SADC Plant Genetic Resources Centre (SPGRC)

Regional Technical Review and Planning Workshop, 2015
Lusaka, Zambia

October 2015
Lusaka, Zambia

Acronyms

ABS	Access and Benefit Sharing
ABSF	Access and Benefit Sharing Fund
ACP	Africa, Caribbean and Pacific (countries)
AFRA	African Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology (under IAEA)
APPSA	Agricultural Productivity Programme for Southern Africa
BCA	Botswana College of Agriculture
BCN	Biodiversity Community Network, Zambia
CCARDESA	Centre for Coordination of Agricultural Research and Development for Southern Africa
CIMMYT	International Maize and Wheat Improvement Centre
COSTECH	Commission for Science and Technology, Tanzania
CTDT	Community Technology Development Trust, Zimbabwe
CWR	Crop Wild Relative
DAR	Department of Agricultural Research
DNA	Dioxy-Ribonucleic Acid
DRC	Democratic Republic of Congo
FANR	Food, Agriculture and Natural Resources (Directorate at SADC Secretariat)
FAO	Food and Agriculture Organisation
FIFAMANOR	Centre for Rural Development and Applied Research, Madagascar
FIGS	Focused Identification of Germplasm Strategy
FOFIFA	National Centre for Applied Research in Rural Development, Madagascar
GBRI	Genetic Resources and Biotechnology Institute, Zimbabwe
GCDT	Global Crop Diversity Trust
GIS	Geographic Information System
GMO	Genetically Modified Organism
GPS	Global Positioning System
IAEA	International Atomic Energy Agency
ICGEB	International Centre for Genetic Engineering and Biotechnology
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IIAM	*Instituto de Investigação Agrária de Moçambique* (Agricultural Research Institute), Mozambique
INERA	*Institut National pour l'Etude et la Recherche Agronomique* (National Agricultural Research Institute), DRC
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
LUANAR	Lilongwe University of Agriculture and Natural Resources
LUSIP	Lower Usuthu Small-holder Irrigation Project, Swaziland
MAW&F	Ministry of Agriculture, Water and Fisheries, Namibia
MLS	Multi-Lateral System (under ITPGRFA)
NARDI	National Agricultural Research and Development Institute, Botswana
NBRI	National Botanical Research Institute, Namibia
NPGRC	National Plant Genetic Resources Centre
NPGRCom	National Plant Genetic Resources Committee
NPRSC	National Remote Sensing Centre, Zambia
PCR	Polymerase Chain Reaction
PGR	Plant Genetic Resources
PGRFA	Plant Genetic Resources for Food and Agriculture
QTL	Quantitative Trait Loci
RAPD	Rapid Amplified Polymorphic DNA
RISDP	Regional Indicative Strategic Development Plan, SADC
RUFORUM	Regional Universities Forum for Capacity Building in Agriculture
SAA	Seychelles Development Agency
SADC	Southern African Development Community
SAMP	Seeds and markets Projects, Swaziland
SASSCAL	Southern African Science Service Centre for Climate Change and Adaptive Land Management
SCAR	Screen and Generate Molecular Markers
SDIS	SPGRC Documentation and Information System
SLU	Swedish University of Agricultural Sciences
SPGRC	SADC Plant Genetic Resources Centre
TCP	Technical Cooperation Project
UNZA	University of Zambia
ZARI	Zambia Agricultural Research Institute

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1. Objectives

Holding of the SPGRC technical committee was in preparation of the Ministers of Agriculture Meeting that is due to take place in November 2015. SPGRC is an important unit of Food Agriculture and Natural Resources (FANR) Directorate of the SADC Secretariat and more so of the region as it is mandated to and does maintain and conserve for present and future generations plant genetic material from the region.

The SPGRC/NPGRCs Regional planning and review workshop was held in Lusaka, Zambia with the objective to:

a) Deliberate on and adopt the SPGRC Sustainability Strategy 2015-2025;
b) Deliberate on and endorse a generic programme proposal developed by SPGRC Management entitled "Enhancing Capacities for Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture in the SADC Region (2015 - 2020)";
c) Deliberate on national annual PGRFA progress reports;
d) Consider and endorse PGRFA national annual work plans and budgets for the coming year; and
e) Discuss and make recommendations on the newly developed web-based SPGRC Documentation & Information System (SDIS) with a view to adopting it and replacing the current standalone version.

2. Expected Outputs

Accordingly, expected outputs from the workshop were:

a) An adopted SPGRC Sustainability Strategy 2015-2025;
b) A generic PGRFA Programme Proposal agreed upon by stakeholders;
c) National annual PGRFA progress reports;
d) Endorsed PGRFA national annual work plans and budgets for the coming year (2016 – 2017); and
e) Adopted new web-SDIS, replacing the current standalone version.

3. Attendance

In attendance were forty three (43) participants from NPGRCs and SPGRC. Due to logistics, Mauritius and South Africa did not attend the meeting. Madagascar attended the meeting after a long absence. There were also representatives from Bioversity International, FAO (represented by the Sub-Regional Office for Southern Africa), and the International Centre for (ICRISAT). In attendance were also two consultants who assisted SPGRC in the development of web-SDIS.

4. Venue

The meeting was held at the Mulungushi International Conference Centre in Lusaka from 8th to 10th September 2015. Meanwhile, delegates were accommodated at a nearby Radisson Blu Hotel.

A detailed meeting programme is found in Annex I.

5. Opening Ceremony

The meeting started by the Session Chair welcoming all participants to the 2015 regional technical and planning workshop, focusing on achievements made over the last year of implementing programmes related to plant genetic resources for food and

agriculture (PGRFA). Participants were advised to submit their registration and claim forms to the workshop secretariat.

5.1 Welcome Address by Head of SPGRC

In his opening remarks, the Head of SPGRC, Dr Paul Munyenyembe welcomed participants to Lusaka. The Head extended a special welcome to international partners in attendance, namely FAO, ICRISAT and Bioversity International. He thanked the sponsors, the Multi-Donor Trust Fund coordinated by the World Bank from which SPGRC accessed the funds facilitated by the SADC Secretariat.

He then proceeded to narrate some of important achievements made by the network during the year (2014/2015). These included; successful conclusion the FAO-funded Technical Cooperation Programme (TCP) on the development of National Strategies for PGRFA for 6 participating countries, namely, Botswana, Lesotho, Malawi, Mozambique, Tanzania and Zambia. He reported that a new proposal for TCP Phase II incorporating lessons learnt from the first Phase had been drafted and was to be discussed at this meeting.

The Head reported finalization of the development of the SDIS, which was later to be presented and hopefully adopted for use by the network.

SPGRC continued conducting the evidence-based evaluation of conservation facilities and practices in our network members and finalized both the generic proposal on conservation and sustainable utilization of PGRFA and SPGRC Sustainability Strategy, which were approved by the SPGRC Board and will be presented to SADC Ministers Responsible for Agriculture and Food Security in November 2015 for their approval.

SPGRC hosted a meeting of the Africa Group in preparation for the Open-Ended Working Group-3 in Brazil on ABS; facilitated the revision of the SPGRC founding document - the MOU Establishing SPGRC by the SPGRC Board Task Force on Restructuring; made inputs into the Regional Indicative Strategic Development Plan (RISDP) which was approved by Council in April 2015. In the revised RISDP, conservation (and sustainable utilization) of PGRFA is considered regional priorities. It also continued our participation in the SADC Crop Wild Relatives Project coordinated by Bioversity International.

In terms of capacity building, the Head informed the meeting that the Curator of Malawi NPGRC Dr Lawrent Pungulani successfully completed his PhD studies at Massey University in New Zealand and congratulated him. He added that other NPGRC staffs were continuing with their PhD studies including Mr Kusena, Ms Loots and Ms Mahlaodi. We wish them every success in their studies.

The challenges remained the same as reported last year. They were mainly due to financial constraints. As a way forward, he hoped that the meeting will have an opportunity to chart the way forward for our network when discussing strategic issues.

5.2 Remarks by FAO Representative

The representative informed the members in the meeting that FAO Secretariat has revised its strategies on how to support SPGRC and NPGRCs initiatives on the conservation and promotion of sustainably utilization of PGRFA.

The FAO representative, Ms Joyce Mulila-Miti said FAO will continue to support the SPGRC and NPGRCs through TCP-Phase II project whose main objectives will be: to develop, adopt and publish National Strategies for PGRFA for the effective and efficient conservation and use of PGRFA in selected countries within SADC, to increase significantly the scope for using PGRFA in crop improvement as means for addressing

climate change threats, to strengthen linkages between conservation, use and seed delivery as means to ensuring that farmers access high quality seeds and planting materials of the most suitable crop varieties, to strengthen national and regional capacities for the conservation and sustainable use of PGRFA, and to improve and strengthen information exchange and sharing mechanisms between communities, countries and globally.

5.3 Remarks by ICRISAT Representative

In her greetings and remarks to the meeting, the ICRISAT representative, Ms Sakule Kudita said ICRISAT will continue to do research on five selected crops in the region. These include sorghum, finger millet, groundnuts, pigeon peas, and chickpea. The representative informed the meeting that ICRISAT has centres in West Africa, Nairobi and Malawi which caters for Africa hub.

The main objective in ICRISAT's support is characterization of genetic resources of the selected crops to molecular level, conservation and promotion of sustainable utilization of the same to farmers, breeders and scientists.

5.4 Remarks by Representative of Bioversity International

The representative of Bioversity International, Dr Ehsan Dulloo on his remarks insisted on the collaboration of NPGRCs with Bioversity International which has reviewed their objectives and come up with new ideas for establishing a new project. The project will be enhancing the link between *in-situ* conservation and use of crop wild relatives in the SADC region to address the regional food security and mitigate predicted adverse impact of climate change. However, the representative highlighted the objectives of the project that will be to conduct an assessment of the needs and the capacities in crop wild relative conservation and use in partner countries and in SADC region; to train and build capacity of personnel from partner countries in innovative sciences and Technology tools for the conservation and the use of crop wild relatives; to generate knowledge on the diversity, and conservation status of crop in partner countries and their value to use and also to prepare national strategic action plan for conservation of crop wild relative in partner countries and promote them among policy and decision markers.

5.2 Programme and Logistics Announcements

The Session Chairperson made logistical announcements regarding the filling and submission of registration and claim forms.

6. Matters Arising from the Last (2014) Meeting

6.1 Question whether Member States were using SDIS or not

Action 6.1: Generally observed that Member States were using the SDIS to manage their collections. However, it was noted that some countries such as Zimbabwe and South Africa were inputting their data in Excel sheet since when they finished re-arranging their genebanks. SPGRC got the Zimbabwean and South African databases and converted them to SDIS. List of accessions sent to SPGRC by each NPGRC was generated and sent to respective countries.

In order to avoid for NPGRCs sending accessions that have already been sent to SPGRC, it was agreed that SPGRC generates a list of all accessions already sent to the base by each country, and then NPGRCs will compare with what they have.

6.2 NPGR Committee Issue: Meetings

After participants noted that almost all NPGRCs were not holding NPGRCom meetings, SPGRC was asked to present the issue with Board members why the meetings are not being held.

It was also proposed that Alternate Chair can be appointed to stand in the committee meetings for the Chairperson. Alternate Chair should preferably be from other institutes out of the genebank system.

Action 6.2: *When presented to the Board, it was resolved that Board Members being the chairs of NPGRComs must ensure that the committee meetings are held regularly.*

6.3: SADC Protocol on PGRFA

While SADC has a number of protocols, none was available on PGRFA. It was mentioned that PGR is superficially noted in other protocols such as Forestry Protocol, *etc*. The meeting agreed that combined efforts should be put to come up with the PGRFA protocol document.

Action 6.3: *The matter was presented to the Board and it was not in favour of the development of the PGRFA Protocol. In fact, many issues regarding PGRFA are now well incorporated in the Regional Agricultural Policy.*

6.4 Rice Regeneration and Characterisation at SPGRC

In its quest to conduct characterization, SPGRC was advised by the meeting to consult with NPGRCs of Malawi, Tanzania, and Mozambique who have expertise in rice characterisation.

Action 6.4: *This is still work in progress, consultations are ongoing.*

6.6. Giving Access to Materials (Access and Benefit Sharing)

In order to have more or less common access rights to germplasm materials, the meeting requested countries that already have the sharing/access mechanisms in place, to forward them to SPGRC where modalities for harmonised accessibility can be worked on.

Action 6.6: *Nothing received from Member States*

6.7 Planning Meeting Participants

Given that for the time being, SPGRC cannot sponsor more than one participant per country to attend the planning meeting, it was resolved that all member countries who can afford to sponsor more people are free and encouraged to do so.

Action 6.7: *Resolution presented to Board for their attention and action.*

6.8 Equipment Replacement Plan and List of Suppliers

It was recalled that SPGRC promised to share with NPGRCs its equipment replacement plan and list of suppliers since last year. This was not promptly done as SPGRC was refining its plan to be in line with the new RISDP focus.

During the meeting, SPGRC once again promised to share the said documents with NPGRCs with immediate effect.

Action 6.8: *The SPGRC replacement plan will be shared.*

6.9 Characterization of Materials and Packaging Materials

While there is a general outcry for inadequate packaging materials such as aluminium foil bags, it was noted that frantic efforts are being done to ensure funds are sourced for the same. It was reported that some foil bags and pollination bags will be provided by SPGRC through FAO for the TCP project participating countries.

Action 6.9: *Although pollination bags were not supplied, foil bags and chemicals were supplied through the FAO-TCP to NPGRCs that were participating in the project.*

7. Presentations by SPGRC and Bioversity

7.1 Development of Web-based SDIS

The Senior Programme Officer – Documentation & Information, Mr B Kapange presented progress made in the development of web-based SDIS.

He presented the milestones that the process has gone through, all the modules that are ready for use (collections, accessions, distribution, references and the reports) which were later on demonstrated on a live system through a local host.

