E-CONTENT

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NEED Of PLANT CONSERVATION

Plants are universally recognized as a vital part of the world's biological diversity and an essential resource for the planet. Many thousands of wild plants have great economic and cultural importance, providing food, medicine, fuel, clothing and shelter for humans around the world. Plants also play a key role in maintaining the Earth's environmental balance and ecosystem stability. They also provide habitats for world's animal and insect life.

Many plant species are threatened by habitat transformations, over-exploitation, invasive alien species, pollution and climate change, and are now in danger extinction. The disappearance of such vital and large amount of biodiversity presents one of the greatest challenge for the world community: to halt the destruction of plant diversity that is essential to meet the present and future needs of humankind.

In 2002, the Conference of the Parties of the Convention on Biological Diversity, through decision VI/9, adopted the Global Strategy for Plant Conservation

(GSPC): a strategy that aims to halt the current and continuing loss of plant diversity, and to contribute to poverty alleviation and sustainable development.

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1. Plants are a vital component of biodiversity and healthy ecosystems. They provide a range of ecosystem services, from production of oxygen and removal of atmospheric carbon dioxide emissions, creation and stabilization of soil, protection of watersheds and provision of natural resources including food, fibre, fuel, shelter and medicine.

2. Two thirds of the world's plant species are in danger of extinction with pressure from the growing human population, habitat modification and deforestation, over-exploitation, spread of invasive alien species, pollution and growing impacts of climate change.

3. The GSPC, whose goal is to halt the current and continuing loss of plant diversity; has provided a solid foundation for real and significant progress in plant in plant conservation throughout the world.

4. The emerging trends of climate change pose an even more serious threat to the conservation and sustainable use of plant diversity and may compromise gains made this far, if not urgently addressed.

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THE ESSENTIAL ROLE OF PLANT DIVERSITY

Plants are universally recognized as a vital component of biodiversity and global sustainability. For example, plants provide food (around 7,000 species are used for food). Some other well recognized uses include fibre, fuel, shelter, medicine.

Healthy ecosystems based on plant diversity provide the conditions and processes that sustain life and are essential to the well-being and livelihoods of all humankind. **Ecosystem services** provided by plants include:

- The production of oxygen and assimilation/sequestration of CO_2 in both terrestrial and marine systems that currently removes about 50% of anthropogenic CO_2 emissions;
- The creation, stabilization and protection of soil, essential for most of the Earth's productive agricultural systems and the major carbon pool in the terrestrial biosphere; and
- The creation and protection of watersheds, slowing run-off rate of precipitation and promoting water infiltration and purification.

Plants also form the basis of the trophic pyramid in all terrestrial and most marine ecosystems on which we and all other animal species inevitably depend. In addition, plants provide a vast multitude of natural resources for humanity, especially in developing world. They provide the basis for all our food, most medicine and many other materials essential for our daily lives.

THE OVERALL STATUS AND TRENDS OF PLANT DIVERSITY

An accurate picture of the status of plants and the trends that are impacting on them is difficult to determine. Indeed, we do not yet know the exact number of plant species in the world (estimated >370,000 known species). However, it is predicted that as many as two-third of the world's plant species are in danger of extinction in nature during the course of the 21st century (Blackmore *et al.* 2000).

Extinction and declines in plant diversity is due to a range of factors including population growth, high rates of habitat modification and deforestation, over-exploitation, the spread of invasive alien species, pollution and climate change. The Millennium Ecosystem Assessment noted that approximately 60% of the ecosystem services evaluated are being degraded or used unsustainably. The degradation of ecosystem services often causes significant harm to human-being and represents a loss of a natural asset or wealth of a country. The assessment also noted a continual decline in the status of provisioning services of the environment, especially wild foods, timber, cotton, wood-fuel, genetic resources, and medicine. ***It is clear that the overall trend for plant diversity is declining.***

THE GLOBAL STRATEGY FOR PLANT CONSERVATION (GSPC)

The 16th International Botanical Congress in St. Louis, Missouri in 1999 called for plant conservation to be recognized as an outstanding global priority in biodiversity conservation, given the continuing loss of plant diversity and the fundamental role played by plants for sustenance of human life and other biodiversity. As a result, on the initiatives of many other organizations also, it was proposed that a GSPC should be developed and implemented through the framework of the Convention on Biological Diversity (CBD).

Important points:

- Understanding and documenting plant diversity;
- Conserve plant diversity;
- Using plant diversity sustainably;
- Promoting education and awareness about plant diversity; and
- Building capacity for the conservation of plant diversity.

GSPC
Goal: "…to halt current and continuing loss of plant biodiversity…"

Since its adoption, the GSPC has been implemented throughout the world through an impressive combination of local, national and international initiatives.

