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Analysis of Forest Policy in Myanmar

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Abstract: With the long history of scientific forest management based on the Burmese customs of timber extraction, forest policies and its development supported the economy of country and livelihoods of the people until the 21th century. Forests provide not only tangible benefits such as timbers, foods, fodder and shelters for the people and biodiversity but also intangible benefits such as water storage, soil formation, air purification, etc. Using the forests in sustainable manner is particularly contributes well life support system to all living things. Forest policy formulation and legislation in one country tell how people behave on their own scarce resources in order to achieve from their minimum subsistence economy to the goal of national economy as well. Good governance to forest policy and laws always reflect to sound forest management system and that leads to sustainability of forests and well beings of the people in the country. Due to growing population and changing conditions of natural forest ecosystems, every country in the world emphasizes on land use policies and tries to reform to adapt with varying attributes of forests and other political sectors. Security of forest Land tenure system is one of the most important issues and its changes has dynamic effects on people in the country. This paper tries to find out briefly on how forest policy affected to the people and sustainability of forests from 17th century to 21th century in Myanmar. Although country's economy mostly depended on the raw timber production throughout the several decades, forest policy, land tenure patterns and its reform are still needed to reflect the real changing conditions of environment.

Keywords: scientific forest management, customs of timber extractions, forest policy, land tenure reforms

1. Introduction

The total area of Myanmar is 676,577 km^2. It stretches for 936 km from east to west and 2,051 km from north to south as the second largest country in Southeast Asia after Indonesia. It shares the border with five nations; China, Laos, Thailand, Bangladesh and India. It is endowed with rich natural resources—arable land, forestry, minerals, natural gas, freshwater and marine resources, and is a leading source of gems and jade. In 2014, country has 51.4 million of people and 68% of population lives in rural area based on agriculture and natural resources. Myanmar's economy is on track to grow by 7.8% of GDP in both Fiscal Year 2014 (ending 31 March 2015) and in FY2015. Growth is supported by rising investment propelled by improved business confidence, commodity exports, rising production of natural gas, buoyant tourism, and credit growth - all complemented by the government's ambitious structural reform program.

Since the general elections in 2010, Myanmar has undertaken significant political and economic reforms. In the area of economic reform, the government has liberalized the telecommunications sector and it plans to issue licenses to a number of shortlisted foreign banks to enter the market in a move that is expected to improve efficiency in the banking sector. Myanmar's application to join the global Extractive Industries Transparency Initiative was accepted in July 2014, marking a step forward to improved accountability in the governance of oil, gas, and minerals.

2. Forest Resource

Forests generate wealth in the form of wood and related products, which is used for domestic purposes and exported. There are six different forest types in the country; Hill and Temperate evergreen forest, Deciduous Indaing (Dipterocarp) Forest, Dry Forest, Mixed Deciduous Forest, Tropical Evergreen Forest, and Mangrove forests. Forests cover about 31.773 million ha or 46.96 % of the total land area. The production forest area is 19.633 million ha constituting 61.791% of total forest area. Total growing stock is 1430 million cubic meters and of which commercial species possess 398 million cubic meters. So, the commercial growing stock constitutes relatively 27.85% of total growing stock. Carbon in living biomass has 1653 million metric tonnes. Major economic species are Dipterocarpus species, Dipterocarpus tuberculatus, Tectona grandis, Eugenia species and Xylia dolabriformis, etc.

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Myanmar' forests are an essential source of biodiversity and environmental sustainability for Southeast Asia. The forested areas are also a major habitat for tropical and subtropical flora and fauna; thus as well as being a major economic resource.

3. History of Forestry Development

3.1 Monarchial Times

The first forest policy was started in 18th century legislating that the Teak tree was royal and no one was allowed to cut without permission of the king (government). Teak trees were cut to supply for the development of kingdom and were also used in construction of palace buildings and ships. Citizens of kingdom can use other species of woods paying taxes to local authorized person who was delegated from the kingdom. Since 17th century, timber trade had been started between foreign countries.

3.2 Laissez-Faire Forestry Development (1824-1855)

After the first Anglo-Burmese war at 1824, the British conquered some lower *Tenasserim* region of Burma and its timber firms over extracted *Tenasserim* teak forests and *Ataran* forest area for the construction of the British naval vessels and other purposes. Trees were cut freely and there are few forest rules in a limited scope till 1857. It was Laissez-Faire forestry (Bryant 1997).

3.3 Scientific Forestry Development (1856-1938)

Scientific forest management system was introduced after second Anglo-Burmese war at 1852 occupying lower Burma. Forest department was founded and contract system was introduced in 1856 to regulate the trade of *Pegu* teak forest area. Forest rules first proclaimed in October 1856 provided a framework within which the forest department could operate. Forest rules were provisioned at 1865. First forest reserve created in May 1870. Extraction techniques and tax regulations from Burmese were being adopted to British forest management system. Forests are also declared State owned as in Burmese monarchial times. Burma forest act was legislated at 1881 in which procedures for creation of reserve forest, *Taung-ya* system regulations, taxation systems, manuals for timber extraction, and regulations of trade are described and then it was leading to expansion of forest control.

After the third Anglo-Burmese war, all Burma was lost freedom. Forest sector development was addressed according to India Forest Policy 1894, and sometimes by ad hoc measures until the Burma Forest Act was enacted in 1902. Forest management under this Act became to promote long term commercial timber production in reserves according to scientific principles. Forest officials produced elaborate working plans for long term commercial timber production. From that times, Forest department gained higher power upon local private timber companies and foreign firms. With the introduction of political diarchy system on 1 January 1923, the first Burmese Forests minister, Joseph A. Maung Gyi, was chosen by Governor Harcourt Butler in January 1923. At 1938, forty-two individuals of Burmese had been awarded a Bachelor of Science in Forestry from Rangoon University to manage the remaining forests.

