seed accessions. Well-equipped cryopreservation and *in vitro* conservation facilities were developed to cater to the conservation of recalcitrant seed species and vegetatively propagated materials in 1986. The NGB maintain a germplasm holding of 0.29 million accessions of field and horticultural crops. Germplasm accessions numbering about 0.1 million have been evaluated and 79 catalogues published. Realizing the need for molecular characterization of the indigenous genetic diversity, a National Research Centre on DNA Fingerprinting was established at NBPGR in 1996. Also, to document the performance of promising germplasm and promote their exchange and use, the ICAR started the registration of potentially valuable plant germplasm at NBPGR in 1996. The NGB, ranks fourth in terms of base collection of germplasm in the world.

For better evaluation and enhanced utilization of PGR, the activities of NBPGR have been recently expanded in a network mode. This involves coordination with the Project Director/Project Coordinators, All-India Coordinated Crop Improvement Projects, who serve as the National Active Germplasm Sites. In addition, collaboration is carried out with the Consultative Group and National Genebanks of other countries.

The modalities for access to PGR have changed rapidly in the last decade with the advent of the Convention on Biological Diversity (1993), the World Trade Organization (1995) and the International Treaty on Plant Genetic Resources for Food and Agriculture (2004). These treaties have also led to strengthening of intellectual property regimes in areas of agriculture and biotechnology which have directly and indirectly impacted PGR management in India. Important aspects related to these issues would be discussed in the presentation.

Plant Introduction in India during Pre- and Post-CBD Periods–An Analysis

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The Introduction of exotic germplasm has enriched the Indian agriculture since times immemorial, resulting in establishment of a large number of crops and in development of high yielding varieties. In fact most countries are dependent on crops that have originated elsewhere and are considered to be interdependent with respect to genetic resources required for their crop improvement programmes.

In last two decades with the enforcement of CBD and provisions of the TRIPs under WTO, there is a general apprehension that free exchange of germplasm would be adversely affected because of issues related to sovereign rights of countries and IPR. Therefore, an analysis has been carried out on introduction of germplasm from other national genebanks and Consultative Group (CG) centres. The CG centres have assembled a large amount of germplasm in their mandate crops through international cooperation and freely distribute the genetic resources of these crops to the world community. The analysis includes the number of accessions received during the last 5 years of pre-CBD era (1988-1992) and another 5 year (1997-2001) of post-CBD era. The period during 1993 to 1996 was not included to avoid the effect of transit phase.

A total of 46,650 accessions were received from national genebanks in different crop groups during pre-CBD (52.1 percent) and 42,911 (47.9 percent) from CG centres. Whereas, post-CBD 39,625 (47.3 percent) accessions were received from national genebanks and 44,057 (52.7 percent) accessions from CG centres. The data also indicates that national gene banks are major providers of cereals, oilseeds, forages, vegetables and fruits, while for grain legumes supply was almost equally distributed between national genebanks and CG centres. In cereals, the germplasm received in the form of international nurseries/trials which are received from CG centres was not included in this data. In cereals, national genebanks contributed 33.46 percent during pre-CBD, which got slightly increased (34.75 percent) during post-CBD.

Further, analysis regarding the type of genetic material received in cereals indicated that of the total

introductions received from national genebanks, 95.3 percent and 96.5 percent were germplasm; 3.5 percent and 2.2 percent varieties and 1.2 and 0.5 percent wild and weedy relatives in pre- and post-CBD era, respectively. Similarly from CG centres 94.3 percent and 93.4 percent were germplasm; 2.9 percent and 4.4 percent varieties and 2.7 and 2.3 percent wild and weedy relatives in pre- and post-CBD era, respectively. Amongst the national genebanks, USDA, USA was the main supplier. Significant number of accessions were also introduced from Australia, UK, Italy, Germany and Canada.

These results indicate an overall decline of 6.6 percent in the introduction of germplasm during post-CBD period. However, this decline was confined to the supplies from national genebanks, which suggest of the cautious approach adopted by different countries in sharing of germplasm. Another interesting observation was that despite overall decrease, there was an increase in import of accessions from CG centres, probably because of the attempts on restoration of germplasm from CG centres. Also, the results indicated that 81 percent of germplasm was introduced from technology rich countries, which are not the centre of diversity of respective crops. This might be because of early realization of the importance of plant genetic resources in these countries in crop improvement, leading to collection and conservation from world over.

Prehistoric Plant Introductions in South Asia

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Archaeo-botanical records have revealed an independent beginning and diffusion of Agriculture in Uttar Pradesh, India, in the ninth millennium BC, and the subsequent diffusion /introduction of rice based agriculture into Kashmir, Gujarat, Pirak, Baluchistan and Sind in the third millennium BC. Several crops of Indian origin were domesticated and grown in summer and kharif seasons at several archaeological sites located in the Saraswati river valley. Agriculture also began to be practiced in Mehrgarh, Baluchistan and adjoining southeastern Iran during the seventh–sixth millennium BC and in Afghanistan during the third millennium BC, using local domesticates and introduced crops from Southwest Asia. At the archaeological sites in Gujarat and in the Indus valley in Sind and Punjab, crops of Indian, Southwest Asian and African origins began to be grown in the third millennium BC. With the decline of the Harappan civilization and the joining of the Satluj river with the Indus river and the Yamuna river with the Ganges river, agriculture spread to Bihar, Bengal and Madhya Pradesh. This presentation discusses the impact of pre-historic plant introductions from Southwest Asia into South Asia, especially the agricultural revolution, using crop rotation for the first time in the world, viz., the growing of introduced crops of Southwest Asian origins in winter and crops of African and Indian origins in summer and kharif seasons. Mention is also made of prehistoric plant introductions from East and Southeast Asian regions into South Asia, although archaeological records are not available to elucidate the time frame of such introductions.
