TRAFFIC’s newsletter on wildlife trade in India was started in September 2007 with a primary objective to create awareness about poaching and illegal wildlife trade.

Illegal wildlife trade is reportedly the fourth largest global illegal trade after narcotics, counterfeiting and human trafficking. It has evolved into an organized activity threatening the future of many wildlife species.

TRAFFIC Post was born out of the need to reach out to various stakeholders including decision makers, enforcement officials, judiciary and consumers about the extent of illegal wildlife trade in India and the damaging effect it could be having on the endangered flora and fauna.

Since its inception, TRAFFIC Post has highlighted pressing issues related to illegal wildlife trade in India and globally, flagged early trends, and illuminated wildlife policies and laws. It has also focused on the status of legal trade in various medicinal plant and timber species that need sustainable management for ensuring ecological and economic success.

TRAFFIC Post comes out three times in the year and is available both online and in print. You can subscribe to it by writing to trafficind@wwfindia.net

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Pangolin billboards at Indian zoos highlight the story of the world’s most trafficked wild mammal

Indian Customs Department extends support to sensitize travellers about illegal wildlife trade at the Delhi International Airport

Making CITES work for wild medicinal and aromatic plants: the role of voluntary certification explored

Wild plant experts and stakeholders meet at FairWild Forum 2019 in Budapest

CITES postpones CoP18

India proposes change in status of various wildlife species in CITES at CoP18

Customs seize over 18 tonnes of Red Sanders declared as car spare parts in Chennai

Man held with 45 kg of agarwood at Delhi airport
Dear Readers

With approximately 18,000 flowering plant species found in the country, India is one of the world’s richest floral biodiversity hotspots. Approximately 7,000 of these species are used in traditional Indian medicine systems—Ayurveda, Unani, Siddha and Homeopathy (AYUSH). Although these plants have been in use for centuries, their demand has expanded in recent times. The domestic use of medicinal plants was estimated to be 195,000 metric tonnes (mt) in 2014–2015, while the volume of exports was estimated to be 134,500 mt during the same period.

According to the National Medicinal Plant Board, 1,178 species of medicinal plants are considered to be in trade of which 242 species have annual consumption levels in excess of 100 mt/year. With the improving economy, enhanced purchasing power, trade facilitation and inclination towards using alternative medicines, the demand for plant-based medicines has expanded in the international marketplace. Exports of medicinal plants and plant-based products have shown a growth of 6% in the last decade. This secures substantial foreign revenue for the government and provides livelihood opportunities for local communities although the sustainability of extraction of medicinal and aromatic plants (MAPs) on this scale is a concern.

The emphasis on MAP trade assumes another level of urgency when we are dealing with demand—legal or illegal—for endemic species which are only distributed in restricted areas. India has about 5,725 endemic taxa of angiosperms (which comprise approximately 33.5% of Indian flora) found in 25 hotspots. The major hotspots in India that contain large numbers of endemic plant species are the Southern Western Ghats and Eastern Himalayas, which are reported to have 1,286 and 1,808 endemic species respectively.

The challenges are many, while 335 plant species in the country are classified as threatened on FRLHT’s Red Data list (2019), India’s Wildlife (Protection) Act provides a layer of protection to only five species and one genus of plants through their listing under Schedule VI. With increasing pressures on wild floral resources, there is a definite need to expand protection to other widely traded wild species as well. Policy-level changes are the need of the hour but before that a comprehensive and systematic attempt should be made to document the most traded species of flora, so that any enforcement related interventions and limited conservation resources can be targeted. An attempt to gain a better understanding of MAP trade in India has been made and presented in this volume.

One of the most discussed and quoted examples of an issue impacting an Indian (and South Asian) MAP species is that of *Ophiocordyceps sinensis* also known as *Keeda Jadi*, Yarsa Gumba, Himalayan Gold or Caterpillar Fungus. This unique interaction between an insect and fungus gained popularity with the claim that Caterpillar Fungus could enhance stamina and vigour when consumed. This led to a fad in its use beginning with athletes competing at professional level but soon spreading to the “aphrodisiac” market. Demand for the fungus rose to unprecedented levels and as a result its habitat, which is fragile alpine meadows, was literally raided by wild plant collectors. The sky high prices attracted traders and illegal traffickers into the business. Today in most of its areas of distribution in India, Nepal
and Bhutan, the collection of Caterpillar Fungus is legal (with certain local restrictions), although due to the very high demand, if no prescribed regulations for sustainable harvesting are followed it might ultimately lead to its local extinction from some areas. A similar story holds true for many other non-glamorous species including *Sausaria caustus, jatamansi, kuth,* and *taxus.*

Trade of Caterpillar Fungus is an important example of the need to develop cross-border regulations to ensure sustainable harvesting and apply a market-linked certification scheme to achieve the twin aims of ensuring sustainability of production and gain maximum financial benefit for wild MAP collectors/harvesters. This has been highlighted in detail through an article under the *Wild Cry* section of this newsletter.

Often the traders operate in the higher Himalayas where wildlife law enforcement is a challenge, and may not restrict their operations to trade of MAPs but also simultaneously indulge in illegal trade of other wildlife species such as Snow Leopard *Panthera uncia,* Common Leopard *Panthera pardus,* and Red Panda *Ailurus fulgens.* Since little information about the prevailing wildlife crime scenario is available, it is a challenge to plan and execute effective wildlife crime combating protocols in such areas.

One of the main reasons for the expanding international market is eased trade regulations and penetration of the newly established e-commerce sector. Today the estimated 51% of the world population uses the internet and many of them are members of social media sites or trade using e-commerce platforms. The global e-commerce sector saw a robust growth of 12.4% in 2018, the year India witnessed the fastest growth in internet penetration in the world with 40 million new customers joining the internet bandwagon. Today, India accounts for 12% of world internet users globally, the second highest number in the world. Many of the transactions happening over the internet are illegal in nature and due to the anonymity that cyberspace provides, it is a challenge for enforcement agencies to track such transactions. Hence an important aspect of combating illegal wildlife trade is building the capacities of law enforcement staff to monitor and tackle wildlife related cybercrime over e-commerce and social media platforms. TRAFFIC’s CyberCLAW programme, which is both timely and crucial, has gained immense popularity among participating Tiger Reserves of the country.

A fast-shrinking world means it is clear that combating illegal wildlife trade cannot remain a “nation specific” issue but must be dealt at the global level to be effective. Consequently, international agreements like the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) assume immense importance. India while working on harmonization of CITES within its national legislation, is also pursuing for providing added protection to certain “minor” traded species like Indian Star Tortoises *Geochelone elegans,* Tokay Gecko *Gekko gecko,* wedgefishes, otters etc through CITES. The Government of India will aim during the 18th Conference of the Parties (CoP18) to CITES in Geneva to garner support for its proposals to uplist these species in the CITES appendices to help regulate their international trade. TRAFFIC, whose mission is to ensure that trade in wild flora and fauna isn’t a threat to the conservation of species, will be working with various Parties at CoP18 to secure a better future for our biodiversity.

Happy Reading!

Dr Saket Badola, IFS
Head- TRAFFIC, India Office
Trade in Medicinal and Aromatic plants of India: An overview

Pramod K. Yadav and Saket Badola

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Trade in Medicinal and Aromatic plants of India: An overview

Introduction
Medicinal and Aromatic plants (MAPs) have been the historical mainstay of traditional healthcare practices across major societies and are still used today by 75–80% of the world population for their primary health care needs (Majaz & Khurshid, 2016). The global market for the MAPs was USD 1.1 billion in 1999, USD 1.8 billion in 2009 and USD 3 billion in 2015 (TRAFFIC, 2018). This is further expected to reach USD35.4 billion by 2020 with a compound annual growth rate of 6.6% from 2015 to 2020 (BCC, 2015).

India has strong traditional health care practices represented by classical medicine systems such as Ayurveda and Siddha which use about 7,000 species of flowering plants (Mukherjee, 2001).

India has been a big player in MAP trade across the globe. It exported raw herbs worth USD330.18 million during 2017–18 with a growth rate of 14.22% over the previous year (MoC&I, 2019). The export of value-added extracts of medicinal herbs/herbal products during 2017–18 stood at USD456.12 million recording a growth rate of 12.23% over the year before (MoC&I, 2019). As per a published report of NMPB (2017) out of 6500 medicinal plant species traditionally used by Indian communities, only 1622 botanicals corresponding to 1178 plant species are found to be in all India trade. Of these 42% are herbs, 27% trees and 31% are shrubs & climbers. Only 242 species witness high volume trade (>100 MT) annually (Goraya & Ved, 2017).

A study conducted by Goraya & Ved, (2017) revealed that nearly 90% of the medicinal plants used by local communities in India are sourced from the wild. This study also revealed that approximately 72% of the medicinal plant species and 50% of the annual quantities consumed as herbal raw drugs by the domestic herbal industry are also sourced from the wild. This high demand for herbal drugs has led to rampant collection of MAPs from the wild, leading to depletion of biodiversity. For instance, the western belt of the Himalayas (in India and Nepal) has seen depletion of medicinal herbs like Jatamansi *Nardostachys grandiflora* that is profusely harvested for extraction of sesquiterpenes found to exhibit anti-malarial, anti-nociceptive, and cytotoxic activity and enhance the action of nerve growth factor (Peng-Cheng et al., 2013). Similarly, numerous other Critically Endangered MAPs including *Aconitum heterophyllum*, *Taxus wallichiana*, *Dactylorhiza hatagirea*, *Polygonatum verticillatum*, *Gloriosa superba*, *Arnebia benthamii*, and *Megacarpoea polyandra* are overexploited for their therapeutic potential (Padalia et al., 2015, Maikhuri et al., 2017).

Since 1995, FRLHT (Foundation of Revitalization of Local Health Traditions) has conducted threat assessment exercises using IUCN Red List Categories and Criteria with respect to wild medicinal plant species across 18 States of the country. These assessments have resulted in categorising 335 medicinal plant species as threatened at the regional, national and global levels (Shankar, 2019). Many of these Red-listed medicinal plant species continue to be in active commercial trade putting pressure on these wild resources.

In order to understand the threats to these vulnerable species due to excess extraction from the wild, it is...
important to monitor the MAP trade and develop policies and practices that will lead to long-term sustainable collection and fair trade of the species without endangering their future in the wild.

**Commonly traded MAPs in India**

For the purpose of giving an overview of various aspects of collection and trade in MAPs in India, some of the most commonly traded MAP species are highlighted below. These species are reported to be in trade in relatively high volumes, potentially meaning their future is under threat (Gupta et al., 2014; Kala, 2015; Maikhuri et al., 2017). The species assessed here are not protected under India’s Wildlife (Protection) Act, 1972, the key legislation aimed at curbing wildlife related crimes although they are listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), which regulates their international trade.

