

CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA



Tenth meeting of the Plants Committee
Shepherdstown (United States of America), 11–15 December 2000

**IMPLEMENTATION OF THE CITES APPENDIX II LISTING OF
JATAMANSI *NARDOSTACHYS GRANDIFLORA* AND
KUTKI *PICRORHIZA KURROO***

**A REPORT OF THE FINDINGS OF RESEARCH CONDUCTED
BY THE TRAFFIC NETWORK UNDER CONTRACT
WITH THE CITES SECRETARIAT**

COMPILED BY TRAFFIC INTERNATIONAL

DECEMBER 1999

INTRODUCTION

Kutki *Picrorhiza kurroo* and Jatamansi *Nardostachys grandiflora* were included in CITES Appendix II during the tenth meeting of the Conference of the Parties to CITES (Harare, June 1997) following proposals for listing from the Government of India, supported by the Government of the People's Republic of China. The listings became effective on 18 September 1997 and are annotated to designate "*whole and sliced roots and parts of the roots, excluding manufactured parts or derivatives such as powders, pills, extracts, tonics, teas and confectionery*".

The rhizomes of these two Himalayan perennial herbs are used in several traditional medicine systems to treat a wide variety of ailments. Both species are widely distributed in the Himalayas (3000-5000 m), occurring in Pakistan, India, Nepal, Bhutan and southern China. They have declined in some parts of their range owing to overharvest for medicinal use and trade.

An early review of the implementation of CITES for these species was considered a priority by the CITES Plants Committee in conjunction with the CITES significant trade process for plants for 1998-2000. The CITES Secretariat contracted TRAFFIC to undertake such a review, with TRAFFIC East Asia, TRAFFIC India and TRAFFIC International working cooperatively in this regard. A summary of research was presented to the CITES Plants Committee during their ninth meeting (Darwin, Australia). The following is a more comprehensive report of these findings, which it is hoped will assist the Parties, the Plants Committee and the Secretariat in bringing the international trade in these and other medicinal species under more effective control.

METHODOLOGY

Literature reviews were undertaken in China, India and Nepal. Interviews were conducted with CITES Management and Scientific Authority staff in range States that are Party to CITES (China, India, Nepal and Pakistan) as were staff in the appropriate authority in the range State of Bhutan (a non-Party). In India, specifically, the office of the Assistant Management Authority (Regional Deputy Director-East) in Calcutta, the office of the Assistant Management Authority (Regional Deputy Director-West) in Mumbai and the office of the Assistant Management Authority (Regional Deputy Director-North) were visited. Government forest officers were also interviewed in India.

TRAFFIC staff and consultants visited several international borders and Customs points to assess mechanisms in place to control the trade at these locations, including the checkpoints at Amritsar on the border between India and Pakistan and at Dharchula on the border between India and Nepal. They also visited several medicinal plant markets in India to assess the volume of trade in *Nardostachys grandiflora* and *Picrorhiza kurroo*, including Khari Baoli in Delhi, the biggest wholesale market of medicinal plants in northern India. A single market was visited in Pakistan.

Representatives of the pharmaceutical industry, traders and the staff of local NGOs were also interviewed in India. In Pakistan 106 pharmaceutical companies and six important laboratories preparing traditional herbal preparations were sent questionnaires requesting information on their use of *Nardostachys grandiflora* and *Picrorhiza kurroo*. Questionnaires were also sent to 18 forest divisions in the north and north-western Pakistan. However, the response rate to these questionnaires was very low and therefore the small amount of information collected via this method was deemed not of use to this study.

It is important to note that while the annotation refers only to 'roots', the main parts in trade are not actually roots but underground stems, which are more accurately referred to as 'rhizomes'. The latter term is used in the *CITES Guide to Plants in Trade* (Mathew, 1994) and the *Checklist of Medicinal and Aromatic Plants and their Trade Names Covered by CITES and EU Regulation 2307/97* (Lange and Schippmann, 1999). Texts referring to the medicinal properties of these species (e.g., Jain, 1968; Anon., 1970; Keys, 1976; Yang, 1996) use both 'root' and 'rhizome' to refer to the plant parts in trade. According to Jain (1968) and Yang (1996), both the roots and rhizomes of *Nardostachys grandiflora* are used, while Jain (1968) and Zhang *et al.* (1994) state that only the rhizomes of *Picrorhiza kurroo* are used. By contrast, Keys (1976) refers only to roots when describing the medicinal properties of these two species. The text that follows generally refers to the parts used and traded as 'rhizomes', following Lange and Schippmann (1999); however, it should be understood that this may refer to both roots and rhizomes. 'Root' is used in cases where this is the specific term used by the source being cited.

