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Value and global demand of medicinal herbs and its conservation

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Abstract

Biodiversity forms the foundation for sustainable development and also constitutes the basis for the environmental health of our planet. However, the continuous exploitation without conservation results in depletion of source of economic and ecological security for our future generation and drives to the loss of valuable medicinal plants all over the world. The science and the study of Indian medicines (Ayurveda, Siddha and Unani) a mutual relationship which bring out a valuable attention now-a-days to make use of flora and fauna for their medicinal values. Plant products always have a conspicuous role in providing medicine for human being. Most of our modern medicines are derived from the herbs. The major contributors to pharmacology and pharmaceutical and clinical therapeutics are also derived from herbs like *Andrographis paniculate*, *Asparagus racemoses*, *Azadirachta indicia* and so on etc. The demand for natural products, their secondary metabolites and scientific advancement leads to exploitation of large amount of products without giving importance for their conservation. The usage of herbal plants for medicine was much popular and had been in practice for a long period in England. Americans used herbal medicines to cure much illness before the advent of scientific pharmaceuticals. The medicinal plants occurring in various habitats have been used for medicinal purpose in various forms. Demands of medicinal herbs at global level including India shows remarkable global trade of medicinal plants that leads to threatening of valuable biodiversity. In a nutshell this abstract attempts to highlight the need of bio-diversity conservation of medicinally valuable herbs at global level.

Keywords: medicinal plants; pharmaceuticals; biodiversity

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Introduction

Over the last 15-20 yrs the world health organization health assembly has passed a number of resolutions of interest in study and use of traditional medicine in health care world wide it has been estimated as many as 75 to 90% of the world's rural people rely on herbal traditional medicine for their primary health care. Medicinal plant sector has traditionally occupied an important position in socio cultural, spiritual and medicinal arena of rural and tribal lives of India. Also modern pharmacopoeias till contain at least 25% drugs derived are synthetic analogues built on prototype compounds Isolated from plants. Thus, the demand for medicinal plant is increasing in both developing and developed countries. It is observed through ethno-therapeutics in drug development is gaining much

importance in recent days. For example, many recent therapeutically important secondary metabolites compounds like the reserpine, vincristine, vinblastine, artemisin, taxol, camptothecin, podophyllotoxin, plauntol from plants such as *Rawvolfia serpentina*, *Cataranthus roseus*, *Artemisia annua*, *Taxus* sp, *Podophyllum* sp, that are used curing disease like hypertension, leukemia, fever, ovarian, lung and testicular cancer, Alzheimer diseases respectively (Sukh Dev, 1997).

In ayurveda, siddha systems of medicine-the traditional heritage of India include plants drugs curing for various diseases and preparations of phytomedicines and selling them are increasing drastically day by day globally (Nair and Henry, 1983). It has been estimated that the present global market of plant drugs of US $ 2000 crore. In India, that the total herbal products market, including Sales of crude drugs, had been estimated at Rs. 25 crore of which about 50% is contributed by ayurveda and siddha classical preparations. Habitat loss is the primary use of species loss at local, regional and global scales ad it is also harmful not any to a single species bat to whole communities and ecosystems. An estimated 50,000-70,000 plant species are used in medicines throughout the world. They make an essential contribution to health care (Yoganarasimhan, 2000). The vast majority of medicinal and aromatic plant species used today is collected from the wild. Unfortunately, resulted extinction forever (for example), wolf's bane (Arnica Montana), used to treat sprains, bruises, and muscle aches, and great yellow gentian (*Gentian lutea*) are harvested for long time. These plants requiring management measures because of exploitation concerns. Thus, this immense type of public utilization in the usage of plants as medicines has been based in the assumption that the plants source resulted in growing demand is putting a heavy strain on the existing resources. It is a warning that conservation of biodiversity loss must be checked simultaneously in order to make life sustainable and make protection to the endangered plants and valuable herbals on the universe which leads to threatening in their natural habitat (Hong Bo Guo, 2011) Hence, to maintain for the future needs the cultivation of medicinal plants has to be encouraged thereby counteracting in conserving the resource of wild plants on the global demand. Thus, the disappearance and declining populations of many endangered plant species have to be focused on habitat loss, and degradation, introductions of invasive alien species.

Threats

The main factors that have contributed to the progressive decline of plant diversity are:

Habitat loss and degradation: Habitat loss is the primary cause of species loss at local, regional and global scales. Urban development, over-drafting of groundwater, road building, recreation, forest fires, agriculture and tree logging all destroy and degrade plant's natural habitats. It is estimated that habitat destruction from human activity is the primary cause of risk for 83% of endangered plant species (Allard, 1970). Habitat loss is harmful not only to a single species, but to whole communities and ecosystems. According to the United Nations Environment Programme (UNEP), it has been estimated that by the year 2032, more than 70% of the land's surface will have been destroyed or disturbed. Habitat loss is also a problem because it leads to the fragmentation of the remaining habitat resulting in further isolation of plant populations.

