Planting Teak for the Rehabilitation and Restoration of Productive Landscapes

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Natural Distribution

Gyi and Tint 1998

<table>
<thead>
<tr>
<th>Country</th>
<th>2010 (Area) (,000 ha)</th>
<th>% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>6,810</td>
<td>23.45</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>1.5</td>
<td>0.01</td>
</tr>
<tr>
<td>Myanmar</td>
<td>13,479</td>
<td>46.42</td>
</tr>
<tr>
<td>Thailand</td>
<td>8,744</td>
<td>30.12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>29,035</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

(Kollert and Cherubini 2012)
Planting teak

- A globally emerging hardwood.
- About 2.0-2.5 million cubic meter teak roundwood is harvested annually from natural and planted forests.
- The annual wood increment of planted teak forests is estimated to be much higher.
### Area of planted teak forests by region

<table>
<thead>
<tr>
<th>Region</th>
<th>1000 ha</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa (10 of 19)</td>
<td>469.8</td>
<td>10.8</td>
</tr>
<tr>
<td>Asia (10 of 16)</td>
<td>3,598.04</td>
<td>82.8</td>
</tr>
<tr>
<td>Caribbean (3 of 5)</td>
<td>15.32</td>
<td>0.4</td>
</tr>
<tr>
<td>Central America (7 of 7)</td>
<td>132.78</td>
<td>3</td>
</tr>
<tr>
<td>Oceania (3 of 5)</td>
<td>8.13</td>
<td>0.2</td>
</tr>
<tr>
<td>South America (5 of 8)</td>
<td>122.3</td>
<td>2.8</td>
</tr>
<tr>
<td><strong>World (38 of 60)</strong></td>
<td><strong>4,346.37</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

(Kollert and Cherubini 2012)

- 5,982,000 ha (ITTO (2009);
- 6,887,000 ha (Estimated areas of teak plantations, after Midgley et al., 2015)
Ten countries with the largest area of planted teak forests:

- India: 1667,000 ha
- Indonesia: 1269,000 ha
- Ghana: 390,000 ha
- Nigeria: 214,000 ha
- Thailand: 146,000 ha
- Bangladesh: 128,000 ha
- Brazil: 73,000 ha
- Panama: 65,000 ha
- Ecuador: 55,000 ha
- Myanmar: 45,000 ha

Ten countries with the highest teak coverage in the landscape (%):

- Trin and Tob: 17.5%
- Ghana: 9.4%
- Panama: 7.4%
- Indonesia: 7%
- Costa Rica: 6.2%
- Myanmar: 5.9%
- India: 5.6%
- Bangladesh: 5.6%
- El Salvador: 4.7%
- Sri Lanka: 4.1%

Area change in planted teak forests from 1995 to 2010:

- Ecuador: 45 Growth Factor
- Ghana: 21.8 Growth Factor
- Guatemala: 16.4 Growth Factor
- Panama: 14.1 Growth Factor
- Nicaragua: 12.6 Growth Factor
- Laos: 12 Growth Factor
- Nigeria: 4.9 Growth Factor
- El Salvador: 4.9 Growth Factor
- Tanzania: 4.5 Growth Factor
- Benin: 3.1 Growth Factor
- Myanmar: 2.8 Growth Factor
- Costa Rica: 2.2 Growth Factor
- Malaysia: 1.9 Growth Factor
- Indonesia: 1.8 Growth Factor
- India: 1.7 Growth Factor

(Kollert and Cherubini 2012)
Age class distribution of planted teak forests

(Kollert and Cherubini 2012)
Ownership (%) of planted teak forests by region

(Kollert and Cherubini 2012)
Plantations from Seeds
- Age of Plantation: 50-80 years
  - Average DBH 70 cm
  - Average Height 40 m
- Average height growth at younger stages on good sites: 3-6 m/yr
- Average diameter growth at 3-6 yrs on good sites: 3-5 cm

Clonal Plantation
- Higher productivity are expected.
- 32 m$^3$/ha/yr in Mexico and Brazil.
- Average annual diameter increments: >3 cm/year.
- Exceptional height growth and large standing volumes
Seeds vs Clones

Sources: a) Smit & Oestreich (2014); b) Floresteca (2016).
Success of teak plantation

- Good site selection
- Genetically improved plant material
- Adequate soil preparation
- Timely execution of operations
- Planning, Monitoring and Evaluation
Trends for planted teak

- Planted teak markets will continue to expand in future.
- Wider spacing, early and intensive thinning and shorter rotation (15-20 years) in Latin America countries.
- Sustainability and environmental services
- Adoption of modern techniques and concepts

From Establishment and Management of Planted Teak Forests by Mauricio Jerez-Rico and Sylvio de Andrad Coutinho
Importance of broad genetic bases for planted teak

The biggest teak tree in Myanmar

Tree Name: Homemalynn 1
Location: Au Tu RF, Sagaing, Myanmar
GBH: 27.5 feet (8.38 m)
Height: 110 feet (33.5 m)
Found: 28th August 2017

Teak forests in Bago Yoma
Planting teak in productive landscapes in Myanmar

Dietrish Brandis Teak Plantation

Area: 31.5 ha
Year of establishment: 1857
Location: Kyun RF, Pyay, Myanmar
No of trees: 3503 trees
Maximum GBH: 15 ft 8 in (4.75 m),
Mini GBH: 3 ft 2 in (0.98 m),
Average GBH: 4 ft 8 in (1.4 m)
Height: 86 ft (26.2 m) to 124 ft (37.80 m)
Planting teak in the productive landscape in Myanmar

Photo: Nyi Nyi Kyaw, 2014
Myanmar Reforestation and Rehabilitation Program (2017-2026)

- 350,000 acres (141,643 ha) of public plantation
- 162,900 acres (65,924 ha) of commercial tree plantation (teak is major spp for reforestation)
- 285,104 acres (115,380 ha) of private plantation (teak is major spp)
- SPAs, CSOs, Selection of Plus Trees
- Training and awareness raising activities
- Forest Landscape Restoration Approach
Challenges

- Policies, laws and regulations
- Access to quality planting materials
- Low investment in tree breeding and improvement
- Long term maintenance and monitoring
- Illegal logging
- Land use conflicts
Thanks for your kind attention!

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References