

Rose Wood (*Dalbergia* spp.); A Luxury Timber

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Abstract

Rose wood (*Dalbergia* spp.) of family fabaceae is categorized as precious woods and have been subjected to increasing demand over the past decade, created mostly by increasing wealth of the middle class in China and also in Vietnam. In 2014, a list of commercial timber species included 32 species of *Dalbergia* which were present in trade with high economical value. All types of rose wood timber are relatively hard, dense, heavy varieties of wood, with distinct colour and fragrance. *Dalbergia* spp. have a pan-tropical distribution occurring throughout Asia, Africa and the America in a wide array of habitats. There is sufficient evidence available to assume that all precious rosewood timber producing species in the *Dalbergia* genera are threatened (or likely to be threatened in the near future) and demand keep rising. Forestry contributes to economic growth in developing countries, and contrariwise, rising wealth in those countries increases domestic demand for wood products. Like other Asian countries (Malaysia, Thailand, Vietnam), Sri Lanka also possess the potential of entering world timber market. There is a high potential of planting Rose wood species in agroforestry systems and timber plantations in Sri Lanka with a promising future in the timber production.

Key words: Agroforestry, *Dalbergia* spp., Rose wood, Timber

I. INTRODUCTION

The term ‘rosewood’ is used to describe species from several genera. In 2014, a list of commercial timber species included 32 species of *Dalbergia* which were present in trade (Mark et al., 2014) out of a possible 64 timber-producing species (Groves and Rutherford, 2016). Species of the genus *Dalbergia* is widely distributed in tropics (Groves and Rutherford, 2016), occurring throughout Asia, Africa and the Americas in a wide variety of habitats (Winfield et al., 2016). There are at least 7 highly valued timber species

of *Dalbergia* in Asia, most of them are indigenous to India and Myanmar. *Dalbergiasissoo* (Biradi) and *D. latifolia* (Indian Rose Wood) are among the most important timber trees of the genus.

Many species of *Dalbergia* are under a range of threats, including deforestation, forest conversion for agriculture and human development, and highly from legal and illegal logging to supply domestic and international markets (Winfield et al., 2016). Some *Dalbergia* species are considered to be ‘exquisite luxury woods’ and draw high prices. These are highly valued for a range of valuable inherent qualities including appearance, tone, physical, scent, chemical, medicinal or spiritual properties, and (are) rare or of limited availability (Jenkins et al., 2012). And, it should also be noted that there are large number of *Dalbergia* species with no commercial value, and do not resemble the species in international trade.

As a result of significant surges in demand for wood and timber products mainly due to constantly growing demand for wood, particularly by emerging economies like Brazil, China, India, and South Africa, is strongly affecting forests and forest-dependent people in producer countries. For example, in China total forest product imports rose from 40 million cubic meters (m³) to almost 150 million m³ between 1997 and 2005 (Winfield et al., 2016). It is anticipated that demand, both domestic and from outside the country, will continue to rise, and forest-product imports to China are likely to double within the next 20 years (Forest trends, 2006).

Forestry contributes to economic growth in developing countries, and conversely, rising wealth in those countries increases domestic demand for wood products, so sustainably grown wood products are needed in Sri Lankan context. And this should be achieved using one or more species with an increasing market value with a higher consumer preference. Timber *Dalbergia* spp. like *Dalbergialatifolia*, *Dalbergiasissoo* would play a main role.

Forest plantation in Sri Lanka consist of mainly forest plantations belong to forest department and companies under ministry of plantation industries consisting 16 463 ha of total forest plantations and average harvested timber volumes of Teak (super luxury) and Mahogany (luxury) were 47.7 and 13m³/ha respectively in 2007 (Ruwanpathirana, 2011) and were not adequate to fulfill local demand.

A. Why *Dalbergia* is important

The demand for Rosewood has been surged over the past decade, created mostly by the increasing wealth of the middle class in China, but also in Vietnam. As such, tree species that produce precious woods under the umbrella term ‘rosewood’ are threatened. Traditionally *Dalbergia* species have been the main target of Chinese Hongmu Standard Trade, however as these species have become less available, through stricter conservation measures and/or enforcement of logging and export bans, there is a necessity of commercial plantation, afforestation and conservation of the species in wild.

Consecutive depletion of rosewood species throughout the world is a real and substantial risk to their survival. There is clear evidence that trade in rosewood species rapidly shifts from one highly valued species to another as stocks become depleted. Following the 1992 listing of *D. nigra*, the preeminent rosewood appreciated in the market on CITES Appendix I, Madagascan species began to appear in trade at much higher levels than previously recorded. Similarly, by 2013 of *D. cochinchinensis*, Malagasy *Dalbergia* species and several South American *Dalbergia* species have been listed on CITES. There is sufficient information available to deduce or predict that all precious rosewood timber producing species in the *Dalbergia* genera are threatened (or likely to be in the near future) (CITES CoP17 Information Paper).

Another classic rosewood comes from *Dalbergialatifolia* known as (East) Indian rosewood. Madagascar rosewood (*Dalbergiamaritimais* highly prized for its red color. It is also being overexploited in the wild (Convention on International Trade of Endangered Species of wild fauna and flora).

Throughout southeast Asia *Dalbergiaoliveri* is harvested for use in woodworking (Nghia, 1998) and has a very fragrant and dense grain near the core, however the outer sapwood is soft and porous. *Dalbergiacultrata* that has variegated wine-red to light brown color, a blackwood timber is sold as Burmese Rosewood (Hoang et al., 2004).