**Jatamansi Nardostachys jatamansi**

Jatamansi is an important medicinal plant in India and endemic to Himalayan mountain ranges. It is found at an elevation of 2,200-4,800 m above sea level in Nepal, Bhutan, Myanmar, and south-west China. In India, it is found in Himachal Pradesh, Uttarakhand, Sikkim, and Arunachal Pradesh.

Jatamansi is mainly traded for its roots that are used for treatment of epilepsy, as an antiseptic, for curing diabetes and also in heart-related ailments. Cultivation of the species is largely unknown in India; it is very unlikely that wild populations can supply an estimated demand of 500 mt of roots per year (Goraya and Ved 2017). Unregulated and unsustainable collection of Jatamansi roots for medicine as well as habitat loss are the major threats to the species in the wild. The species is collected from the wild in an indiscriminate manner leading to a decline in its wild populations (Ved et al., 2015). The rhizomes of Jatamansi are collected by local harvesters throughout the alpine meadows of the Himalayas and the air-dried rhizomes are traded through well-established marketing chains from the Himalayas to cities in the plains of India as well as to western countries where it is in high demand.

**Queen Sago Cycas circinalis**

*Queen Sago* is endemic to India and restricted to the States of Kerala, Karnataka, and Tamil Nadu. Large populations occur in Melkote Temple Wildlife Sanctuary and Niligiri Biosphere Reserve located in the Western Ghats. It is targeted mainly for its leaves and pith that are believed to have medicinal properties. The pollen is a narcotic. The bark and the seeds are ground to a paste with oil and used as a poultice on sores and swellings. The juice of tender leaves is used in the treatment of flatulence and vomiting. The seeds are harvested and used for food as a regular part of the diet of local communities. The cycad leaves are also harvested for the urban floricultural market. Land clearing is thought to have destroyed more than 50% of the original habitat of *C. circinalis*. Large numbers of older specimens of the species are hacked down for the extraction of pith (Varghese et al., 2010).

**Himalayan Yew Taxus wallichiana**

*Taxus wallichiana* is widespread in the Himalayas and western China. In India, it is found in the States of
Uttarakhand, Meghalaya and Manipur. The species has been heavily exploited for its leaves and bark which are used to produce the anti-cancer drug (paclitaxel) and other similar drugs. The species is used in traditional medicine systems like Ayurveda and Tibetan Medicine. For *T. wallichiana*, a population decline of up to 90% has been reported in India and Nepal, while in western China a decline of more than 50% has been reported (Thomas & Farjon 2011). Across most of its range, *T. wallichiana* has been heavily exploited for its leaves and its bark used to procure Taxol for the treatment of ovarian cancer (Padalia *et al.*, 2015).

**Ginseng *Panax pseudoginseng***

Ginseng is reported from the Indian Himalayan States of Sikkim, Arunachal Pradesh, Manipur, and Meghalaya between altitudinal ranges of 2,900–4,000 m above sea level. The species is also found in China, Nepal, Bhutan, and Myanmar. Ginseng (rhizome) is popularly known as the “elixir of life” and consumed as a popular rejuvenating and revitalising tonic. It is used to increase longevity, mental agility and check hypertension. Of the various threats documented, improper harvesting, habitat loss and trade are amongst the most destructive to populations (Gajurel *et al.*, 2015).

**Salampanja *Dactylorhiza hatagirea***

Salampanja is a high-value medicinal plant found in temperate to alpine regions at elevations of 2,500–5,000 m above sea level) in the Indian States of Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, and Arunachal Pradesh. It is also found in Pakistan and Nepal and is generally used as a nerve tonic and for its astringent and aphrodisiac properties. The species has been widely used to cure dysentery, diarrhoea, chronic fever, coughs, stomach ache, wounds, cuts, burns, fractures and for general weakness, particularly in debilitated women after giving birth. The high medicinal demand for *D. hatagirea* has led to over-exploitation of wild resources (Warghat *et al.*, 2013). There is also evidence that the recent expansion of tourism has severely impacted the habitats of *D. hatagirea* (Kelly *et al.*, 2003).

**Kutki *Picrorhiza kurrooa***

Kutki occurs in alpine meadows and glacial, rocky beds at altitudes between 3,200 to 4,500 m above sea level where it forms dense patches in fairly moist, well-exposed slopes in Jammu and Kashmir, Himachal Pradesh, Uttarakhand, and Sikkim. *P. kurrooa* is highly valued in Ayurvedic medicine systems and has been used traditionally to treat liver ailments, dyspepsia, chronic diarrhoea and upper respiratory tract ailments. In modern medicine, it is used in the treatment of hepatic disorders, gastric troubles, anaemia, asthma and pregnancy-related problems.
rising demand, limited cultivation and reckless collection from the wild has rendered *P. kurrooa* a Critically Endangered plant species (Bhat *et al.*, 2014).

**Himalayan Mayapple *Podophyllum hexandrum***

*P. hexandrum* is a perennial alpine herb that produces the anti-cancer metabolite podophyllotoxin (PPT). This has been the primary driver of its trade and also a factor leading to its Endangered status. The species is found in the Indian States of Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, and Arunachal Pradesh at altitudes from 2,500 and 4,200 m above sea level. It is used in veterinary medicine as a cathartic for dogs and cats and also used in removing warts in animals. *P. hexandrum* is consisted at risk of extinction in large part of its natural habitat because of the indiscriminate uprooting of wild plants to meet the ever-increasing demand for the pharmaceutical industry (Gupta & Dutta, 2011; Kitchlu *et al.*, 2011). Due to increasing commercial demand for PPT, extraction of *P. hexandrum* has negatively affected its wild populations over the last 20 years (Lv and Xu, 2011).

**Elephant’s Foot *Dioscorea deltoidei***

In India’s Himalayan regions, *D. deltoidei* is mostly distributed at altitudes of 550–3,100 m above sea level in Arunachal Pradesh, Sikkim, Assam, Meghalaya, Jammu & Kashmir, Himachal Pradesh, and Uttarakhand. It produces rhizomes or bulbils which are used for the treatment of diseases like cardiovascular disorders, central nervous system disorders, disease of bones and joints, metabolic and digestive disorders. It also cures diarrhoea, abdominal pain, dysfunctional changes in the female reproductive system and skin diseases. *D. deltoidea* is an important Endangered medicinal plant, commercially exploited for the extraction of diosgenin, a precursor of steroidal drugs. Due to indiscriminate harvesting and shrinking of its natural habitat, this native Indian species faces a serious threat of extinction (Dixit-Sharma *et al.*, 2005).

**Red Sanders *Pterocarpus santalinus***
Red Sandalwood, also called Red Sanders, is endemic to the States of Andhra Pradesh, Tamil Nadu, and Karnataka. Its timber is used to make furniture, musical instruments and carvings. The species has also been harvested for pharmaceutical and medicinal purposes. In powdered form, it is used for the treatment of diabetes, to reduce bleeding, and to alleviate swelling, and pain. The species is used as an ingredient for immunity enhancing medicines in China. The extraction of older trees (large girth size) for heartwood has left the remaining population skewed towards younger trees. This has further led to reduced regeneration and an increase in the occurrence of inbreeding (Hedge et al., 2012). Illegal trade and habitat loss are also adversely affecting the population structure of the species (Barstow 2018).

**Agarwood**

*Aquilaria malaccensis* is a large evergreen tree which occurs in Bangladesh, Bhutan, northeast India, Sumatra and Kalimantan of Indonesia, Iran, Malaysia, Myanmar, Philippines, Singapore and southern Thailand. The species is targeted extensively for its valuable resin created in response to fungal infection, known as Agarwood. The majority of the wood produced from *A. malaccensis* is processed to make oil, perfumes and cosmetics products. Similarly, wood chips are processed into powder, which form the raw material to create incense sticks. In Thailand *A. malaccensis* is used as a blood and heart tonic. The predominate threat to *A. malaccensis* is unregulated harvesting and trade of agarwood (Harvey-Brown, 2018).

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Parts used</th>
<th>Estimated current annual consumption (Dry weight in mt)</th>
<th>IUCN Redlist</th>
<th>FRLHT Redlist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jatamansi</td>
<td><em>Nardostachys</em></td>
<td>Root (Rhizome)</td>
<td>500–1,000</td>
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<td>CR</td>
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<td><em>grandiflora</em></td>
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<tr>
<td>Agarwood</td>
<td><em>Aquilaria</em></td>
<td>Bark (Stem),</td>
<td>50–100</td>
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<td><em>malaccensis</em></td>
<td>Heart Wood</td>
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<td>Queen Sago</td>
<td><em>Cycas</em></td>
<td>Flower, Pith</td>
<td>&lt;10</td>
<td>EN</td>
<td>CR</td>
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<tr>
<td>Himalayan Yew</td>
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<td>Leaf</td>
<td>100–200</td>
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<td><em>wallichiana</em></td>
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<td>Red Sanders</td>
<td><em>Pterocarpus</em></td>
<td>Wood</td>
<td>200–500</td>
<td>NT</td>
<td>CR</td>
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<td>Ginseng</td>
<td><em>Panax</em></td>
<td>Root</td>
<td>&lt;10</td>
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<td><em>pseudoginseng</em></td>
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<td>Salampanja</td>
<td><em>Dactylorhiza</em></td>
<td>Root (Tuber)</td>
<td>10–50</td>
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<td>Kutki</td>
<td><em>Picrorhiza</em></td>
<td>Root (Tuber)</td>
<td>1,000–2,000</td>
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<td>Himalayan Mayapple</td>
<td><em>Podophyllum</em></td>
<td>Fruit, Root</td>
<td>10–50</td>
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<td><em>hexandrum</em></td>
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<td>Elephant’s Foot</td>
<td><em>Dioscorea</em></td>
<td>Root</td>
<td>10–50</td>
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<td><em>deltoidea</em></td>
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**Table: Estimated annual consumption of MAPs extracted from the wild**

(Source: National Medicinal Plant Board (NMPB) for the period 2014–15 published in 2018.)

NMPB extensively surveyed the herbal market of India in collaboration with the Indian Council of Forestry Research and Education (ICFRE), Dehradun (NMPB))

Mt – metric tonnes; IUCN – International Union for Conservation of Nature; FRLHT – Foundation for Revitalization of Local Health Traditions; CR – Critically Endangered; EN – Endangered; NT – Near Threatened
Demand and emerging markets for MAPs

MAPs have been an integral part of India’s healthcare system and the livelihoods of local communities for centuries. The World Health Organization (WHO) has a target of “health for all” which can only be realised through utilisation of herbal medicine (Gupta et al., 2014; Kala, 2015). The demand for herbal-based drugs in developing countries is huge and with some consumers becoming increasingly sceptical about the use of modern medicine rising in developed countries (Mazid et al., 2012). For example, consumption of the herb Hypericum perforatum is twice as high as that of the allopathic medicine Prozac used as an anti-depressant in Germany (Schmidt & Butterweck, 2015; Hritcu & Cioanca, 2016).

