

Conservation and Utilization of Wild Relatives of Horticulture Crops, Focusing on Climate Change

Safina Kossar, Susmita Das, Tashi Angmo, Meena Yadav and
Karukumalli Sindhura.

Sher-e-Kashmir University of Agricultural Science and Technology Jammu

ARTICLE ID: 18

“Conservation or utilization of PGR is imperative for healthy and peaceful society”

(Norman Ernest Barlaug)

United nation sustainable development goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture is seriously challenged by rapid climate change. Global warming, rise in sea level and oceans, rapid increase in atmospheric carbon and increase risk of disease and new pest are the predicted effect of climate change. Global warming is a reality man has to live with. Future food security will be dependent on a combination of the stresses, both biotic and abiotic, imposed by climate change, variability of weather within the growing season, development of cultivars more suited to different ambient conditions, and the ability to develop effective adaptation strategies which allow these cultivars to express their genetic potential under the changing climate conditions.

Nature is very kind to us to provide huge wealth of genetic resources which are future of tomorrow. Those plant species which are very closely related to crops, including their progenitors, having the potential to contribute beneficial traits for crop improvement, such as, resistance to an array of biotic and abiotic stresses, enriching the gene pool, leading ultimately to enhanced plant yield, thereby aiding humanity's relentless search for production of more food to meet the ever growing needs of a burgeoning world population, are Called the “Crop Wild Relatives”(CWRs).Climate change is likely to be one of the most important factors affecting our future food security. To mitigate negative impacts, we will require our crops to be more genetically diverse. Such diversity is available in crop wild relatives (CWRs), the wild taxa relatively closely related to crops and from which diverse traits can be transferred to the crop. Conservation of such genetic resources resides within the nation where they are found; therefore, national-level conservation recommendations are fundamental to global food security. Wild plant species related to crops, are a key resource



for adapting agriculture to the challenges posed by climate change. Untended by humans, crop wild relatives continue to evolve in the wild, developing traits – such as drought tolerance or pest resistance that farmers and breeders can cross with domesticated crops to produce new varieties. There are approximately 50,000 to 60,000 species of CWR, of which 10,000 may be considered of high potential value to food security, with 1,000 of these being very closely related to the most important food crops.

Therefore characterization and conservation in crop breeding programs assume great importance. At the same time crop wild relatives are also face threat from the climate change hence crop wild relatives are international conservation and food security priority and this highlight to need the to conserve wild relatives either in *exsitu* or *insitu* with accessible documentation of all that is conserved. Crop wild relatives are not important only from the present point view but they are future of tomorrow agriculture. The focus need to be adaptation, especially in case of perennial crops as plant breeding may not be an option that require long gestation period. There is not much time left because due to human exploitation of natural resources led to environmental degradation and consequently threatened wild crop relatives in their natural habitat so our objective should be need based. Vavilov was followed the 1960s and 1970s by a generation of scientists who developed method for storing *ex situ*. *Exsitu* conservation is the conservation of components of biological diversity outside their natural habitats. *Exsitu* collections are stored in seed genebanks, field gene banks and *invitro*. The convention on biological diversity, adopted in 1992, defines in situ conservation as the conservation of ecosystem, natural habitatas and the maintenance of species population in their natural surroundings.

Significance of genetic conservation of crop plants

The growing population pressure, urbanization of agricultural lands and rapid modernization in every field of our day to day life eroded biodiversity in direct and indirect way. From the beginning of agriculture, natural genetic variability has been exploited within crop species to meet subsistence requirement, and now it is being focused to surplus food for growing populations with the help of high yielding and fertilizer responsive dwarf varieties. These prolonged activities lead to the huge coverage of single genetic cultivar made situation again worse in other form such as loss of genetic diversity and extinction of primitive species. Today with an advancement of agricultural and allied science and technology we still ask



ourselves whether we can feed the world in 2050, therefore it is important to look at the agriculture not only as food producing machine but also an important source of livelihood. However, the problem is that modern crop varieties, have been developed for high yielding such varieties are not suitable for low income farmers in marginal production environment as they are facing highly variable stress conditions. Crop wild relatives have been found to have higher stability in low input agriculture under marginal environment thus their conservation is important to face present food production shocks.

