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Forest in climate change research and policy: the role of forest management and conservation in a complex international setting
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Is Forestry Sector in Myanmar Approaching International Contexts? Potentials & Challenges

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Outline of the presentation

I. Forestry in Myanmar : Forest
 Status, Policy, Legislations, Institutions, Managing Natural Forests, Protected Areas (PAs), Plantation Forestry, Community Forestry, Deforestation,

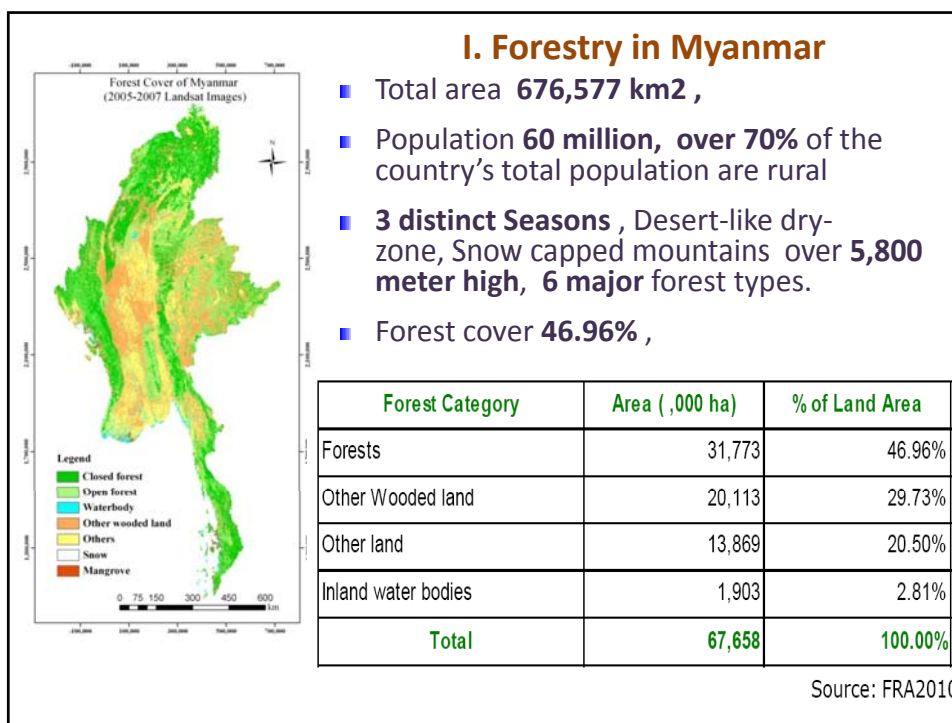
II. Signatory concerned to forestry sector in Myanmar to the International Settings

III. Potentials : International/regional level, National level, Forestry Sector, University

IV. Challenges : International/regional level, National level, Forestry Sector, University

V. Conclusion : Policy, Legal aspect: Institutional, Planning Process, Implementation, Resources, Technical aspect

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Myanmar Agenda 21: sustainable forest resources management
SFM , reservation, protected areas; participatory, harvesting and utilization; and capacity building,

How **Myanmar Forest Policy** Imperatives (1995) are potential for international context..

- 1) **PROTECTION** of soil, water, wildlife, biodiversity and environment;
- 2) **SUSTAINABILITY** of forest resources to ensure perpetual supply of both tangible and intangible benefits
- 3) **BASIC NEEDS** of the people for fuel, shelter, food and recreation;
- 4) **EFFICIENCY** to harness, in the socio-environmentally friendly manner, the full economic potential of the forest resources;
- 5) **PARTICIPATION** of the people in the conservation and utilization of the forests;
- 6) **PUBLIC AWARENESS** about the vital role of the forests in the well being and socio-economic development of the nation.

Missing to mention/ contribute International contexts?

