Supply Trends and Grading of Timber in Sri Lanka

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පොළොන්නරුව රජමාළිගය

මහා පරාක්‍රමබාහු රජතුමා විසින් පොලොන්නරුවේ ඉදිකරවන ලද්දකි. මෙය තට්ටු ගොඩනැගිල්ලක් ලෙසට සැලකීමට ඇති සාධක අතර ඉතා ඝන බිත්තිවලින් නිර්මාණය කර තිබීම වැදගත් ලක්ෂණයකි. මෙම රජමාළිගය නිර්මාණය සඳහා විශාල ලෙස දැව භාවිතා කර ඇති බව සිතිය හැකිය.

පොළොන්නරුවේ වෙනත් පැරණි ගොඩනැගිලි

පොත්ගුල් වෙහෙර

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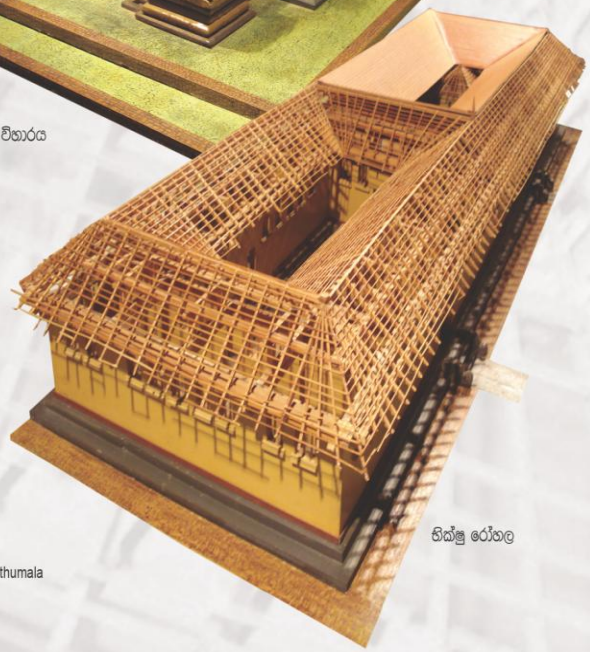

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Photographs - C.K. Muthumala

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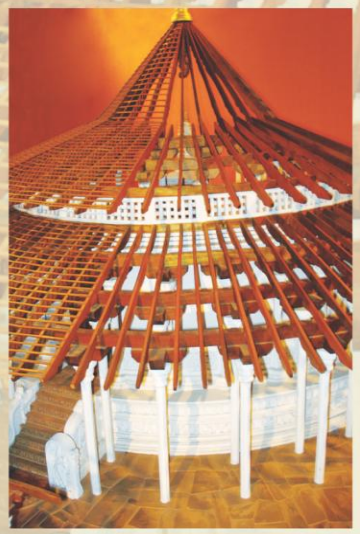
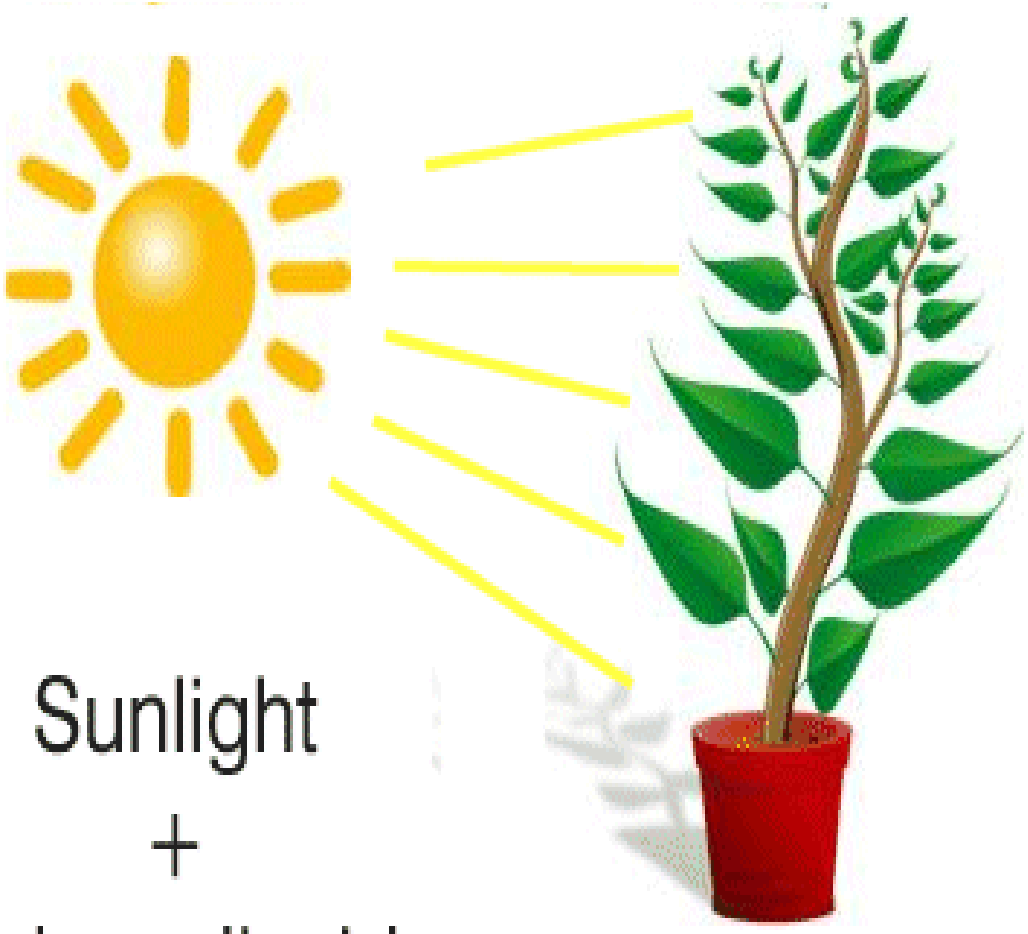


කුඩා දාගැබක් මැද්දකර විශාල ගෘහයක් තනා ඇති අතර දාගැබ වටා ඉතිරි වී ඇති ගල්කණු ස්ථිර වශයෙන්ම වහළය නිර්මාණය කර ගැනීමට යොදාගෙන ඇතිබව පැහැදිලිය. මෙහි වහලය තනිකරම දැවයෙන් නිර්මාණය කරන්නට ඇත. එම වහලයේ ආකෘතියක් මෙහි දැක්වේ. මෙය පොළොන්නරුව කෞතුකාගාරයේ තබා ඇත.