Some rosewood comes from *Dalbergiaretusa*, also known as the Nicaraguan rosewood which is controlled by CITES under Appendix 2 which allows some commercial activity. Other than that for the manufacture of marimba keys, guitar parts, clarinets and other musical and ornamental applications several species are known as Guatemalan rosewood or Panama

The main factors influencing increment of timber demand is mainly from, increasing economic development, particularly in emerging-market economies (for example, Brazil, China, India, and South Africa), decrease of production forest area (natural forests), resulting in traditional net exporters

rosewood, *D. tucerencis*, *D. tucarensis*, and *D. cubiquitzensis*, Honduran rosewood, *D. stevensonii*.

B. *Dalbergia*, as a luxury timber

Dalbergia spp. rosewood was reported to be highly prized by international traders and price up to USD 6000 per cubic meter (Environmental Investigation Agency, 2012). The global trade in rosewood is estimated to have surged from around US\$300 million to close to US\$3 billion over the past decade (International Tropical Timber Industry, 2016).

The heartwood of rosewood can be either golden brown or a dark blood-red, while the sapwood is pale yellow and up to 60mm wide. The wood is of medium texture and the grain is variable. Freshly cut, the wood has a fragrant odor. Most varieties of rosewood feature a moderately coarse, uniform texture. Grain patterns in this type of wood are generally interlocking. All types of rosewood timber are relatively hard, dense, heavy varieties of wood. Compared with other hardwood varieties, these woods offer medium shock resistance, relatively high crushing strengths and high bending strengths. Rosewoods also offer good stability. Most varieties of rosewood machine and sand very well, making easy in handling. These woods hold nails and screws very well compared to other types of hardwood, and glue adheres relatively well. Leading furniture makers actively seek out the timber because of its flexibility, strength and the relative ease of its working qualities and finishing properties as well as its low shrinkage and stability in-service. Most varieties of rosewood offer generally the same densities. The density of East Indian rosewood is slightly higher than Bolivian rosewood; it is approximately 48.7 pounds per cubic foot.

Timber produces a beautifully figured wood enhanced by the presence of ‘ripple-marks’ and its ring-porous wood structure. A ribbon or banded figure is apparent on quarter-sawn faces and a cathedral-like figure on back-sawn faces.

The timber seasons readily and well, however care should be taken not to dry the timber too fast as distortion and checking can occur. It is a remarkably stable timber with very low shrinkage and very little movement when in-service. Properly seasoned timber is dimensionally stable, and retains its shape well after manufacture and highly resistant to termites.

C. Potential to grow in Sri Lanka

turning into net importers of timber and timber products (for example, Malaysia, the Philippines, Thailand), population rise. according to the forest trends in 2016 within an average of 10-15 years the world main timber exporters will runoff their timber sources as shown in Table 1.

TABLE I
Estimated Number of Years Left of Economically Accessible Timber, by Country

Country of origin	Years
Russia (far eastern region)	> 20
Papua New Guinea	13–16
Myanmar	10–15
Indonesia	10
Cambodia	4–9

Source: Forest Trends 2006

Today, plantation forestry plays a significant role for wood production, especially in tropical countries, because of several important characteristics including high yield, short rotations, and accessibility. Although some plantations are for protection purposes, most are for production (FAO 2006). At present plantation forestry is also gradually changing from

large-scale investments in monocultures to small-scale investments in which local households and communities are the principle owners of the means of production, not just employed as laborers.

Also, agroforestry systems are accepted to provide support for the wider acceptance of the role of promotion of enhanced livelihoods for poor farmers in the tropics (Leakey et al., 2017) and many *Dalbergia spp.* are excellent agroforestry tree components with their ability to fix atmospheric nitrogen. The species like *Dalbergiasissoo*, *D. latifolia*, *D. melanoxylon* are excellent soil conditioners and provide fodder for cattle and are easily adoptable to Sri Lankan conditions.

According to world agroforestry organization Sri Lanka is within the range, where exotic *Dalbergiaspp* can be introduced (Fig. 1).



Fig.1 Documented Species Distribution of Dalbergia

Though, many of preeminent *Dalbergia* timber species are banned from logging due to over exploitation and threat of extinction, the demand is sky rocketing markets are shifting. As an example, there has been a definite shift from exporting of logs from Vietnam to China in favor of sawn wood, despite both commodities being banned for export if obtained from natural forests in Vietnam (Winfield et al., 2016). Whilst China still relies on rosewood species from Asian nations for logs and sawn wood, and there is a high possibility of Sri Lanka entering the rosewood market. Hence, Sri Lankan timber sector can introduce unbanned and emerging *Dalbergiaspp* like *Dalbergiasissoo*, a tree component in agroforestry, because *Dalbergia* does not yield only precious timber, but also many other important products and advantages.

There is a possibility of mass production of plantlets through *invitro* and *invivo* (using root cuttings and layering) (Subasinghe et al., 2016).

II. CONCLUSION

Rose wood is a precious timber species, for which demand keeps rising. But, due to threat of extinction and non-availability of sustainable timber plantations of rosewood in main producing countries, there is a trend in shifting the market. There are a large number of rose wood species like *Dalbergiasissoo* and *Dalbergialatifolia* which can be easily adopted and propagated in Sri Lanka and there is a high potential of planting Rose wood species in agroforestry systems and timber

plantations to meet future local and world demand. This will provide support for the role of conservation and sustainable tree management of rose wood species for timber and promotion of enhanced livelihoods for farmers in Sri Lanka.

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