3.4. Policy and Organizations Development in Forestry (1948 -2015)

After the liberation of the country from British colony on 4 January 1948, created on 10 April 1948 under the State Timber Board Order, the agency was formally legislated into an existence by an act of the Union Parliament in 1950. Private sector involvement in the timber trade was ended after 1 October 1963 as the State Timber Board (STB) took responsibilities for extraction, milling, marketing all kinds of timber. Later, STB reorganized and renamed Timber Corporation (TC) in 1974 and then transformed as Myanmar Timber Enterprise (MTE) beyond the market oriented era of 1989. Forest department was confined to the "supportive" functions of conservation and research.

Due to the outbreak of civil war after 1948, forest policy formulation was hindered under development. A major change took place in 1988, when the state-run timber industry was opened to private sector participation along the market oriented principles. Harvesting and export of hardwood other than teak were permitted to the private sector from 1989 to 1993. Due to their indiscriminate cuttings and failure to follow the procedures of the system, logging and log export by the private sector had been banned in 1994(FAO country report 1997). After that, private sector was allowed to export value-added wood products only. With a view to stepping up the manufacturing of forest products and to promote internal and external distribution, a Forest Products Joint Venture Corporation has been established jointly by Myanmar Timber Enterprise, the Forest Department and private enterprises in 1993 (Status of Tropical Forest Management report, ITTO 2005).

After 1990s, the government adopted an ambitious environmental agenda in line with international commitments to promote sustainable policies in the country. Notably, National Commission for Environmental Affairs (NCEA) was created in February 1990. A signatory to both the Framework Convention on Climate Change and the Convention on Biodiversity as well as participant in the Global Environment Facility, country decided to join International Tropical Timber Organization (ITTO) in 1993. Then, series of efforts were made to reinforce the forest policy and management: Forest

Law was revised in 1992, national forest policy formulated in 1995, community forestry given a legislative basis (1995) and Dry Zone Greening Department (DZGD) created in 1997(EPA report, 2009). In 2012, the Environmental Conservation Law was approved and then land use policy was planned to draft in 2014 for expansion and consolidation of forest control and sustainable utilization of the forest land throughout country.

3.5. Myanmar Selection System (MSS)

The system involves formation of felling series, each of which is divided into 30 annual coupes based on equal productivity and more or less the same size and worked over a period of 30- year felling cycle (Forestry in Myanmar, 2010). It is an exploitation cum-cultural system first known as the Brandis Selection System and later modified into the Burma Selection System or Myanmar Selection System (MSS). The MSS which became already well established by the year 1920 has ever since been practiced throughout the country (country report, 1997).The development of sustainable management regimes for the teak forests of Bago and the Myanmar Selection System (MSS) built around the concepts of annual allowable cut, forest-working plans (FWP), decentralized management and "local supply working circles" (EPA report 2009).

Under MSS, only mature trees are selected and harvested. Harvesting of trees is regulated based on annual growth and controlled by girth limits prescribed species wise. Felling of exploitable trees is within the bounds of carefully calculated Annual Allowable Cut (AAC). Fixing AACs, therefore, accords the increment of individual tree species, which has taken place over the course of 30-year felling cycle. AAC is thus a tool that ensures the harvest of timber yield on a sustained basis. AACs for teak and for non-teak other hardwoods are periodically revised and fixed based on the updated information (Forestry in Myanmar, 2010).

3.6. Plantation Forestry Development

Attempt on raising teak plantation using *taungya* (agroforestry) method was first made in 1856. The success with this method led to a wide spread planting of teak, *Acacia catechu*, and *Xyliakerri* and by 1930, a total of over 19,000 ha had been planted (country report 1997). It is now a world-famous agro-forestry method based upon agro-forest intercropping (Kevin Woods and Kerstin Canby 2011).

Extensive forest plantations in large blocks were formed commencing from 1972, and further large scale plantation program was launched starting from 1980. It started with a target of 16,190 ha annually to reach a target of 36,420 with the rate of increase of 4,050 ha annually. It reached a peak of 36,340 ha in 1985. A total of 543,288 ha had been planted up till 1995 (Country report 1997).

With growing population pressure and corresponding increase in demand for firewood and charcoal, the FD started the establishment of Village Supply Plantations in degraded reserved forests and protected public forests. Fast growing multi-purpose tree species like mezali (*Cassia siamea*), sha (*Acacia catechu*), auri-sha (*Acacia auriculiformis*), and bawzagaing (*Leucaenaleucocephala*) are used. In addition, *Eucalyptus camaldulensis* and *Prosopisjuliflora* are also planted in the central dry zone where average annual rainfall is approximately 500 mm. Village plantation establishments is increasingly combined with CF where plantations and degraded natural forests are handed over to communities for 30-year renewable leases. There are no fees or land taxes for the establishment of these community level plantations.

Industrial plantations are established near each specific industry as required. The main objective is to assure a supply of raw material to industry without depending on natural forests and to reduce the cost of transportation of raw materials.

In view of the construction of more than 100 dams and reservoirs, big and small, in the last two decades by the government, watershed management has become vital to extend the life span of reservoirs through mitigation of siltation and sedimentation. The current strategy is to promote reforestation as well as agro-forestry practices in the interest of local level farmers who traditionally cultivate various agricultural crops on the slopes of the watersheds (REDD+ road map, 2013). According to global forest resource assessment, plantation establishment from 1896 to 2007 was as follows;

Table 1 Plantation establishment

Year	**Type of Plantation**				**Total (ha)**
	Commercial (ha)	Village supply (ha)	Industrial (ha)	Watershed (ha)	
1896-2007	496737	210327	73620	125167	905851

4. Forest Cover Changes

According to past assessments, the forest cover of the country decreased continuously from 65.8% to 50.8% of the total land area between 1925 and 1989. This corresponds to a decrease of 15% in 65 years. From 1989 onwards, forest cover started to increase to reach 52.4% in 2004, indicating an increase of 1.6% in 15 years (REDD+ road map, 2013). According to the FRA 2010, the loss of overall forest cover amounted to 5.5% of the total land area during 2004-2010. This corresponds to a total loss of 3,721,190ha or 744,238ha per year. The annual deforestation rate of 1.1% during 2004-2010 indicates that the forest cover is now declining at a far higher rate than at any time previously.