Bogoda timer bridge



Sunlight
+
Carbon dioxide
+
Water

Photosynthesis

Glucose
(sugar)
+
Oxygen

• Timber as –Green building material

	ඉරෑ දැව •Sawn timber	වානේ Steel	කොන්ක්‍රීට් Concrete	ඇලුමිනියම් Aluminum
කාබන් නිදහස් කළ ප්‍රමාණය (kg/m^3) • C- Release	15	5320	120	22000
කාබන් ගබඩා කළ ප්‍රමාණය (kg/m^3) • C-Store	250	0	0	0

Source: Ferguson et al, 1996

Sustainable Forest Management

Pine

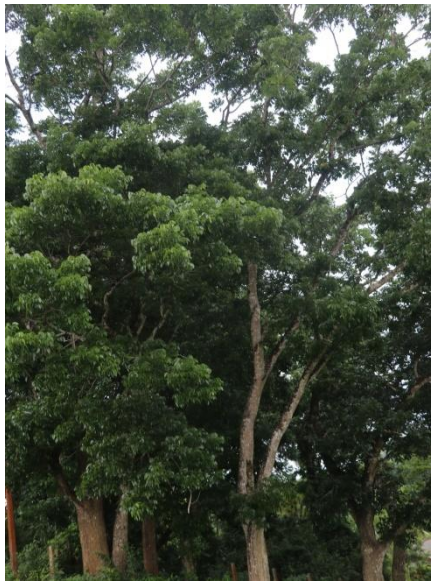
Khaya

E. microcorys

Accasia

Teak

E. grandis



Jack /Mahogany mix

Forest Plantations (ha)

Teak	23, 266
Eucalyptus	20 716
Pinus	16,365
Mahogany	4,997
Acasia	3,856
Khaya	291
Others	5417
Total	**74908**

Another (Protective, Dev. Areas)	20,000 ha (FD web site)

Sri Lankan timber requirement 1.6-2 million m3/ year

- Home gardens - 40 %
- Rubber plantation - 17 %
- Coconut cultivation - 13 %
- Imported timber - 17 %
- Plantation company - 06 %
- STC/FD - 06 %
- Others - 01 %

However, timber extraction from natural forests is strictly prohibited in Sri Lanka and the forest plantation for the timber is insufficient to meet this requirement. Therefore, a large number of swan timber have been importing to Sri Lanka.

Main imported Timber species in Sri Lanka.
இலங்கைக்கு இறக்குமதி செய்யப்படும் பிரதான வகை மரங்கள்

- Thulang
- Kempas
- Kekaton
- Kapur
- Kasai
- Pelewan
- Meranthi
- Pine

Authenticity % is very low in Imported timber spp.

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Investigation the Authenticity of Local and Imported Timber Species in Sri Lanka

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Abstract

In Sri Lanka there are over 400 different timber species, which show a remarkably wide range of variation in their physical properties as well as their anatomical structures. Hence timber Identification is a highly important task to confirm its authenticity.

The objective of this study is to investigate the authenticity of local and imported timber species used in Sri Lanka. In this study 237 timber identification reports (local and imported) were studied. These reports were issued by State Timber Corporation to various timber users and companies during past four years (2007, 2008, 2009 & 2010) after identifying the status of authenticity of timber samples.

According to timber identification reports, there were 118 local timber samples claimed by end users among 237 total samples. Out of 22 local timber species, it was found that 12 local timber species claimed by end users were 100% correct (authentic): Satin, Kumbuk, Batadomba, Mahogany, Pelen, Jak, Dawata, Hulanhik, Lunumidella, Sabukku, Bedidel and Kon. However claims for 10 local species were incorrect (not authentic). The claim for species Microcoris, Gammalu, Munamal, Ginisapu and Milla were not authentic in 100%. Out of 28 timber species, there were only 6 imported timber species. In these samples, Bitis is the only timber species found with 100% of correct (authentic) end user claims. The claims for species Balau was totally incorrect. Authenticity percentages of Kandis, Tualang, Kempas and Red Balau were, 92, 77, 25 and 10 respectively.

According to the results, it can be concluded using of local species has higher authentic percentage compared to imported species.

Quality and authenticity of timbers used in Sri Lanka were also investigated using different timber samples collected from different construction sites in Western Province including large scale construction sites and house construction sites by a field survey conducted in Colombo district. 104 timber samples were collected from 68 construction sites randomly and claims for timber species by end users were also recorded.

According to the results, there were 28 timber species claimed by end users among 104 samples. Out of 28 timber species, it was found that 20 timber species claimed by end users were 100% correct (authentic): which were Satin, Kumbuk, Paramara, *Pinus*, Hora, Microcoris, Domba, Margosa, Palu, Dawata, Hawarinuga, Lunumidella, Ginisapu, Milla, Grandis, Coconut, Bedidel, Kon, Ketakala and Kandis. However claims for 8 species were incorrect. The claim for species Jak was 93.3% (15 samples) correct/authentic and the rest 6.7% (1 sample) was identified as Bedidel. The claim for species Mahogany was found with

88.8% authentic and the rest 11.2% (1 sample) was identified as Paramara. The claim for species Teak was found with 75 % (3) authentic and the rest 25 % (1) was identified as Paramara. The claim for species Liyan was found with 66.6 % authentic.

