Plant Genetic Resources activities - Nagaland

National Bureau of Plant Genetic Resources, Regional Station – Shillong, Umiam, Meghalaya – 793103

Germplasm enhancement is an essential link between collection / evaluation and its utilization to benefit agriculture. India represent a very hetero-genus group of plants comprises of tropical, sub-tropical and temperate species of indigenous and exotic origin, exhibiting enormous variation with respect to their morphology, growth and bearing behavior and ecological requirement etc. Preservation of genetic diversity in plants requires effective application of storage technologies, the object, aims and location of conservation. India recognized the role and importance of plant genetic resources in crop improvement research as early as mid forties. Systematic activities on exchange of plant genetic resources of agri-horticultural crops started in 1946 at the Indian Agricultural Research Institute (IARI), New Delhi. A separate division of Plant Introduction at IARI started functioning in the year 1961. National Bureau of Plant Genetic Resources (NBPGR) was established in the year 1976 in New Delhi. Besides, meeting the germplasm requirements for Research Institutes and Universities within India, the Bureau has exchange relations with more than 80 countries as well as International Institutes under CGIAR including IPGRI. NBPGR is working as a nodal agency for PGR management with its Regional Stations at Akola, Bhowali, Cuttack., Jodhpur, Hyderabad, Ranchi, Shimla, Shillong, Thrissur and Base Stations at Jammu & Kashmir, Andman & Nicobar.

Eastern Himalayan Region popularly known, as NEH Region of India is geographically located between latitudes $21^0$3'-$29^0$3' N and longitude $87^0$5'-97^0 3' E . It is located in the eastern part of Himalaya comprising of eight states inhabited by several communities dwelling in remote and inaccessible areas. NEH Region being the mountainous region (except plains of Assam, Barak valley and Imphal valley) is the core area of global biodiversity. There is more than 7 million tribal population (67 major tribes) spread over 1.81 lakhs sq. Km as against total geographical area of 2.55 lakhs sq. Km comprises 80% in Arunachal Pradesh, 31% in Manipur, 80% in Meghalaya, 94% in Mizoram, 88% in Nagaland and 29% in Tripura . Great variation of climatic, topographic, socio-economic and cultural aspects in the Himalayan led to the evolution of diverse traditional farming systems. In addition, the region is well known for its richness in variety of land races/primitive cultivars of several horticultural crops besides a huge floristic wealth of great economic importance. The richness in agro-biodiversity of this mountainous region warrants the great concern for its sustainable management and utilization of Plant Genetic Resources for the well being of mankind. The NBPGR, R/S Shillong has been entrusted the responsibility of the collection, characterization, documentation, maintenance, conservation and sustainable utilization of agro-biodiversity of NEH Region.

The Regional Station of National Bureau of Plant Genetic Resources, Shillong was started functioning in the North-Eastern region since 1978. The independent functioning was started since 1986, and the responsibilities entrusted with the station were for the collection of local crop diversities, maintenance and characterization of mandate crops under the subtropical, sub-humid conditions in the farm, located at Umiam, Barapani, Meghalaya. At the onset of new millennium (i.e. 1-1-2000) the station has started its entire functioning in its new building and establishment at NBPGR Shillong, Umiam, Barapani Campus, Meghalaya with a 6 ha. land (at three places – main building 2.6 ha. , at low lying paddy field area 1.5 ha. and horticultural block 2.0 ha.). This station represents the entire Northeastern region of the country for the purpose of crop germplasm collection. The collection jurisdiction encompasses eight states such as Arunachal Pradesh, Assam,

Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. Regional Station, Shillong is situated at 25^0 41' N latitudes 91^0 55' E longitudes at an altitude of 1100 msl in humid, sub-trpoical climate with an average annual rainfall of 2205.8mm and temperature ranges from 6.8 ^{0} to 29.7 ^{0} C . The station is located 25 km away from the district Headquarters, Shillong and 95 Km away from Guwahati the nearest railway Station.

Plant Genetic Resources activities - Nagaland :

The State of Nagaland was formally inaugurated on **1st December, 1963**, as the 16th State of the Indian Union. It is bounded by Assam in the West, Myanmar (Burma) on the East, Arunachal Pradesh and part of Assam on the North and Manipur in the South. The State consists of eleven Administrative Districts, inhabited by 16 major tribes along with other sub-tribes. Each tribe is unique in character from the other in terms of customs, language and dressing pattern. Each of the 16 major tribes and sub-tribes that dwell in this hill State can easily be distinguished by their colourful and intricately designed costumes, jewellery and beads that they adorn. Nagaland has basically an agricultural economy. Over 70% of the population is dependent on agriculture. The main crops are rice, millet, maize and pulses. Cash crops like sugarcane and potato are also becoming popular. Coffee, cardamom and tea are the main plantation crops in Nagaland.

