



## Mitigation of Climate Change Impacts through Restoration of Degraded Forests and REDD-Plus Activities in Bago Yoma Region Myanmar

# Current Status of REDD+ Readiness Preparation in Myanmar



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## **Current Status of REDD+ Readiness Preparation in Myanmar**

### **I. Forest Conditions (Forest cover, ownership and structure)**

#### **1.1. Forest cover change**

The Republic of the Union of Myanmar is geographically located in Southeast Asia between latitudes 9°32' and 28°31'N and longitudes 92°10'E and 101°11'E. Myanmar is bordered on the north and northeast by China, on the east and southeast by Laos and Thailand, on the south by the Andaman Sea and the Bay of Bengal and on the west by Bangladesh and India.

The total area of Myanmar is 676,577 km<sup>2</sup>. It stretches for 936 km from east to west and 2,051 km from north to south. The topography of Myanmar can roughly be divided into three parts-the Western Hills Region, the Central Valley Region and the Eastern Hills Region. The Central Valley of the River Ayeyawady consists of Sittaung Valley and Chindwin Valley. The Eastern Hills Region is the Shan Plateau. River Thanlwin flows through the Shan Plateau to the northern Tanintharyi Coastal Strip.

Myanmar is endowed with a rich diversity of habitat types arising largely from its unusual ecological diversity. About 47% of the country's total land area is still covered with natural forests. Myanmar has been protecting and conserving its diverse biological resources on a sustainable basis. Myanmar's forests are socially and economically significant to the country. As a matter of fact, over 70% of the country's total population is rural and dependent on forest resources for basic needs such as food, fodder, fuel, and shelter. Relative abundance of natural forests in the country is a reflection of the consistent exercise of sound forest management practices for years. In Myanmar, all the lands belong to the government. Since 2006, private sectors are allowed to invest in the establishment of forest plantations with the land lease of 30 years.

Already four appraisals have been made of the forest cover status of Myanmar. The first one, carried out in 1962, used aerial photographs taken in the 1950s, while the later ones are conducted in the 1980s based on the satellite images of the 1970s and 1980s. The fourth appraisal was based on the analysis of the 1989 Landsat TM imageries.

The Forest Resource Assessment (FRA 2010) conducted by the Food and Agriculture Organization of the United Nations (FAO) in cooperation with the Myanmar Forest Department has indicated that forest covered area was reduced from 52% to 47% of the country's land total area of 676,577 km<sup>2</sup>. But Myanmar is still one of the highest in the Asia-Pacific Region. The status of forest cover and forest type are shown in Table 1 and 2, respectively.

**Table 1. Forest cover status in Myanmar (2010)**

Category	Area (,000 ha)	Percentage
Closed forest	13445	19.9
Open forest	18329	27.1
Total forest	31773	47.0
Other Wooded land	20113	29.7
Other land	13869	20.5
Inland Water bodies	1 903	2.8
<b>Total Area of Country</b>	<b>67658</b>	<b>100.0</b>

Source: Forest Resource Assessment, 2010 (FAO)

**Table 2. Area coverage of the major forest types, dominant species and rainfall range**

Forest types	Typical rainfall (mm/year)*	Dominant tree species	Area (km <sup>2</sup> )	% of total forest area
Tidal, beach, dune and swamp forest	>3,500	<i>Rhizophora apiculata</i> , <i>Bruguiera gymnorhiza</i> , <i>Heritiera fomes</i>	13,750	4
Hill and temperate evergreen forest	>3,000	<i>Pinus insularis</i> , <i>P. khasya</i> , <i>Quercus serrata</i> , <i>Syzygium cummini</i> , <i>Bischofia javanica</i>	89,378	25
Evergreen forest	2,500-4,000	<i>Dipterocarp spp.</i> , <i>Eugenia spp.</i> , <i>Syzygium spp.</i> , <i>Credrela spp.</i>	55,004	16
Mixed deciduous forest	1,250-2,500	<i>Tectona grandis</i> , <i>Xylia xylocarpa</i> , <i>Pterocarpus macrocarpus</i> , <i>Gmelina arborea</i> , <i>Millettia pendula</i>	134,068	38
Deciduous dipterocarp forest	900-1,250	<i>Pentacme siamensis</i> , <i>Shorea oblongifolia</i> , <i>D. tuberculatus</i> , <i>Terminalia tomentosa</i>	17,187	5
Dry forest	< 900	<i>Acacia catechu</i> , <i>Tectona hamiltoniana</i> , <i>Terminalia oliveri</i> , <i>A. leucophloea</i>	34,377	10
Fallow land	-	-	9,983	2
<b>Total</b>			<b>353,747</b>	<b>100</b>

Source: \*Kermode, 1964; Kyaw, 2003; Forest Department, 2006

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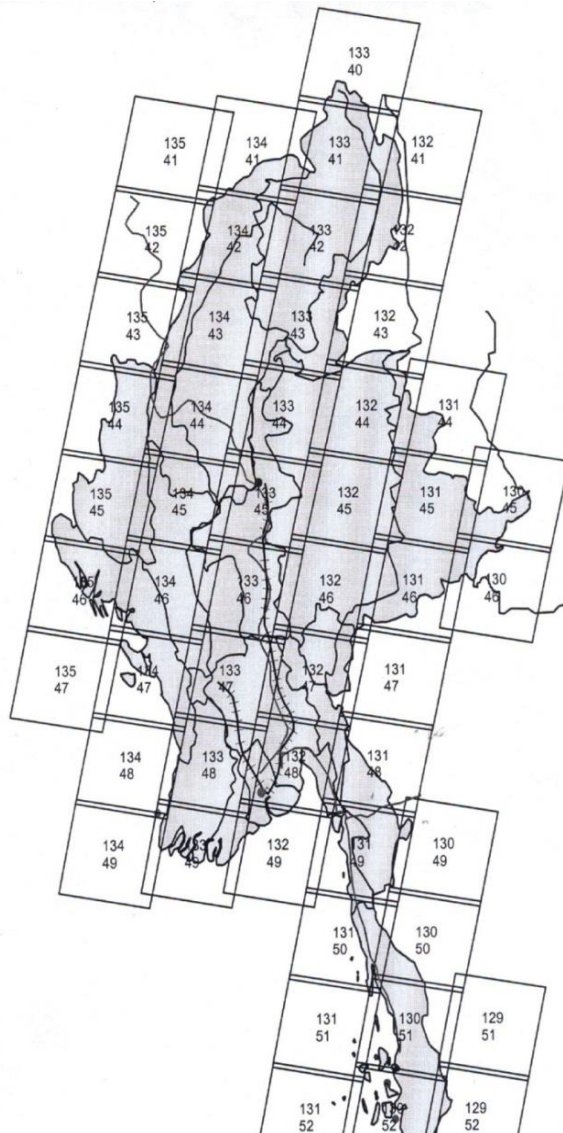
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**Table 3. Forest Cover at Different Periods**

<b>Year of appraisal</b>	<b>Forest cover (km<sup>2</sup>)</b>	<b>% of total area</b>
1925	445,187	65.8
1955 (1st Appraisal)	387,003	57.2
1975 (2nd Appraisal)	356,656	52.7
1989 (3rd Appraisal)	343,701	50.8
1997 (4th Appraisal)	353,747	52.3
2004 (FRA 2005)	354,780	52.4
2010 (FRA 2010)	353,750	46.9

Source: FRA 2010

Total number of Landsats scene = 52, Coverage area of one scene = 185 km x 185 km, Spatial resolution 30 m x 30 m



**Figure: 1 Landsat Paths and Rows**

The assessment of the change in forest cover conducted in 1990 revealed that the actual forest cover had decreased at an annual rate of 220,000 ha or 0.64% of the actual forested area during the period of 14 years from 1975 to 1989. The change was mainly due to shifting cultivation, illicit cutting and encroachment for the agricultural purposes. During the period of 1990-2010, annual loss of forest cover amounts to 372,250 ha (FRA 2010).