Overall results indicated that out of 23 local timber species, the end user claims 19 local timber species were 100% correct/authentic. Among the 28 timber species investigated in the field survey, there were only 5 imported timber species out of which Kandis is the only timber species found with 100% of correct end user claims (all four samples have proven to be authentic). The calim for species Balau and Red Balau was totally incorrect. The sample was claimed as Balau was identified as Kandis and the samples of Red Balau (3 samples) was identified as Kandis (2) and Tualang (1). Authenticity percentages of Kempas and Taulang were 42.8% and 80% respectively. Based on overall results for imported timber species, it was found that out of five imported timber species, only one timber species claim was 100% correct/authentic. Based on the results of the present study it can be concluded that the end users get higher percentage of authentic local timber species compared to the imported species.

Keywords: Local timber, Imported timber, Authenticity

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Evaluation the Authenticity of Wood Species in Sri Lankan Timber Market

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Abstract

People have ability to identify the wood that they are using in their day today life. Scientific timber identification is based on the anatomical properties of wood. Sri Lankan wood industry is performing as one of the important in manufacturing sector and constructions. Both Local and imported woods are using in the country and the authenticity of timber is more essential for a systematic wood industry. This study is aimed to investigate the timber authenticity of the local and imported timber species using in Sri Lankan timber market in past 6 years by studying 615 timber identification reports issued byState Timber Corporation from 2012 to 2017. Total of 50 species were found in identification reports. Among local timber 55% of species were correctly claimed 6% of species were incorrectly claimed and 39% of species were not mentioned by the client. Among imported timber 49% of species were correctly claimed 16% of species were incorrectly claimed and 35% of species were not mentioned by the client. Correctly claimed timber identification reports had 54% and 46%local and imported species respectively. Incorrectly claimed reports had 28% and 72% local and imported species respectively. It was found that 23 out of 36 local species claimed by timber users were 100% correct; Albizia, Eucalyptus spp., Ginisapu, Grandis, Halmilla, Havarinuga, Hora, Jak, Kolon, Koon, Kothalahimbatu, Mahogany, Margosa, Milla, Palu, Para Mara, Pine, Rubber, Sabukku, Satin, Wal Del, Walla Patta, and Roshiya. Correctly claimed percentages of other local species; Teak, Sandalwood and Liyan were claimed 95%, 88% and 62% correct respectively, Kumbuk and Lunumidella with 67% accuracy, Kanda, Katakela, Mango, Mee and Toona were claimed with 50% of accuracy. Dawata, Duriyan and Kaya were claimed totally incorrect by clients.Out of 14 imported species 9 were claimed 100% correctly; Kapur, Kasai, Kekatong, Kelat, Keranji, Meranti, Merbau, Resak, and Rosewood. Thulang, Kempus and Kendis were claimed by clients 80%, 72% and 67% correct respectively, Balau 56% and Oak 40% accurately. Most common local timber species were proposed to identify by customers are Teak, Ginisapu, Mahogany, Hora, Eucalyptus spp. and Kumbuk. Imported timber species areThulang, Kempus, Balau and Kandis. Sri Lankan timber users have higher authentic rate for local timber than imported timber.

Keywords: Timber authenticity, Wood species, Local, Imported

Sawn wood quantity imported in 2017 has increase by 192 % compared in year 2013

?

Imports

Item	2013	2017	2018
Sawnwood Importation USD	25,000	55,101,000	56,166,000
Sawn wood Importation conifers USD	382,000	3,197,000	4,362,000

FAO, 2017, 2018)

CLASSIFICATION OF TIMBER

(Logs & Sawn Timber)

Super Luxury Class :

Teak. Ebony. Nedun. Calamander

Luxury Class :

Satin. Halmilla. Milla. Mahogany (Narrow leaved). Mahogany (broad leaved). Jak

Special Class Upper :

Gammalu. Hulanhik. Margosa. Suriyamara. Rannai. Wewarana. Kolon. Velang. Palu

Special Class :

Tamarind (Hard Wood). Kumbuk. Eucalyptus microcorys

Class I :

Tawwanna. Uva Mandora. Munamal. Ubberiya. Eucalyptus Pilularis. Eucalyptus Citriodora. Accasia Melanoxylon. Panakka. Hora. Kirihambiliya. Urukanu or Uruhonda. Mandora. Pihimbiya. Etathimbiriya or Ginikulu. Helamba. Del. Liyan. Neralu. Madan. Kon. Wanami. Mi. Na. (Mesua Ferrea) Ketakela.--Pathkela & Kecriya. Trestania comserta. Paramara. Hedawaka. Treated Grandis. Damba. Dambu.

Class II

All Dun species other than Thiniyadun. All Keena species other than Walukeena. Alubo. Dawata. Dawul-Kurundu. Godapara. Halmandora. Panamora. Wa. Welipenna. Toona. Mihiriya. Karaw. Panu-Dan. Rathatiya. Thimbiri. Dorana. Na-Imbul. Gonapana. Thiththeta. Kosganna. Kiripedda. Talang. Eucalyptus Grandis. Cypress Ethdemata. Ginisapu. Ehela. Kirikon & Dunumandala. Boron Treated Sawn Rubberwood. Alastonia (Havari Nuga). Boron Treated Sawn Pinus. Eucalyptus Robusta (Red Gum). Eucalyptus Globulus (Blue Gum). Comporta. Redness. Coconut. Eucalyptus Thoraliyana.

Class III

Aridda. Malabada. Diyathaliya. Pinus. Lunumedella. Kalu-Sudu. Thelambu. Bath-hik. Atamba. Bulu. Kahata. Rubber. Rata-amba (Mango). Ratadel. Davu. Godakaduru. Gokatu. Sabbukku (Graviliya). Accacia docaran. Eucalyptus Kamaldensis. Athdemata. Godakirilla. Mora. Kataboda. Goraka. Tammarin (Sapwood). Bakme. Kakuna. Casurina (Kasa Kasa). Beli.

