted to encourage local communities to conserve their plant biodiversity and practice appropriate conservation strategies.

On-farm Conservation

Activities that were carried out in collaboration with World Vision Lesotho (WVL) were suspended due to inadequate staff for close supervision and monitoring. Due to budget constraints, WVL does the monitoring at the district level since they are closer to the farmers. While awaiting new working strategies with WVL, arrangements are underway to collaborate with another NGO whose objective is to promote indigenous seeds against GMOs.

(vi) Germplasm collection

Lesotho did not request funding for this activity; however a collecting expedition was carried out at Thaba Tseka using funds from the recurrent budget. The targeted areas were Mashai and Linakeng where 423 accessions of multi crop species were collected including 123 maize, 72 sorghum, 97 beans, 26 peas, 38 pumpkins, 4 lentils, 35 wheat, 7 sunflower, 8 barley, 5 cowpea, 1 sweet reed, 1 oats, 2 Basotho tobacco and 1 mustard seed samples. All accessions need to be multiplied.

(vii) Constraints

- Farmers were reluctant to part with the cow pea in particular which they said they had saved for the coming cropping season
- Most farmers don't know the specific names for their material other that to call them indigenous seed obtained from their parents
- Samples look different in terms of size, colour and yet they may be the same as that difference could be purely due to different soil types and agricultural practices.

(viii) Documentation and Information

SDIS

The SDIS sent during 07/08 was not activated, hence not installed. SPGRC was contacted on this issue but it appeared that they had given out a wrong CD still without activated distribution Module.

The SDIS modules that were updated include gene bank Management Information System (Regeneration and active collection data). Also an update of geographic coordinates was done in in Germplasm Collection Information System

Internet Access

The NPGRC has access to the Department's Internet connection. The centre received a server from Sweden, which is not yet installed awaiting upgrading of the Departmental Internet facility.

Constraints

Require more training on the use of GIVA–GIS software. Angola NPGRC was consulted or assistance on GIS guidelines and was helpful.

(ix) Achievements and Constraints

- The backlog of accessions will be addressed quicker with the availability of a new drier;
- Weeding efforts were interrupted by continuous rainfall resulting in low yields for some crops;
- Continued to experience frequent power cuts experienced countrywide, particularly during winter. This should be solved when the stand-by generator is installed;
- The Extension of NPGRC took longer than anticipated because the contractor had

serious health and financial problems, however Extension of the NPGRC building with additional 3 offices and a bigger storage space is nearing completion;
- The training opportunity on PGR management offered to the newly recruited research technical officer was a big accomplishment;
- The national workshop to domesticate the treaty (ITPGRFA) was another big achievement by the NPGRC.

(x) Requirements

Equipment
The Centre is in need of a germinator, colour chart, Seed counter, and moisture analyzer. It is also in shortage of pollination bags, aluminium foil bags and also needs a laptop computer.

(xi) National Workshop on ITPGRFA Sensitization and Domestication

The workshop was held in July 2009. It had two folds: One day policy-makers workshop for sensitization and domestication of the Treaty, and a two days stakeholders' national workshop for sensitization and domestication of the Treaty.

The key expected outputs were to have awareness of policy makers raised and to entice support on PGR conservation and utilization, and draw an action plan that will guide the process of internalizing the treaty

Among the major constraints observed include lack of legislations/ local pgr conservation and utilization legal frameworks and non-implementation of the existing Legal plant biodiversity frameworks. It was also noted that the country is faced with inadequate PGR conservation facilities as well as lack of breeding facilities and local capacity.

The two workshops recommended that more awareness creation be done on PGR-related issues, and that simple and clear regulations/legal frameworks on PGR conservation and utilization be developed. Promotion of community/on farm conservation measures on PGR and strengthening of research efforts were highly echoed. The participants recommended coordinated efforts by government, NGOs, private sector and stepped-up dissemination of information on PGR conservation. The future is for the NPGRC to hold PGR conservation and ITGRFA sensitization and domestication workshops/awareness creation at the community level, translate the Treaty into local languages, conduct a national survey to take inventory of locally adapted crop species/landraces to determine what is extinct, threatened and available, and hold NPGRCom meetings. All the above cost approximately US$ 40,000 being asked from SPGRC.

Discussions: It was pointed out that there was good will at global level to assist with the national processes of domestication of ITPGRFA. However, there was need to streamline existing national policies to galvanize this process. In that regard, there was need to be more focused on the proposed steps.

(xii) Collection Report

In the 2008/09 season, the Lesotho NPGRC carried out collecting expedition in Thaba-Tseka district covering some villages in Mashai (Sehonghong Resource Centre) and Linakeng (Mohlanapeng Resource Centre). The rationale behind that was that, there is a belief that most of the farmers in the Highlands of Lesotho still grow local varieties. The total of 423 samples

was collected. The include the following crops 123 maize, 72 sorghum, 97 beans, 26 peas, 38 pumpkins, 4 lentils, 35 wheat and 7 sunflower, 8 barley, 5 cowpea, 1 sweet reed, 1 oats, 2 Basotho tobacco and 1 mustard. This costed Maloti 18,037.5

MALAWI

General

(i) Staffing

The Centre has 2 degree holders and 2 technicians at Technician grade – one chief and other senior. The Senior Technical Oficer is on a study leave, pursuing a Diploma course. One scientist left the genebank in December 2008.

(ii) NPGRCom

Last meeting was held in 2006 since then no any other NPGRCom has been held. During 2009/10 we are proposing to have one committee meeting that will review implementation of the 5 year plan of action developed in 2006. A modest sum of U$ 4,000.00 is being requested to hold this meeting.

(iii) Training and Workshops

During the review period, one officer finished a BSc degree, three officers finished their Diploma in Agriculture whilst one officer is still pursuing it and is expected to finish in December 2009.

In the same period, the Curator attendexd a few meetings including the International advisory council for the Global Seed Vault in Svalbard (February 2009), third governing body meeting of the Treaty (June 2009), SANBio/SPGRCmeeting for review national PGR policies and develop regional PGR policy guidelines (July 2009), workshop on review of implementation of national biodiversity strategy and action plan (NBSAP), and a meeting on development of issue paper on management of crop and crop-associated biodiversity for sustainable production in agroecosystems.

(iv) Equipment and Facilities

Building

The genebank building underwent major renovations that include re-roofing and painting with resources provided through SPGRC /NordGen. These resources were made available after virement of funds that was meant for holding a national workshop.

A walk-in drier was installed last year soon after the planning meeting. A spacious room for keeping all freezers was created in the genebank.

Equipment
The genebank is reported to have 29 deep freezers (27 are full while 2 are empty). There are 6 functional computers, a bag sealer, seed grinder and 2 balances, 1 digital camera and 512 MB memory card. Other items that were received include: label printer, database server, CD for regeneration of different crop species, one desktop computer. A Local Area Network was installed in the genebank through SPGRC/NordGen funding.

Requirements
The genebank is in need of pollinationa bags, hilding of NPGRCom, and connectivity to the Internet.

Technical Activities

(i) Multiplication, Rejuvination and Charcterization of Germplasm – 158 samples

During the year, seed multiplication and rejuvenation activities were carried out at Chitedze, and Chitala and atotal of 158 samples of different crop species were planted.

Multiplication of germplasm was implemented effectively. Most of the materials multiplied were as aresult of high demand from the public of the indigenous edible plants. Some of the indigenous edible crops demanded include: livingstone potato, yams, finger millet, wild eggplants, African potato, as well as the local sweet potato varieties for vegetable.

All the planted accessions have been successfully multiplied and harvested without causing any loss of germplasm. It is highly recommended that this exercise continues for proper maintenance of Malawi's genetic resources for food and agriculture. The continued multiplication will ensure that demand of the materials is met.

(ii) Seed Processing, Packaging, Storage and Documentation – 98 Samples Ready for ….

This year we have dried and packaged 150 samples. Seed processing and packaging activities progressed efficiently, as we did not have problems in drying seeds. The process of drying is still in progress.

Duplicate samples of the materials were sent to SPGRC for long term storage and to date, 1506 samples from different species have been sent. This year samples will be sent from 9 crop species that include 96 accessions.

Bean germplasm was planted at Chitedze during rainy season but due to heavy rains the crop was not harvested. As such this work is planned to be implemented during the winter season of 2009/10. Planting materials were reserved in case the crop fails.

This activity cost US$ 8,980 leaving a balance of US$ 1,020 from the allocated budget provided through SPGRC/NordGen.

(iii) Wild Cowpea (*Vigna* spp.) Collection in Malawi

Exploratory surveys were carried out in all three regions of the country particularly focussing on districts which favour production of cows. The surveys were done prior to collection missions. SPGRC questionnaire was used for getting such data as sample status, collection source, associated wild, and weedy crop species, topography, soil texture, propagation method and

associated indigenous knowledge. NPGRC and Herbarium staffs were involved in the surveys.

The exploratory surveys/collection missions were carried out in all the three regions of the country. Wild Cowpeas are found throughout the country in different quantities, with much of it being found along the lakeshore areas. The exploration has indicated that Malawi has one species of wild cowpeas known as *Vigna luteola*. The sites surveyed were identified after ecogeographic survey conducted prior to the missions.

The species was identified in Salima, Mchinji, Nkhotakota, Dedza, Nkhatabay, Mzimba Zomba, Chikwawa and Nsanje districts, and during the trips, nine samples were collected. One sample was collected from each district. The collection criteria were based on habitat in each district. Samples were collected from wide range of habitats and such habitats include farmland, wetlands, and virgin landsmargins. Distribution of accessions by region is as follows; three in the central region and two in the northern region and four in the southern region. Some selected habitats where wild cowpea was collected are shown below.

Threats

The species is threatened in wild by several factors. Major threats of the species are destruction of the forests (virgin lands), drying up of wetlands (drought), and unsustainable harvesting of the species by the communities (digging of tubers for food, and floods and drought in the Shire valley. Considering these factors, it is worth promoting conservation of these species either through collection or *in-situ* conservation strategies.

Utilisation of the species

The species is widely used as relish in form of leaves and its seeds. Local communities know the species and are locally known as *'mtambethengo'*The fresh tubers are sweet hence communities harvest the tubers and chew them as a snack.

Traditionally, some people in the communities' especially traditional birth attendants grow the wild cowpeas in their backyard gardens and use it in the concoction for healing umbilical code for newly born babies as well as mothers. Traditional birth attendants have started establishing home gardens for the species for medicinal use considering the rate at which the species is disappearing from the wild.

Exchange of information

The collection mission has acted as a platform for information exchange among different age groups in the communities visited. There was high level of interaction by old people, youngsters, researchers, and traditional healers. This exchange of information will necessitate continuation of conservation of wild cowpeas at community level.

Conclusion and recommendation

The work has been of great significance to the Malawian NPGRC as it has contributed wild cowpea diversity in the genebank. It has also helped in identification of wild cowpea localities and documented indigenous knowledge associated with the species and proper collection timing. The exploration has also contributed to establishment of conservation status of the species. It is recommended that *in-situ* conservation initiatives be explored for the conservation of the species at farm level.

This activity cost US$ 9,720 and left behind a balance of US$ 455 from the allocated funds by SPGRC/NordGen.

(iv) Promotion of Fingermillet on Farm Conservation and Utilization: Phase III

Phase III (2008/2009 season) of this project was a continuation of activities and objectives pursued in Phases I and II. Instead of conducting two seed diversity fairs in each of the three Extension Planning Areas (EPAs), one coordinated field day and one diversity seed fair were conducted for all the three EPAs. The field day was conducted when the crop was fully mature and it gave the farmers the opportunity to observe and assess performance and morphological characteristics of different varieties. The seed diversity fair was conducted after harvest and, apart from showing seed samples various food items produced from finger millet were on display. Below were the implemented activities:

On Farm Demonstration Plots
Out of the six planned demonstration plots only one failed due to severe moisture stress during germination. Unlike in the previous season (2007/2008), this year, farmers successfully and effectively managed the plots from field preparation, sowing, transplanting, thinning, weeding, and up to harvesting.

Field Days
The first field day was the national one which was held at Chitedze Agricultural Research Station and the second was conducted at LukweLukwe in Bulala EPA, Mzimba RDP, where farmers and extension staff from all the three EPAs gathered to learn from each other the successful and impressive story of growing finger millet on ridges.

Market Rersearch
The farmers realized that the high volumes of finger millet produced surpassed their domestic demand. This necessitated the need to look for better markets where they could make profits. Normally, farmers in Mzimba mostly sell their produce to vendors at exploitative prices which lead to losses to the farmers.

A training session was organized to help identify opportunities and constraints in the current marketing arrangements and production. After the training a four member gender balanced group was selected to travel to Mzuzu to search for finger millet markets. The farmer representatives realized that they were being exploited by the vendors back home and agreed that, in the absence of a deal with the companies, they organize themselves to sell on retail either in Mzuzu or at Jenda market in order to make profits.

Diversity Seed Fair
Farmers from all the three EPAs were brought to one central point where a single coordinated diversity seed fair was conducted. On display were samples of various finger millet varieties, a range of processed products from finger millet, Livingstone potato, sorghum, pumpkins, African potato *etc*. Farmers with high diversity were awarded with prizes and certificates.

Community Seed Banks
In order to ensure reliable availability of planting materials (seed), the project has introduced Community Seed bank concept in the sites where the project is being implemented. Community seed banks aim to serve and fulfill the rights of rural communities in on-farm conservation of agricultural biodiversity, recovery and restoration of both the materials and related knowledge and utilization of their plant genetic resources. Farmers have started keeping seed as a communal asset and they do give each other turn to manage the seedbank.

Conclusion

This project has learnt that farmers are custodians of finger millet and they have maintained finger millet through utilisation. This effort has encouraged the already existing practices of maintaining local genetic resources. To add on the existing tradition practices, concept of community seedbank has been introduced so as to ensure sustaibale availability of material.
The total cost of this project culminated to US$ 16,381 kleaving a balance of US$ 1,204 out of the projected expenditure.

(v) Public Awareness on Conservation and Sustainable Utilization of lant Genetic Resources for Food and Agriculture

Cognizant that farmers are the main custodians and users of Malawi's plant genetic resources, it was deemed important that they should be made aware of the efforts and roles being taken by other stakeholders, like the NPGRC, in promoting conservation and sustainable utilization.

It was for this reason that farmers, extension workers and other stakeholders needed to be sensitized to be in a position to deposit such materials in the genebank for long term conservation and request materials for different uses and an awareness campaign aimed at promoting conservation and utilization of Malawi's plant genetic resources.

Different methods were used to capture attention of clientele and these included participation in field days and agricultural shows, mounting displays during seed fairs in Mzimba.

Impact of Public Awareness on Distribution of Germplasm
Sensitization exercise has greatly improved access to germplasm conserved in the Genebank. Figeure1 below summarises distribution list of germplasm since 2005. A total of 611 accessions belonging to 26 species have been distributed to different users. Beneficiaries include farmers, researchers, church communities, NGOs as well as students. The beneficiaries indicated that the collected materials will be used for research (plant breeding, evaluation *etc.*), restoration, as well as medicinal use.

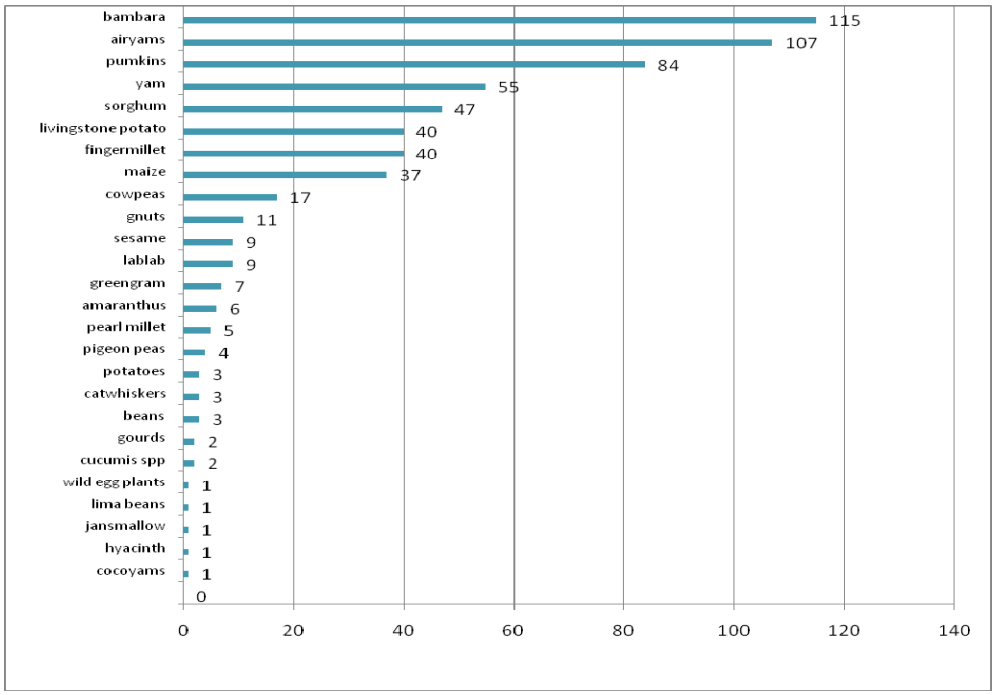


Figure 4: Summary of distributed accessions by crop since 2005.

In conclusion, it must be ackbnowledged that public awareness increased demand for lost genetic resources. This is a very good development as part of promoting utilization of the conserved germplasm. It is recommended that public awareness should be prioritized in genebank operations to avoid turning genebank into a museum.

MAURITIUS

General

(i) NPGRC Staffing

The genebank now has a Scientific Officer who was appointed in January 2008, two Senior Technical Officers - one for seed gene bank, and the other for field gene bank, one Technical Officer (Seed gene bank activities/ Documentation), and one Technical Assistant (Field activities). One Techical Assistant resigned since March 2009.

(ii) Available Facilities

The NPGRC has one vehicle, a drier – currently out of use because it is overheating, freezers and a germinator which is under repair though.