**Table 4. Forest by Legal Status**

Category	Area (km <sup>2</sup> )	Percentage of land area
Reserve Forest	122,317.91	18.07
Protected Public Forests	44,198.60	6.53
Protected Area System	35,107.85	6.67

Source: FRA 2010 and Forestry in Myanmar 2011

## 1.2 Ownership system

According to the National Constitution, all the land belongs to the State. Accordingly, forests are also owned and managed by the Government. With the support of the new Forest Law (1992), the Forest Department initiated community forestry in 1995 soon after the Community Forestry Instructions (CFIs) were issued in 1995. CFIs are a major breakthrough in forestry sector in order to keep pace with the changing socio-economic and environmental concerns. Government also opens for the investment of private sectors in forest plantations establishment in 2005.

### 1.2.1 Government owned forest plantations

Myanmar initiated the formation of teak plantation as early as 1856 on a small scale using *taungya* method. Large-scale plantation forestry began in 1980 and about 30,000 ha of forest plantations have annually been formed since 1984. Plantation forestry has always been the supplement to the natural forest management. It is asserted in the 1995 Myanmar Forest Policy that existing natural forests will not be substituted with forest plantations. Plantation forestry has a complementary role to natural forest in order to control deforestation and forest degradation. Accordingly, the objectives of plantation establishment in Myanmar have been to rehabilitate degraded forest lands, restore deforested areas and supplement various timber yields from the natural forests.

Total planted areas and percentages by types of forest plantation and also by tree species are given in Tables 5.

**Table 5. Area of forest plantation established by year and by type**

Sr.	Year	Area of Plantation (Hectares)				Total
		Commercial	Watershed	Industrial	Village Supply	
1	1981	11493	915	162	6063	18633
2	1982	14706	3553	486	3491	22236
3	1983	16319	4304	769	6219	27611
4	1984	18516	3960	1433	6907	30816
5	1985	18626	4228	2776	10711	36341
6	1986	18917	2615	3446	7968	32946
7	1987	17322	2716	5540	6730	32308
8	1988	16382	2777	4958	5799	29916
9	1989	13812	1165	2448	1304	18729
10	1990	18312	1807	4573	6006	30698
11	1991	18255	1607	3905	7268	31035
12	1992	17335	2232	4128	7892	31587
13	1993	13406	3163	3244	11198	31011
14	1994	6309	2641	890	12742	22582
15	1995	11790	4089	2750	13469	32098

16	1996	13409	3399	2226	13729	32763
17	1997	13871	7305	2206	6803	30185
18	1998	16779	3905	2084	5981	28749
19	1999	17264	7110	1093	5247	30714
20	2000	16847	7450	2086	4335	30718
21	2001	15571	6941	3703	4543	30758
22	2002	15358	7831	3513	4694	31396
23	2003	15344	7386	3318	4393	30441
24	2004	16279	8134	3905	3656	31974
25	2005	17085	8903	2995	4219	33202
26	2006	17094	6712	1922	2600	28328
27	2007	12890	6961	1926	2125	23902
28	2008	15743	6536	4	2003	24286
29	2009	15439	5059	0	1841	22339
30	2010	13861	223	0	917	15001
	<b>Grand Total</b>	<b>464334</b>	<b>135627</b>	<b>72489</b>	<b>180853</b>	<b>853303</b>

### **1.2.2 Private Forest Plantation**

With the decreasing availability of logs from natural forests, plantations are the important source of timber to meet the demand. This suggests a need for more private investment in plantations apart from state-own with the aim to provide development of private sector and national economy, and also sustainable forest. The majority of plantation has been established under government in Myanmar, however government is now actively encouraging to private sector investment for plantation establishment since 2005. Particularly, the private sector has increasingly become interest for the establishment of teak plantation and is likely to be significant for foreign earnings. Up till 2010 March, private teak and non-teak plantations have been established 13,127 ha and 16,220 ha respectively. Over 100 private national companies/entrepreneurs have been investing in plantation forestry in Myanmar.

**Table 6. Area of private teak plantation**

Sr.	State/Region	Area allowed(ha)	Planted Area (ha)					Total
			2006-	2007-	2008-	2009-	2010-	
1	Kachin	3,035	40	295	202	81	40	<b>660</b>
2	Kayah	40	0	0	0	0	20	<b>20</b>
3	Kayin	1,012	0	40	81	180	93	<b>395</b>
4	Sagaing	3262	0	0	945	754	518	<b>2,217</b>
5	Bago (East)	35,089	12	113	194	3,326	3941	<b>7,587</b>
6	Bago(West)	2,995	61	182	283	1,376	243	<b>21,45</b>
7	Magway	2,911	0	101	111	223	674	<b>1,109</b>
8	Mandalay	1,841	0	0	81	121	567	<b>769</b>
9	Yangon	1,760	0	40	0	0	866	<b>907</b>

10	Shan(south)	101	0	20	40	40	0	<b>101</b>
11	Shan(North)	2,347	0	0	81	121	310	<b>512</b>
12	Ayeyawady	2,525	0	202	688	1012	567	<b>2,469</b>
	<b>Total</b>	<b>56,920</b>	<b>113</b>	<b>996</b>	<b>2,707</b>	<b>7,234</b>	<b>7,839</b>	<b>18,890</b>

Source: Planning & Statistics Division, Forest Department

**Table 7. Private Hardwood Plantation**

Sr.	State/Region	Planted Area (ha)				Total
		2007-08	2008-09	2009-10	2010-11	
1	Kachin	4,451	338	28	0	4,817
2	Kayah	40	45	20	0	105
3	Kayin	15	138	250	91	495
4	Chin	3	87	60	111	261
5	Sagaing	685	460	440	106	1,692
6	Taninthayi	14	40	48	0	102
7	Bago (East)	421	716	692	512	2,342
8	Bago(West)	72	217	111	0	400
9	Magway	62	474	382	311	1,230
10	Mandalay	390	789	786	0	1,965
11	Mon	0	101	36	0	138
12	Rakhine	29	191	244	399	863
13	Yangon	166	81	141	0	389
14	Shan(south)	45	59	527	0	631
15	Shan(North)	60	166	81	54	361
16	Shan(East)	0	20	29	24	74
17	Ayeyawady	55	105	126	0	286
	<b>Total</b>	<b>6,509</b>	<b>4,027</b>	<b>4,004</b>	<b>1,609</b>	<b>1,6149</b>

Source: Natural Forests & Plantation Division, Forest Department

### **1.2.3 Community forestry programme**

In Myanmar, forests and forestlands are state owned, and are managed by the Forest Department (FD). In line with the international trend of decentralization in forest management, the Ministry of Environmental Conservation and Forestry (MOECAF) issued the Community Forestry Instructions (CFI) in 1995 with its Notification numbered 1/95 on December 1, 1995. It is a major breakthrough in forestry sector in order to keep pace with the changing socio-economic and environmental concerns. It is part of the government policy of transferring national forests to community management. The main objective is to plant trees on barren lands and to reforest degraded areas with the active participation on

the people in order to contribute to national economy, to regain environmental stability and to assist in satisfying the basic needs for the local communities. CFI stipulates areas where Community Forest (CF) could be established and areas where CF will be permitted.

CFI offers local people (rural people) to be able to participate in forest management activities such as establishment of forest plantations and in some areas conservation of natural forests especially in watershed areas. According the CFIs (1995), Community Forestry is defined as "Forestry operations in which the local community itself is involved; such as:

- Establishment of woodlots where there is insufficient fuel-wood and other products for community use
- Planting of trees and exploiting of forest products to obtain food supplies, consumer products and incomes at farmers' level.

