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

Eighteenth meeting of the Conference of the Parties
Colombo (Sri Lanka), 23 May – 3 June 2019

CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

The proponents propose delisting of *Dalbergia sissoo* DC., from CITES Appendix II as it does not meet the listing criteria set out in Article II [(paragraphs 2(a)]of the Convention text or the criteria laid down in Annex 2(a) of Resolution Conf. 9.24 (Rev. CoP17). The species is widely distributed and in India it is found abundantly in wild and on cultivation as well. The species has very fast growth rate and capacity to become naturalized outside of its native range, even it is invasive in some parts of the world. The regulation of trade in the species is not necessary to avoid it becoming eligible for inclusion in Appendix I in the near future and the harvest of specimens from the wild is not reducing the wild population to a level at which its survival might be threatened by continued harvesting or other influences.

B. Proponent

Bangladesh, Bhutan, India and Nepal*:

C. Supporting statement

1. Taxonomy

1.1 Class: Magnoliopsida

1.2 Order: Fabales

1.3 Familly: Fabaceae

1.4 Genus, species or subspecies, including author and year: *Dalbergia*L. f.1781 [1782]

1.5 Scientific synonyms: *Amerimnon sissoo* (Roxb. ex DC.) Kuntze

1.6 Common names: English: Indian rosewood, Himalaya raintree, Indian Dalbergia, Penny leaf tree, Sisso
French:
Spanish:

1.7 Code numbers: Not available

2. Overview

Dalbergia sissoo is a fast growing perennial tree which is economically important for its value in forestry, agroforestry, horticulture. The species is sustainably utilized for its timber, fuel wood, fodder, medicines etc. The species is native to Afghanistan, Bangladesh, Bhutan, India, Islamic Republic of Iran, Iraq, Myanmar,

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Nepal, Pakistan, Philippines, South Africa and also widely introduced especially in Africa and Asia.It is even treated as invasive in Florida, USA and the Northern Territories, Australia, and has failed a risk assessment for the Pacific (https://www.cabi.org). In India, the wild subpopulations of *D. sissoo* are widely distributed in the sub-Himalayan tracts and outer Himalayan valleys of India and the species is also found naturalised outside its wild occurrence (extending up to southern India).The wild population of *D. sissoo* does not fall under any Threatened categories (Bhattacharjee & al., 2018). Moreover, *D. sissoo* is one of the most widely utilised plantation tree species in the Indian subcontinent (Hossain& Martin, 2013), largely due to its fast growth and multiple economic uses and in India the species is found abundantly on cultivation/ plantation. The abundance of *D. sissoo* both in wild and cultivated populations is also reported from other countries of Indian subcontinent (Hossa in& Martin, 2013; Groves & Rutherford, 2015). *Dalbergia sissoo* is the second most important cultivated timber tree in India. The species can be found in plantation/cultivation and/or agroforestry system in almost every parts of the country and it is very common in the northern, northwestern, central, eastern parts of country mainly along highways, roads, riverbeds, water bodies, railway tracks, lands for cultivation and also found in villages, cities, forest area. In Bihar, Chhattisgarh, Gujarat, Haryana, Jharkhand, Odisha, Madhya Pradesh, Punjab, Rajasthan, Uttar Pradesh, Uttarakhand, West Bengal, *D. sissoo* is found almost in every villages/town/cities. The NDF study (Bhattacharjee & al., 2018) of the species in India has also revealed that the harvest of *D. sissoo* is being done mostly from planted/cultivated trees outside the locations of its wild occurrence. The major threat to *D. sissoo* both in wild, naturalised and planted/cultivated population is not harvest and trade, but diseases .The impacts of both harvest and trade are low as harvest and trade do not pose threats to the existing wild population of *D. sissoo* in India. Due to its extensive availability on cultivation/ plantation, the illegal trade of the species from its wild population is rarely reported at present.The existing management procedures (also supported by laws to regulate harvest of the natural population) are appropriate and effective to mitigate (= reduce the severity of) the identified wild harvest impacts and trade impacts of *D. sissoo* (Bhattacharjee & al., 2018).In spite of high availability of harvestable trees under cultivation/ plantation and timber in depots, the legal restrictions on export of *D. sissoo* products have caused severe financial loss to the wood carving industry during 2017–18 and livelihood of around 50000 artisans is affected.

3. Species characteristics

3.1 Distribution

The species is native to Afghanistan, Bangladesh, Bhutan, India, Islamic Republic of Iran, Iraq, Myanmar, Nepal, Pakistan, Philippines, South Africa and exotic to Antigua and Barbuda, Australia, Cameroon, Chad, China, Cyprus, Dominican Republic, Ethiopia, French Polynesia, Ghana, Guinea-Bissau, Indonesia, Israel, Kenya, Mauritius, Malaysia, Mozambique, New Caledonia, Niger, Nigeria, Oman Paraguay, Philippines, Puerto Rico, Senegal, Sierra Leone, Sri Lanka, Sudan, Thailand, Togo, Uganda, United Republic of Tanzania, United States of America, Virgin Islands of the USA, Zambia, Zimbabwe.

In India, the species is found almost throughout the country. However, it is difficult to assess the wild localities of *D. sissoo* in the country due to its wide use in agroforestry, plantation, afforestation, reforestation programmes and as a result the species is now found naturalised in many places from where it was not found earlier as wild. As per the best available information the species is indigenous to gravelly river beds of the sub-Himalayan tracts and outer Himalayan valleys extending from Assam to Jammu and Kashmir. Further, it is found naturalised outside its wild occurrence, extending up to southern India.