Increasing awareness and demand for herbal-based drugs by consumers in both developed and developing countries has led to multinational pharmaceutical industries exploring their use on commercial scale. This is putting pressure on wild populations of MAPs. Taking advantage of legal lacunas and inefficient international trade regulation agreements, indiscriminate harvesting of MAPs is leading to unprecedented depletion of some natural resources (Arora & Gupta, 2014). Herbal products contribute about USD62 billion in international markets (of which India’s current contribution is only 2.5%) which is expected to grow to USD5 trillion by 2050. (Bhattacharya et al., 2014). This demonstrates the escalating growth in the herbal sector of international markets over the coming years. In order to fulfil the demand for MAPs through sustainable and fair trade, it will be essential to engage all stakeholders including farmers, collectors and traders, as part of an holistic inclusive approach to enable expansion of the herbal sector in India.

Legal provision governing conservation and trade of MAPs in India

The wild population of many medicinal plants is believed to be drastically declining due to increased exploitation, bringing many of these species to the brink of extinction. These diverse herbal raw drugs are collected from the wild, cultivated, or imported and transported through various trade channels to different parts of the country for use by the domestic herbal industry, processing for export, or retail sale. The production including cultivation and import, trade, consumption and exports of medicinal plants, usually covered as a subset of Non-Timber Forest Produce (NTFP), is subject to various policy and regulatory regimes put in place by the national or State governments. An overview of these policies and regulatory regimes applicable to the medicinal plant sector in the country is given below.

a. The Wildlife (Protection) Act, 1972

Plants species are listed in Schedule-VI of the Act, which prohibits picking and uprooting of listed species growing in the wild. This Act prohibits export of the following six species/species groups, included in Schedule VI (Section 2).

1. Beddome’s Cycad Cycas beddomei
2. Blue Vanda Vanda soerurec
3. Kuth Saussurea lappa = S. costus
4. Lady’s slipper orchids Paphiopedilum spp.
5. Pitcher Plant Nepenthes khasiana
6. Red Vanda Rananthera inschootiana

b. The Biological Diversity Act, 2002

Various sections of the Act deal with regulations related to obtaining permission for export and trade of biological resources. Section 38 of the Act empowers the central government to notify red-listed species and prohibit or regulate collection thereof for any purpose in consultation with the concerned State government. To date, 118 plant species were notified under this section across the country. Further, as per Section 3 of the Act, foreign nationals and non-residential Indians are required to obtain prior approval from the National Biodiversity Authority to access biological resources for research, or for commercial utilisation, or even for bio-surveys.

c. Indian Forest Act 1927

Export and transit of wild collected and cultivated MAPs is regulated under the Forest Produce Transit Rules listed under the Indian Forest Act, 1927. These rules apply to procedures that are related to storage, transit and export of MAPs. Under this Act, each State government has been vested with the power to create their own rules to regulate the transit of forest produce including MAPs.

Transit rules also provide authority to State governments to prohibit the collection and trade of forest produce obtained from a species considered to be of conservation concern in that particular State. This is in addition to the federal
regulations which are applicable across the country. For example, in Himachal Pradesh, the trade of *T. wallichiana* is prohibited while it is allowed in Uttarakhand. Similarly, the trade of *Saussurea costus* is prohibited in Jammu & Kashmir where the species is found in the wild while it is permitted in Himachal Pradesh where it is extensively cultivated in Lahaul.

Provision of issuance of clearances and certificates exist at every level from cultivation to legal procurement and then for transit of the legally collected product.

d. The EXIM Policy

Provisions of international trade of wildlife products including MAPs are made by the Ministry of Commerce and established through the EXIM policy. The policy provisions for MAPs is decided in consultation with the Government of India and the Management Authority for CITES implementation in the country on the basis of threats to the wild population of these plants due to indiscriminate trade. Under the existing policy, the export of 29 plants, portions and their derivatives and extracts obtained from the wild, except formulations*, is prohibited. These plants are listed below.

*The term "Formulation" used here includes products which may contain portions/extracts of plants on the prohibited list but only in unrecognisable and physically inseparable form.

<table>
<thead>
<tr>
<th>S. No.</th>
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<th>IUCN Redlist status</th>
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<td>Swertia chirata</td>
<td>Charayatah</td>
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</table>

13
e. Trade of plants listed in CITES appendices:
India as a signatory to CITES has put in place provisions related to the export of plants, plant portions and their derivatives and extracts obtained from the wild. Trade in plants and plant portions of species listed in the Wildlife (Protection) Act, 1972 or in Appendix I of CITES is allowed if the produce is obtained from cultivation carried out in accordance with the rules. The exporter must have a Certificate of Legal Possession issued by the jurisdictional Divisional Forest Officer (DFO). For species listed under Schedule VI of the Wildlife (Protection) Act, 1972, the trader needs to comply with provisions under Section 17-A of the Wildlife (Protection) Act, 1972.

For cultivation of CITES Appendix I species, the nursery where the plants acquired are maintained and multiplied must be registered with the Assistant CITES Management Authority. CITES Appendix I and Wildlife (Protection) Act Schedule VI plants cultivated this way are eligible for export, subject to obtaining a transit pass from the concerned DFO if the plants were cultivated on sites within forests, or a Certificate of Cultivation from a District Agriculture, Horticulture or Forest Officer if cultivated at sites outside forests. Foreign trade in respect of species listed in Appendix II and III of CITES whether wild or cultivated is regulated only to the extent that the exporter needs to have a Certificate of Legal Possession issued by jurisdictional DFO, and the export is subject to CITES provisions.

Way forward
Considering that wild populations of CITES-listed MAP species may be diminishing due to unregulated collection to meet the rapidly-expanding international demand, exploring means of cultivations for long-term sustainable supply may be beneficial for conservation of the species in the wild as well as for generating livelihood opportunities for farmers in India. To ensure sustainability, there is need to implement CITES non-detriment finding guidance and management plans for the species.

It is also advised that species recovery programmes should be implemented for Critically Endangered species to be reintroduced back to their natural habitat. Establishing in situ regeneration blocks can play a vital role towards achieving this. These blocks can also act as nodes for wild propagation of the species in surrounding areas as well.

The herbal raw drug trade in India is far from transparent, with little demonstrable mechanism to reflect fair trade practices. Data management with respect to wild collected medicinal plants has also become an area of concern. There needs to be greater enforcement of harvesting quotas to ensure compliance with CITES Appendix II.

Collection and trade of these MAPs from the wild provides livelihood opportunity for millions of rural dwellers but it has brought ecological and social vulnerability in the country. A robust system for traceability and ensuring chain of command for wild collected products will not only check illegal wild collection but will also guarantee better remuneration to the harvesters for their products in national and international markets. In this scenario, there is need to implement market-based tools such as FairWild certification for conservation, sustainability and equitable trade of the MAPs from the wild. These initiatives may enhance investment in education, health and food security which could play key role in building resilience among rural communities to fight against biodiversity loss and climatic vulnerability.

There is a complex regulatory mechanism for trade in wild collected/cultivated MAPs which varies from State to State. This has led to a variety of interpretations and there is a need for improved harmonisation among various stakeholders for a national policy/strategy on conservation while promoting fair trade in MAPs to achieve Sustainable Developmental Goals 2030.

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TRAFFIC Post
June 2019
Wild Cry

Challenges in conservation and sustainable trade of Caterpillar Fungus in India

Pramod K. Yadav and Saket Badola

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Saket Badola, IFS: Head, TRAFFIC, India Office
Challenges in conservation and sustainable trade of Caterpillar Fungus in India

Introduction

The harvesting of Non-Timber Forest Products (NTFPs), including medicinal plants, by rural communities is widespread across the Himalayan region in India and its neighbouring countries such as Bhutan, China, and Nepal. These NTFPs are traded in large volumes in domestic and international markets, supplementing household incomes as well as providing livelihoods to the community members (Yadav et al., 2011; Roe et al., 2014). Caterpillar Fungus *Ophiocordyceps sinensis*, locally called Yarsa Gumba, Himalayan Gold or Keera Ghaas in India, Nepal and Bhutan is one such species, a valuable medicinal resource and a highly sought after NTFP found in alpine meadows of the Himalayas.

Due to a recent surge in demand, its price in international market has surpassed all other medicinal plant species (Shrestha et al., 2010). It is used to treat lung and kidney ailments, increase energy and vitality, stop haemorrhages, and decrease phlegm (Holliday & Cleaver, 2008). Caterpillar Fungus is also widely traded as an aphrodisiac as well as a power tonic and is popularly known as the “Himalayan Viagra.”

About Caterpillar Fungus

*Caterpillar Fungus* belongs to the family Ophiocordycipitaceae. It is a flask fungus that feeds on about 60 species of the larvae or caterpillars of the ghost moth *Thitarodes* spp. The fungus derives its nutrients from the caterpillar itself (Wang & Yao 2011). In late autumn, fungal spores are released that infect the caterpillar and by early summer of the following year, the fungal infestation kills the caterpillar. The fruiting body of the fungus can be seen protruding from the caterpillar’s head. Since it resembles a grass sprout, it is called *Yarsa Gumba* meaning “winter insect summer grass.” The approximate size of this fungus is between 5–7 cm with only 1–2 cm protruding above the ground (Yadav et al., 2017).
Distribution

Caterpillar Fungus is found predominantly in the Tibetan Plateau and adjoining Himalayan mountains, spanning a large area of the Tibet Autonomous Region, Qinghai, Gansu, Sichuan and Yunnan provinces in China, Bhutan, India, and Nepal (Winkler, 2009). The species occurs within an elevational range of 3000–5000 m above sea level in the high-altitude meadows and grasslands. In India, the species has been observed in a few areas of the Great Himalayan National Park in Himachal Pradesh, Dihang-Dibang Biosphere Reserve in Arunachal Pradesh, Nanda Devi Biosphere Reserve and Askot Wildlife Sanctuary in Uttarakhand and Khangchendzonga Biosphere Reserve as well as adjoining alpine meadows in Sikkim.