Class III Lower Grade

All species not otherwise classified.

CLASSIFICATION OF TIMBER

(Logs & Sawn Timber)

Super Luxury Class :
Teak, Ebony, Nedun, Calamander

Luxury Class :
Satin, Halmilla, Milla, Mahogany (Narrow leaved), Mahogany (Broad leaved), Jak

Special Class Upper :
Gammalu, Hulanhik, Margosa, Suriyamara, Rannai, Wewarana, Kolon, Velang, Palu

Special Class :
Tamarind (Hard Wood), Kumbuk, Eucalyptus microcorys

CLASSIFICATION OF TIMBER

(Logs & Sawn Timber)

Class I :

Tawwanna, Uva Mandora, Munamal, Ubberiya, Eucalypus Pilularis, Eucalyptus Citriodora, Accasia Melanoxylon, Panakka, Hora, Kirihambiliya, Urukanu or Uruhonda, Mandora, Pihimbiya, Etathimbiriya or Ginikulu, Helamba, Del, Liyan, Neralu, Madan, Kon, Kirikon, Wanami, Mi, Na (Mesua ferrea), Ketakela, Pathkela & Keeriya, Trestania comserta, Paramara, Hedawaka, Treated Grandis, Damba, Dambu, Domba.

CLASSIFICATION OF TIMBER

(Logs & Sawn Timber)

Class II :

All Dun species other than Thiniyadun, All Keena species other than Walukeena, Alubo, Dawata, Dawul – Kurundu, Godapara, Halmandora, Panamora, Wa, Welipenna, Toona, Mihiriya, Karaw, Panu-Dan, Rathatiya, Thimbiri, Derana, Na Imbul, Gonapana, Thiththeta, Kosganna, Kiripedda, Talang, Euclyptus Grandis, Cypress, Ethdemata, Ginisapu, Ehela, Boron Treated Sawn Rubberwood, Alastoniya (Havari Nuga), Boron Treated Sawn Pinus, Eucalyptus Robusta (Red Gum), Eucalyptus Globulus (Blue Gum), Comporta, Redness, Coconut, Eucalyptus Thoraliyana, Eucalyptus Kamaldensis, Kaya, Eucalyptus Tereticornis, Accacia docaran, Accacia mangium, Lunumidella.





CLASSIFICATION OF TIMBER

(Logs & Sawn Timber)

Class III :

Aridda, Malabada, Diyathaliya, Pinus,Thelambu, Bath-hik, Atamba, Bulu, Kahata, Rubber, Rata-Amba(Mango), Ratadel, Davu, Godakaduru,Gokatu, Sabbukku (Graviliya), Godakirilla, Mora,Kataboda, Goraka, Tammarin (Sapwood), Bakme, Kakuna, Casurina (Kasa Kasa), Beli, Dunumandala, Batadomba.

Class III Others :

All species not otherwise classified.