(iii) Equipment Purchased

Two portable humidifiers purchased using local fund to enhance seed drying capacity at the gene bank.

(iv) Training given by PGRU Staff

Twenty one students from University of Mauritius (BSc. Hons. Agricultural Biotechnology) trained for two weeks at seed and field gene banks.

Training of PGRU Staff

Technical officer awarded with Masters Degree in Management of Biological Diversity at Swedish University of Agricultural Sciences in Sweden.

Request

More advanced training, particularli areas of molecular characterisation and laboratory facilities, GIS tool for ecological mapping, gap analysis studies, and chemotaxonomy to promote bioprospecting of indigenous species.

(v) NPGRCom

Several informal meetings held to discuss arising ITPGRFA and FAO plant genetic resources issues

Technical Activities Progress Report

During the year, the NPGRC was engaged in maintenance of field gene bank, characterisation, management of seed genebank and in the rescue operations of *Hyophobe amaricaulis* palm species.

(i) Regeneration/Multiplication

This activity had the objective of regenerating/multiplying, maintaining a high percentage of germination, and multiplying accessions with limited number of seeds.

Results: From the total number of 72 accessions that were sent for regeneration and multiplication, 49 accessions were harvested and 2 accessions still in field (at the time of reporting). However, 23 accessions failed to germinate.

(ii) Maintenance of Germplasm

In the field genebanks, 36 species are being maintained that include grarlic – 28 accessions, yam – 4, ginger - 2, mango ginger – 1, turmeric – 1.

(iii) Monitoring and Management of Seed Genebanks

The major objective for monitoring is to determine accessions with poor seed viability and low quantity to become prioritised under regeneration/multiplication programme. In the monitoring process, moisture content and germination tests are done on samples.

(iv) Field Genebank Activities

In the field genebanks, live conservation of 105 accessions are maintanined. Activities peformed in the field genebanks include plant propagation, management of experimental plots, and seed production

(v) Characterisation

Figure 5 : Five accessions each of okra and eggplants were characterised during the year

(vi) PGR Utilization

In the process to step up utilization, close collaboration with other research institutions has been forged; as a result, 1 cauliflower and 1 beetroot accession were provided to seed production centre and 19 mkmaize accessions were provided to AREU for field trials and evaluation. The NPGRC also undertook to promote underutilised crops.

(vii) Documentation and Information System

One new PC was obtained from AID/Ministry of Agro Industry, Food Production and Security. The NPGRC is now connected to the Internet. There is a problem with SDIS database in that the database is corrupted and there is no back ups.

(viii) Materials Requirements

The NPGRC is in need of RHS or Methuen colour chart, one seed counter machine, and freezers.

MOZAMBIQUE

General

(i) Introduction

The Mozambique National Plant Genetic (CNRFG) is under administration of the Agronomy and Natural Resources Directorate of the Agriculture Research Institute of Mozambique (IIAM).

(ii) Staffing

The staff composition of the NPGRC has almost remained the same as from last year except for Mr Abilio Afonso – Research Officer who joined in the year after completion of his degree studies.

(iii) National Genetic Resources Committee (NPGRC Com)

The NPGRC Com personnel are the same as in the previous year.

(iv) Training, Workshops and Meetings

Short courses

- Mr. Egas Nhamucho, maize breeder from the Chokwe Research Station (Gaza province) has attended a six weeks training course on PGR in Sweden last June/July, 2009.

- Ms. Esperança Chambo, forest researcher, based in IIAM was nominated to attend the SIDA course on Intellectual Property Rights on PGR, in May 2009, in Sweden.

- Mr. Paulino Munisse, attended the short course on Biosafety Clearing House (BCH), held in Maputo, in July, 2009.

- Ms. Carla do Vale, has participated on Borlaug Fellowship Program ''Women in Science in Africa'', during September–November, 2008, held in Texas A&M University, USA.

Long term courses

- Mr. Paulino Munisse is pursuing his studies at PhD level (Water Mellon Diversity) at University of Life Sciences in Denmark. He started the course in summer, 2008 and is expected to complete his studies by the end of 2010.

Workshops and Meetings

- Mr. Abílio Afonso, attended the SPGRC Board Meeting in last September in Zambia.
- Mr. Paulino Munisse attended the Biosafety Public Awareness Workshop, held in Maputo in July, 2009.
- Ms. Carla do Vale, attended the Policy Review Workshop in July, 2009 in South Africa.

(v) Equipment, Supplies and Facilities

The Mozambican NPGRC is currently in possession of the following equipment: 11 deep upright freezers, 1 Seed walk-in drier, a precision weighing balance, aluminum sealing machines, and a moisture analyzer, one desktop computer and a laserjet printer. Acquired from NordGen, were also 2 UPS APC. Of the 3 airconditioners, only one is functional. The Centre also has 3 camping equipment.

Nevertheless, for the genebank to effectively accomplish its activities, requires the following: a GPS, an altimeter, pollination bags (maize, millet) and paper labels. It also needs a laptop computer, a USB memory drive, a photocopier and at least one air conditioner.

(vi) Achievements/Constraints

After finishing 5 year agricultural studies at the University of Agronomy in Niassa in 2008, Mr. Abilio Afonso has joined the NPGRC. Currently, the NPGRC does not have any allocated personnel for threshing activities.

(vii) Awareness Seminars

A number of visitors came to visit the NPGRC during the 2009. These included the Honourable President of Mozambique, Mr. Armando Guebuza, and Honourable, Minister of Agriculture of Mozambique, Mr. Soares Nhaca. The Centre was also visited by scientists/researchers representing the CGIARs centers, Royal Botanic Gardens Kew (RBG) and Millenium Seed Bank Project staff. A number of Students from the Eduardo Mondlane University (UEM), Polytechnic Institute (ISPO), Agrarian Institute of Boane (IAB) visited the Centre.

Technical Activities

(i) *Ex-situ* conservation

Germplasm conservation

Currently, the NPGRC holds a total number of 2,273 accessions. During the crop season 2008/09 there was an increase of 199 germplasm accessions stored in the NPGRC. The centre has conducted 3 collection expeditions in 2009.

A total of 159 seed samples have been deposited at SPGRC for safe duplication. The remaining 40 accessions were not sent to SPGRC due to insufficient quantities.

Regeneration and Multiplication/Characterization

Neither multiplication nor characterization activities were conducted by the NPGRC during the cropping season 2008/09 due to late allocation of funds.

The NPGRC has submitted a proposal to Global Trust Diversity and as soon as the funds will be transferred, the Centre will be able to start the planned activities.

(ii) Utilization of Plant Genetic Resources

A total of 24 seed samples were processed and distributed to various end-users. In general, the requesters are students attending PhD courses in Universities abroad.

(iii) Germplasm Collection

The NPGRC has conducted 3 multi crop collection missions during 2009. Two collection missions were carried out in Northern provinces of the country, namely, Cabo Delgado and Niassa provinces. These two missions were sponsored by the SPGRC and a total of 50 seed samples were collected in Cabo Delgado province and 65 seed samples were collected in Niassa province.

The third collection mission was sponsored by IIAM in collaboration with Eduardo Mondlane University (UEM) and Limpopo Game Reserve. This multidisciplinary expedition was conducted in 4 districts of Gaza province (South region of the country) and a total of 84 seed samples were collected in the mission. The duplicates with enough amounts of seeds of the all 3 missions were sent to SPGRC.

Collection Mission in Niassa and Cabo Delgado Provinces

In May 2009, the NPGRC carried out 1 multi-crop collection mission in Niassa province. Since its establishment, it is the first time that the NPGRC had an opportunity to conduct a collection mission in this province. For the first time, representative seed samples from this province has been collected and stored in the NPGRC. A total number of 65 germplasm accessions were collected and brought to the NPGRC for conservation.

During the season in review, the NPGRC carried out 1 multi-crop collection mission in Cabo Delgado province. So far, only 1 collection mission has been conducted by NPGRC in this province. A total number of 50 germplasm accessions were collected in this mission.

The total amount spent in the above two collection missions was US$ 8,888.

Collection Mission in Gaza Province

Gaza province is located in south part of Mozambique. This province is part of the semi-arid regions of the country. Very few collection expeditions have been conducted in this region. A total number of 84 germplasm accessions were collected in this mission.

(iv) Documentation and Information

SDIS

Currently, the NPGRC has registered manually a total of 2,273 accessions. 1956 accessions have been computerized using the SDIS software. A new computer was allocated to the NPGRC this year. The NPGRC has requested assistance from the SPGRC for re- installation of the SDIS software and as soon as it will be installed, the PGRC will continue editing information in order to reduce the backlog data.

Internet Access

Up to now, the NPGRC does not have access to the Internet. However, 1 LAN and 1 server have been provided by the NordGen this year. An effort needs to be done in order to facilitate its installation. The major constraint of the NPGRC is having funds for covering the equipment installation and monthly running expenses. Therefore, the NPGRC is requesting support from the SPGRC for covering those costs.

NAMIBIA

General

(i) Staffing

The staff of the NPGRC remained much the same as last year except that the newly recruited technician resigned at the end of 2008. The NPGRC is in the process of recruiting another technician.

(ii) National Plant Genetic Resources Committee (NPGRCom)

No NPGR Committee meetings were held during the reporting period. There is still sufficient funds left in the NPGRC's SPGRC account to facilitate the next NPGRCom meeting, which should take place early in 2010.

(iii) Training, Workshops and Meetings

- Two staff members from the Ministry of Agriculture, Water and Forestry (Mr. F. Shooya and Mr. L. Tjaveondja) attended the short course in Sweden in June/July;
- Mr. Steve Carr who is the head of the section "Plant Product Development" at the NBRI and also a member of the NPGRCom, attended a meeting on the "Review and Harmonisation of national PGR policies, sponsored by NEPAD/SANBio;
- Dr. Maggs-Kölling, the SPGRC board member and chair of the NPGRCom attended the SPGRC Board meeting in September 2008 as well as the Third Session of the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture, held in Tunisia inn June 2009.

(iv) Equipment, Supplies and Facilities

Building
The NPGRC has moved into the building that was renovated for this purpose, on the same premises as the NBRI. SPGRC funds were used to cover some of the costs, for example moving and re-installing the extraction cabinet, installing an alarm/security system and water still.

Vehicles
The NPGRC is currently in possession of two 4x4 vehicles. The Toyota Hilux is a 1996 model and the Nissan is a 2006 model. Both are in excellent working condition and are regularly used for field work.

Freezers
There are currently a total of 47 upright freezers in the NPGRC of which seventeen are filled. The ministry provided funds for 24 new Siemens upright freezers. One freezer is still not in working condition, and needs to be fixed. Currently the storage capacity of the NPGRC in terms of number of freezers is still sufficient.

Computers
The NPGRC currently has two computers and one printer in working order. They are linked to a network that is maintained by the NBRI's Bio-Informatics section (post vacant at the moment). The NPGRC has fairly reliable access to e-mail and the internet. The NPGRC is currently featuring its own web page in the website of the National Botanical Research Institute at the following address: www.nbri.org.na. The website has links to the SPGRC website as well as that of the ITPGRFA. We also received a server from SPGRC.

Dehumidifiers
The NPGRC currently has two dehumidifiers. The new dryer is functioning properly. The Jermaks drying cabinet is still out of order. SPGRC has been approached to send a technician to fix this one.

Equipment
The NPGRC currently has two sealers, two grinders, two growth chambers (germination cabinets), 3 electronic scales, all in working condition, as well as two moisture content analysers. There is also a laminar flow cabinet, which has to be serviced and the filters replaced.

(v) Requirements

The Namibian NPGRC has the following requirements:

- Laminated foil bags: 1000 small bags and 1000 large bags;
- 100 waxed carton boxes for storage in the freezers are needed;
- 15 boxes of pollination bags (15000) and 40 boxes of brown bags (14000) for pearl millet for the multiplication trial of the next season and one or two regeneration trials after that; and
- A technician to repair the Jermaks drier.

(vi) Constraints

- The backlog in Documentation remains a constraint and updating SDIS is progressing slowly without a technician;
- The fact that the distance between the NPGRC and the research station where multiplication trials are normally being carried out, is so large, is a serious constraint. Other stations that are closer to the NPGRC either do not have expertise in crop trials or the climate is not suitable;
- The NPGRC is once more without a technician. This post will have to be filled as soon as possible, as it will be challenging to conduct certain activities without a technician; and
- The post of Bio-Informatics co-ordinator is vacant at the moment, with negative effects on the institute's computer network and this also has repercussions for the NPGRC.

(vii) Awareness seminars

The current NPGRC staff situation does not allow conducting awareness seminars at the moment.

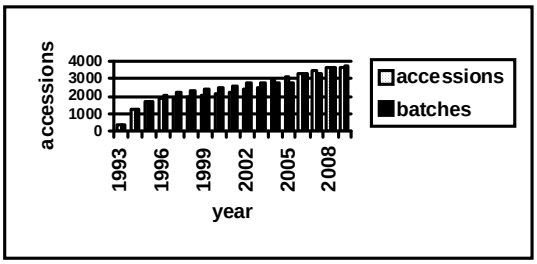
Technical Progress Reports

(i) *Ex situ* Conservation

Conservation

Some 73 new accessions of wild endemic, threatened and useful species have been added to the collection by the Millennium Seed Bank Project. The number of accessions in the collection has increased from 3600 to 3673.

As the NPGRC has multiplied 60 accessions of pearl millet in the main season of 2009, the number of batches has increased with 60 accessions from 3681 to 3750 (Fig. 1). Note that this does not include the accessions multiplied by SPGRC on behalf of the NPGRC.



The NPGRC sent 48 accessions of Pearl millet to SPGRC for duplication at the base collection.

Fig. 6: Accessions and batches in the Namibian NPGRC

In the collections, Namibian NPGRC has a substantially big number of wild species as seen in the figure which however, will not be multiplied or characterised in the foreseeable future.

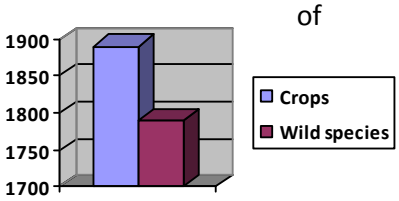


Figure 7: Wild species vs *crops: accessions in collection*

(ii) Germplasm Regeneration and Multiplication

Pearl Millet

The 60 accessions that were characterised and multiplied in the main season of 2008 were harvested on 29 July 2009. The seed characterisation and processing of the accessions were taking place at the time of reporting.

A total of US$ 1,287 as contribution from SPGRC against the planned US$ 838 for the reason that casual labour for the pearl millet trial was under-budgeted and the rates for casual labour increased from US$ 5.2 to US$ 5.9 per day. In addition, although US$ 544 was budgeted for from Government funds, these funds are released very slowly. This meant that a larger amount had to be used from SPGRC funds than planned.

SPGRC has multiplied 81 accessions of pearl millet on behalf of the NPGRC in the 2008/9 season. They are still being processed. Many of the accessions multiplied by SPGRC on behalf of the NPGRC since 2006 are still being processed and accessions that did not perform well but had sufficient seeds left, were planted again in an effort to obtain sufficient amounts of seed for the active and base collection. Some 48 accessions were sent to SPGRC for duplication at the base collection.

Cucurbits

The NPGRC planned to investigate the possibility of conducting multiplication and characterisation trials for *Citrullus lanatus* at the Dagbreek Centre in Windhoek. According to what was planned, the staff of the NPGRC visited the centre to discover whether the land would be suitable and what the situation is. It was discovered that although the school principal was very helpful and willing to assist, there are several challenges that will first have to be resolved.

It was therefore decided to postpone this option and to attempt another multiplication and characterisation trial at the Mahanene Research station instead. Five accessions were planted. The north-central regions experienced a second flood during the 2009 rainy season and the trial failed a

second time. It is believed that this is due to water-logged soils. A number of plants did reach flowering stage but all hand-pollinated flowers withered after pollination. After consultation with the local Kalahari Melon Seed breeder, it came to light that it is normal to lose up to 70% of hand-pollinated flowers. During our multiplication trial all the hand-pollinated flowers were lost. This may mean that the number of seeds sown per accession needs to be revised.
The proposed budget was US$ 538 out of which only US$ 93.75 was actually utilized this year for the activity.

SPGRC carried out 125 multiplications on behalf of the NPGRC. SPGRC carried out more multiplications for pearl millet than was planned because accessions that did not perform well in previous years were planted again. The NPGRC will determine whether seeds are still available for accessions that did not perform well and send them to SPGRC to be multiplied. Along with the accessions sent to SPGRC, all the Namibian accessions of *Pennisetum glaucum* has now been multiplied at least once.

Of the 1887 crop accessions, 1794 (95%) have been multiplied and 789 (41.7%) have been characterised to date (Table 7). Theoretically, only the 65 remaining cucurbits still have to be multiplied (3.4%) of crop accessions remain to be multiplied.

(iii) Characterisation

The NPGRC planned to characterise 60 accessions of pearl millet (*Pennisetum glaucum*), and this was carried out successfully. The NPGRC also planned to carry out characterisation of 5 accessions of *Citrullus lanatus* but this was not successful.

(iv) Utilisation of Plant Genetic Resources

Dispatch of germplasm samples from the Namibian NPGRC is dependent on the signing of a comprehensive Material Transfer Agreement. Namibia has draft legislation on access and benefit sharing. The draft bill on Access to Genetic Resources and Associated Traditional Knowledge was initiated in the 1990s and considers mainly indigenous species. An Interrim Bio-prospecting Committee (IBPC) has been established and considers applications for access to genetic resources that are to be used for commercial purposes.

(v) **On-farm/*In-situ***

In situ
In the year under review, the NPGRC completed a project that was conducted in partnership with Rio Tinto, Rössing Uranium Limited, and RBG Kew. A report was written and some of the results were forwarded to SPGRC for the July 2009 issue of the newsletter. Entering all the data collected, analysing the results and compiling the report took most of the time set aside for *in situ* conservation. The report includes a chapter on assessments undertaken in the Rössing mine license area, a chapter on assessments conducted over the entire distribution area, a chapter on species management and monitoring plans and a number of appendices, most notably the report on the contribution of the MSBP, which includes a guide on species that have to be targeted for seed collection. A copy of the full report will be given to the SPGRC library.