The salient points of CFIs (1995) are:

- ❖ Any land at the disposal of the State, including reserved forests and village supply plantations, can be alienated as community forests;
- ❖ Land tenure is initially granted for 30 years, but can be extended;
- ❖ The tenure right is inheritable;
- ❖ Forest products harvested from CF for domestic use are tax-free;
- ❖ No restriction is imposed on the selling and pricing of the surplus forest products;
- ❖ Seeds and seedlings needed for the first rotation and technical assistant are provided by FD free of charge;
- ❖ Forest Department's approval to establish CF can be easily and quickly obtained; and
- ❖ The duties and responsibilities of the user's group are reasonable.

In line with the CFI, the Forest Department has established community forests in all the States and Divisions of the country because community forestry is recognized as the major strategy by which forests can be managed and utilized sustainably. In addition, it also aims at improving living conditions of the local people by supporting Forest User Groups (FUGs) to manage community forest more effectively, sustainably and equitably. Up to June (2011), 108364 acres (43,872 ha) of community forests have already been established across the country (Forest Department, 2011).

**Table 8. Current status of community forestry in Myanmar (by June 2011)**

No.	States/Regions	Area (ha)	No. of FUGs	No. of members
1	Kachin	3,496.8	7	824
2	Kayah	40.5	1	70
3	Kayin	446.6	4	278
4	Chin	1,389.7	17	243
5	Taninthayi	1,725.4	33	1,434
6	Sagaing	180.2	5	118
7	Bago (East)	115.4	3	116
8	Bago (West)	120.4	3	134
9	Magwe	4,094.8	99	2,206
10	Mandalay	4,258.0	38	18,188
11	Mon	66.8	4	59

12	Rakhine	1,665.6	85	3447
13	Yangon	309.7	6	210
14	Shan (South)	2,0621.9	192	10,239
15	Shan (North)	559.5	15	178
16	Shan (East)	2,268.3	14	652
17	Ayeyarwady	2,512.5	49	2,228
<b>Total</b>		<b>43,872.0</b>	<b>575</b>	<b>40,624</b>

Source. Planning and Statistics Division, FD, 2011

### 1.3 Plantation scenario

In Myanmar, forest plantations have been established by the Forest Department for decades. Along the development of market economy, private investments are allowed in plantation forestry since 2006 in order to meet the demands of the timber as well as to restore the degraded forests and to maintain the environmental stability. Since then, area of private forest plantations has increasing significantly. On the other hand, Forest Department has a plan to gradually reduce the annual planting target in order to manage forest plantations more effectively. Therefore, plantation scenario is likely to be in a way that private forest plantations will continue to increase while decreasing the Government owned forest plantations. Current trend of establishment of forest plantation is showed in Figure 2.

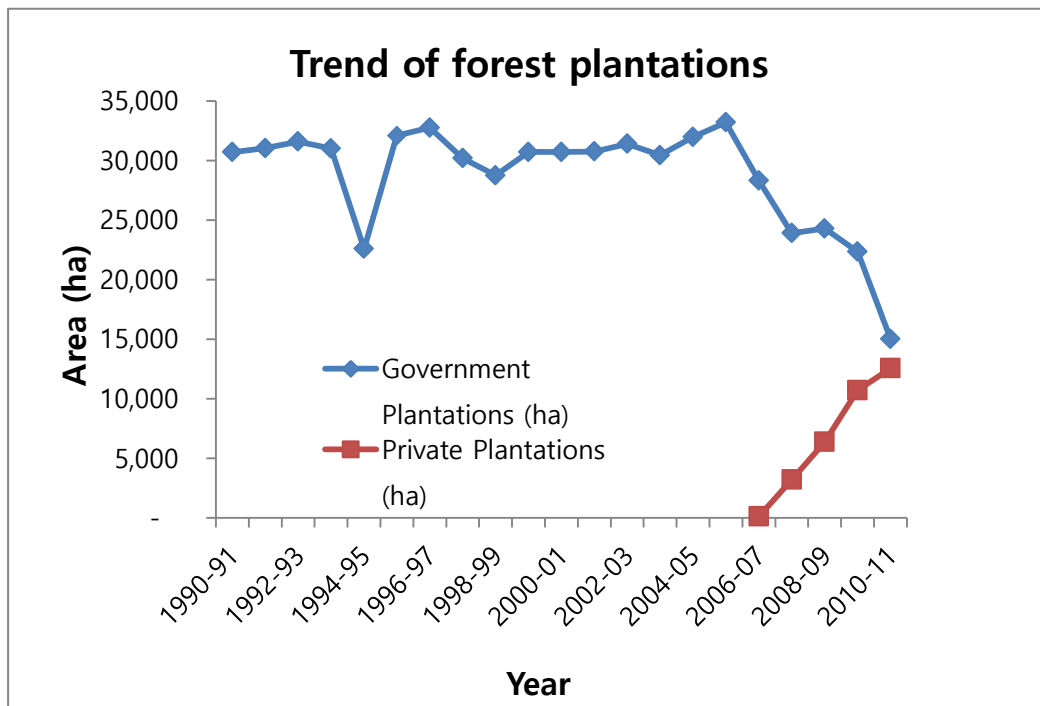


Figure 2. Trend of Forest Plantations establishment

Table 9 shows the structure of planted forest (teak plantation) and selected natural forests, namely, tropical deciduous forest in Oktwin Township, Ywangan Township and Yinmarbin Township.

**Table 9. Stock density and diameter distribution of planted forests (Teak) of Myanmar**

No.	Age (year)	Ave: Height (m)	Ave: DBH (cm)	Stock density (n/ha)	Volume (m <sup>3</sup> /ha)	Volume (ton/ha)	Remarks
1	8	11.3 (±1.4)	14.3 (±2.3)	1134	101.89	71.96	Before 1 <sup>st</sup> thinning
2	8	11.3 (±1.4)	14.3 (±2.3)	567	51.03	36.03	After 1 <sup>st</sup> thinning (mechanical)
3	15	23.2	22.4	283	69.69	49.22	After 2 <sup>nd</sup> thinning (mechanical)
4	25	28.7	30.0	170	83.30	58.83	After silvicultural thinning (assume to harvest 60% of trees)
5	40	34.1	38.6	113	99.88	70.34	Final harvesting

Tree heights were stratified into three different layers (upper, middle and lower) based on the height of the dominant tree of each study site. Depending on the forest management activities, the structure of the forest can be varied significantly. According to Thaug Naing Oo (2009), the structures of tropical deciduous forest which share the largest area among forest types in Myanmar are shown in Table 10.

**Table 10. Comparison of stand parameters among three study sites (trees with DBH≥5 cm)**

Parameters	Oktwin Township	Ywangan Township	Yinmabin Township
Range of tree height of upper layer (m)*	22.9~34.1	22.1~33.0	26.7~39.8
Range of tree height of middle layer (m)*	11.5~22.8	11.1~22.0	13.4~26.6
Range of tree height of lower layer (m)*	4.5~11.4	3.4~11.0	5.5~13.3
Mean stock density (n ha <sup>-1</sup> )	312 (18.6) <sup>b</sup>	536 (15.6) <sup>a</sup>	413 (14.1) <sup>c</sup>
Mean BA ha <sup>-1</sup> (m <sup>2</sup> )	46.9 (3.2) <sup>a</sup>	49.0 (5.1) <sup>a</sup>	60.0 (3.9) <sup>a</sup>
Mean standing volume ha <sup>-1</sup> (m <sup>3</sup> )	352.6 (27.15) <sup>a</sup>	376.2 (40.11) <sup>a</sup>	506.8 (56.78) <sup>a</sup>
Holdridge's complexity index (C <sub>HCI</sub> )	52.2 (14.1) <sup>c</sup>	145.2 (16.4) <sup>b</sup>	452.4 (44.5) <sup>a</sup>

\* Upper layer: tree height  $>2/3$  of top height, Middle layer: tree height  $<2/3, >1/3$  of top height, Lower layer: tree height  $< 1/3$  of top height. Numbers are the means (except tree height) with standard errors in the parentheses. Different letters indicate significant difference among the forests according to Duncan's multiple range tests at 5% level of probability. The letters are the rank order from highest to lowest value (alphabetically).