The main drivers of deforestation are considered to be maximized volume of timber extraction, non-monetary production and consumption of fuelwood and charcoal, the expansion of subsistence and commercial agriculture, large scale urbanization, infrastructure development, gold, jade, and gems mining, hydro-power construction development, and illegal logging near politically conflicted areas of ethnic minorities. Global Witness (2009) reported that, since 2006, deforestation to make way for sugar cane, tapioca, castor oil and rubber plantations has become one of the biggest threats to Myanmar's northern frontier forests.

Table 2 Forest cover at different periods

Year of appraisal	**Forest cover (ha)**	**% of total land area**	**% of closed forest (crown cover>40%)**
1925	44,518,700	65.8	
1955	38,700,300	57.2	57.0
1975	35,665,600	52.7	47.8
1989	34,370,100	50.8	43.2
1997	35,374,700	52.3	37.4
2004 (FRA 2005)	35,478,000	52.4	27.3
2010 (FRA 2010)	31,773,000	46.9	19.9
Total land area	67.658,000	100.0	

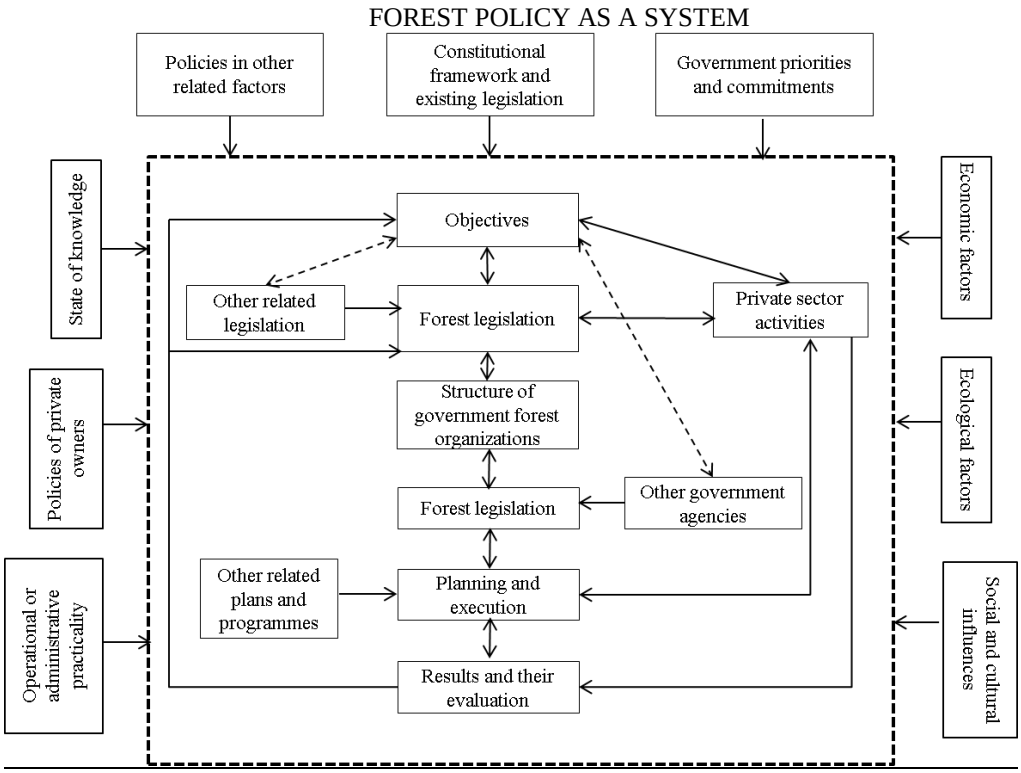
Source: Source FRA 2010 (Current state of REDD+ Readiness preparation in Myanmar) and Myanmar Forestry Department, 2000 (Brief on National Forest Inventory (NFI), Myanmar, FAO 2007)

5. Framework and Characteristics of forest policy

Kennedy (1985) defined: "Forestry is the management of forest resources to provide a satisfactory amount and mix of social values (consumptive and non-consumptive) for clients living, while protecting these values and use options for future generations".

The rational use of the forest resource requires decisions on what goods, services and benefits we wish to obtain and, subsequently, on other decisions how we propose to get them. Policy questions may range from what may seem trivial to the momentous: from an issue of whether or not villagers should be allowed to gather fuelwood on government lands (this will not be trivial to the villagers) to a critical decision on whether or not the government should regulate the use of privately owned forest resources.

A country's forest policy is best understood as a system of interrelated elements. The system (or policy) establishes the form in which a government carries out its forestry programs and influences or controls how the population makes use of its forest resources (Husch 1987).



Source: Guidelines for forest policy formulation, 1987.

5.1. Forest Policy (1995)

Myanmar Forest Policy (1995) was formulated in a holistic and balanced manner within the overall context of the environment and sustainable development taking full cognizance ofthe forestry principles adopted at UNCED.

The policy has focused on the **Protection** of soils, water catchment, ecosystems, biodiversity, genetic resources, scenic reserves and national heritage sites, on the **Sustainable** forest management to ensure in perpetuity the level of benefits both tangible and intangible forthe present and future generations, on providing the **Basic Needs** such as fuel, water, fodder,shelter, food and recreation, on the **Efficiency** in harnessing the full economic potential of theforest through increased productivity while controlling the socio- economically and environmentally unacceptable side effects, on the **people's participation** in forestry, wildlife and nature conservation activities and in establishing plantations and increasing non-farmincomes by applying community and agroforestry systems, and on raising **Awareness** of the decision-maker and politicians in national socio-economic development, bio-diversity, soil and water conservation and environmental stability essential for sustained life on earth.

