



ZIMBABWE

**Genetic Resources and Biotechnology Institute
(GRBI)**

Research Services Division



Department of Research and Specialist Services

Ministry of Lands, Agriculture, Water, Climate and Rural Resettlement

**THE NATIONAL CENTRE FOR GENETIC RESOURCES CONSERVATION AND RESEARCH SINCE
1998**

Association and Location

The Genetic Resources and Biotechnology Institute is a center for research under the Department of Research and Specialist Services of the Ministry of Lands, Agriculture, Water, Climate and Rural Resettlement which falls under the Research Services Division. The Institute also houses the National Genebank of Zimbabwe and is also part of the SADC Plant Genetic Resources Center Network of Genebanks

Our Vision

To be the leading research organization in maintaining crop genetic diversity and provision genetic resources and its information needed by plant breeders and farmers in order to enhance seed security and hence address food insecurity and eradication of extreme poverty and hunger in Zimbabwe and the globe at large.

Our Mission

To maintain and enhance the diversity of crop genetic resources which includes the threatened, underutilized, indigenous and naturalized crops that are important for food and agriculture through conducting and promoting research activities aimed at their conservation and sustainable utilization thereby achieving food security and eradicating extreme poverty and hunger

Our Mandate

To conduct research, conservation, dissemination of information on the threatened, underutilized, indigenous and naturalized crop genetic resources in Zimbabwe through crop ecogeographic surveys, germplasm collections, characterization and evaluation and on farm conservation activities. In addition the institute is the focal point for the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) and all policy issues that impinge on plant genetic resources.

Our Products

All underutilized, indigenous and naturalized crop genetic resources which include pearl millet, finger millet, sorghum, cowpea, Bambara nut, cucumbers, lagnaria and wild crop relatives



GENETIC RESOURCES AND BIOTECHNOLOGY INSTITUTE (GRBI) PROGRAMMES

Ex- Situ Conservation



Ex-situ conservation involves seed collections from farmers then processing the seed, through cleaning, germination and moisture testing then drying the seeds to 7% moisture percentage to ensure the standard Gene banking quality for long term storage in freezers at minus 21 degrees Celsius for up to 10 years not exposed to the changing environmental conditions. This conservation strategy also enables farmers, breeders and other researchers to freely access this seed, which is the basic component of food security. Our *ex-situ* seed collection currently stands at over 3000 traditional variety accessions freely available to farmers, breeders and other researchers upon request.



Insitu/Onfarm Conservation



Insitu/Onfarm conservation implies simply the conservation of crop plant species in their natural habitats as live plants either on farms or in special protected reserves. This strategy also allows the conservation of crops that cannot be propagated by seeds such as sweet potato, cassava, taro and

various fruit trees. *In situ* On-farm Conservation of crop plants involves the active participation of farmers thereby capacitating them with seed security at the household level through strengthening their farming strategies and use of traditional knowledge and hence enhancing food security and eradicating extreme poverty and hunger. The GRBI plans to conserve three root and tuber crops namely Livingstone potato sweet potato and taro by establishing field genebanks in a number of communities and research centres across the country. In addition also plans are underway to distribute the conserved seed to a number of communities and promote their utilization and conservation in communities through on farm conservation and farmers will be capacitated the participatory pre-breeding techniques.



Eco-Geographic Surveys and Germplasm Collection

An ecogeographic survey is the process of obtaining, collating and analyzing different kinds of existing data pertaining to a specific group of crop species within a defined geographic region. Such a study is essential in that it provides information on the current status of crop genetic resources in the country and hence also is the first step in the development of an effective conservation strategy. The Ecogeographic survey gives indication on the crops to be prioritized for collection and when to collect the crop. This programme involves mapping and use of GIS information systems.

Regeneration and Characterization



Regeneration is the process of generating fresh new seed from conserved crop seed. This is usually done when conserved seed loses viability. If the germination percentage of the stored seed falls below 80% then the seed is planted out in order to obtain new seed with a prolonged life span.

Regeneration is carried out in most cases in other research centres across the country particularly in Natural regions with environmental conditions well suited to the specific crop to be regenerated.

Characterization is the physical assessment and recording of the basic botanical and morphological characteristics of plant species that are easily seen and measured. Morphological characters (includes plant height, grain colour, grain size, leaf shape, *etc*) are recorded with the aim to establish differences or similarities in phenotypic identity of each accessions. Characterization information is important to Genebank for it facilitates the development of core collections by identification and removal of unnecessary duplication of material hence conserves what is necessary. The characterization information adds value to accessions stored in the Genebank, and also provides a basis for decision making in crop breeding or crop development program hence must be carried out on every accession in the Genebank. Characterization is usually included during regeneration.



Biotechnology



The Biotechnology program involves two major activities which are:

Biotechnology Research

Biotechnology program involves the conservation and research on genetic resources through the use of technologies used in biotechnology such as *tissue culture*, *Invitro conservation*, *cryopreservation*, *DNA marker techniques* (for use in molecular characterization), *embryo rescue*, and *pollen culture*.

Genetically Modified Organisms (GMO) testing

Zimbabwe is a GMO free country and for all plant genetic resources being exported or imported into the country, GRBI is responsible for verifying the GM status of the materials, being exported through GM certification and GM testing for materials being imported into the country.

Focal Point for the International Treaty On Plant Genetic Resources For Food And Agriculture

**International Treaty
on Plant Genetic
Resources for Food
and Agriculture**



Zimbabwe is a signatory to the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). The Government of Zimbabwe signed the ITPGRFA on 30 October 2002 and subsequently ratified it on 5 July 2005. Therefore for Zimbabwe to fully realize and capitalize on the privileges and opportunities brought about by the ITPGRFA, Zimbabwe has to domesticate this Treaty. Domestication means that Zimbabwe has to incorporate the ITPGRFA into national laws and legislation. The GRBI is the national focal point for all policy issues related to plant genetic resources and the domestication of the ITPGRFA. The GRBI is currently working on developing the National Agro biodiversity Act, which is aimed at the management and conservation of agro biodiversity in Zimbabwe.