There is confusion regarding the taxonomy of these species (e.g. Schippmann, *in litt.* to IUCN Species Survival Commission, 1997 in Anon., 1997), as well as the application of general trade names to more than one species. For this study, research in China was conducted with the assumption that *Nardostachys grandiflora* is a synonym for *N. chinensis* and *N. jatamansi* and that *Picrorhiza kurroo* is a synonym for *P. scrophulariiflora* although *P. scrophulariiflora* is identified as a distinct species from *P. kurroo* by some experts (see Olsen, 1999). In Pakistan, *Nardostachys grandiflora* is traded mixed with *Valeriana wallichii* (syn. *Valeriana jatamansi*, local name *Mushakbala*) (Stewart, 1972). As a result, all

information on *Nardostachys grandiflora* from Pakistan pertains to a mixture of *Valeriana wallichii* and *Nardostachys grandiflora*.

Unless otherwise specified, information below was collected by TRAFFIC staff and consultants.

DOMESTIC USE

The rhizomes of these two species, the main parts valued for their medicinal properties, are similar in appearance to those of some other medicinal plant species in the region. They may also be used in a similar way to other species to treat similar ailments. This increases the difficulty of acquiring an accurate picture of the trade and trade volumes both domestically and internationally.

Nardostachys grandiflora

Nardostachys grandiflora is used for medicinal purposes both within range States and internationally. The rhizomes and extracts made therefrom are used in traditional medicines in Bhutan, India, and Nepal and in traditional Chinese and Tibetan medicine (Anon, 1993; Fratkin, 1986; Tsarong, 1986, in Anon., 1997; Yang 1996). The taxon has also been reported as being made into stick incense and sold in certain countries in the Middle East (Burbage, 1981, in Anon., 1997), while it has long been used to make a costly perfumed ointment, much valued in ancient times. In **Bhutan**, plant material is primarily used in incense during religious rites and ceremonies. It is mixed with other plants in the manufacture of incense. A very small quantity is used as an ingredient in the preparation of indigenous medicine. In **China**, the species is listed in the current version of the *Pharmacopoeia of People's Republic of China* (Anon., 1995a). The use of *N. grandiflora* was first recorded in *The Compendium of Materia Medica* which was compiled in the sixteenth century (Fu, 1993; Zhang *et al.*, 1994). According to literature on traditional Chinese medicine, *N. grandiflora* is effective in pain relief, regulating *Qi*, and treating a turgid chest (Zhang *et al.*, 1994). *N. grandiflora* is not considered to be a commonly used medicinal plant in China by those interviewed during this study, one individual noting that it was also used as incense.

Nardostachys grandiflora has been widely used for medicine and in perfumery for centuries in **India**. The plant is valued for its antispasmodic and stimulant properties and is therefore useful in the treatment of fits and heart palpitations and also to regulate constipation, urination, menstruation and digestion (Jain, 1968). In **Nepal**, it is used in tonics, stimulants, as an antiseptic, for the treatment of epilepsy, hysteria, convulsions and heart palpitations (Anon., 1993). In **Pakistan**, the species is said to be extremely useful in the treatment of hysteria, epilepsy, neurosis, insomnia, excitation, habitual constipation and scorpion stings (Kazmi and Siddiqui, 1953; Zaman and Khan, 1970; Anon, 1982; Khan and Zaidi, 1989). Under the name of *Asaroon*, the plant is used in nine herbal preparations according to the *Hamdard Pharmacopoeia* (Qarabadain-e-Hamdard), for treatment of hemiplegia, Bell's Palsy, Parkinson's Syndrome, tremors, indigestion and deafness due to age. The essential oil is used as a flavouring agent and in the cosmetic and perfume industries and indeed is reported to be a basic ingredient in all quality perfumes. The species is also said to be used as an aphrodisiac.

Picrorhiza kurroo

Picrorhiza kurroo is a well-known and important medicinal plant employed to treat a wide variety of ailments. It is used in traditional medicinal systems of Bhutan, China, India and Nepal (Anon, 1993; Tsarong, 1986, in Anon., 1997). The species is traded as rhizomes or rootstock and an extract made from the rootstock is consumed as a tonic. The medicine is regarded as being one of the major components of *Arogyavardhini*, a potent Ayurvedic formulation used to treat liver ailments (Kapahi *et al.*, 1993, in Anon., 1997).

In **Bhutan**, *P. kurroo* is mainly used as medicine for cough, cold and fever. The National Institute of Traditional Medicines and other indigenous hospitals use this plant as an ingredient in manufacturing indigenous medicine. In **China**, the species' use is recorded in the *The Newly Revised Compendium of Materia Medica*, or the *Xinxiu benaco*, which is believed to have been compiled as the first official pharmacopoeia in China during the first century (Fu, 1993; Zhang *et al.*, 1994), and is also listed in the current version of the *Pharmacopoeia of China* (Anon., 1995a). Only the rhizome of *P. kurroo*, known in pharmaceutical nomenclature as *Rhizoma Picorhizae*, is used in traditional Chinese medicine (Zhang *et al.*, 1994). The rhizome has been found to contain the chemicals Kutkin, D-mannitol and vanillic acid (Yang, 1996). *P. kurroo* is said to have effects on fever, malnutrition due to digestive disturbance, jaundice, diarrhea and dysentery (Zhang *et al.*, 1994). *P. kurroo* was not considered by those interviewed for this study as a widely used medicinal plant species in China, and is rarely traded in Hong Kong. The species is also used in traditional Tibetan medicine (Yang, 1996).

