PRIMARY FORESTS IN ASIA AND THE PACIFIC: DIVERSITY, STATUS, TRENDS AND THREATS

Asia-Pacific Forest Sector Outlook: Roadmaps for primary forests conservation and innovative forest technologies

Validation Workshop, 23-24 November 2021
1. Historical extent and status of the Primary Forests in the Asia-Pacific region,
2. Diversity of Primary Forest types in Asia and the Pacific,
3. Pressures and threats on Primary Forests, modelling future risks,
4. Governance instruments for Primary Forests conservation in the Asia-Pacific region,
5. Mechanisms and tools for Primary Forests conservation,
6. Recommendations and roadmap for Primary Forest conservation in Asia and the Pacific
1. Historical changes in natural forest cover 2000, 2010 and 2020

- **FAO definition**
- **Minimal mappable area 1 ha**
- **Forest cover analyzed by Ecological Zone (GEZ-FAO 2010), Humid vs. Seasonal vs. Temperate**
- In line with the minimal 10% tree cover threshold of the FAO forest definition
- **Includes logging 2000 - 2020 and old fallow forest ≥ 20 yrs old.**
Intact forest assessment using Landsat time-series trajectories (adapted from Wang et al. 2019)

- Intact/undisturbed forest tend to have low slope of regression and low standard deviation of the NDWI.
- Forest experiencing large disturbances have higher coefficient of variation than undisturbed forests.
Intact forests cover 519 million ha in the Asia-Pacific region. Large intact forest surfaces outside the Protected Area.
Forest fragmentation analysis

Total intact Forest  189 Mha
Contiguous intact   143 Mha
Forest fragments      46 Mha

For the whole region Asia Pacific
140 Mha of fragments ≤ 100,000 ha
Meaning 379 Mha contiguous Intact Forest
2. Diversity of forest types in Asia and the Pacific

Cradle of evolution

- 4 biogeographic realms
- 10 biodiversity hotspots
- NW vs. SE Himalaya, Myanmar, Yunnan floristic region
- Sino-Japanese floristic region
- Succession of glacial-interglacial cycles: refugial flora
- Wallacea transition zone between Australasia and SE Asia
Framework for a finer ecological zoning and mapping of the Asia Pacific Forest formations and types

“An alternative route for a new FAO Global Ecological Zoning map would be to determine EZs independently of the national or regional maps by using a more objective approach, notably by relying solely on climate and altitude data to delimit zones, taking into account potential vegetation, and vegetation classification” (FAO, 2012)
Building upon existing classifications and knowledge, review the forest formations of the Asia Pacific region and their specificities

Classification derived from widely measured, simple parameters: Bioclimates, physiography, elevation, and main substrate

25 forest formations and related forest types of the Asia-Pacific region identified in line with regional classifications

Provide basic information for encouraging further research into the eco-floristic pattern inherent to each forest type.
Ecofloristic zoning for conservation priorities in the Asia Pacific

1985

2015
3. Increasing pressures and threats on primary forests:

Socio-economics drivers

• Population growth (4.9 billions 2050)
• Migrations and conflicts
• Globalization and economic growth
• Urbanization and infrastructure development
• Agriculture and planted forest expansion
• Land grabbing and land tenure conflicts, war
• Loss of traditional knowledge and wisdom
• Lack of capacity, policy and regulatory framework

Political ecology

https://ngdc.gov/eog/dmsp/downloadV4composites.htmlnoaa
3. Increasing pressures and threats on primary forests: biophysical drivers

- Climate changes (temperature, rainfall pattern, sea level rise)
- Fires
- Pollution
- Invasive species

Köppen-Geiger Climate Classification

Detecting forest fires with satellites (MODIS and VIIRS)
Fire risk assessment

AUSTRALIA

NEPAL

Future fire probability
- High
- Low
Forecasting the primary forest cover in 2050 in Southern and South East Asia

“forestatrisk” Python package (Vieilledent, 2021)

Intact forest area of the Asia Pacific is predicted to decline from 519 Mha in 2020 to 415 Mha in 2050.
Among the main conclusions

- There are still important areas of primary forests in the Asia Pacific region.

- A large part of these primary forests is not covered by any Protected Area network and represent identified regions for OECMs (Other effective area-based conservation measures) concept that IUCN and FAO are developing.

- The diversity of forest formations and types in the region is unique, and many specific types of primary forests are particularly threatened by deforestation and degradation.

- Lack of knowledge on the floristic variation with forest types, on the distribution of species, and on population dynamics, especially in the tropical zone.
Large-scale ecological vegetation mapping (1:50,000) and related socio-ecological surveys

- New satellite remote sensing platforms
- Very high-resolution sensors
- Sentinel satellites series
- Protocol to initiate at sub-national level analysing rather large area, then zooming into specific with higher resolution, eventually completed by drone surveys
- Easily integrated with SEPAL platform
Thank you