In addition, a field trip was undertaken to the Namib Naukluft Park in order to assess populations of *Raphionacme haeneliae*, the only true desert species of this genus. Some species in this genus are well known for their large underground tubers that contain substantial

amounts of water and are often used by the San people to quench their thirst. It is therefore an example of an important useful wild species. The data collected on this species have not been analysed and the species still has to be assigned to an IUCN Red List category. This activity had a budget of US$ 19,605 all of which was provided by the Government.

On-farm

On-farm conservation is a mandate of the SPGRC network and was emphasised as a priority at a previous SPGRC/NPGRC technical planning meeting. Until now, the NPGRC had no capacity to do work on on-farm conservation and the situation has deteriorated again with the resignation of the technician. However, Ms. Moses is prepared to take on a small scale project on on-farm conservation to start the process and to familiarise the NPGRC with the situation with on-farm conservation practices.

The NPGRC has the support of the NPCRCom, who has offered some advice in this regard. Although the NPGRC has no experience in doing on-farm work, we will be able to draw on research that has already been done in the region through the network. During the year under review, the NPGRC started the development of a proposal in coordination with SPGRC's *in situ* officer and the NPGRCom, for a small project in the Omusati region. The title of the proposal is "Documentation of farmer's crop conservation practices through a participatory methodology.

(vi) Germplasm Collection

The NPGRC did not plan any collecting missions, and therefore did not carry out any collecting missions. The NPGRC is currently understaffed and is therefore not planning any collecting missions for 2009 / 2010. The current phase of the Millennium Seed Bank Project will come to an end in December 2009.

(vii) Documentation and Information

SDIS

The country profile has been updated and the manual register contains 3633 accessions. The number of accessions in the registration module in SDIS also stands at 3633. The active collection module also contains 3633 accessions. Characterisation data from 60 accessions multiplied and characterised in the off season of 2008 were entered, exported to an Excel file and is now being processed.

Challenges: The Germplasm collection information system is still behind, but 250 accessions were added so that the module now stands at 3,352. Most characterisation data still need to be re-entered into the SDIS characterisation module.

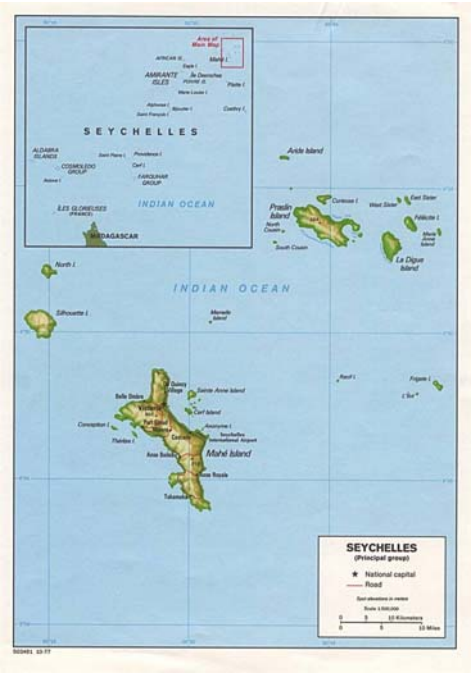
Internet Access

Access to the internet is reliable at the moment. Internet access in the new facilities is provided through wireless technology. There are some problems at the moment, but these will be sorted out in time.

SEYCHELLES

General

(i) Country Background



Seychelles is an archipelago occupying the Western part of the Indian Ocean between 4 and 10 degrees South of the Equator, with a total land area of 455km^2 (45, 500ha).

The distribution is of 115 island (40 granitic and the rest coralline) with a general climate being humid tropical with annual mean temperature of about 27^o C and relative humidity is high at about 80% throughout the year.

Average Annual rainfall 2350 mm and the population is approximately 87,000.

Figure 8: Map of Seychelles

(ii) Introduction

From early 1970s Seychelles has engaged itself in a series of conservation activities. It had avocado field gene bank >60, mango field gene bank >100, and and a national fruit nursery- mainly for propagation. Over the past 35 years there have been several changes in the administration of the agricultural sector of the country, leading to change in priorities in some case.

(iii) The Seychelles Agricultural Agency

Agency was created in 2008, and given responsibility for the evelopment of the agricultural sector of the country.

Besides its mandates of facilitating and supporting the enhancement of national food security, facilitating the increase of contribution of agriculture in the country's GDP, and facilitating modernization and development of the agricultural sector; the PGR issues were not included as a section under the new agency. However, the different units maintained their normal activities.

(iv) Rejoining SADC/SPGRC

Seychelles is now pleased to be back in the SADC and has automatically resumed its membership in the SPGRC.

After the country did a lot of work in the conservation and utilization of PGR, after leaving SADC, a few activities such as inventory of PGRFA and promotion of conservation of PGR, local campaign "Every Home a Garden", and promotion of activities through media to encourage people to preserve local varieties of food crop continued.

As a result, still, few varieties of fruits and root crops have been maintained through various propagation techniques and has maintained the achie=vements made though the "Every Home a Garden" campaign.

(v) Proposed Plan for 2009/10

In the Agricultural Development Strategy 2007-2011, a provision is made for conservation and utilisation of threatened and neglected Plant Genetic Resources for Food and Agriculture (PGRFA), along with farm-saved seeds.

(vi) Conclusion

Seychelles like many other countries of the world have for the past two to three years, experienced a series of threats toward its food security and the government has taken positive steps to counteract these threats.

It is therefore opportune to be back in the SADC and to be once again a member of the SPRGC and it is hoped that with the support of the SPGRC and other institutions both locally and internationally, Seychelles will be able to develop its NPGRC and promote it as another pillar for the national food security.

Discussions: It was observed that the concept of 'every home garden' promoted in Seychelles could appropriately be linked to on-farm conservation of plant genetic resources

SOUTH AFRICA

General

(i) Staffing

The composition of staff at NPGRC has remained unchanged and the position of the Curator has remained vacant. The post has been advertised and selection processes will be done before the end of August 2009. The Acting Curator is Ms Jermina Moeaha.

(ii) National Plant Genetic Resources Committee (NPGRCom)

Nothing to Report

(iii) Training, Workshops and Meetings

The following personnel attended courses during the year 2008/2009:

- Ms Tshidi Manamela finished her MSc Management of Biological Diversity at University of Uppsala, Sweden.
- The Senior Programme Manager-Documentation and Technical Officer-Documentation visited the NPGRC from the 01st–05th December 2008 to provide training to the NPGRC' staff on the operation of SDIS. The staffs attended include Mr T. Mukoma; Ms J. Moeaha; Mr P. Moila and Mr A. Phasha.

(iv) Equipment, Supplies and Facilities

The National Plant Genetic Resources Centre on the Roodeplaat Farm consists of the following facilities: 12 chest freezers and 5 upright freezers, 12 low-temperature incubators and 2 drying oven. It also has 4 weighing balances, a microscope, waterbath, autoclavepump dispenser, orbiotal shaker and liquid nitrogebn supply tank.

In addition, the NPGRC has a pH meter, compass, aluminium bag sealer, GPS and 3 working motor vehicles. It has 5 desktop and 2 notebook computers, as well as a camera, 4 printers, seed cleaning machine and camping equipment.

Items that needed regular maintenance at NPGRC include air conditioners in dryer and cold storage rooms, glasshouse; and irrigation system for the shade house. The NPGRC is in need of aluminium foil bags.

(v) Constraints

The NPGRC has faced a number of constraints which had a huge impact on some of the activities of the centre including multiplication and regeneration activities. The germplasm that were planted at Roodeplaat fields were eaten by monkeys and as a result no adequate seeds have been made from the planted accessions of cowpea, Sorghum and Pearl Millet.

Technical Activities

(i) *Ex-situ* Conservation

Conservation

The total number of accessions at the NPGRC increased from 5,800 in 2008 to 5,996 in 2009. Due to a lot of samples received from Kew as part of repatriation to South Africa to be registered, a lot of newly collected samples in 2009 have not yet been registered in SDIS and are still in the drying room. Three batches of seed samples totaling to 768 have been received this year from Millenium Seed Bank in Kew, United Kingdom. All batches have been verified and in a registration process.

The base collection has undergone a major reorganisation whereby all samples have been taken out of the freezers and cartons and were re-arranged physically by all NPGRC officials because of the difficulty in tracing exactly where a particular sample is, in the base collection. This work is a result of the realisation of Mr Barnabas Kapange and Mr Kennedy Hamudulu during the SDIS training workshop as one of the exercises to test if our system is updated and functions properly. The exercise is done and information submitted to SPGRC for updates.

Regeneration and Multiplication

A total of 610 accessions of 7 crop species were multiplied at NPGRC during the 2008/2009 season. No scientific analysis was done so far on any of the characterised accessions.

Characterisation

All the accessions 400 accessions (120 maize against 200 planned, none for cowpea and pearl millet against planned 100 and 500 respectively, and none for sorghum against planned 50 accessions). These were planted at the field of Roodeplaat Evaluation Centre, which is situated approximately 30 kilometres north of Pretoria. This is the site of the NPGRC and 2 hectares of land have been obtained for multiplication and characterisation.

Cowpea, pearl millet and sorghum accessions were eaten by monkeys in the field.

(ii) Utilisation of Plant Genetic Resources

A total of 78 accessions were distributed to requesting parties that needed the materials for different purposes including screening for desirable traits (genes) for Africa's Biofortification of Sorghum Project by Limpopo Department of Agriculture, screening for early maturity and agronomic evaluation for response from different nitrogen levels, by ARC- Institute for Industrial Crops, and evaluation of agronomic, morphogenetic charactersiation and nutritional value of wild *Corchorus spp* from some provinces of South Africa by the KwaZulu-Natal University.

Species most sought out were sorghum, sesame, *Chorchous sp*., and *Citrullus lanatus*.

(iii) *In-situ*/On-Farm

On-farm

Community Seed Banks Scoping Sessions were held in Mpumalanga, Siyabuswa, Machiding Village in June 2009, and in August 2009 with the participation of NPGRC staff and senior officials from the Ministry of Agriculture.

Farmer-to-Farmer exchange training workshop was held in June 2009 in KwaZulu Natal, invited by KwaNgwanase Farmers Organisation. The personnel attended were Ms Natalie Feltman (Deputy Director: Genetic Resources, NPGRC) and Ms Jermina Moeaha (*Ex-situ* Specialist/Acting Curator, NPGRC).

Training was provided, two communities, thus KwaNgwanase (KZN) and Sekhukhune (Limpopo) on the operations and management of community seed banks. A seed fair was organised by the community of KwaNgwanase in KZN province.

(iv) Multiplication of *Vigna subterrarea* (bambara nuts) and *Vigna unguiculata* (cowpea)

A total of 25 bambara nuts and 55 cowpea accessions were planted in different localities, in three different provinces around the country, thus Limpopo, KwaZulu-Natal and Mpumalanga, in collaboration with small-scale farmers.

Out of 80 accessions planted for multiplication, 23 produced more that 3000 seeds suggesting that the remaining 57 accession will be continued to be multiplied in the 2009/2010 season by the farmers to accomplish the required amount.

Accessions of which sufficient seed amounts are obtained during the multiplication process will be duplicated as soon as possible at SPGRC.

(v) Germplasm Collection

There were four landarace collection trips accomplished during the year. The first was carried in September 2008 in North West Province, Moretele district), where a total of thirty (30) accessions were collected. The second trip was carried out from in March 2009 in Limpopo Province (Waterberg district) and a total of four (4) accessions were collected.

A collection mission of vegetatively propagated species was undertaken in June 2009 in Mpumalanga Province (Komatipoort and Malelane villages), where a total of thirty (30) accessions were collected. Lastly, a fourth collection trip was carried out in Limpopo

Province in August 2009 and a total of 101 samples were collected during a two weeks collection mission in Mokopane district. Some of the areas were not covered during this collection mission due to time limitation. Based on the number of samples and the quality, another collection mission need to be conducted in future. All samples were collected and are currently in the dry room awaiting cleaning, verification and registration.

The four collection trips were not all successful as samples from trip 2 are not in genebank's possession and therefore cannot be counted. A total of 60 samples (not registered yet) were collected.

(vi) Challenges

Re-collection of vegetatively propagated species

As proposed during the last year's planning meeting, the NPGRC intend to re-collect lost samples of cassava, sweet potato and taro which believed to have been lost during transportation. Efforts to liaise with local extension officer found that some of the targeted farmers were no longer farming in the above said crops, while others have passed away and unfortunately their immediate families or children are not active in farming. It was then had to change the said collection expedition to be a new one.

Grass and forage species

One collection expedition was conducted in Mpumalanga from which a few lessons noted during the collection mission:

- Most of the sites / camps were inaccessible due to torrential rains which were experienced in the area, as some low-lying bridges were flooded;
- Some camps were burnt, as a management tool to control moribund, and this is compromising the existence of certain grasses as result in dominance of certain species at the expense of others;
- Unreliability of ecologists with regard to collection mission planning;

Solutions to the above include use of Précis Programme (from SANBI) on previous collections by other institutions/ collectors. Even though in certain instances is likely not to be accurate as some of the data is very old, it can be found that they are some developments in those sites.

Secondly, NPGRC now plans to target government and ARC farms, since it has strong relation with researchers and there is no difficulty in entering their properties like private ones.

(vii) Mixed Collection Mission

Lately, a mixed collection mission was conducted in Mokopane district. In two separate incidences the Tribal authorities were very upset about local extension officers.

Suggested solutions to these problems include when conducting pre-collection briefing

representative from both farming community, tribal authorities together with district agricultural office need to be present; and that people need to be educated how the three spheres of government work (national, provincial and local) because they seems to be confusing them, their roles and responsibilities in particular.

(viii) Documentation and Information

SDIS
Comments and problems were continually communicated through to the Documentation and Information Officer, which resulted in SPGRC officials (Mr Barnabas Kapange and Mr Kennedy Hamudulu) visit NPGRC and conducted week long SDIS training in December 2008.

Internet Access
The NPGRC has no problem regarding access to internet.

SWAZILAND

General

(i) Staffing

There have been no changes in the staff composition of NPGRC. The team is still composed of Curator who is only assisted by 5 semi skilled labourers. A new request to the government for additional staff was submitted this year and is still pending.

(ii) National Plant Genetic Resources Committee (NPGRCom)

There was only one change within the committee. Swaziland Environmental Authority representative, Ms. Lungile Gumbi left the organization and was replaced by Mr. Daniel Khumalo as a Biosafety officer who then became the new representative for SEA in the committee. Other membership remains unchanged.

The NPGRCom held two meetings during the 2008/09 season to be updated on the 2008 planning meeting and way forward on preparations for the Treaty awareness workshop. The Committee allso had a follow-up meeting with Parliamentary Portfolio Committee to brief them on the issue of the ITPGRFA and the proposed awareness workshop for policy makers to facilitate accession to the Treaty.

The meetings costed US$ 450.00.

(iii) Training, Workshops and Meetings

- Mr. Gugu Mavuso, a technician at the University of Swaziland attended the

Nordic Genetic Resources Centre short course in management of plant genetic resources in Alnarp Sweden from June to August 2009.

- The Curator attended a PGR Policy Planning meeting held in Pretoria South Africa which was jointly organized by SPGRC and the Southern African Network of Biosciences (SANBio) in July 2009.

(iv) Equipment, Supplies and Facilities

The NPGRC is in possession of a vehicle that is in good running condition, together with 11 upright and 2 chest freezers. The genebank has two desktop computers, freezer drier, sealer and digital camera that are in good condition. It also has a grinder, label printer, printer/fax/scanner and a good working moisture analyser.

The Centre is needful of a GPS, non-destructive moisture meter, a colour chart, seed blower, refractometer, and 1,000 cartons.

(v) Constraints

Shortage of staff or posts for the NPGRC is the major limiting factor that is negatively affecting the successful implementation of the NPGRC activities.

Technical Activities

(i) *Ex-Situ* Conservation

Conservation

Following the recent rescue collection missions undertaken during the 2008/09 season which together added to 64 accessions, the NPGRC's current accession holding in the active collection has been increased to 988 accessions.

The NPGRC deposited 21 accessions at base collection at SPGRC during the 2008/09 season. These included 10 bean, 9 groundnut, 2 cowpea accessions, and 23 sorghum accessions are in preparation before depositing.

Regeneration and Multiplication

Following the late and erratic rainfall pattern in the normally high rainfall Middleveld and Highveld regions of Swaziland, and in fear of poor rains and subsequent yields in the Lowveld region, multiplication activities were undertaken at the Malkerns Research Station site. 25 groundnuts, 22 cucurbits and 27 sorghum accessions were planted during the 2008/2009 season.

However, a prolonged drought spell from December 2008 to mid January 2009 delayed

the replanting of sorghum accessions and also resulted in stunted cucurbits plants which at the failed produce fruits. Groundnuts on the other hand showed hardiness to some extent and improved with improve later in January. Hence on average, most plants yielded some pods even though the seed obtained was too little. Twelve (12) beans, 5 cowpea and 1 okra accessions planted for multiplication purpose produced a good crop stand. Hailstorm late in May 2009 adversely affected the good crop even though it later recovered. Thus remaining pods were harvested, processed and dried.

Characterisation of Sorghum Accessions

As stated under multiplication, only 27 accessions were to be planted and seed characterization is currently ongoing and analysis will hopefully be accomplished this season. However, the need for a refractometer for determination of soluble solids as well as an RHS colour chart is being noted. This activity was estimated to cost US$ 27,099.

(ii) Field Genebank Maintenance

The two field genebanks are located at Malkerns Research Station at the Lowveld Experiment Station. While the later is for the conservation of wild germplasm species, the Malkerns field genebank on the other hand is for conservation of vegetatively propagated (clones) crop species and medicinal plants from areas with similar climatic conditions with Malkerns.