The forest policy aims at a balanced and complimentary land use, gazette 30% of the total land area as reserved forest and 5% as protected areas systems, with the long-term goal of including 10% of the total land area (country report, 1997). According to the statistics, status of permanent forest estate (PFE) of Myanmar in 2009 was;

Table 3 Status of Permanent Forest Estate(PFE) in Myanmar

Category	**Area(ha)**	**Percent of Land Area (%)**	**Forest Policy target**
Reserved Forests	12,184,291	18.00	30% of land area
Protected Public Forests	4,094,960	6.05	
Protected Areas	3,510,685	6.67	10% of land area
Permanent Forest Estate	**19,789,936**	**30.73**	**40% of land area**

Source: Planning and Statistics Division, FD, 2010 (Forestry in Myanmar, October 2011)

With an estimated forest cover of 46.9 % of the total land area (FRA 2010), the above figure show that a substantial area of forest is not classified as PFE. It is in fact expected that as much as 50% of the PFE no longer qualifies as 'forest' due to long-term agricultural encroachment. A recent presidential decision has recommended the revision of the boundaries of the PFE to reflect this ground reality. This would reduce the real PFE to 15% of the total land area, leaving over 30% of the total land area as unclassified forest. To reach the PFE policy target of 40% would still be feasible but would require the accelerated gazette of remaining forest last. It would also require the sustainable management and protection of an increasing PFE which will become challenging considering the steady deforestation rates and ongoing forest degradation. What becomes very clear and what has already been recognized in the 1995 Forestry Policy is that state management of forests needs to evolve. Local communities and where appropriate the private sector, need to become major partners in forest management (REDD+ road map, 2013).

5.2. Forest law (1992)

The Legislation of Forest law in 1992 highlights forest protection, environmental and biodiversity conservation, and extended set-up of the permanent forest estates (PFE) and protected areas system (PAS). It provides opportunities for the promotion of private sector involvement in reforestation and timer trade, and decentralizes management responsibilities. It encourages community participatory approach in managing forest resources, particularly to satisfy the basic needs of the rural people. It demonstrates a shift from the concept of revenue generation and restriction to motivation and share of management responsibility with people (http://www.moecaf.gov.mm/userpage2.aspx?mid=13).

5.3. Forest Rules (1995)

Ministry of Environmental Conservation and Forestry promulgated the Forest Rules in 1995 to implement the provisions of the Forest Law. The Forest Rules deal with: reserved forest (forest areas reserved for the state and off-limits to development); the declaration of areas as protected public forest; the management of forest land; the establishment of forest plantations; and the procedures for obtaining permission to extract forest produce. The rules also cover procedures for: harvesting forest produce; establishing and operating timber depots; establishing wood-based industries; investigating violations; administrative actions to penalize violations, such as imposing fines and confiscating the timber; and offenses and penalties (USAID, 2013).

5.4. Protection of Wildlife and Wild Plants and Conservation of Natural areas Law (1994)

The Protection of Wildlife and Wild Plants and Conservation of Natural areas Law (1994) which replaced the old Wild Life Protection Act (1936) focuses attention on the identification of nature reserves, establishment of zoological gardens and botanical gardens, protection of wildlife and wild plants, permission for hunting, conduct of research studies, permission to establish zoological and botanical gardens, registration, search, arrest and administrative action, and offences and penalties (Forestry in Myanmar 2010).

5.5. National Biodiversity Strategy and Action Plan (NBSAP)

According to Article 6 of the United Nations Convention on Biological Diversity (CBD), each member country needs to develop its own National Biodiversity Strategy and Action Plan (NBSAP) to integrate conservation and the sustainable use of biodiversity. In order to fulfill this commitment to the Convention, Myanmar conducted a project entitled National Biodiversity Strategy and Action Plan in Myanmar (NBSAP Myanmar). The Government approved to formulate NBSAP of Myanmar in 2006. The United Nations Environment Program (UNEP) and Global Environment Facility (GEF) agreed to support the technique and funding in formulating NBSAP. Forest Department of the Ministry of Environmental Conservation and Forestry signed the Project Cooperation Agreement (PCA) which is also accountable to the GEF Council for GEF financed activities, on 10th April 2009 (National Biodiversity Strategy and Action Plan (Myanmar), 2011).

5.6. National Commission for Environmental Affairs (NCEA)

The Government formed the National Commission for Environmental Affairs (NCEA) in February 1990. The commission acts as the national focal point for environmental matters Vis-a'-Vis other countries and international organizations coordinates the works of various line ministries and departments and reports directly to the cabinet (Forestry InMyanmar 2010).

Its key functions are to:

(i) Formulate policies on natural resource management,

(ii) Prepare environmental legislation (standards and regulations) for pollution control, monitoring and enforcement,

(iii)Promote environmental awareness through public education and to liaise as necessary with international organizations in environmental matters.

NCEA drafted National Environmental Policy in 1994 to establish sound environment policies, utilization of water, land, forests, mineral, marine resources and other natural resources, in order to conserve the environment and prevent its degradation

(http://risk.forestlegality.org/countries/652/laws).

5.6.1 Projects under Implementation

Pertaining to implementation of the projects by National Commission for Environmental Affairs (NCEA) in Myanmar, a total of five projects to mitigate the Climate Change and toprotect ozone layer are under implementation.They are:
1. Preparation of the initial National Communication Project (IMIS:GFL - 2328-2724-4931);
2. Institutional Strengthening project for the establishment of National Ozone Unit (Phase I and II);
3. Preparation of Ozone Regulations;
4. Project for monitoring of implementation of RMP activities; and
5. Project for establishing conversion practice of domestic refrigerators.