It was mentioned that much as web-SDIS has inherited all fields from the standalone system, there have been a lot of improvements to allow ease of navigation, data inputting and querying, as well as other managerial tasks. It has for example, the following improved features:

- Allows automatic updating of all NPGRC accessions deposited at SPGRC with an SPGRC number;
- Facilitates label printing (by range or by selected individual accessions) directly from the system to labels on A4 print sheet;
- Against the standalone system where an accession number is given during registration without enforcing passport data entry; the web-SDIS will only assign accession number after passport data has been entered;
- Has increased number of crop descriptors for characterization purposes from 24 to 36 crops;
- Allows download of selected information in CSV format that can eventually be saved to MS Excel for example, for further data analysis;
- Will have an elaborate system documentation manual to guide all steps and stages of data entry, editing, and general navigation through the system, as well as basic troubleshooting tips;
- Where there are more than one option for entering data, especially in characterization and species names, the system has devised a drop-down menu that will ensure consistency and accuracy; and
- Working distribution module

All of the above have so far been done with SPGRC and Zambian NPGRC data and will be replicated to other NPGRC databases. This being a new system will need set up of NPGRC system (database, web and application server, public access), and will involve training and testing on-site of NPGRC users. In future, a general regional training for all users will be conducted, drawing at least two users from each NPGRC and SPGRC so that feedback is noted from users, together with imparting the best ways of using the new system.

7.2 On-farm Conservation Strategies

This was presented by the Senior Programme Officer – *In-Situ* Conservation, Ms T Lupupa who said the on-farm regional strategy was meant to lay out a road map in the implementation of activities and to provide guidance in the development on national strategies.

In her presentation she mentioned one objective of the proposed strategy as being to reduce plant genetic erosion and increase options of PGR and seed systems to enhance productivity and that this can strategically be achieved through maintenance of agro biodiversity through promotion of on-farm conservation at community level.

A second objective is to improve the local seed systems and Community Seed Banks which can strategically be achieved through strengthening the seed systems at community level.

A third objective was to facilitate *Climate Smart Agriculture* practices which can be achieved through integration of farming systems and diversified agriculture. And lastly, the fourth strategy presented was that of developing regional and national CWR checklists and conservation strategic plans.

7.3 Draft Proposal for SADC/FAO-TCP II

The draft proposal titled "Support for the development of national capacities for conservation and sustainable utilization of plant genetic resources for food and agriculture" was presented by the Senior Programme Officer – *In-Situ* Conservation, Ms T Lupupa. It was partly a continuation of the Phase I of the same capacity building outlook but with some changes in focus and coverage for Phase II taking into account lessons learnt from the preceding phase.

After discussions, and with useful inputs from the FAO representative, it was agreed that a re-drafting of the proposal with the assistance of Ms Joyce Mulila-Mitti will be done and the draft shared with the Curators for their inputs.

7.4 Evidence-Based Technical Evaluation of NPGRCs

The technical evidence based evaluation report was presented to show the gap analysis that persists between numbers of collections that were held in NPGRCs as active collections and their duplicates at SPGRC as base collection. In particular, it focused on the main factors that led to persistence of the gap and made recommendations for filling the gap.

The summarized SPGRC EBE found there was a 53% gap in 2005 between active and base collections. The calculation of gap from SPGRC Completion Report, 2007/2008 – 2010/2011 resulted in 60% gap meaning that despite the various multiplication activities SPGRC had embarked on from 2008 to 2011, the gap increased by more than 7%.

The summary of conclusions the EBE made included that:

- there were 47% of collections that were conserved as base collections at SPGRC in 2005 meaning a 53% gap of collections formed the gap at that time.
- in parallel to multiplication efforts the SPGRC network implemented to reduce the gap, in contrary, gap had increased to above 60% during the same period multiplication was increased.
- Member States incurred new gaps in 2014/15 alone demonstrated how simple it was for a genebank to incur a gap but how difficult it is to remove it once it is incurred contrary to the challenges the network is confronted with to stop the gap from recurring.
- The compulsory alliance that is required for the national and regional genebanks to enhance the collecting expedition results was never taken advantage of by the NPGRCs in the past.
- There is a need for the NPGRCs to recognize the importance of engaging regional genebank staff to all future national collecting missions and address genebanking procedural challenges that are regional genebank related by nature.

The full EBE report recommended application of critical conservation strategies as they are defined ensure confusion is avoided during implementation.

7.5 Overview of EU-ACP *in-situ* Conservation of Crop Wild Relatives in SADC Region

This overview was presented by a Senior Officer of the Crop Wild Relatives, Ehsan Dulloo who talked about evolution in Bioversity, importance of *in-situ* conservation of Crop wild relatives and finally about the SADC CWR – *in situ* conservation of CWR project.

Upon describing what is in-situ conservation, then Dr Dulloo narrowed into CWRs focusing on their value and challenges especially those that are related to climate change and their agro-environment; and loss, degradation and fragmentation of their natural habitats and competition from alien species.

He then reported on progress made the SADC Crop Wild Relatives projects that is being implemented in three Member States of Mauritius, South Africa and Zambia. He particularly zeroed in progress made by each work package: 1. Improving national capacities in the three ACP countries of SADC region on conservation and use of CWR, 2. Science, technology and innovation tools for in situ conservation and use of CWR are deployed and tested in three ACP countries of SADC, 3. National Strategic Action Plans, supported by information systems, for on in situ conservation and use of priority CWR, 4. Awareness raising among national policymakers, and 5. Project management and governance.

The project runs until December 2016.

8. NPGRC PROGRESS REPORTS

Angola

A. General

(i) Introduction

Plant genetic resources are the basis of subsistence of mankind. They supply basic needs and help solve the problems of hunger and poverty (Jamarillo & Baena, 2001). However they have been lost, mainly by improper use by man, as well as by the destruction of their habitat. This destruction has taken place mainly due to the reduction in the number of varieties, extensive monoculture plantations and others are the result of the destruction of many areas of natural vegetation, so as to cultivate different crops.

(ii) Staffing

Staff composition at NPGRC remained unchanged during the year.

(iii) National Plant Genetic Resources Committee (NPGRCom)

In the period under review the Angolan NPGRCom met once to consider four options for the proposed models to improve the benefit sharing arrangements of the International Treaty of Plant Genetic Resources for Food and Agriculture.

(iv) Training, Workshops and Meetings

- Elizabeth Matos, Evaldina Pedro, José Pedro. Cláudio Marques and Teresa Martins attended a one day national Conference on Family Farming organized by Angolan Agriculture Ministry on 4th November 2014 in Luanda;
- Angola NPGRC was visited by Mr. Barnabas Kapange from 01st to 7th February 2015 to solve the anomaly found in the Angola database related to the addition of missing districts in its database and also to add characterization descriptors for more than 15 crops and update and back up the system;
- In December 2014 and June 2015, Elizabeth Matos participated in the ITPGRFA Open-Ended Working Group meetings on the enhancement of the Treaty's Multilateral System, and with particular concern about improving the Benefit Sharing arrangements of the MLS. Prior to the June meeting, she participated in a small consultative meeting that formed African region position to be presented to the Open-ended Working Group;
- Dr Pedro Moçambique attended the SPGR Board meeting in Pretoria, South Africa in October 2014;
- In 20th May 2015 the Angolan NPGRCom members, students in the PGR Conservation and Utilization MSc course and the Environment Governance MSc course attended a meeting on "Access to genetic resources and benefit sharing arising from their utilization" held in Luanda at Sciences Faculty of Agostinho Neto University;
- Evaldina Pedro, Teresa Martins, Isabel Daniel and Mbemba Pedro Massala attended a four day Fisheries and Environment Fair held in Luanda from 6th to 10th November 2014;
- Ihangika Chichi and Joana Salvador went for six months training to Santa Catarina University in Brazil to complete their MSc theses on studies of 51 and 38 accessions of maize respectively.

(v) Equipment, Supplies and Facilities

Angolan NPGRC reported of having 3 vehicles that are in good condition. It acquired more vertical freezers, making a total of 52 freezers, all functioning properly. A computer hosting the NPGRC database is not working and requested that the database be installed in the new computer as soon as possible. Internet links at the NPGR Centre are generally reliable.

(vii) Requirements

The Centre is in requirement of laminated foil bags, as well as large pollination bags.

(vi) Constraints

The fall of over 50% in the price of oil in 2015 (Angola's principal export) has resulted in severe financial restrictions to all government sectors, including support for education and research.

The NPGRC is still faced with a serious lack of space for all areas of work in the building where it is housed, and is still short off aluminium foil bags.

B. Technical Report

(i) *Ex-Situ* Conservation

Conservation
Due to lack of funds, Angola NPGRC did not organize a collecting mission, but a MSc student went to the two provinces of Cunene and Huíla to research for his final thesis "Comparing the diversity of local varieties of sorghum [*Sorghum bicolor* (L.) Moench,

maize (*Zea mays* L.), cowpea (*Vigna unguiculata* (L.), Walp.] and millet [*Pennisetum glaucum* (L.) R. Br.], existing in the provinces of Huíla, Cunene and Namibe in 2015 with the diversity of varieties found in these provinces in 1991-1994. He brought some samples of various crops as shown below, including 41 accessions of food crops that include *Sorghum bicolor* (8), Pearl millet (13), *Vigna unguiculata* (5), *Citrullus vulgaris* (2), *Phaseolus vulgaris* (5), *Zea mays* (7), and *Cucurbita* sp. (1).

The total accession number at Angolan NPGRC stands at 4,144. While the NPGRC brought 20 accessions to the planning meeting in 2014, it brought 10 in 2015, the latter of which include *Zea mays* (2), *Phaseolus vulgaris* (2), *Vigna unguiculata* (2), *Sorghum bicolor* (2), and *Pennisetum glaucum* (2).

Regeneration and Multiplication
During the period under review (2014-2015), the Centre carried out and completed activities of characterization (accessions of maize – 50, common beans – 30, sunflower – 30, peanut – 20, and bambara -10), which aimed to support the four students´ work in order to complete their master course in conservation and utilization of plant genetic resources. It also multiplied (accessions of maize -1, peanut -1, water melon – 3, cowpea – 1, cowpea -1, pea – 1, rice – 1, sorghum -1). It also regenerated 1 accession of millet.

(ii) Molecular Characterization Laboratory

Between February and August 2015 the Molecular Biology Laboratory has implemented a project of Molecular characterization of the germplasm of 50 common bean accessions entitled "Variability analysis of the common bean accessions, *Phaseolus vulgaris* (L), stored in the PGR Centre's Genebank".

The implementation of the project included among other tasks, the extraction and quantification of genomic DNA via PCR, using microsatellite markers of kidney beans by third year biology students of the Faculty of Science of the Agostinho Neto University. This work began in February 2015 and is due to end in August 2016.

(iii) Field Genebank Maintenance

There are field banks in some Ministry of Agriculture Research Stations: Roots and tubers in Malange (Malange province) and Mazozo (Bengo province). Mango and banana genebank is at the IIA Benguela Fruit Research Station. *Robusta* coffee is conserved on-field in Huambo and at national coffee research stations in Kwanza Sul and Uige provinces.

(iv) Utilisation of Plant Genetic Resources

The genebank distributed a total of 101 maize accessions, 16 accessions of sunflower and 30 accessions of common beans. It also distributed 20 and 10 accessions of groundnut and bambara nuts respectively.

All of the above were distributed to MSc student for thesis research work.

(v) Documentation and Information

The computer in the documentation centre ceased to function for the last time in July 2015. It is an old machine and the whole documentation area must be supported by a functional database.

The present situation at Angola's NPGRC is that no work can be done until another computer is installed. For this reason NPGRC has requested SPGRC to send

installation CD with instructions on how to install the WinSDIS programme in a–new computer.

With the start of MSc in Conservation and Utilization of plant genetic resources at the Angolan NPGR Centre, the database has provided valuable support for students' final thesis work, especially for producing distribution maps for the germplasm collected. The addition of names of municipalities (local districts) which were not previously in the SDIS system was made during the visit of Mr. Barnabas Kapange (SPGRC Senior Programme Officer for Documentation & Information) in February 2015.

Botswana

A. General

(i) Staffing

Staffing for Botswana NPGRC has not changed since last year. Mr Chiyapo Gwafila continued with an MSc in Crop Science at Botswana College of Agriculture (BCA).

(ii) Training, Workshops, Courses and Meetings

Ms Mary Kneen Molefe participated in the following workshops:

- In situ conservation and use of Crop Wild Relatives in Mauritius
- Agro-ecology workshop: 20 -24 April 2015 at Kasisi Retreat Centre, Lusaka, Zambia

Tiny Motlhaodi participated in the following workshops/meetings:

- Regional training workshop on 'Predictive characterization and pre-breeding of crop wild relatives' held in Pretoria, South Africa
- National Plant Taxonomy Committee - in collaboration with National Museum, Environmental Affairs, Dept of Range Resources, Wildlife and National Parks, UB, BCA, Birdlife Botswana

Churchill Modise

- Attended an Information, communication technology (ICT) Consultative meeting, Gaborone, Botswana

Ms Tiny Motlhaodi presented to the meeting results of her PhD thesis on Genetic Diversity and Nutritional value in Sorghum [*Sorghum bicolor* (L.) Moench] accessions from Southern Africa which she will defend in October, 2015 at the Swedish University of Agricultural Sciences (SLU).

(iii) Visits

- Ms G Mashungwa and BSc students from Botswana College of Agriculture with purpose of understanding the work done at NPGRC as well as look for career opportunities
- Maatla Morapedi from BCA to appreciate the diversity of *Lageneria ciceraria* that was in the field and request seeds of the same for agro-morphological and molecular characterization for her MSc research project
- NARDI Board visited the NPGRC to appreciate the gene bank and its role in Botswana germplasm conservation. This was necessary as NARDI will be the new mother organization of the NPGRC.

(iv) Equipment, Supplies and Facilities

The NPGRC has two types of storage facilities which are upright freezers and cold room. There are 10 upright freezers and are all in good working conditions. The cold room is also functioning well at the temperature of –5°C.

Accessions duplicated to the freezers) as per recommendation by *Ex–situ* Programme Officer way back in December 2012

The drier room is working well. The germinator, seed counter, moisture analyser and seed grinder are still all in good working condition. Meanwhile, the two sealers are currently not working.

