

Some Important Rosewood and Their Deforestation Status in Southern Shan State of Myanmar

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Abstract

Myanmar is the largest country in mainland of Southeast Asia with a land area of 675577km². Forty-two percent of the area of Myanmar is mountainous and these areas form some of the most important land scopes in term of biological, cultural, traditional and ethnic diversity and identity. Mountainous areas are also important for the country's economy, providing most of the fresh water for the country. In this research, 12 species in 7 families of important various Rosewood (hardwood) in some areas of Southern Shan State were studied on botanical points of views, which have deeply effect on forest-ecosystem for environmental status, over-exploitation and illegally forest-trade of Rosewood species by native people in this region. It is located in eastern plateau of Myanmar. Very popular native species such as, *Dalbergia oliveri* (Ta-ma-lan), *Dalbergia cultracta* (Yin-daik), *Dipterocarpus tuberculatus* (In), *Shorea robusta* (In-gyin), *Shorea obusa* (Thit-ya), *Lithocarpus magnificus* (Gaw-phyu), *Castaneopsis argyrophylla* (Gaw), *Sapindus rarak* (Sat-pyar-thi-pyin), *Cedrela serrata* (Taung-ta-ma), *Pterocarpus macrocarpus* (Thit-padauk), *Schima wallichii* (Thit-yah) and *Pinus kesiya* (Tinyu-net) are highly value and increasingly sold illegally across the border as Rosewood supplies are exhausted in neighboring countries. The rate of all natural habitats, including forests, is at least halved and it is close to zero, and so, degradation and fragmentation must be significantly reduced. Finally, the vision of this research highlights the conservation, management and utilization of Rosewood in a sustainable manner for sound and resilient ecosystem in some areas of Southern Shan State, Myanmar.

Keywords: Rosewood, deforestation, conservation

Introduction

Myanmar is situated on the dividing line between the Indian sub-continent and South-east Asia, and holds incredibly rich biodiversity and habitats. Environmental conservation in parallel with economic development opportunities is one of the greatest challenges for Myanmar in the 21st century. In many cases, the remaining habitats in Myanmar are globally important for endangered and critically endangered species survival because large trades of habitat still remain.

In this research, 12 species in 7 families of important various Rosewood (hardwood) in some areas of Southern Shan State were studied on botanical point of view, which have deeply effect on forest-ecosystem for environmental status, over-exploitation and illegally forest-trade of Rosewood species by native people in this region. These species are; *Dipterocarpus tuberculatus* (In), *Shorea robusta* (In-gyin), *Shorea obusa* (Thit-ya) in family Dipterocarpaceae, *lithocarpus magnificus* (Gaw-Phyu), *Castaneopsis argyrophylla* (Gaw) in family Fagaceac, *Sapindus rarak* (sat-pyar-thi-pin) in family Sapindaceae, *Schima wallichii* (Thit-yah) in family Theaceac, *Cedrela serrate* (Taung-ta-ma) in family Meliaceae, *Dalbergia cultrata* (Yin-daik), *Dalbergia oliveri* (Ta-ma-lan), *Pterocarpus macrocarpus* (Thit-padauk) in family Fabaceae and *Pinus kesiya* (Tinyu-net) in family Pinaceae. *Dipterocarpu stuberculatus* (In), *Shorea obtuse* (Thit-ya), *Lithocarpus magnificus* (Gaw-Phyu), *Castaneopsis argyrophylla* (Gaw), *Schima wallichii* (Thit-yah), *Dalbergia cultrata* (Yin-daik), *Dalbergia oliveri* (Ta-ma-lan), *Pterocarpus macrocarpus* (Thit-padauak), *Cedrela serrata* (Taung-ta-ma) and *Sapindus rarak* (sat-pyar-thi-pin) and *Pinus kesiya* (Tinyu-net) are threatened plant

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families (IUCN 2015-2020) with data reference of National Biodiversity Strategy and Action Plan (2015-2020). Dipterocarpaceae family (In, In-gyin, Thit-ya) species are the most threatened plant family among them. Therefore, the consequences of their deforestation impact on ecological balance and sustainable development in areas of Southern Shan State must be known and conserved. Therefore, this research highlights the protection of environment degradation around some areas of Southern Shan State, Myanmar.

Survey to Field Area

12 species in 7 families were collected in some areas of Southern Shan State, such as Nansann, Maisu, Maisan, Sannin and Lachia during flowering and fruiting periods. If it is not the flowering time, detail morphological vegetative characters can be got from collected plants. Usually, we survey some difficult wild important valuable plantation areas monthly. Moreover, deforestation status of 12 wild hardwood native species data was recorded by the help of native people, Forestry and Conservation of Nature of Resources Department in Loilem District during the study period.