Rhizanthella gardneri, one of the most remarkable plants, fully underground orchid from the Western Australian biodiversity hotspots produces a tulip-like cluster of small orchid flowers from a leafless underground plant. The population size of the species is <50 mature individuals as an ex-situ collection of seed and plants as part of a major program by Kings Park. The main aim is to secure seed and mycorrhiza of all orchids from Western Australian biodiversity hotspots.

A working-list of known plant species is essential for biodiversity management. It is an inventory of resources and a means of organizing information in a logical and retrievable way. The name of a plant is the key to information about its uses, conservation status, relationships and place within ecosystems. The accepted name is a unique identifier for species without which it is impossible to find the information necessary to plan and manage the conservation and sustainable use of plants, and understand their role in ecosystems. Thus a working list of known plant species has a very broad range of potential users.

The IUCN has developed a new method named 'RAPID LIST'. This method was developed specifically as a response to the need articulated by the GSPC.

Another major contribution was the SAMPLED RED LIST Index Project incorporating bryophytes, pteridophytes, gymnosperms, monocots and dicots.

Of the total 254 species of Magnolias identified at global level, the Red List identified 131 wild magnolias as being in danger of extinction.

AT LEAST 10% OF EACH OF THE WORLD's ECOLOGICAL REGIONS EFFECTIVELY CONSERVED

The protection of ecological regions is one of the principle means for the conservation of biological diversity. This aspect calls for the identification of each of the world's ecological regions, and the conservation of at least 10% of its area. This is particularly important as it treats plant conservation within the context of the protection of communities, rather than individual habitats, sites or species.

According to the world Database on Protected Areas, maintained by UNEP-WCMC, the current estimate for coverage of the global network of protected areas is that at present it includes 11.6% of the Earth's land surface, totaling 19 million

square kilometers, within 106,926 areas. The degree to which protection is effective, and actually represents each ecological region, is uncertain.

The Conservation of the IPAs for the medicinal plants in the Himalaya:

Fifty-three IPAs for the medicinal plants (sites of International significance for conservation recognized at national level) were identified across the Himalayas by organizations in Bhutan, China, India, Nepal, and Pakistan. IPAs were found to be useful for landscape planning and conservation monitoring, based on the gross geography of the Himalayan IPA network. Involving local communities was found to be fundamental to conserving medicinal plants at the local level (involving traditional doctors, cultural leaders and industry) to facilitate IPA conservation.

SIXTY PERCENT OF THE WORLD'S THREATENED SPECIES CONSERVED IN SITU

This is concerned with conserving threatened plant species in their natural habitats. These species are those considered the most likely to become extinct, and hence achieving this target would be a major step forward in halting the loss of plant diversity. Threatened species include many medicinal plants, timber species and crop wild relatives, which are important for livelihood.

The exact number of threatened species in the world remains to be determined. Among the plant groups, only the gymnosperms have a complete assessment, and one third of all gymnosperm species are considered threatened. It is not known what proportion of other plant groups is threatened. Some estimates suggest that more than one third of all plant species are currently threatened with extinction.

SIXTY PER CENT OF THREATENED PLANT SPECIES IN ACCESSIBLE EX SITU COLLECTIONS, PREFEREBLY IN THE COUNTRY OF ORIGIN, AND

10% OF THEM INCLUDED IN RECOVERY AND RESTORATION PROGRAMMES

Ex situ conservation of plant is defined as the conservation of plant diversity outside its natural habitat to safeguard identified families or individual plant species from danger or loss. It has been developed as a vital tool for plant conservation and is today integrated closely and effectively with protection of plants in their wild habitats. The increasing awareness of the effects of climate change on plant distributions *in situ* has made the appropriate application of *ex situ* techniques potentially more crucial to assist in adaptation of species and ecosystems to changed conditions in the wild. *Ex situ* conservation involves the collection, maintenance and conservation of samples of organisms usually in the form of live whole plants, seeds, pollen, spores, vegetative propagules, tissue or cell cultures or other genetic material of growing or preserved individuals.

Those involved in ex situ conservation include botanic gardens, gene and DNA banks, agriculture and forestry bodies and a diversity of other Governmental and non-governmental organizations. The focus and emphasis of different sectors involved are varied, in botanic gardens (wild plant species) and in gene banks (crop varieties and crop wild relatives).

SEVENTY PER CENT OF THE GENETIC DIVERSITY OF CROPS AND OTHER MAJOR SOCIO-ECONOMICALLY VALUABLE PLANT SPECIES CONSERVED, AND ASSOCIATED INDIGENOUS AND LOCAL KNOWLEDGE MAINTAINED.