(v) Requirements

The NPGRC expressed need for:

- Irrigation facilities
- Stand-by electric generator
- Walk-in drier (current space inadequate)
- Germination trays

(vi) Constraints

The NPGRC has continued succumbing to the shortage of qualified staff especially in the fields of taxonomy, documentation, and in-situ. Lack of funds for short and long courses training for genebank staff is another setback. Lack of irrigation facilities hampers some of the planned multiplication/regeneration activities.

B. Technical Report

(i) Conservation

About 4,651 accessions of both cultivated and wild species are conserved in the Genebank. The bulk of the accessions are from the cultivated species because initially the centre mandate was to conserve cultivated and their wild relatives. With the change of the Department of Agricultural Research (DAR) mandate, collection of wild plant species stands at 1,090 (23%) accessions while cultivated species and their wild crop relatives is 3,561 (77%) accessions.

(ii) Germplasm Collection

The NPGRC managed to collect 34 species during the reporting period.

(iii) Regeneration/Multiplication

The NPGRC planted 50 accessions each of bambara and cowpea of which only 25 and 15 accessions of bambara and cowpea were respectively harvested. The failed accessions were due to drought spell experienced during growth period. Another 4 accessions were regenerated and all of which were successfully harvested during the year.

(iv) Conduct evaluation and Pre-breeding of identified promising germplasm addressing climate change for use in breeding

In the process of evaluating and pre-breeding the following activities were done:

- Sorghum characterisation trial for 250 accessions
- Sorghum and groundnut evaluation trial (2014/15) NPGRC and breeders
- Molecular characterisation of sorghum and groundnut 2014/15 - NPGRC and breeders
- 250 accessions of sorghum characterized morphologically
- 120 accessions of bambara characterized morphologically

(v) Utilization of Plant Genetic Resources

During the reporting period, *Lageneria ciceraria* accessions were distributed to a MSc student from BCA; whereas, maize, cowpea were also distributed to an MSc student from Vienna, Austria. In the same year, *Blepharis leendertziae* and *Hypoxis* species were respectively distributed to PhD students from Swedish University of Agricultural Sciences (SLU) and the University of Toronto, Canada. A further distribution was made of *Amaranthus* sp. to the Horticulture Unit of the DAR in Botswana.

(vi) *In-situ*/On-farm Conservation

No seed fair was held in 2014/15 and none planned for 2015/16.

(vii) Documentation and Information

SDIS is working well and data entry is going on. A groundnut catalogue is lined up for printing through a FAO-TCP project.

Democratic Republic of Congo

A. General

(i) Introduction

The National Plant Genetic Resources is cross-cutting programme that deals with all species and thematic programmes in DR. Congo. Genetic resources are *in-situ* and *ex-situ* species collected or developed by thematic programmes.

The NPGRC of DR Congo has the mandate of collecting, documenting and evaluating genotypes from the national thematic programmes. The bottleneck remains on conservation of these genetic resources and availability of adequate conservation equipment and facilities.

The National research Institute, INERA is the apex organization to which NPGRC belongs and have all its thematic research programmes (food crop, industrial crop and forestry) appended to the activities of the NPGRC. INERA has research centres spread across six agro-ecological zones of the country.

(ii) National Plant Genetic Resources Committee

The National Plant Genetic Resources Committee (NPGRCom) was institutionalized in 2008 with committee members approved from ministries, universities and other institutions involved in genetic resources activities. However, the committee did not hold any meeting during the reporting period.

(iii) Staffing

The staffing for the newly established NPGRC include Professor Mbikayi Nkonko – Director Scientific Research at INERA, Mr Ramazani Lumbe – Head of Division Management of Genetic Resources, and Programme Chiefs at respective Research Centres across the country.

(iv) Facilities and Equipment

The established NPGRC for DRC reported of having an office and a faulty desktop computer at INERA in Kinshasa. As a result of joining the network late, DRC has not

received any kind of equipment support and was therefore asking for SPGRC to enable it start up activities.

(v) Constraints

The NPGRC is lacking sufficient financial resources to conduct its activities. Poor Communication, insufficient Internet linkage between centres, stations and Head quarters, and lack transport facilities constrains swift operation of the Centre. While there is no dedicated infrastructure for *ex situ* conservation and documentation equipment, the programme lacks qualified staff to run it.

Lesotho

A. General

(i) NPGRC Staff

There has been no change in terms of staff strength at the NPGRC. The positions of those who have left the NPGRC have not been filled. The staffing at the NPGRC still stands as follows: curator, documentation officer, laboratory technologist, technical officer and one general assistant.

(ii) National Plant Genetic Resources Committee (NPGRCom)

The Lesotho NPGR committee did not hold any meeting during the year. However, there were informal and individual meetings between members to discuss matters of interest to the Committee.

(iii) Training, Workshops, Meetings

- The Curator attended the Diplomatic Conference for adoption of the Protocol for the Protection of New Varieties of Plants,
- The Curator attended the SADC Regional Workshop on Climate Change
- The Curator attended the senior policy seminar on agriculture in Africa's transformation: The role of small-holder farmers
- The Documentation Officer was nominated to represent the Department in Biodiversity and Protected Areas Working Group which is coordinated at the Ministry of Tourism, Environment and Culture (MTEC). She attended three meetings (November 2014, April 2015 and August 2015) during the reporting period.
- The Laboratory Technician attended an attachment training on seed testing, seed certification and seed field inspection organised by SAMP, in Swaziland.

Visitors

The NPGRC received a number of visitors during the reporting period which include, among others:

- Visit by Lesobeng Secondary students to the Department of Agricultural Research including the NPGRC in August 2014. They were briefed on the activities of the NPGRC and they were shown diversity maintained at the genebank.
- Visit by Action Aid officer who was briefed on the activities of the NPGRC and was guided on the establishment of a Community Seed Bank.
- Visit by Katse Botanical Garden officers. They were shown around the Medicinal Plants Field Genebank.

(iv) Equipment and Facilities

The seed drying cabinet is still not functional. One technician is still looking into the problem of a drying cabinet.

The computer hosting the SDIS database is becoming problematic and needs replacement. Requests are awaiting approval for purchase of a new computer and repairs of two printers at the NPGRC.

The NPGRC received chemicals reagents in October 2014 and received the growth chamber in June 2015; all these were bought under FAO Technical Cooperation Project.

Seeking of quotations for PGR specialized equipment and accessories (such as GPS with a built-in camera, desiccators and air-conditioner repairs) are still underway.

Arrangements for solar panels installation, as a backup in-case of irregularities from the power cuts, are still not accomplished due to financial constraints.

(v) Constraints

The major constraints which impede the optimal maintenance of collections at the NPGRC are frequent power cuts which often damage the electronic equipment, shortage of staff and inadequate funds for fulfilling different genebank activities.

However, the NPGRC is trying by all means to ensure conservation and sustainable use of plant genetic resources of Lesotho. Collaboration for on-farm conservation has been solicited with organizations such as *Growing Nations*. Requests were also made to agencies such as Metolong Authority for financial support.

With regard to progress made in rehabilitating the field genebank, lack of infrastructure such as net shading, irrigation system and glass house for species that are sensitive to varying climatic conditions poses substantial losses of PGR.

B. Technical Report

(i) *Ex-situ* Conservation

The total number of accessions in the seedbank including accessions which are in cold storage and those which are not yet in freezers is 3,015 (total number of cultivated species 2361, indigenous leafy vegetables 27 and wild species 627). A total of 40 accessions were lost due to storage pests.

The NPGRC did not collect or package new accessions in freezers since there was a drier problem. The number of accessions in freezers is still 1,519 accessions comprising cereal crops, leguminous crops, forage crops, cucurbit vegetables, oilseed crops and wild species.

No accessions were deposited at SPGRC during the reporting period.

Four accessions (1 bean, 1 maize and 2 sorghum) were sent to the seed testing laboratory for viability testing. They resulted in 88, 94, 87 and 100% germination respectively.

(ii) Multiplication and Characterization:

No regeneration and multiplication activities were conducted during the reporting period.

(iii) Field Genebank Maintenance

Lesotho NPGRC maintains a Medicinal Plants Field genebank at the Department of Agricultural Research main station. The NPGRC is still maintaining collections of medicinal and aromatic plants for Metolong Authority until they have established their own conservation garden.

Seeds of spiral aloe (9g) were obtained from a dealer at Ha Seshote for propagation at the Medicinal Plants Field Genebank. 20 different plant species were obtained from Ts'hehlanyane National Park but nine did not survive the transplanting shock, 5 plant species from Outward bound (1 died) and 4 different plant species from Mafeteng district (2 died). For plants which were at flowering stage or seed formation during the collection period, arrangements were made for collection in the next coming season.

A total of 14 plots have been constructed and planted with newly collected plant species. Six water pipes were also installed for irrigation at the Field Genebank. However, it was discovered that the water pressure was too low for irrigation. Metolong Authority was approached for financial support for upgrading of the water supply system and the request is being processed.

(iv) On-farm Conservation

The NPGRC has collaborated with Growing Nations Farmers Organization at Maphutseng in Mohale's Hoek district for on-farm conservation. 12 different bean varieties (45g on average) and one *lagenaria species* (17g) were distributed to Growing Nations Farmers Organization who planted part of the seeds on-station and distributed the rest among 15 farmers from 11 villages. The accessions were doing very well during the vegetative stage but pod formation delayed until they were hit by early frost. This led to very poor yields, both on-station and on-farm.

One farmer from Berea district was given two varieties of beans and pumpkin to multiply on-farm. The two varieties of beans performed well and the yield was satisfactory, while the pumpkin varieties, which were planted on a separate farm, dried out due to dry spell which occurred just after seed emergence.

(v) Germplasm Collection

No germplasm collection expeditions were undertaken during the reporting period.

(vi) Documentation/SDIS

Documentation and Information
No technical problems were faced in using the SDIS except the problem with the SDIS computer which is becoming too slow and non-responsive. A total of 1,090 records were entered in the SDIS modules during the reporting period, including Germplasm Registration module, Germplasm Collection Information System and Active Collection Module.

The Linux server is still kept at the Department of Communications.

Internet Access
The NPGRC has access to the department's internet connectivity, but currently there is a technical problem at the block where the NPGRC is located. This problem was overcome by purchase of two modems for the NPGRC staff.

(vii) Utilization of plant genetic resources

Four accessions of beans, pumpkins, peas and lentils were distributed to an NGO for seed multiplication. The NPGRC also received a request of beans and soyabean seed from a farmers' organization – Growing Nations.

6. Requirements

The NPGRC requests for a germinator, a laptop, colour chart, seed counter, moisture analyzer, aluminium foil bags (large, medium, small), and carton boxes. It also needs a laptop, and a video camera. The genebank is also in need of a computer dedicated for SDIS.

Madagascar

A. General

The NPGRC is supposed to be within the establishment of the National Centre for Applied Research in Rural Development (FOFIFA) which is the main research institution of the Madagascar National Agricultural Research System, created in 1974.

The Mission of FOFIFA is to implement the national research policy in terms of rural development; define, direct, promote, coordinate all research activities concerning agricultural production, forestry and natural resources management, animal production, fish breeding , conservation and post-harvest processing, and economy and social sciences applied to rural development.

FIFAMANOR

This is a Centre for Rural Development and Applied Research (FIFAMANOR), created in 1972 through cooperation between Malagasy and Norwegian Governments. It has the mission of promoting wheat, tuber crops and milk production and is located at Antsirabe, Madagascar (Central Highland).

It conducts genetic resources management within its research department.

B. Technical Report

(i) Rice Genebank

The Rice Genebank has a total of 7,233 accessions of *Oryza sativa* out which 4496 are landraces and 653 are local improved varieties. Introduced accessions count to 2,084 in total.

Types of Conservation

- Base Collection (Freezers: -20°C)
- Active Collection (Cold room: 5°C - 10°C)
- *ex-situ* conservation for *Oryza longistaminata* and *Oryza punctata*

(ii) Wheat and Triticale

Wheat collection:

- 20 wheat released varieties

Triticale:

- 6 varieties of triticale released at FIFAMANOR
- Conserved at -20°C

(iii) Potato

Irish Potato
The collection: 69 accessions with 19 released varieties; conserved *in-vitro*

Sweet potato
The collection: 41 accessions, conserved *in-vitro* with 7 released varieties
401 accessions conserved on field with 30 released varieties

(iv) Taro

The collection: 71 advanced lines conserved in vitro with 2 local varieties; 45 advanced lines on field

(v) Fodder Crops

The collection: 35 accessions on field (Cannaceaes, Légumineuses fourragères, Perennial grasses) is renewed every 5 years. 450 accessions are kept in freezer (148 oats)

(vi) Problems and Suggested Solutions

- Conservation is costly
- Risk of loss of genetic diversity and genetic integrity
- Lack of qualified and efficient technicians
- Lack of financing
- Long term preservation
- Partnership for funding
- Capacity building
- Training of technicians

(vii) Achievements in 2014/15

- Madagascar **regenerated:** *In-vitro* collections: (Irish potato, sweet potato, taro), maize (184), bean (108), cowpea (51), bambara groundnut (47), peanut (243), soybean (2), sesame (1), sunflower (1), Lima beans (9), and rice (1006).

- It also **multiplied:** wheat (6), oats (3), beans (10), and peanuts (13).

- It is **conserving**: sweet potato (5), wheat (6), rice-1000 accessions regenerated (in progress), and as for cassava the conservation is on field.

Malawi

A. General

(i) Staffing

The Malawi Plant Genetic Resources Centre has 3 scientists, 1 chief technician, 4 technical staff and 4 research attendants. Two members of staff completed their studies during the year. Dr Lawrent Pungulani attained a PhD from Massey University in New Zealand and Modester Kachapila-Millinyu attained a Master's degree from Australian National University. Ireen Nyirenda and Jackson Chikasanda are pursuing Bachelor's degree studies at Lilongwe University of Agriculture and Natural Resources. Comfort Mphangamu recently joined the MPGRC as a research technician.