Malkerns field genebank holds 147 clones mostly of *Aloe* sp. (78 clones), followed by sweet potato (49), *Ochna arborea* (9), cassava (7), taro (3), and Livingstone potato (1).

The loss of vegetatively propagated material under the NPGRC custody currently held at the Malkerns site Field Genebank is of major concern. About 10 samples of the medicinal *Ochna arborea* (*Mahlanganisa*) have been stolen from the field genebank. The worry therefore is that the loss will increase if the material is transferred to the LES field genebank which is designated for them wild species especially those collected in the Lowveld region of Swaziland. This has thus resulted in further delaying the transfer of vegetatively propagated germplasm to LES.

The LES field genebank on the other hand is designated for wild species germplasm of medicinal plants, wild fruit trees as well other genetic resources of value in Swaziland.

Lowveld Experiment Station field genebank holds over 1000 *Aloe vanbalenii*, over 200 *Acacia* sp., Aloe sp., *Ficus* sp., *Sclerocarya* sp., *Ximenia* sp., and one *Gossypium* spp.

(iii) Maintenance of Germplasm

The NPGRC will continue maintaining the local germplasm of sweet potato, cassava, and Taro by applying general crop husbandry practises ad thereby ensuring their survival and continuation. Sweet potato in particular will be replanted so as to avoid loss of older material as a result of cold and also ensure that clean and highly viable germplasm

is available. This is more so because the Root and Tuber crops Agronomy Section lost most of its sweet potato material.

(iv) Utilisation of Plant Genetic Resources

The NPGRC distributed material in the magnitude of 6 maize accessions to the cereals Agronomy Section of DAR, 2 maize accessions and 1 accession pigeon pea to individuals for multiplication and breeding purposes.

(v) *In-situ*/On-Farm

On-farm

During the year under review (2008/09) the Swaziland NPGRC proposed to continue supporting conservation of crop diversity on-farm at Shewula and by so doing recognize the contribution of Shewula Community Seed bank farmers in conserving indigenous crop diversity and further promoting their utilization by other farmers.

The NPGRC further proposed to encourage more diversification by introducing and further promoting of the utilization the drought and frost-tolerant pigeon pea among the same farmers as another candidate crop to include in the crops they were already conserving.

The NPGRC had planned to then host a field day for the farmers so that they could display their indigenous crop diversity including the new crop. However, they had planted late the crop was not mature when the time to host the field day came. The field day was then held in August 2009 with the attendance of not only the farmers, but also, Agricultural Extension team, collaborating partners from COSPE, an NGO that partnered with the NPGRC in the initiation of Community Seed banking of local crops. Since the dates for the field day were clashing with those intended for COSPE, it was decided that NPGRC and COSPE pool .resources together and organize even a bigger event for the two communities which was then held at Mafucula

It was urged that this kind of collaboration should be reinforced and that be continued to promote diversification for a healthy living of rural people. As such, a similar but bigger activity is planned and together with COSPE, the NPGRC will now be expanding the promotion of the conservation and sustainable utilization of local crop diversity to more communities from this moment on.

This activity costed US$ 9,350 out of which SPGRC contribution was US$ 1,400.

(vi) Germplasm Collection

Two rescue collection missions were undertaken during the 2008/09 season: The first one was a 2 days rescue collection mission at at Mhlosinga Nature Conservatory in the Lowveld region of Swaziland where Ubombo Sugar Company had revealed her intention for sugarcane expansion in the area, an activity that was impacting negatively to

biodiversity. This mission was undertaken in October 2008.

The team was rushing on the first day trying to cover as large an area as possible ahead of the bulldozer that were already in the field and had had cleared a considerable area for the first centre pivot. And similarly on the second day, the team continued to sample all the areas that were earmarked for clearing for the sugarcane crop. Unfortunately, the mission was ill-timed as it was the beginning of the summer season and it was therefore the driest period long after trees had shed their fruits and seed was very scarce. Beside that, vegetation particularly grass, small plants and shrubs had been severely destroyed due to the presence of wild game that by then relied on seed and fruits for food.

In light of that fact, everything as long as it was forage, medicinal, edible or even rare from seed or fruits (if available), herbarium specimens (for identification purposes) as well as live plants particularly in the case of grasses was targeted. It was some live plants would at some stage bear seed under food management and if transplanted in time. Thus for the above reason, only 31 samples were collected and processed. These comprise seed or 10 samples, 14 live plants and 7 herbarium specimens.

The second rescue collection mission a continuation of the 2007/08 rescue collection mission in the Lower Ususthu Smallholder Irrigation Project (LUSIP) area. Two trips ware planned with the first targeting seed (fruits) and live plants of wild forages, medicinal plants, edible fruits as well as rare plants. This trip was undertaken in October 2008. Unfortunately the second trip targeting harvested crops which was planned for July 2009 could not be undertaken and will now be undertaken before the end of September 2009 due to work pressure. Hence the only crop germplasm received this year was obtained from Shewula on-farm farmers.

Thirty (38) samples comprising of 23 species of which 4 were seed samples and 34 live plant samples that were collected during the LUSIP mission. Seed were processed while live plants were transplanted at Malkerns Research for close monitoring and security purposes. Thus the collection made by the NPGRC excluding herbarium specimens comprise 24 samples from Mhlosinga, 38 from LUSIP and 2 more samples of pigeon pea and groundnuts received from Shewula on-farm farmer which now brings the total collection held by the NPGRC to 988 accessions.

The problems encountered mainly were with regard to heavy plant equipment which were destroying the diversity that we were trying to rescue. Hence there was competition during these wild germplasm collection missions.

The budgets for the collections missions were US$ 8,875 for Mhlosinga Game Reserve and US$ 980.00 for LUSIP rescue mission, all of which was provided by SPGRC.

(vii) Documentation and Information

SDIS

Currently, efforts are being made to update the active collection manual register in order to define or indicate the true location of every accession for ease of access, However, nothing is has been achieved with regard to electronic registration of data due to staff shortage. As such the backlog is on the increase in as far as electronic registration of data is concerned. The only hope therefore is the recruitment of junior staff for the Agricultural Research Division hopefully before the end of the 2009/2010 season ending in March 2010.

Internet Access

The NPGRC's internet access through local area network (LAN) is now good following the replacement of the dial-up with a lease-line connection after receiving a LAN Internet kid from the NordGen SPGRC project. The installation and for the NPGRC to be connected through a lease-line has been a major breakthrough not only for the NPGRC but as even for Malkerns Research Station as most officers are now accessing Internet.

TANZANIA

General

(i) Staffing

The list of staff remained the same as in the previous year, except for the change brought about by the departure of Mrs. A.H. Makundi who went for her MSc. studies in New Zea land. Furthermore Mr.L.M. Sambai retired from service after the age of 60 years and passed away in August 2009. In early August,2009 we also got 2 new staff, namely, Mr. Solomon Shedrack and Mr. Emmanuel Mausa who will work in the Tissue culture Laboratory.

(ii) Training and Education

Mrs Anna H. Makundi is still pursuing her M.Sc. Studies in New Zealand on Legal Frame work in Plant Genetic Resources .

(iii) NPGRCom Meeting

No meeting was held during the period under review.

Technical Progress Reports

(i) Collection and conservation activities

- Two tree seeds collection missions were carried out in Tabora, Rukwa, Singida, Dodoma and Manyara regions, through funding from MSBP. A total of 55 seed samples were collected and brought for conservation at NPGRC and at the Royal Botanic Gardens, Kew;
- A Project on the evaluation of 200 cowpea accessions for resistance to insect pests was done at Miwaleni and Madiira, Tengeru- with the help of a PhD. student. Preliminary results show that out of these 200 accessions, some appear to be promising with respect to insect pest resistance;
- One multicrop collection mission to Coast region was carried out; a total of 60 crop landraces was collected and brought to the genebank for conservation.

(ii) Laboratory Work on Seed Accessions

Accessions of different field crops were cleaned, dried and packed for conservation purposes.

(iii) Distribution of Germplasm

A total of 200 sorghum accessions were distributed to ARI Mikocheni for research purposes. On the other hand 96 watermelon accessions were sent to the University of Copenhagen, in Denmark, for DNA analysis as part of the activities of the project on enhancement of watermelon germplasm

The Centre also distributed 61 accessions of maize to Mr. Leon Tairo an M.Sc. student from the University of Zambia.

(iv) Documentation and Information

Updating of database of the already computerized data continued. Registration and data entry in the computer continued, bringing the total number of accessions recorded to 5,299. Updating of database of the already computerized data continued. Registration and data entry in the computer continued.

(v) Multiplication and Characterization

During the period multiplication and characterisation activities were conducted at Miwaleni and Madiira farms.

At Miwaleni 45 accessions of sorghum, 35 accessions of ground nuts, 50 accessions of finger millet, 28 Bambara ground nuts and 28 cowpea accessions were grown on 2 acres.

At Madiira 30 accessions of cucurbits, and 16 field pea accessions were multiplied and

characterized.

In collaboration with research staff from Copenhagen University and collaborators from Bukinafaso, we embarked on a project to multiply and evaluate 400 bambara ground nut germplasm for drought tolerance, at Hombolo Research station.

(vi) Inventory of Germplasm Maintained Under Cold Storage at NPGRC

With the help of SPGRC Senior Progamme Manager and his assistant NPGRC managed to carry out the inventory of crop accessions kept under cold storage at the NPGRC. After the completion of the exercise some suggestion to improve the inventory were given by the Senior Programme Manager. The Centre is now in the process of implementing them.

(vii) Material Requirements and Requests

In order to cope with the number of seed accessions yet to be conserved under cold storage, Tanzanian NPGRC urgently needed additional freezers, as well as carton boxes (300). With support from SPGRC/NordGen, funds for purchasing 10 freezers have been transferred to NPGRC.

NPGRC needs to have a more powerful generator, as the currently available one is not adequate to run all our freezers and driers. Additional building needs to be constructed to accommodate all the equipment, as well as, provide sufficient office space for all the staff.

(viii) Major Constraints in Achieving Technical Goals

Currently available generator is very small to run all the available equipment in case power disruption occurs. TPRI, the mother institution has got a sufficiently big generator; however, there are technical difficulties of connecting NPGRC to the system

One drier is out of order, due to unavailability of spare parts. Filters are needed to make it operational. Lack of reliable services towards maintenance of freezers and driers, this is compounded by lack of sufficient space to accommodate additional freezers, which are required to store new collections.

The two vehicles are getting old; as a result it is becoming very expensive to run them. Two screen houses and the green houses need to be renovated, hence need financial support for this purpose.

(ix) Major Achievements

The Division carried out Multiplication and Characterization of 232 seed accessions for cowpeas, sorghum, Bambara ground nuts, finger millet, cucurbits, field peas and groundnuts at Madiira and Miwaleni. A total of 55 tree seed samples were collected

from Manyara, Singida, Dodoma, Tabora, and Rukwa regions and brought to NPGRC for long term storage.

Through financial and technical support from Global Diversity Trust and SPGRC/NordGen, NPGRC acquired and installed a walk in drier in their premises. It has also obtained financial support from SPGRC/NordGen to purchase 10 additional freezers.

NPGRC's participation in the Task Force for the preparation of the Legal frame work for the PGRFA has enabled the development of the drafting instructions, as well as, the draft for the same.

Since the beginning of the MSBP in Tanzania in January, 2006 to date, a total of 386 plant species have been collected and deposited for long term cold storage at the NPGRC and at RBG Kew.

Recently, the Centre managed to collect, multiply, and evaluate and 200 cowpea germplasm from Dodoma, Tabora and Singida regions for conservation and use in the Cowpea Productivity Enhancement project, being funded by DANIDA.

With the help of various stakeholders on Plant Genetic Resources for Food and Agriculture and supervision by the National Focal Point on Global Plan of Action we have been able to prepare and submit Tanzania report on Plant Genetic Resources for Food and Agriculture to FAO.

Through collaboration with ICRISAT in a project on sorghum we have been able install sprinkler irrigation system at Miwaleni Farm- this will make our multiplication and characterization activities much easier.

(x) Implemented Projects

(a) Promotion of On-farm Conservation of PGR for Improved Food Security and Adaptation to Climatic Changes in Tanzania

Has the objective to generate knowledge (Indigenous knowledge) on useful traits and traditional cultural practices on crop management and utilization

Activities

One meeting involving the District Agricultural Extension Officers from 8 districts of the Tanzania main land was conducted in Lushoto on 16th March 2009 The named districts includes Lushoto, Pangani, Mbinga, Mtwara, Rungwe, Dodoma, Morogoro rural and Bukoba rural district.

Achievement

- The project was presented to the DEO

- Presentation of the status of PGR conservation in each district was given by the DEO.
- Activity plan for the project was developed

Field survey

The following tasks were carried out.

- Development of questionnaire to be used in data collection
- Testing of the questionnaire in Chamwino district
- Data collection in Chamwino and Bahi district in Dodoma region, and Morogoro rural district in Morogoro region targeting Sorghum, Fingermillets, Lablab beans, Yam and Pumpkins.

Achievements

- Questionnaire for the data collection developed and tested
- Data collection in the named districts done involving 150 farmers.
- Data collection is still going on till October 2009 in Mbinga, Mtwara, Pangani, Rungwe and Bukoba, where by the analysis will be carried out and general report compiled.

The activities costed approximately US$ 7,668

(b) Multiplication and Regeneration

Introduction

The National Plant Genetic Resources Centre multiplied and characterized a total of 232 accessions of 7 different crop species. This activity was carried out at Madiira Farm (Arusha region), and Miwaleni outpost station (Kilimanjaro region). At both sites supplemental irrigation was necessary, mainly because sowing was done rather late and the rains tailed off fairly earlier than expected. Nevertheless, the crops were generally good, except for finger millet, bambara nuts and groundnuts – where some accessions did not germinate at all and some had extremely poor plant stand.

Multiplication and Characterization of Sorghum, Cowpeas, Finger Millet, Groundnuts, Bambara Nuts, Pumpkins and Field Peas

The objective of this project was to multiply accessions of crops recently collected from farmers to obtain enough seed for base and active collection, and characterize crop accessions to obtain information for use by plant breeders.

Materials and Methodology

While normal crop husbandry practices were carried out on all crops planted, sorghum (45 accessions), cowpeas (28 accessions), groundnuts (35 accessions), fingermillet (50 accessions), and 28 accessions were planted at Miwaleni farm. Another 27 aand 3 accessions of pumpkin and Cucumis

accessions respectively, together with 16 accessions of field peas were planted at Madiira farm.

Highlights of Results

Out of the 7 crop species sown for Multiplication and Characterization, to the date of reporting only cowpeas and field peas have been harvested.

The expenditure for the activity was estimated to be USD 8,577.00 and was received from NordGen through SPGRC. However, only US$ 6,390 was actually spent, leaving a balance of US$ 2,187.

ZAMBIA

General

(i) Introduction

The Zambia NPGRC has the national mandate of implementing the National Plant Genetic Resources Programme covering collection, conservation, characterisation and documentation activities in close collaboration with relevant crop research programmes within the Zambia Agriculture Research Institute in partnership with other organisations, including local NGOs involved in plant genetic resources related activities. These programmes and activities are also implemented in close collaboration with the SADC Plant Genetic Resources Centre (SPGRC) within the framework of SADC PGR Networking.

(ii) Staff Position

The staff position at the NPGRC has changed during the period under review. Currently, there are four (4) professional officers and one (1) Technical Research Assistant. The current position at the NPGRC is not very good especially at Technical Research Assistant level. Currently, there is only one Technical Research Assistant, Ms. Womba Kamusaki, who is pending commencement of the two year Diploma course in Agricultural Sciences at Monze College of Agriculture.

(iii) National Plant genetic Resources Committee (NPGRCom)

The composition of the NPGRCom in terms of stakeholder institutions represented is still the same. During the period under review, the committee did not hold any meeting. The NPGRCom form the backbone of the national plant genetic resources programme as far as policy guidance is concerned. In most cases limitations of support have impeded the activities of the NPGRCom.

The NPGRC has plans to hold at least one NPGRCom meeting during the 2009/2010 season. The purpose of this meeting is to update the membership, drawn from key

stakeholder institutions of the policy issues related to internalization of the ITPGRFA.

In order to successfully hold this meeting, the NPGRC is seeking support amounting to US$3,500.

(iv) Training, workshops and Meetings

- Mr. D. Ng'uni has continued with his PhD programme at SLU-Alnarp in Sweden. He also attended the Leafy Vegetable meeting in Arusha 24 – 28 August, 2009, Tanzania.
- Mr G. Munkombwe completed his undergraduate Degree in Agro-forestry programme at the Copperbelt University, and he has since resumed work at Gene bank.
- Ms I. Kaywala participated at the scientific proposal writing in Arusha, 20-25 April 2009 and the introductory gene bank management course in Sweden, June-July 2009.

- Mr. A. Phiri participated the third session of the Governing Board meeting on ITPGRFA in 1-5 June 2009 held in Tunisia.
- Ms. W. Kamusaki has continued with her diploma course at Zambia College of Agriculture, Monze, Zambia.

(v) Facilities and Equipment

Motor Vehicles
The NPGRC has a total of three vehicles, one (new Toyota Hilux) of which is a runner while the other two are non-runners. Currently, only one of these vehicles, Toyota Hilux is reliable enough to be used for field work. The old Toyota Hilux acquired in 1992 is non-runner whose engine requires some attention. The third vehicle, procured in 1999, a Nissan QD32, is currently also a non-runner because of an engine problem. It requires engine overhaul and cylinder head replacement.

Seed Drying and Processing Equipment
Since procurement and installation, the seed drier has not presented any serious setback. However, regular servicing of this facility is required to prolong its life. In that regard and as promised during the short course on servicing the driers, SPGRC will be required to make available the reference manuals as guidelines for servicing this equipment.

Standby Generator
In 2007 and through the SPGRC Project, the NPGRC acquired a 30 KVA Genset. The machine is in its working state and has not presented any problems.

Deep Freezers
The genebank has a stock of 27 deep freezers. Of these, 25 freezers are in their working condition and two (2) upright freezers available are still non-functional. The non-

functional freezers require replacement of the compressors.