## II. Deforestation and forest degradation: trends and drivers

### 2.1 Forest cover change and deforestation in Myanmar

At the national level, forest cover of Myanmar declined 65.8% in 1925 to 46.96% in 2010. According to FAO 2010, the loss of forest cover amounted to 0.95 percent during 1990-2010. Figure 3. show the status of forest cover change at different year.

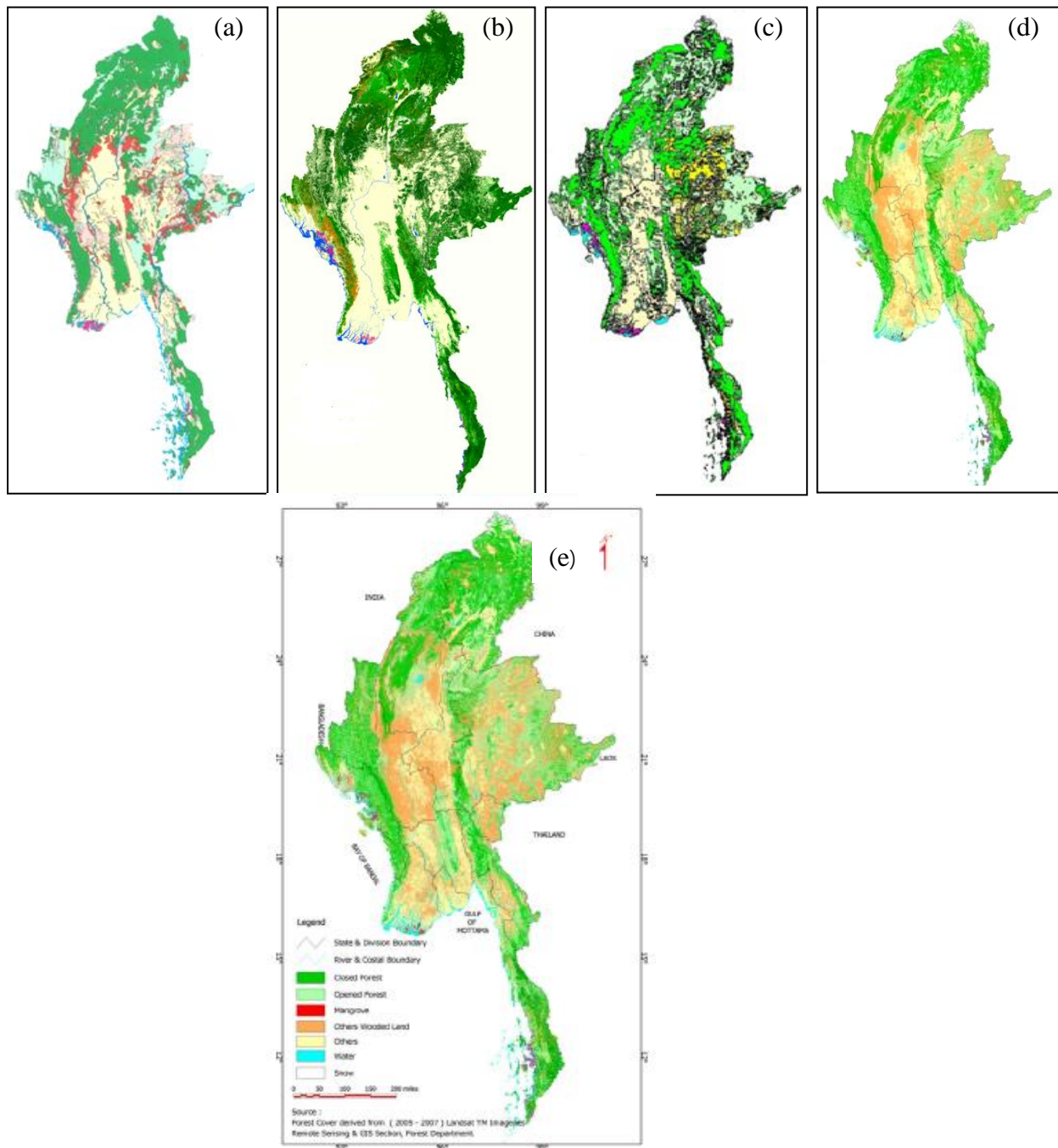
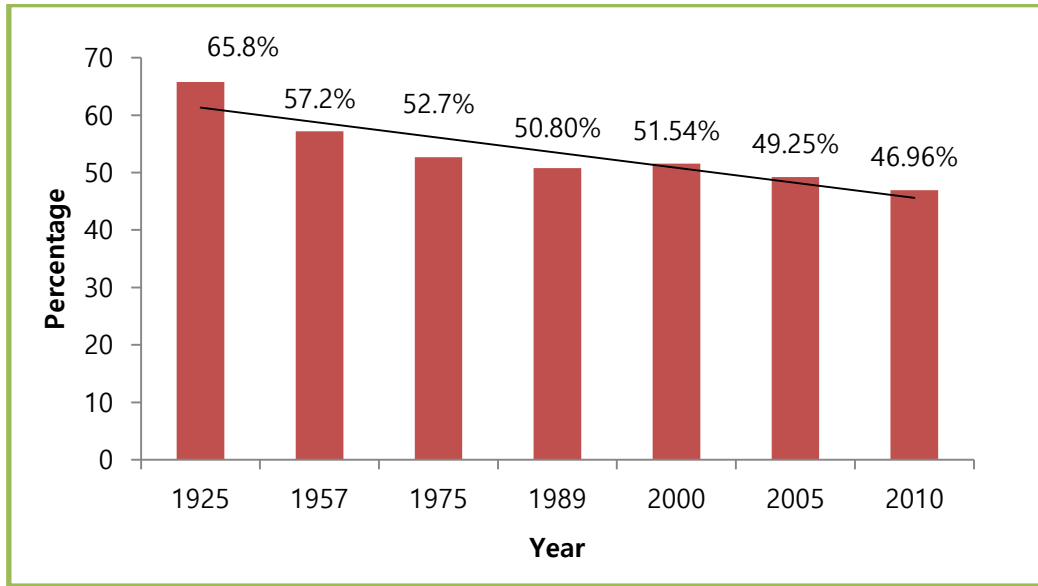


Figure 3. Status of forest cover in 1989 (Fig-a),1996(Fig-b),2000(Fig-c),2006(Fig-d) & 2010 (Fig-e)



**Figure 4. Forest Cover Change in Myanmar**

### III. Major drivers of deforestation and forest degradation

Similar to other developing countries, the major drivers of deforestation in Myanmar are overexploitation, illegal logging, shifting cultivation, expansion of agricultural land, urbanization, infrastructure development and conversion of forest into other land uses. In addition, other compounded factors of deforestation are conversion of forest land into other land uses aiming at to support the development of national economy. These are:

- a) Special development projects (eg. Dawai Special Economic Zone)
- b) Construction of express way (eg. Yangon-Mandalay Express Road), hydropower dams and gas-pipeline;
- c) Military-based land;
- d) Expansion of urban area;
- e) Establishment of private teak and hardwood plantations;
- f) Establishment of industrial plantations (eg. rubber plantation and oil palm plantations);  
and
- g) Mining (eg. gold and metal mining)