IMPLEMENTATION OF THE CITES APPENDIX II LISTING OF
JATAMANSI *NARDOSTACHYS GRANDIFLORA* AND KUTKI *PICRORHIZA KURROOA*

In **India**, *P. kurrooa* rhizomes are valued for their demonstrated value as an antibiotic. They are also used as an adulterant of, or as a substitute for, *Gentiana kurrooa*. Properties that the two species share include the ability to stimulate appetite and gastric secretions (Jain, 1968). The plant is used in Ayurvedic and Unani traditional medicines. Rhizomes of the species have been used by various ethnic hill groups in India since time immemorial for various ailments and diseases. *Picrorhiza kurrooa* has been used as an adulterant of, or as a substitute for, *Gentiana kurrooa* in **Nepal**. According to Anon. (1993), the root of *Picrorhiza kurrooa* is used in Nepal as a cathartic, in cases of dyspepsia, as a purgative, as well as in the treatment of scorpion bites. The roots of the plant have traditional use in the Ayurvedic and Greek-Arab systems of medicine in **Pakistan**. The common uses are as an aromatic, carminative agent, stimulant, for coughs, bronchial asthma, persistent hiccups, diseases of blood, liver, kidney, skin and as an aphrodisiac tonic. Roots also have antiseptic and disinfectant properties and used locally, according to conversations with forest staff, as a repellent of insects, including against moth damage to woollen clothing. Under the name of *Qust-talakh*, *Picrorhiza kurrooa* is used in two herbal preparations listed in the *Hamdard Pharmacopoeia*. These are *Maajoon-e-murravehul-azwah* and *roghane-qust-talakh* (an essential oil), which, in addition to the above indications, are also used for treatment of hypothermia, debility, tremors, tetanus and gout. The roots are used in the religious ceremonies of Buddhists and burnt as aromatic incense.

INTERNATIONAL TRADE

No CITES Annual Report data were available for this review owing to the very recent listing of these species in the Appendices, and permit data were not available from CITES Management Authorities requested to provide this information. Other quantitative information on trade volumes is also limited, as much of the trade is apparently unregulated and/or occurring outside of established trade controls, and therefore undocumented. As noted above, the similarity of appearance in the rhizomes of these and other species and substitution of one species for another further impedes trade monitoring.

Available information indicates that the main products in international trade of both species are rhizomes, with smaller amounts of trade in finished products such as oil. Nepal is the primary country of export for both species, exporting large amounts of unprocessed rhizomes, and smaller quantities of 'spikenard oil', oil produced from the rhizomes of *Nardostachys grandiflora*. Based on existing case studies, Olsen (1999) estimates that Nepal's annual export to India of dried unprocessed rhizomes of *Nardostachys grandiflora* involves approximately 1000 t per year, with only about 17% of this subsequently re-exported from India. Information acquired during visits to Delhi's Khari Baoli medicinals market similarly indicate that most of the *N. grandiflora* in trade originates from Nepal. Nepali Customs data from two border posts show the export of 2739 kg of jatamansi oil to India during 1996/97. Olsen (1999) considers *N. grandiflora* to be one of the two most important species traded from Nepal.

Olsen (1999) gives a conservative and rough estimate of annual 'kutki' exports (which he classifies as *P. scrophulariiflora*) from Nepal to India to be 100 t of air-dried rootstock. The import of 4 t of *P. kurrooa* to India from Nepal is reported to have taken place in April 1998 (S. Panda, Regional Deputy Director, Wildlife Preservation, Western Region, *in litt.* to TRAFFIC India, 9 November 1998).

As is apparent from the above, as well as being a range State itself, India is the primary country of import for *Nardostachys grandiflora* and *Picrorhiza kurrooa* rhizomes in international trade. Most of the material imported into India is processed and consumed locally (roughly 80% according to individuals interviewed for this study), with relatively smaller amounts re-exported in the form of manufactured products, e.g. medicines.

Smaller but potentially significant amounts of rhizomes of *P. kurrooa* are traded back and forth between India and Pakistan. Research for this study indicated that domestic demand for *Picrorhiza kurrooa* in Pakistan may exceed the amounts harvested domestically, with the remainder imported from India. Olsen (1999) confirms that *P. kurrooa* is exported from Pakistan to India. There also appears to be a relatively small trade in these species from Bhutan to India.