3.2 Habitat

The species is adapted to a wide range of ecological habitats. The species naturally grows in porous soils containing sand, pebbles and boulders and found gregariously in river beds on alluvial soil, shingle boulders, along water channels occupying 500–900 m elevation belt but exceptionally ascending to 1500 m with 4–45°C mean annual temperature, 500–4500 mm mean annual rainfall. It is a gregarious colonizer of landslips, hillsides, roadsides, new embankments, grasslands and other places where mineral soil is exposed, and when stream and rivers alter their courses or add fresh deposits of sand, shingle and boulders (Troup, 1921; Parker, 1956; Streets, 1962). *Dalbergia sissoo* is a characteristic species of the 'Khair-sissoo' primary seral-type forest, and tropical dry mixed deciduous and dry deciduous scrub forest types, occurring in open and low forest formations composed entirely of deciduous trees and some trees of the thorn forest type, with a predominantly deciduous shrub layer, and are limited to Himalayan foothills and adjoining Siwaliks, and recent alluvial deposits (Champion & Seth, 1968). It regenerates naturally in soil with good drainage and sufficient aeration on fresh embankment, riverine slopes, exposed soil, laid down terraces, road cutting, etc. The species is

considered as pioneer species in riverine succession of sub-Himalayan tracts and outer Himalayan valleys. The species is fairly drought-resistant and frost-hardy (CSIR, 1952).

3.3 Biological characteristics

The species is naturally propagated by seeds, root suckers and it also coppices vigorously. In wild condition, the regeneration from seeds and root suckers is very common. *Dalbergia sissoo* is fast growing and in nine months it can start producing flowers. Seed germination takes place during monsoon. Availability of adequate amount of overhead light and protection against grazing and fire are vital factors determining the success or failure of natural regeneration obtained through seeds. The rate of regeneration (RR) is moderate to high in different parts of country, ranging from 136% to 1218% (Bhattacharjee & al., 2018).The species usually flowers between February to June (rarely in September in some parts of South India) in India and the fruiting period of the species is usually between end of March to December (- February). The species is open-pollinated and the seed raised plants show wide genetic variability. The tree sheds pods during December–April and seeds germinate at the commencement of rains. Pods are disseminated by wind. Due to growing near streams/rivers, the pods are also dispersed by water along streams/rivers.

3.4 Morphological characteristics

Dalbergia sissoo is 10–30 m high deciduous tree, with trunk of 2–4 m in girth at base. The bark is grey to pale brown, flaking in narrow longitudinal strips. Leaves are imparipinnately compound usually with 5 leaflets (sometimes 3, rarely 4); leaflets are alternately arranged, sub orbicular, obcordate, broadly ovate to obliquely ovate in shape which are 3.9–9 cm long and 3–7 cm broad with conspicuously and abruptly cuspidate apex. Flowers are yellowish white, 7–9 mm long; calyx is campanulate with 5 segments, two upper ones rounded and three lower are acute with the middle one longest; petals are 5 in number, vexillum is sub orbicular with emarginate at apex and narrowed at base into a long claw; wings and keels are oblong, distinctly clawed; stamens are 9, Monadelphous. Pods are linear-oblong, strap-shaped, 4.8–9.7 cm long and 0.7–1.3 cm broad, acute at apex (sometimes rounded),mucronulate with narrow base with usually 1–3-seeds (rarely 4), glabrous.

3.5 Role of the species in its ecosystem

The species is largely used in agroforestry, plantation, afforestation, reforestation programmes. It is a nitrogen fixer and also improve the soil fertility with its leaf litter which decomposes slowly and releasing nutrients gradually. The honey is dark amber and strong-flavoured and serves as important food source for honeybees, beetles, wasps, bumble bees, butterflies and other insects. Leaves are used as a source food for mammals. The tree serves as host of other plants such as epiphytic orchids, ferns, and fungi, lichens, etc. and also for birds and other insects. Based on available records there are no dependent species for *D. sissoo*.

4. Status and trends

4.1 Habitat trends

According to the 'India State of Forest Report 2017', the total forest cover of the country is 708273 km^2which is 21.54% of the geographic area of the country (FSI, 2017). As per the report, during the two assessments periods of 2015 and 2017, increase of 6778 km^2 forest cover at the national level was recorded. Three states, namely Andhra Pradesh, Karnataka and Kerala had contributed to an increase of 2141 km^2, 1101 km^2 and 1043 km^2, respectively, much of which could be attributed to plantation and conservation activities both within and outside the Recorded Forest areas as well as improvement in interpretation due to better radiometric resolution of the recent satellite data. Other states contributing significant increase were Odisha (885 km^2), Assam (567 km^2), Telangana (565 km^2), Rajasthan (466 km^2), Himachal Pradesh (393 km^2), Uttar Pradesh (278 km^2), Jammu and Kashmir (253 km^2) and Manipur (263 km^2). The states which showed reduction in forest cover primarily include Mizoram (531 km^2), Nagaland (450 km^2) and Arunachal Pradesh (190 km^2).