5.6.2 International Environmental Agreements

Myanmar is a party to several international environmental conventions. Among those conventions, the followings are the most important conventions for which the NCEA is acting as the national focal point.
(a) United Nations Framework Convention on Climate Change (UNFCCC) (25November 1994) & its Kyoto Protocol;
(b) Convention on Biological Diversity (CBD) (25 November 1994) & its Catagena Protocol;
(c) Convention on Combat Desertification (CCD) (2 January 1997);
(d) Convention on International Trade in Endangered species of Wild Fauna and Flora
(CITES) (11 September 1997);
(e) Vienna Convention for the Protection of the Ozone Layer (24 November 1993) & it's Montreal Protocol; and
(f) Convention on Persistent Organic Pollutant(PoPs) (7 April 2004).
The NCEA has relations with ASEAN Secretariat and other member countries for the implementation of ASEAN Projects such as ASEAN State of the Environment Report (SOER), ASEAN Environment Year, and ASEAN Environmental Education Action Plan (AEEAP) and so on. The Secretary of NCEA is acting as the National Chairman for ASEAN Senior Officials on Environment (ASOEN). The NCEA is assisting and collaborating with the followingASEAN Working Groups under ASOEN.
- Working Group on Nature Conservation and Biodiversity(AWGNCB);
- Working Group on Coastal and Marine Environment(AWGCME);
- Working Group on Multilateral Environmental Agreements(AWGMEA);
- Working Group on Water Resource Management(AWGWRM);
- Working Group on Environmentally Sustainable Cities(AWGESC); and
- Haze Technical Task Force(HTTF).

Apart from the UNEP, other contact partners of NCEA are as follows:
- Greater Mekong Sub region (GMS);
- United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP);
- United Nations Industrial Development Organization (UNIDO);
- Japan International Cooperation Agency (JICA);
- Korea International Cooperation Agency (KOICA);
- Commission on Sustainable Development (CSD);
- Global Environment Facility (GEF); and
-Hanns Seidel Foundation (HSF)

As NCEA serves as a National Focal Point for Environmental related matters, NCEA has been participating and sending the delegates and trainees to the International and national workshops, seminars, meetings and trainings which are related to environmental affairs for the enhancement of the capacity building of the country.

5.6.3 Other Activities
The NCEA has also been making sustained efforts for enhancing public awareness and participation in environmental protection activities. Workshops, seminars and training courseshave also been held with aim of disseminating education and knowledge on environmentalprotection among the departments and the public. World Environment Day is also celebrated early on a nation-wide scale to draw public attention to environmental matters.

The Commission is undertaking the activities such as convention implementation at the global and regional level by its small capacity with the assistance of international environmental organizations. At the national level, undertaking research projects in collaboration with relevantgovernment organizations is a part of the work program of NCEA.

NCEA has also made the activities of the project on Air Quality Assessment. Successive Air Quality monitoring activities were done at Yangon in 2007, Mandalay in 2008 and Nay Pyi Taw in 2009.

5.7. National Environment Policy of Myanmar
As a follow-up to United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil in 1992, the Government of the Union of Myanmar adopted the following policy on 5 December 1994 with the aim to establish sound environment policies in the utilization of water, land, forests, mineral, marine resources and other natural resources in order to conserve the environment and prevent its degradation.

"The wealth of a nation is its people, its cultural heritage, its environment and its natural resources. The objective of Myanmar's environment policy is aimed at achieving harmony and balance between these through the integration of environmental considerations into the development process to enhance the quality of life of all its citizens. Every nation has the sovereign right to utilize its natural resources in accordance with its environmental policies; but great care must be taken not to exceed its jurisdiction or infringe upon the interests of other nations. It is the responsibility of the State and every citizen to preserve its natural resources in the interests ofpresent and future generations. Environmental protection should always be the primary objective in seeking development" (Forestry InMyanmar, 2010).

5.8. Myanmar Agenda 21

For the implementation of Myanmar Environment Policy, Myanmar Agenda 21 was adopted in 1997. It is a blue print for all natural resource management and environmental conservation work and the pursuit of the activities contribute to biodiversity conservation throughout the country; for example, efforts made in sustainable forest management, sustainable tourism and sustainable transport and infrastructure development with a reduced impact on biodiversity (National Biodiversity Strategy and Action Plan (Myanmar), 2011). Myanmar Agenda 21 seeks to achieve four main objectives:

(a) To provide a forum and context for the debate on sustainable development and the articulation of collective vision for the future;

(b) To provide a framework for negotiation, mediation, and consensus-building in the country to achieve development with due regard to the environment, to focus the entire country on a common set of priority issues;

(c) To provide a strategy and implementation plans for the changing and strengthening of values, knowledge, technologies and institutions with respect to environmental protection and development; and

(d) To provide the impetus and the frameworkfor the development of organizational capacities and institutions required for sustainable development (Forestry in Myanmar, 2010).

5.9. National Sustainable Development Strategy (NSDS)

National Sustainable Development Strategy (NSDS) was established in 2006 and is in line with the UN's mandate of Article 162 of World Summit of Sustainable Development (WSSD). It is designed to reduce pressures from habitat loss, land use change and degradation, and unsustainable water use. It includes a draft action plan to control desertification and reduce pollution and its impact on biodiversity. The Strategy also requires countries to address challenges to biodiversity from climate change, and pollution (http://risk.forestlegality.org/countries/652/laws).

Given the commitments made to Agenda 21, Millennium Development Goals (MDGs) and JPOI, the NCEA and the United Nations Environment Program Regional Resource Center forAsia and the Pacific (UNEP-RRC-AP) signed a Memorandum of Understanding (MOU) in October2007 for the formulation of NSDS for Myanmar towards mainstreaming sustainable developmentin the decision making process. The NCEA hosted three consultation meetings and one expertreview meeting with the assistance of UNEP in 2007. As mentioned before, the NCEA incollaboration with UNEP has drafted NSDS in 2009 and the Commission has printed the NSDS publication and distributed to the ministries and organizations concerned so that to mainstreamthe actions of the NSDS in their present and future work plan. As mentioned before, the NCEAin collaboration with UNEP has drafted NSDS in 2009 and the Commission has printed the NSDSpublication and distributed to the ministries and organizations concerned so that to mainstreamthe actions of the NSDS in their present and future work plan. This will enable Myanmar achieving sustainable development (Forestry InMyanmar, 2010).

