



ECOSF
ECO Science Foundation



Concept Proposal

COMSTECH-PARC-ECOSF Workshop on Plant Genetic Resources and Genebank Operations Management System

May 8-11, 2018

Venue: COMSTECH Secretariat, 33-Constitution Avenue, G-5/2, Islamabad

**Organization of Islamic Conference (OIC)
Standing Committee on Scientific and Technological Cooperation
(COMSTECH) Secretariat, 33-Constitution Avenue
G-5/2, Islamabad, Pakistan**

Summary

It is proposed to hold a four-day workshop for participants from OIC member states to engage them in the preservation and management of plant genetic resources. This training would be crucial for conservation of plant genetics resources in various countries currently facing threats from climatic change and genetic erosion to vital crops. The Workshop, to be conducted by experts in this field, would provide hands-on training to participants in handling plant genetic resources and aims to initiate work in the setting up and management of Plant Genebanks.

Introduction:

Plant genetic resources for food and agriculture (PGRFA) are imperiled due to both manmade and naturally occurring hazards. Diseases, disasters and climate change threaten not only the produce and reproduction but at times the very existence of plant species is endangered. Researchers and breeders use these PGRFA as the building blocks to tackle the challenges of food security for growing populations not only to sustain productivity but also to enhance the food and nutrition production for feeding the ever increasing population.

Impacts of climate change on global agriculture and ultimately the food security are serious threats for feeding the growing population. The only viable option to mitigate these impacts is the development of climate resilient crop varieties that can thrive in more extreme, changeable and uncertain environmental conditions. In the changing scenario, PGRFA have become crucial for minimizing risks of crop production. Development of new cultivars has been found to be the most effective modification to improve crop yields in a range of climate change and adaptation scenarios, achievable through facilitated access to PGRFA. Plant breeders are therefore in need of a continuous supply of diverse and novel genetic diversity to produce new crop varieties able to sustain various challenges. A vast pool of this diversity exists in production systems in nature, and can be preserved in genebanks. The PGRFA community has the knowledge, tools, techniques and rapidly evolving technology to conserve and use these genetic resources wisely to sustain crop production. However, as highlighted by Food Agriculture Organization (FAO), there is a range of complex issues being confronted in this context in general and in OIC countries in particular. These are causing significant limitations to the effective management and availability of PGRFA, resulting in loss and inefficient utilization of plant diversity which is critical for food industry and food security.

Justification of the Program:

Collection, conservation and distribution or exchange of germplasm are very crucial for attaining food security, and genebanks are the functional units where these plant genetic resources are conserved for sustainable utilization. Considering the importance of Plant Genetic Resources for Food & Agriculture, FAO has prioritized the conservation and sustainable use of these genetic resources under Sustainable Development Goals (SDG). COMSTECH has also aimed for setting up genebanks in the OIC countries, and included it as a priority area in the Ten Year Plan of Action for the uplift of Science, Technology and Innovation capabilities of member states. The plan was presented and approved at the OIC Summit in Astana, Kazakhstan in September 2017.

COMSTECH in consultation with the Bio-resources Conservation Institute (BCI) of Pakistan Agriculture Research Council (PARC), Islamabad, has planned a workshop on *Plant Genetic Resources and Genebank Operations Management System* in May 2018 in Islamabad, Pakistan. This can be a milestone towards the establishment of genebanks in various OIC countries. The collaborating Institute, BCI has a well-established genebank and allied facilities/laboratories to

handle PGRFA for collection, evaluation, conservation, distribution and sustainable utilization. It has so far undertaken more than 100 collecting expeditions, conserved 36,500 accessions in the genebank and distributed 10 to 12 thousand samples per year to stakeholders in the NARS and abroad. Pakistan, as the hosting country of this activity, is the signatory to international treaties including CBD, ITPGRFA & NP, and committed to implementing these treaties by sharing its expertise globally via Standard Material Transfer Agreement (SMTA) in the Multi-Lateral System (MLS). Pakistan is also maintaining safety duplicates with Svalbard Global Seed Vault (SGBV), Norway. It is crucially important that breeders in other countries learn to utilize the stored material in the genebanks so as to develop new varieties. To this end breeders need information about the PGRFA that is being carried out by the BCI researchers including the collaborators in the NARS in line with international standards.

Present Condition and Identified Needs:

The OIC countries are blessed with natural wealth of PGR. However, facilities for collection, conservation and distribution of these genetic resources are available in only some OIC countries. The protocol requires standards of genebank management to be followed for sustainable utilization. The level of knowledge as well as the state of infrastructure varies with the countries, hence OIC countries need to collaborate and join this mission. The planned workshop aims to improve capacity in PGR material and information management, quality control and standard operating procedures in national genebanks, in support of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) of FAO.

Desired Condition:

Trailing fair agricultural policies to promote PGRFA conservation and sustainable utilization are international obligations that may be addressed through;

- a. development and maintenance of diverse farming systems for sustainable use of agricultural biological diversity,
- b. strengthening R & D that conserves biological diversity for the benefit of farmers,
- c. appropriate plant breeding efforts allowing participation of farmers to develop varieties particularly adapted to social, economic and ecological conditions, including in marginal areas,
- d. broadening genetic base of crops and increasing the range of genetic diversity available to farmers,
- e. promoting underutilized crop species,
- f. supporting *in-situ* conservation and developing strong links to plant breeding and agricultural development in order to reduce crop vulnerability and genetic erosion, and
- g. periodic reviewing of breeding strategies and regulations concerning variety release and seed distribution.