Available information indicates potentially significant international trade in *Picrorhiza kurrooa* into China. Data for the early 1980s record the total import into China of 456 t of *P. kurrooa* from 1980-1985; data were next available for 1994, when 100 t were reported as imported (Song, 1996).

CITES IMPLEMENTATION IN KEY RANGE STATES

Bhutan

Bhutan is not a Party to CITES. Protection of flora and fauna is provided for under the *Forest and Nature Conservation Act*. Collection of both species from the wild is allowed under this Act, and transport within Bhutan controlled under a system of permits through a related regulation. Specific guidelines have been set by the Royal Government Forestry Service Division for the extraction of *Picrorhiza* spp., e.g. restricting collection to less than 30% from any clump, and covering exposed roots remaining with soil. Collections are required to be made under the strict supervision of forestry staff. According to a regulation issued by the Royal Government Forestry Service Division, it is necessary for regional forestry divisions to submit a quarterly report of extraction of all forest products to the central headquarters. The reports are based on the quantities stated on permits. Although exports of most medicinal plants are banned, including *Nardostachys grandiflora*, exports of *Picrorhiza* spp. are allowed, but only once the needs of indigenous peoples of Bhutan are met. A Certificate of Origin and a transit permit are required to be presented to Customs checkpoints at the time of export.

China

At present, there is no law formulated specifically to implement CITES within China, however, certain laws contribute to the Convention's implementation in this country.

P. kurrooa is one of 388 species included in the China Plant Red Data List, where it is listed as a "Category III species" (Anon., 1987). No statutory protection is provided as a result of a species' inclusion in the Red List. *P. kurrooa* has also been classified as a Category III species under the *Law of Medicinal Resources Protection*, which became effective 1 December 1987. According to this law, Category III species are those considered to be "major and commonly used and wild medicinal species whose resources are reducing". Exports of Category II and III species are subject to a quota system under Article XV of this law, although it is unclear if such a quota system is being implemented for *P. kurrooa* or other species.

China's *Law of Wild Plant Protection* took effect 1 January 1997. Under this law, protected plant species are classified into those of "national key significance" and those of "local key significance". Protected plant species of national key significance are further divided into Category I and Category II protected species. Trade in Category I protected species is not allowed. Trade in plant species listed as Category II is subject to authorization by the relevant government agencies at the provincial/autonomous region level. The State Forestry Administration, the Ministry of Agriculture and other authorized governmental authorities at the provincial/autonomous region level are responsible for enforcing the *Law of Wild Plant Protection*. It is not clear whether a list of protected plant species has been compiled under this law thus far and therefore whether it applies to either *Nardostachys grandiflora* or *Picrorhiza kurrooa*.

From 1 January 1998, China's regulatory system for the export of wild animals and plants was strengthened by the Endangered Species of Wild Fauna and Flora Import and Export Administrative Office (under the State Forest Administration), the designated CITES Management Authority, and the Customs Authority. A wide range of animals and plants with their corresponding Harmonized System Customs codes are specified in an annex attached to a Joint Notification from the Management Authority and the Customs Authority. The list is said to be compiled on the basis of the CITES Appendices and the lists of key national protected animals and plants. It includes *P. kurrooa* but not *N. grandiflora*. The notification has been circulated among the officers of the Management Authority and Customs across the country and was copied to various other governmental agencies. Trade in live animals or plants, parts in their raw form, and products made from those animals and plants specified on the said list are controlled. According to the Joint Notification, where applicable, import/export permits or certificates are required.

India

Domestic use of these species is not regulated by any legal provision except in Uttar Pradesh, which has banned extraction of *Nardostachys grandiflora* and *Picrorhiza kurrooa* from the wild.

The Director of Wildlife Preservation of the Government of India is the CITES Management Authority and oversees CITES implementation in the country. The Director has four Regional Deputy Directors and four sub-regional offices of wildlife preservation, these serving as assistant CITES Management Authorities.

CITES is implemented in India through a combination of the *Wildlife Protection Act, 1972/1991* and the Export and Import Policy (EXIM) of the *Foreign Trade (Development and Regulation) Act, 1992* and the *Customs Act, 1962*. Neither

IMPLEMENTATION OF THE CITES APPENDIX II LISTING OF
JATAMANSI *NARDOSTACHYS GRANDIFLORA* AND KUTKI *PICRORHIZA KURROOA*

Nardostachys grandiflora nor *Picrorhiza kurrooa* are included in the list of species provided in Schedule VI of the *Wildlife Protection Act*, and therefore are not protected under this legislation, but are covered under the EXIM policy. All violations of the EXIM Policy constitute an offence under the *Customs Act* and are dealt with by Customs officials, who alone have the responsibility to enforce compliance with CITES at border posts. Inspection of consignments by Wildlife Inspectors, co-operating with Customs staff, may also be carried out at border crossings, but such specialist investigators are few. Enforcement of any violations detected is still the responsibility of the Customs authorities (S. Panda, Regional Deputy Director, Wildlife Preservation, Western Region, *in litt.* to TRAFFIC India, 9 November 1998).

