Satellite Symposium on

Dryland Agrobiodiversity for Adaptation to Climate Change

Co-organized by

Indian Society for Plant Genetic Resources (ISPGR)
New Delhi, India

Bioversity International (BI)
New Delhi, India

Asia-Pacific Association of Agricultural Research Institutes (APAARI)
Bangkok, Thailand

with support from

United Nations Environment Programme (UNEP)
and
Asia-Pacific Consortium on Agricultural Biotechnology and Bioresources (APCoAB)

during the
13th International Conference on Development of Drylands (ICDD-2019)
Jodhpur, Rajasthan, India

Date : February 13, 2019

Venue: Indana Palace Hotel, Shikargadh, Jodhpur, Rajasthan, India

Background

- Drylands, which encompass deserts, semi-deserts, grasslands and rangelands, occupy 41.3% of the land surface on Earth, but are among the lesser-researched ecologies with respect to agriculture and somewhat over-looked by decision- and policy-makers. Considering the fact that drylands are home to about 44% of area of all the world's cultivated systems and50% of the world's livestock and habitats for wildlife, it is imperative to give focussed attention on the role of agrobiodiversity in these regions to address the issues of food, nutrition and livelihood security of the nearly 2.1 billion people in habiting these terrains, especially in the context of climate change threats.
- Amongst the total 34 global hotspots, 9 are in the drylands and about 0.5% of the plant species are endemic to the region. In terms of agriculture, plant species endemic to the drylands make up 30% of the plants under cultivation today, including many ancestors and crop wild relatives (CWRs). However, exact status of species in the drylands remains unknown, as no comprehensive assessment has been collated.
- The main occupation of humans who inhabit drylands are agriculture and animal husbandry. Local inhabitants use the agrobiodiversity in drylands for multiple purposes like food, feed, wool production, dairy, medicines and transport. However, due to the fragile natural resource base, achieving food security in drylands has been a great challenge. With the threat of climate change looming large and additional threat of massive out-migration, the livelihoods of people who live in these areas, will be further at considerable risk.
- Species and ecosystems in drylands are a result of distinctive evolutionary process, developing strategies to cope with environmental constraints such as water scarcity, extreme hot and cold temperatures, and unpredictable long drought periods with sporadic rainfall. In plants, these manifest into features such as short growth cycles, long roots, water storage in roots and trunks, and dormancy during dry seasons. Livestock species and breeds have adapted by optimizing the use of scarce vegetation and water, minimizing their water loss, being able to walk long distances over rough terrain, and other characteristics. Paradoxically, agricultural genetic resources are of fundamental importance for adaptation to climate change, and also become a casualty under certain extreme edapho-climatic changes.
- Many dryland areas, especially mountain regions, which are the centres of origin and/or diversity of domesticated plants and animals (including their wild relatives) are under threat. Domestication of plants and animals in these regions is the outcome of efforts of farmers and herders who bred and selected the innumerable varieties/breedsspecifically adapted to these niche areas. These farmers and herders are the most extraordinary innovators and conservers of agrobiodiversity, as they managed to develop unique and highly technological agriculture and pastoral management systems – many of them still in use – adapted to very adverse and changing environments. Empowering local communities and combining farmers' and external knowledge have been identified as some of the strategies for meeting the

challenges in such ecologies. There is urgent need to understand the link between agrobiodiversity and climate change resilience, using a trans-disciplinary approach.

- With respect to use of plant genetic resources (PGR) to address challenges in drylands, efforts are required on the development of varieties that are tolerant to higher temperatures and more frequent droughts. In this context, landraces and CWRs that are still found within the prevailing traditional farming systems in the drylands, are potential sources of useful genes for plant breeding, especially to overcome adverse effects of climate change, which must be conserved. Unfortunately, many of the remaining hot spots of dryland biodiversity which have potential to contribute to climate change solutions are under rapid erosion, due to the combined effects of over-exploitation, destruction of natural habitats, and modernization of traditional farming systems. Hence, an important aspect of food security within the context of climate change will be to take measures to secure the genetic resources of agricultural drylands.
- The problems of dryland degradation, climate change and agrobiodiversity loss, along with issues such as resource depletion, pollution, and urban expansion into productive farmland are symptomatic of lack of understanding of natural processes by society in general. Global changes in drylands will not only affect the local inhabitants, but also the livelihoods and welfare of a considerable portion of human population. Land management systems that protect top soil, conserve and recycle nutrients, conserve and concentrate water are those that will maintain productivity in the drylands. Agrobiodiversity contributes to resilience through a number of, often combined, strategies: the protection and restoration of ecosystems, the sustainable use of soil and water resources, agroforestry, diversification of farming systems, various adjustments in cultivation practices and the use of stress-tolerant crops and crop improvement.
- Sharing of knowledge, capacity building of all stakeholders and partnerships to research and adopt new technological options is imminently required for meeting the future demand of managing agrobiodiversity of dry areas to optimize adaptive mechanism and risk aversion. Increased and targeted use of genetic resources, for new varieties and breeds through fast track utilization of germplasm is needed to cope with changed production environments.
- Agrobiodiversity management in drylands also requires functional convergence of global policy and regulatory frameworks that deal with biodiversity, food and agriculture, desertification and climate change. Specifically, they relate to the Earth Summit (1992) in Rio de Janeiro, which led to the establishment of the three sister conventions: Convention on Biological Diversity (CBD, 1993), United Nations Framework Convention on Climate Change (UNFCCC, 1994) and United Nations Convention to Combat Desertification (UNCCD, 1994). Other instruments are the FAO's International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA, 2001), Nagoya Protocol on Access and Benefit Sharing (NP-ABS, 2010) and Aichi Targets (2011-2020). Global commitment for greater coordination in legal,

policy and management issues shall pave the path for sustainable livelihood security in drylands and in converting dryland areas from grey to green.