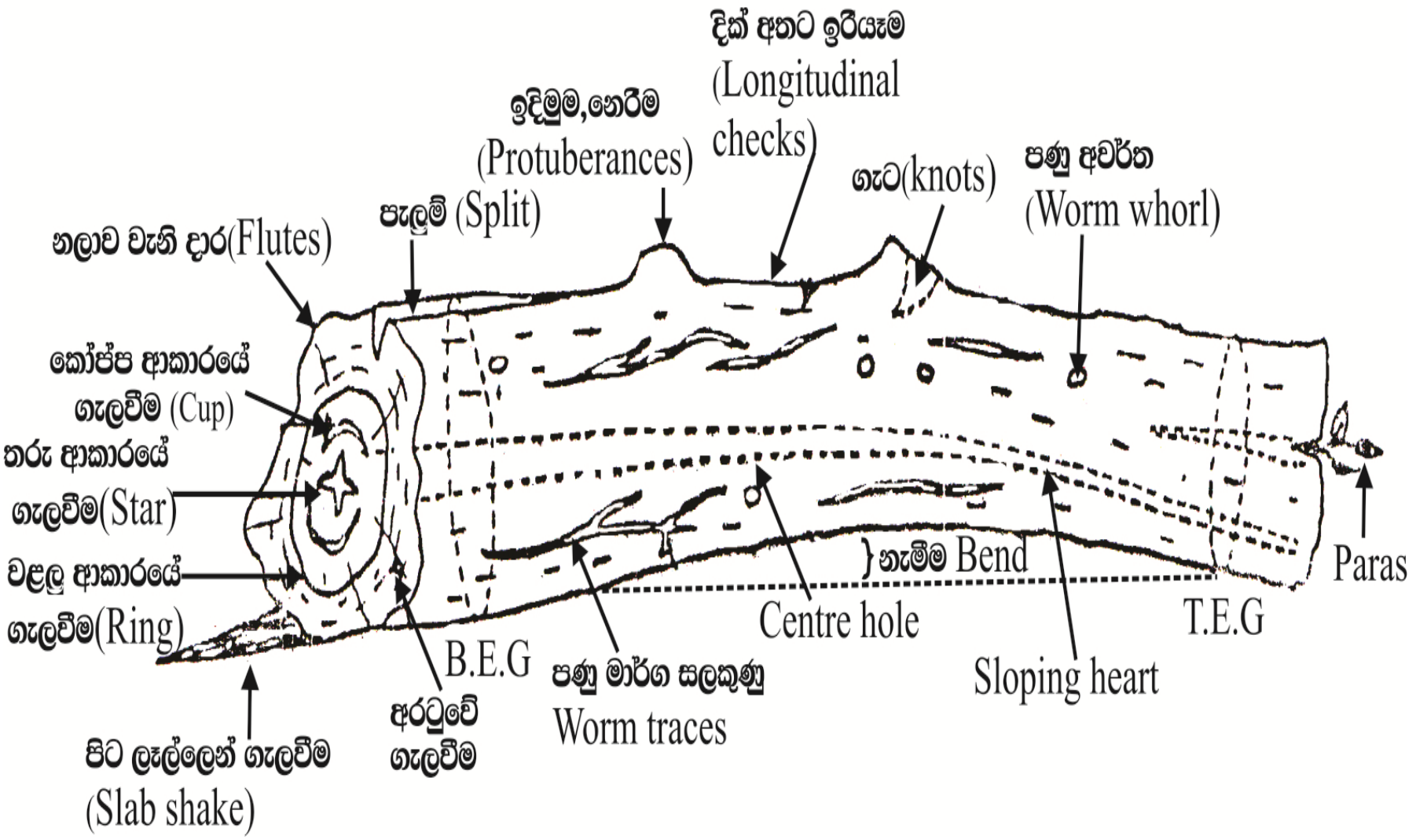
Timber Classification of Malaysia

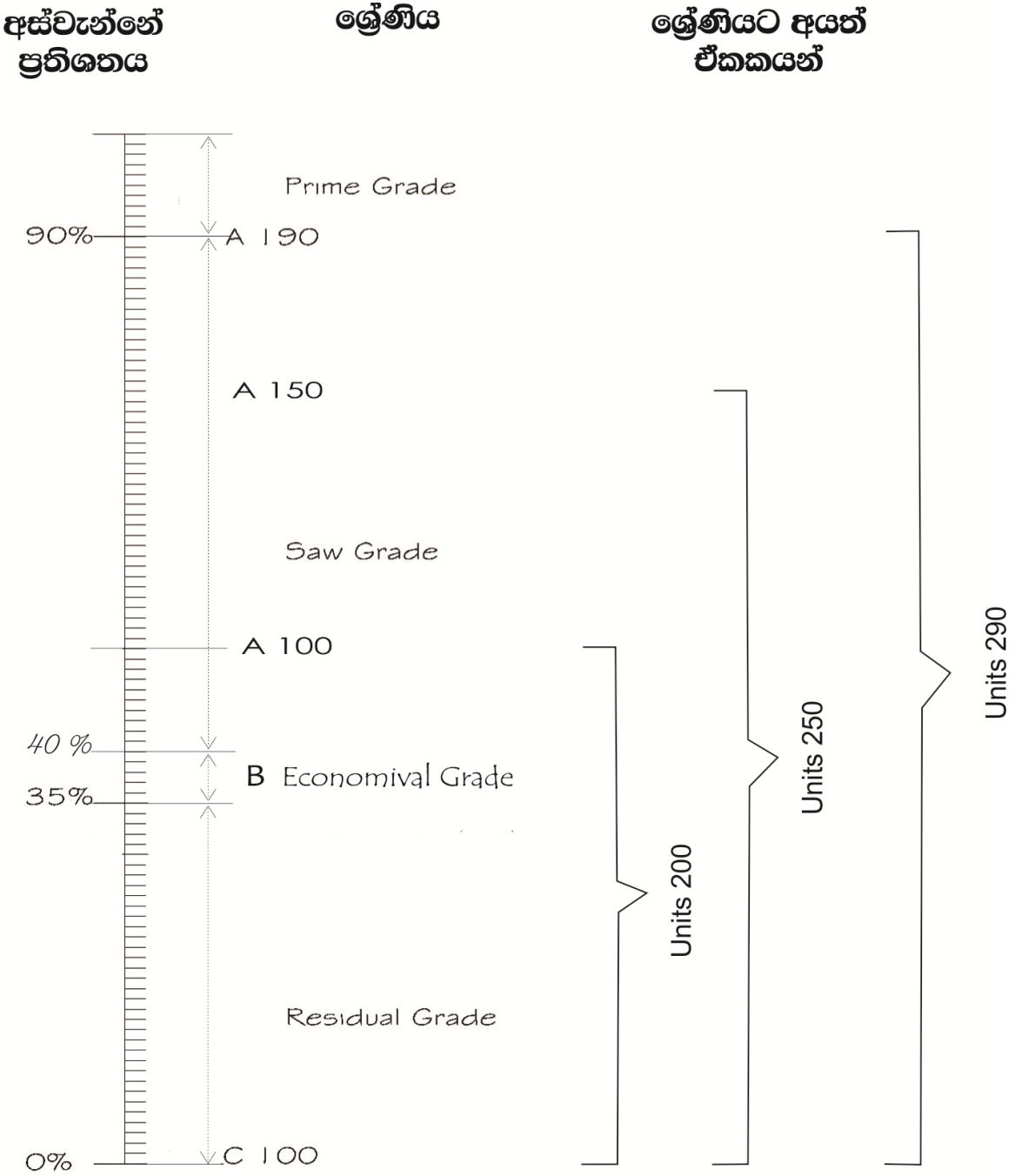
Classification	Density Range, kgm^{-3} (at 15% MC)
Heavy Hardwood	800-1120
Medium Hardwood	720-880
Light Hardwood	400-720

Source: MTIB (2008)

Timber Defects

කඳක විවිධ දෝෂ දක්වන රූප සටහනක්

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ශ්‍රේණිය
ශ්‍රේණියට අයත් ඒකකයන්
Prime Grade
90%
A 190
A 150
Saw Grade
A 100
40 %
B Economival Grade
35%
Residual Grade
0%
C 100
Units 200
Units 250
Units 290

Uses of different timber species

• Construction timber / • Roof work	• E. Microcoris, E. grandis, Hora, Alastonia, Teak, Satin, Coconut
• Door/Window frames	• Teak, Jack, Nedun, Milla, Mahogany , Margosa, Palu
• Doors	• Teak, Jack, Mahogany, Pine , Margosa
• Flooring	• Teak, Kumbuk, Paramara
• Furniture	• Teak, Kumbuk, Jack, Nedun, Mahogany, Pine, Satin