The EXIM Policy is announced periodically by the Ministry of Commerce under the provisions of the *Foreign Trade (Development and Regulation) Act*. It lays down conditions governing the import and export of all goods, including wildlife. The Policy, as far as it concerns wildlife, is decided in consultation with the CITES Management Authority and enforced through the *Customs Act, 1962*. Customs officials are informed of changes to the Policy via executive orders and circulars from their superiors, including a monthly publication *EXIM Update*, issued by the Directorate General of Foreign Trade, Ministry of Commerce. The 14 October 1998 Notification was the first notice provided to Customs authorities regarding the Appendix II status of *Nardostachys grandiflora* and *Picrorhiza kurrooa*.

The Notification coincided with the 14 October 1998 listing of 29 plants (*Nardostachys grandiflora* and *Picrorhiza kurrooa* included) under the EXIM Policy covering the period 1997-2002 (*Notification No. 24 (RE-(98)/1997-2002, New Delhi*). Exports and re-exports of both *Nardostachys grandiflora* and *Picrorhiza kurrooa* in raw form are banned under this policy. Exports of finished products (formulations), e.g. medicines, are allowed if the contents are 'unrecognizable and physically inseparable' or if proof can be provided that the raw material originated from imported stock. Cultivated specimens may also be exported upon satisfactory proof of cultivation, with a requirement that these be accompanied by a CITES export permit if the species are included in the Appendices.

Current legislation and policies do not provide for CITES import controls for *Nardostachys grandiflora*, *Picrorhiza kurrooa* or other CITES-listed medicinal plant species. As a result, CITES is not routinely implemented for imports of these species into India. However, at least one shipment of *P. kurrooa* has been prevented from import owing to lack of an accompanying CITES export permit from Nepal (see below).

Nepal

Conflicting information was collected regarding the harvest and trade controls for medicinal plants in Nepal, and additional clarification is required. As demonstrated by the information that follows, taxonomic issues also require clarification.

CITES is implemented in Nepal under the *Forest Act, 1993* and accompanying Forest Rules (1995). The National Herbarium of His Majesty's Government Department of Plant Resources, Ministry of Forests and Soil Conservation is the CITES Scientific Authority. A list of CITES species published by the Government of Nepal in September 1997 includes "*Valeriana jatamansi*, Indian Spikenard, local name Jatamansi". Schippmann (*in litt.* to IUCN Species Survival Commission, 1997 in Anon., 1997), noted the apparent confusion regarding *V. jatamansi*, which is a valid taxon (*V. wallichii* DC being considered a synonym by Jain, 1968, who describes the medicinal qualities of this species), and *Nardostachys grandiflora* (often referred to as *N. jatamansi*, which has been described as a synonym as well as a separate species). The list of CITES species does not include *Nardostachys grandiflora*. *Picrorhiza scrophulariiflora* is included, however, Olsen (1999) contending that *P. kurrooa* and *P. scrophulariiflora* are similar but distinct species, the former being native to Pakistan and the latter native to Nepal. An official of the Ministry of Environment and Forests, Wildlife Regional Office, Mumbai, India, stated that an import of *P. kurrooa* was refused because it lacked a CITES export permit from Nepal, the Government of Nepal stating that the species was not included in the CITES Appendices (S. Panda, *in litt.* to TRAFFIC India, November 1998).

According to research for this study, the Forest Act stipulates rules pertaining to the collection of both *Nardostachys grandiflora* and *Picrorhiza kurrooa*. Collection is authorized via permits issued by District Forest Offices, which specify the collection area but not harvest times or the specific quantity allowed to be harvested. District Forest Offices are responsible for enforcing harvest restrictions. According to Bhattarai (1999) of the National Herbarium, however, there are no restrictions on the collection or transport of *Nardostachys grandiflora*, although exports of raw products of this and *Valeriana jatamansi* are banned.

Export of *Nardostachys grandiflora* and *Picrorhiza kurrooa* requires prior presentation of the collection permit and payment of royalties (Anon., 1995b). Exports are controlled by His Majesty's Government Department of Plant Resources, Ministry of Forests and Soil Conservation, which is the CITES Management Authority, and by Customs officials and the police. Research conducted for this study indicates that there is a ban on exports of the unprocessed rhizomes of both

IMPLEMENTATION OF THE CITES APPENDIX II LISTING OF
JATAMANSI *NARDOSTACHYS GRANDIFLORA* AND KUTKI *PICRORHIZA KURROO*

Nardostachys grandiflora and *Picrorhiza kurroo*, however, the basis for these restrictions is unclear, and large volumes of both species are being exported to India in raw form. It is suspected that these exports may be taking place (possibly in mixed shipments) accompanied by Certificates of Origin specifying them as jari-buti, a generic term used to describe herbs, 975 t of which was reported as exported from Nepal to India in 1995/96.