Table 11. Conversion of forest lands to other land uses

No.	Major drivers	Area (ha)	Remarks
1	Special development projects		
	- Dawai Economic Zone	878.1	
	- Zawtika Natural Gas Project	115.8	
	- Myanmar-China Corridors	175.4	
	- Myanmar-China Petrol & Gas Pipeline	194.4	
2	Military based camp and others	369659.1	
3	Gold and metal mining	13225.1	
4	Private teak and hardwood plantation	83799.1	
5	Rubber, sugar cane and other crops	133133.0	
6	Palm oil plantations	176723.8	
7	Dam and water area	144959.5	
8	Encroachment by farms and villages	655102.4	
		1577965.8	

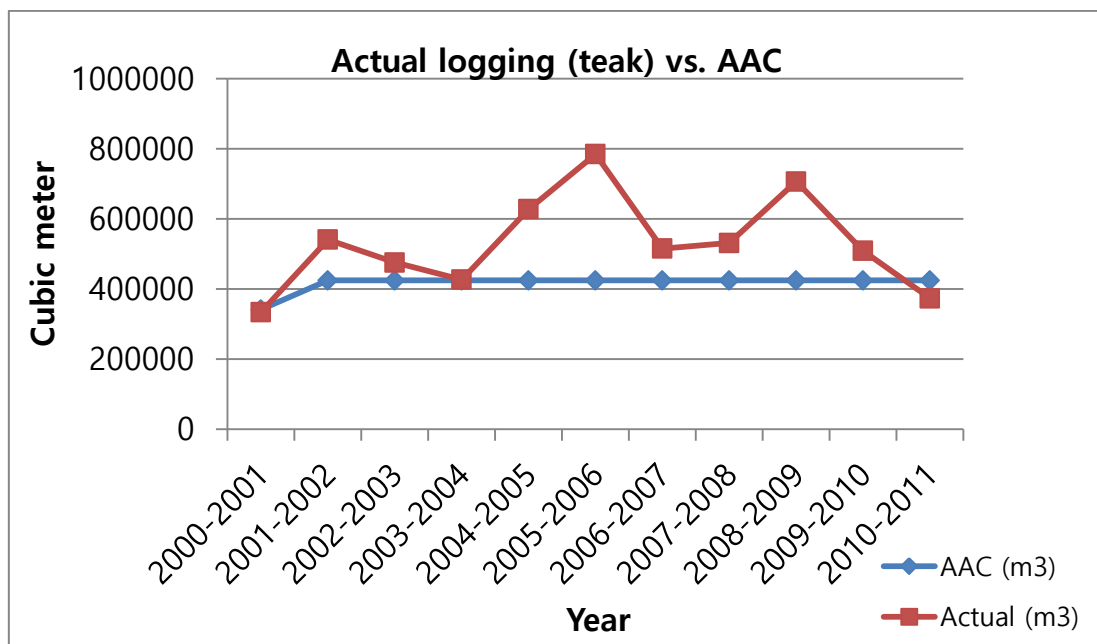
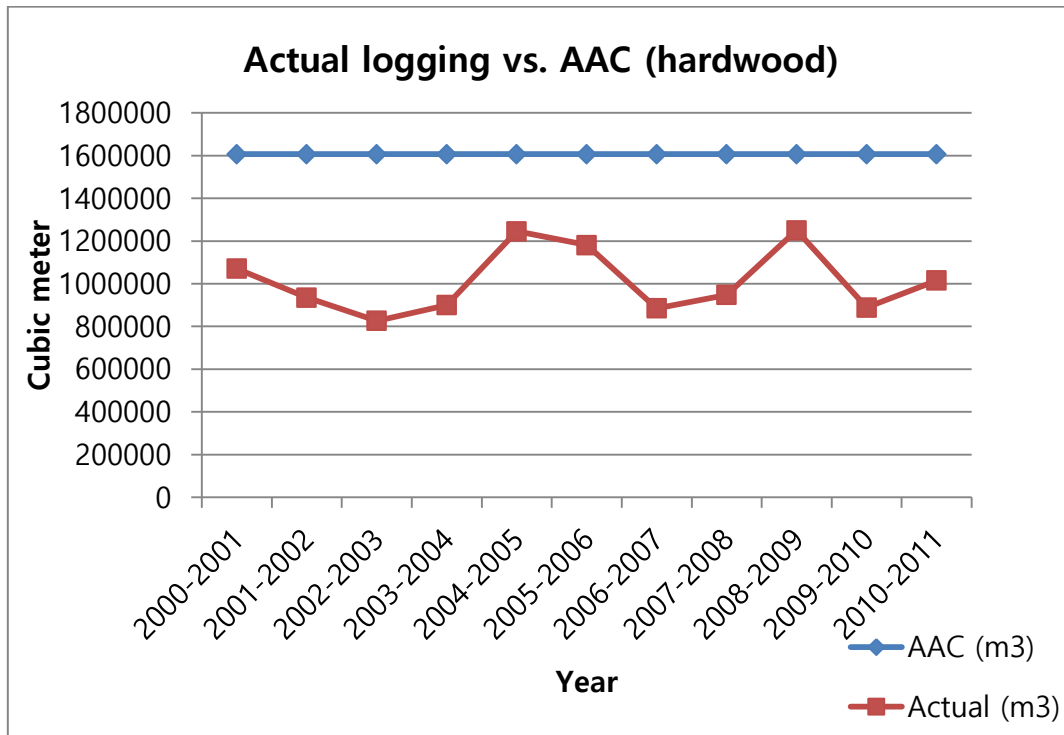


Figure 5. Comparison between actual logging and AAC at the national level (for teak)



**Figure 6. Comparison between actual logging and AAC at the national level (for hardwood)**

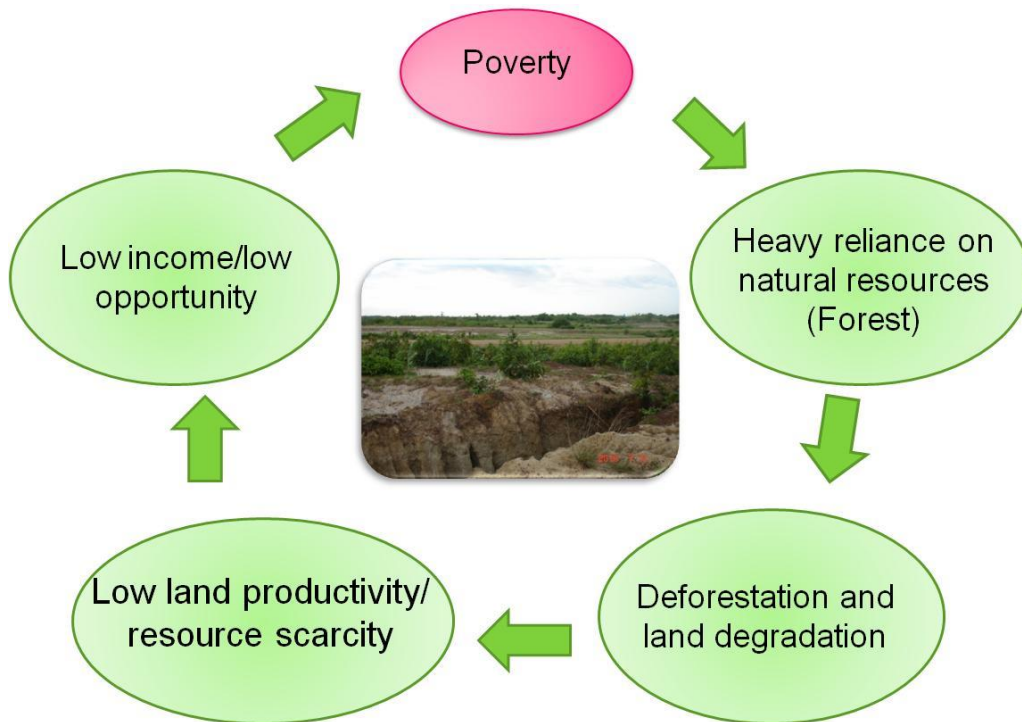
### 3.1 Underlying causes of deforestation

The major underlying causes are macroeconomic factors, governance factors, demographic factors, technological factors. With the increasing market force, the people will often clear land to accommodate higher demand for products that can be cultivated (or grazed) on forest land.