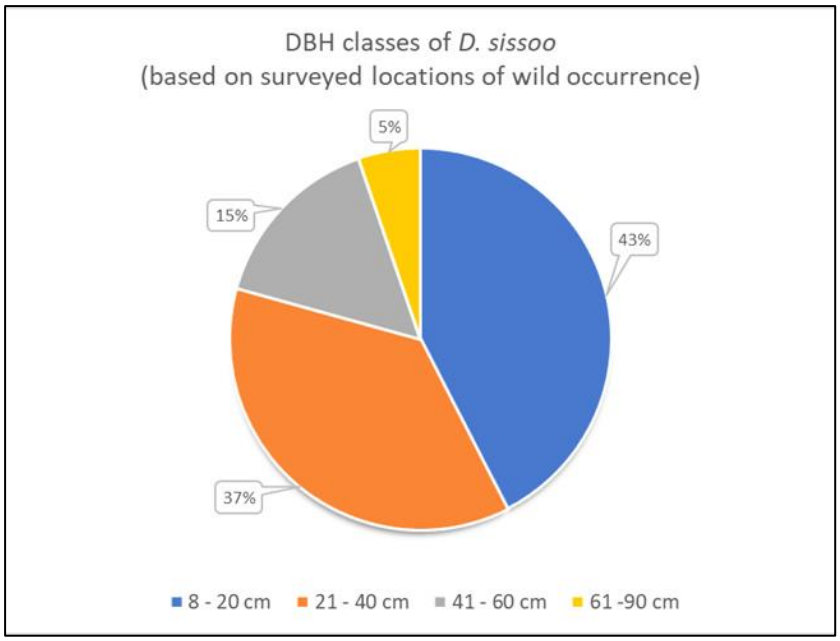
4.2 Population size

The species is abundantly found in wild mostly along riverine tracts of Jammu and Kashmir, Punjab, Haryana, Himachal Pradesh, Uttarakhand, Uttar Pradesh, Bihar, West Bengal, Assam and Arunachal Pradesh; whereas the species is found on cultivation/ plantation almost throughout the country. As per

the NDF study (Bhattacharjee & al, 2018) of *D. sissoo* in India, 8 to 38 mature individuals are found per hectare (Annexure 1) for wild population in different parts of country, whereas it is 3 to 39 per hectare (Annexure 2) for cultivated stocks and up to 1600 per hectare for pure and mono specific plantations. The Extent of Occurrence (EOO) of *D. sissoo* in India is at least 1, 98,974 km^{2}considering only the sub-Himalayan tracts from where wild subpopulations of the species are reported.

4.3 Population structure

Wild subpopulations of the national population of *D. sissoo* are mostly medium-sized, sometimes large, unevenly distributed. As per the survey report (Bhattacharjee & al., 2018) in different parts of India,43% mature individuals are with 8–20 cm DBH, 37% are with 21–40 cm DBH, 15 % are with 41–60 % DBH, whereas 5 % are with 61–90 cm DBH. Apart from that plants in seedling/ saplings stage are found in all locations of its wild occurrence and the rate of regeneration (RR) is moderate to high in different parts of country, ranging from 136% to 1218% (Bhattacharjee & al, 2018).



4.4 Population trends

Though the population trend of *D. sissoo* is slightly decreasing in some parts of the country during last few decades due to some diseases, the wild population of *D. sissoo* in India is not affected by harvest and trade as the harvest/ trade of *D. sissoo* is being done mostly from planted/cultivated trees. The impacts of both harvest and trade are low as harvest and trade do not pose to threats to the existing wild population of *D. sissoo* in India. The existing management procedures (also supported by laws to regulate harvest of the natural population) with high initiatives for cultivation/ plantation of the species by the farmers, villagers, forest departments throughout the country are effective to maintain the overall population of *D. sissoo* in India.

4.5 Geographic trends

Though the population density of this species was declined in past in some parts of Bihar, Odisha, Punjab, Haryana, Uttarakhand, Uttar Pradesh, but majority of this decline was from planted/ cultivated population. But due to its high capacity to be naturalised in new areas, the overall geographic range of naturalised population has been expanded, even up to South India. The species is also reported to be introduced in different parts of World and the trend of geographic distribution is increasing at Global level.

5. Threats

Diseases

The main threats to the wild, naturalised as well as cultivated/ planted populations of *D. sissoo* are fungal and bacterial diseases and from insects. But due to very high regeneration and growth rate the overall population is not much affected. The frequency of mortality due to diseases is lower in wild/ naturalised subpopulations than that of in cultivation/ plantation. Several insects, especially two defoliators, *Plecoptrareflexa*Guenée and *Dichomeriseridantis* Meyrick have been reported to damage *D. sissoo*. *Plecoptrareflexa* is a serious defoliator in nurseries and young plantations (Sharma & al., 2000). There are two major diseases severely damaging *D. sissoo*, wilt and dieback, caused by three fungi i.e., *Fusarium solani* (Mart.) Sacc., *Ganoderma lucidum* (Curtis) P. Karst and *Phellinus gilvus* (Schwein.) Pat. The Fusarium wilt disease has been reported from Uttar Pradesh, Bihar and Punjab in plantations, raised on unsuitable sites i.e., stiff, clayey soils and water logged conditions. Trees of advanced age are usually susceptible to the disease. The affected trees die within a few months (Bakshi, 1954). Root rot of *D. sissoo* due to *Ganoderma lucidum* is common both in natural forests and in plantations. It causes white spongy rot in the sapwood. The affected trees exhibit a stag-headed appearance and are eventually killed. Lateral spread of the disease in plantations is through root contact, which results in gaps in pure plantations. Another fungus causing root rot is *Phellinus gilvus* which is a wound parasite and is known to infect plantation trees (Sharma & al., 2000). According to Gill & al., (2001) the primary cause of dieback in *D. sissoo* is *Phytophthora cinamomi* Rands. Powdery mildew disease is caused by another fungus, *Phyllactiniacorylea* (Pers.) P. Karst. (Singh, 2011). Stem canker in trees of advanced age is caused by Polyporusgilvus (Schwein.) Fr. and can be seen in naturally growing trees of terai region, outskirts of villages and canal banks in Punjab and Uttar Pradesh. Collar rot of seedlings is caused by *Rhizoctoniasolani* J.G. Kühn (CSIR, 1952). The Root-Knot Nematode *Meloidogyne javanica* (Treub) Chitwood has been recorded to form galls on roots of *D. sissoo* from Lachhiwala range nursery, Dehra Dun (Mehrotra & Sharma, 1992). Heavy infestations of the nematode affect plant growth adversely.