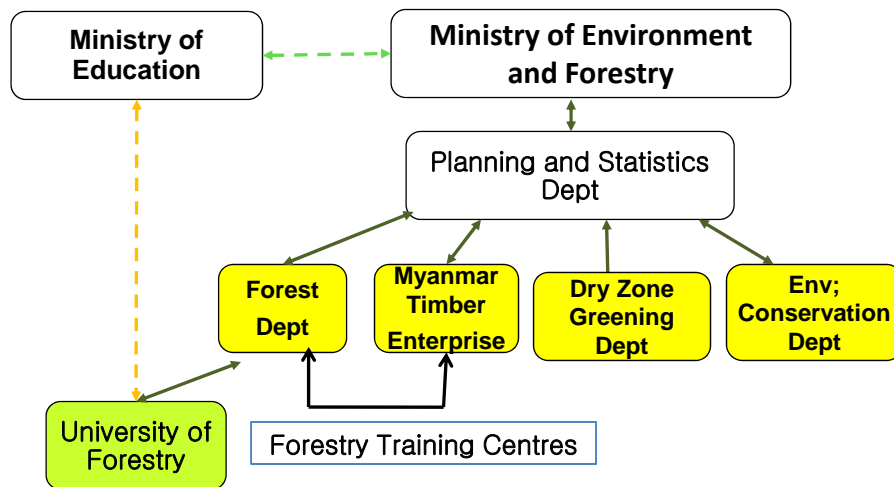
Legislations

- ❖ Forest Law (1992),
- ❖ Forest Rules (1995),
- ❖ Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law (1994),
- ❖ Community Forestry Instructions (1995),
- ❖ National Forestry Action Plan (1995),
- ❖ Format and guidelines for district forest management plans (1996),
- ❖ Myanmar Agenda 21(1997),
- ❖ Criteria and indicators for sustainable forest management (1999),
- ❖ National Code of Practice for Forest Harvesting (2000)
- ❖ Environmental Law (2012)

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Institutional setting of MOECAF while addressing International settings

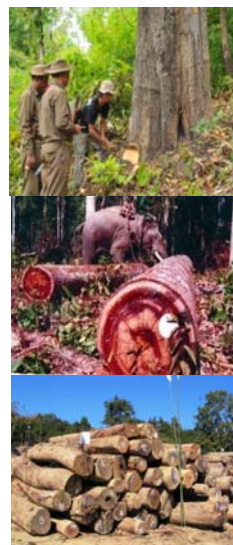
(MOECAF: Ministry of Environmental Conservation and Forestry,)



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Managing Natural Forest (Myanmar Selection system, to figure out SFM)

- An **exploitation-cum-cultural** System,
- **Minimum** impacts to the environment,
- **MSS is practiced within the bound of:**
 - (1) **Space**/Area limit (Felling series), (2) **Size**/Girth limit and (minimum girth limit), (3) **Time** limit (a felling cycle of 30 years)
- **Enumeration** of future yield trees,
- Leaving high quality teak tree as **seed tree (mother tree)**
- Fixing of **Annual Allowable Cut** for teak and hardwood



AAC	No. of Tree	Cubic Meter
Teak	147,300	424, 790
Hardwood	1,131,461	1,602,034

Natural capitals potentials for climate change mitigation and Biodiversity conservation

Conservation of carbon stock at permanent forest estate

Legal classification	Area (km ²)	% of land area
Reserved forest	121,842.91	18.00
Protected public forest	40,949.60	6.05
Protected area system	35,106.85	6.67
Area of PFE	197,899.36	30.73

Source: Forestry in Myanmar, 2011

Conservation of Protected Areas (PAs)

Notified 32 Wildlife Sanctuaries and 2 National Park covering 7.3% of the total land area (49456.46 sq.km), planned to achieve for 10%

1. Khakarborzi NP
2. Tamanthi WS
3. Pidaung WS
4. Chatthin WS
5. Minwun-Taung WS
6. Shwe-U-Daung WS
7. Alaungdaw-kathapa NP
8. Pyin-Oo-Lwin WS
9. Mingon Taung WS
10. Lawkanandar WS
11. Natmataung NP
12. Wethikan WS
13. Shwesettaw WS
14. Popa NP
15. Padalingu WS
16. Taunggyi WS
17. Inle Lake WS
18. Loimowe WS

19. Parsar WS
20. Rakhine-Yoma elephant range
21. Thamiha Kyun WS
22. Mainmahla Kyun WS
23. Hlawga WP
24. Moyingyi WS
25. Kelatha WS
26. Kyaikhtiyo WS
27. Kahilu WS
28. Mulayit WS
29. Moscos Island WS
30. Lampi Marine Park
31. Indawgyi WS
32. Kyauk Pan Taung WS
33. Hponkan Rzai WS
34. Hukaung Valley WS