(ii) National Plant Genetic Resources Committee

The NPGRCom comprise of members from government departments, parastatals and NGOs. It was noted that there is need for incorporating representation from the farming community through organizations like Farmers' Union of Malawi (FUM) as they have direct links with farmers.

The NPGRCom is supposed to meet annually, but for the past few years the meetings have not taken place due to financial hiccups. The MPGRC also has three Crop Working Groups: the Food Crops Group; the Industrial and Horticultural Group; and the *in-situ* and Forestry Group. Crop working groups are advisory committees for the MPGRC. Their role is to develop strategies for collecting, characterization, multiplication and conservation of plant genetic resources in situ, on-farm and ex situ. Although, the approved SPGRC programme has 12 crop working groups, only three crop working groups were formed and operationalized before 1996 in Malawi and remained so due to inadequate staff at the MPGRC then. It is unfortunate that medicinal plants, ornamentals and underutilized plants were not included in the three crop working groups.

(iii) Training, Workshops, Meetings

The following NPGRC staff attended the listed meetings and workshops:

- Technicians managing trials in all bambara nut trial sites attended a workshop on bambara nut trial data collection and management in Lilongwe, Malawi;
- Technicians in all rice and maize characterization trial sites attended a workshop on Rice and Maize germplasm characterization trial data collection and management in Lilongwe, Malawi;
- L. Pungulani attended a workshop on review of draft protocol on Plant Breeders' Rights and the draft SADC Seed Centre Charter in Pretoria, South Africa;
- L. Pungulani attended a workshop on Southern and Eastern African agro-ecology knowledge and skills sharing in Lusaka, Zambia;
- L. Pungulani attended a national conference on farmers' rights in Malawi;
- L. Pungulani attended a workshop on Youth in Agriculture Summit "*unlocking agri-business opportunities for youth in Southern Africa*" in Durban, South Africa;
- M. Kachapila-Millinyu attended an agricultural sector national adaptation plan consultative meeting in Lilongwe, Malawi;
- M. Kachapila-Millinyu attended a workshop on reviewing & updating the country programme framework under the International Atomic Energy Association in Lilongwe, Malawi
- R. Chitezi attended a in-situ training workshop in Mauritius;
- N. Mponya attended a workshop on predictive characterization and pre-breeding in Pretoria, South Africa; and
- N. Mponya attended a workshop on research proposal writing focusing on upgrading value chains of neglected & underutilized species of plants in Mutare, Zimbabwe.

(iv) Equipment and Facilities

The genebank has 28 up-right freezers that have a storage capacity of 120 accessions and run at -18^{0}C and 12-15% RH. The two out of service mini seed driers operated at 18^{o}C and 12% relative humidity and had a handling capacity of about 20-50 seed accessions with a seed drying capability to below 5% moisture content. The walk-in drier operated at 10% Relative humidity and 15^{o}C temperature. Currently, seed drying is a challenge as all seed driers are not functioning. A local electrician has been consulted and repaired the walk-in drier a couple of times, but still not been successful.

B. Technical Report

(i) Germplasm Conservation

Malawi plant genetic resources centre has to date a total of 5,021 accessions. This includes 4,456 seed samples and 565 vegetative samples. However, the total number of accession includes both the samples that are currently in storage and some that have been lost. An assessment of the lost samples is currently underway to determine specie type and the actual number of lost samples.

(ii) Characterization, Multiplication and Rejuvenation

Due to financial constraints only maize was multiplied and no rejuvenation activities were conducted during the 2014/15 growing season. All the samples that have been processed during the reporting period are yet to be dried for storage due to the continuous breakdowns of the walk-in drier. Characterization was conducted for 4 crops namely maize (102), sorghum (30), pearl millet (30) and rice (50). Analysis of the characterization data is underway, results to be shared upon finalization. During the reporting period 137 accessions (maize – 56, pearl millet – 10, sorghum – 15, okra – 2, one each for limanda, chidede, and pumpkins, finger millet – 8, and rice – 49) were sent to SPGRC for duplication and 74 more accessions are yet to be sent.

(iii) Maize germplasm collection and characterization for climate change adaptation

The APPSA project has the objective to improve climate change adaptation in drought prone areas of Malawi, Mozambique and Zambia and the entire SADC region through identification and promotion of climate change ready germplasm of maize.

The core activities of the project include: collection of maize germplasm to fill the gaps; conservation of the collected germplasm in national, regional and CIMMYT genebanks; and establishment of national on farm conservation sites in areas with high diversity. It further targets to characterize conserved germplasm to establish core collections; and promote the fully characterized maize germplasm to users (breeders).

Key activities that were conducted in 2014/14 were: molecular characterization of 40 maize accessions, conduct. It also conducted phenotypic characterization of 50 local maize accessions.

The conclusions from results after data analysis are that wide gaps in plant height, ear height indicate and yield were observed, indicating existence of phenotypic variations (diversity) among accessions in the expression of these parameters. Though analysis not done for other parameters; much of the variations in the accessions is from the measured parameters.

Preliminary recommendations from the above are that the ten accessions (2722, 2012, 787, 725, 4550, 2723, 1992, 2862, 1983 and 1915) which gave yield > 2000kg/ha and those that had 0 to 1 anthesis-silking interval across locations could be useful parental breeding lines.

(iv) Rice germplasm collection, characterization and conservation Malawi, Mozambique and Zambia

The APPSA funded project had the object of preventing the loss of indigenous rice germplasm and increase availability of readily accessible and properly characterised indigenous and exotic germplasm for rice improvement.

It target to enhance capacity in the proper collection and conservation as well characterization of rice germplasm that will eventually be made available to users. It should also assist in identifying sites for rice *in-situ* conservation.

During 2014/15, the NPGRC identified sites for *in-situ*/on-farm conservation, an activity that is still ongoing; developed a tool for diversity analysis; and collected 74 samples of cultivated samples against planned 100 samples. At the time of reporting, collection in the Central region was in progress.

In the year, the NPGRC Characterized 50 accessions of cultivated rice at Lifuwu and data collection was still in progress.

(v) Bambara market growth and nutrition in Malawi, Mozambique and Tanzania (2014-2018)

The objective of the study was to enhance scaling out selected (and potential new) bambara varieties and production management recommendations identified in Phase II in selected bambara producing areas.

One of the expected outcomes would be the release of current varieties in range states and identification of new varieties from current stock. To achieve this, inter-state material transfers between countries were arranged, and on farm trials and on station trials in Malawi and Mozambique conducted in order to gather data for variety release in respective countries.

Agronomic and yield performance evaluation trials in Malawi that had the objective of gathering agronomic data and evaluate performance of these varieties as well proposal to release one or two of the exotic varieties. So far, data is available and the data cleaning is on progress.

(vi) Improving livelihoods of local communities in semi-arid zones of Malawi through on farm conservation and exploitation the genetic potential and seed production of yams, sorghum, pearl millet, finger millet and cowpeas germplasm mitigating climate change

This is a FAO funded project for two years (2012-2014) with a budget of US$ 295,000 that had two components: PGRs Conservation and PGR utilization.

The project aimed at improving livelihoods of smallholder farmers in semi-arid zones of Malawi through identification and promotion of climate change ready crop varieties of sorghum, yams, finger millet, pearl millet and cowpeas.

While in year 1 the project raised awareness/sensitization meetings, did baseline and eco-geographical surveys, established research sites created groups and trained on participatory seed selection and multiplication; in the second year, the project conducted morphological characterization of two target crops; did glass house drought screening experiments (pre-breeding) and implemented market research for the target crops through surveys.

In terms of achievements, the project created awareness on the role of locally adapted germplasm to climate change created; and built capacity of farmers to cope up with climate change through trainings, workshops, on-farm conservation, etc. The project ended in March 2015.

(vii) Field Genebank Maintenance

Besides seed collection the Genebank is maintaining vegatatively propagated crops in field gene banks. Previously, there were three field gene banks (i) Banana field gene bank at Bvumbwe Research Station (ii) Sugarcane Field Genebank at Kasinthula Research Station and (iii) Chitedze Research Station for ground yams, Livingstone potato and air yams. Unfortunately, the banana field gene bank was wiped out due to disease infestation. Activities done during the reporting period were mainly maintenance operations of the two field gene banks such as weeding.

(viii) Germplasm Collection

A number of collection missions were conducted by the MPGRC during the 2014/15 season and managed to collect a total of 330 accessions of different crop species that include: maize – 128, rice – 124, sorghum – 14, finger millet – 19, pearl millet – 14, beans – 8, cowpeas – 28, and pigeon peas - 9.

(ix) Germplasm Utilization

During the 2014/15 season the MPGRC has distributed a total of 112 seed samples comprising 19 crop species to farmers, scientists/ crop breeders and non-governmental organizations. While many scientists, who have accessed the plant genetic resources, are from Department of Agricultural Research Services the other group is mainly from the universities. The materials have been requested for various reasons including breeding, academic research, development interventions and production.

(x) Documentation and Information

The SDIS is working well. MPGRC is also now well connected to the Chitedze research station internet that was installed under support from the Agricultural Productivity Program for Southern Africa (APPSA). However, it has been observed that there are huge gaps between the manual documentation system and the SDIS entries; hence plans are underway to update information in the SDIS.

(xi) *In-situ*/On-Farm Conservation of Landraces

To effectively promote conservation of plant genetic resources, the Malawi national plant genetic resources centre in collaboration with Lilongwe University for Agriculture and Natural Resources (LUANAR) are implementing an on-farm conservation program for bambara nuts in Ntchisi and Mzimba districts. During the 2014/15 season farmers in the project sites were supplied with seed of which each farmer received 5Kgs seed and was expected to pay back to the project 10Kgs so that other farmers can also benefit in the next farming season.

The Malawi Plant genetic resources centre also participated in a seed fair organized by Biodiversity Conservation Institute, a local NGO working on biodiversity conservation. The fair was held in Rumphi district in the northern region of Malawi. During the fair MPGRC had a display pavilion where it showcased some of the centre's sample collections.

(xii) Constraints

The major constraint that has been faced during the reporting period is the frequent breakdown of the drier that has disturbed the drying and storage of samples from the previous and current harvest.

(xiii) Challenges

Malawi NPGRC would appreciate if it could be assisted with the following things

- Sample grinder
- Pollination bags
- Cotton bags for drying samples

Mozambique

A. General

(i) Staffing

The Mozambique NPGRC personnel have changed during the 2014 due to departure of Mrs. Dulce Magalhães wo was a field technician working at the Umbeluzi Research Station (Maputo Province) since 2008; her position has been replaced by Mr. Tito Chibamba in 2015.

(ii) NPGRCom

The Mozambique NPGR committee did not hold any meeting during the last crop period.

(iii) Training, Workshops and Meetings

- The NPGRC staff from Mozambique attended two APPSA project planning meetings, namely, the Monitoring and Evaluation Meeting, held on 23rd. March, 2015, Maputo, organized by the APPSA Coordinating Unit, Mozambique and the Planning Meeting, held on 2nd – 4th June, 2015, Maputo, co-organised by APPSA Coordinating Unit (Mozambique) and the staff project. The purpose of these meetings was to review the implementation of the project activities as well as to revise the work plan and budget for 2015 and 2016.

- The Head of the NPGRC, Dr. Paulino Munisse attended the Diplomatic Conference for the Adoption of the ARIPO Draft Protocol for the Protection of New Varieties of Plants in Tanzania, July 2015.

- Ms Carla do Vale attended the In situ conservation of crop wild relatives and diversity assessment techniques training workshop. The workshop was held during 10-14 November, 2014 in Pointe Aux Piments, Mauritius and was organized by Bioversity International and University of Birmingham, hosted by University of Mauritius and Funded by the European Union through the Secretariat of the African,Caribbean and Pacific Group of States (ACP)-EU Co-operationProgramme in Science and Technology.

- Mr. Abilio AfonsoVirissimo, attend the APPSA Dissemination Technology Training Workshop. This workshop was held in Maputo –Mozambique during 12-13 August 2015.

- Ms Carla do Vale attended the Regional training workshop “Predictive characterization and pre-breeding of crop wild relatives” 13-16 April 2015. The training workshop was held in Pretoria and attended by 23 trainees form the tree participating countries (Mauritius, South Africa and Zambia) and 6 other SADC countries.

- Mr. Francisco Reis continued with BSc study programme in Maputo, Mozambique

(iv) Visitors

During the reporting period, the NPGRC has not received any prominent visitors as the previous years.

(v) Equipment and Facilities

With the exception of the faulty desktop, one sealing machine and a seed drying cabinet most of the equipment is in good working condition.

Under the TCP-FAO Project, the NPGRC is making all efforts to get an exemption taxes for the new germinator provided by this project. This is a lengthy and bureaucratic process that involves different institutions.

(vi) Requirements

The NPGRC still need to request the following equipment and supplies: 1 seed drier, 6 deep freezers, 2 GPS, 1 altimeter, 1 desktop, 1 Laptop computer, 3 air conditioners, pollination bags, paper labels, carton boxes, and 7 thermometers.

B. Technical Report

(i) Germplasm Conservation

About 2,899 accessions of both cultivated and wild species are conserved in the Genebank. During the year, Mozambique NPGRC sent 78 cultivated rice seed samples to SPGRC for long term conservation.

(ii) Regeneration and Multiplication/Characterization

During the report period, the NPGRC has carried out two multiplication and characterisation trials at the Umbeluzi Research Station. Under the APPSA Subproject Rice Germplasm Collection and Characterisation, Mozambique has carried out one field multiplication and characterisation trial containing 107 cultivated rice accessions at Umbeluzi Research Station from December 2014 to June 2015. A total of 86 accessions were successfully multiplied and characterised at morphological level using IRRI/ Bioversity International descriptor. Regrettable, 21 accessions were lost due to severe floods in the trial site. For each accession, 5 plants were randomly selected from which 34 characters were recorded at vegetative, reproductive and post-harvest stages of the plants. Data are now being organized in Excel sheets for further multiple-variate statistical analysis in order to assess the accession diversity at morphological level. Furthermore, a total of 77 multiplied seed samples of rice will be sent to SPGRC for safety duplication.