Materials and Methods

A. Collection Procedure, Classification and Identification

12 species in 7 families of Rosewood (hardwood) were collected from some areas of Southern Shan State during June, 2017 to March 2018. Then, the classification and identification were made by using vegetative and reproductive characters according to many author citations.

B. Sustainable Development of deforestation Impact on Ecological Balance

12 species in 7 families of Rosewood (hardwood) were nearly clearly cut for many purposes. A few are cut legally according to Myanmar selection system. Many are cut illegally and traded by native people in their regions (MOECAAF, Ministry of Environmental Conservation and Forestry). Clearing cutting species data and deforestation status are surveyed by the field trips and with the help of native people and Ministry of Forest and Nature Resources Reserve conservation in Loilem District. Finally the data are according to the reference data by National Biodiversity Strategy and Action Plan 2015-2020, Myanmar Biodiversity Conservation Investment Vision (2013), Myanmar's Timber woody selected system (2017) and many author citations.



Fig. 1

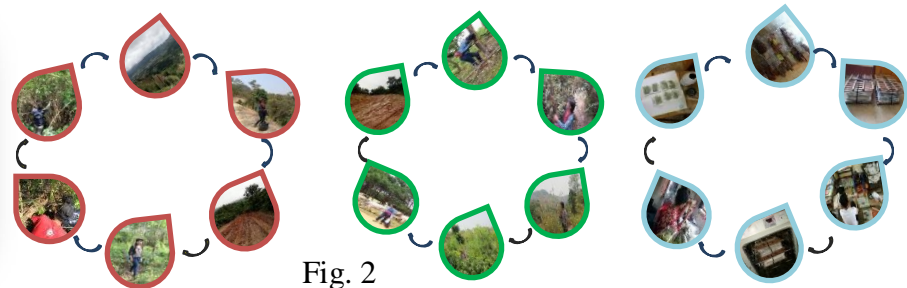


Fig. 2

RESULTS

Family - Fabaceae
Scientific Name - *Dalbergia oliveri* Gamble.
Common Name - Ta-ma-lan

General Information

Dalbergia oliveri grows in deciduous tree form, 15-30 meter tall and 150 cm in diameters. The fruit is a green pod, containing one to two seeds which turn

brown to black when ripe. It is threatened by habitat loss and over-harvesting for its valuable red lumber. This species occurs mainly in Myanmar. It is considered as an endangered species due to over-harvesting in IUCN Red list and due to a population reduction of over 50% in the past three generations caused by a decline in their natural range.



Fig. 3

Family - Fabaceae
Scientific Name - *Pterocarpus macrocarpus* Kz.
Common Name - Thit-padauk (Mai-chi-tauk)
General Information

Pterocarpus macrocarpus is a species of *Pterocarpus* native to South-eastern Asia in Myanmar. It is a medium sized tree, growing up to 10-30 meter tall and 170 cm in diameter. Bark is flaky and grey- brown, and it secretes a red gum. Leaves have 9-11 leaflets and flowers are yellow. Fruit is pod. Their wood is durable and resistant to termite. It is very important and used for various purposes and treaded as rosewood. It is a threatened species and must be sustainable for reforestation in IUCN Red list.



Fig. 4

Family - Fabaceae
Scientific Name - *Delbergia cultracta* Grah.
Common Name - Yin-daik
General Information

Dalbergia cultracta is a mixed deciduous tree with an open narrow crown. It can grow from 10-30 meter tall and 200 cm in diameter. This tree is harvested from the wild for its timber, resin and oil. The timber is said to be of very good quality. The tree is grown in study area and reforestation status in Myanmar. (IUCN)



Fig. 5

Family - Fagaceae
Scientific Name - *Lithocarpus magnificus* (Brandis.) A. Camus
Common Name - Gaw-phyu (Mai-man)
General Information

Lithocarpus magnificus is native to Asia –Tropical shrubs to 1.3 meter tall tree and 150 cm in diameter; stem densely covered with pale aceous pectinate hairs.

Leaves prominently lanceolate and serrate margin. Flowers are solitary or few are in dense cluster the illegal logging of this species is increased in region. Myanmar needs to safeguard its forest from rampart and Chinese growing demand for valuable *Lithocarpus* species. (IUCN)



Fig 6

Family - Fagaceae
Scientific Name - *Castaneopsis argrophylla* King.
Common Name - Gaw (Mai-kaw)

General Information

Castaneopsis argrophylla is an evergreen tropical tree. Stem is up to 20 meter tall and 175 cm in diameter. Leaves are evergreen and slightly broad. Global distribution is in India, Nepal, Asia and Southern Shan State. This species is used only for construction and it is a rare status species in IUCN list.