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Enhancement of carbon stock (Re- afforestation 1981-2010) potentials for climate change mitigation

Plantation type	Area (ha)	% of total area
Commercial	450,656	53.7
Industrial	72,519	8.6
Village supply	180,009	21.5
Watershed	135,459	16.2
Total	838,642	100

Additional 49,809 ha of Private teak plantations (2006-2010)

Research findings on total carbon sequestration of pure teak and mixed species plantations at different ages

Plantations	Above-ground C (ton/ha)	Root C (ton/ha)	Litter C (ton/ha)	Under-growth C (ton/ha)	SOC (ton/ha)	Total carbon storage (ton/ha)
	I	II	III	IV	V	I+II+III+IV+V
6-yr-old	20.8 (0.83) ^b	6.2 (0.25) ^b	0.8 (0.02) ^d	2.2 (0.13) ^d	35.5 (1.08) ^a	65.5 ^b
16-yr-old	37.6 (5.98) ^a	8.7 (1.78) ^a	1.6 (0.15) ^c	2.8 (0.05) ^c	39.7 (1.25) ^a	90.4 ^b
26-yr-old	42.1 (2.10) ^a	12.6 (0.63) ^a	1.9 (0.08) ^b	4.1 (0.13) ^b	55.5 (4.40) ^a	116.1 ^b
26-yr-old	47.8	11.9	2.1 (0.09) ^a	4.2 (0.18) ^a	59.9	125.9 ^a
Mixed PT	(1.61) ^a	(0.40) ^a			(5.77) ^a	

Total carbon storage was significantly different among the plantations ($p < 0.01$).

Source: Thuang Naing Oo (2009)

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Carbon sequestration of commercial tree species in natural forest

No.	Species	Mean DB H (cm)	Tree C* (ton /ha)	SOC (ton/ha)	Litter-fall C (ton/ha)	Undergrowth C (ton/ha)	Total C (ton/ha)
1	Teak	26.0	54.7	59.9	2.1	4.2	116.1
2	Pyinkado	24.6	71.5	59.9	2.1	4.2	137.7
3	Padauk	27.7	72.7	59.9	2.1	4.2	138.9
4	Thinwun	27.6	72.5	59.9	2.1	4.2	138.7
5	Taukkyan	22.8	53.8	59.9	2.1	4.2	120.0
6	Yemane	25.0	36.3	59.9	2.1	4.2	102.5
7	Yinma	24.0	63.1	59.9	2.1	4.2	129.3

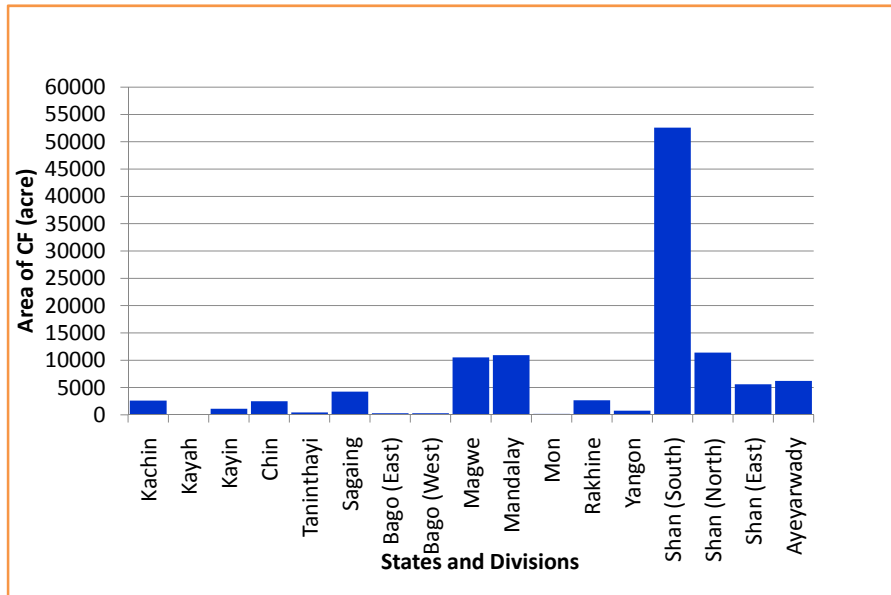
Source: Thuang Naing Oo (2009)