Specific legislation to more effectively implement CITES has been drafted, known as the *Endangered Species (Trade Control) Act*, and a policy specifying the exports and imports allowed is being formulated.

Very little quantitative information regarding the impact on wild populations of current harvest levels in Nepal was identified during the course of this study. Bhattarai (1999) and Manandhar (1999) both express general concern regarding the status of medicinal plants in Nepal. Bhattarai comments that traditional systems of collection and use were functional for a long period, but cannot serve as a model for the future owing to increased threats from human factors including habitat destruction and overexploitation. Olsen (1999) contends, however, that harvest of these two species in Nepal is likely to be within sustainable levels. Bhattarai (1999) notes that ongoing research within the Plant Research Division of the Department of Plant Resources, Ministry of Forest and Soil Conservation includes preparation of an inventory of wild medicinal plants, assessments of threats to wild plant resources and efforts to improve cultivation.

Both Olsen (1999) and Bhattarai (1999) draw attention to the importance of medicinal plant harvest and trade to rural economies in Nepal. Olsen (1998) estimates that 470,000 households are involved in commercial medicinal plant collection.

Treaty of Trade between His Majesty's Government of Nepal and the Government of India

In an effort to expand trade between their two countries, the Governments of India and Nepal entered into a bilateral trade agreement in 1991. This treaty, which remains in force today, provides for preferential treatment for the import into India of certain goods from Nepal. These include 'forest produce' which has not 'undergone processing' and ayurvedic and herbal medicines (Article IV). Under this treaty, a certificate of origin issued by the Government of Nepal is the only document required for presentation to India Customs authorities at the time of import. Border officials are unaware that CITES documentation might also be required for export (as noted above, under India's current CITES implementing legislation and the EXIM Policy, CITES export permits would not be required to accompany shipments into India in any event). The treaty contains provisions for stronger domestic measures on the part of national governments, and, in Annex C, provides a list of articles not allowed preferential treatment (e.g. cigarettes and alcohol). It appears that this Annex could be amended to reflect CITES requirements.

TRAFFIC India has informed Government authorities in both India and Nepal of the apparent relevance of this treaty with respect to CITES trade controls. Initial research results from this study were communicated to the second Indo-Nepal Trans-border Meeting in February 1999. As a result, the final resolution of that meeting called for bringing the bi-lateral treaty into line with CITES requirements.

Pakistan

The collection of medicinal plants is controlled by the Forest Department and commercial exploitation from reserved forests is forbidden throughout Pakistan by order of the Inspector General of Forests, Islamabad, according to the District Forest Officer of Galiyat Forest Division. Where harvesting of *Picrorhiza kurroo* and *Nardostachys grandiflora* is allowed, it is usually through the sale of the lease of an area to a person or party for one year. Before taking plants from the site of collection, the local Divisional Forest Officer must be approached for the issue of a transport permit, obtainable on the payment of a fixed duty. The size of the consignment and transport permits are checked at forest exit points.

The CITES Management Authority is the National Council for the Conservation of Wildlife (NCCW), under the authority of the Ministry of Environment, Local Government and Rural Development, in Islamabad. CITES permits are issued by the NCCW, which is also responsible for formulating country-wide legislation for regulating harvest and national and international trade of CITES-listed species. It issues directives to various provincial Forest Departments to control the harvest and trade of *Picrorhiza kurroo* and *Nardostachys grandiflora* and intervenes wherever a violation of CITES is reported. Inter-provincial co-ordination of CITES implementation is carried out by the NCCW through the office of the Inspector General of Forests, also within the Ministry of Environment, Local Government and Rural Development. International action in CITES matters is also the remit of the NCCW. Enforcement officials interviewed at border posts were generally unaware of CITES requirements.

CONCLUSIONS

International trade in *Nardostachys grandiflora* and *Picrorhiza kurrooa* consists largely of exports of rhizomes from Nepal to India, with smaller amounts of trade taking place between India and Pakistan, and, to a far lesser extent, between India and Bhutan. Further research is required regarding international trade involving China. Exports of *N. grandiflora* oil from Nepal have been recorded in Nepali Customs data.

The CITES Appendix II listings for *Nardostachys grandiflora* and *Picrorhiza kurrooa* have thus far failed to be implemented effectively, with large scale trade conducted without accompanying CITES permits. Exports of rhizomes from Nepal appear to be in violation of a national ban on the export of the unprocessed forms of *Nardostachys grandiflora* and possibly both species. Confirmation of the status of this ban is required. Exports appear to be taking place without any accompanying CITES documents (which would be expected in the event that such exports are illegal). At present, there are no CITES-related controls on the import of these species into India. This reflects both a lack of CITES implementing legislation in India for imports of these species, and the effect of the Indo-Nepali trade treaty, which aims to reduce trade barriers for these and other items. Suspected exports of raw products from India to Pakistan are in violation of India's export controls. Controls on the trade from Pakistan require further clarification. There are currently no controls on the trade in *N. grandiflora* from China. There is confusion regarding the taxonomy of the species covered by the listings, which in some cases is reflected in national legislation.