Objectives of the Program:

The workshop is aimed to achieve two main objectives;

1. Raise the capacity of the existing PGRFA conservation and utilization facilities in OIC countries with particular focus on;
 - Current status of plant diversity: its use & preservation
 - Main achievements at the global, regional and national level
 - Key technical and scientific advances

- Major gaps and needs that require urgent attention
2. Development of projects in consultation with the experts for setting up Gene Banks in the OIC member states

Target Audience:

Managers, technicians and conservationists working or planning to develop genebanks are mainly targeted to benefit from the workshop. Faculty members from the relevant departments can also attend the workshop. The workshop is aimed to entertain 30 to 35 participants from OIC member countries. **There are fifteen Genebanks/ Genetic Resource Management Centres operative in OIC member states and invitations have been sent to all these institutions.**

Prospective Resource Persons:

Resource Persons from Abroad:

1. Dr. Mohd Shukri bin Mat Ali
Program of Conservation and Management of Genetic Resources
Genebank and Seed Centre
Agricultural Research and Development Institute (MARDI),
Persiaran MARDI-UPM, 43400 Serdang
Selangor, Malaysia
2. Dr. Nevzat BİRİŞİK
Director General,
General Directorate of Agriculture Research and Policies - Ministry of Food
Agriculture and Livestock,
Ankara, Turkey
3. Dr. Abdallah Bari
Researcher – Founder: Math Coding and Analytics (MCA),
Canada
4. Mr. Akio Yamamoto
Researcher
Genetic Resources Center,
National Agriculture & Food Research Organization,
Japan
5. Mr. Asmund Asdal
Coordinator of operation and management at Svalbard Global Seed Vault,
Nordic Genetic Resource Center,
Norway

Resource Persons from National Agriculture Research Council (NARC), PARC, Islamabad, Pakistan

6. Dr. Abdul Ghafoor, Director, Bio-resources Conservation Institute (BCI) at NARC
7. Dr. Sadar Uddin Siddiqui, Curator National Genebank of Pakistan, BCI

8. Dr. Shahid Abdullah, Department of Plant and Environmental Protection
9. Dr. Anjum Munir, Director Department of Plant and Environmental Protection, PARC Institute of Advanced Studies in Agriculture (PIASA)
10. Dr. Asif Javaid, Principal Scientific Officer, BCI
11. Dr. Tariq Rafiq, Senior Scientific Officer, BCI
12. Dr. Shakeel Ahmad, Principal Scientific Officer, BCI
13. Dr Iftikhar Ahmad, Molecular Genetics Resources Program

Speakers from Other Pakistani Institutions

14. Mr. Muhammad Irfan Tarar, Director General, Intellectual Property Organization, Islamabad
15. Dr. Amir Sultan, Program Leader, National Herbarium, Islamabad
16. Dr. Shakeel Farooqi, Assistant Prof. Department of genetics, University of Karachi, Karachi

Workshop Contents:

1. Plant Genetic Resources for Food and Agriculture (PGRFA): Past, Present and Future Needs
2. Protection of Genetic Resources and Traditional Knowledge: Current Scenario and Future Plans
3. Genebank Database Management
4. PGRFA Evaluation, Utilization and Pre-Breeding in Context of International Centers
5. Develop GO Flow-chart by Participants
6. International Treaties and National Legislation on PGRFA
7. Management of Risk, Infrastructure and Equipment
8. Country Reports
9. Visits to BCI/NGP and Allied Facilities; National Herbarium and Hands-on Practice for PGR Collection

Scope of the Program:

The primary scope of the workshop is to bring PGR stakeholders closer and share on how these stakeholders are handling the germplasm and its associated information; learn from each other's experience while maintaining and observing the global standards developed by FAO and others. Secondly, the workshop is aimed to develop joint projects on plant genetic resources and genebank management in OIC member states.

Outcomes:

- a. A number of OIC personnel would receive hands-on training on handling genetic resources, who may go on to become Master Trainers in their respective countries.
- b. Serve as a starting point for the development of Gene Banks in different OIC countries.
- c. After assessing the baseline of Countries participating; participants will put together an achievable goal for plant genetic resources and genebank management to be accomplished during the subsequent 6 to 12 months.
- d. This will help ensure that necessary resources are available to continue to build on the "Genebank Operations Management System" (GOMS) objectives of regional genebanks.

- e. Develop capacity to operate as part of a global community through deployment of quality management and operational standards.
- f. The germplasm stored with OIC country gene banks will be more secure and the information associated with it would be the driving force to trigger the germplasm utilization leading to food security.

Contributions from Different Sources

No.	Co-Financers	Contribution
1.	COMSTECH, Pakistan	COMSTECH will provide venue for conducting the workshop; and will cover board & lodging for foreign experts & participants, and workshop material expenses
2.	Pakistan Agriculture Research Council, Pakistan	Experts from PARC will mainly deliver the workshop and host hands-on sessions in their facility; provide material resources for hands on training. PARC has also committed to provide board, lodging and transportation for the local participants.
3.	ECO Science Foundation, Pakistan	ECOSF is requested to provide funding for ticket of 7-10 Participants from ECO member countries