Computers and other IT facilities
The NPGRC has four (4) functional desktop computers, a laptop computer and three printers. The NPGRC procured a HP LaserJet P1005 printer arising because of the breaking down of a bigger printer HP LaserJet 4200 PS and lack of appropriate toner cartridge for Sharp model AL-1556, AL-1566.

Other Equipment
The NPGRC has procured a seed grinder to replace a faulty one that was procured by SPGRC. In the past, the NPGRC collaborated with Seed Control and Certification Institute (SCCI) in the area of seed germination testing. However, due to limited capacity it has been difficult to use the facility at SCCI. Lack of seed germinator at the NPGRC has hampered seed viability work on the conserved genetic resources in the genebank.

(vi) Visitors

During the period under review, the NPGRC was visited by a number of visitors including the following:

- Ministers of Science and Technology from South Africa and Zambia;
- Minister of Agriculture and Co-operatives, Dr. B. Chituwo;
- Bioversity International Global Plan of Action (GPA) project reviewer, Dr. Brad Marco Binnendijk, Gene bank Manager, Enza Zaden, The Netherlands;
- SPO Documentation and Information, Mr. B. Kapange and Documentation Technician, Mr. Hamudulu on a mission to update the active collection.

(vii) Constraints

- Reduced staffing level especially at the Research Assistant level;
- Lack of the germinator renders management of collections very difficult;
- Internet connectivity has continued to be unreliable because of limited bandwidth
- The assistance rendered through provision of deep freezers for storage of germplasm accessions is highly appreciated. However, there are problems of failure by carton boxes to fit in the lower compartments of the new stock of upright freezers.

(viii) National process for internalization of the provisions of the ITPGRFA

Zambia is member of FAO and the Commission on Genetic Resources for Food and Agriculture (CGRFA) and has been part of process for development of the Global System on Plant Genetic Resources (PGR). Zambia is a Contracting Party to the ITPGRFA which is legally binding upon signing and ratifying it on 4 March 2004 and 13 March 2006 respectively.

Article 4 of the Treaty obliges Contracting Parties to the Treaty to ensure conformity of its laws, regulations and procedures with its obligations as provided in its Treaty.

One approach has been identified as feasible if domestication of the provisions of the International Treaty on Plant Genetic Resources has to be realized in a relatively short time. This approach will entail review of current national policies and legal frameworks involving a task force or working group from key stakeholder institutions.

These reviews should be undertaken in the light of perspectives of the PGR policies at the global level.

(ix) Proposed Process for Domestication of the ITPGRFA

- Identification of key stakeholders;
- Formation of the task force or working group headed by Zambia Agriculture Research Institute to spearhead the internalization process;
- Review work of existing National policies and frameworks relevant and related to the ITPGRFA; analysis of the current situation;
- Compilation of the comprehensive report on the extent to which existing policies and legal frameworks accommodate the PGR issues including recommendations and way forward;
- Soliciting input from stakeholder through an extensive stakeholder consultations; and
- The review document should provide for the proposal writing to solicit support for implementation process of the recommendations arising from the updated document of the review process.

In order to successfully undertake this comprehensive review of the existing national policies and legal frameworks, the NPGRC seeks support of USD$ 15,000.

Technical Activities

(i) *Ex-situ* Conservation

Conservation

The active collection at the NPGRC is being reorganised and realigned to match the record on the SDIS with technical assistance from SPGRC. The number of accessions held in the active collection will increase following registration and accessioning of germplasm collections made during the period under review. The number of accessions during that period was 6,012. The NPGRC is also maintaining living collections of 114 accessions of sweet potato and 154 accessions of cassava in the field gene bank at Mount Makulu Research Station.

Regeneration, Multiplication and Characterisation of Genetic Resources

During the 2008/2009 season, the NPGRC undertook multiplication of germplasm accessions of various crop species in the gene bank for purposes of rejuvenating the collections and duplication to the SPGRC base collection and other international gene banks. A total of 555 germplasm accessions of various crops species were planted at Mount Makulu and Mansa Technology Assessment Site.

At Mansa TAS, 225 accessions have been planted, and harvested, broken down as follows, 180 accessions of sorghum, 12 accessions of finger millet and 10 accessions of Bambara ground nuts, total area planted 1.2ha. At Mount Makulu Central Research station, 330 accessions were planted, broken as follows: 36 accessions groundnuts, 91 accessions maize, 50 beans, 17 Hibiscus, 58 cowpeas, 24 accessions amaranths, 9 accessions sesame, 8 cleome, 11 accessions solanum, 10 corchorus and 16 accessions okra, total area planted is 1.8ha.

A total of 205 accessions of sorghum and finger millet were characterized during the period under review. Characterization data of both qualitative and quantitative nature were collected on 10 randomly selected plants for each crop species using the IPGRI descriptor lists.

Poor germination and low seed yield was seen in bambara accessions, due to pests and disease infestation and flooding of the field. There was a problem of stem maggots in beans accessions, to which remedial spray measures were carried out. Generally, majority of crops that were planted performed very well. These materials have been harvested, processed and stored.

The above activities costed US$ 820.00

(ii) Regeneration Project under the Global Crop Diversity Trust

This is the project between Global Crop Diversity Trust, the Coordinating institution SPGRC and the NPGRC identified as grant recipient to implement the named project. During period under review, the NPGRC undertook the regeneration of threatened prioritized crop collections in the gene bank. A total of 371 accessions of Maize, sorghum, beans and cowpeas were planted under project broken as follows: maize (91), cowpeas (50), beans (50), Mount Makulu site, and sorghum (180) at Mansa. These materials have been harvested, dried, and packaged. 180 accessions of sorghum which were planted in Mansa were characterized. A total of USD$ 6,443 was spent to implement the regeneration. During the planting period, the NPGRC had not yet received money from the Trust. The funds used came from Nordic/SPGRC project support funds another budget line. The NPGRC is preparing the passport data and materials in for duplication to SPGRC, Svalbard Seed Vault and other international gene banks. Characterization data will be made available both electronically and hard copies.

During the 2009/2010 season, the NPGRC will continue with the regeneration activities involving maize, sorghum, beans and cowpea germplasm accessions with support from the Trust.

The table 2 below provides summary information of accessions that need regeneration during the project, germplasm accessions regenerated during 2008/09 season and those planned for regeneration during 2009/2010 growing season.

(iii) Field Gene Bank Maintenance

The field gene bank of the Zambian NPGRC is located at Mount Makulu Central research station in Lusaka. This serves to conserve the vegetatively propagated crops of cassava and sweet potatoes. There are currently 154 accessions of cassava and 114 of sweet potatoes. The activities undertaken during 2008/09 season included maintenance of the crops already established that is pruning of the cassava, replanting of sweet potatoes, irrigation and weeding.

(iv) *In-situ*/On-farm

On farm conservation of plant genetic resources activities in Zambia involving two pilot sites namely, Rufunsa and Lukwipa began in 2003/2004. During the 2007/2008 farming season, the activities were extended to Nadezwe camp in Chikankata of Mazabuka district. During the period under review, three more sites have been identified as potential sites for upscaling participatory conservation of crop genetic diversity. These sites are Situmbeko and Manvule areas of Mumbwa district and Simutwe camp of Chikankata.

The NPGRC has been working in partnership with SADC Plant Genetic Resources Centre, Biodiversity Community Network, Department of Agriculture and most recently, Self Help Africa International.

(v) Implemented On-farm Activities

Rufunsa and Lukwipa Farming communities

The total number of farmers involved in the project activities in Rufunsa now stands at 140. Of these farmers, 56 were included to participate in the local varietal restoration activities during this period under review. The crops involved in the restoration activities in this area are groundnuts, sorghum, beans and bambara nuts. The expected returns from the last harvest for 2008/09 season are 1.2 tons of groundnuts, 300kg of beans and 150kg of sorghum. Bambara nut yields this year were very poor.

The other activity that was carried out during the period under review is the holding of the farmer field day in Rufunsa, which was held in March 2009.

This is a very active community and the farmers are now requesting for a community seed bank. The crops to be grown this year are maize, sorghum, groundnuts, beans and cowpeas. In Lukwipa, fairly minimal activities were undertaken during the 2008/09 season because of reduced participation of the local farmers and lack of measurable progress.

Nadezwe

The total number of farmers in Nadezwe stands at 146, 20 of which are old farmers and the rest are newly recruited. The crops grown by the old farmers are maize (Bilimba) and groundnuts (kadononga). With the new farmers, maize (kampelya and Bilimba), beans (kabulangeti), groundnuts and cowpeas will be grown.

One field day and a seed diversity fare were held to showcase the activities and the diversity within the community respectively.

New Sites

Three new sites have been identified and preliminary groundwork of farmer sensitization and recruitment has been done.

Manvule

This is one of the two sites in Mumbwa district. A total of 44 farmers were recruited and the crops requested for are maize (Gankata) and Groundnuts.

Situmbeko

This is also in Mumbwa district and a total of there are 50 farmers registered. Crops to be grown are maize, groundnuts, sorghum, cowpeas and beans.

Simutwe

Simutwe Agricultural Camp is located in Chikankata district along with Nadezwe Agricultural Camp. A total of twenty (20) farmers registered for the project. The crops requested for are maize, cowpeas, groundnuts and beans.

(vi) Germplasm Collection

The NPGRC undertook a multi crop germplasm collection of threatened crops and gap filling collection mission covering Luapula(Mansa,Samfya and Kawambwa) Northern (Mbala,Kasama,Mpulungu) and Southern (Mazabuka-Nega Nega, Chikankata, Magoye, Siavonga) provinces, and a total of 275 number of seed samples were collected ,crops collected include maize, sorghum, cowpeas, beans, groundnuts, finger millet, pearl millet, bambara, tomato(small), okra, cleome, amaranths, corchorus, hibiscus solanum and others amalumbwe. It costed US$ 4,730 to accomplish the above activities.

(vii) Documentation and Information

SDIS

Current status on SDIS:

- Germplasm distribution module is not active.
- Tools and utilities module is not active.
- Characterization module is limited to eight (8) crops.
- Characterization traits is limited, on certain crops some traits are not there on SDIS, there is no conformity.

- On the accession module, selected or searched accessions always being appended to the previous searches after every search.

Internet Access
The NPGRC has been connected to the institutional VSAT through the radio. However, internet accessibility has since remained a serious problem at the NPGRC. Among other problems are the constant breakdowns of the internet radio and the limitation or inadequacy of the available bandwidth.

ZIMBABWE

General

(i) Staffing

The staff situation improved during the period under review. Eleven new staff members joined the Genetic Resources and Biotechnology Institute. There is only one vacant post for Research Technician and plans are underway to fill that post.

(ii) National Plant Genetic Resources Committee (NPGRCom), Workshops and Visitors

The NPGRC committee met in February 2009. Reviewing of progress on the NPGRC activities was done and the introduction of new members to the committee.

Current NPGRCom membership
There have been no changes to the composition of NPGRCom.

(iii) Training, Workshops, Meetings and Visitors

Training

- Mr K Kusena completed his Msc Studies on Management of Biological Diversity at Uppsala University in Sweden from 2007 to 2009;
- Mr O Chipfunde attended the annual short course on Management of Plant Genetic Resources at the Swedish Agricultural University in Sweden from the 22nd of June to the 2nd of August 2009;
- Mrs Rudo Musango is pursuing a 3 year Bsc Honors degree in Agriculture with Womens University of Africa in Harare Zimbabwe;
- Ms Alter Murangi attended a 5 day training course on Holistic foundations for assessment and regulation Genetic Engeneering and Genetically modified organisms at Orange Free State, Bloemfontein South Africa from the 28th of June to 3rd of July 2009.

Workshops

- Mr O. Chipfunde and Mr K Kusena attended a workshop on a Policy Proposal for the Implementation of Farmers Rights Legislation in view of the ITPGRFA, held at the NPGRC on the 3rd of November 2008
- Mr K. Kusena and Mr O Chipfunde attended a seminar on Farmers Rights Legislation at the Ministry of Agriculture in Harare on the 5th of December 2008
- Mr O. Chipfunde attended a Farmers Rights workshop on the 12th of March 2008 in Harare.
- Mr O. Chipfunde attended a National Workshop Discussing Policy options for Increased Production, Consumption and Marketing of Indigenous Vegetables at Rainbow Towers Hotel in Harare on the 16th of April 2009
- Ms A. Murangi and Mr K. Kusena attended a workshop on Farmers Rights targeting law enforcement agents, judges, and other stakeholders at Meickels Hotel on the 16th of July 2009.
- Mr K. Kusena attended a farmers rights workshop targeting Ministry of Agriculture policy makers and parliamentarians of Cresta Lodge.
- Mr K Kusena attended a SANBio workshop on policy on the International Treaty on Plant Genetic Resources for Food and Agriculture in South Africa from the 23rd to the 24th of July 2009.

Meetings

- Mr K. Kusena and Mr O Chipfunde attended meetings for awareness raising on Farmers Rights with communal farmers and their local authorities in various districts on the Country in September 2008.

Visitors

- Ms T. Lupupa visited the NPGRC on a Community Seedbank Evaluation Project in February 2009;
- Mr L. Qhobela visited the NPGRC for the review of Progress on the Technical backstopping and also to discuss the Tripartite Agreement Project on Renegeration, in March 2009;
- Mr B. Kapange and Mr K Hamudulu visited the NPGRC in March 2009 to assist with Documentation;
- Mr L. Qhobela visited the NPGRC to assist on the Drier problem in July 2009.

(iv) Equipment, Supplies and Facilities

Equipment

The NPGRC is in possession of 27 functioning freezers and one each grinder, heat sealer, 4 desktop computers, dehumidifier and fax/copier/scanner. Additionally, the Centre has one running motor vehicle, one each faulty drier and moisture analyzer, printer, laptop and sealer.

Supplies Received

The Centre reported to have received 1 box germination paper, a server and small and medium aluminium foil bags.

Requirements
The NPGRC is however, needy of a grinder, moisture analyzer, germination incubators, seed counter, consumables fior photocopier, desktop and laptop computers.

Technical Activities

(i) *Ex-situ* Conservation

Conservation

Laboratory-based Seed Cleaning
A total of 4073 (68%) of the 5995 accessions targeted for during the previous planning meeting were cleaned and the remainder 1922 accessions can be cleaned by the end of the year 2009.

Packing and storage of dried samples
A total of 5995 accessions were targeted for packing and storage and 54% (3226) as been packed and stored. The remainder 46% (2769) of the samples is still outstanding, and 18 % (580) of that remainder had 0% germination and were recommended disposal.

Resorting and repacking of samples in freezers
Four freezers have been sorted and samples repacked. There are still 11 freezers that need this exercise.

Viability and moisture tests of 5995 accessions
About 75% (4497) of samples that needed viability tests where tested.The remainder 25 % (1498) will be tested by December 2009.

Re-registering of Accessions - 5995
About 54% (3226) of the accessions have been re registered and the remainder 46% will be registered by December 2009.

Regeneration and Multiplication
There were no regeneration and multiplication activities done in the year 2008/09. However the NPGRC is planning to take part in the Tripartite Safety Duplication project with SPGRC and the Global Crop Diversity Trust and crops to be regenerated include: 30 accessions of finger millet, 84 accessions of cowpea, 404 accessions of sorghum, 73 accessions of pearl millet.

Preparatory activities have been covered that include:

- Development of regeneration protocols and work plans for each crop.

- Preliminary negotiations with other collaborating Institutions have been done. This is with regard to issues of crop management, land availability, irrigation etc
- Selection of the crops targeted for regeneration has been done and the samples have been prepared.
- The NPGRC has managed to identify reference persons for field trials off station

(ii) Characterization

No characterization was done in 2008/2009 year. The crops listed above are going to be evaluated and characterized in addition to the regeneration and multiplication in the coming farming season.

(iii) Field Genebank Maintenance

There were no field genebank maintenance activities since there was no budget allocated to the exercise

(iv) Germplasm Collections

There was no collection done by the NPGRC and also there are no planned collections in the coming season

(v) Documentation and Information

SDIS
Since the genebank is busy resorting accessions, the process of updating the electronic SDIS stopped. Emphasis is on having clean and correct manual documentation before starting the electronic SDIS.However there have been challenges of malfunctioning and inadequate number of computers. It would be ideal if there was a computer dedicated just for the SDIS.

There is also need to have the SDIS on a Compact disc to allow easy reinstallation in cases where the system is lost due to computers crushing because of viruses or incases where the system needs to be updated to a newer version and also to install new computers.

Internet Access
The NPGRC has access to a dial –up internet connection which is unfortunately unavailable most of the time because of the faulty telephone lines. Has been down for the past 4 months and is currently down. It is only connected to one computer in the main office.

The Government had plans to enhance connectivity but the project was abandoned because of lack of resources.