Under the APPSA Subproject Maize Germplasm Collection and Characterisation, the NPGRC has also carried out another multiplication and characterisation trial at the Umbeluzi Station. 60 accessions of maize have been sown during the beginning of June 2015 and at the moment this material still at vegetative stage.

(iii) Germplasm Collection

Mozambique carried out two germplasm collection missions during this reporting period. One rice collection mission was undertaken in Changara District (Tete Province) where a total of 14 germplasm accessions of cultivated rice were collected from 5 villagesand further conserved at the NPGRC. The most of the collected germplasm were from lower land and late maturing farmer'svarieties. Farmers said that some varieties were aromatic, less attack by birds and rare.

The other collection mission was also carried out in Changara District (Tete province) and a total of 16 accessions of cultivated maize were also collected and conserved at the NPGRC.

In both missions, the collection activities were constrained by massive floods that affected most of the collecting target sites in 2015, which resulted in loss of farmer'sfield seeds. The APPSA Project (Subproject Rice Germplasm Collection and Characterisation and the Subproject Maize Germplasm Collection and Characterisation) provided funds for these two missions.

(iv) Documentation and Information

The SDIS was reported working very well with back-ups being made at routine basis. However, recently the desktop where the SDIS was installed is becoming to show some problems with the onboard battery, and consequently the data entry has been affected. From now, we have being advised to replace the battery and to buy a new desktop later on.

Namibia

A. General

As mandated by SPGRC, the Namibian NPGRC has been conserving the genetic materials for their immediate or potential usefulness to humans, in breeding or in some other form of research or development as per prescribed standards.

(i) Staffing

Staff strength has remained unchanged at NPGRC, i.e. still remains at 3 staff members.

(ii) National Plant Genetic Resources Committee (NPGRCom)

There were no reported changes in the NPGR committee, and the committee remained in dormancy.

(iii) Training, Workshops and Meetings

The NPGRC attended the following meetings, trainings and workshops:

- Mrs Hilukwa- Studies MSc in Natural Resource Management
- Mrs Hilukwa- Attended *In-situ* conservation of crop wild relatives in Mauritius November 2014
- Ms K. Sikute together with Gobabeb Research, trained farmers in Northern Namibia May 2015
- Ms. K. Sikute attended the Biodiversity summit 22-24 May 2015
- NPGRC (together with SPGRC Ms T. Lupupa) conducted on-farm survey in Zambezi region June 2015

(iv) Equipment, Supplies and Facilities

The NPGRC possesses two 4x4 vehicles running vehicles. There are a total of 48 upright freezers in the NPGRC of which 26 are filled. The NPGRC has one functioning r computer and two faulty dehumidifiers.

The NPGC building is in good condition.

(v) Constraints

The lack of pollination bags (brown and white) is the major constraint at the NPGRC. The government encourage us to buy through a registered company in Namibia and there are no companies interested in ordering the material from Zimbabwe.

B. Technical Report

(i) *Ex situ* conservation

Germplasm Conservation
The NPGRC received an additional 145 accessions (52 crops and 93 wild) gathered from collections during the year. This has enriched the register to 4,176 accessions (2080 crops and 2096 wild).

Germplasm Multiplication
In terms of multiplication, the NPGRC reported that two maize accessions were currently in the field, planted 29 July 15 at Mahenene.

Distribution of Requested Germplasm

Over 350 accessions were given to an MSc student studying genetic diversity in *P. glaucum*. More requests were received but for wild species.

(ii) *In situ*/On-farm Conservation

***In-situ* Conservation**

Under on-farm conservation, a survey was conducted in Zambezi where farmers were encouraged to continue growing traditional crops, and rare and lost crops were identified. On this survey, seed samples for multiplication and distribution were also collected.

Drought was experienced in all visited areas where maize is a major staple food but also wild animals are a problem, possibly competing for food that has become scarce following droughts. As a result of the persistent droughts, most farmers have lost their traditional crops. Farmers indicated that they are keen to get the traditional crops back and have great interest in agro-biodiversity incorporating trees.

Identified rare/lost crops include *Ipomoea batatas* (sweet potato), *Sorghum bicolor* (Libele, Murwa, Tou, Kankota, Kakubama *etc*.), *Vigna subterraneae* (bambara), *Cucurbita pepo* (calabash), *Citrullus lanatus* (Lunobu), *Manihot esculenta* (cassava), and Kruger maize.

In terms of seed sources, selection and storage, it was observed that seeds were bought from shops & MAWF, eliminating the culture of sharing; selection is done at harvesting and threshing; and that seeds were stored in bottles, sacks, drums and ash is sometimes added.

(iv) Documentation and Information

SDIS
While the desktop computer was reported not working, the overall Internet access is rated reliable at the Genebank. Namibia reported to had received two hard drives (for the database server) from Sweden (NordGen/Sida) to replace the 'lost' disks.

Seychelles

A. General

(i) Introduction

For the year 2014-2015, Seychelles made significant step in its process to revitalise the plant genetic resources conservation activities because there is need for such an institution like NPGRC and its significance in the national efforts to sustain food security endeavour. Through the effort of the Acting Curator, Seychelles made history

and in realising the first Plant Genetic Resource Centre in the form of a Public Private Partnership.

Seychelles being a small island nation provides a unique environment for conservation within the SADC. Its conservation needs and requirements differ greatly from most if not all NPGRCs simply because its focus is on plant produce through vegetable propagation instead of seeds. This makes the requirement for large field germplasm a must and therefore the need for high level of investment which can only come from the private sector. Success in the setting up of this PPP with the private sector will be the main Seychelles contribution to this year's meeting and hope that it will help other NPGRCs present to think in this direction and face future challenges.

The Seychelles Agricultural Agency (SAA) is the national institution with portfolio responsible for plant genetic resources development. However, this section of the SAA has been crippled for the past years due the lack of institutional and human capacity. This has lead to loss of a wide range of genetic resources as a result of other sectors activity. NPGRC Seychelles functions under the umbrella of the Department of Crop and Livestock Development Support, as a unit of the Research and Development section.

Currently SAA is going through a series of institutional restructuring processes and at present the new structure is not available, but hope is there to have it shortly. However, one thing is certain, the NPGRC will as from the 21st August 2015 function under the umbrella of a public Private Partnership agreement.

(ii) Staffing

We have added one staff to the PGR and Laboratory Unit. Miss Nathalie Meme joins SAA from the Agro-industry laboratory. She specialise in microbiology. She will require an in-depth introduction to PGR and training of the same.

(iii) Projects and other Collaborations

a) **The Val D'en Dor Project on Plant conservation**, funded under the UNDP Small Grant Programme has ended and search for new source of funding continues so that the initiated works can continue. These include the nursery which is already functioning at Val D'en Dor to mass-produce the old local food crops and selling them to the farming community at Val D'en Dor and the general public;

b) **Collaboration with COGENT** continues. Because of the limited work being done on coconut in Seychelles, the overall contribution to COGENT is very minimal. However, Seychelles remains part of COGENT due to the vast potential on the domain which also includes its work on the Coco Der Mer (*Lodoicea maldivica).*

c) **Public Private Partnership for NPGRC** aims at providing the appropriate institutional set up to finally launch its NPGRC and initiate the activity of the NPGRCom. Mr Jean-Paul Geffroy a young prominent local farmer was taken on board with the responsibility of partnering with the government though the Ministry of Fisheries and Agriculture (parent ministry of the SAA) to establish and operate the NPGRC within the framework of a PPP agreement. The private investor (Mr Geffroy) and the government signed the PPP agreement on the 21st of August 2015. High-level government representatives including the Designated Minister, Minister for Finance, Minister for Environment and Minister for Fisheries and Agriculture attended the ceremony. The project outcome will be that the farmer will benefit from the fruits produced from the genebank, which will include wide varieties of fruits and root crops including cassava, yam and sweet potato. The Agency will benefit from the propagation

materials. The Agreement is still being reviewed and SPGRC will be informed of the progress.

d) **The International Atomic Energy Agency (IAEA)** remains a huge collaborator with the SAA and now with the new NPGRC. The NPGRC can now benefit under the new AFRA project under the umbrella of the IAEA with training for staff in the domain of molecular science, mutation breeding and micro propagation or biotechnology. The AFRA project also makes provision for supply of equipment to support national programme in mutation breeding and micro propagation.

(iii) Accomplishments and Failures

Successes

a) Mr. Nourice (Curator for Seychelles) commenced his PhD in March 2015 and is due to complete his study and return to the Seychelles during the month of March 2018;
b) Initiations of new IAEA project SEY5007 for 2014, a project that came first (priority number 1) for IAEA funding among many others including projects from the rest of the Indian Ocean countries. The project is titled "Improving crop production in the coastal plateau through effective management of salinity and sodicity using nuclear and related techniques" which will last from January 2014 to December 2017. In 2016, NPGRC will implement the PGR component of the project that will focus on crop selection for salt tolerance;
c) Establishment of good working relationship with NGOs and private sector in order to get them involved in PGR conservation;
d) Setting up of the NPGRC under the umbrella of the PPP agreement; and
e) Inclusion of budget for the construction of tissue culture laboratory and seed bank to support the activity of NPGRC.

Drawbacks

a) Sitting of the NPGRcom was the major setback in the 2013 -2014 work plan. Inability of the committee sitting resulted in the following:
   - Failure to nominate and approve chairman, secretary and other seats on the committee;
   - Failure to initiate the development of national policy to govern PGR activities in Seychelles;
   - Failure to initiate discussion on the need of legislation for the protection, conservation and utilisation of our PGRFA;
   - Failure to discuss on pertinent issue such as domestication of the ITPGRFA and other international protocol related to PGRFA;
   - With the realisation of the NPGRC this year Seychelles will do its uttermost to ensure that this committee meet in order to come out with a clear way forward for Seychelles NPGRC.
b) Collection mission: With lack of appropriate institutional setup and lack of trained personnel this activity had to be delayed once more. Now with the NPGRC set up the only way to move forward is to have an active collection mission for the year 2014 – 2015.

(iv) Equipment and Facilities

The seed-testing laboratory has received new sets of analytical equipment for viability analysis which included the following: Automatic moisture analyser (2), automatic seed counter (1), oven with timer (2), seed germinator (4), seed separator (1), EC Meter (1), microscope (stereo and compound one each), glassware, and Lamina flow cabinet (1). Some of the equipment requires specific power input (2 phase power supply and this is being address by the Agency) therefore commissioning has been delayed.

Procurement of equipment for our genebank will take place next year provided that the allocation for the genebank gets the necessary approval. Therefore, our commitment depends on the above.

B. Technical Report

(v) *In-situ* Conservation

The only in-situ conservation area remains with the Val D'Endor Farmers association and the list of conserved crop remain the same as presented last year.

(vi) *Ex-Situ* Conservation

The NPGRC field genebank at Barbaron is now set up and planting of a wide accession of different varieties of fruit trees and root crop is ongoing.

(vii) Documentation and SDIS

There is no progress with regard to the documentation and SDIS. Seychelles first needs to have the genebank and then all this will surely fall in place. However, it is good to note that Seychelles has a server available at SAA and the proposal is to have a partition for SDIS. There will be need to retrain people on SDIS to manage this database.

Swaziland

A. General

(i) Staffing

The NPGRC staffing status has slightly improved with the engagement of a senior technician Mrs. T. Dludlu who doubles her service support to the DARSS as well as the NPGRC. Otherwise, Mr T. Gumedze remains the Curator assisted by the technician, Mpande Zulu.

Three desired NPGRC posts were finally created and actual recruitment currently delayed due to wrong designation of requested posts. However, the anomaly is being addressed. Further delays may be expected due to longish procurement processes for advertisement and interviewing.

(ii) Membership and Strengthening of NPGRCom

There was no meeting held by the NPGRCom during the past season.

(iii) Meetings, Trainings and Workshops

The following trainings and workshops were attended during the season under review.

- The Curator attended a workshop on plant tissue culture and healthy seedling propagation – Taiwan – 27 October to 20 November 2014.
- The Curator attended a National Biodiversity Strategy and Action Plan and Aichi targets drafting workshop - 23 to 24 July 2015.
- The Curator attended a workshop on briefing of stakeholders under the SADC FANR Sub-sector by the Swaziland SADC Office on the need for:
    - Establishment of Swaziland National Committee for FANR sub-sector
    - Alignment of national programmes and reporting mechanism to be in line with the SADC Regional Indicative Strategic Development Plan.

(iv) Equipment, Supplies and Facilities

It was reported that most of the genebank's equipment was working except for the faulty sealers and grinder as well as the standby electric generator has a battery charging problem and thus both need attention. The motor vehicle has not been running for the whole of the reporting period. A desktop computer is old and the process to replace is on the pipeline.

(v) Challenges

The Genebank is faced with the chronic inadequate staffing just like is the case for the entire Department of Agricultural Research. As a result of 7 vacant research officer posts and 2 researchers on study leave, the Curators finds himself occupied with DARSS issues resulting in divided attention for the Curator.

Transport has also been an outstanding challenge whose is not forthcoming. There has also been a push for introduction of GMOs in the country which brings about a lot of contravening discussions and opinions by both policy makers and other stakeholders.

B. Technical Report

The NPGRC, during the 2014/2015 cropping season, accomplished the following activities:

(i) *Ex-Situ* Conservation

Germplasm Conservation

The NPGRC planned a second collection of *Amaranthus spinosus* from Ubombo Sugar Ltd but was not accomplished because the Company cleared the bargass dumping site before Amaranth could produce seed in November. However, the Centre managed to collect other high value but rare species from Agricultural shows and from the wild.

In total, 19 accessions (*Gossypium arboreum* - 4, *Phaseolus vulgaris* - 4, *Plectranthus esculanthus* - 3, *Colocosia* - 2, *Pennisetum glaucum* - 1, *Penisetum clandestinum* - 1, and *Drimia* sp - 5) were collected thus making a total germplasm accessions collected at the Genebank to reach 996.

Of the above, 14 accessions were duplicated to SPGRC for long term conservation.

Germplasm Multiplication

While 5 cowpea accessions were multiplied for the purpose of increasing seeds and some crop advance research, the NPGRC also multiplied 30 pigeon pea, 10 lablab and 20 mucuna accessions for crop advancement research.