Harvest

Dalbergia sissoo is primarily harvested for its timber which is making of handicraft items, boat, carts, carriages, gun handles, rail-sleeper, cabinet, furniture, decorative veneer, ornamental turnery, plywood, musical instruments, skis, carvings, boats, tool handles, floorings, etc.

6. Utilization and trade

6.1 National utilization

Dalbergia sissoo is one of the most useful timber species of India which is primarily used in making of handicraft items, furniture, veneer, plywood, and several other tools and artifices. The leaves of *D. sissoo* are used as medicine, fodder, whereas the wood is also used as fuel wood, especially in villages of India. The total monetary gains estimated for *D. sissoo* was Rs. 13.4 million per hectare (Jalota& Sangha, 2000). The price of the *D. sissoo* wood in domestic market is Rs. 400/- to Rs. 750/- per CFT (cubic feet), depending on the quality and distance to source (Sinha & Pasha, s.d.).

6.2 Legal trade

During February 2013 to November 2016, total 4739 shipments (Quantity: 260347) of *D. sissoo* worth $ 1,079,870 (https://www.zauba.com) with $4.15 average price per unit and $228 value per shipment were exported from India. The export was from nineteen ports (port of loading) viz., Jawaharlal Nehru Port/Nhava Sheva port (INNSA1), Delhi Air Cargo (INDEL4), Tughlakabad (INTKD6), Bombay Air Cargo (INBOM4), Piyala/Ballabhgarh ICD (IN BFR 6), Faridabad (INFBD6), Noida-Dadri ICD (INDER6), Patparganj (INPPG6), Dadri-ACPL CFS (INAPL6), Pakwara (INMBD6), Mundra (INMUN1), Dadri-CGML (INCPL6), Bhagat ki Kothi (INBGK6), Sabarmati ICD (INSBI6), Bangalore (INBLR5), Trivendrun Air Cargo (INTRV4), Kanakpura (INKKU6), Dadri STTPL (INSTT6), Jaipur (INJAI4) to Netherland, Sweden, United Arab Emirates, China, Australia, Switzerland, Italy, France, Qatar, Hong Kong, Romania, Uruguay, Columbia, Argentina, Peru, Austria, Island, Poland. However, the volume of specimens in trade from wild subpopulations is very small in relation to abundance of the species, and the major part of the traded material is sourced from planted/ cultivated subpopulations (Bhattacharjee & al., 2018).

6.3 Parts and derivatives in trade

Primarily harvest of whole plants for timber, but also harvested for firewood and fodder. Leaves, bark and seeds are also harvested for ethno medicines in some parts of India but in very less extent.

6.4 Illegal trade

Dalbergia sissoo is the second most important cultivated timber tree in India. Due to its extensive availability in cultivation/ plantation, the illegal trade of the species from its wild population is very rarely reported at present.

6.5 Actual or potential trade impacts

The wild population is insignificantly affected by trade at present as the harvest/trade is infrequent from wild mainly due to enormous availability of harvestable trees in plantation/ cultivation. Therefore, the actual or potential trade impact is low.

7. Legal instruments

7.1 National

The wild subpopulations of *D. sissoo* are found in several Protected Areas of the country, viz. Nandini Wildlife Sanctuary of Jammu and Kashmir, Corbett National Park, Rajaji National Park of Uttarakhand, Sher Jung National Park of Himachal Pradesh, Pilibhit Tiger Reserve,Dudhwa National Park of Uttar Pradesh, Valmiki National Park, Kanwar Lake Bird Sanctuary of Bihar, Daying Ering Wildlife Sanctuary of Arunachal Pradesh, Bura Chapori Wildlife Sanctuary of Assam etc. and the Wild Life (Protection) Act, 1972 prevents removal of any tree from any Protected Area. The harvest of *D. sissoo* outside the Protected Areas is also regulated by rules/Acts of different States/ Union Territories. The species is listed as 'restricted species' in Jharkhand, West Bengal and permission is required for harvesting (in private lands), transportation and marketing of this species. As per the 'Jharkhand Timber and Other Forest Produce (Transit and Regulation) Rules, 2004' (with amendments proposed in 2010), tree of *D. sissoo* can be removed only after obtaining permission from DFO or authorized ACF. In West Bengal, the 'West Bengal Private Forest Act, 1948', 'West Bengal Forest Produce Transit Rules, 1959' and 'West Bengal Trees(Protection and Conservation in Non Forest Areas) Act, 2006' are in forces which regulate permission for felling and transit of trees grown on private lands and permission is mandatory for11 species, including *D. sissoo*. Assam (Control of felling and removal of Trees from Non Forestland) Rules, 2002 vide Notification No. FRM-88/2001/77 dated 7th May, 2002 regulates felling permission and transit of timber derived from non-forest areas of Assam and 48 tree species have been declared as 'Reserve tree' in Assam including *D. sissoo*. In Haryana only dead, diseased and drying trees of *D. sissoo* are being harvested. Working plans of the state do not prescribe for green felling of *D. sissoo*. However, green trees are harvested only in case of emergency felling when forest area is diverted for non-forestry activities. *D. sissoo* is the state tree of Punjab and no green tree of this species has been marked for felling as per the Working Plan of the state.