Table 1: NPGRCom & Public Awareness

Country	NPGRCom		Budget	Public Awareness		Budget Requested
	Conducted	Planned		Conducted	Planned	
Angola	1	-		-	1	
Botswana	1	-		-	-	
DRC	1	-		Stakeholders' workshop	1	??
Lesotho		1		1 (ITPGRFA)	1	3,000
Malawi	0	1	4,000	-	1 Public awareness 1 Promote finger millet 1 National workshop	10,000 36,840 30,000
Mauritius						
Mocambique	1	-	-	-	-	-
Namibia			-	1	Previous resources available	-
Seychelles	-	-	-	-	-	-
South Africa	-	-	-	-	-	-
Swaziland	-	1	1,200			
Tanzania	-	-	-	1	-	-
Zambia	-	-	3,500	1		
Zimbabwe	1	1	2,000	1 (ITPGRFA)	1 (ITPGRFA)	7,000
Total			**10,700**			**86,840**

NPGRCs should identify means of reinvigorating NPGRCOm and the network to identify proper ways of making the NPGRCom attractive

Table 2: Multiplication, Regeneration and Characterisation

	Conducted	Sent to SPGRC	Budget	Planned	SPGRC Budget	Remarks
Angola	135	71	-	92	-	No funds required
Botswana	172		3,897	120	-	
DRC	-				-	DRC to start with stakeholders' workshop
Lesotho	524	386				Multiplication and Characterisation
Malawi	158	96	10,000	203	10,700	Beans to be multiplied under irrigation
Mauritius	72					
Mocambique	-	-		174	6,740	From Crop Diversity Trust
Namibia	60	-		120	4,933	
Seychelles	-	-	-	-	-	No planned activity
South Africa	610			560		
Swaziland	93		5,447	320	8,761	From Trust
Tanzania	229	-	8,577	320	9,437	
Zambia	555	438	11,180	785	21,703	Part of the money from Trust. Rescue and wild sp. missions
Zimbabwe	-	-	-	620	5,500	Conservation processes in genebank
Total			**39,101**		**67,774**	

Table 3: Collection

	Conducted	Budget	Planned	Budget	Remarks
Angola	211	-	-	-	
Botwana	15				
DRC	-	-	Inventory	???	
Lesotho	423			15,732	Legumes, wild species
Malawi	9	10,175	Water melons	10,500	Rescue: mixed, wild sp.
Mauritius			1 mission	-	
Mocambique	115	8,880	Collection mission from 2 provinces	11,921	Gap-filling in Niassa nd Cabo Delgado Provinces
Namibia	Conducted under MSBP	-	To continue with the MSBP		
Seychelles	-	-	-	-	
South Africa	165	-	1	-	
Swaziland			1	980	Available from last season
Tanzania	125	10,352	1	15,440	
Zambia	275	4,730	Wild relatives	4,032	To start with surveys to come up with a concrete number of species
Zimbabwe	-	-	-	-	No work proposed
Total		**34,137**		**58,605**	

Table 4: On-farm Conservation

	Conducted	Budget	Planned	Budget	Remarks
Angola	-	-	-	-	Not planned
Botwana	-	-	1	12,089	
DRC	-	-	-	-	
Lesotho	-	-	-	-	Not planned
Malawi	1	17,585		15,683	Includes market infrastructure establishment
Mauritius	-	-	-	-	-
Mocambique	-	-	-	-	-
Namibia	-	-	1	2,305	Documentation of farmer conservation practices
Seychelles	-	-	-	-	-
South Africa	-	-	-	-	-
Swaziland	-	-	1	15,000	
Tanzania	1	6,000	1	6,020	Additional budget will come from the treaty
Zambia			1	13,886	Includes upscaling on-farm conservation
			1	6,526	Eco-geographic survey of *Dioscorea* sp. and 'amalumbwe'
Zimbabwe	-	-	-	-	
Total		**23,585**		**71,509**	

***6 countries proposed the on farm activities.

7. NPGRC PLANNED ACTIVITIES FOR YEAR 2009/2010

A) ANGOLA

(i) Planned Regeneration and Multiplication

In 2009/10 season, NPGRC plans to multiply ten (10) accessions of cowpea, fifty two (52) accessions of groundnut, thirty (30) accessions of maize.

Site Locations, Status of Field Establishment, Yields, any Attacks by Pests/Diseases
Plans for characterization, multiplication and regeneration of accessions are dependent on the setting up of a new experimental field for NPGRC and on closer collaboration between NPGRC and some principal stations of IIA. The NPGRC has recently been assured that space for a new experimental field will be assigned to the Centre within the extensive grounds of the new University Campus, by the first trimester of 2010. For 2009/10 season, NPGRC will be working in a temporary experimental field.

(ii) Planned Documentation and Information

The NPGRC is planning to make a better use of the NTSYS software. An internal training and refresher course in the use of NTSYS is being carried out at present by José Pedro and Claudia Manuel, so that there is greater capability to produce numerical analysis of morphological and agronomic characters of local varieties collected in Angola and to able to present the phylogenetic relationships between accessions

Angola would like to propose that additional software is added to the SDIS programme to allow for the registering of data obtained from molecular characterization work.

B) BOTSWANA

(i) Germplasm Collection for Conservation

The collections would target national wild seed of threatened and useful plant species, seed store for long term conservation, establish distribution of target species, and assess located populations over time.

Justification
Germplasm collection is one of the basic activities of the NPGRC. Through the collaborative germplasm collection agreement with MSBP, the NPGRC has committed itself to collect germplasm every year until the end of the project. The resources have already been mobilised and it does not discriminate against collections of species important to NPGRC but not part of the agreement. This therefore is an opportunity that will be taken to crops wild relatives' species and the forage species.

Material and Methods

The collection expeditions under MSBP will be undertaken in five field trips between September and December 2009 covering Okavango Delta, Southern region and Kgalagadi, Ngamiland, Central and Northeast.

(ii) Multiplication and Regeneration of Sorghum and Pearl Millet Germplasm

This has the objectives to multiply 70 accessions of sorghum and pearl millet with low seed amounts and to regenerate 70 accessions of sorghum and pearl millet with low seed viability.

Justification
Following the reorganisation of the cold room exercise it was noted that majority of the accessions in the genebank have not been duplicated at SPGRC. The NPGRC attempted to send the accessions to SPGRC immediately but later realised that some of the accessions were collected some years back and assumed that their viability might had gone down. Therefore, viability test was conducted in all the sorghum and pearl millet accessions. The accessions scored as low as 40% and it was decided that anything below 80% should be regenerated first before it could be duplicated at SPGRC.

Material and Methods
70 accessions of sorghum (40) and pearl millet (30) will be planted at Sebele Research Station.

Post-harvest Management
The accessions will be harvested manual, panicles dried in shade until seed moisture content is reduced to 12%. Panicles will be threshed individually and collect equal quantities of seed from each panicle and bulk to reconstitute the original accession. The seed samples will be dried until they reach the required moisture content, packaged and stored in the cold storage and duplicated at base collection.

This activity is estimated to cost a total of US$ 3,897 all of which will be covered by the Government.

(iii) Characterisation and Multiplication of Groundnuts and Bambara Nuts (*Arachis hypogaea*)

This activity has the objective to characterize 50 accessions of groundnuts and bambara nuts, and multiply accessions to obtain sufficient seeds amounts for storage in both the active and base collections

Justification
It is important for the NPGRC to characterise all food crops that are of major significance in the country to avail information needed for their further improvement. Also to make sure that each accession stored in the genebank has enough seed stock for both active and base collection. Therefore, NPGRC has decided to multiply and characterise atleast 50 accessions groundnuts and bambara nuts.

Material and methods
The characterisation work will be done in Sebele research Station.

(iv) On-farm/*In-Situ* Activities

Seed Fairs: A tool for Assessing Diversity in Farmers Conserved Landraces and Promoting Access

The farmers hold the bulk of genetic resources because they retain seed of the indigenous landraces for security. This is important especially where formal seed systems do not offer seed of indigenous landraces. These practices have however, contributed to a rich genetic base of these landraces which is often explored in crop improvement.

In Botswana it is evident that genetic base of traditional landraces is gradually being lost due to the use of improved farming practices such as mono-cropping. More so, several factors exacerbate the disappearance of farmers' landraces due to seed certifying authority not having supply seed of traditional landraces, Government's interventions such as issuing of free seed of improved cultivars, and availing of free seed of improved seed through an agricultural development programme.

In Eastern part of Botswana however, concerted efforts by an NGO - Permaculture Trust, has supported small farming communities to continue growing traditional landraces. The Trust facilitated the establishment of a Seed Bank for safeguarding and increasing the genetic base of cultivated crops among subsistence farmers in Eastern Botswana using traditional crops. The Trust had identified farmers who are still growing indigenous landraces. Both the Trust and farmers need support for sustainability. The National Gene Bank has played insignificant role in complementing on-farm conservation efforts and seeks to promote participation of NPGRC using tools such as seed fairs.

Objectives
The seed fair provides a platform for exhibition of seeds of indigenous landraces by farmers and NPGRC, and for NPGRC to assess species diversity among farmers' exhibited landraces. Exhibitors will have the opportunity to exchange of landraces and information.

Methodology
The Seed fair will be organised jointly by NPGRC and Permaculture trust. It will be conducted in one of the villages which fall in Central District (Serowe area) where Permaculture Trust is located to cater for farmers associations in surrounding villages. About 15 groups of farmers from about six surrounding villages of Serowe will participate in the seed fair. Prizes will be awarded to best exhibitors with most of best diverse indigenous landraces.

The activity is estimated to cost US$ 12,089 all of which will be provided by the Government of Botswana.

C) DR CONGO

As part of activities in the newly estanblished network member, DRC proposes to undertake the following:

- Organize sensitization workshops on PGR;
- Conduct an inventory on the number of accessions per species;
- Build up capacity through training on collection, evaluation, characterization and conservation of germoplasm; and
- Strengthen collaboration in between the thematic programmes and the NPGRC.

D) LESOTHO

(i) Collection of Legumes (Cow Peas, Beans, Lentils) in Phamong, Mohale's Hoek District

Objective

The overall objective of the collection mission was to collect and conserve germplasm of legumes, which still exist in Phamong, Mohale's Hoek district.

The collecting mission will be undertaken between February-May 2010 to cover the period during which most of these legumes are harvested. Seeds will be collected from farm stores. The idea is to visit all farmers who at first donated the germplasm as well as visiting others. Farmers will be requested to donate the landraces they had donated, in the amount they can afford to donate. Other cultivated crops will also be collected during the mission especially those varieties of interest (those which were not collected earlier or anywhere else).

The activity is estimated to cost US$ 4,332 of which US$ is being asked from SPGRC while the remainder will be covered by the Government.

(ii) Collection of Wild Plant Species in Polihali Dam Construction Area

Objectives

The overall objective of the collection mission was to collect and conserve germplasm and herbarium specimens of wild plant species, which occur at Polihali reservoir area in Mokhotlong district.

The collecting mission will be undertaken during 2009/2010 season targeting different collecting windows. Seeds will be collected from wild. All plants of value will be collected during the mission.

The activity is estimated to cost approximately US$ 14,635, of which, US$ 11,400 is being asked from SPGRC while the rest will be a government contribution.

(iii) Planned Activities for Documentation and Information

- Make an inventory of conserved germplasm checking registration data against actual samples;
- Registration of accessions collected during the current year;
- Update the germplasm collection Information System and record characterization data.

(iv) NPGRCom Meetings

Approximately US$ 3,000 is requested to hold National Plant Genetic Resources Committee meetings**.** Frequent meetings will be held to lead the process in internalizing the Treaty in accordance with the workshop recommendations

E) MALAWI

(i) Multiplication, Rejuvination and Characterization of Various Crops

Background

Seed rejuvenation and multiplication will be carried out on different crops from 203 samples. This aims at increasing quantities of seeds, rejuvenating to improve viability thus storability. Documentation of the various growth habits of different crops is also done through characterization.

Methodology

Samples will be planted at 3 different sites, Chitedze, Lifuwu and Bembeke Research stations. Recommended agronomic practices will be followed. This year, *Phaseolus vulgaris* will be characterized at Bembeke experimental site following IPGRI descriptor list.

The expected outputs are acquisition of viable seed and sizable seed amounts for storage and distribution to users. During the regeneration activities germplasm characterization is also conducted on some crop species and this enables accumulation of useful information on the seed samples which eventually encourages utilization of such materials. The activity is estimated top cost approximately US$ 10,700 all of which is being sought from SPGRC.

(i) Recollection of Water Melon (*Cucumis melo*)

Background

Water melon germplasm was previously (mid 1990s) successfully collected by the GeneBank. However, due to a major breakdown of the dryer during seed processing,

the samples were not dried and this acceralated loss of viability before storage. To date the genebank does not have any viable samples of this valuable germplasm.

Considering the important role this crop plays in enhancing food security and income generation at household level there is great need to have the germplasm recollected and properly processed and conserved. This will ensure the availability of this crop species for future use at household level and in crop improvement programmes. Farmers are now using improved varieties acquired from shops. The adoption of the improved varieties is a threat to survival of local varieties.

The recollection will have the objecvtive to ensure conservation of water melon germplasm for use in future crop improvement programmes, household food security and income generation.

Methodology

Efforts will be made to collect from all the different ecological zones of Malawi and, more importantly, major production areas of Shire Valley, Balaka, Mangochi, Salima, Rumphi and Karonga will be targeted. Standard SPGRC collection forms and a GPS will be used to capture relevant data including ethamobotanical information. Collection will be done around March /April, 2010 when the crop is mature.

Expected Outputs

By the end of the project, substantial number of water melon germplasm diversity shall have been collected and conserved.
These will then become readily available to the farming community and scientists.

The estimated total cost of the project amounts to US$ 10,500, all of which is being sought from SPGRC.

(ii) Conservation and Sustainable Utilization of African Potato – The Miracle Traditional Herb

Background

The high publicity on *Hypoxis* sp. (African Potato) as a miracle traditional herb and the overwhelming resultant response from both the scientific and traditional users are causing great concern to the people in the field of plant genetic resources conservation.

Although traditional knowledge on dosages and efficacy regarding formulations and concortions in Malawi is not fully documented, the mere publicized awareness on the effectiveness in restoration of the body immune system, particularly with regard to HIV/AIDS infected persons, has caused such massive and unsustainable exploitation that, if no immediate conservation measures are taken, the plant could soon be driven to extinction.

The African Potato *(Hypoxis hemerocollidea*) has recently attracted the interest of the biomedical and ethano-botanical community because of its unusual chemical

constituents and their efficacy in the treatment of immune system disorders, including AIDS and cancers. Researchers have found that the plant sterols and sterolins, which are found in high concentrations in the African potato, increase the functioning of T-cells, which control and regulate the immune system. This increases the body's immune system and helps fight illnesses.

Problem Analysis

Given the publicity and awareness on the positive attributes of the African potato on maintenance and restoration of the immune system, the HIV/AIDS infected and affected persons, traditional healers and fortune hunters have all gone out in search of this magic plant. In rural areas most people infected with HIV/AIDS do not have access to ARVs, hence the increased demand to use the African potato.

In Malawi no deliberate efforts have been instituted to safeguard and develop methodologies for sustainable utilization of this plant. It will be very unfortunate for future generations if the African potato, which is indigenous to Malawi with all its potential is not properly and adequately conserved.

The project has the objective to ensure safe and long-term conservation (both *insitu* and *ex-situ*) of Hypoxis goetzei for present and future use.

Methodology

The programme will be carried out by personnel from the National Plant Genetic Resources Centre (NPGRC), a plant taxonomist from Forestry Research Institute (FRIM) and a local expert from the District Forestry Office. The actual implementation will cover exploration in all known and potential areas to ascertain the availability of the plant and determine the extent and its levels of genetic threat. When the plant species are physiologically mature collection missions will be conducted and the collected materials will be conserved ex-situ in field gene banks at Chitedze and Mbawa Research Stations.

Expected Impact

Once the programme is fully implemented it is expected that the health of HIV infected people especially those in rural areas, who currently do not have easy access to ARVs, will greatly improve through restoration of their immune system.

Overall, the project is estimated to cost approximately US$ 15,683 all of which is being solicited from SPGRC.

(iii) Promotion of Finger Millet On-Farm Conservation and Utilization: Phase IV

The overall objective of the fourth phase is to scale out the on farm conservation concept to other areas in Malawi where finger millet is under threat and also plays a critical role in improving livelihoods standards.

Phase IV of this project will specifically concentrate on sensitisation meetings in two

sites that will be identified in Rumphi district where finger millet is under threat due to promotion of other crops in the areas, construction of market structures in three strategic places based on the findings from the market survey conducted in the third phase of the project, and hold diversity fairs ro which will be asked to bring the diversity they are maintaining. The project also proposes to conduct on-farm demonstrations and lastly, proposes to construct community seedbanks using locally available materials as well as plastic containers for storage of different varieties of finger millet as well as other crops.

The above is expected to help scale-out on-farm conservation concepts, building of market infrastructures, bring farmers and other stakeholders to appreciate of finger millet diversity. It will also help in the dissemination of competitive environment friendly production methods in terms of yield, labour intensity outcomes and bring about a common understanding of different varieties by farmers and other stakeholders. It will lastly, help ease availability of seed of farmers choice through community seed banks.

The project is estimated to cost approximately US$ 36,840, all of which is being solicited from SPGRC/NordGen.

(iv) Public Awareness on Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture

To ensure continuing support for national efforts towards conservation and utilization of plant genetic resources, it will be necessary to convince decision makers that such an undertaking offers a great contribution than other options to a country's short as well as long term development. Public awareness is a tool for mobilizing popular opinion and for generating and sustaining action and political and funding support. A targeted public awareness programme can promote the development of synergies to involve communities, and local and non-governmental organizations in natural genetic resources activities thus ensuring a broader base for conservation.

Major objective of the project is to sensitise the public on importance of conserving plant genetic resources for food and agriculture.

Methodology

Implementation of the project will involve a series of activities that include organizing talks with public institutions, production of leaflets with information gathered in the desk study and compiled and packaged, posters and radio & television messages, posters and radio messages, and mounting displays in agricultural field days and shows.

The project is estimated to cost approximately US$ 10,000, all of which is being solicited from SPGRC.

(v) National Workshop on Plant Genetic Resources Conservation and Utilization

Introduction
Malawi held the last National Workshop in 2000 that looked at different issues affecting conservation and utilization of plant genetic resources for food and agriculture. In order to assess any change on conservation and utilization of plant genetic resources since the last workshop Malawi plans to hold a one-day workshop in March 2010 which will also assess the impact of a 20 year project with support from the Nordic countries. One national workshop will be organized in March 2010 to discuss different aspects affecting conservation and utilization of plant genetic resources in Malawi. Also workshop will

The main objectives of the workshop include facilitation of exchange of information and experiences regionally and nationally and discussion of opportunities and benefits of networking and of sharing conservation responsibilities, as well as on discussing international instruments affecting conservation and utilization

Methodology
Call for papers will be made from different stakeholders on a number of topics covering the conservation and utilization areas of plant genetic resources.

Estimated budget for the project US$ 30,000.