Characterization of Maize Germplasm

A collaborative research work with Mr. Victor Simelane (PhD student at University of Orange Free State) on assessment of genetic diversity of 127 NPGRC maize landraces finally kicked off in May 2015 at INCOTEC Molecular Laboratory in South Africa. It will involve:

- Trial on phenotyping, conducted at Malkerns Research and Lowveld Experiment Stations in Swaziland during the 2015/16 season;
- Promising material identified from the results will be test-crossed with some double haploid lines from CIMMYT; and
- Nutritional analysis will also be conducted at University of Orange Free State.

(ii) Maintenance of germplasm in Field Genebanks

The NPGRC continued with monitoring and maintenance of vegetatively propagated crop germplasm of 9 cassava, 15 sweet potato, 2 livingstone potato, 2 Zulu potato, and 5 *Drimia* sp. at the MRS field genebank. Cassava germplasm was further re-transplanted.

(iii) Distribution of requested germplasm

Six (6) requests for germplasm were received from farmers and processed. They included three (3) pearl millet accessions, one (1) each for water melon, Lagenaria (gourd), melon, sesame, and mung bean germplasm. One more request is yet to be processed.

(iv) *In-situ*/On-Farm conservation

On-farm participatory evaluation of cowpea germplasm could not be conducted at Lonhlupheko (*Siteki*) due to armyworm and livestock damage and drought.

Collaboration in Community seed banking between NPGRC and Vusimvelo Farmers Group at Shewula in the Lubombo region was also on hold during the past seasons. However, the farmers continued with on-farm conservation and seed banking activities even without any support. They continue to hold their monthly meetings.

Although focus crops are groundnuts, sorghum, cowpea, jugo bean, mung bean; farmers have expressed need for inclusion of pearl millet, finger millet, cassava, sweet potato, Pigeon pea, for the coming season.

(v) Documentation and Information

The computer hosting SDIS crashed forcing the NPGRC to capture and enter data on an Excel sheet. It was mentioned that the NPGRC was to receive one new desktop computer that will be dedicated for management of Genebank data and the government procurement process is ongoing.

The NPGRC reported that Internet connectivity is currently fairly good.

Tanzania

A. General

(i) Staffing

During the report period, there was no change in staffing at NPGRC.

(ii) Meetings, Workshops, Trainings

- Mr. W.C. Hamisy attended SADC Crop Wild Relative Regional Training Workshop in Mauritius, 10-13, November, 2014; and
- Dr. Margaret Mollel attended a Regional Training Workshop on predictive characterization and pre-breeding in Pretoria, South Africa from 13th – 16th April 2015

Trainings/Short courses

- Mr. S. M. Kabululu and Ms G. Kanyairita are attending studies at PhD and MSc levels at Mandela University - Arusha, and USA respectively.

(iii) National Plant Genetic Resources Committee (NPGRCom)

Due to lack of funds, no NPGRCom or Crop working Groups meetings was held during the period under review.

(iv) Constraints and Material Requirements

- The centre is facing a problem of storage facilities both freezers)and space to cope with the number of the collected accessions
- The vehicles which the centre has are too old, hence the need for a new motor vehicle is crucial
- There is a need for renovating available green and screen houses as they in
- very bad shape
- The SDIS database system presents some technical difficulties on data export to Excel
- Very limited funds for general operation of the centre's activities

B. Technical Report

(i) Exploration and Collection

During the reporting period, NPGRC managed to implement two collecting missions as follows:

a) A joint collection mission with ICRISAT for finger millet germplasm was conducted in August, 2015. This was sponsored by ICRISAT and the area covered included the northern part of the country whereby a total of 112 samples were collected

b) A collection mission is on going in the southern part of Tanzania. This is sponsored by ICRISAT.

(ii) Multiplication, Regeneration and Characterization

During the period, the NPGRC regenerated and characterized a number of accessions of different crop species.

It characterized and evaluated 73 cowpea accessions from the genebank materials. This was done in collaboration with breeders from AFRISEM Co. Ltd., a branch of RIJK-ZWAAN Company in Holland which deals with vegetables. The aim is to select/ separate varieties with high vegetative growth (leaves) and seeds. Data compilation is in progress.

(iii) Germplasm Distribution

During this season, the centre distributed a total of 235 accessions to Mikocheni Agriculture Research Institute for screening of possible lines that are resistance to Maize Lethal Necrosis Virus Disease (234 accessions)

It also distributed thirty four 34 accessions of cowpeas and 29 of pigeon peas have been distribute to Nelson Mandela University for breeding research purposes.

(iv) Documentation and Information

The main activities undertaken during the year include registration and data entry in the SDIS and re-arrangement of all the germplasm conserved in the genebank. However, we are facing some difficulties with our database system, especially with the host desktop machine that often hang up, compromising data security.

Data was also entered manually in hard books which acts as backup for the documentation system.

(v) Progress on the Mapping of Quantitative Trait Loci (QTLs) linked to Powdery Mildew Resistance in Tomato Project

The progress was based on a study that overall aims at promoting utilization of molecular marker techniques in the breeding programmes in Tanzania. To achieve this, the project aimed at screening tomato landraces for resistance to PDM and associated molecular markers in Tanzania; characterizing the QTL markers for powdery mildew disease resistance in tomato; and facilitating the utilization of disease resistant genes in tomato breeding programs in Tanzania.

In the course of generating F_1 populations, seeds were collected (10 resistant and 10 susceptible accessions) in experiment 1, planted in the screen house at the NPGRC. Hand crossing was done (diallel crossing) upon flowering to generate the F_1 population.

In the process of screening for disease resistance and generation of F_2, a total of 448 crosses were generated in the crossing experiment. Seeds collected from the F_1 populations were raised in the screen house at the NPGRC and planted in a replicated trial at Miwaleni farm in Moshi. As for now, data collection is progressing and leaf samples have been collected for the tomato landraces, F_1 populations for Molecular characterization (AFLPs).

In 2015/16, F_2 populations will be evaluated, molecular characterization conducted as well as data analysis.

Zambia

A. General

The National Plant Genetic Resources Centre (NPGRC) is a section in the Crop Improvement and Agronomy Division within the Zambia Agriculture Research Institute (ZARI), which aims at conserving the genetic diversity, facilitating access to and promoting sustainable utilization of plant genetic resources for food and agriculture.

(i) Staff Position

During the period under review the staff positions at the NPGRC remained unchanged both at professional and technical levels. There are three (3) professional officers, one (1) Technical Research Assistants and two support staff.

(ii) Training, workshops and Meetings

During the period under review, some staff attended different training workshops including:

- Dr Ng'uni and Mr Munkombwe attended coordination meetings on APPSA maize and rice subprojects in Mozambique and Malawi respectively.
- Dr Ng'uni attended a Joint ACP stakeholders' meeting in Brussels, Belgium.
- Mr Munkombwe and two plant breeders attended the Pre-breeding and characterisation workshop in the Republic of South Africa from 13 to 16 April 2015.
- Dr Ng'uni and Mr Munkombwe attended the in-situ conservation of crop wild relatives and diversity assessment techniques regional workshop in Mauritius from 10 to 13 November 2014.

– Mr Munkombwe and Mr Bwalya attended a training workshop on resilient seed systems and adaptation to climate change in Zambia from 24 to 28 August 2015

(iii) Facilities and Equipment

The number of deep freezers has remained at 28. However, there is need for additional sets of freezers considering the anticipated increase in the number of accessions and batches arising from collecting and regeneration activities.

The NPGRC does not have a seed germination chamber making the most needed facility for now. A glasshouse is not functional, needing rehabilitation.

The NPGRC has three (3) functional desktop computers and two functional printers, a LaserJet M1132 MFP and HP LaserJet P1005.

(iv) Collaborating Institutions

The NPGRC is collaborating with both national and international institutions in the implementation of the plant genetic resources conservation activities. Some of the national collaborating institutions are Community Technology Development Trust (CTDT), Biodiversity Community Network (BCN), National Remote Sensing Centre (NRSC), University of Zambia (UNZA), Seed Control and Certification Institute (SCCI). At international level, the NPGRC is collaborating with the University of Birmingham, Bioversity International and the SADC Plant Genetic Resources Centre.

B. Technical Report

(i) PGR Conservation

Currently, the number of accessions held in the genebank stands at about 7,000 without taking into account the recently collected plant genetic resources. The centre is also maintaining a living collection of 100 accessions of cassava in the field genebank.

(ii) Distribution of Germplasm

As part of its mandate, the NPGRC is charged with the responsibility of facilitating access to conserved plant genetic resources for purposes of research and development.

During the reporting period, 419 accessions were distributed to users of which 389 accessions of maize were given to ZARI Maize Improvement programme, 10 accessions of rice to UNZA, School of Agricultural Sciences, and finally 20 accessions of bambara nuts to Mulungushi University.

(iii) On-farm Conservation

Under the Southern African Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL) Project activities in which Zambia participates, the country managed to strengthen local seed systems through restoration of local crop varieties in some communities.

The SADC *In situ* conservation and use of Crop Wild Relatives project supported by ACP-EU and coordinated by Bioversity International, Zambian NPGRC developed a partial national CWR checklist whereby a total of 464 CWR taxa were developed. It also prioritized CWR for conservation with a total of 36 CWR taxa prioritized; and also populated the occurrence data of CWR priority taxa.

(iv) Multiplication and Characterization of Germplasm Accessions

Under the Agriculture Productivity Programme of Southern Africa (APPSA) Subprojects in which Zambia is participating in its implementation together with Malawi and Mozambique; in the current year Zambia collected and characterized rice and maize germplasm. The overall objective of the R&D Project is to broaden the genetic diversity of conserved rice and maize germplasm and make it available for use in research for the development and improvement of rice and maize.

While fifty (50) rice landraces were agromorphologically characterized, 72 rice landraces were collected. Hotspot sites for rice landraces on farm management were identified and recorded as Katongo, Sefula, Kaande, Namushakende, and Mukangu for Mongu District. Other hotspots were Lyangati, Lukanda, Lui-wanyau, Lui-lipuwa, Lui-namaungu, Kaeya, Siukale, Maata, and Lui-mweemba for Senanga District.

On the same vein, fifty (50) maize landraces were agromorphologically characterized, 43 rice landraces were collected. Sites rich in maize landraces on farm management were identified and recorded. Hotspots for Kazungula District were identified and documented as Kanchele, Musokotwane, and Siachitema; and Chisomo, Kabamba, and Kankoso for Serenje District.

Zimbabwe

A. General

The year 2015 has been a challenging one for the Genetic Resources and Biotechnology Institute (GBRI) which is an apex organization under which NPGRC falls. The major challenge has been inadequate resources to effectively execute the Institute mandate. Inspite of all these adversities the GRBI managed to make some significant achievements in the 2014/2015 year.

During the period under review, the GRBI successfully implemented a number of programmes among them includes regeneration and characterization of selected accessions of cowpeas and finger millet, the diversity assessment of cowpeas through the use of molecular marker techniques and the development of publications from completed research work. Other important achievements were on the training of staff on predictive characterization and pre-breeding of crop wild relative, climate modeling and also access and benefit sharing.

The GRBI acknowledges the support from strategic partners in many of the these achievements such as University of Zimbabwe, Chinhoyi University, Midlands State University, Swedish University of Agricultural Sciences, Community Technology Development Trust, Bioversity International and University of Capetown. These organizations have partnered with the Institute on conservation and sustainable utilization of plant genetic resources in Zimbabwe and also important areas such as climate change.

(i) Staffing

Five staff members from the GRBI were transferred to other institutes who were working under Genebank. Ms F. Chinosengwa (Research Technician) was promoted to a Research Officer and transferred to the Seed Services Research Institute. Ms Esnath Chisveto a Research Technician from Department of Agritex and Miss Vimbayi Muteyo a General hand from Livestock Division joined the institute this year.

Staff Development

- Mr K. Kusena – Doing PhD at the University of Zimbabwe (completion: 2016)

- Ms D. Seka – Bachelor Of Science Honors Degree in Agriculture (completion: 2018)

(ii) Workshops, Meetings and Seminars

- Mr O. Chipfunde attended the third Regional Technical Workshop on Pre-Breeding and Predictive Characterisation of Crop Wild Relatives (CWR) of the Project Titled: "*In Situ* Conservation and Use of Wild Crop Relatives in the Three African, Caribbean and Pacific held at Bronte Hotel, on 13 to 16 April 2015.
- Mrs R. Musango and Mr O. Chipfunde attended a Crop Breeding Institute training workshop on Research Methods on 20 to 24 April 2015.
- Mrs R. Musango and Mr O. Chipfunde attended a training workshop on Climate Change and Crop Suitability modelling on the 11th to15th of May 2015 held at Rainbow Tower in Zimbabwe
- Mr O. Chipfunde attended a training workshop on the Access and Benefit Sharing from the 1st to 5th of June 2015 at the Bronte Hotel in Zimbabwe.
- Mrs R Musango attended a national workshop for reviewing the National Biodiversity Strategy and Action Plan hosted by the Ministry of Environment Water and Climate at Chinhoyi from 23 to 25 June and Nyanga from the 6th to the 11th of July 2015.

(iii) National Genetic Resources Committee

No meeting was held during the reporting period.

(iv) Equipment, Supplies and Facilities

The genebank has 27 freezers, 4 of which are faulty – compressors breaking down and replacement parts cannot be sourced locally. It also has faulty drier whose cooling fans are broken making temperatures fall below zero. Freezers are now breaking down and difficult to repair, currently 4 freezers are down. There is a persistent drier unit problem that needs immediate attention.

The Genebank acquired toner and drum cartridge for the Sharp 3-in-1 fax scanner, copier and printer; as well as aluminium foil bags (all sizes)

(v) Requirements

The NPGRC is in need of weight scale and hand-held GPS.