Total extent of Plantation spp , released by FD for year 2023

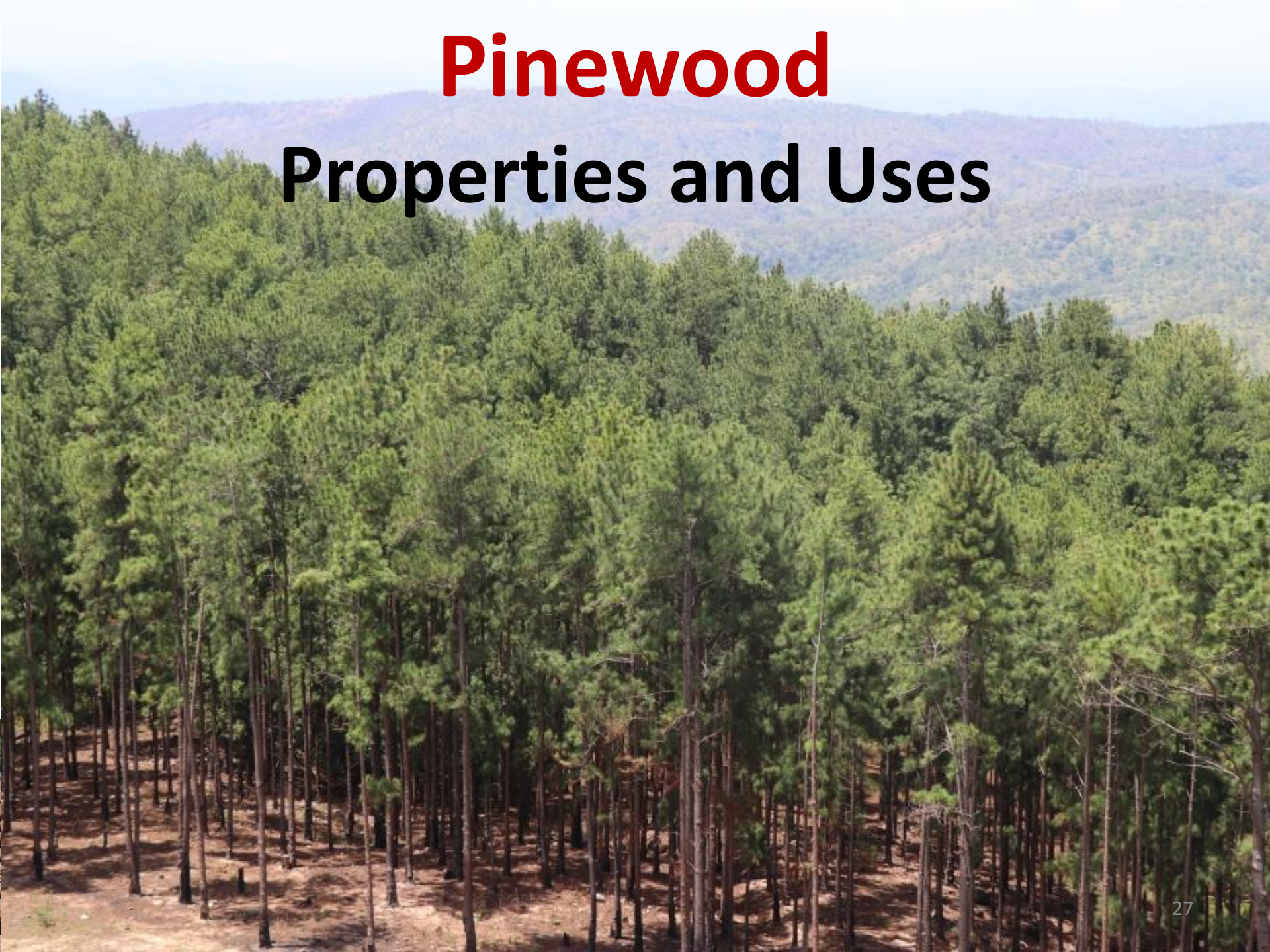
Species	Total Extent (ha)
Teak	653
Eucalyptus	119
Acacia	55

Total extent of Pine , released by FD

Year	Total Extent (ha)	Log Volume m^3
2018	124.00	33,826.00
2019	71.00	22,562.00
2020	109.44	27,905.00
2021	230.80	65,050.59
2022	196.73	49,292.93
2023	319.59	

Pinewood

Properties and Uses



- Pine is a well-established wood for construction in USA, Europe and many other countries
- Pine wood supplied 20 % wood of World demand
- Pine forests plantations in Sri Lanka
  - Several species of pines have been introduced to Sri Lanka; two species were selected for large-scale use
    - *Pinus caribaea*

Pinus patula

Important features of Pine wood

a) Pine is a well-established wood for wood working industry

b) It's easy to work (Sawing, sanding, nailing ,polishing etc)

c) wide range of uses

d) Pine is an easy wood to stain to achieve in desired color

e) Pine is a very stiff wood

Timber properties

- As a coniferous plant, the wood density of pine plants growing in Sri Lankan ecosystems is in the range of 400 – 650 kg/m^3

- The average Modulus of Rupture (MOR) -75 Nmm^{-2}
- The average Modulus of Elasticity (MOE) - 10,400 Nmm^{-2}
- The compressive strength (parallel to the grain)- 40 Nmm^{-2}.