5.10. Environmental Conservation Law

In 2012, the Environmental Conservation Law was approved and which contains 14 chapters that define the rights and responsibilities of the Ministry of Environmental Conservation and Forestry, environmental standards, environmental conservation, management in urban areas, conservation of natural and cultural resources, process for businesses to apply for permission to engage in an enterprise that has the potential to damage the environment, prohibitions, offences and punishments.

The Law is designed "to reclaim ecosystems as may be possible which are starting to degenerate and disappear" and to ensure that "The relevant Government departments and Government organizations shall, in accord with the guidance of the Union Government and the Committee, carry out the conservation, management, beneficial use, sustainable use and enhancement of regional cooperation of forest resources(http://mizzimaenglish.blogspot.com/2012/07/burmas-environment-law undergoes.html).

5.11. Timber Certification Committee (TCC)

The government has also started numerous initiatives over the years to promote certification, including various committees across different agencies, Criteria and Indicators (C&I), national codes, reduced impact logging (RIL) and chain of custody (CoC), among

others.

The Timber Certification Committee (TCC) was formed in August 1998 by the Ministry of Forestry. Since then the TCC has been establishing links with other timber certification bodies on a bilateral basis, including the Malaysian Timber Certification Council and the Indonesian Eco-labeling Institute. The TCC is developing a timber certification scheme that reflects Myanmar's forest management system, using Myanmar's C&I as the basis of a timber certification checklist at the Forest Management Unit (FMU) level. As of mid-2010, any area of forest in Myanmar had not been certified (e.g. FSC 2010)(Blaser et al, 2011).

5.12. National Code of Harvesting Practices (NCOFHPs)

In 2000, Myanmar's MOF developed a National Code of Harvesting Practices (NCOHP) based on the regional FAO/Asia-Pacific Forestry Commission Code of Practice for Forest Harvesting in Asia-Pacific, which was revised in 2003. FAO and the Japanese government supported the "Enhancing Sustainable Forest Harvesting in Asia" from 2003-08, which were the initial stages for applying improved forest harvesting. In 2008, Myanmar developed "reduced impact logging" (RIL) guidelines. Meant to lead to the development of an internationally recognized national timber certification standard, RIL guidelines aim to provide guiding mechanisms to realize NCOFHPs.

5.13. REDD

Having signed the United Nations Framework Convention on Climate Change (UNFCCC) on 11 June 1992 and ratified the convention on 25 November 1994 and the Kyoto Protocol in 2003 as a non-Annex 1 party, Myanmar is fully aware of the causes and potential impacts of climate change. Hence, whilst undertaking political reform and aiming at rapid economic development, Myanmar is striving to reduce its greenhouse gas (GHG) emissions (REDD+ road map, 2011).

REDD+ in particular have not been integrated into Myanmar's forest policies and laws, although the need to mainstream REDD+ in national forest management plans was raised by Myanmar at a meeting of the ASEAN Social Forestry Network in June 2010. Myanmar's initial national communication to the UNFCCC is being prepared. The Small-scale Reforestation Project in Mangrove Forests of Ayarwaddy Delta, a CDM project, was also under way in 2010 (Kyaw& San 2009). To date Myanmar has not become involved in any of the major ongoing REDD+ initiatives (Blaser et al, 2011).

5.14. Forestry Master Plan

A comprehensive Forestry Master Plan for 2001-2031 reinforced the policy support for sustainable forest management. This Plan was initiated by Forestry Department as a National Forestry Program Exercise. Medium-term plans of 10 years for 62 districts (FMU) covering the whole country have been formulated and adoptedfor action (http://risk.forestlegality.org/countries/652/laws). It is including a mandate to "protect and extend reserved forests and protected public forests (PPF); pursue sound programs of forest development through regeneration and rehabilitation; effectively manage watersheds for the longevity of dams and water reservoirs; optimize extraction of teak and hardwood within the available means; extend forestry research; enforce effective law against illegal extraction of forest products; encourage increasing use of fuel-wood substitutes; export timber and value-added forest products and seek ways and means to export other NWFPs; and promote ecotourism to earn more foreign exchange" (Kevin Woods and Kerstin Canby 2011).

6. Institutional Framework

To take more efficiency in management of environmental conservation, Ministry of Forestry (MoF) was changed its name to Ministry of Environmental Conservation and Forestry (MoECAF) in 2011 and Environmental Conservation Department was created in 2012.

The Ministry of Environmental Conservation and Forestry (MoECAF) is responsible for managing all forest lands in the country including the Permanent Forest Estate (PFE) and Public Forests. MoECAF develops the forest policy and legal frameworks and coordinates Climate Change related policy analysisand development. The ministry contributes to UNFCCC negotiations through the Ministry of Foreign Affairs (MOFA) and is in charge of developing the National Communications to the Convention. MoECAF is also in charge of environmental protection including the development and implementation of rulesrelating to Environmental and Social Impact Assessments (ESIA) (REDD+ road map, 2013).

Six departments come under the control of the Ministry of Environmental Conservation and Forestry (MoECAF): the FD; the Myanmar Timber Enterprise (MTE); the Dry Zone Greening Department (DZGD); the Planning and Statistics Department; the Survey Department; and the Environmental Conservation Department (http://www.moecaf.gov.mm/userpage2.aspx?mid=13).