Collection and harvesting of Caterpillar Fungus

The normal harvesting season starts at the beginning of May and lasts until the end of June (approximately 30–35 days) and is dependent on many site-specific factors like the local weather, condition of snow in the pasture and elevation of the collection site. For collection of Caterpillar Fungus, harvesters recline on the ground in the high-altitude expanses, attentively scanning the terrain. It is a difficult task requiring attention and agility as only 1–2 cm of the Caterpillar Fungus protrudes above the ground. The Caterpillar Fungus once collected is cleaned carefully, often using a toothbrush, to remove soil and dirt. It is then dried in the shade, and afterwards stored in airtight containers to minimise moisture absorption.
Impact of Caterpillar Fungus on livelihood

Due to its scarcity and high publicity, both the demand and price of Caterpillar Fungus is very high leading to serious competition among harvesters and traders. Over the last decade, Himalayan villagers have become aware about the commercial potential of Caterpillar Fungus. After harvesting, the produce is sold to traders who supply it to meet the growing demands in Asia’s urban centres, as well as in western countries (Shrestha & Bawa 2014).

Collection and trade of Caterpillar Fungus provides valuable income to local collectors which contributes towards alleviating poverty, improving food security, upgrading housing facilities, providing alternative livelihood, increasing livestock numbers, enabling the buying of assets, increasing savings, and raising household education standards among the rural people (Childs & Choedup 2014; Shrestha & Bawa 2014; Caplins & Halvorson 2017). It is estimated that Caterpillar Fungus collection contributed to 64.5% annual household cash income in Jumla, Nepal (Shrestha et al. 2019); 53.3% in Dolpa, Nepal (Shrestha & Bawa 2014); 80–100% in Bhutan (Wangchuk et al. 2012); up to 98% in Nandakini valley (Kuniyal & Sundriyal 2013), up to 60–78% in Gori valley (Laha et al., 2018), and approximately 74% in Nanda Devi Biosphere Reserve (Yadav et al. 2019) in Uttarakhand, India.

Policy related to collection and trade of Caterpillar Fungus in India

In India, as there are no policy guidelines at the central level, different States have their own set of rules and policies to regulate the extraction and trade of Caterpillar Fungus.

a. Sikkim: The Forest, Environment and Wildlife Management Department (FEWMD) of Sikkim recently revised its earlier policy and brought out new guidelines on 12th April 2016 for sustainable harvesting and trade of Caterpillar Fungus in the State involving various stakeholders so as to benefit both the community as well as ensure conservation of the species. The relevant rules are as follows:

According to the new policy, members of a local household that represents the Joint Forest Management Committee (JFMC) or Eco-development Committee (EDC) under Forest Department, are eligible for collection of Caterpillar Fungus from respective administrative jurisdiction of JFMC/EDC. Government employees, children below 18 years of age and non-native persons are not allowed to harvest the species. The Forest Division office is mandated to collect prescribed processing fee from each eligible

Trade status and policies for Caterpillar Fungus in India

Indian Wildlife (Protection) Act, 1972: Not Listed

CITES: Not Listed

IUCN Redlist: Not assessed (India, Bhutan and Nepal); Critically Endangered (China); Vulnerable (Globally)

International trade of Caterpillar Fungus is managed by organised transboundary networks and involves several levels of intermediaries like collectors/harvesters, suppliers and traders, linking the remote mountain areas of Bhutan, China, India, and Nepal to the global market (Cannon et al., 2009, Shrestha and Bawa, 2013, Yeh and Lama, 2013, Wallrapp et al., 2019).
member before issuing the permission for collecting. This fee shall be subject to 20% increment once in two years. The concerned Forest Range Officer will issue a maximum of 50 permits per range per season on rotation basis to ensure that every household of the area gets equal opportunity to collect Caterpillar Fungus. Collection period for Caterpillar Fungus shall be strictly restricted to 20 days during the harvesting season including the number of days of journey to and from the collection site. The authorized collectors are to ensure that they do not collect other NTFPs or make any attempt to poach wildlife.

The collectors shall ensure eco-friendly living in the meadows during the harvesting period. A patrolling team shall visit the site at least two times for inspections during the stay of collectors in the area. On their return, every collector shall declare to the concerned Range Officer, the quantity/numbers of fungus collected. The Range Officer shall provide a Certificate of Origin (CO) to all such collectors which shall be a proof of ownership of the stock. For sale of their products, harvesters and traders shall ensure that they take part in the government auctions ONLY, for which date shall be fixed well in advance. No sale outside the government auctions are allowed to curb illegal trade and illegal collection.

During the auction, the successful bidder shall pay a fixed royalty to the FEWMD. The successful bidder shall also pay 5% of the proceeds of the auction or purchase amount to the Sikkim Biodiversity Board as royalty under Access and Benefit Sharing (ABS) provisions. The legitimate seller shall also pay 25% of the total amount earned, to the FEWMD as a royalty. The auction shall be carried out by an auction committee and should ensure facilitation of trade by legal collectors. The auction shall take place in the presence of the District Collector or his representative at the designated place.

Violation of any rule under these guidelines shall be considered as an offence and will be dealt with in accordance to existing and revised clauses of the Wildlife (Protection) Act 1972, Sikkim Forest, Water Course and Road Reserve (Preservation and Protection) Act 1988, Forest Conservation Act 1980 and Indian Biological Diversity Act 2002 as relevant.

b. Uttarakhand: In order to address the problems associated with unregulated trade, the State Government of Uttarakhand has declared Caterpillar Fungus as an NTFP on the basis of the Indian Forest Act, 1927 and has issued (latest circular dated: 8th October 2018) guidelines for the collection and trade of the species.

As per these guidelines, collection and trade of Caterpillar Fungus is not allowed from the National Parks and Wildlife Sanctuaries. Harvesting of the species is allowed only by local communities from the reserve forest and civil land or unclassified land, after getting due permission from the Range Officer. Local people must register themselves in the concerned registration office in the range following which the Forest Range Officer will issue a permission letter with photo identification to harvesters. On their return from the collection sites, collectors will declare quantity of harvested Caterpillar Fungus to the concerned registered office. The office will collect a fixed royalty and accordingly issue transit pass for trade. The transit pass will be valid for 15 days and it should be destroyed after getting checked at first check post of the forest department. After payment of the royalty, the harvester can sell Caterpillar Fungus to any traders or individuals registered with forest department. The amount of royalty will be reviewed from time to time and will be changed accordingly. To ensure sustainability of Caterpillar Fungus, specified sites for collection will be designated on rotational basis and enforced by the forest department. The state government has also directed the Uttarakhand Forest Department to establish trade centres in the state to promote fair trade practices of Caterpillar Fungus.
Policy related to collection and trade of Caterpillar Fungus in other range countries

While assessing the policy of collection in various States within India it is also prudent to consider the policies being applied in other range States.

**Bhutan:** For sustainable collection and fair trade of Caterpillar Fungus, several procedures have been enacted including a complete prohibition on collection, except in the month of June through implementation of a permit system against paying a nominal fee. The collectors are required to leave two of every five specimens encountered in the ground and restricts collection to only three members from each household (MoA&F, 2014). The collected Caterpillar Fungus can only be sold at a legally administered auction. The buyers at these auctions can only be Bhutanese nationals who can later sell their stock (Caterpillar Fungus) in the international markets.

**China:** The policy stipulates that every Caterpillar Fungus collector must apply for a permit from the local government and no collection activities are allowed in the core zones of nature reserves where poaching and habitat destruction are strictly forbidden (Li *et al.*, 2011). Violations of the provisions can result in penalties such as hefty fines and confiscation of collection permits. According to the policy, private enterprises and individual households who want to acquire Caterpillar Fungus from collectors should obtain a business licence from the Department of Industry and Commerce and a Caterpillar Fungus acquisition permit from the Department of Agriculture and Animal Husbandry (Weckerle *et al.*, 2010).

**Nepal:** Caterpillar Fungus is protected under Nepal’s Forest Act 1993 and Forest Regulations 1995. The Government allows collection, use and sale of Caterpillar Fungus after receiving a royalty from collectors as well as traders (Shrestha and Bawa, 2013). Under the present management system, there is open access to Caterpillar Fungus as a common natural resource and as such there is no control over the number of collectors and trading procedures (Pant *et al.*, 2017).

**Illegal Trade of Caterpillar Fungus**

Although there are legal mechanisms for trade provided under various rules and laws in different States of India, the current marketing mechanisms and legal channels are not preferred by Indian collectors and traders mainly due to huge differences in profit margins from legal versus illegal trade. (Yadav *et al.*, 2019 and Wallrapp *et al.*, 2019).

From India, Caterpillar Fungus flows illegally to international markets through various towns and cities in Nepal. Insufficient regulatory mechanisms for collection and trade of Caterpillar Fungus in Nepal and a better price paid to the collectors and traders in the illegal international market are the main reasons for the trade flowing from India through Nepal to other demand countries. Therefore, reports have continuously indicated smuggling of the species across borders for higher profits (Negi *et al.*, 2016; Yadav *et al.*, 2016; Caplins *et al.*, 2018).

The Caterpillar Fungus seizures in India between 2008 to 2018 as reported by the media were just 52 amounting to a total of 136,553 kg of the fungus seized. These seizures are a fraction of the estimated 400 to 500 kg of illegal trade flow of the species from Dharchula (Uttarakhand) to Nepal every year (Negi *et al.*, 2016). However, the seizure records do provide a glimpse into the prevailing trade and include a single seizure of 90 kg in 2009.

Based on seizure reports between 2008 and 2018, the trade starts from the collectors in villages in India before reaching border towns that also act as local trade hubs. Owing to the porous Indo-Nepal borders, Caterpillar Fungus easily enters Nepal through innumerable informal trade channels and eventually moves to international markets, primarily in China, where the demand for Caterpillar Fungus for use in traditional medicines is high.
The dynamics of the illegal trade from India are still not clear and there is a need for a detailed investigation to understand the trade linkages and drivers. There is also a need to harmonise polices within the country and to strengthen enforcement action amongst range countries—India, Nepal, and Bhutan—to stem the illicit flow of this species. Instances of poaching and illegal trade of other wildlife species have also been reported under the guise of Caterpillar Fungus collection from these pristine areas. Hence there is an urgent need to step up mechanisms to monitor collection and trade in Caterpillar Fungus.

**Ecological Threats**

Every year thousands of villagers go en masse to the alpine slopes of the Himalayas along with their tents, fuel, food, other consumables as well as their domestic animals to collect Caterpillar Fungus. This leads to over-grazing, and the chopping of trees for firewood with a negative impact on the entire ecosystem. Degradable and non-degradable garbage disposal as well as open defecation in the vicinity of collectors’ base camps create major environmental issues in affected areas. There is a lack of management practices to mitigate or reduce such anthropogenic pressures during the harvesting period that can destroy the ecosystem, affecting many other threatened Himalayan wildlife species such as the Snow Leopard *Panthera uncia*, Blue Sheep *Pseudois nayaur*, ground-dwelling birds (*Satyr Tragopan Tragopan satyra*, Snow Partridge *Lerwa lerwa* etc.) and rare and endangered alpine flora.