- It is very easy to glue under pressure using suitable adhesives
- The wood working ability of pine wood - good
- The ability to preserve is also very high

Preservation and seasoning of pine wood

- By preserving pine wood it can be kept for a long time without any damage caused by the wood decaying organisms/agents

- Pine wood is susceptible to Blue-stain fungus and should be preserved as soon as it is cut down as well as when it is converted into swan wood

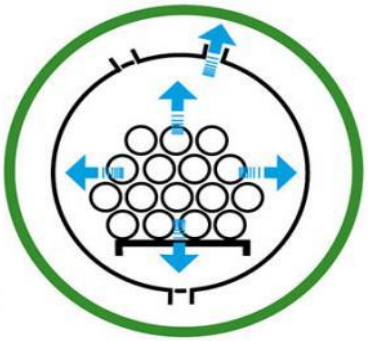
- As soon as it is cut, it should be sprayed with fungicides (Ex : Anti blue)on all the exposed areas

Preservation and seasoning of pine wood

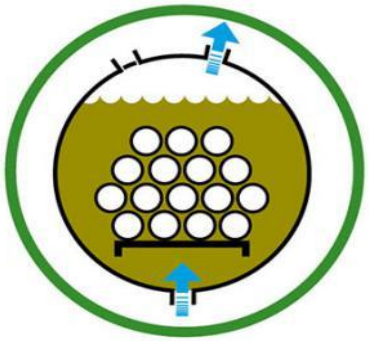
- Boron treatment is more popular mtd for pine sawn wood treatment, however which is recommended to treat **interior items**
- Vacuum-pressure treatment process is more effective to preserve pinewood

Preservation and seasoning of pine wood

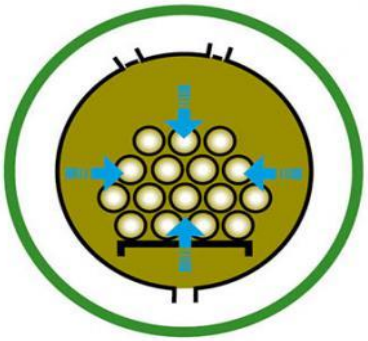
HIGH PRESSURE TREATMENT PROCESS



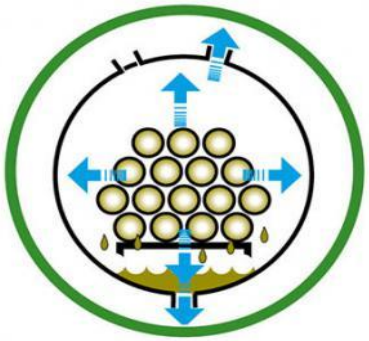
Timber loaded into treatment vessel. Initial vacuum applied and the timber cells are evacuated of air. Vacuum held.



Cylinder flooded under vacuum with TANALITH wood preservative.

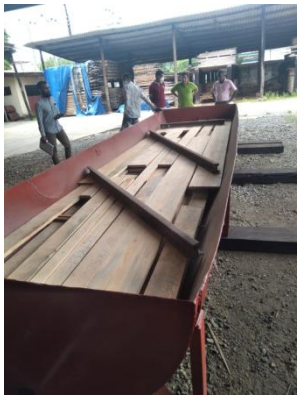


Hydraulic pressure applied, forcing the preservative deep into the structure of the timber.



Final vacuum extracts excess preservative solution, which is pumped back to storage.