Fig. 7

Family - Theaceae
Scientific Name - *Schima wallichii* Chois.
Common Name - Thit-yah
General Information

Schima wallichii is a medium evergreen tree up to 35 meter tall, diameter up to 100 cm. It may only be seen mostly over 40 ft high. Bark surface is ruggedly cracked into small, thick, angular pieces, red- brown to dark grey. Leathery leaf margins are entire or slightly toothed. Flowers are white and fragrant. Their timber is used for fence post and house construction. It is in the level of threatened species in commercial market. (IUCN)



Fig. 8 Habit

Family - Meliaceae
Scientific Name - *Cedrela serrate* Kyole.
Common Name - Taung-ta-mar
General Information

Cedrela serrate is a moderate sized evergreen deciduous tree. Stem grows up to 30 meter and 330 cm in diameter. Arching leaves give a palm like appearance. Twigs are stout and barks are thick, dark-brown, rough, and regular and have vertical fissures. It is a very important timber tree, producing a light-weight fragrant wood with very good resistance to termites and insects. This species is protected by extant harvesting in region and it is in threatened level in IUCN.



Fig. 9

Family - **Dipterocarpaceae**
Scientific Name - ***Dipterocarpus tuberculatus* Robx.**
Common Name - **In (Mai-tong)**
General Information

Dipterocarpus tuberculatus is a large deciduous tree species, open crown, growing 15-25 meters tall, 40-60 cm in diameter. The stem form is usually very good on soils. The tree yields a resin and a valuable timber and is commonly harvested from the wild. This species is threatened by habitat loss and fragmentation. Habitat is continuing to decline in area, extent and quality due to agricultural expansion, and is also at risk from selection logging. (IUCN)



Fig. 10

Family - **Dipterocarpaceae**
Scientific Name - ***Shorea robusta* Gaerch.**
Common Name - **In-gyin**
General Information

Shorea robusta is an evergreen tree with an elongated crown when young, becoming more rounded as the tree ages. It can grow up to 50 meters in fertile soil, and up to 200 cm in diameter. It is a very important multi-purpose tree. It is one of the main commercial timbers in region, being harvested from the wild for local use and export. (IUCN)



Fig. 11

Family - Dipterocarpaceae
Scientific Name - *Shorea obusa* Wall.
Common Name - Thit-ya

General Information

Shorea obusa is a large tree species. It is open crown, growing 10-20 meters tall, 35-55 cm in diameter. The stem form is usually excellent on good soils. This species is globally assessed as nearly threatened and of commercial importance. This species population and habitat decline are monitored and remaining species habitat is protected to ensure that the species does not become further threatened. (IUCN).



Fig. 12

Family - Sapindaceae
Scientific Name - *Sapindus rarak* BL.
Common Name - Sat-pyar-thi-pin

General Information

Sapindus rarak is a deciduous tree up to 42 meters tall and 150 cm in diameters. It is a species of soapberry. It is a timber tree but the wood is not durable. Its fruits and seeds are used as buttons and beads. The fruits are used to make a traditional soap for washing clothes. This is cut for construction and fuel.



Fig. 13

Family - Pinaceae
Scientific Name - *Pinus kesiya* Royle.
Common Name - Tinyu-net
General Information

Pinus kesiya is an evergreen deciduous tree. It is up to 30 meter tall and 60 cm in diameter. Bark is brown and irregularly flaking. Its crown is broadly domed and branchlets yellowish-brown. Seeds are black-brown and slightly compressed. This soft and light timber is used for a wide range of many applications and especially it is intensely used for timber. This species is remarked as threatened species in IUCN by over-exploitation in region.



Fig. 14

Phylogenetic trends between 7- Families of Southern Shan State



Fig. 15

Environmental Impact Assessment by Clear Cutting and Illegally Wildlife Trade of Rosewood Species in some Area of Southern Shan State

Variations in latitude, altitude and climate in Myanmar create a variety of habitats and support correspondingly rich plant biodiversity. There are 61 globally threatened plant species known to occur in Myanmar. Of these, 16 are assessed on the IUCN Red list of Threatened Species as Critically Endangered (CR), 24 as Endangered (EN) and 21 as Vulnerable (VU). The main threats to plant species in Myanmar are overexploitation by legal and illegal logging, conversion to agriculture, especially commercial plantations, degradation and fragmentation from road construction and small scale agriculture (WCS 2013). Illegal logging for valuable timber species is a driver of deforestation.

Rosewood forest which absorbs carbon dioxide and maintains global



temperature once destroyed will lead to global warming and will affect the weather.