7.2 International

As the genus *Dalbergia*is listed under Appendix II of CITES since 2nd January 2017, CITES permit (for parties)/ comparable certificate (for non-parties) is required to export/import for any material of *D. sissoo.*

8. Species management

8.1 Management measures

The wild subpopulations of *D. sissoo* are found in Jammu and Kashmir, Punjab, Haryana, Himachal Pradesh, Uttarakhand, Uttar Pradesh, Bihar, West Bengal, Assam, Arunachal Pradesh, whereas the cultivated plants of *D. sissoo* are found almost throughout the country. The wild population is insignificantly affected by harvest as the harvest is infrequent from wild mainly due to enormous availability of harvestable trees in plantation/ cultivation. Moreover, the legal instruments enforced in different states/ union territories also protect the wild population, even the cultivated population of *D. sissoo*in India. *Dalbergia sissoo* is the second most important cultivated timber tree in India. The species can be found in plantation/cultivation and/or agroforestry system in almost every parts of the country and it is very common in the northern, north western, central, eastern parts of country mainly along highways, roads, riverbeds, water bodies, railway tracks, lands for cultivation and also found in villages, cities, forest area. In Bihar, Chhattisgarh, Gujarat, Haryana, Jharkhand, Odisha, Madhya Pradesh, Punjab, Rajasthan, Uttar Pradesh, Uttarakhand, West Bengal, *D. sissoo* can be found

almost in every villages/town/ cities. This abundance is mainly due to its first growth rate and utility of its timber in making handicraft, furniture, tools and artifices etc. for which it is mostly preferred by the forest departments, NGOs, other agencies in afforestation/ restoration programmes and also by the farmers for commercial use. The species is enormously available in several Government and private nurseries (Bhattacharjee & al., 2018)) of almost all states and union territories of India for ex-situ conservation, plantation, afforestation, reforestation and also for distribution/sale. The forest departments of different states (like Haryana) are following a protocol (Bhattacharjee & al., 2018) to combat against the diseases of *D. Sissoo* which is found effective.

8.2 Population monitoring

Being a very common species on cultivation, the market demand is easily fulfilled from cultivated plants. The wild population of *D. sissoo* is also not affected by harvest and trade and therefore, the programmes related to monitoring the status of wild populations and the sustainability of off take from the wild are not taken up. In Haryana, only dead, diseased and drying trees of *D. Sissoo* are being harvested and the Working plans do not prescribe for green felling of *D. sissoo*. However, sometimes green trees are harvested only in case of emergency felling when forest area is diverted for non-forestry activities.

8.3 Control measures

8.3.1 International

Apart from the CITES Management Authority of India, the Export Promotion Council for Handicrafts (EPCH) is also authorised for verification of legality and legal origin of wood and wood products in India and EPCH has developed the "Vriksh standard Timber Legality Assessment and Verification Scheme". The EPCH is entitled to issue 'Vriksh Shipment Certificate' for exporting goods containing *D. sissoo* by verifying Forest auction note/ sales invoice of forest department, social forestry sales invoice, cutting permit issued by the forest department, attested Khasra/field details indicating the location from where the tree was removed, Mandi Samiti (Agricultural Produce Marketing Committee) receipt and Gate Pass, invoice of sawmills, License and sawmill record (register) attested by the forest department, transit permit, weighment bridge slip, sales Invoice of immediate supplier, Vat or Sales Tax document, etc.

8.3.2 Domestic

The species is listed as 'restricted species' in Jharkhand, West Bengal and permission is required for harvesting (in private lands), transportation and marketing of this species. In Assam, *D. sissoo* is 'reserved tree' and therefore, felling and transit of the species is regulated.The timber of *D. Sissoo* sourcing from Bihar to other states has been banned.

8.4 Captive breeding and artificial propagation

In India, *D. sissoo* is very common in cultivation and found growing in farmers' land, gardens, plantations etc. (i.e. under controlled conditions). These trees are grown from seeds, cuttings, stumps, propagules derived from cultivated parental stock and therefore are 'artificially propagated'.Artificial regeneration is possible through almost all common practices such as direct sowings, entire transplanting, planting stumps and root sections and stem cuttings, cloning, etc. Stump planting (planting c. 5 cm of stem and 20 cm of root) is known to be the best method of artificial regeneration (Lodhiyal& al., 2001). Artificial propagation of *D. sissoo* is frequently done by the Forest departments of almost all states and union territories of India resulting enormous availability of seedling/ saplings/ stump at their nursery.

8.5 Habitat conservation

Dalbergia sissoo is found in wild condition in several Protected Areas (PAs) of the country namely Ramnagar Wildlife Sanctuary, Jasrota Wildlife Sanctuary and Nandini Wildlife Sanctuary in Jammu and Kashmir, Saraswati Plantation Wildlife Sanctuary in Haryana, Nangal Wildlife Sanctuary in Punjab, Sher Jung National Park in Himachal Pradesh, Corbett National Park, Rajaji National Park in Uttarakhand, Pilibhit Tiger Reserve and Dudhwa National Park in Uttar Pradesh, Valmiki Tiger Reserve, Kanwar Lake Bird Sanctuary in Bihar, Daying Ering Wildlife Sanctuary in Arunachal

Pradesh, Bura Chapori Wildlife Sanctuary in Assam etc. Apart from PAs, the species is also found in Reserve Forests which are also protected and regulated by forest department of concerned state/ union territory.

8.6 Safeguards

Not applicable

9. Information on similar species

Dalbergia sissoo is easy to identify in living condition, unlikely to be confused with other species.

10. Consultations

India has circulated the draft proposal of *D. Sissoo to the* Range countries of namely; Afghanistan, Bangladesh, Bhutan, Islamic Republic of Iran, Iraq, Myanmar, Nepal, Pakistan, Philippines and South Africa on 18th December, 2018. In response to India proposal, Bhutan, Bangladesh and Nepal have agreed to become a co-proponent of the proposal.

11. Additional remarks

From a policy perspective, delisting of *D. Sissoo* from CITES Appendix II is recommended as the species is widely distributed and also very common in Indian subcontinent, but due to its recent inclusion in CITES Appendix II the trade and export of this species is highly affected, in spite of its abundance both in wild and on cultivation. The wild population of this species does not fall under any Threatened categories. *Dalbergia sissoo* is the second most important cultivated timber tree in India and its abundance on cultivation is linked with its fast growth rate and also with its capacity to generate revenue for its sustainable utilization in several industries. It has been found that putting restriction on trade/ export of *D. Sissoo* is discouraging the farmers to grow the species in their fields which may be detrimental to overall population of the species in future.