Planning and Statistics Department (PSD) coordinates and facilitates the tasks of FD, MTE and DZGD following the directives of MOF, and deals mainly with policy matters and issues related to forestry.The PSD is divided into:

- Policy and Planning Division
- Commerce and International Cooperation Division
- Environment Division

Forest Department (FD) is responsible for protection and conservation of biodiversity and sustainable management of the forest resources of the country.The Forestry Department also has delegated authority over areas of land classified as Protected Public Forest and Public Forest. The FD is responsible for the protection and conservation ofbiodiversity and the sustainable management of forest resources in the country; The FD isdivided into:

- Planning and Statistics Division
- Watershed Management Division
- Extension Division
- Training and Research Division
- Budget Division
- Wildlife Conservation Division
- Natural Forest and Plantation Division
- Administrative Division
- Zoological Gardens
- Forest Research Institute
- Inspection Division
- University of Forestry
- 15 sub-national Offices covering all States and Regions and including 64 District Offices covering the management of Reserved Forests around the country. District Offices aresub-divided into township offices.

Environmental Conservation Department (ECD):Is a newly created Department responsible for Environmental and Social Impact Assessments (EIA) of investments and the development of theNational Communications to UNFCCC; The ECD is divided into:

- Administrative Division
- Policy, International Relations, Training and Research Division
- Pollution Control Division
- Natural Resources Conservation and EIA Division
- 5 sub-national Offices (Yangon, Mandalay, Ayeyawady, Sagaing and Tanintharyi Regions with plans to expand in all States and Regions).

Dry Zone Greening Department (DZGD) is responsible for reforestation of degraded forest lands, protection and conservation of remaining natural forests, and restoration of the environment in the dry zone of the Central Myanmar.The DZGD is divided into:

- Projects Division
- Engineering Division
- Administrative Division
- 3 sub-national Offices covering the Mandalay, Sagaing and Magway Regions

Myanmar Timber Enterprise (MTE) is responsible for timber harvesting, milling and downstream processing and marketing of forest products (Forestry InMyanmar, 2010).There are 63 FMUs in Myanmar, of which 41 are dedicated to timber production. Thirty-four FMUs are actively managed for teak and other hardwoods, covering an area of about 470 000 hectares. An estimated 19.6 million hectares of forest is allocated for production, and a further 8.7 million hectares is allocated for multiple-use (FAO 2010).

The MTE operates 38 extraction and rafting agencies throughout the country. Most log-skidding is done by elephant, which has been shown to do less damage to the forest than machines, and wastage is less. Mechanical extraction is not favored as it is not considered economically feasible under the Myanmar Selection System and is only used in limited areas. So far, heavy equipment has been used mainly for road construction, the loading and unloading of logs, and for transportation (Blaser et al, 2011).

MTE has a set of extraction manuals, departmental instructions, standing orders, and so forth, for carrying out harvesting procedures in a systematic order, besides, "NationalCode of Harvesting Practices in Myanmar" was developed in 2000, which is now under review. MTE also has an on-going project on "Enhancing Sustainable Forest Harvesting in Asia, "currently being implemented in Laos- PDR, Myanmar and Vietnam. Objectives are effectiveimplementation of Reduced Impact Logging (RIL) and Sustainable Forest Management (SFM); also aiming for increased awareness of economic, environmental and social dimensions of forestry (Forestry in Myanmar 2010).

7. Timber production and trade

Timber extraction is totally come from natural forests. Forest Department manages the forests and Myanmar Timber Enterprise extracts the timbers coordinating with forest department. Annual quota for timber production is set by annual allowable cut (AAC). Current AAC for Teak and hardwood production is as follows;

Table 4 Annual Allowable Cut for Teak and Hardwoods

	No of trees	Cubic Meter
Teak	147,300	424,790
Hardwoods	1,131,461	1,602,034

Source; Planning and Statistics, Forest Department

Annual average local consumption from 1999 to 2009 was 247491 m^3 and local consumption in 2010 was 311248 m^3. It promotes 26 % for local consumption as before a decade (Forestry in Myanmar 2010).

Round wood production in 2005 was estimated at 43.1 million m^3, of which 39.2 million m^3 (91%) was fuel wood (FAO 2010). The estimated production of industrial round wood in 2009 was 4.24 million m^3, as it was in 2004 (although it was only about 3.35 million m^3 in 1999; ITTO 2011). In 2009, estimated production of tropical hardwood sawnwood was 897 000 m^3, down from 979 000 m^3 in 2004 and up from 298 000 m^3 in 1999. An estimated 1.38 million m^3 of tropical hardwood logs were exported in 2009, similar to the 1.37 million m^3 exported in 2004 (ibid.).

Major export destinations are India (reported by the Government of India at 741 000 m^3 in 2008), China (reported by the Government of China at 462 000 m^3 in 2008) and Thailand (96 600 m^3 in 2008).

The estimated value of Myanmar's exports of primary timber products amounted to US$859 million in 2008, of which logs contributed US$716 million (83%) (ITTO 2010)(Blaser et al 2011). Forestry exports totaled $778 million and domestic income totaled Kyats 60411millions as annual average income of last three years (The Mirror Newspaper, 2014). Timber extraction was gradually minimized from 2011 to be sustained within annual allowable cut (AAC) and log export was totally banned in 1 April, 2014 aiming to maximize national income from finished products exports of wood based industries.

8. Forest land Tenure Reform in Myanmar

8.1 Forest Tenure

Almost all forests are owned by the state; they are designated as reserved forests and public or unclassified forests, and commercial timber and NTFPs can be extracted from both classes. Reserved and public forests constitute the PFE. Particular rights apply to teak: according to the 1992 Forest Law (Chapter III), "a standing teak tree wherever situated in the state is owned by the state" (Status of tropical Forest management 2011).

Table 5 Forest tenure

Ownership category	Total area	Of which PFE
	'000 ha	
State ownership (national, state or provincial government)	33 300	-
Other public entities (e.g. municipalities, villages)	0	-
Total public	**33 300**	-
Owned by local communities and/or Indigenous groups	41	-
Privately owned by individuals, firms, other corporate	0	-

(Source: FAO 2010)

8.2 Community Forestry Program

The 1995 Community Forestry Instruction (CFI) is a legal framework to promote community participation in forestry. The CFI provides that the following areas are suitable for the establishment of community forests: reserved and non-reserved forests authorized by the government and the lands which could be managed by the government; village-owned firewood plantations established with the permission of the Director General of the Forest Department (FD); private lands whose owners agree to community use of their property, and lands which are owned by governmental or non-governmental organizations(Tint et al 2011).