The habitat of Caterpillar Fungus is also a vital source of water for people living at lower altitudes as many rivers originate from these areas. The anthropogenic pollution and habitat destruction have a negative impact on the quality and availability of water in these rivers systems. Unsustainable collection of the fungus can also impact the local population and distribution of the fungus adversely. Recent studies (Kuniyal & Sundriyal 2013, Shrestha & Bawa 2013, Yadav et al., 2019, and Shrestha et al., 2019), have reported that increasing trade-induced over-harvesting and anthropogenic pressures are almost certainly responsible for the sharply declining populations of Caterpillar Fungus and is anticipated to lead to local extinction of the species from many landscapes.
Since its commercial discovery, Caterpillar Fungus trade has remained localized within its distributional area in India (Sikkim and Uttarakhand), and is generally influenced by local and cross-border traders (mostly Nepalese nationals). However, due to legal ambiguities, Caterpillar Fungus’ collection and trade is marred with risks; many a times conflicts with local administration lead to detentions of collectors and traders.

**Challenges**

Since its commercial discovery, trade of Caterpillar Fungus in India is controlled by local and cross-border traders (mostly Nepalese nationals). However, due to legal ambiguities, Caterpillar Fungus collection and trade is associated with risks including frequent conflicts with local administrations leading to the detention of collectors and traders.

Although areas have been identified for collection by Van Panchayats or Joint Forest Management, collectors sometimes also enter Protected Areas illegally to harvest.

Smugglers who are involved in trafficking of illegal wildlife products are sometimes engaged in simultaneous smuggling of Caterpillar Fungus using the same *modus operandi* and trade routes. For instance, in July 2018, two people were arrested carrying bear bile, a musk deer pod as well as Caterpillar Fungus in the same consignment in Uttarakhand (Amarujala, 2018).

Considering the challenges affecting the collection and trade of this species, the following recommendations are made to ensure an ecologically sustainable harvest of the species supporting communities in the long-term.

1. Framing of a policy to promote sustainable harvesting, equitable trade and conservation of Caterpillar Fungus requires in-depth knowledge and understanding of its trade dynamics and legal status in range States (Sikkim and Uttarakhand) in India. Therefore, there is a need to conduct further studies to map trade hotspots and routes, analysing linkages to national as well as international markets and reviewing the existing State policies for collection and trade of the species.

2. There is an immediate need to understand the impact of climate change and wild collection of Caterpillar Fungus on its habitat and population. A long-term management plan is needed for each area, which should determine the expected sustainable harvest and focus on minimising ecological damage due to collection activities.

3. The current marketing mechanism in India encourages collectors to use informal means to sell their Caterpillar Fungus. To promote formal and equitable trade of the species, existing marketing mechanisms should regularly be monitored in India and other range countries i.e. Bhutan, China, and Nepal. Establishing regional marketing standards may help define a trans-boundary trade mechanism for Caterpillar Fungus.

4. There is also a need to formulate and implement national level policies to integrate conservation, livelihood and governance for sustainable harvesting and equitable trade of Caterpillar Fungus in the region.

5. A major gap in enforcement of any rules, regulations or policies regarding sustainable collection and trade of Caterpillar Fungus has been a lack of awareness: there is need to raise understanding and knowledge among collectors, traders and enforcement agencies. There is also a need to develop the capacity of the collectors to encourage sustainable harvesting of Caterpillar Fungus, garbage management in alpine meadows and conservation of local biodiversity.

6. An assessment of the international trade in Caterpillar Fungus could provide the basis for listing the species under the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) to help ensure its long-term management. Since illegal trade exists throughout its distribution countries—Bhutan, China, India, and Nepal—there is a need to bring stakeholders onto
a common platform through international networks and conventions such as the South Asia Wildlife Enforcement Network (SAWEN).

7. Implementation of market-based conservation tools such as FairWild certification could be helpful for ensuring sustainability of the trade as well as for protecting this enigmatic species. Successful implementation of FairWild could also play a key role in increasing investment for education, improving food security and alleviating poverty of the rural mountain dwellers in the Himalaya.

Caterpillar Fungus is a valuable resource for local communities in its region. However, unless the harvesting and trade is managed sustainably the future of this species in the wild appears threatened. The amount of money associated with its trade has already led to social discord in the peaceful Himalayan region. TRAFFIC calls for all stakeholders to recognise this threat from overharvesting and illegal trade and develop and implement policies and initiatives that can be helpful for long term sustenance of the species in the wild, measures that would help fulfil India’s commitments under the Nagoya Protocol on strengthening Access and Benefit Sharing (ABS) of natural resources. These initiatives would also play a key role to bring conservation-compatible investment to deliver resilient economic, social and ecological benefits to meet the Sustainable Developmental Goals (SDGs) 2030 in the Himalayas.

Acknowledgements

The authors are thankful to the State Forest Departments of Sikkim and Uttarakhand for providing policy documents on Caterpillar Fungus harvest and trade. This policy review and analysis was undertaken as part of the GEF funded SECURE Himalaya project.

References


1. Wildlife cybercrime is a mounting concern globally: TRAFFIC helps forest departments to gear up for the challenge

2. High flying: Securing livelihoods and biodiversity in India's Himalayas

3. Valmiki Tiger Reserve to intensify efforts to curb cross-border wildlife crime

4. Pangolin billboards at Indian zoos highlight the story of the world's most trafficked wild mammal

5. Indian Customs Department extends support to sensitise travellers about illegal wildlife trade at the Delhi International Airport

6. Role of communities in conservation: Experts meet to strategise and develop new policies
Wildlife cybercrime is a mounting concern globally: TRAFFIC helps forest departments to gear up for the challenge

Illegal wildlife trade is one of the most prominent threats to wildlife conservation. Traditionally, physical markets have played a crucial role in bringing poachers, traders and buyers to one place to trade products illegally including derivatives of tigers, leopards, bears, elephants, rhinos, birds, turtles and tortoises, pangolin scales and other protected wildlife in India. However, with growing internet penetration reaching nearly 500 million citizens in India, the trading of illegal wildlife products is fast moving to cyberspace, which provides a level of anonymity to traders. In this changed scenario, tracking illegal wildlife trade in cyberspace and taking enforcement action against criminals, is emerging as a tough challenge for enforcement agencies especially considering their limited capacities to handle this new age crime.

In December 2018, TRAFFIC, in collaboration with WWF-India, the National Tiger Conservation Authority (NTCA) and the Police Radio Training School (PRTS), Indore started its pioneering project called “Cyber CLAW”—a specialised training programme for enforcement officials, especially those from forest departments to monitor, investigate and curb wildlife-related cybercrime. Under this programme, TRAFFIC organised trainings at the beginning of 2019 to enhance the knowledge and skills for combating wildlife crime in virtual space for the officials of Karnataka and Kaziranga Forest Departments.

Dr Saket Badola, Head of TRAFFIC’s India Office said: “Traffickers and criminal networks are exploiting e-commerce websites and social media platforms to trade in illicit wildlife products. It is vital to have a tech-savvy response to this new form of organised wildlife crime. This programme is the first of its kind in India for combatting wildlife crime in cyberspace and we hope that it serves its purpose.”

Mr Varun Kapoor, IPS and Additional Director General, Madhya Pradesh added: “The phenomenon of monitoring wildlife cybercrime has been fairly naive in India with agencies employing traditional monitoring protocols. The demand for wildlife commodities on such growing platforms has led to a further surge in poaching and illegal wildlife trade. Therefore, it becomes imperative to understand and devise effective methods to monitor virtual markets to combat illegal wildlife trade in India”.

The training was imparted by experts in the field of monitoring cybercrime through sessions on intelligence, investigation, and search and seizure techniques; communication device investigation; cybercrime scene management; digital intelligence collection; wildlife forensics; telecom surveillance and Call Detail Record (CDR) analysis and IPDR—(CDR of IP address) analysis. After completion of these training programmes at various strategic locations across the country, about five candidates from each location will be selected based on their competency in cyber monitoring for the next phase of the programme which will include five-days of comprehensive hands-on training. During this course, participants will receive in-depth training on various modern tools and techniques available including website and email investigation, OSINT (Open Source Intelligence Collection), financial trail analysis and darknet investigation, making them the leading experts for their state specialising in monitoring and curbing wildlife-related cybercrime.

1. Karnataka Forest Department: In April 2019, 38 officials from Karnataka Forest Department attended a two-day training programme on monitoring and curbing illegal wildlife trade on virtual platforms at Kali Tiger Reserve, Karnataka.
Trainers included Dr Saket Badola, Head of TRAFFIC’s India office; Mr Varun Kapoor, Additional Director General, Madhya Pradesh Police; Mr Malay Mahant, Incharge Training, PRTS Indore; Mr Afzal Khan, Incharge Technical Cell, PRTS Indore; and Pramod K. Yadav, Senior Project Officer with TRAFFIC.

Mr B. V. Patil, Director of Kali Tiger Reserve is confident that such training events will help the officials of Kali Tiger Reserve to improve their response to emerging challenges, such as the use of cyberspace for illegal wildlife trade.

2. Assam Forest Department: With over 2,000 Greater One-horned Rhinoceroses *Rhinoceros unicornis* and over 100 Royal Bengal Tigers *Panthera tigris* among several other endangered wild species in Kaziranga Tiger Reserve as well as in other wildlife areas of the state, Assam is undoubtedly a biodiversity hotspot not just in the country but also at the global level. However, due to these extremely rich bio-resources, the state also remains a prime target for wildlife poachers, smugglers and traders who have now extended their nefarious activities into cyberspace.

In light of this, on 2nd February 2019, the cybercrime monitoring workshop was organised at Kohora range in Kaziranga Tiger Reserve. During the training event, 30 forest officials from five wildlife divisions i.e. Eastern Assam Wildlife Division, Nagaon Wildlife Division, Bishwanath Wildlife Division, Mangaldoi Wildlife Division, and Sonitpur Wildlife Division participated to learn new skills for cybermonitoring, and investigation tools and techniques.

Mr D. P. Bankhwal, IFS (retd.), former Principal Chief Conservator of Forests/Chief Wildlife Warden said: “We must regularly conduct such trainings for forest officials and over a period of time select and train a few individuals who can become specialists in this field thus building an important capacity in every department. This skill will certainly be a game changer in the field of wildlife conservation and protection.”