Scope

In light of the above, the Indian Society of Plant Genetic Resources (ISPGR), New Delhi, Bioversity International, New Delhi and Asia-Pacific Association of Agricultural Research Institutes (APAARI), with support from United Nations Environment Programme (UNEP) and Asia-Pacific Consortium on Agricultural Biotechnology and Bioresources (APCoAB) are co-organizing a Satellite Symposium on 'Dryland Agrobiodiversity for Adaptation to Climate Change' during the 13thICDD at Jodhpur, India. Issues would be addressed through in-depth deliberations among researchers, intellectuals, policy makers, executives and other stakeholders on a common platform. The symposium will be moderated and would include a keynote lecture, invited presentations and a panel discussion.

Objectives

- To examine the current threats to dryland agrobiodiversity, deliberate upon the opportunities and challenges due to climate change, and the required policy interventions to overcome the threats and challenges.
- To take stock of agrobiodiversity in the Indian, Central and West Asian, and North African dryland regions and management strategies of their genetic resources.
- To Identify the possible role of regional and international organizations in management of dryland agro-ecosystems through research and development, in partnership mode for harnessing agrobiodiversity to address the global challenges being faced by dryland communities.

Expected Outputs

- Knowledge and experiences on agrobiodiversity of drylands exchanged among the diverse stakeholders to enhance awareness about their importance, conservation and utilization.
- A cohesive network established to provide an effective platform for presenting on-going research activities, and discussing policy implications related to dryland agrobiodiversity.
- A road map including implementation strategy (action plan) for efficient conservation and sustainable use of agrobiodiversity developed to ensure food and livelihood security in the drylands, in the changing climate change scenario.

CORE ORGANIZING COMMITTEE

CHAIR

R.S. Paroda (Chairman TAAS)

CO-CHAIR

Kuldeep Singh (Director, NBPGR)

MEMBERS

J.C. Rana (Bioversity International), **R.K. Tyagi** (APAARI), **O.P. Yadav** (CAZRI), **Sunil Archak, Rakesh Singh** and **Anuradha Agrawal** (ISPGR)

PROGRAM

February 13, 2019 (Wednesday); 14.00 – 17.00

Chair:	R.S. Paroda, Chairman, TAAS	**Co Chair:**	Kuldeep Singh, Director, NBPGR
Convenor:	Anuradha Agrawal, ISPGR	**Co-Convenor:**	Rakesh Singh, ISPGR
Rapporteurs:	Sunil Archak and S. Rajkumar		

Time	Title	Speakers
Keynote Lecture		
14.00-14.20	Current threats to dryland agrobiodiversity and required policy interventions	**R.S. Paroda** TAAS and ISPGR, India
Invited Lectures		
14.20-14.35	Managing agrobiodiversity of Indian drylands for climate adaptation	**O.P. Yadav** CAZRI, India
14.35-14.50	Conservation and use of agrobiodiversity in CWANA drylands	**Ahmed Amri** ICARDA, Morocco
14.50-15.05	Agrobiodiversity of fruits and nuts to adapt to climate change in Central Asia	**Muhabbat Turdieva** Bioversity International, Uzbekistan
15.05-15.20	Dryland agrobiodiversity for adaptation to climate change: Role of regional organizations	**R.K. Tyagi** APAARI, Thailand
15.20-15.35	Role of Bioversity International for *in situ* conservation in drylands in the context of climate change	**J.C. Rana** Bioversity International, India

Panel Discussion : Issues and way forward for agrobiodiversity for adaptation to climate change

	Crop Group	Panelist
15.35-16.35	Millets	**S.K. Gupta,** ICRISAT, India
	Arid legumes	**D. Kumar,** Ex CAZRI, Jodhpur
	Arid oilseeds	**D.K. Yadava,** ICAR, Delhi
	Arid horticultural crops	**P.L. Saroj,** ICAR-CIAH, Bikaner
	Seed spices	**Gopal Lal,** ICAR-NRCSS, Ajmer
	Forages	**R.K. Bhatt,** ICAR-CAZRI, Jodhpur
	Underutilized and medicinal plants	**Suresh Kumar,** Ex CAZRI, Jodhpur
	Dryland PGR	**Omvir Singh,** NBPGR, Jodhpur
16.35-16.55	General Discussion on Way Forward	
16.55-17.00	Concluding Remarks	**Chair and Co-Chair**