The objective of the CFI was to engage local populations in forest management. The FD issued an instruction, avoiding a lengthy legal review process and allowing the rapid initiation of CF. CFwas prioritized in the National Forestry Action Plan (1995) to contribute to SFM and to address thenational fuel wood demand (REDD+ road map,

2013).

Under the CFI, community members from Forest User Groups (FUGs) form a committee and develop a management plan. Upon approval of the plan by the FD, the FUG receives 30 year(renewable) use rights documented in a Community Forestry Certificate. The 30 year National ForestMaster Plan (NFMP 2001) mandated that 2.27 million acres (equivalent to 920,000 ha or 1.36% of thetotal land area) be handed over to FUGs by 2030-31 (REDD+road map, 2013).

Annual progress of Community Forest establishment since 1995 had averaged 6,943 acres (2,810 ha), and there are now 572 Forest Users‟ Groups with certificates, managing 104,146 acres (42146.391ha) of forest, (with more awaiting their certificate). However, the rate of CF hand over has been far lower than that needed to meet the Master Plan's 30-year target (i.e. 2.27 million acres by 2030) (Tint et al 2011).

Studies have documented certain problems, such as insufficient local agro-forestry planning as well as the lack of participation by women and marginalized groups, both of which negatively affect food security.This could illustrate the lack of stakeholder and community involvement in the development of these plans (REDD+ road map, 2013).

8.3 Management of forests outside the PFE
Public Forest lands are forests which have not been gazetted or classified as Permanent Forest Estate but fall under provisions found in the Forest Law (1992) and remain under the responsibility of the MoECAF. Areas of Public Forest land fall within the definition of virgin land under the VFV Law (2012). The Central Committee for the Management of Vacant, Fallow and Virgin Lands, headed by the Minister of Agriculture and Irrigation (MoAI), may make a request to the Ministry of Environmental Conservation and Forestry (MoECAF) that these lands be used for State economic development under the VFV Law.

Currently the most common land use in public forest land is by smallholder farmers in the uplands practicing shifting cultivation.

"Virgin land'' is defined in Article ๖ of the VFV Law as new land or other woodland, in which cultivation has never been done before. The land may or may not be covered in forest, and includes land that has been cancelled legally from Reserved Forest land. The Forest Department of MoECAF and the MoAI currently have overlapping authority over these areas of land.

"Vacant and Fallow Lands'' are areas of land defined in Article 2 of the VFV Law as land which was cultivated and consequently abandoned. This land classification includes fallows and therefore shrub land and secondary forests in shifting cultivation areas. There are mechanisms by which Community Forests can be established within VFV land. Requests for CF establishment have to be submitted through the General Administration Office (township level) to the General Administration Department of the Ministry of Home Affairs.

8.4 Stabilization of shifting cultivation
Shifting cultivation is often cited as a major cause of forest degradation. Nevertheless, the FD recognizes swidden agriculture as a traditional way of life for many ethnic groups living in upland areas but also a survival strategy for the landless poor living in and around forest areas. A growing body of research also shows that shifting cultivation, especially on a sufficient rotational basis, is sustainable and supports survival of natural forests, wildlife, ecosystems and biodiversity. The taungya system, which was in fact the fore-runner of agro-forestry and community forestry, began with shifting cultivators. One family uses an average of one hectare of land annually with an average fallow period of 7 years. The shifting cultivation area in the country was estimated at 22.8 % of total land area approximately 2 million families involved in this practice.

With a rapidly growing population and the loss of traditional shifting cultivation land to private investment and other developments, fallow periods have been shortened. This has led to changes in the vegetation structure and increased the area of degraded secondary shrub or grassland with reduced regeneration potential. This problem is more acute in the coastal zone and in eastern and north eastern Myanmar. Since shifting cultivation is no longer remunerative in the existing areas and because farmers are losing their traditional land, pioneering shifting cultivation into new forest land is becoming agrowing problem.

To stabilize shifting cultivation there is a need to establish a well-defined tenure system to serve as an incentive for the shifting cultivators to improve the productivity of the land.

"Farmland" as defined under Article 3 of the Farmland Law includes "taungya land" or upland farms but only when it is not in a rotational fallow or shifting cultivation system. Rotational fallows are defined as "vacant and fallow land"in Article 2 of the VFV Law. They are not considered as "farmland" and therefore fall outside the land surveys conducted by the Settlement and Land Record Department (SLRD) resulting in weak land use rights. Customary land tenure linked to shifting cultivation is not officially recognized (REDD+ road map, 2013).

Another problem of forest land reform is human interferences such as mining, crop plantations, dam construction in areas of reserved forest and public reserved forest areas. In 2012, encroachment to forest land was 7% of total areas of reserved and public reserved forests (Forest Department, 2012). In 2014, the government planned to delete the land encroachment areas of 724203.12 acres.

So, the government organized National Land Resource Planning Central Committee and held workshop with international organizations to appear a drafted land use policy in 2014. This policy will be applied to all land resources improvements, uses and tenure in both rural and urban areas of the country.

9. Conclusion

Forest policy development in Myanmar was many years prolonged and still evolving to more strong foundation with its new reforms. Since the establishment of forest department and introduction of scientific management in 1856, forest policy plays important role in macroeconomic policies of the country until now. With the changing conditions of political system and increasing population, management of forest resources has been receiving policy, legal and institutional support during the last two decades. Apparently, not only timer production, country is more emphasized on environmental conservation issues after 1990s. It recognized the importance of sustainable forest management (SFM) to take prosperity for the future generations in Myanmar.

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