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**High flying: Securing livelihoods and biodiversity in India's Himalayas**

Uttarakhand is a remote region, with rich biodiversity and long international borders with Tibet Autonomous Region (TAR) and Nepal. The Pithoragarh district within Uttarakhand lies at the juncture of India, Nepal and TAR and there have been numerous cases of poaching and smuggling of wildlife contraband in the area including that of bear bile, musk pods and leopard skins through the porous borders. Yarsa Gumba *Ophiocordyceps sinensis*, commonly known as Caterpillar Fungus, is also illegally traded through transboundary regions, together with various other threatened plant species.
In April 2019, a GEF funded SECURE Himalaya project, a new initiative to document and combat illegal wildlife trade in the Himalayas region, was launched through a stakeholders’ consultative meeting organised by TRAFFIC in collaboration with Uttarakhand Forest Department.

The project is led by the Government of India through the Ministry of Environment, Forest and Climate Change, in partnership with the United Nations Development Programme (UNDP-India) and State Forest Departments, with financial support from the Global Environment Facility (GEF). TRAFFIC is a partnering agency in SECURE Himalaya.

The project aims to ensure conservation of biodiversity, land and forest resources, while enhancing the lives and livelihoods of local communities in the high-altitude Himalayan region (Jammu & Kashmir, Himachal Pradesh, Sikkim and Uttarakhand).

This meeting set out to engage local communities, identify relevant stakeholders, assess levels of wildlife trade, and enhance collaboration among various enforcement agencies working in the Himalayan region of Uttarakhand. Those attending included members of local communities (village heads/Pradhans) and 31 senior officials from the State Forest Department, Indo-Tibetan Border Police (ITBP), Sashastra Seema Bal (SSB) and local Police Departments.

Dr Vinay Bhargav, Divisional Forest Officer, Pithoragarh Forest Division chaired the meeting and spoke about the purpose of the SECURE Himalaya project and the essential involvement of various stakeholders to address the threat to biodiversity in this fragile ecosystem, posed by illegal and/or unsustainable wildlife trade.

Mr Kishan Baunal, Head of Baun Village spoke about the economic importance of medicinal plant trade and suggested simplifying the rules and regulations for collection and trade of plants such as Sea Buckthorn Elaeagnus rhamnoides, whose pulp, seeds and oils are traded across the country. He said that such a move would encourage local communities to engage on sustainability issues.

The meeting outlined plans to engage local communities, providing support for legal and sustainable medicinal plant trade and exploring alternative livelihood options. Capacity building for various enforcement agencies would help them deal with wildlife crime and illegal wildlife trade and other authorities could be brought in, including the revenue department and the military.

Valmiki Tiger Reserve to intensify efforts to curb cross-border wildlife crime

Enforcement agencies came together to enhance their knowledge and skills, and coordinate efforts to curb poaching and illegal wildlife trade across the borders at a capacity building workshop on wildlife law enforcement organised by TRAFFIC and WWF-India on 25-26th March 2019 at the Valmiki Tiger Reserve, Bihar. In this two-day workshop, 28 officials representing the departments of forest, police, railway protection force, revenue and paramilitary forces including the Sashastra
Suraksha Bal (SSB) participated. The interactive sessions during the workshop included those on the latest trends in wildlife trade, and trends in changing demands and supplies. Knowledge and skills were imparted on identification of common specimens in illegal wildlife trade; thematic trade issues focusing on freshwater turtles, tortoises and birds; laws governing domestic and international trade in wildlife and other related topics. The participants were also given a simulated hands-on training on wildlife crime scene investigation.

TRAFFIC has always stressed the need to enhance the capacity of enforcement agencies in vulnerable Tiger Reserves and Protected Areas, which have special sensitivities due to their proximity to international borders and to traditional illegal trade routes. Valmiki Tiger Reserve in Bihar fits this profile as it is located along the India-Nepal border in a richly biodiverse region, sharing its boundaries with Sohagigarwa Wildlife Sanctuary of Uttar Pradesh and Chitwan National Park and Parsa National Park of Nepal. The Tiger Reserve has lost several Tigers in recent years to poaching syndicates operating across the borders of India and Nepal. With improvements in protection, Valmiki Tiger Reserve has seen a growth in its tiger population and to maintain this there is a perceived need to strengthen protection measures further and co-ordinate with other enforcement agencies in the region.

Valmiki Tiger Reserve also uses four deep search metal detectors provided by TRAFFIC for locating traps and snares set up by the poachers to ensnare wild animals.

Dr Saket Badola, Head of TRAFFIC’s India Office, emphasised the need to enhance protection mechanisms in the reserve, which is a favoured habitat for tigers and rhinos. Given its location close to the porous Indo-Nepal border region, protection of wildlife cannot be ensured without the active support of paramilitary and railway protection forces. Hence robust co-ordination between various enforcement agencies needs to be in place”.

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Pangolin billboards at Indian zoos

highlight the story of the world's most trafficked wild mammal

On 15 February 2019, the eve of #WorldPangolinDay 2019, which is celebrated on the third Saturday of February every year, TRAFFIC in collaboration with WWF-India, the Wildlife Crime Control Bureau (WCCB) and the National Zoological Park (NZP), New Delhi, installed information billboards at the NZP, New Delhi. Similar billboards were also put up at the zoos in Patna and Mysore to highlight the plight of pangolins in illegal wildlife trade.

The message #ChooseYourSide urged the public to help decide the future of pangolins in India by choosing Pangolin in Wild or Pangolins in Illegal wildlife trade.

Last year, a TRAFFIC study found nearly 6,000 pangolins in illegal wildlife trade in India during the period 2009–2017, equating to nearly 650 pangolins every year.
since 2009. However, this was a conservative estimate as only a fraction of illegal wildlife trade was presumably detected, and actual numbers were likely to be higher. Based on the intensity of seizures that took place, Manipur and Tamil Nadu emerged as the hotspots for pangolin smuggling.

Globally, pangolins are considered the most trafficked wild mammal and their meat is consumed as a delicacy and as a “tonic food” because of its unproven yet alleged medicinal properties. Pangolin scales are traded in huge quantities for use in traditional Asian medicines. Most of the poaching and smuggling across pangolins’ range countries are targeting international markets in Viet Nam, China and southeast Asian countries/territories.

India is home to two species of pangolins—Indian Pangolin *Manis crassicaudata* and Chinese Pangolin *Manis pentadactyla*. Hunting and trade in both pangolin species are banned under India’s Wildlife (Protection) Act, 1972 while international trade is prohibited under CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora). Despite this protection, the trade continues unabated threatening the future of these species in the wild.

Dr Saket Badola, Head of TRAFFIC’s India Office said: “Improving our understanding of this elusive animal is important for curbing its illegal trade. Poaching and smuggling of pangolins and their body parts is driven by consumer demand and if the buying can stop, the supply of pangolins into illegal wildlife trade will eventually cease. Therefore, through this informative hoarding on pangolins we ask people to choose the side of keeping Pangolins in the Wild.”

Ms Renu Singh, Director of NZP, New Delhi said: “The Zoo is an important place for students, youth and others to see wild animals and learn about them, and lakhs of visitors come to NZP, New Delhi every year. Therefore, the Zoo becomes an important forum for increasing knowledge and understanding about wild animals and threats to them.”

World Pangolin Day is celebrated on the third Saturday in February every year, with the eighth such event having taken place on 16th February 2019. World Pangolin Day is an important opportunity to raise awareness about these unique mammals.

Indian Customs Department extends support to sensitize travellers about illegal wildlife trade at the Delhi International Airport

The Indian Customs Department; TRAFFIC and WWF-India are reaching out to travellers passing through Indira Gandhi International Airport, Delhi—one of the world’s busiest airports—on issues related to poaching and illegal wildlife trade. Four life-sized, brightly lit standee displays of Snow Leopard *Panthera uncia*, Greater One-Horned Rhino *Rhinoceros unicornis*; pangolins; Asian Elephant *Elephas maximus*; have been set up in the Arrivals hall at the Customs checkpoint in Terminal 3. Additionally, a special information board listing wildlife species whose possession or trade is prohibited in India has also been set up to assist Customs Officers during baggage screening.
Unsustainable consumer demand is a leading threat facing many wildlife species and traffickers often rely on existing transport links to smuggle illegal wildlife products across the world. Misuse of the aviation system by smugglers to evade Customs and other enforcement agencies is a major concern. Meanwhile, sometimes both international and domestic airline passengers are also unaware about the illegality of buying certain wildlife products in a country of their travel and the grave conservation impact of their actions on various species in the wild.

In India, the Customs Department is tasked with preventing trade of contraband, including illegal wildlife products, across the borders at entry/exit points and therefore has a crucial role in curbing wildlife crime.

Dr Amandeep Singh, Additional Commissioner, Office of the Commissioner of Customs, IGI Airport, Terminal-3, Delhi said: “Illegal wildlife trade has grown to become a very serious crime globally. Here at Customs, we recognise this threat to our country’s biodiversity and have therefore undertaken this awareness initiative to help enlighten travellers as well as Customs officials about the species impacted by illegal wildlife trade. Customs is fully behind the efforts to control wildlife crime in the country.”

Mr Manish Kumar, IRS, Commissioner of Customs, IGI Airport added: “Stamping out wildlife crime and smuggling is a high priority objective for Indian Customs. At the IGI Airport, we are constantly alert for any attempts to smuggle wildlife contraband. We appreciate the efforts undertaken by TRAFFIC and WWF-India for engaging in initiatives that will help to curtail smuggling of wildlife products and derivatives.”

Dr Saket Badola, Head of TRAFFIC’s India Office said, “This is the first time TRAFFIC has partnered with Customs at Delhi’s IGI Airport and we hope this partnership can be extended to other airports in the country.”

Mr Ravi Singh, Secretary General and CEO of WWF-India added: “Lack of awareness is one of the biggest hurdles in efforts to curtail wildlife trafficking in the air transport sector. These displays will help raise awareness and sensitize both travellers and airport staff about wildlife trafficking through the air transport sector.”

TRAFFIC encourages travellers to look out for the displays at the Arrivals hall, Terminal 3, IGI airport, Delhi; take a picture and share it widely to raise awareness about illegal wildlife trade in India.
Role of communities in conservation: Experts meet to strategise and develop new policies

India’s forests are home to charismatic megafauna, endemic flora and also several indigenous groups. Consequently, there is dependence of these communities on natural resources for sustenance and trade. Therefore, the current scenario provides scope for development and implementation of sound policies for harvesting, trade and conservation of wild resources in the country.

In India, sustainable use largely means harvesting of, and trade in, non-timber forest products including honey and medicinal plants. In many of the harvester communities, the traditional knowledge linked to the resource exists, but questions remain about the transfer of this knowledge to the next generations and whether the younger generations are interested in using it at all.