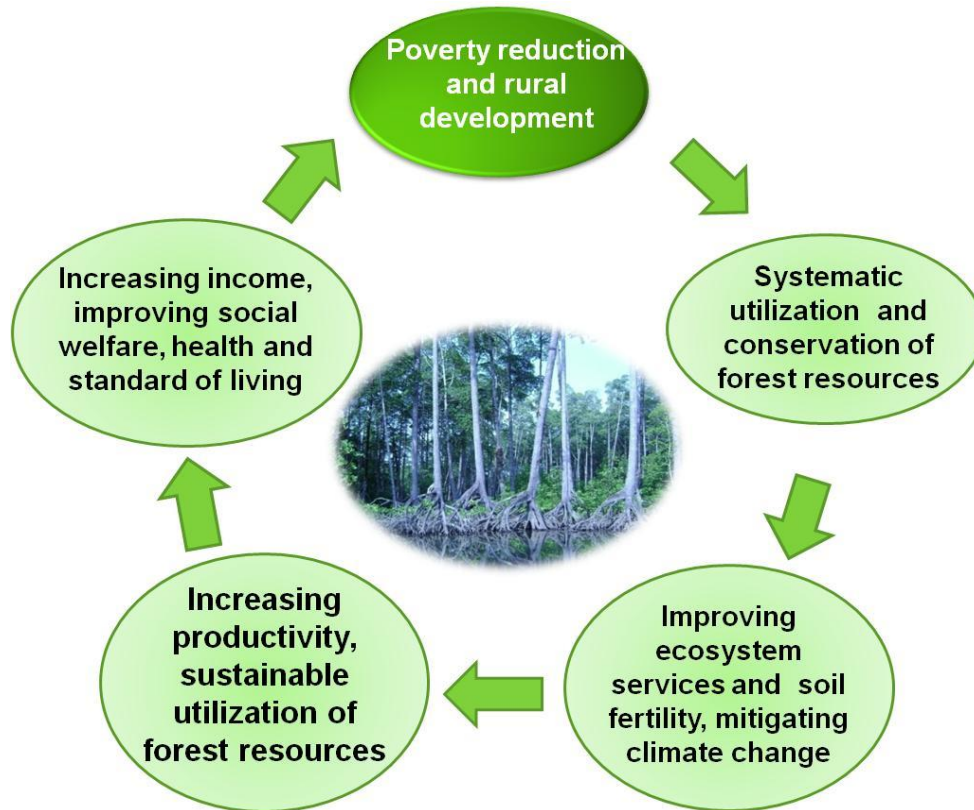
Economic growth may increase deforestation at early economic development stages, when forests are cleared for agricultural commodity production. In later stage of economic development, pressures on forests may decrease as agricultural production becomes more intensive, service sectors increase their share in the economy, and the demand for forest products and services rises, making timberland more valuable. The higher the profitability of the agriculture is the main economic factor underlying the conversion of forests to other uses. Rising agricultural products prices and reduced input prices render agriculture more profitable, and lead to expanded areas under production.

Other macroeconomic factors with significant potential to impact upon deforestation include external debt, foreign exchange-rate policy, and trade policies governing sectors linked to deforestation (Kanninen et.al, 2007). Economic crisis can also stimulate deforestation. When country's economy grows very slow, many people who had lost their jobs in the formal sector or who need additional income, turned to the forest for supplemental income. Their activities include the clearing of forest for cultivation, illegal logging and the use of fire to facilitate access to bush meat. Policies supporting the expansion of forest product industries and related debt can be a significant force driving deforestation.

Generally, the underlying causes of deforestation and forest degradation are lack of land use policy and land tenure system, conflicting policy and planning, weak law enforcement and coordination between government agencies, limited cooperation and coordination of government agencies with NGOs and civil societies, weak monitoring and evaluation, limited access to alternative sources of livelihood products, particularly fuel wood and timber, poverty and lack of livelihood alternatives. Figure 4 shows viscous cycle of poverty.



**Figure 7. Vicious Circle Poverty**



**Figure 8. Vicious Circle Poverty**

#### **IV. REDD relevant policies, laws, strategies and plans**

The forestry section in Myanmar Agenda 21 is an advanced document to guide sustainable forest and forestry development. However, proper implementation requires financial support, institutional strengthening, and political commitment.

Apart from Agenda 21, the 1995 Myanmar Forest Policy emphasized the future development process for the forestry sector and sustainability of the forests. The Forest Law (1992), Forest Rules (1995), Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law (1994), Community Forestry Instructions (1995), Myanmar Agenda 21, National Forestry Action Plan (1995), Criteria and Indicators for Sustainable Forest Management (1999), Format and Guidelines for District Forest Management Plans (1996), National Code of Practice for Forest Harvesting and National Framework for Environmental Law are major tools to realize forest policy. The 1992 Forest Law in addition focuses on awareness and participation in the conservation and sustainable utilization of forest resources, and stresses the importance of collecting and updating resource information, planning, continuous monitoring of all forest operations and maintaining the ecological balance and environmental stability.

## 4.1 Myanmar Forest Policy

Myanmar Forest Policy (1995) is formulated in a holistic and balanced manner within the overall context of the environment and sustainable development taking full cognizance of the forestry principles adopted at United Nations Conference on Environment and Development (UNCED). It formalized the commitment and intent of the Government to ensure sustainable development of forest resources while conserving wildlife, plants, and ecosystem. There are six imperatives are in Myanmar Forest Policy 1995. They are:

- **Protection** of soil, water, wildlife, biodiversity and environment;
- **Sustainability** of forest resources;
- **Fulfilling** basic needs of the people;
- **Efficiency** to harness the full economic potential of the forest resources;
- **Participation** of the people in the conservation and utilization of the forests; and
- **Raising public awareness** about the vital role of the forests in the well being and socio-economic development of the nation.

## 4.2 Forest Legislation

- **Forest Law 1992** - superseding the Burma Forest Act 1902, the new Forest Law was enacted in 1992, with adequate provisions for increased private sector involvement, community participation, biodiversity conservation, and increased forest resources security. Forest Law (1992) has already encompassed in its basic principles as follows;
  - ❖ to promote the sector of public co-operation in implementing the forestry policy and environmental conservation policy of the Government;
  - ❖ to develop the economy of the State, to contribute towards the food, clothing and shelter needs of the public and for perpetual enjoyment of benefits by
  - ❖ conservation and protection of forest;

Accordingly, to safeguard livelihoods of local people, their rights and privilege are identified and notified since beginning of the process to constitute a reserved forest

Myanmar Agenda 21 was formulated reflecting to the call of the Earth Summit. It gives special emphasis on sustainable forest resources management and biodiversity conservation in chapter 14 and 15, respectively. The following programme areas to solve forestry related issues could be well adapted to REDD+ components no. 1 and 2.

- ❖ Accelerate sustainable development of forest resources
- ❖ Develop the forestry sector to meet basic needs
- ❖ Promote efficiency in the production of forestry goods and services
- ❖ Strengthen forestry policies legislation and institutions
- ❖ Enhance people's participation in forestry development and management
- ❖ Strengthen protected area planning and management
- ❖ Conserve biodiversity

- **Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law 1994** - The Wildlife Protection Act 1936 was replaced by the new Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law in 1994. Under the new Law, the modern concept of biodiversity conservation was introduced and the need for extended formulation of the protected areas system was also highlighted.