The species has been widely introduced, especially in Africa and Asia and it is even treated as invasive in Florida, USA and the Northern Territories, Australia, and has failed a risk assessment for the Pacific. It has a tendency to naturalise in other areas, but its use as a high value timber and agroforestry species may over-ride any risks of invasion in many developing countries (https://www.cabi.org/ISC/datasheet/17808).

Indian handicraft industry has been affected highly due to inclusion of *D. sissoo* in CITES Appendix II. In spite of huge availability of harvestable trees under cultivation/ plantation and timber in depots, the legal restrictions on export of *D. sissoo* products have caused severe financial loss to the industry during 2017–18and livelihood of around 50000 artisans is affected. As per the data obtained from Export Promotion Council for Handicrafts (EPCH), India has potential to export over Rs.1000 crores of wooden handicrafts items made from *D.sissoo*, however due to the challenges, the exports which took place was around Rs. 617 crores in respect of this species, out of the total wood ware exports of around Rs. 4200 crores in 2017–18.

Therefore, delisting of *D. sissoo* from CITES Appendix II will be helpful to utilize this widely available, common species sustainably and also to control its invasiveness in many countries.

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Annexure 1				
Wild population data of *Dalbergia sissoo* based on hectare wise randomly surveyed locations in some parts of India				
State	**Location**	**No. of trees (DBH ≥ 8 cm) per hectare (average based on minimum 3 plots of 100 x 100 m)**	**No. of seedlings/saplings/plantlets per hectare (average based on minimum 3 plots of 100 x 100 m)**	**#Regeneration rate (RR) = No. of individuals reproduced or regenerated (Nr)/ No. of individuals at the age of reproduction (Ns) x 100**
Arunachal Pradesh	Tezunala river side	17	85	500
Arunachal Pradesh	Lai Nala river side	44.3	540	1218
Arunachal Pradesh	Dying Ering Wildlife Sanctuary	19.6	232	1183
Arunachal Pradesh	Near Parshuram Kund along river side	33.3	70	210
Assam	Bura Chapori Wildlife Sanctuary	31.6	90	284
Bihar	Valmiki Tiger Reserve	18	70	388
Bihar	Kanwar Lake Bird Sanctuary	11	24	218
Himachal Pradesh	Swarghat Range	34.6	125	361
Himachal Pradesh	Naina Devi Range	32	96	300
Himachal Pradesh	Kaula Wala Toba	27	97	359
Himachal Pradesh	Kangoo forest	31	62	213
Himachal Pradesh	Sundarnagar	9	50	555
Himachal Pradesh	Tandu Forest Division	17	85	500
Himachal Pradesh	Narla	16.3	29	177
Himachal Pradesh	Gwali	14	21	150
Himachal Pradesh	Jaisinghpur	29	145	517
Jammu and Kashmir	Nagrauta	27	84	311
Jammu and Kashmir	Jagti	21	57	271
Jammu and Kashmir	Tanda	31	67	109

Jammu and Kashmir	Samba	25	102	408
Jammu and Kashmir	Hariachak	27	79	292
Jammu and Kashmir	Jasrota Wildlife Sanctuary	21	67	319
Jammu and Kashmir	Kathua	30	79	263
Jammu and Kashmir	Akhnoor	17	85	500
Jammu and Kashmir	Nandini Wildlife Sanctuary	29	120	413
Jammu and Kashmir	Udhampur	31	62	200
Jammu and Kashmir	Jaganoo	29	87	300
Jammu and Kashmir	Markana	22	55	250
Jammu and Kashmir	Forest area nearby Jammu	15.3	65	424
Jammu and Kashmir	Ramnagar Wildlife Sanctuary	35	148	422
Jammu and Kashmir	Udhampur	32	78	243
Sikkim	After crossing Rongpoo along Teesta river	16	45	281
Uttar Pradesh	Barahi Range	13	65	500
Uttar Pradesh	Bankati Range	9	36	400
Uttar Pradesh	Haripur Range	16.3	51	312
Uttar Pradesh	Faizullagange Beat	37	74	200
Uttar Pradesh	Mahof Range	12	48	400
Uttar Pradesh	Simra Beat	33	45	136
Uttarakhand	Along riverbeds near Doiwala	38	410	1078
Uttarakhand	Near Ramnagar along riverbeds	22	110	500

Uttarakhand	Sitabani, Corbett National Park	15	56	373
Uttarakhand	Kayri	8	12	150
West Bengal	Along Teesta river at c. 4 and 7 km before Rangpo	15	68	453

RR = 0–100 = low; 100–1000 = Average; > 1000% = High (Anon. 2013. *Evaluation écologique des boisprécieux, provision de donnéestaxonomiques, validation et mise au point de méthodes de quantification pour la gestion durable des boisprécieux de Madagascar*. Department of Biology and Plant Ecology of the Faculty of Science of the University of Antananarivo, Final report ITTO-CITES)

Tress ≤ 5 = Rare; 6–10 = Scarce; 11–20 = Common; >20 = Abundant

Annexure 2

Cultivated population (excepting pure and monospecific plantations) data of *Dalbergia sissoo* based on hectare wise randomly surveyed locations in some parts of India