There are many challenges for highly marginalized communities who are the usual harvesters of wild produce. The tenure security is uncertain, harvest protocols have been developed but not fully adopted, accountability on the part of the herbal industry is poor and overall there seem to be a general lack of proven examples that make a case for sustainable harvest as a conservation goal.

To address the above, in February, a workshop was organised in the Nilgiri Biosphere Reserve region in South India, hosted by the Keystone Foundation in collaboration with the IUCN Sustainable Use and Livelihoods Specialist Group (SULi) which is a joint initiative of the Species Survival Commission (SSC) and the Commission on Environmental, Economic and Social Policy (CEESP). This workshop brought together experts who work on issues of human use of natural resources, conservation of biodiversity rich habitats, endangered species, policy, and governance to discuss future strategies for sustainable use of biodiversity in India.

The workshop was supported by Conservation International and Global Alliance for Green and Gender Action (GAGGA). Organizations and institutions that were represented at the workshop were Indian Institute of Forest Management (IIFM), Dakshin Foundation, Ashoka Trust for Research in Ecology and the Environment (ATREE), TRAFFIC, WWF, Foundation for Revitalization of Local Health Traditions (FRLHT/TDU), Nature Conservation Foundation (NCF), and the Keystone Foundation.

During the workshop, Ms Anastasiya Timoshyna, TRAFFIC’s Programme Leader – Medicinal Plants gave an
insight into the trade in wild plants globally while Mr Pramod K. Yadav, Senior Officer with TRAFFIC’s India spoke about marketing and trade of the Himalayan medicinal and aromatic plants.

The group came up with strategies that needed to be worked at if sustainable use and livelihoods were to become more mainstreamed in the discussions on conservation and development. These included empowering communities to manage resources by integrating traditional knowledge with official management practices; getting young people equipped with skills to manage resources and carry forward their traditional uses; monitoring resources in the long term and understanding the ecological links to resource sharing with wildlife; consumer awareness and education about sustainable use and ecological links of wild resources and science of sustainability needs to be communicated in simple/common language that speaks to many stakeholders.

In a country where 8.6% of the population (104 million) is indigenous tribal people, dependant on wild resources for livelihoods, where the Ayurveda industry is estimated to be worth USD4.4 billion and wild resources are extracted from land (more than 20% of land area is under forests) and water (with an 8000km coastline and 4 million marine fishers) – sustainable use is crucial for the future.

Finally, sustainable use as a concept must cut across other disciplines to be able to communicate its objectives and to go well beyond market demands and conservation. Sustainable use is a dynamic concept that is calibrating to the changes in the environment - a moving goalpost and therefore it needs a robust governance system that can detect changes and feedback for adaptive management.

The workshop group is ready to start a sustainable use and livelihoods chapter for the Indian subcontinent to pool knowledge and experience to bring science to policy and advocate for sustainable use and livelihoods as a conservation goal.
1. Making CITES work for wild medicinal and aromatic plants: the role of voluntary certification explored

2. Wild plant experts and stakeholders meet at FairWild Forum 2019 in Budapest
Making CITES work for wild medicinal and aromatic plants: the role of voluntary certification explored

A stakeholder workshop held in January 2019 at the David Attenborough Building in Cambridge examined the potential role of voluntary third-party sustainability certification schemes in supporting implementation of wild plant trade controls under the CITES.

The meeting brought together government officials responsible for CITES implementation in nine countries with representatives from: businesses involved in wild plant trade, sustainability standards organisations, the CITES Secretariat, the International Union for Conservation of Nature (IUCN), and the United Nations Conference on Trade and Development (UNCTAD) BioTrade Initiative.

CITES is the main intergovernmental agreement providing for co-ordinated regulation of international trade in wild animals and plant species listed in its appendices. Over 800 medicinal and aromatic plants are listed in CITES Appendix II, which means regulated trade is permitted, subject to proof of legality and sustainable sourcing. Key exporters in recent years have been Mexico, Cameroon, and South Africa, who between them accounted for 75% of all wild-sourced exports of CITES Appendix II listed plants and their products by weight, while five countries were responsible for 77% of imports: France (26%), USA (16%), Japan (15%), Germany (11%) and Spain (7%).

The top five traded wild-sourced plant species by reported volume in the period 2006–2015 were: Candelilla *Euphorbia antisyphilitica*, African Cherry *Prunus africana*, Cape Aloe *Aloe ferox*, Agarwood *Aquilaria malaccensis*, and Jatamansi *Nardostachys grandiflora*.

Although implementation of CITES provisions should ensure the sustainability and legality of harvests, there are concerns about the capacity and resources available to CITES-implementing authorities, in particular in some source countries. This may undermine the impact of CITES implementation and has sometimes led to precautionary trade restrictions being applied by importing countries.

Furthermore, businesses trading wild plant resources sometimes perceive CITES permitting as complicated and slow or acting as a barrier to trade. Some companies prefer to avoid trade in CITES-listed species entirely. This is unfortunate: contrary to species not listed under CITES, an export permit for wild-collected CITES Appendix II-listed plants, if properly obtained, should act as a guarantee of sustainable sourcing.

To examine whether market tools such as third-party certification can further support CITES implementation, the stakeholder workshop was organised under a project implemented by TRAFFIC and supported by the German Federal Agency for Nature Conservation (BfN) that aims to identify how voluntary certification can assist with implementation of CITES provisions for Appendix II-listed plant species.

“Although recognising that third-party voluntary certification schemes do not provide a ‘silver bullet’ to solving the issues governments and businesses currently face in implementing CITES trade controls, they can clearly provide useful support. The detailed, audited, assessment of sustainability factors carried out through the certification process has enormous potential to help fill knowledge gaps faced by government regulators. Combined CITES trade controls and certified traceability can provide buying companies with the reassurance they should be seeking to ensure their supplies are from sustainable sources,” said Anastasiya Timoshyna, TRAFFIC’s Senior Programme Co-ordinator – Sustainable Trade and the project manager.

Wild plant experts and stakeholders meet at FairWild Forum 2019 in Budapest

In April 2019, 20 people from 14 different countries including India, South Africa, Canada, Ukraine, France, USA and Nepal gathered in Budapest, Hungary for the first “FairWild Forum”. The training, networking, and professional development event was focused on the implementation and verification of sustainable wild plant collection according to principles of the FairWild Standard.

Launched with the support of grant funding from the Bio Foundation, Switzerland, the event was open to a mixed audience of professionals with a technical background in sustainable wild collection. The workshop provided a platform for experience exchange from different perspectives including government, herbal products industry, certification bodies, NGOs, researchers, and conservation/development consultants.

The event included an introduction to the FairWild auditing framework and other topics including sustainability issues related to wild collection; access and benefit-sharing; the FairWild Premium fund and social context; risk analysis and classification of the target species; and market linkages and needs for FairWild-certified products. Participants joined break-out groups for in-depth discussion.

To link workshop discussions with experience on the ground, the FairWild Forum also included a field visit to FairWild-certified operator Schmidt und Co. Kft located in Baksa in the south of Hungary. The operator sources FairWild-certified ingredients such as nettle, elderflower, and lime flower as part of a fair-trade relationship with their buyer Martin Bauer GmbH & Co. KG, Germany. The visit provided an opportunity to observe harvesting of Wild Garlic Allium ursinum and meet some of the collectors involved.

The FairWild Forum was organised in the framework of the FairWild Auditor Competence Program (building capacity and knowledge of FairWild auditors) and was held in conjunction with a meeting for accredited FairWild control bodies, attended by ECOCERT IMOSwissAG and CERES GmbH. Technical issues discussed during the FairWild Forum also fed into a review workshop held on Saturday 27th April, where FairWild Standard implementation experience and stakeholder feedback was assessed in line with FairWild Foundation’s policy on revision of the FairWild Standard.

1. CITES postpones CoP18

2. India proposes change in status of various wildlife species in CITES at CoP18
CITES postpones CoP18

On account of the terrorist attacks in Colombo, Sri Lanka, on 26th April 2019, the CITES Secretariat postponed its 18th meeting of the Conference of the Parties (CoP18), originally scheduled to take place from 23rd May to 3rd June, as well as the associated 71st and 72nd meetings of the Standing Committee. These meetings will now take place during the period 16th to 28th August in Geneva, Switzerland.

India proposes change in status of various wildlife species in CITES at CoP18

In advance of the 18th Conference of Parties (CoP18), CITES asked Parties to send in their proposals for changes to the listing of wildlife under the Convention’s various appendices. A record 107 working documents and 57 species listing proposals were received reflecting the massive interest across the globe in the conservation and sustainable use of wild fauna and flora. With a 20% increase in the number of agenda items, CoP18 is set to be the largest meeting of the Conference of the Parties in the history of CITES.

CITES CoP meetings occur roughly every three years and changes to trade rules, through amendments to the Convention’s appendices, can have profound conservation implications for affected species. The listing of a species in Appendix I effectively prevents all commercial international trade, while those listed in Appendix II can be traded under special permit conditions.

India has submitted proposals regarding changes in the listing for Smooth-coated Otter Lutrogale perspicillata; Small-clawed Otter Aonyx cinereus; Indian Star Tortoise Geochelone elegans; Tokay Gecko Gecko Gecko; wedgefishes Rhinidae and Indian Rosewood Dalbergia sissoo.

1. Smooth-coated Otter:
Proponent: Bangladesh, India and Nepal
India is among the Parties proposing a move of the Smooth-coated Otter from CITES Appendix II to Appendix I. The species is reported to be facing high risk from international trade; human-wildlife conflict and habitat loss and degradation.

It has a broad distribution, from Java, Sumatra and Borneo, northward to south-western China, east through Nepal, Bhutan and India to Pakistan, with an outlying, and taxonomically distinct population in Iraq. In the Indian subcontinent, the species is adapted to living in the semi-arid region of north-western India and the Deccan Plateau (Prater 1971). In the Punjab plains of India, it occurs along some stretches of the Beas, Sutlej, and Ravi Rivers and the HARIKE wetlands (Khan 2015).

The population of L. perspicillata is inferred to have declined by more than 30% in the last 30 years (Pacifici et al., 2013), due in large part to exploitation for the global trade in otters skins and the pet trade and significant reductions in its range and quality of habitat; L. perspicillata is listed as Vulnerable by IUCN.

Historically, otters have been in high demand for their pelts and illegal pelt trade persists in several range states.
2. Small clawed Otter:
Proponents: India, Nepal and the Philippines
India is among the Parties proposing that the listing of the Small Clawed Otter be changed from CITES Appendix II to Appendix I. The species is reported to be facing high risk from international trade, habitat loss and degradation.