B. Technical Report

(i) Characterization and Evaluation

The regeneration and characterization programme is ongoing and for this year it was on 5 cowpea and 5 finger millet accessions. The molecular characterization work was done for 14 cowpeas accessions in collaboration with a student from Chinhoyi University. The GRBI aims to expand the molecular characterization for the whole genebank collection. Among the publications that have been developed includes research paper on "Screening unimproved Zimbabwean sorghum landraces for tolerance to witch weed" accepted for publication in the African Journal of Crop Science. Additionally a manual on Molecular Laboratory work on watermelons (*Citrullus lanatus*) was also developed in collaboration with the Swedish University of Agricultural Sciences (SLU).

The GRBI is in the process of carryout the molecular characterization of 14 cowpeas (*Vigna unguiculata*) accessions conserved at the Genetic Resources and Biotechnology Institute in Zimbabwe.

(ii) Evaluation of Sorghum landraces for tolerance to *Striga asiatica*

A paper was developed on "Screening unimproved Zimbabwean sorghum landrace for tolerance to witch weed accepted for publication in the African Crop Science Journal"

(iii) Germplasm Distribution

Three requests were for *sorghum bicolor* germplasm. A total of 19 accessions were distributed for research purposes.

(iv) Genetic Diversity analysis of *Vigna ungucuilata* using RAPDs

Materials conserved in the GRBI are a reservoir of important gene pool that can be used in crop development research to answer several breeding problems that includes pests and diseases resistance and drought tolerance. However, the conserved materials only have value to the breeders and researchers if information of their molecular and morphological characteristics is readily available. In addition for easy curation, molecular and morphological information helps the GRBI to identify duplicates and remove them to establish a core collection. Therefore this study seeks to generate molecular information for profiling 13 cowpeas accessions in the GRBI.

The objectives of the analysis were to analyse the molecular diversity within 13 cowpea accessions from the GRBI; and to create a cowpea core collection that eliminates duplications in the GRBI.

The research will generate preliminary data that is important for breeders and researchers to utilize GRBI materials in their crop development research.

(iii) Documentation and Information

The NPGRC has registered: 142 *Sorghum bicolor* and 174 *Eleusine coracana*. The process is a bit slow as NPGRC numbers have to be retrieved from the accession register book then the information is entered into the SDIS.

The NPGRC internet is down due to fail of settling the bill that was shared but the whole department.

(iv) On-farm Conservation and Characterization

No activities were carried out on-farm.

9. NPGRC PLANNED ACTIVITIES FOR THE YEAR 2015/2016

Angola

(i) Multiplication, Regeneration and Characterisation of some accessions in the genebank

The proposed activities for 2015/16 include characterization of 30 accessions (sorghum – 20, and peanut – 10), multiplication of 70 accessions (common beans – 30, cowpea – 8, maize – 12, sorghum – 11, peanut – 10, millet – 6 and pumpkin – 3). The NPGRC is also proposing to regenerate 23 accessions (common beans – 21 and sorghum – 20).

All of the above activities are expected to cost US 36,132 to implement.

(ii) Germplasm Collection

For the next season, Angola NPGRC is planning to collect more variety of food crop germplasm in the areas so far not visited, such as municipalities in Lunda–Norte, Lunda–Sul, Moxico, Kuando-Kubango and Zaire.

Democratic Republic of Congo

(i) Installation and Training on WebSDIS

Through support by the Trust, SPGRC Documentation staff will install a server, one desktop computer and a printer for managing data for PGR. During the installations, the SPGRC staff will also conduct a short training on webSDIS.

Lesotho

(i) Multiplication and characterization proposal

The centre is planning to multiply accessions which are less represented in active collection such as cowpeas (*Vigna unguiculata*), watermelons (*Citrullus lanatus*), cultivated gourds (*Lagenaria sp*), oats (*Avena sativa*) and rye (*Secale cereale*).

(ii) Field Genebank

The NPGRC plans to undertake more collection missions of wild plant species in the next summer season and to construct more plots at the field genebank.

(iii) On-farm Conservation

The plan is to continue with the same farmers who have shown interest and capacity to manage the accessions on-farm.

(iv) Documentation and Information

For the next season, data entry in different SDIS modules will continue, with more emphasis on Characterisation data.

Madagascar

In 2015/16, Madagascar NPGRC plans to characterize 8 accessions of potato, 20 sweet potato, 100 beans, and 400 accessions of rice.

It will regenerate 35 accessions of fodder crops, 100 beans, 243 peanuts, 47 bambara, and 800 rice accessions.

The NPGRC will conduct plants exploration for sweet potato, beans, cowpea, rice, Lima beans, and also updating of the documentation system.

Malawi

Apart from the normal genebank activities such as collections, multiplication, characterization, documentation and maintenance of field genebanks, the Malawi NPGRC intends to carry out the following activities in the 2015/16 season:

1. Maize germplasm collection and characterization for climate change adaptation

2. Rice germplasm collection and characterization for climate change adaptation.

   Both maize and rice collection and characterization projects are supported by the APPSA project and are ongoing activities.

3. Enhancing cowpea *(Vigna unguiculata* (L.) Walp*)* germplasm for improved livelihood in Malawi.
   - Presented to the Department of Agricultural Research Services for possible funding.

4. Farmer-centred evaluation of cowpea germplasm for production in maize-based conservation agriculture farming systems
   - Presented to the Sustainable Agricultural Productivity Programme Secretariat in the Department of Agricultural Research Services for possible funding.
   - Proposed budget USD 183,000.00

5. Improving access to Pigeon pea (*Cajanus cajan (L.*) germ plasm for adaptation to climate change in agricultural farming systems
   - Presented to the Sustainable Agricultural Productivity Program Secretariat for in the Department of Agricultural Research Services for possible funding.
   - Proposed budget USD 188,000.00

Mozambique

(i) Rice and maize germplasm collection missions in Central and Northern provinces of Mozambique (Sofala, Nampula and Cabo Delgado provinces)

Three exploratory expeditions will be conducted in regions particularly targeting on districts, which have not been covered in the previous expeditions.

The main objectives of these missions will be to collect as much possible the existent germplasm (rice and maize) occurring in Sofala, Nampula and Cabo Delgado provinces for conservation and future use in plant improvement programmes.

The three collection missions will be undertaken during the harvesting period (May-July 2016). Geographical and local farmer knowledge data will be also recorded.

Representative seed samples collected in each province will be multiplied, characterized and stored at the NPGRC and the accessions with enough amounts of seeds will be sent to SPGRC for safe duplication.

(ii) Multiplication and Characterisation proposals

For the next cropping season, the NPGRC has planned to multiply and characterize 100 accessions of rice and 50 accessions of maize. These activities will be carried out at Umbeluzi Research (Maputo province). Funds will be provided through the APPSA Project.

Also under APPSA Project activities, the NPGRC is planning to conduct the following activities in 2015/2016: Capacity building (training farmers, extensionists); hold one seed diversity fair; molecular characterisation (50 rice accessions & 50 maize accessions); and produce promotion of materials (poster, leaflet).

Namibia

(i) Multiplication and Characterization

The NPGRC plans to multiply and characterize maize accessions currently in the field at Omahenene Research Station.

(ii) On-farm conservation

The NPGRC plans to distribute seeds to 23 farmers in the Zambezi Region. The same farmers will be given tree seedlings for agroforestry; and a seed fair will be conducted after harvest.

Seychelles

Seychelles NPGRC is proposing the following activities for next financial year:

- Initiate holding of the first NPGRCom meeting in last quarter of 2013 or first quarter of 2014 in order to launch all activities mentioned
- Creation of Unit responsible for the Conservation of PGR in Seychelles.
- Identification of new staff for training in PGR
- Training of staff members in PGR documentation and database management
- Arrange for staff to attend short courses on PGR with the assistance of SPGRC as and when requested
- Securing space for SDIS in the SAA server, with the help of SPGRC technical personnel
- Initiate collection mission
- Attend SPGRC meetings and workshops as requested

Collection Mission

Our first collection mission will take effect first quarter of 2016. This will follow by a second collection mission in the second quarter of 2016 and a third in the third quarter of 2016 with a proposed total budget of US$ 5,710.

Swaziland

The following activities are proposed during the 2015/2016 cropping season:

(i) Germplasm rescue collection

The NPGRC intends to undertake a rescue collection of germplasm in Lowveld under LUSIP Phase 2 expansion, mainly targeting wild threatened medicinal plants and Crop Wild Relatives.

(ii) On-farm Conservation

The NPGRC will continue with on-farm participatory variety evaluation and selection of cowpea accessions at Lavumisa and Lonhlupheko communities.

It will also revive collaboration with Vusimvelo Farmers Group on Community seed banking at Shewula.

(iii) Characterization of Maize and Sorghum

He Centre will continue with collaborative research work with Mr. Victor Simelane on assessment of genetic diversity of 127 NPGRC maize landraces at INCOTEC Molecular Laboratory in South Africa and University of Orange Free State. This work will mainly

focus on agro-morphological characterization of those genetically diverse maize accessions at Malkerns Research and Lowveld Experiment Stations.

It is also proposing a trial on evaluation of sorghum germplasm (6 accessions and 4 commercial varieties) for birds' preference/damage trial at Malkerns Research Station. Nutritional composition analysis will also be conducted on these accessions.

(iv) Germplasm Multiplation

The NPGRC plans to multiply a total of 12 accessions comprising of bean (4), pearl millet (2), finger millet (1), Livingstone potato (3), and Zulu potato (2).

Tanzania

NPGRC depends much on donors' and government funds for its activities, through proposals write-ups and collaborative works. In the next season, the NPGRC will among other activities do the following:

(i) Continue with the project on strengthening on-farm conservation of selected neglected and underutilized crop species (cucurbits, finger millet and yams) in Tanzania project, under Government-COSTECH funding. The aim of the project is to identifying best traditional management practices for their conservation and sustainable use and to raise awareness on their value in food security, nutrition and adaptation to climate change;

(ii) Continue with the projects under Government (COSTECH) and ICGEB funding on Identification of molecular markers for biotic and abiotic stresses in finger millet and powdery mildew in tomato crops. The main objective of this project is to survey and map the distribution of finger millet germplasm in order to screen and generate molecular markers (SCAR) linked to diseases (fungal blight), drought and acidic soil resistance in finger millet;

(iii) Engage in development of a new project with RIJK-ZWAAN, a private company in Holland on indigenous vegetable materials conserved at the NPGRC and AVRDC and also conduct few collection missions. The aim of this project is to do phenotypic characterization of leafy vegetables to select the ones with better qualities preferred by farmers. Vegetable of interest includes amaranth, cowpeas and pumpkins.

(iv) Promote open source seed systems for beans, forage, legumes, millet and sorghum for climate change adaptation in Tanzania, Kenya and Uganda with sponsorship from ITPGRFA, Access and Benefit Sharing Fund (ABFS) FAO - Period 2015 – 2017.

Zambia

(i) Germplasm Collection and Characterization

Under APPSA project, the NPGRC is planning to undertake rice collection covering north-western province of Zambia.

Under the same project, in 2015/16, the NPGRC plans to characterize agro morphologically and with molecular techniques 50 accessions each of the rice and maize germplasm.

(ii) Germplasm Multiplication

Under the SASSCAL project, the NPGRC will in 2015/16 undertake a participatory seed multiplication and farmer training in seed growing and handling.

(iii) Field genebank management

The Genebank will characterize and evaluate the cassava germplasm collection; and also continue with the maintenance of the cassava as a living collection.

(iv) SADC Crop Wild Relatives Project

- The NPGRC will identify national *in-situ* CWR hotspots and priority sites for *in-situ* conservation and *ex-situ* collection validated through expert interviews and field visits using innovative GIS technology;
- NPGRC will endeavour to predict which CWR in-situ populations and materials from ex-situ collections have traits adapted to extreme climate conditions (e.g. heat, drought) using Focused Identification of Germplasm Strategy (FIGS) or other GIS approaches;
- It will also develop exemplar Strategic Action Plans (SAP) on *in-situ* conservation and use of priority CWR in three participating countries;
- Facilitate the mainstreaming of CWR SAP into national and regional policies;
- Develop a range of communication and public awareness materials to promote the conservation and use of CWR among target groups of stakeholders including the general public; and
- Conduct midterm review and final dissemination workshop.

Zimbabwe

(i) Community-based conservation, utilization and management of climate adapted sorghum, pearl-Millet, cowpea and bambaranuts in Matabeleland South Province of Zimbabwe

The GRBI participated in the Third Benefit sharing Fund Call for Proposals of the ITPGRFA in partnership with Practical Action Zimbabwe and Crop Breeding Institute on the above titled project proposal. The GRBI/Practical Action project was accepted among 60 other proposals from other countries and Institutions and the will be carried out in 3 districts of Mateleland South Province in Zimbabwe. The project will run for 3 years with a three-pronged focus towards plant genetic resources conservation and sustainable utilization, participatory variety development and climate change adaptation in Zimbabwe's marginal areas.

The project will focus on strengthening and sustaining on-farm and community level conservation, utilisation and management of sorghum, pearl millet, cowpeas and bambaranuts genetic resources. The potential of these crops to contribute towards food and nutrition security has not been fully exploited in the past mainly because the crops have been regarded as minor crops and therefore not prioritized by researchers most work has been done on maize.

The role of the GRBI in the project is to promote the conservation of locally adapted varieties by involving farmers in on-farm evaluations and characterisation activities. Community seed banks will be established managed by the smallholder farmers themselves with supervision of the GRBI. Field days, seed fairs, and food fairs will be conducted regularly bringing farmers, extension officers and the public together to learn, share knowledge and build community connections in support of conservation

and use of improved varieties. At field days farmers will come together to share details of on-farm research and demonstration and learn from each other.

(ii) Collaborative Regeneration of Small Grains Germplasm with ICRISAT

The ZNPGRC will carry out regeneration and characterization of selected germplasm of small grains namely pearl millet, finger millet and sorghum. The project will be done in collaboration with ICRISAT at Matopos Research Station in Bulawayo that is about 495 Km from the NPGRC (Harare). Targeted numbers of accessions to be regenerated are 200 pearl millet accessions, 200 finger millet accessions, and 200 sorghum accessions.

(iii) Gap-filling Germplasm Collection mission with ICRISAT

NPGRC is planning to carry out a collection mission in collaboration with ICRISAT in 2016. The collection is targeted in areas were collections were never carried out in the country and will mainly targeted crops such as pearl millet, finger millet, and sorghum.