F) MAURITIUS

The NPGRC is proposing to undertake the following activities in 2009/10:

- Collection of germplasm;
- Regeneration / Multiplication;
- Characterisation;
- Monitoring of accessions in seed gene bank;
- Maintenance of accessions in field gene bank;
- Rescue of endangered species; and
- Documentation (depending on availability of staff).

G) MOZAMBIQUE

(i) Gap filling multi-crop germplasm collection mission in Niassa and Cabo Delgado provinces

Objectives
The main objectives of the mission will be to collect as many existent germplasm as possible that occurring in Niassa and Cabo Delgado provinces for conservation and future use.

Expected Outputs

Representative seed samples collected in these 2 provinces will be multiplied and stored at the NPGRC and the duplicate seed samples will be taken to SPGRC during the planning meeting 2011.

The total cost for the 2 collection missions will be approximately US$ 11, 920.66 all being requested from SPGRC.

(ii) Planned Documentation and Information: Global Plan of Action Project

Mozambique, like the other three SADC countries is also part of the project on the Global Plan of Action (GPA) for the conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture (PGRFA)

The second national workshop was held in Maputo, on 6 and 7th of March, 2008 and aimed to identify stakeholders to be involved in the establishing of the mechanism, including collecting, managing and sharing data. So far, attempts have been made for editing information on the database provided by the project, however, the feedback from the main stakeholders is not as much as required. More data is needed in order to complete the questionnaire and the common tables.

(iii) Multiplication of Germplasm Accessions Collected in the Past Seasons

Objective: To multiply crop accessions in order to obtain enough seeds for safe storage and for utilization.

Justification: The NPGRC holds material that has been collected in small quantities during the last crop seasons. To achieve the standard patterns for safe conservation and utilization, it is necessary to multiply those accessions.

Methodology and materials: The seed samples will be sown in Umbelúzi Research Station (EAU), located about 30 km south from the NPGRC. In general, this station is used by the NPGRC for multiplication and characterization activities, it is the closest station and the irrigation facilities and casual labours are available.

The Centre proposes to to multiply a total of 174 accessions (97 maize and 77 sorghum) at the cost of US$ 6,740 funds being requested from Global Trust Fund through SPGRC.

H) NAMIBIA

(i) Planned Regeneration and Multiplications

Assistance will once again be sought from SPGRC for multiplications:

- The NPGRC will re-send seeds of accessions that SPGRC claim they did not receive from the NPGRC and request that these be multiplied;
- The NPGRC requests that accessions that did not perform well, but for which seeds are still available at SPGRC will be planted again at SPGRC;

- Accessions that did not perform well and for which no seeds are left at SPGRC, will be sent again, provided that seeds are still available for those accessions;
- The NPGRC will find the 65 (minus 5 to be multiplied by the NPGRC) accessions of cucurbits that have not been multiplied yet and send those to SPGRC.

(ii) Characterisation of 120 Accessions of Pearl Millet at Mahenene Research Station

Objective

To do preliminary morphological characterisation of accessions to make them more valuable for germplasm users

Methods and Materials

The accessions of pearl millet will be planted at Mahenene Research station, 900 km north of the NPGRC. This site was selected because it represents the millet growing area and irrigation is available so that at least the multiplication activities can be saved if rains should fail. The staffing at Mahanene Research Station is not adequate to perform this activity optimally. Heavy reliance will therefore have to be made on casual labour for most activities.

Budget: The proposed activities are estimated to cost approximately US$ 41,050 of which US$ 3,495 is being requested from SPGRC while the Namibian Government will cover the remaining costs.

(iii) Multiplication and Characterisation of 5 accessions of *Citrullus lanatus* at Mahenene Research Station

Background

The NPGRC has attempted, without success, to multiply and characterise accessions of *Citrullus lanatus* at the Mahenene Research Station since 2007. The multiplication failed, mainly because of two consecutive floods. The fact that the station staff lack experience in multiplying cucurbits, may have been a contributing factor. The NPGRC would therefore like to repeat this multiplication trial. Some 65 accessions remain to be multiplied and 100 accessions should still be characterised. By repeating the exercise, the NPGRC staff and station staff hope to gain experience and knowledge in order to conduct multiplication and characterisation of cucurbits more effectively.

Accessions will be planted at the Mahenene Research station, some 900 km north of the NPGRC. The staffing at the NPGRC is presently not adequate to perform this activity optimally. Heavy reliance will have to be made on casual labour.

The proposed activities are estimated to cost approximately US$ 17,778 of which US$ 1,438 is being requested from SPGRC while the Namibian Government will cover the remaining costs.

(iv) Documentation of Farmer's Crop Conservation Practices in Namibia Through a Participatory Methodology

Introduction

The activities under on-farm conservation for the coming season will focus on completing the research proposal and implementing a number of activities in the Omusati region, some 900 km north of Windhoek. It is believed that the proposal is now ready for presentation to SPGRC in order to obtain input from the regional stakeholders and expertise.

Background

This project aims at collecting and preserving such experiences, knowledge and practices within a pilot area in crop-producing, northern Namibia. It is anticipated to later roll out this exercise to all cropping areas, some 5 500 000 ha, in order to compile a comprehensive overview of practices throughout the country. The results of this baseline survey will underpin the development of strong agrobiodiversity policy instruments, including those protecting and promoting Farmers' Rights in Namibia.

The lessons learned from documenting how farmers cope with the arid conditions in Namibia, and the translation of this knowledge into strategies for plant genetic resources conservation, may be applicable to other countries in the southern African region that are vulnerable to the effects of global climate change.

Objectives

The main objective of this study is to investigate and document traditional farming practices with regard to the conservation of genetic resources of local crops in a pilot area in Namibia, in order to develop strategies for on-farm conservation later.

Methods and Materials

Study Area

Omusati region was chosen as the study area, because most farmers farms with traditional crops and also the project leader is most familiar with this region. To keep the project manageable one region had to be chosen. After documenting the farming practices of that region, other regions farming with crops will also be looked at.

Collaboration

Upon approval from SADC and MWARF the NPGRC will continue with the project. The NPGRC staff members will liaise with extension officers in the regions for better operation. The extension workers will be informed of this project, as they will play a big role in advising NPGRC on how to go about meeting the farmers. They will assist in mobilising farmers to a meeting point, where the questionnaire will be conducted out. Extension officer will be part of the team in carrying out the questionnaire in 2010.

Future Work
How the information and experience gained can be used to improve the methodology of the project and continue to other regions in Namibia.

Budget: The proposed activities are estimated to cost approximately US$ 17,992.5 of which US$ 2,305 is being requested from SPGRC while the Namibian Government will cover the remaining costs.

(v) Documentation and Information

The following activities are planned for Documentation and Information:

- Enter characterisation data for 60 accessions that were multiplied in the main season of 2009 onto the SDIS characterisation module;
- Analyse characterisation data of 120 accessions characterised in off season of 2008 and main season 2009, interpret results and publish;
- Register new accessions on SDIS as they come in;
- Update SDIS Base/Active;
- Update SDIS Germplasm collection from 3352 to date;
- Sort out problem with collection data that is not saved in collaboration with SPGRC; and
- Continue to update the NPGRC web page.

I) SEYCHELLES

Below is a list of proposed activities by Seychelles:

- Creation of a unit responsible for PGR and training of staff in PGR conservation, utilisation and management;
- Retracing information on inventory carried out by ex-officers responsible on PGR in Seychelles;
- Documentation of information gathered on PGR in Seychelles so far;
- Updating of data collected from 2001 – 2006 inventories, through field survey/visit and any other means;
- Attend all SPGRC meetings and workshops as requested.

J) SOUTH AFRICA

(i) Regeneration and Multiplications and Characterisation for the 2009/2010 season

The NPGRC plans to multiply and characterize 200 maize accessions, 40 sorghum, 100 cowpea accessions. It will multiply 100 accessions of dry bean, 100 groundnut, 20 pearl millet, and 10 pumpkin acceesions.

(ii) Planned On-farm/*In-Situ* Activities

The NPGRC plans to establish new community seed banks in Eastern Cape and Mpumalanga provinces. A survey is to be conducted in former KwaNdebele, Mpumalanga province to identify the beneficiaries of the project and verify crops grown in the area.

Infrastructural support of two existing community seed banks (Biowatch initiative) in KwaZulu-Natal (installation of roof ventilators) and Limpopo (re-thatching of the roof) provinces are also planned activities.

(iii) Collection Proposals

The following collection missions are proposed for September 2009 to August 2010 season:

- Forage legume and grass species collection from all ecological zones.
- Mixed collection in Limpopo Province (Mokopane & Sekhukhune Districts).
- Mixed collection in the North West Province (Moses Kotane District).
- Re-collection of vegetatively propagated species in the Eastern Cape & KwaZulu Natal Provinces.

The NPGRC's current collection status with regard to forage grasses stands at three percent (16) grass species out of sixty (60) from the SPGRC Mandate List. Extensive collection has been done in Limpopo and North West Provinces thus far. However, Mokopane and Sekhukhune in Limpopo Province and Moses Kotane in the North West Province are important Districts in terms of landrace diversity that have not been covered.

A number of vegetatively propagated accessions that were collected in KwaZulu Natal and the Eastern Cape were lost during the collection trip and transportation. These are important and unique traditional varieties that must be represented in the NPGRC collection.

K) SWAZILAND

(i) NPGRCom Meeting

The committee anticipates series of three (3) meetings that will also include reviewing the outcome of the proposed International Treaty workshop. Some if not all of the meetings will involve the Ministry of Agriculture's Portfolio (Parliament representative) committee to reinforce on the workshop's logistics as well as lobbying for plant genetic resources policy implementation (approval). The proposed reimbursement request for members with respect to transport and food costs is US$1,200.00 at US$ 75 per member for all meetings for 16 members including members of the Ministry of Agriculture Parliamentary portfolio committee (representatives).

(ii) Awareness

Through its participation in the Swaziland International Trade Fair (ITF), the NPGRC was able to raise public awareness. Thus public demand for indigenous crop diversity exhibits was so high that people cramped Agriculture stand in need of the seed that was exhibited during the ITF. Agricultural Research Division which manned the stands for NPGRC exhibits were already receiving public requests for seed of the exhibited crops.

The awareness workshop on the ITPGRFA proposed during the year under review could not be held because it mainly targeted policy makers in the country who unfortunately were in other state activities engagements. Hence during the time when funds were availed for the workshop, parliamentarians had already been fully engaged. Thus the next targeted date for staging the workshop will be late January 2010 when parliamentarians will be on recess.

In light of the workshop's target group, the NPGRCom has also realized the need for assistance in acquiring the services of an expert on the ITPGRFA who can conduct the workshop for the policy makers. NPGRC is soliciting SPGRC's assistance in identifying expert(s) who can conduct a national workshop for policy makers, and further securing funding for the expert(s)' travel, lodging and other related costs whilst carrying out duties in Swaziland.

(iii) Germplasm Collection

No new collection missions are planned for 2009/10 season other than finishing the collection for 2008/09 Lower Usuthu Smallholder Project area as the season was better than in previous years. Instead, the focus of the available human resource will be mainly channelled to regeneration, multiplication and characterization. Hence the remaining US$980 will be utilized for the collection mission this September 2009.

(iv) Documentation and Information

The NPGRC hopes to continue updating the manual active collection register as a lot of problems have been discovered while conducting an inventory of the seed register in the refrigerators.

(v) Regeneration and Multiplications

The NPGRC is planning to rejuvenate, 145 maize accessions, 80 sorghum accessions, 42 bean accessions as well as 53 cowpea accessions during the 2009/10 season. Maize and Sorghum accessions will be planted at Malkerns Research Station while beans and cowpea will be planted at the Lowveld Experiment Station. Maize was planted in August 2009 while sorghum is still to be planted in November 2009. All maize and sorghum accessions will be characterized. As basic characterization information on characteristics of most of the NPGRC accessions is lacking, the regeneration period will provide an

opportunity to also carry out preliminary characterization on the accessions that will be regenerated.

Due to inadequate human capacity, the NPGRC solicits assistance from the Trust and SPGRC on maize regeneration during the flowering (maize pollination). Cucurbits and jugobeans are also proving to be problematic (difficult to multiply). SPGRC is also requested to assist in the multiplication and characterization of cucurbits therefore.

The estimated expenditure being sought from the Trust is US$ 8,765.

(vi) On-farm/*In-Situ* Activities

The NPGRC is planning a similar but bigger collaborative farmers day than that of the year under review. Together with COSPE, the NPGRC will now be expanding the promotion of the conservation and sustainable utilization of local crop diversity to at least both the Shewula and Mafucula communities from this moment on.

The estimated cost for the event is US$ 15,000 and SPGRC is being asked to provide it all.

L) TANZANIA

(i) Field Survey

The field survey is still going on in the named proposed areas (Mtwara, Mbinga, Rungwe, Pangani, Lushoto and Bukoba). This will make use of the available budget from 2008 – 2009.

(ii) Diversity Fair and Seed Germplasm Collection

This activity aim to generate planting materials for the objective 2 (Promote increased utilization of sorghum, finger millet, lablan beans, Cucurbits and Yam in areas where they meet farmer's needs). The activity is estimated to cost US$ 6,020.

(iii) Field Trial

This activity aim to implement objective 2 of the project. Four trials will be established in four districts to evaluate the identified management practices and the collected crops. Funding for this activity has been obtained from FAO (ITPGRFA).

(iv) Multiplication and characterization of selected crop accessions

Objective: To obtain sufficient quantities of seed for storage in the base collections and to characterize accessions of different crops, so as to determine genetic diversity existing among them for germplasm users.

Justification: Crop seeds collected from farmers are generally insufficient for storage as base and active collections. Furthermore, for effective utilization of accessions it is important to obtain preliminary information about them. To achieve these objectives, it is important to carry out multiplication and characterization of the same during the 2009/2010.

Materials and Methods: Seeds of collected crops will be sown in the field during the 2009/2010 season. Plot sizes and spacing will depend on the type of crop. Recommended crop husbandry practices will be followed and descriptors for respective crops will be used to characterize the accessions.

The proposed number of accessions for characterization and preliminary evaluation for 2009/2010 include 80 *Oryza sativa* (KATC), 40 *C. maxima* and 100 *A. hypogeae* (Miwaleni), and lastly, 100 *V. subterranean*.

The above proposed multiplication and characterization of the crop accessions is expected to cost approximately US$ 9,436.88, all of which is being requested from SPGRC.

M) ZAMBIA

(i) Regeneration, Multiplication and Characterization of Germplasm Accessions

The main objective of this proposal is to rejuvenate and increase amount of seeds of germplasm accessions in the Gene bank in order to sufficiently duplicate the germplasm collections to Base collection, other international gene banks and enable facilitated access to the genetic resources.

The process of site selection has been taken into account the proximity of germplasm collection sites, photoperiodic sensitivity, specific suitability and availability of crop specialists. The regeneration will be carried out in three sites, namely; Mount Makulu, Nanga and Mansa TAS. The success of this activity depends largely on strong collaboration with Commodity research teams in these regional stations.

The implementation of the above activities is estimated to cost US$ 21,703.

(ii) Field Genebank

The planned activities during the 2009/2010 growing season mainly will involve field rejuvenation of sweet potato and cassava germplasm collection at an estimated cost of US$ 1,479.

(iii) Continued On-farm Activities and Up-scaling in Chikankata and Mumbwa

About 80% of Zambia's food production is produced by small scale farmers, who

constitute 75% of the total farming population in the country. This category of farmers is very important in as far as custody, conservation and management of plant genetic diversity are concerned. However, this category of farmers is mostly resource poor. To this effect, small scale farmers use minimal inputs as most do not have sufficient funds to purchase seeds, fertilizers and other agricultural inputs.

The on-farm conservation activities in Zambia began as an SPGRC regional project in 1998 involving NPGRCs in Malawi, Zambia and Zimbabwe. Following the successes at the regional level, Zambia initiated on-farm activities involving initially Rufunsa and Lukwipa communities during 2003/2004 farming season which in subsequent season was replicated to Nadezwe community of Chikankata in Southern Province. The overall activities are participatory in nature involving the participation of farmers in the restoration of lost local crop varieties and conservation of local crop varieties by their growing traditional varieties sourced from either the target community or gene bank. In the subsequent season, the harvest from this group of farmers passed on to other farmers who are in turn involved in the activity in the following season.

Three further sites were identified for extension of these activities and preliminary activities of farmer identification and mobilization have been carried out. These sites are Simutwe Agricultural Camp in Chikankata and Situmbeko and Manvule in Mumbwa District.

Methodology and Workplan

The activity involves mobilization and sensitization of farmers in the target areas, activities which have already been set in motion. Preferred local seed varieties will be sourced either within the community or from the gene bank and provided to the farmers for the purpose of seed multiplication.

The above activities are estimated to cost US$ 13, 886.

(iv) Germplasm Collection of Wild Crop Relatives in Target Regions

The wild relatives of crop plants or crop wild relatives, which include the progenitors of crops as well as other species more or less closely related to them, constitute an increasingly important resource for improving agricultural production and for maintaining sustainable agro- ecosystems. With the advent of climate change and greater ecosystem instability Crop Wild Relatives (CWR) are likely to prove a critical resource in ensuring food security for new millennium. Genetic material from CWR has been utilized by humans for thousands of years to improve the quality and yield of crops. Farmers have used traditional breeding methods for millennia. More recently, plant breeders have utilized CWR genes to improve a wide range of crops like rice (*Oryza sativa*), tomato (*Lycopersicon esculentum*) and grain legumes. CWR have contributed many useful genes to crop plants, and modern varieties of most major crops now contain gene from their wild relatives. Therefore, CWR are wild plants related to socio – economically important species including food, fodder and forage crops, medicinal plants, condiments, ornamental, and forestry species, as well as plants used

for industrial purposes, such as oils and fibres, and to which they can contribute beneficial traits.

Objectives

- To inventories and collect a wide diversity of crop wild relatives
- To document local indigenous knowledge relating to the existing diversity
- To conserve the existing genetic diversity of crop wild relatives.

Methods

The rescue collection missions will target three (3) districts in each province. The provinces include western and southern. Targets crop are wild rice, lusitu grass, and sorghum. Most of these occur in these areas. A distance 5 to 10 km will separate collection sites.