State	Location	No. of trees (DBH ≥ 8 cm) per hectare (average based on minimum 3 plots of 1 hectare each)
Arunachal Pradesh	Tinsukia to Tezu	15
Andhra Pradesh	Pulla village, West Godavari District to Visakhapatnam via Rajmundhry	10.6
Andhra Pradesh	Atmakur to Nandyal road	37
Andhra Pradesh	Nandyal to Mahanandi	29
Andhra Pradesh	Anantapur to Kadiri highway	36
Andhra Pradesh	Dharmavaram to Pulivendula	8.6
Andhra Pradesh	Dharmavaram to Gorantla	31.3
Andhra Pradesh	Gorantla to Kadiri	12
Arunachal Pradesh	TezuNala adjacent areas	7
Arunachal Pradesh	Deopani river side	6
Arunachal Pradesh	Paya, Lohit	35
Arunachal Pradesh	Digaru near Haju river, Lohit	24
Assam	Bamunigaon roadside, West Kamrup	8
Assam	Guwahati roadside	9
Assam	DigholiPukhri roadside, Kamrup metro	20
Assam	North Kamrup (Rangia)	25
Assam	Tulsibari Reserve Forest	7
Assam	Tulsibari roadside	30
Assam	Navodaya Vidyalaya	15
Assam	Vasishta on highway, East Kamrup	35

Assam	Sadiya	13
Assam	Rupai siding	17
Assam	Hansara	19
Assam	Doomdooma	17
Assam	Makum roadsides	30
Bihar	On the way to Betiah to Govardhana, West Champaran	39
Bihar	Govardhana to Valmiki Nagar	32
Bihar	Valmiki Nagar to Betiah	29
Bihar	Bhagalpur to Banka State highway	20
Bihar	on the way to Chausa to UdaKishanganj	27
Bihar	Arrar Nahar area (both sides of road)	26
Bihar	On the way Binpur Railway Station to TulsipurJamunia, Bhagalpur	34
Bihar	Narayanpur Block	10
Bihar	On the way to Haveli Kharagpur to Jamui, Munger	12
Bihar	Munger to Sultanganj	18
Bihar	On the way to Narayanpur to Purnea, Purnea	21
Bihar	Maheshkhunt to Beldaur bazar, Khagaria	32
Chhattisgarh	Raipur	15
Chhattisgarh	Dhamtari to Bilaspur	12
Chhattisgarh	Bilaspur	17.3
Chhattisgarh	Takhtpur Range, Bilaspur	31.3
Dadra and Nagar Haveli	Athal	17
Dadra and Nagar Haveli	Morkhal	16
Dadra and Nagar Haveli	Dudhani	18.3
Dadra and Nagar Haveli	Silvassa	12
Dadra and Nagar Haveli	Randha	15

Haryana	Khazirabad road, Yamunanagar	32
Haryana	Nature Camp, Jagdhari, Yamunanagar	13.3
Haryana	Jaggadhari	32.3
Haryana	Bilaspur, Yamunanagar	34
Haryana	Khazirabad to Bilaspur	31
Haryana	Yamunanagar to Kurukshetra	29
Haryana	Kurukshetra to Ladwa	22
Haryana	Khanpur	29
Haryana	Hinauta	25
Haryana	Chandigarh along roadsides	26
Himachal Pradesh	Sundarnagar to Mandi, Kangoo Forest	19
Jammu and Kashmir	Jammu town	20
Jammu and Kashmir	Nagrauta	22
Jammu and Kashmir	Tanda	19.3
Jammu and Kashmir	Sambha	18
Jammu and Kashmir	Hariachak	12
Jammu and Kashmir	Udhampur	11.3
Jammu and Kashmir	Jaganoo	22
Jammu and Kashmir	Jasrauta	19
Jammu and Kashmir	Jagti	25
Jammu and Kashmir	Markanaand adjacent areas	9
Jammu and Kashmir	Jammu to Udhampur	31

Jharkhand	Jamshedpur	11
Jharkhand	Chaibasa, West Singhbhum	26.3
Jharkhand	Ranchi town	14
Jharkhand	Ranchi to Patratu	13
Jharkhand	Ranchi to Khunti	8
Jharkhand	Ranchi to Lohardaga	22
Jharkhand	Khunti town	9
Jharkhand	Khunti to Korra	15
Jharkhand	Lohardaga to Chandwa	31
Jharkhand	Chandwa to Latehar	23
Jharkhand	Latehar to Betla	31
Jharkhand	Betla to Gumla	21
Jharkhand	Palkot road	19
Jharkhand	Chandwa to Balumath	18
Jharkhand	Balumath to Bariyatu	19.6
Jharkhand	Bariyatu to Chatra District	10.6
Jharkhand	Chatra to Hazaribagh road	27
Jharkhand	Hazaribagh town and Canary Hills area	15.3
Jharkhand	Giridih road	29
Jharkhand	Giridih to SariyaBagodar road	27
Jharkhand	Hazaribagh to Ramagarh	16.3
Karnataka	Shivamogga	8

Karnataka	Chitradurga	9.6
Karnataka	Chikmangluru and its adjacent area	11
Karnataka	Thammenahalli, Bangaluru	10.6
Karnataka	Bangaluru to Tumkuru	14.6
Karnataka	Mysuru to Chamrajnagar	19.6
Karnataka	Way to Chamundi hills	8.3
Karnataka	Mysuru to Bangaluru	23
Karnataka	On the way Chikmangluru to Hassan	9
Karnataka	Sankeshwar and Nipani	25
Karnataka	Satpura Bhawan surrounding area	13
Madhya Pradesh	Satpura Bhawan to Bhadbhada Nursery	25
Madhya Pradesh	Bhadbhada Nursery and adjacent areas	15
Madhya Pradesh	Biodiversity Learning and Demo Centre, Surajnagar, Bhopal	32
Madhya Pradesh	Surajnagar to Sehore	14
Madhya Pradesh	Sehore and adjacent areas	23
Madhya Pradesh	Sehore to Cresent roadside	24
Madhya Pradesh	Indore Naka Road	10
Madhya Pradesh	Indore Highway	37
Madhya Pradesh	Hoshangabad roadside	21
Madhya Pradesh	Bori Gaon	14
Madhya Pradesh	Budhani roadside	15
Maharashtra	Anjaneri hills, Nashik	30.3