#### 4.3 Regulations

- **Departmental Instructions for Forest Officers in Myanmar 1955** include the procedure for:
  - Forest reservation
  - Working plans preparation and updating
  - Maintenance and review of girdling
  - Registers include future yield trees
  - Climber cutting and improvement felling
  - Selection marking of non-teak hardwoods, report keeping, and
  - Measurement and royalty marking of logs extracted under long-term agreement

**Forest Rules 1995** – The Forest Rules, prescribed in 1902 were replaced by the new Forest Rules in 1995, issued by the Ministry of Forestry. In order to facilitate implementation of the 1992 Forest Law, the new rules also place emphasis on increased formation and protection of reserved forests and protected public forests, sharing of forest management responsibility with the local communities, establishment of fast growing plantations on degraded forest lands to conserve soil, water and biodiversity and harvesting of timber and other forest products in an environmentally sound manner.

**Existing Timber Extraction Manual, Logging Rules and Procedures** – regarding teak log, FD and MTE jointly apply the Logging Rules and Standards for Jungle Rejection of Teak Logs which were issued by the Chief Conservator of Forests, Burma in 1936. Also in existence were the Grading Rules for Teak based on the MTE practices and FAO's general guidelines. The Extraction Department of MTE has issued and adopted the following:

- State Timber Board Extraction Manual 1948
- Standing Orders for Extraction Staff 1970
- Departmental Instructions (Series 1-20) for Extraction Department 1986

#### V. Strategies and plan for sustainable forest management relevant to REDD+ Plan relevant to REDD+

The Forest Department has set the strategies and plan relevant to REDD+:

1. Reservation of forest lands (Reserved Forest and Protected Public Forest) up to 30% of the country's total land area from the present status of about 18.04%.
2. Establishment of forest lands under Protected Areas System up to 10% of the country's total land area from the present status of about 6.67%.
3. Continued practice of re-forestation programme at an annual rate of about 20,000 ha.
4. Preparation and updating of 10-year Management Plan at the district level for efficient conservation and development of forestry sector.

5. Initiation to introduce "polluter pays" system for the protection of forest resource.
6. Introduction of management responsibilities sharing through adoption of community/participatory forestry to rehabilitate degraded forest lands.
7. Periodical review on Forest Policy, Legislation, and Institutional Arrangement to keep pace with social preference and international priorities.
8. Continued effort to formulate and adopt multi-sectoral national land use policy respected by all parties concerned.
9. Continued effort for the promotion of private sector in forestry development programme without compromising the carrying capacity of forest ecosystems for the well-being of future generations.
10. Continued effort for the promotion of wood-based industries for increased production of value-added finished products.
11. Encouragement and liberalization of trade and tariff policies to ensure reasonable stability of the declared policies.
12. Continued endeavour to strengthen Research and Development activities.
13. Continued effort to promote human resource development and institutional capacity building.

## **5.1 Actions relevant to REDD+ within the context of sustainable forest management**

### **5.1.1 Forest management system**

Forest management during the colonial period was solely based on teak, as teak was the most intensively studied timber species at that time. The British foresters had formulated and put into practice a system of harvesting teak that provided for the greatest care in the handling of timber, accounting for every tree and every log extracted from the forest, a fair and uniform scale revenue rates for the trade, every form of protection possible for forest conservation. The original method was known as "Sustained yield management of teak in Myanmar". *The Brandis Selection System*, modified into the Myanmar Selection System in 1920, is merely a Selection-cum-Improvement system with the main features being to carefully protect the immature stock and assist it to attain maturity. It is a method of exploiting tree species of prescribed minimum harvestable dbh limits from a complex multi-species forest. Forests are managed under working plans, which generally form the working circles on the basis of the objects of management and accessibility, and also on the nature and form of the forest produce required. The working circles consist of a group of reserves, which are divided into felling series for the convenience of working according to the drainage and geographical situation. The felling series are subdivided into annual coupes, which can be subdivided into compartments. The compartments are the basic management units, which are approximately 250 hectares in size.

Fellings are regulated by area with tree number check. The felling series to be worked is divided into approximately 30 equally productive annual coupes. Each year, trees are selected for felling in one of these coupes and the whole felling series is therefore worked over in a felling cycle of 30 years. Traditionally, the yield capacity of the forest is determined from data obtained from the 10% enumeration of trees below felling limit carried out along with girdling operations. Complete enumeration of teak is carried out down to 39 cm dbh.

At felling time, all marketable trees, which have attained a minimum harvestable dbh are selected for cutting. All teak trees selected for removal are girdled or ring-barked three years prior to felling. This process partially seasons the timber and makes the log floatable after felling. However, in some accessible areas mature teak trees are sometimes also felled and extracted green. The prescribed girth size varies with the type of forest. In good (moist) teak forests, the dbh limit is 73 cm (7.5 ft gbh) and in poor (dry) forests, 63 cm (6.5 ft gbh).

### **5.1.2 Criteria and Indicators (C&I) for Sustainable Forest Management (SFM)**

Identification of Myanmar's C&I for SFM at both national and Forest Management Unit (FMU) levels was completed in October 1999, and formally approved by the Ministry of Forestry. Myanmar's document, which is based on ITTO's C&I of 1998, contains 7 criteria each at both national and FMU levels. There are 78 indicators and 257 required activities at the national level, and 73 indicators and 217 activities at the FMU level, together with standards of performance for each activity. The FD has been testing the adequacy and application of Myanmar's C&I at FMU level for further improvement. The Ministry of Forestry and Forest Resources and Environment Development Association (FREDA), a forestry-related NGO in Myanmar took this initiative with the financial and technical support from Japan Overseas Forestry Consultants Association (JOFCA).

### **5.1.3 Timber Certification**

The Timber Certification Committee (TCC) was formed in August 1998 by the MOECAF, and since then, it has been establishing links with other timber certification bodies on a bilateral basis. Myanmar TCC has links with National Timber Certification Council (NTCC) of Malaysia and Eco-labeling Institute of Indonesia (LEI). Myanmar TCC is now heading for the development of timber certification scheme, reflecting Myanmar's forest management system. Myanmar's C&I is the basis for developing timber certification checklist at the Forest Management Unit (FMU) level.

### **5.1.4 Code of Practice for Forest Harvesting**

MOECAF developed the National Code of Forest Harvesting Practices in Myanmar in 1999 with FAO's financial and technical assistance. A number of training courses have been provided to the staff of the Extraction Department of Myanmar Timber Enterprise (MTE) for thorough understanding and immediate implementation in the field. Pilot implementation of the applicability of the Code at the field level was tested in *Paukkhaung* model forest. On the basis of the findings, the Code is being reviewed and will be revised accordingly.

### **5.1.5 Assessment and Monitoring of Forest Resources**

Over the last 20 years, new technology has increasingly been used in assessing forest resources, including microcomputers, long-distance surveying via low- or high-resolution satellite, and Geographic Information System (GIS) and global positioning systems (GPS). Considering the essential role of forest assessment and surveillance in good forest management, forest authorities should allocate resources to assessment and surveillance. Like other developing countries, Myanmar is in lack of adequate forest inventory resources.

In addition, the accurate and updated information is very critical for resource planner and decision markers. Thus, it is vital to build the necessary capacity.

### **5.1.6 Stabilizing Shifting Cultivation**

It is evident that shifting cultivation is a major cause of forest depletion and degradation. It is, on the other hand, not merely an economic practice for the landless poor living in and around the forests, but it is both a cultural practice and a way of life evolved in consonance with the physiographic set up.

To address this issue, a national level multi-sectoral programme of highlands reclamations has been developed and actions are underway. The program clearly encourages the upkeep of traditional land use system, customary rights and cultural values. In cooperation with other sectors, FD has been implementing activities as follow;

- (i) Community forestry based on agroforestry systems;
- (ii) Provision of improved technologies, complementing traditional forest-related local knowledge;
- (iii) Recruiting shifting cultivators into routine forestry operations such as plantation establishment;
- (iv) Enhancing income-generating opportunities; and
- (v) Provision of awareness raising campaigns and extension services.