DIPPING METHOD

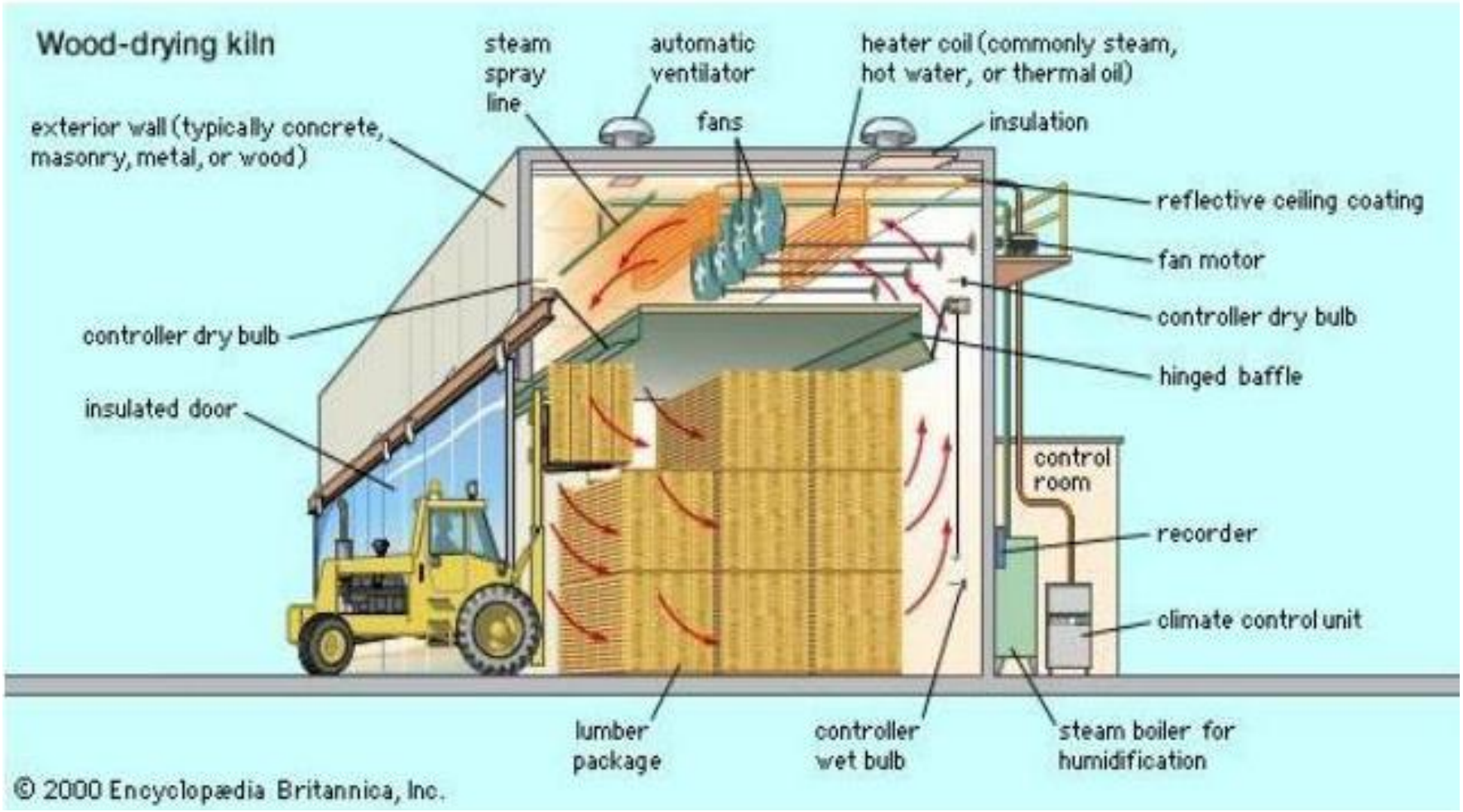


Preservation and seasoning of pine wood

- Preparation of Boron solution
  - **The mixture of Borax and Boric acid**
  - **The ratio Borax : Boric acid = 3:2**
  - **Solution strength 8% is adequate**

- After the treatment process, seasoning/drying is essential
  - Kiln Seasoning is more effective (Air-seasoning is an option however, efficiency is less)
  - **The moisture content of the wood should be decrease upto 12% to use in construction or funiture production**

Kiln seasoning



Preservation and seasoning of pine wood

- **CCB** (Copper Chrome Boric) and **ACQ** (Alkaline Copper Quaternary) are alternative wood preservatives which are appropriate to treat **exterior items**
- **Thermally modified** Pine wood also can be used any

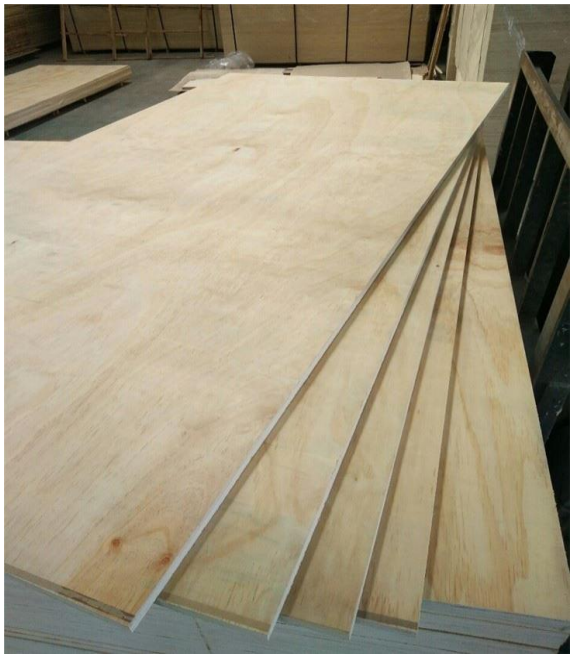
  Non structural applications

- The preservation and proper seasoning increase the strength and durability
- According to the STC classification
  - **Untreated pine wood** is categorized into **Class 3**
  - The **treated-pinewood** is categorized into **Class 2**

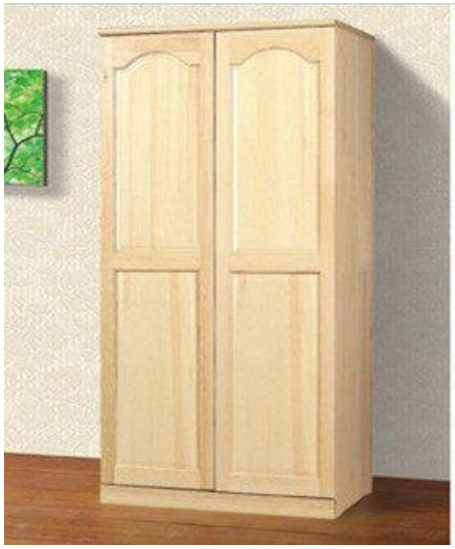
Benefits of pine wood

- The stems of these plants use long fibers to produce pulp and paper
- Used in the manufacture of cealing panels.
- Used in foreign countries as sleepers on railways and used for transmission poles used for telephones and power lines
- Used in the production of oleoresin
- used for the production of furniture
- Pine wood is also used in the manufacturing the plywood
- Production of –jointed boards and furniture
- Use for light construction, fences, door and window frames, wall panels
- Doors

Uses



Uses



Pine Doors

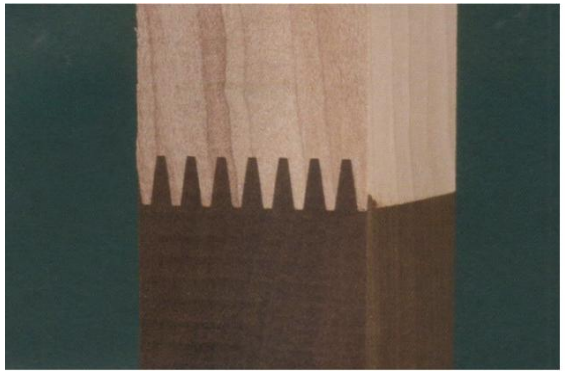
Door Frames and Window Frames

Thermally modified Pine wood chalet


BAKERY
PHARMACY
From farm to store within 24 hours


Scoop & Weigh
As much or as little as you need

Engineering Wood products



(a)

(b)

(c)

(d)

Several engineering wood products

(a) Finger joint
(b) Glulam
(c) I-joist
(d) Composite Lumber

Finger -jointed panels

Conclusion

- Pine can be used in different applications, after treatment processes.
- Pine can be used in sustainable way in timber industry in Sri Lanka.
- Pine can be popularized by awareness programes.
- Average Pine demand of the country is around 50000 m3. (released by FD)
- Excess amount can be exported in critical period of the country.

Thank You

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