Note: *above and below ground carbon (root carbon)

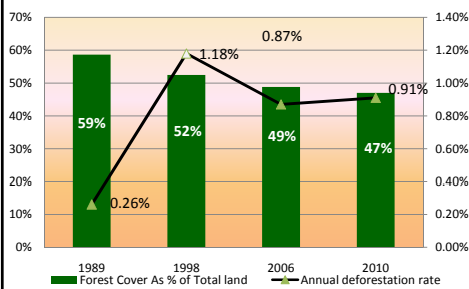
Stock density was assumed to be 400 trees per ha for each species. SOC, litter-fall carbon and undergrowth carbon were also assumed to be the same as 26-year-old mixed-species plantation

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Stakeholder engagement in forest management to enhance carbon stock in Community Forest (41, 458 ha)



Periodical trend of deforestation in Myanmar

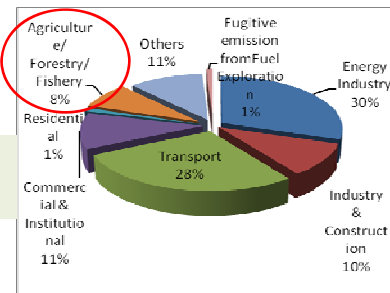


Annual loss between 1990-2010, = 372,250 ha (FAO-FRA, 2010)

Identified major drivers of deforestation

- ▶ Over-exploitation
- ▶ Illicit cutting (plantation)
- ▶ Shifting cultivation,
- ▶ Forest fires,
- ▶ Expansion of agricultural land
- ▶ Infrastructure development
- ▶ Socio-economic related factors

Proportions of CO₂-equivalent emissions from energy sector by sources in Myanmar



II. Signatory to the International Contexts concerned to forestry sector in Myanmar

- ❖ International Tropical Timber Organization (**ITTO**) in November 1993;
- ❖ UN Framework Convention on Climate Change (**UNFCCC**) in November 1994;
- ❖ UN Convention to Combat Desertification (**UNCCD**) in January 1994;
- ❖ UN Convention on Biological Diversity (**CBD**) in November 1994;
- ❖ Convention on International Trade in Endangered Species of Wild Fauna and Flora (**CITES**) in June 1997;
- ❖ Botanical Gardens Conservation International in November 1998.
- ❖ Kyoto Protocol in 2003 as non-Annex I country.

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III. Potentials, Opportunities

International level: Cooperation and participation, financial and technology, equity and responsiveness, enhance national economy, quality of life,

National level: Administrative reform for good governance, signatory to convention, Poverty reduction strategy and action plan, encourage education,

Forestry Sector: Private investment, community forestry (social inclusion), legality of timber, National level land-use planning, technology/ experience in research,

University of Forestry: Teaching all forestry and environmental related subjects highlighting global issues, job opportunities for graduate students,

IV. Challenges identified

International settings: Ever-changing, Complex and complicate for processing (CDM, REDD+, Forest-Certification), Linking & Regulation of old practices, standardization, (Valuation of ecosystem services)

National level: Reform and change (decentralization), Poverty, information gap, national financing system and allotment, officice procedures,

Forestry Sector: Mainstreaming forest management to national planning, Deforestation and forest degradation (drivers), law enforcement, research in silvicultural operations in contributing international settings, capacity building and management,

University of Forestry: Limitation of resource/ experience persons in each international settings, scarcity of references,

V. Conclusion

- **Policy** has recently opened and adapted to international societies,
- **Legal aspect:** Instruction, regulations are being amended/ progressed,
- **Institutional:** Planning to reform for good governance, (still centralized), to be aware the role of good governance, social inclusion, NOGs, CSOs to be invited to involve, cooperation among stakeholders,
- **Planning Process:** old planning system still existing, to be all inclusive,
- **Implementation:** to be transparency, equity, changes,
- **Resources:** Natural capitals are depleting, human capitals needed to build up,
- **Technical aspect:** Research and forest management practices more to align with international contexts,

Thank you very much for your kind attention!
Your suggestions and comments are most
welcome



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