Additional information is required to assess the sustainability of harvest for international trade, especially that involving Nepal and possibly Pakistan, should the latter country be found to be a major source of exports.

Given that the vast majority of international trade in both species appears to involve unprocessed rhizomes, the current annotation seems generally appropriate with respect to the level of processing of products covered. However, it does not accurately describe the plant parts in trade, which are primarily rhizomes, not roots.

SUGGESTED PRIORITIES FOR FURTHER RESEARCH AND ACTION

- Further clarification is required regarding the taxonomy of *Picrorhiza kurrooa*, specifically, whether *P. scrophulariiflora* is a synonym, as it is considered in China, or a separate species, as is put forward by Olsen (1999)
- Further clarification is similarly required with regard to the taxonomy of *Nardostachys grandiflora*, specifically with respect to *Nardostachys jatamansi* and *Valeriana jatamansi*, both of which appear to be used to refer to this species in Nepal
- Modification of the current annotation to include the term 'rhizomes' in addition to roots should be considered, ensuring that the term 'root' is maintained in the annotation as it is more likely to be understood by Customs officials and others implementing CITES for these species
- Further research is required to assess and ensure the sustainability of harvest for international trade of both species
- Trade between India and Pakistan should be investigated further and action taken to address any CITES trade control problems identified
- Modifications in national legislation are an important first step toward more effective implementation of CITES for these species. Specifically:
 - National legislation in China should be expanded to address harvest and trade of *Nardostachys grandiflora*
 - Existing legislation in India should be expanded to include CITES-related controls on imports and re-exports of all CITES-listed medicinal plant species, including *Nardostachys grandiflora* and *Picrorhiza kurrooa*
 - Domestic harvest and trade controls and export policies for *Nardostachys grandiflora* and *Picrorhiza kurrooa* in Nepal should be reviewed and clarified. In addition, CITES implementing legislation providing for the effective control of exports should be adopted

IMPLEMENTATION OF THE CITES APPENDIX II LISTING OF
JATAMANSI *NARDOSTACHYS GRANDIFLORA* AND KUTKI *PICRORHIZA KURROO*

- The Treaty of Trade between His Majesty's Government of Nepal and the Government of India should be modified in order to reflect CITES requirements
- The Government of Bhutan should be encouraged to implement trade controls comparable to those required under the Convention
- Appropriate training materials and programmes should be developed in order to ensure that CITES Management and Scientific Authority staff within range States understand and are better able to implement their responsibilities under the Convention. Training should also be provided to Customs staff, who are largely responsible for CITES enforcement at international borders.