Maharashtra	Tata Radio Station Campus	21
Maharashtra	Wadaj Dam	9
Maharashtra	Satara to Karad	15
Maharashtra	Karad to Kolhapur	25
Maharashtra	Gorewada Rescue Centre, Nagpur and adjacent areas	19
Maharashtra	Gorewada Safari Gate No. 1	26
Maharashtra	Nature Trail and adjacent areas	17
Maharashtra	Katol road side, Nagpur	15
Maharashtra	Banpaoni, Silari	11
Maharashtra	Ramtek	9
Maharashtra	Parshivani and adjacent areas	12
Odisha	North Simplipal National Park, Mayurbhanj	32
Odisha	South Simlipal	26
Odisha	Baripada and adjoining area	24
Odisha	Keonjhar	14
Odisha	Hilly areas of Keonjhar	11.3
Odisha	Rairangpur District	32.6
Odisha	Rourkela, Sundargarh District	31
Odisha	Rourkela to Kuarmunda	23
Punjab	Ludhiana	24
Punjab	Ludhiana to Mulanpur	19
Punjab	Jalandhar	17

Punjab	Kapurthalla	32
Punjab	Kapurthalla to Amritsar	21
Punjab	Amritsar to Atari border	14
Punjab	Bajawa Range, Hosiyarpur	33
Punjab	Hosiyarpur to Ropar	17
Punjab	Kadai Canal	33
Punjab	Ropar to Chandi	10
Punjab	Rock Garden, Chandigarh	6
Rajasthan	Near Abu Road	16
Rajasthan	Pindwara	14
Rajasthan	Bhinder	28
Rajasthan	Banswara	12.3
Rajasthan	Baansi	14
Rajasthan	Sajjangarh	15
Rajasthan	Gogunda	13
Rajasthan	Bhatewar	13.6
Rajasthan	Iswal	14.3
Rajasthan	Kanore	11.6
Rajasthan	Mangalwar	11.3
Rajasthan	Todgarh	13
Rajasthan	Swaroopganj	10
Rajasthan	Pindwara	12

Tamil Nadu	Kovipalayam, Pollachi	8
Tamil Nadu	Kovai Nursery, Pollachi	9.6
Tamil Nadu	Mettupalayam, R.S. Puram, Coimbatore	18
Tamil Nadu	Coimbatore to Gudalur (K. Vadamadurai, MTP road, Coimbatore)	20
Tamil Nadu	Amnankovil and Munukattyur, Telengupalayam to Mettupalayam road	30
Tamil Nadu	Azhakiapandyapuram Range Forest Office compound, Kanyakumari	9
Tamil Nadu	Near Bhavani Sagar Range	31
Tamil Nadu	Sathyamangalam, Erode	6
Tamil Nadu	On the way to Bhavani Sagar Range	5
Telangana	Hyderabad to Narsapur highway	32.3
Telangana	Dullapally Forest Research Institute	36.6
Telangana	Hyderabad to Jadcherla highway	39
Telangana	Jadcherla to Wanaparty road	9
Telangana	Wanaparty to Manajipet road	34.3
Telangana	Warangal to Pakhal road	36
Telangana	Ashoknagar	13
Tripura	Agartala	10
Uttar Pradesh	Roadside of adjacent area of Pilibhit Tiger Reserve	32.6
Uttar Pradesh	Sampurnanagar Range, Dudhwa National Park	31.3
Uttar Pradesh	Sidia Beat, Dudhwa National Park	24
Uttar Pradesh	South Sonaripur Range, Dudhwa National Park	28
Uttar Pradesh	Dudhwa Range, Dudhwa National Park	26

Uttar Pradesh	Etawa to Kanpur roadside	31
Uttar Pradesh	Varanasi roadside	15
Uttar Pradesh	Ramanagar	22
Uttar Pradesh	Varanasi	16.6
Uttar Pradesh	Chakia and adjacent areas	27
Uttar Pradesh	Ahrora, Robertsganj and adjacent areas	23
Uttar Pradesh	Robertsganj DFO Office	10.3
Uttar Pradesh	Robertsganj	9
Uttar Pradesh	Robertsganj Railway yard	25
Uttar Pradesh	RobretsganjObra Forest and adjacent areas	18
Uttar Pradesh	Vijaygarh adjacent areas	19.3
Uttar Pradesh	Babani Range and adjacent areas	29.3
Uttar Pradesh	Bagharu Range, Renukoot	10
Uttar Pradesh	Renukoot to Mirzapur and adjacent area	31
West Bengal	Adina Forest, Malda	16.3
West Bengal	Adra and nearby area	11
West Bengal	Sonajhuri village, Jharpukuria, Malda	22
West Bengal	Halna Forest, Malda	7
West Bengal	Rajadighi Beat, Malda Range	10.6
West Bengal	Rajadighi to Alampur, Malda	19
West Bengal	Abdul Ghata Forest, Raiganj	12
West Bengal	Mukundapur, Raiganj	7

West Bengal	Pindol to Vatol towards Panchvhaya, North Dinajpur	17
West Bengal	Panchvhaya, Raiganj	24
West Bengal	Near Kopai, Bolpur	7
West Bengal	Bishnupur	3
West Bengal	Chainagarh	9.3
West Bengal	Kalikamora	9
West Bengal	Kashmukti to Buniayadpur	31
West Bengal	Danga Forest, Balurghat	25
West Bengal	Gobindpur to Udol	12
West Bengal	Kumarganj Beat	21
West Bengal	Khapur hilly road, Balurghat	25.3

Tress ≤ 5 = Rare; 6–10 = Scarce; 11–20 = Common; >20 = Abundant