The Small-clawed Otter is the smallest of the otter species. It has a broad distribution, extending from India in South Asia eastwards through Southeast Asia, including Lao PDR, Malaysia, Myanmar, Cambodia, Bangladesh and Indonesia to Palawan, Philippines, and southern China (Mason & Macdonald 1986; Wozencraft 1993; Hussain 2000; Hussain et al., 2011). In India it occurs in West Bengal, Assam, Himachal Pradesh, and Arunachal Pradesh as well as in the southern Indian hill ranges of Coorg (Karnataka), Ashambu, Nilgiri and Palini Hills (Tamil Nadu) and Kerala (Pocock 1941; Prater 1971; Hussain 2000; Hussain et al., 2011) and in Odisha in eastern India (Mohapatra et al., 2014).

The population of Small-clawed Otter is declining rapidly due to wetland habitat loss, and poaching for local and international pet trade markets. According to IUCN, it can be inferred that the global population of A. cinereus has declined by greater than 30% over the past 30 years (three generations based on Pacifci et al., 2013).

3. Indian Star Tortoise:
Proponents: Bangladesh, India, Senegal, and Sri Lanka
India is among the Parties proposing uplisting of the Indian Star Tortoise from CITES Appendix II to Appendix I. The species faces two main threats; habitat loss, primarily in the form of conversion of preferred habitat to agriculture, and illegal harvesting for the pet trade, particularly the collection of juvenile specimens. Other threats include accidental mortalities from road kills, agricultural equipment and discarded fishing nets, and deliberate killing to protect crops.

The Indian Star Tortoise is found in northwestern and south-eastern India, eastern Pakistan, and northern and eastern Sri Lanka. In India it occurs in two main disjunct areas in the north western States of Gujarat and Rajasthan, and in the southern States of Andhra Pradesh, Karnataka, Kerala, Madhya Pradesh, Orissa, and Tamil Nadu.

It is categorised by IUCN as Vulnerable based on past and future declines. A decline of greater than 30% (over a three-generation period) was predicted to occur by 2025 (from a start point of 1995), if exploitation continued or expanded.

4. Tokay Gecko:
Proponents: European Union, India, Philippines and United States of America
It has been proposed to include Tokay Gecko Gekko gecko in CITES Appendix II, owing to a perceived growing risk from illegal international trade for use in Asian medicine (Gu et al., 2011) and its sale throughout Southeast Asia in dried form or preserved in alcohol. To a lesser extent, it is also kept as a pet (Caillabet, 2013).

Tokay Gecko is widely distributed in Southeast Asia in Bangladesh, Cambodia, China, India, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, Philippines, Singapore, Thailand, and Viet Nam (Das, 2010).

In India, G. gecko was listed under Schedule IV of the Wildlife (Protection) Act 1972 in 2014 (Government of India, 1972). This has prohibited collection of the species from the wild; however, illegal collecting is considered to have continued (Rahman, 2014).

Consumption of G. gecko for medicinal purposes does occur domestically in Southeast Asian countries, but international trade is assumed to be on a much larger scale and consumption is centred around China and Viet Nam.

5. Wedgefish:
Proponents: Bangladesh, Benin, Bhutan, Brazil, Burkina Faso, Cabo Verde, Chad, Côte d’Ivoire, Egypt, Ethiopia, European Union, Fiji, Gabon, Gambia, India, Jordan, Kenya, Lebanon, Maldives, Mali, Mexico, Monaco, Nepal,
India along with other range countries has proposed inclusion of all species of wedgefish in the family Rhinidae in Appendix II. Wedgefishes are shark-like batoid species comprising up to 10 species, in three genera (Rynchobatus, Rhynchobatina and Rhihna). They inhabit shallow, inshore continental waters of the east Atlantic, Indian and western Pacific Oceans.

Whilst the global population sizes are unknown for all Rhinidae species, populations are reportedly declining based on inferences from fisheries landings, fishing effort, or declines of similar species. Eight species of Rhinidae have recently been assessed by IUCN as Critically Endangered (declines of greater than 80% over the last three generations), with one additional species assessed as Critically Endangered (Possibly Extinct) and one as Near Threatened (with declines of 20–30% over the last three generations).

The primary threat to these species is the unsustainable and unregulated fishing throughout the range. Their retention in catches appears to be driven by the value of their fins on the international market, with fishing pressure being intense across much of their range. Their dependence on inshore habitats makes them susceptible to habitat damage and loss due to anthropogenic impacts.

6. Indian Rosewood:

PropONENTS: Bangladesh, Bhutan, India, and Nepal

This is a Proposal to remove the North Indian Rosewood Dalbergia sissoo from CITES Appendix II. It is a fast-growing perennial tree, native to Afghanistan, Bangladesh, Bhutan, India, Islamic Republic of Iran, Iraq, Myanmar, Nepal and Pakistan, and is also widely introduced, especially in Africa and Asia. In India, it is found throughout except Jammu & Kashmir, Himachal Pradesh, Sikkim, and Arunachal Pradesh. In some regions it is considered invasive.

In Bangladesh, India, Nepal and Pakistan the species is widely cultivated, and has also successfully naturalised within some new areas following afforestation programmes. D. sissoo is primarily harvested for its timber, which is used for a wide range of products including handicrafts and furniture. It has become one of the most widely utilised plantation tree species in the Indian subcontinent where it is economically important for its value in forestry, agroforestry and horticulture. Within India, D. sissoo is said to be the second most important cultivated timber tree.

References:


https://indiabiodiversity.org/species/show/264596
TRAFFIC Alert

1. Customs seize over 18 tonnes of Red Sanders declared as car spare parts in Chennai

2. Man held with 45 kg of agarwood at Delhi airport
A total of 18.5 tonnes of Red Sanders *Pterocarpus santalinus*, falsely declared as car accessories, was seized and one person was arrested at Kattupalli Port near Chennai in March this year. Acting on a tip-off, Customs officials searched a container truck parked close to the entrance of Kattupalli Port and discovered the Red Sanders inside. The documents and shipping bill declared the consignment as “car accessories and parts” meant for a company in Dubai. Officials traced the shipment back to a godown near Porur in the city where they recovered more Red Sanders. The wood was seized under the Customs Act, 1962 and further investigation is ongoing.

**TRAFFIC adds.....**

Red Sanders *Pterocarpus santalinus* is an endemic timber tree species found in the districts of Chittoor, Cuddapah, Anantpur Kurnool, Prakasam, and Nellore in the State of Andhra Pradesh, in Chegalpettu district of Tamil Nadu and some occurrence in Karnataka and Kerala. It is considered one of the most valuable plant species found in southern parts of India. Due to its reddish colour, it is popularly known as “Red sandalwood” and as “Red Sanders” in trade.

In India, the trade of Red Sanders is regulated through various legal mechanisms such as the Andhra Pradesh Preservation of Private Forest Rules, 1978, the Andhra Pradesh Sandal Wood and Red Sanders Wood Transit Rules (1969), the Andhra Pradesh Red Sanders wood possession rules, 1989 and Tamil Nadu Timber Transit Rules, 1968. It is listed in Appendix II of the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES). No export of unfinished Red Sanders wood is allowed under India’s Foreign Trade Policy and it was listed in the negative list of exports in 1998 by the Central Government. The ban applies to wood found in the wild as well as that grown in private plantations. Export of products made from Red Sanders is permitted to promote Indian handicrafts although export was prohibited by CITES in June 2010 citing irregularities in certification of export products and India’s failure to conduct a non-detriment finding (NDF)—a study to ascertain the levels of sustainable offtake of a species in trade. Red Sanders is not listed under India’s Wildlife (Protection) Act, although proposals have been moved to include it in Schedule VI.

The species is heavily exploited for its medicinal uses and as an ingredient in Chinese medicines as well as a beer

*Continued on page 46*
Man held with 45 kg of agarwood at Delhi airport

In March 2019, a man travelling to Bahrain was arrested at Delhi airport for allegedly carrying 45 kg of prohibited agarwood logs in his baggage. He was intercepted by CISF security personnel at the Indira Gandhi International Airport and a search of his bags led to the recovery of agarwood, a wood used in making incense and perfume. He was handed over to Customs authorities along with the recovered wood.

TRAFFIC adds.....

Agarwood is a resinous wood that forms in species of *Aquilaria*, *Gyrinops* and several other tree genera native to Southeast Asia. *Aquilaria malaccensis*, the primary source of agarwood, Agar (*Aquilaria malaccensis* =A. *agallocha*), locally known as Sanchi or Sasi in Assam, is a tree native to West Bengal and north-eastern States of India—Arunachal Pradesh, Assam, Manipur, and Meghalaya. It is known for yielding very high value oil from its fungal infested wood. The wild population of agarwood trees grows up to an elevation of 1000 m above sea level in the foothills of the eastern Himalaya.
With natural populations under threat of extinction due to over exploitation, agarwood species has been listed by the IUCN Redlist as Vulnerable globally and Critically Endangered in India and they are now listed in Appendix II of CITES and also in the negative list of exports issued by the Ministry of Commerce in India. Indian laws neither permit extraction of agarwood from the wild nor do they allow trading of harvested wood in timber form although they do permit export of products made from cultivated wood and re-export of these products.

Export is also permitted for formulations i.e. products which may contain portions/extracts of *A. malaccensis* but only in unrecognisable and physically inseparable form; and of plants and plant portions, derivatives and extracts obtained from cultivated sources subject to production of a Certificate of Cultivation from the Regional Deputy Director (Wildlife), or Chief Conservator of Forests or Divisional Forest Officer of the State concerned from where these plants and plant proportions have been procured.

In recent years, illegal logging and trade of Agarwood has grown, driven by lucrative markets in India and other countries. Therefore, tracking down illegal trade and trade routes coupled with documenting legal trade channels is important for developing policies that will encourage long-term sustainable trade of the species without threatening their future in the wild.

Sources:
Lion cub, possibly African, 3 primates rescued in city

Mumbai: A lion cub possibly from Africa and two other primates were rescued from a north Mumbai flat in Goregaon on Sunday.

A 2-year-old girl, her mother and a male companion were staying in a north Mumbai flat in Goregaon when the three animals vanished. A team of wildlife officials tracked them down to a nearby flat in the area.

They were rescued from a flat in Goregaon and taken to a wildlife sanctuary in the city. The lions and primates are currently being examined by a team of wildlife experts at a hospital in the city.

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#StopIllegalWildlifeTrade

Air passenger held for smuggling leopard cub from Thailand

A 45-YEAR-OLD passenger from Thailand was arrested at the New Delhi airport on Sunday for smuggling a one-month-old leopard cub from Thailand.

The passengers, who was a member of the Mayo Group of Companies, was found in possession of a leopard cub in his luggage at the New Delhi airport.

A wildlife official said that the leopard cub was being flown to India from Thailand and was thought to be a pet.

The leopard cub was taken to a wildlife hospital in New Delhi for treatment.

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