REFERENCES

- Anon. (1970). *Medicinal Plants of Nepal*. H.M.G. Department of Medicinal Plants Publication, Thapathali, Kathmandu, Nepal.
- Anon. (1982). *Markets for Selected Medicinal Plants and their Derivatives*. International Trade Centre UNCTAD/GATT, Geneva, Switzerland.
- Anon. (1987). *Rare and Endangered Plants of China*. Shanghai Educational Press, Shanghai, China.
- Anon. (1993). *Medicinal Plants of Nepal*. Bulletin of the Department of Medicinal Plants No. 3. His Majesty's Government of Nepal, Ministry of Forests and Soil Conservation, Department of Medicinal Plants, Thapathali, Kathmandu, Nepal.
- Anon. (1995a). *The Pharmacopoeia of People's Republic of China, 1995 Edn*. Guangdong Scientific Technology Press, Guangzhou, China.
- Anon. (1995b). *Biodiversity Profile of High Mountains and High Himal Physiographic Zones*. Biodiversity Profiles Project Publication No. 14. Department of National Parks and Wildlife Conservation, Ministry of Forests and Soil Conservation, His Majesty's Government of Nepal, Kathmandu, Nepal.
- Anon. (1997). *IUCN Analyses of Proposals to amend the CITES Appendices*. Prepared by IUCN Species Survival Commission and the TRAFFIC Network for the Tenth Meeting of the Conference of the Parties to CITES. IUCN-The World Conservation Union, Gland, Switzerland.
- Bhattarai, N.K. (1999). Medicinal plants and the Plant Research Division of Nepal. *Medicinal Plant Conservation*. 5:7-8.
- Burbage, M.B. (1981). *Report on a Visit to Nepal: the Medicinal Plant Trade in the Khardep area - a Study of the Development Potential*. Tropical Products Institute, London, UK. In: Anon. (1997). *IUCN Analyses of Proposals to amend the CITES Appendices*. Prepared by IUCN Species Survival Commission and the TRAFFIC Network for the Tenth Meeting of the Conference of the Parties to CITES. IUCN-The World Conservation Union, Gland, Switzerland.
- Fratkin, J. (1986). *Chinese Herbal Patent Formulas: a Practical Guide*. Shya Publications, Boulder, USA. In: Anon. (1997). *IUCN Analyses of Proposals to amend the CITES Appendices*. Prepared by IUCN Species Survival Commission and the TRAFFIC Network for the Tenth Meeting of the Conference of the Parties to CITES. IUCN-The World Conservation Union, Gland, Switzerland.
- Fu, W. (1993). *History of Traditional Chinese Medicine*. Bashu Publications, Sichuan, China.
- Jain, S.K. (1968). *Medicinal Plants*. National Book Trust, New Delhi, India.
- Kapahi, B.K., Srivastava, T.N. and Sarin, Y.K. (1993). Description of *Picrorhiza kurroa*, a source of the Ayurvedic drug *Kutaki*. *Int. J. Pharmacog.* 31(3):217-222. In: Anon. (1997). *IUCN Analyses of Proposals to amend the CITES Appendices*. Prepared by IUCN Species Survival Commission and the TRAFFIC Network for the Tenth Meeting of the Conference of the Parties to CITES. IUCN-The World Conservation Union, Gland, Switzerland.
- Kazmi, M.A. and Siddiqui, I.A. (1953). Medicinal plants of Astore and Upper Guraiz Valleys. *Pakistan J. For.* 3(4):186-212.
- Keys, J.D. (1976). *Chinese Herbs: Their Botany, Chemistry and Pharmacodynamics*. Charles E. Tuttle Company, Rutland, USA and Tokyo, Japan.
- Khan, A.H and Zaidi, S.H. (1989). *Propagation and Regeneration Technology of Pharmacopoeial Medicinal Plants of the Temperate Regions of Pakistan*. Bulletin No.8. Biological Sciences Research Division, Pakistan Forest Institute, Peshawar, Pakistan.
- Lange, D. and Schippmann, U. (Comps.) (1999). *Checklist of Medicinal and Aromatic Plants and their Trade Names Covered by CITES and EU Regulation 2307/97, vers. 3.0*. Bundesamt für Naturschutz (BfN)/German Federal Agency for Nature Conservation, Bonn, Germany.
- Manandhar, N. (1999). Conservation of medicinal plants in Nepalese forests: Problems and perspectives. *Medicinal Plant Conservation*. 5:3-4.
- Mathew, M. (Ed) (1994). *CITES Guide to Plants in Trade*. Department of Environment, UK.

IMPLEMENTATION OF THE CITES APPENDIX II LISTING OF
JATAMANSI *NARDOSTACHYS GRANDIFLORA* AND KUTKI *PICRORHIZA KURROOA*

- Olsen, C.S. (1998). The trade in medicinal plants from Nepal: Status and possible improvements. Theme paper presented at the *International Conference on Medicinal Plants*, Bangalore, 16-19 February, 1998. 12pp. In: Olsen, C.S. (1999). CITES Appendix II re-visited: Is the listing of *Nardostachys grandiflora* and *Picrorhiza kurrooa* appropriate? *Medicinal Plant Conservation*. 5: 8-10.
- Olsen, C.S. (1999). CITES Appendix II re-visited: Is the listing of *Nardostachys grandiflora* and *Picrorhiza kurrooa* appropriate? *Medicinal Plant Conservation*. 5:8-10.
- Song, M. (1996). *Directory for Import and Export of Traditional Chinese Medicine Trade*. Traditional Chinese Medicine Press of China, Beijing, China.
- Stewart, R.R. (1972). *Flora of Pakistan*. Ann Arbor, USA.
- Tsarong, T.J. (1986). *Handbook of Traditional Tibetan Drugs; their Nomenclature, Composition, Use and Dosage*. Tibetan Medical Publications, Kalimpong, India. In: Anon. (1997). *IUCN Analyses of Proposals to amend the CITES Appendices*. Prepared by IUCN Species Survival Commission and the TRAFFIC Network for the Tenth Meeting of the Conference of the Parties to CITES. IUCN-The World Conservation Union, Gland, Switzerland.
- Yang, Y.C. (Ed.) (1996). *Tibetan Materia Medica*. Qinghai People's Press, Qinghai, China.
- Zaman, M.B. and Khan, M.S. (1970). *Hundred Drug Plants of West Pakistan*. Medicinal Plant Branch of the Pakistan Forest Institute, Peshawar, Pakistan.
- Zhang, Y-J., Li, W. and Zheng, M. (Eds.) (1994). *Chinese-English Chinese Traditional Medicine World Dictionary*. Shanxi People's Press, Shanxi, China.