Rice is the dominant crop and also the staple diet of the people. Of the gross cropped area under food grains, rice accounts for about 84.4%. Oilseeds are also important crops which includes rapeseed, mustard etc. Vegetable crops are melon, cucumbers, spinach leaf, mustard, onion, chillies, carrots, tomatoes, brinjal etc.

Germplasm exploration and collection:

A total 1907 acc. were collected and during this year 261 acc. viz. paddy (129), maize (89), king chilli (26) , eye bird chilli (07) from ICAR Research Complex Center Nagaland were augmented for accessioning the IC number (Table-1).

Area	Cereal	Fiber crops	Fruits	M &AP	Misc.	Oilseeds	Orna.	Pseudo-cereal	Pulses	Spices	Tuber crops	Veg.	Total
Dimapur	116	2	18	1	17	26	1	3	54	36	11	8	293
Kiphire	35	1	5	12	22	16	1	20	60	16	49	29	266
Kohima	216		5	4	77	23	1	6	67	23	17	23	462
Medziphema	21								7				28
Mokokchung	248				7	8		2	29		3	9	306
Mon		55			1				1	2		1	60
New Tissen	2				1			1					4
Peren	57				55	2		2	10	11		1	138
Phek	6					1				5	4		16
Tuensang	125		10	1				8	9		20	3	176
Wokha	27					6		3	15	3		1	55
Zoneheboto	41		2		3	4		4	29	2	15	3	103
Total	894	58	40	18	183	86	3	49	281	98	119	78	1907

NATIONAL POLICIES AND ISSUES – FUTURE THRUST

The present status of diversity in ***in-situ*** management of fruit crops is rather a major concern due to degradation of natural habitats and changed environmental conditions. Loss of genetic material can be attributed to various factors such as large scale deforestation, encroachment of forest land for diverse uses, over exploitation and indiscriminate land use. Following are some thrust area for effective management of fruit germplasm.

1. Accessions from wildly distributed habitats are required to be augmented and conserved. Special missions with crop based institutes are needed to be launched in the area of occurrence of rich diversity to collect and conserve the fruit germplasm (plus fruit tree) using *ex-situ* and *in-situ* approaches.
2. Multiplication of fruit germplasm in newer habitats may lead the loss of genetic material due to several biotic and abiotic factors. Hence Fruit germplasm may be multiplied and characterized / evaluated at least two to three geographical locations for conservation and future utilization.
3. Emphasis needs to be given on targeted collection, conservation and sustainable management of plus fruit trees / valuable germplasm of rare / endangered wild relatives of fruit germplasm for future utilization.
4. Collaborative networking approaches through inter institutional linkages can help in periodic monitoring of the status of fruit germplasm.
5. For effective habitat protection, practices such as guided land use plan, ecozoning of an area / buffer zoning should be adopted. Hot spot and critical habitats should be the conservation areas for protection of fruit germplasm like Citrus Gene Century of Meghalaya, *Carissa* genetic diversity at Mount Abu, Gujarat.
6. Enforcement of all existing national (governmental and non governmental) plans / acts, strategies, programmes / regulations in an effective way can gear rescue operations to conserve genetic diversity and restore degraded habitats.
7. Gaps identified in the management of the horticultural genetic resources should be bridged through appropriate research and development (R & D). Different organizations / institutes engaged in the R & D work should come together and work jointly to conserve the diversity.
8. Compilation of passport data of fruit germplasm and their accessioning helps in planning and execution of collection programmes of fruit germplasm.
9. There is a need of systematic documentation and updating the scientific data base. In this, scientific data base of any fruit species is must for sovereign rights over a species. This warrants adequate research work and compilation of comprehensive updated database on plant genetic diversity of India.
10. Awareness generation at various levels through formal and informal education curriculum to conserve the biodiversity.
11.Farmers have played a crucial role in the conservation of biodiversity. It is important that society recognizes and encourages this role through incentives, such as benefit sharing.

OBJECTIVES:

a.Plant exploration and collection of agri-horticultural crop germplasms from NEH region.
b.Maintain and evaluate germplasm collections of crops suited to this region, particularly cereals, pulses and vegetables.
c.Identification of superior genotypes holding the specific trait(s), which can serve as effective tool for breeding programme.
d.Collection of data and cataloguing of information.
e.Supply the germplasm to MTS, LTS, Cryo, *in-vitro* and to indentors.

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State wise collection of plant germplasm from NEH Region:

Arunachal Pradesh	**5961+118=6079**
Assam	**6866**
Manipur	**2088**
Meghalaya	**2084**
Mizoram	**2766 + 110=2876**
Nagaland	**1907**
Sikkim	**1387**
Tripura	**702**