Plant genetic resources of crops and other major socio-economically valuable plant species are the biological base for food security and, directly or indirectly, support the livelihoods of every person on Earth. This aspect recognizes the central role that within-species genetic diversity plays in improving production of crops and other useful species. Socio-economically valuable plant species, which are not crops include important forage, agro-forestry and forestry species, as well as

important ornamentals, medicinal plants and crop wild relatives. Such plant genetic resources, and the associated indigenous knowledge, are among the most important, and often the only, assets available in many poor, rural communities and their significance increases as other resources dwindle or disappear.

It has been demonstrated that 70% of genetic diversity of a crop can be contained in a relatively small sample (generally, <1000 accessions). Indeed, for some 200 to 300 crops, it is expected that 70% of genetic diversity is already conserved ex situ in gene banks. Genetic diversity is also conserved through on farm management and by working with local communities. Maintenance of local and indigenous knowledge associated with useful medicinal plants, crop wild relatives and other useful medicinal plants, crop wild relatives and other useful wild plant species presents its own distinct challenges, especially given the large number of species to be considered.

Svalbard Global Seed Vault has been constructed in Narway, close to the Arctic Circle, aimed to provide the ultimate safety net against accidental loss of diversity in traditional gene banks. While approximately 1.5 million distinct seed samples of agricultural crops are thought to exist, the facility has a capacity to conserve 4.5 million.

Regarding forest tree genetic resources, apart from a few tree species of major socio-economic value, there is little reliable information on the genetic diversity of tropical tree species (80% of the total number of tree species). The genetic diversity of wild, highly variable, undomesticated forest trees is conserved on site. Assessing the genetic diversity of these species is challenging, especially since there is rarely quantitative data on population size or decline upon which to base a characterization of their genetic diversity.

A study conducted for FAO in 2002 concluded that the issue of forest tree genetic diversity was not well addressed in any process, except for the European Forest Genetic Resources Programme established in 1994 by the Ministerial Conference on the Protection of Forests in Europe. Summary information on species

management has partly been compiled in the FAO information system on forests genetic resources (REFORGEN), which contains information from 150 countries and 1,600 tree species collected and checked between 1995 and 2003.

GLOBAL STANDARD FOR SUSTAINABLE WILD MEDICINAL PLANT HARVESTING

A new standard to promote sustainable management and trade of wild medicinal and aromatic plants was launched in 2007. The standard is needed to prevent plants used in medicine and cosmetics from being over-exploited. More than 400,000 metric tons of medicinal and aromatic plants are traded every year, and about 80% of the species involved are harvested from the wild.

Following extensive consultation with plant experts and the herbal products industry, the International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants, ISSC-MAP, was drawn up by the Medicinal Plant Specialist Group of IUCN.

The Management of Medicinal and Aromatic Plants in wild is based on following points:

- Maintaining medicinal and aromatic plant resources in the wild;
- Preventing negative environmental impacts;
- Legal compliance;
- Respecting customary rights;
- Applying responsible management practices; and
- Applying responsible business practices.

THE IMPORTANCE OF PLANT DIVERSITY AND THE NEED FOR ITS COSERVATION INCORPORATED INTO COMMUNICATION, EDUCATIONAL AND PUBLIC-AWARENESS PROGRAMMES

Plants are often under-represented in the conservation debate and neglected in efforts to engage the public in environmental action. Furthermore, increasing urbanization and population movements are resulting in a growing disconnect between people and nature, a trend that is especially notable amongst the young.

Plant Conservation Targets will only be achieved if changes are made at all levels of society, from policy makers through to the general public. For this reason, communication, education and public awareness programmes are essential in underpinning the Strategy.

NETWORKS FOR PLANT CONSERVATION ACTIVITIES ESTABLISHED OR STRENGTHENED AT NATIONAL, REGIONAL, AND INTERNATIONAL LEVELS

Networks supporting plant conservation activities provide the means to share protocols and celebrate successes, exchange data, encourage professional development of conservation specialists and build capacity of the plant conservation community. Organizations participating in such networking include government agencies, museums, academic specialists, botanic gardens and non-governmental organizations. The majority of networks are self-organizing, arising in response to needs and opportunities.

The South African National Biodiversity Institute has recently completed assessing the conservation status for all plant taxa that occur in South Africa.

"Plant Discoveries 2022" contains an enumeration of 339 taxa, which have been added to the Indian flora during 2022. These comprise 319 species, and 20 infraspecific taxa as new to the Indian flora. Of these taxa, 186 taxa are new to science and 153 taxa are new distributional records from India.

Nandadevia pusalkar found in Uttarakhand Himalayas, and *Nilgiriella pusalkar* Endemic to southern Western Ghats in Karnataka, Kerela, and Tamilnadu. Additionally , Calanthe lamellose, an orchid species, previously recorded in China and Myanmar, was found for the first time in India in the Japfu mountain Range in Kohima, Nagaland.

Declaration

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