It is estimated that the activity will cost US$ 4,032.

(v) Eco-geographical Study and Review of the Status of *Dioscorea spp* and Amalumbwe (Wild Tubers still under Identification) in Zambia

Zambia has been experiencing food shortages and hunger despite the government efforts in increasing food production of major crops like maize, cassava, sorghum and millets. The role of these traditional food crops cannot be over emphasised. Wild root and tubers have been from time in memorial in Zambia been used to bridge food shortages in rural communities especially in drought years. In the recent past there has been an increase in demand for wild yams in urban populations creating a demand for these species. To fulfil this market demand, yams are collected indiscriminately with destructive harvesting systems that may reduce their abundance in natural populations.

The genus *Dioscorea* includes around eight hundred tuberous, annual species of twining or rambling habit, mostly found in the tropical and subtropical regions. Yams occur both in the wild as well as under cultivation. The species are native throughout the tropical and warm temperate regions of the world. The vast majority of the species are tropical with only a few species extending into temperate climates. Some species are poisonous due to the presence of dioscorine, an alkaloid with an action like picrotoxin. Over thirteen species has been identified in Zambia as evidenced from herbaria voucher specimens. *Dioscorea hirtflora* is the most common edible wild yam locally known as busala in southern province. Previous herbaria collections reveal that wild yams enjoy a wide geographical distribution in Zambia.

Amalumbwe is almost extinct as evidenced from the multi-crop collection mission 2009. These species are not under organised cultivation. Most farmers interviewed agreed that they used to have such species but have with passing time lost them. Some farmers in Luapula province cultivate the species though little is known about its propagation and production requirements. The tubers can be eaten raw or cooked in several ways. The leaves, stems and roots are similar to those of Livingstone potato; it is probable that it belongs to the genus *Plectranthus*. Further information will be required to identify the

species scientifically.

Problem Statement
There is little or no indigenous knowledge that has been documented about most of the wild root and tuber plants. This has resulted into these species not given the attention they deserve despite the potential they have as food sources.

The *Dioscorea spp* in Zambia in the recent past has become a delicacy to most people in urban centres. This has resulted in increased harvesting of *Dioscorea spp* for commercial purposes. To meet the market demand people have been indiscriminately harvesting the species. The ecological and geographical areas of occurrence of *Dioscorea spp* and Amalumbwe species should be established in order to generate baseline knowledge of the species.

Objectives of the study include establishment of eco-geographical distribution of the species and conservation status and threat of genetic erosion in Zambia. It will also establish socio-economic importance of the species and its genetic diversity.

Methodology
The first part of the study will involve literature study of the species from herbaria voucher specimens, monographs, scientific papers and books. The second part will involve discussions with people in areas of occurrence and also collection of herbarium specimens.

Study Area
Four provinces namely Southern, Luapula, Eastern and Central will be targeted for this study. These provinces will represent 3 agro-ecological zones of Zambia. One district will be selected per province in consultation with provincial agriculture coordinator's office. Only 2 sites per district will be selected for data collection with the help of district agriculture coordinator's office.

The total funding required for this activity is estimated at ZMK 30,672, 200, which is equivalent to about US$ 6, 526. Below is the breakdown of expected expenditure.

(vi) Planned Documentation and Information

- Updating NPGRC/ SPGRC accession numbers.
- Entering characterization data on SDIS.
- Updating active collection data to match with SDIS.
- Propose training on documentation software.

N) ZIMBABWE

(i) Project Proposals for the Year 2009/2010 include:

- Domestication of the International Treaty on Plant Genetic Resources for Food and Agriculture, National Plant Genetic Resources Committee Meetings and Remuneration (On going project)

- NPGRC proposes at least 4 meetings should be convened for the proposed period for the NPGRCom at the estimated cost of US$ 2,000.

- Writing ITPGRFA draft position paper proposed work plan Position paper submitted to cabinet for approval by end of January 2010 At least 4 co-hosted consultative workshops done by June 2009. Several farmer group meetings contributing to draft farmers' rights legal framework by June 2010. Consultative workshops and awareness raising. This activity is estimated to cost approximately US$ 6,000.

- Drafting of the document. The draft legal framework will be submitted for cabinet adoption by August 2010 at the cost of US$ 1,000.

(ii) Documentation and Information

Updating and correction of the manual documentation and repeating the same procedure on the SDIS system.

(iii) *Ex-Situ* Conservation

- Packing and storage of 3215 dried and tested samples whereby 800 accessions will be packed per month and all should be done by December 2009 ata cost of US$;

- Re-sorting and re-packing of samples already in freezers and all accessions re-organized by December 2009;

- Seed cleaning of 1922 samples for about 500 samples will be cleaned per month;

- Viability and moisture tests of 1498 accessions whereby 500 samples will be tested for germination per month. Moisture censoring will be done for samples with desired germination percentage.

- Manual and electronic documentation of the samples, whereby about 500 accessions will be documented manually per month. At least 50 % of all accession information will be electronically documented by December 2010.

All of the above is estimated to cost approximately US$ 8,500 out of which US$ 5,500 is being requested from SPGRC while the Zimbabwean Government will contribute the remaining US$ 3,000.

8. Other Presentations

8.1 Construction of Biotechnology Laboratory

It was reported that all preparatory processes including finalizing and approving drawings were completed aand that now the papers were with the architects who had since proceeded with the engagement of other engineers – structural, electrical, *etc*. in readiness for start of construction before start of the rain season.

The meeting concurred that there were no further justification needed on establishment of Biotechnology Laboratory and the work needs to go ahead. SPGRC was asked to request Sida representative to request the money before deadlines for spending the money.

8.2 SPGRC-SANBio Project: Review opf National PGR Policies and Development of Regional PGR policy Guidelines

Emanating from the generic and broad proposal for enhancing capacities in the conservation and utilization of PGR that was presented to this meeting last year, it was reporting by SPM – Documentation & Information that SPGRC was asked by SANBio to further develop one or two activities from the broad proposal that could be funded with the little secured funds through BioFISA project by the Finnish Government.

SPGRC undertook the proposal document and submitted to SANBio. It was awarded a sum of €147,000 for reviewing national PGR policies in SADC region with view to developing regional PGR policy guidelines that will enhance capacity in better conservation and management of PGR. It is one of the eight projects being funded by NEPAD in the region in biosciences.

The project has started with fewer activities such as planning workshop and training of coordination officers and is anticipated to be fully in motion by December 2009.

8.3 Regeneration Project Funded by the Trust

It was reported that SPGRC network has partnered with the Global Crop Diversity Trust (Trust) in implementing the Regeneration Project in five countries namely: Mozambique, Swaziland, Tanzania, Zambia, and Zimbabwe whereby SPGRC shall administratively support the project and technical activities will be implemented by the participating National Plant Genetic Resource Centres between July 2009 and December 2010.

The objective of the project is to regenerate and duplicate 2,404 regionally prioritized crop collections of the SPGR network held in the five participating countries.

8.4 *In-Situ*/On-Farm Draft Project

The Team that was composed by SPGRC to develop an in-situ/on-farm proposal met more than twice and continued sharing and further developing the proposal onle.

Ms T. Lupupa, the SPM – *In-situ* Conservation informed the participants that the proposal is at advanced stage and final comments were being awated before it is finally submitted to potential funding agencies and collaborators.

8.5 MSc Theses

Two of three students who successfully graduated from the Swedish Agricultural University presented their therses with titles:

- **Mr Kudzai Kusena.** Land use / cover change and its impact on human-elephant conflicts in the Zimbabwe, Mozambique, and Zambia (ZiMoZa) Transboundary Natural Resource Management Area.

- **Ms Houshna Banu Najeer.** Morphological diversity in Eggplant (*Solanum melongena* L.), their related species and wild types conserved at the National gene bank in Mauritius.

9. Discussions on Strategic Issues

9.1 Sharing of Responsibilities between SPGRC and NPGRCs

The meeting felt that due to diminishing resources, sharing of respomnsibilities between SPGRC and NPGRCs is the ideal way but clear responsibilities and commitments need to be put in place.

SPGRC was asked to develop a working document with regard to sharing of responsibilities for people to comment on.

9.2 Role of SPGRC in Multilateral Systems

Member states need should take a leading role in domesticating the Treaty by considering its elements. It was urged that this should be developed further taking advantage of the Policy project being implemented in collaboration with SANBio.

9.3 Benefits to the Network from Global Frameworks

Partners felt important to develop partnerships with global partners and enhance relationships with other institutions, participate in international gatherings like the Commission meetings and strive to develop convincing regional project proposals for funding. It carries more weight if it is done jointly as a region than stand alone country.

9.4 Regional Contribution to Regional Food Security

The participants were reminded on the network's role into improving the regional food security thus urging them to ensure we ensure visibility and relevance. The network should conduct regional diversity fairs, give value to materials through evaluation (role of researchers in collaboration with Curator) and consider organising side events in fora such as SADC Council of Minister and others.

The network should pioneer in strengthening informal seed system and should keep a strong verge in promoting on-farm conservation concept to overcome climate change scenariosm, as well as strengthening marketing strategy for local genetic resources.

In promoting the utilization of local varieties, participants were requested to do their best in doing demonstrations to display local varieties and in the exploration of export avenues of local plant genetic matertials.

9.5 Capacity Building

It was agreed that training on MSc. and PhD should continue even though the project is winding up, especially given the fact that money for such training had already been committed.

The Trust indicated that it was ready to help solicit training resources for the network at all desirable levels. Participants urged for some ways or mechanisms for retaining the trainees at least for them to serve the network.

9.6 Gap Filling Between Active and Base Collections

Although it was agreed in Pretoria in 2007 that countries will multiply their materials to bridge gap between active and base collections, it was observed at this meeting that NPGRCs were not fully honouring their obligation of bridging the gap. NPGRCs were reminded that it was their responsibility to honour the Pretoria agreement in order to achieve the goal of bridging the existing gap and where assistance in multiplication by SPGRC is required, it should be pursued.

9.7 General Issues on Collection

Considerable and commendable work has been done on rescuing traditional crops in the region. This was confirmed by the shift of proposed collection missions to target wild crop relative and other wild edible species, i.e. wild cotton, rice, cow pea, *Citrullus* sp., weedy species, ground orchids and other useful plants. It is only a few countries that are yet to cover remote areas which were war zones or not passable due to lack of infrastructure.

Countries involved in the MSBP will continue with collections. It was pointed out that there is good will at the global level to assist countries with funding for rescue missions.

Tanzania might need SPGRC's participation in a pending collection mission to Zanzibar.

9.8 General Issues on *In-Situ*/On Farm Conservation

It was noted that those countries where on-farm activities were piloted way back since 2003/4 were now at the stage of scaling up and spreading out to reach other communities while others were at the initial level of conducting base line surveys for the identification of farmers and target crops. Participating farmers in Malawi and Zambia have experienced surplus produce and are now faced with marketing problems. Restoration of target crops in areas like Rufunsa, in Zambia, was successfully achieved and the crops are now in abundance (sorghum, groundnuts, bambara and beans). Farmers are requesting for assistance in the construction of Community Seed Banks for the facilitation of seed storage and sharing.

Countries like Swaziland, South Africa and Zambia are in the process of extending the activities to new sites/communities. South Africa is in the verge of establishing 2 Community Seedbanks, one at the Eastern Cape and one at Mpumalanga, for enhancing access to planting material on time and strengthening seed sharing and supply at community level.

During the discussions, it was evident that seed fairs have continued to improve the utilization and maintenance of crop diversity through the spirit of competitions. It serves as an easy tool for assessing and monitoring genetic erosion, seed availability before the next cropping season. As farmers display their diverse range of crops and food dishes (as practiced in South Africa, Swaziland, SPGRC), it becomes feasible to determine what is available, threatened and not common in the area. Farmers also share Indigenous Knowledge of farming practices and share or exchange seed.

It was encouraging to note the increase in the number of countries carrying out on-farm activities, from 6 to 9. The representative from the Global Trust advised the meeting to clearly report on achievements realized through on-farm conservation.

The meeting was informed that the *in-situ*/on-farm project proposal will soon be finalized and sent to donors for fund mobilization.

9.9 General Issues on Multiplication and Characterisation

Upon presentations and discussions, it was observed that viability testing equipment was required by almost all members of the network. However, it was revealed that driers in use in NPGRCs can easily be used for germinations tests.

It was agreed that, an inventory should be taken to assess which countries do not really have the germination facilities and if possible, action taken to rectify the situation.

9.10 General Issues: Documentation and Information

Development of Web-Based SDIS

The SPM – Documentation & Information reported that the work on developing the web-based SDIS was rightly on the tracks and it was demonstrated to participants during the meeting. He said that SPGRC would wish that users to highly contribut to the programming process by critically looking at the design and usability and giving recommendations to the developers.

Database servers procured by NordGen have been delivered to most NPGRCs, waiting for installation.

Connectivity Project for NPGRCs

The SPM – Documentation & Information reported that the envisaged project had materialised by a large percentage and that now, almost all countries had Local Area Networks (LANs) and were connected to the Internet.

It must however, be acknowledged that although the project was estimated to cost approximately US$ 123,000 for building LANs and connecting to Internet more than three quarters of NPGRCs, by sheer coincidence, a number of them got the proposed infrastructure through their national governments. Basically, the project built LANs in Malawi, Swaziland and Zambia plus connecting them to the Internet. Mozambique, Tanzania and Zimbabwe will only be partially supported to either finish their LANs or in payment for Internet subscriptions.

SPGRC Web Portal

With regard to the portal, the SPM – Documentation & Information reportyerd that for SPGRC to have a full access to the SPGRC portal, it had to re-design and add the necessary features of the new portal accessible at http://www.spgrc.org.zm hosted by a local company in Zambia. It is now kept up to date and NordGen has promised to look into reclaiming the older domai9n name (www.spgrc.org) which is better known by partners and stakeholders. Most information and publications are available from the portal.

10. Closure

On his closing remarks, the Head of SPGRC, Dr Munyenyembe, thanked participants for their open-minded and critical contributions and promised that SPGRC will work hard to secure funding for the next year's meeting, because they are of extreme importance for exchange of experience and expertise among scientists. He promised technical backstopping from SPGRC whenever and wherever needed.

In his closing remarks, the NordGen representative, Mr Morten Rasmussen commended SPGRC for being a strong network and asked scientists to keep up and never succumb to the periodic diverging waves like in the current sustainability risky situation the network is entangled in.

The Trust representative Ms Kijo Waruhiu expressed her overwhelming confidence she had on the huge network. She was encouraged by the strong voices that spoke for the strategic direction and path towards the ending of the project, as exit plans. She promised the backing of the Trust on SPGRC's endeavours.

The Project Technical Advisor, Dr Moneim Fatih, thanked participants for their constructive contributions during the duiscussions which he encouraged them to keep up wit.

The meeting was officially closed at 12:45. After lunch that followed at the hotel, participants visited SPGRC facilities at Chalimbana.

Appendix 1: Programme

Sunday, 6th September 2009: Arrival of Participants	
General Rapporteurs: L. Pungulani & D. Ng'uni	
Monday, 7th September 2009 - Chair: L Qhobela	
Session 1:	**Opening Ceremony**
	Rapporteurs: C. Gwafila
09:00 – 09:20	Welcome address – Head of SPGRC
	Dr M B Fatih – Sida
	Morten Rasmussen – Nordgen
	– Bioversity
	G Mwila & Ms K Waruhiu – Trust
09:20 – 09:30	Programme and Logistics Announcements: L. Qhobela
09:30 – 10:30	Issues arising from the last meeting: L. Qhobela
10:30 – 11:00	**TEA BREAK**
Session 2:	**General Progress Reports, Chair: R. Moses**
	Rapporteur: S. Naha
11:00 – 13:00	Country presentations
13:00 – 14:00	**LUNCH BREAK**
14:00 – 15:30	Country presentations
15:30 – 16:00	**TEA BREAK**
16:00 – 16:30	Country Presentations
16:30 – 17:00	MSc. theses presentations (K. Kusena, T. Manamela, H. Najeer)
Tuesday, 8th September 2009 - Chair: A. Phiri	
Session 3:	***Ex-situ* Conservation – Progress & Proposals**
	Rapporteurs: T Gumedze & K. Kusena
09:00 – 10:30	Country presentations
10:30 – 11:00	**TEA BREAK**
11:00 – 13:00	Country presentations
13:00 – 14:00	**LUNCH BREAK**
14:00 – 15:00	Country Presentations
15:00 – 15:30	Regeneration project – L. Qhobela
15:30 – 16:00	**TEA BREAK**
Session 4:	***In-situ*/On-farm Conservation – Progress & Proposals Chair: Prof Nkonko**
	Rapporteurs: T. Mukoma & R. Chitezi
16:00 – 16:45	Country Presentations
16:45 – 17:00	Report: Assessment of community seed banks – T Lupupa
Wednesday, 9th September 2009 – Chair: M. Molefe	

Session 5:	**Documentation & Information – Progress & Proposals**
	Rapporteurs: L. Mapunda & C. Dovale
09:00 – 10:30	Country Presentations
10:30 – 11:00	**TEA BREAK**
11:00 – 11:20	Demo: Web-based SDIS
11:20 – 11:30	Policy review project – B. Kapange
Session 6: General Issues – Chair: P Munyenyembe	
	Rapporteurs: A. Murangi/H. Naujeer
11:30 – 13:00	Summary Presentations - *Ex-Situ*: L L Qhobela - *In-Situ*/On-farm: T J Lupupa - Documentation & Information: B W Kapange
13:00 – 13:30	Way Forward
13:30 – 14:00	Closing Remarks - Dr P M Munyenyembe - Head of SPGRC - Dr M Fatih – Sida - M. Rasmussen – Nordgen - Bioversity - Trust
14:00 – 14:45	**LUNCH BREAK (at Hotel)**
14:45 – 16:30	Visit to SPGRC
	CLOSURE
Thursday, 10th Sept. 2009	**Departure of participants**

Appendix 2: List of Participants

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