10. Summary of Planned Activities for 2015/16

Country	Activity
Angola	**(i) Multiplication, Regeneration and Characterisation of some accessions in the genebank** Proposing to characterize 30 accessions (sorghum – 20, and peanut – 10), multiply 70 accessions (common beans – 30, cowpea – 8, maize – 12, sorghum – 11, peanut – 10, millet – 6 and pumpkin – 3); and regenerate 23 accessions (common beans – 21 and sorghum – 20). **(ii) Germplasm Collection** Planning to collect more variety of food crop germplasm in the areas so far not visited (Lunda–Norte, Lunda–Sul, Moxico, Kuando-Kubango and Zaire).
DRC	**(i) Installation and Training on WebSDIS** With support by the Trust, acquire and install a server, one desktop computer and a printer for managing data for PGR. Training of staff on webSDIS.
Lesotho	**(i) Multiplication and characterization proposal** Multiply accessions which are less represented in active collection (*Vigna unguiculata*), watermelons (*Citrullus lanatus*), cultivated gourds (*Lagenaria sp*), oats (*Avena sativa*) and rye (*Secale cereale*). **(ii) Field Genebank** Undertake more collection missions of wild plant species in the next summer season and to construct more plots at the field genebank. **(iii) On-farm Conservation** Continue with the same farmers who have shown interest and capacity to manage the accessions on-farm. **(iv) Documentation and Information** Data entry in different SDIS modules will continue, with more emphasis on characterisation data.
Madagascar	– Characterize 8 accessions of potato, 20 sweet potato, 100 beans, and 400 accessions of rice. – Regenerate 35 accessions of fodder crops, 100 beans, 243 peanuts, 47 bambara, and 800 rice accessions. – Conduct plants exploration for sweet potato, beans, cowpea, rice, Lima beans, and also updating of the documentation system.
Malawi	– Maize germplasm collection and characterization for climate change adaptation – Rice germplasm collection and characterization for climate change adaptation. – Enhancing cowpea *(Vigna unguiculata* (L.) Walp*)* germplasm for improved livelihood in Malawi. – Farmer-centred evaluation of cowpea germplasm for production in maize-based conservation agriculture farming systems – Improving access to Pigeon pea (*Cajanus cajan (L.*) germ plasm for adaptation to climate change in agricultural farming systems
Mozambique	**(i) Rice and maize germplasm collection missions in Central and Northern provinces (Sofala, Nampula and Cabo Delgado)**

	Three exploratory expeditions will be conducted in regions particularly targeting on districts, which have not been covered in the previous expeditions esp. Sofala, Nampula and Cabo Delgado provinces. Collection missions will be undertaken during the harvesting period (May-July 2016). **(ii) Multiplication and Characterisation proposals** The NPGRC will multiply and characterize 100 accessions of rice and 50 accessions of maize at Umbeluzi Research (Maputo province). It will also conduct capacity building (training farmers, extensionists); hold one seed diversity fair; molecular characterisation (50 rice accessions & 50 maize accessions); and produce promotion of materials (poster, leaflet).
Namibia	**(i) Multiplication and Characterization** Multiply and characterize maize accessions currently in the field at Omahenene Research Station. **(ii) On-farm conservation** Distribute seeds to 23 farmers in the Zambezi Region. The same farmers will be given tree seedlings for agroforestry; and a seed fair will be conducted after harvest.
Seychelles	– Initiate holding of the first NPGRCom meeting in order to launch all activities mentioned – Identification of and training of staff in PGR and databases management – Securing space for SDIS in the SAA server, with the help of SPGRC technical personnel – Collection Missions: First collection mission will take effect first quarter of 2016. This will follow by a second collection mission in the second quarter of 2016 and a third in the third quarter of 2016
Swaziland	**(i) Germplasm rescue collection** Undertake a rescue collection of germplasm in Lowveld under LUSIP Phase 2 expansion, mainly targeting wild threatened medicinal plants and CWRs **(ii) On-farm Conservation** Continue with on-farm participatory variety evaluation and selection of cowpea accessions at Lavumisa and Lonhlupheko communities. Also revive collaboration with Vusimvelo Farmers Group on Community seed banking at Shewula. **(iii) Characterization of Maize and Sorghum** Continue with collaborative research work with Mr. Victor Simelane on assessment of genetic diversity of 127 NPGRC maize landraces at INCOTEC Molecular Laboratory in South Africa and University of Orange Free State. **(iv) Germplasm Multiplation** Multiply a total of 12 accessions comprising of bean (4), pearl millet (2), finger millet (1), Livingstone potato (3), and Zulu potato (2).
Tanzania	– Continue with the project on strengthening on-farm conservation of selected neglected and underutilized crop species (cucurbits, finger millet and yams) in Tanzania;

	– Continue with the projects under Government (COSTECH) and ICGEB funding on Identification of molecular markers for biotic and abiotic stresses in finger millet and powdery mildew in tomato crops; – Engage in development of a new project with RIJK-ZWAAN, a private company in Holland on indigenous vegetable materials conserved at the NPGRC and AVRDC and also conduct few collection missions; – Promote open source seed systems for beans, forage, legumes, millet and sorghum for climate change adaptation in Tanzania, Kenya and Uganda with sponsorship from ITPGRFA;
Zambia	**(i) Germplasm Collection and Characterization** Under APPSA project, undertake rice collection covering north-western province of Zambia and characterize agro morphologically and with molecular techniques 50 accessions each of the rice and maize germplasm. **(ii) Germplasm Multiplication** Under the SASSCAL project, undertake a participatory seed multiplication and farmer training in seed growing and handling. **(iii) Field genebank management** Characterize and evaluate the cassava germplasm collection; and also continue with the maintenance of the cassava accessions as a living collection. **(iv) SADC Crop Wild Relatives Project** – Identify national *in-situ* CWR hotspots and priority sites for *in-situ* conservation and *ex-situ* collections; – Predict which CWR *in-situ* populations and materials from *ex-situ* collections have traits adapted to extreme climate conditions; – Develop Strategic Action Plans (SAP) on *in-situ* conservation and use of priority CWR in three participating countries; – Facilitate the mainstreaming of CWR SAP into national and regional policies; – Develop a range of communication and public awareness materials to promote the conservation and use of CWR among target groups of stakeholders including the general public; and
Zimbabwe	**(i) Community-based conservation, utilization and management of climate adapted sorghum, pearl-Millet, cowpea and bambaranuts in Matabeleland South Province of Zimbabwe** Strengthen and sustain on-farm and community level conservation, utilisation and management of sorghum, pearl millet, cowpeas and bambara nuts genetic resources by involving farmers in on-farm evaluations and characterisation activities. **(ii) Collaborative Regeneration of Small Grains Germplasm with ICRISAT** Carry out regeneration and characterization of selected germplasm of small grains namely pearl millet, finger millet and sorghum. **(iii) Gap-filling Germplasm Collection mission with ICRISAT** Carry out a collection mission in collaboration with ICRISAT in 2016, targeting areas were collections were never carried out in the country and will mainly targeted crops such as pearl millet, finger millet, and sorghum.

11. General Discussions

1. How do we document and maintain data for *in-situ* conservation or available diversity using web SDIS?

The meeting commented on the importance of proper documentation of in-situ/on-farm conserved materials which many times is ignored.

Against proposal to commit SPGRC to find ways how a study can be made; considering possible financial implications, the meeting agreed that SPGRC should develop indicators and matrix from selected global initiatives to make own reporting format (to clearly inform tools and elements needed in the standard format).

The web-SDIS like the standalone version, did not take into account of *in-situ* materials but developers promised to do so in future.

2. Frequent drier and cold room (gensets, computers, freezers) breakdowns

With the background of dependency of supply and servicing/repairing by donor, the network was advised to seriously consider contracting alternative local sources of technical support for the Genebank equipment and facilities. Countries were advised to prioritize maintenance in their future projects that could possibly support equipment/facilities supply and maintenance.

SPGRC once again promised to share with Member States a list of local supply and maintenance companies available in the region, but also reminded them that this is available at the end of the "*Manual for Seed Handling in Genebanks: Handbooks for Genebanks No. 8*" published in 2006 by Bioversity International.

It was also mentioned that major failures in the driers include compressors and capacitors which need examination in diagnosis and if proved faulty, once replaced and the system re-gassed has proved easy and working.

3. Standard format for accession numbering

It was clarified that from SDIS, accession numbers are normally automatically generated by the system in sequence although it can be overridden. So, each country will have its sequential assigning of accession numbers but which when duplicated to SPGRC will be assigned additional SPGRC Number that run concurrently with the respective NPGRC number.

4. Format for country reports and scientific presentations of results

It was reported that a particular format was designed and started being used in 2007. The meeting agreed to continue using the current format with its inclusiveness though SPGRC need to revise it and if need be, make suitable changes such that it was more interactive and highlighting emerging issues and share with the Curators for comments.

A shorted version of the report should also be developed that will only capture those emerging issues for information, discussions and actions at presentation.

5. Agreement on when Web-based SDIS can be released for use

The meeting adopted the web-SDIS and agreed to start using it once installed in their respective countries. The region will be able to share information on the global platform, GENESYS.

The database is globally accessible with a link at SPGRC website (www.spgrc.org.zm) or directly to http://sdis.spgrc.org.zm

The only hitch is insufficient resources that will enable Documentation staff to travel and install and provide initial training to staff in each NPGRC. SPGRC promised to look into sourcing funds that will facilitate installations and training, possibly at the end of the Financial Year if any savings can be allocated to this activity.

6. Should NPGRCs do the separation of mixed samples?

The network members agreed that samples with mixed seeds should never be separated because then we are altering the integrity of the collection.

7. How can the NPGRCs be assisted to facilitate germplasm utilization

Members were urged to categorically include the issues of utilization in their national strategies to ensure increased use of materials from the genebanks. Where there are projects and resources allow, countries were also urged to bring in stakeholders including NPGRCom members to increase awareness and advocacy for increased utilization. Countries were reminded that NPGRCom meetings should not necessarily be called upon in full and formally.

8. Gene bank management training (short and long-term)

SPGRC reported since the ending of the donor funding, it has been difficult to conduct any of the short and long-term trainings as it used to be due to lack of funds.

However, short term courses have been provided through projects with partners such as Crop Wild Relatives Project (Bioversity), FAO-TCP (FAO), APPSA (NEPAD?). As for long-term training, SPGRC is in discussions with CCARDESA and RUFORUM for possible joint training programmes within the region.

It was reported that The Agostinho Neto University in Angola offers MSC degree in Conservation of PGR though in Portuguese, which is a pre-requisite. It was also reported that this programme has just started and that it might be too early to be floated for admission to the region for now.

9. ABS issues (utilization and MTAs)

It was agreed that this was more of a policy level issue that do not befit this meeting. However, it was hinted that Articles 6, 7, 8, and 11 of the Treaty mostly dealt with ABS issues there was likelihood that the Governing Body (GB) 6 will discuss them with view to reviewing them.

Annex I: SPGRC/NPGRC Planning and Review Workshop Program

Monday, 7th September 2015: Arrival Participants	
General Rapporteurs: G. Munkombwe & K. Sikute	
Tuesday, 8th September 2015	
Session 1:	**Opening Ceremony** **Chair: L. Qhobela**
	Rapporteur: **E. Mausa**
09:00 – 09:40	Welcome address – Head of SPGRC
	FAO Representative
	Trust Representative
	ICRISAT Representative
	Bioversity International
09:40 – 10:00	Programme and logistics announcements – T. Lupupa
	Issues arising from the previous meeting (2014) – L. Qhobela
10:00 – 10:30	**MORNING TEA BREAK**
Session 2:	**Presentations - SPGRC** **Chair: D. Ng'uni** ***Rapporteur:*** **K. Sikute**
10:30 – 13:00	Presentation on Web-SDIS Development/Progress (B. Kapange) Discussions & Deliberations on Web-SDIS
13:00 – 14:00	LUNCH BREAK
14:00 – 14:30	Presentation: FAO – TCP II Project Proposal (T. Lupupa)
14:30 – 15:00	Presentation: Ex-*Situ* Evidence-Based Evaluation, Gap Reduction Base & Active Collections (L. Qhobela)
15:00 – 15:30	Presentation: Updated Generic Proposal (B. Kapange) Presentation: SPGRC Strategy (P. Munyenyembe)
15:30 – 16:00	AFTERNOON TEA BREAK
16:00 – 16:30	Presentation: Crop Wild Relatives Project – Bioversity & T. Lupupa
16:30 – 17:00	Presentation: Draft Regional On-Farm Conservation Strategy – T. Lupupa
Wednesday, 9th September 2015	
Session 3:	**Presentations: Country Progress and Plan Reports** **Chair: C. do Vale**
	Rapporteur: **M. Kachapila**
09:00 – 10:30	Country Presentations
10:30 – 11:00	**MORNING TEA BREAK**
11:00 – 13:00	Country Presentations
13:00 – 14:00	**LUNCH BREAK**
Session 4:	**Presentations: Country Progress and Plan Reports** **Chair: N. Mponya**
	Rapporteur: **W. Hamisy**
14:00 – 15:30	Country Presentations
15:30 – 16:00	**AFTERNOON TEA BREAK**
16:00 – 17:00	Country presentations
Thursday, 10th September 2015	

Session 5:	**Country Presentations** **Chair: M. Mollel**
	Rapporteurs: N. Mponya
09:00 – 10:30	Country Presentations
10:30 – 11:00	**TEA BREAK**
Session 6:	**General Issues** **Chair: P. Munyenyembe**
11:00 – 12:15	**Summary of Presentations** - *Ex-Situ*: L Qhobela - *In-Situ*/ On-farm: T Lupupa - Documentation & Information: B Kapange
12:15 – 13:00	General Discussions
13:00 – 14:00	**LUNCH BREAK**
14:00 – 18:00	Visit to SPGRC
19:00 – 21:00	Reception
Friday, 11th September 2015: Departure of Deligates and Participants	

Annex II: List of Participants

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