On-farm conservation and its practice

Generally, the strategy of conservation regularly for endangered plants should include both in situ and *ex situ* conservation. The *in situ* conservation has the advantage that allows continuing evolution of those distribution limited endangered species in its natural habitat. On-farm conservation proposed here is different from the same name suggested by Hammer et al. (2003), with additionally includes resources utilization for family income with special domestication pattern except genetic diversity conservation. Wild seeds collected from few individuals or populations in indigenous mountain or introduced from other regions [in this case field experiments are necessary (Guo et al., 2009) are nursed in farm land spring, season. On farm conservation proposed practice, exhibits both protecting endangered plants and at the same time to guarantee the sustainable utilization by on form domestication. Simultaneously the relative high genetic diversity must be maintained during cultivation which could help to bring out the quality of harvesting medicinal plants during conservation. Totally nature has been contributing to the conservation of endangered plant species by maintaining and restoring their habits, as well as implementing management and recovery plans within the framework of the Natura 2000 network. I am presenting some LIFE project that will help to combat the loss of plant diversity and also help to conserve the Natural resources for ever (Brown, 1981).

In-situ conservation

In has been well established that the best and cost-effective way of protecting the existing biological and genetic diversity is the *in-situ* or on the site conservation wherein a wild species or stock of a biological community is protected and preserved in its natural habitat (Brown, 1995). The prospect of such a 'ecocentric', rather than a species centred approach is that is should prevent species from becoming endangered by human activities and reduce the need for human intervention to prevent premature extinctions. Establishment of biosphere reserves, national parks, wild life sanctuaries, sacred groves and other protected area network has taken a central place in all policy decision process related to biodiversity conservation at national, international and global level.

Ex-situ conservation

Several medicinal plants are already threatened, rare, or endangered. In addition, the precautionary principle applies to those where status is currently unknown and to segments of germ pools (Ge and Hong, 1999). There is an immediate need to consolidate and finally link the existing herbal gardens and gene banks as well as reference specimens in herbaria to ensure that the 540 species of importance in the major classical systems, as well as those supplied to the international market, are protected in ex-situ reserves. This requires strategic planning since the range of germ plasm obtained for each species must be representative (Guo et al., 2010). Plant collections need to evolve from being species reference collections to being genetic resources collections. Conservation of medicinal plants can be accomplished by the *ex-situ* i.e. outside natural habitat by cultivating and maintaining plants in botanic gardens parks, other suitable sites, and through long term preservation of plant propagules in gens banks (seed bank, pollen bank, DNA libraries etc (Guo, 2007) and in plant tissue culture repositories and by cryopreservation.

- Preparatory actions: such as the preparation of surveys, mapping, definition of seedling protocols,

genetic analysis etc. these actions help to further knowledge of the targeted species and set out improved conservation measures.

- Land or actions targeting the protection of plant populations and conservation of their habitats in certain locations.
- Direct conservation actions: for the conservation of plant species and their habitats: *ex situ*-creation of nurseries, *in-vitro* propagation, germoplasm banks and *in situ*-recovery of degraded areas, habitat restoration, alien species eradication, establishment of fences etc.
- Monitoring: included scientific monitoring during the project periods the longer-term included species and habitats surveillance (forest fires/collecting/grazing).

Plant through micro-reserves in which a small plot that has a peak value of maintaining plant richness end emission, long term monitoring plant species and vegetation types. Thus, following micro-reserve method which will enrich to maintain the valuable plants under safety conservation measures.

Restoration of habitats

Many endangered plant species are narrow-range endemic species with special habitat requirements. Their conservation status is highly dependent on the status of the habitat. Thus, the restoration and management of their habitats is crucial for their survival. Projects for restoring endangered plant species habitats, and at the same time promoting conservation actions on-and off-site in order to guarantee the long-range conservation of the plant species.

Introductions of invasive alien species (IAS)

Aliens are not science fiction, but a nature conservation fact. An alien is any species that is moved by humans to an area outside of its native range. In the vast majority of cases, these species will not survive because they are not adapted to the new area. Nevertheless, in a minority of cases, a species will be able to survive in its new location and sometimes will even thrive in a new location. The management of human use of the biodiversity so that it may yield the greatest sustainable benefit to present generation while maintaining its potential to meet the needs and aspirations of future generations. The definition invokes two complementary components conservation and sustainability (Ma et al., 1990; Longxi, 2000; Hammer et al., 2003). Medicinal plants are potential renewable natural resources. Therefore, the conservation and sustainable utilization of medicinal plants must necessarily involve a long term, integrated, scientifically oriented action programme. This should involve the pertinent aspects of protection, preservation, maintenance, exploitation, conservation and sustainable utilization (Sjogren and Wyoni, 1994). The holistic and systematic approach envisaging interaction between social, economic and ecological systems will be a more desirable one. Most widely accepted scientific technologies of biodiversity conservation are *in-situ* and *ex-situ* methods. Plants are vital to almost every aspect of our daily life (Yang, 2000). Conservation efforts and importance of preventing the disappearance of so many species of plant is one of the major challengers to achieve the goal of halting the loss of biodiversity.

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