Fig. 16

Discussions and Conclusions

Three-quarters of Myanmar is 132 key Biodiversity Areas (KBA), these areas are identified as being particularly important for biodiversity. They are located in mountainous areas, and are home to several endemic and globally important species.

In this research, some studied areas and collected species are presented in Southern Shan State of Myanmar. It is located in eastern plateau of Myanmar. Karst formations can be found in Shan State. Plants play a vital role for the survival of human society. Various points of views of 12 native rosewood species in some areas of Southern Shan State were recorded. Very popular native species such as, *Dalbergia oliveri* (Ta-ma-lan), *Dipterocarpus tuberculatus* (In), *Shorea obusa* (Thit-ya), *Schima wallichii* (Thit-yah), *Cedrela serrata* (Taung-ta-ma), *Sapindus rarak* (sat-pyar-thi-pin) and *Pinus kesiya* were used for various purposes and fuel. *Dalbergia cultracta* (Yin-daik), *Dalbergia oliveri* (Ta-ma-lan), *Pterocarpus macrocarpus* (Thit-padauk), *Castaneopsis argrophylla* (Gaw), *Calamus sp.* (kyein) were mostly illegally traded to neighboring countries. Especially, *Dalbergia oliveri* (Ta-ma-lan) and *Dalbergia cultracta* (Yin-daik) are sold illegally to China. *Pterocarpus macrocarpus* (Thit-padauk) is highly valuable like teak. Because, its flexible texture is used more than teak in traditional furniture. *Lithocarpus magnificus* (Gaw-phyu) and *Castaneopsis argrophylla* (Gaw) are widely used for construction. *Sapindus rarak* (sat-pyar-thi-pin) fruit is used to make soap. *Pinus kesiya* (Tinyu-net) wood is thick, rigid, less oil and it is used in construction.

Rosewood species, *Pterocarpus macrocarpus* (Thit-padauk) and *Dalbergia oliveri* (Ta-ma-lan) are highly valued and increasingly sold illegally across the border as rosewood supplies are exhausted in neighboring countries.

The biodiversity of Myanmar is under increasing threat. These threats were also discussed extensively; these were because of low conservation awareness, poverty and weak systematic biological monitoring system. Biodiversity and environmental services need to be improved urgently.

The main threats to plant species in regions are over-exploitation by illegal logging, conversion to agriculture, commercial plantation, degradation and fragmentation from road construction and small scale agriculture. Illegal logging for valuable timber species is a driver of deforestation.

The participation of the native people of these regions is an integral part of the process and, a broader engagement of civil society is necessary to achieve conservation success.

Myanmar was covered by 70% of forests area long ago. Nowadays, only 40% of forest areas cover the whole Myanmar, including Southern Shan State.

So, this research highlights the valuable natural resources of some areas of Southern Shan State 12 species and they must be protected and sustainable for the native region and Myanmar.

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References

- BANCA.(2001). Integrated multi-stakeholder ecosystem approach at Inle Lake (Myanmar). Biodiversity and Nature Conservation Association, Yangon, Myanmar.
- FAO. (2015). Global Forest Resources Assessment 2015, Country Report: Myanmar.
- IUCN.(2015). The IUCN Red List of Threatened Species .Version 2015.
- MOECA. (2015). National Environmental Quality. The Government of the Republic of the Union of Myanmar, NayPyi Taw, Myanmar.
- NBSAP. (2013)(2015-2020). National Biodiversity Strategy and Action Plan 2015-2020.
- WCS.(2014 b). Myanmar priority species for conservation. Yangon, Myanmar. Woods, K.(2015). Commercial Agriculture Expansion in Myanmar: Links to Deforestation, Conversion Timber, and Land Conflicts. Forest Trends Report Series: Forest Trade and Finance.
- Wohlfart, C., Wegmann, M., & Leimig, P.(2014). Mapping threatened tree deciduous forest in South-east Asia for conservation management.
- Business Investing.(2015 a). Talking Business: the Importance Of Natural Capital Valuation And Applying Landscape Approach For Business Investing Along The Road To Dawei.
- Business Investing.(2015b). "Lake Inle". Retrieved from http://wwf.panda.org/aboutour_earth/ecoregions/lake_inle.cfm.
- D.A.Simpson, (2014) Plant systematic.
- တင်ဝင်း(ဦး) (၂၀၁၇) မြန်မာ့သစ်လုပ်ငန်း၊ သစ်ထုတ်လုပ်ရေးဌာန၊ လိုက်နာကျင့်သုံးလျက်ရှိသောလုပ်ထုံးလုပ်နည်းများအကျဉ်း၊ သယံဇာတနှင့်သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန၊ မြန်မာ့သစ်လုပ်ငန်း၊ လျှိုင်လင်သစ်ထုတ်လုပ်ရေးဌာန။