### **5.1.7 Measures taken to illegal Logging Control**

Today illegal logging is almost under control and the measures are being intensified to meet the ultimate goal to eliminate the threat to deforestation. The following measures have been undertaken to reduce illegal logging at the initial stage and to eliminate it eventually:

- (i) Strict enforcement of the existing forest law, rules and regulations;
- (ii) Setting up the checkpoints along the main shipping routes across the country;
- (iii) Inspection of logging operations to ensure that they are carried out in accordance with the procedures and prescribed rules and regulations;
- (iv) Adoption of an incentive scheme for the staff and those who are actively engaged in protecting illegal logging;
- (v) Forming a partnership with the institutions concerned and local communities in combating illegal logging; and
- (vi) Cooperation and coordination with the neighboring countries in fighting the illegal logging along the borders.

## **VI Protected Area System for conservation of natural forests and its biodiversity**

Out of 43 protected areas established, 34 represent mountain biodiversity. Myanmar has been a member country to International Center for Integrated Mountain Development (ICIMOD) since early 1990s. Biodiversity studies such as regional collaboration in conservation of the *Hkakaborazi* Mountain Ecosystem and study on technical approach to model management for *Pidaung* Wildlife Sanctuary were undertaken jointly by the Forest Department and ICIMOD.

Although rich in biodiversity in the region, loss of biodiversity due primarily to the socio-economic pressure is unavoidable in a developing country like Myanmar. The general trend of wild animal population is appeared to be decreasing compared with their relative abundance over the past 20 or 30 years. Due to habitat destruction, their population is not large enough to reproduce a viable population. The down-ward trend is apparent with large mammals such as tiger and elephant because of reduction of their sex ratio and home range by human activities. There can be decrease of wildlife where there is easy access to people and heavily populated areas. But, Myanmar is trying to conserve the habitats of wildlife species through establishment of protected areas. Therefore, there is an up-ward trend of wildlife in protected areas in general.

Up till the September 2012, 36 Protected Areas, constituting about 6.67 percent have been formed and managed. Myanmar has intended to increase PAS coverage up to 10 percent of its total land area in the long run. The Wildlife and Nature Conservation Division of FD is promoting PAS throughout the country.

### **6.1 Afforestation and Reforestation Activities**

Plantation forestry has a complementary role to natural forest in order to control deforestation and forest degradation. The objectives of plantation establishment in Myanmar have been to rehabilitate degraded forest lands, restore deforested areas and supplement various timber yields from the natural forests. Re-afforestation in Myanmar got momentum in early 1960s and large-scale plantation forestry begun in the 1980s. Since then the annual plantation programme has been intensified gradually till it has reached the annual planting rate of over 20,000 ha. FD establishes four types of plantations, of which local supply plantations and watershed plantations especially aim at satisfying wood-fuel demand of local communities and rehabilitation of degraded watershed areas.

A Special Teak Plantation Program was launched in 1998 in addition to the normal teak plantation scheme. The Program with 40-year rotation is structured with a series of 8 consecutive phases. Each phase, with the duration of 5 years, consists of 20 plantation centers. The harvest will be made by clear cutting at the end of the rotation of 40 years. Each centre establishes 405 ha of Teak plantation annually. The programme would, therefore, have completed the establishment of teak plantation over an area of 324,000 ha at the end of the 40-year rotation.

### **6.2 Greening of the Dry Zone of Central Myanmar**

Desert-like formation has been a threatening environmental issue facing the dry zone of the Central Myanmar. Excessive cutting of trees and clearing of natural forests for farming under the harsh climatic conditions are attributable to the occurrence of extensive desert-like formations in the country. Since the 1960s, all possible measures have taken to revegetate the bare and degraded lands which were once forested. The Dry Zone Greening Department (DZGD) was therefore formed in 1997 with special tasks to restore environment, prevent desertification and mitigate climate change in the Dry Zone of the Central Myanmar. Since then, the DZGD has been establishing forest plantations in order to meet these objectives.

And also four major tasks assigned to the DZGD are as follows:

- (i) Establishment of forest plantations for local supply and greening;
- (ii) Protection and conservation of remnant natural forests;
- (iii) Promotion of wood-fuel substitution; and
- (iv) Development of water resources.

The Integrated Plan for the period from 2001-02 to 2030-31 was prepared by the Department to green the Central Dry Zone of Myanmar. The extent of the closed forest in the Dry Zone is now 1.72 million ha constituting only 19.7percent of the total land area of the region. The policy being to increase it to 35percent, the plan has envisaged making up the balance by conserving and improving degraded forests and by artificially regenerating suitable sites. Therefore, approximately 730,000 ha of the degraded forests will be conserved and upgraded by natural means, while 323,750 ha will be planted during the Plan period of 30 years. In addition, about 500,000 ha of the natural and planted forests will be converted to community forests by the end of the Plan. International organizations also contribute to the environmental restoration in the Dry Zone by the establishment of forest plantations.

### **6.3 Greening Activities of the Bago Yomas Range**

In order to rehabilitate the the *Bago Yoma Region*, the Forest Department has been carrying out the *Bago Yomas Greening Project* as a special project and the first phase is from 2004-05 to 2008-09. During the project, the major activities are being implemented as conservation and protection of natural forests, enrichment planting, natural regeneration and establishment of plantations. All possible means and activities such as establishment of community forests, extension services, water supply, establishments of teak seed production area and research activities are also carried out to support the greening of the the *Bago Yoma Region*. This project covers six divisions and the total area is 50,700.23 sq. km. The objectives of this special project are:

- (i) To maintain the *Bago Yoma Region* sustainable as a home of teak growing area;
- (ii) To prevent the *Bago Yoma Region* from forest degradation by plantation establishment; forest conservation with suitable silvicultural ways and protection with forest law;
- (iii) To conserve watershed area of constructed dam systematically for supplying water which is important for agriculture; and
- (iv) To support the *Bago Yomas* greening by establishing community forests with people participation.

### **6.4 Conservation of mangrove forests**

The mangroves are found at three geographical locations along the coast of Myanmar, concentrated particularly in the *Ayeyarwaddy* delta. Due to extensive use of the forests and encroachment for cultivation purposes, some 386,000 ha of total mangrove forests in Myanmar in the early 1990s have decreased to almost half in 2002. Depletion of mangrove forests has resulted in the loss of coastline protection, decreased crop production, and

decline in fish and prawn catches among others. Most of remaining mangroves suffer from various levels of degradation, rendering the rehabilitation of these forests to be a crucial issue.

As routine activities FD is implementing rehabilitation tasks such as regeneration improvement felling in remaining mangrove forests, plantation establishment in depleted areas and abandoned paddy fields, and community forestry. In cooperation with international organizations, conservation and rehabilitation projects have been also carried out. An example is the UNDP/FAO Project (MYA/96/008) implemented in the *Ayeyarwaddy* delta. The project focused, apart from the uplifting the well-being of the grass roots level communities of the region, on the rehabilitation and conservation of mangrove forests. In this connection, its strategy has been to raise awareness of the communities on the importance of the conservation of mangrove forests and promote community forestry. In collaboration with JICA, a pilot project was recently implemented and an Integrated Mangrove Management Plan has been formulated for further implementation.

### **6.5 Social Tree Planting Programme**

Realizing the direct and indirect benefits of trees, the Forest Department has launched the Nation-wide Tree Planting Programme since 1997-78 with the objective of raising public awareness and greening the non-forest area in order to enhance environmental services. Some of those are provision of basic needs of local people for fuel-wood, poles, posts and small timber, raw materials for handicrafts and agricultural instruments, food and medicinal products for people, fodder for domestic animals, preventing wind erosion and maintaining soil fertility for agriculture, helping to slow the accumulation of carbon dioxide (CO<sub>2</sub>) in the atmosphere, regulating local climate conditions and making the environs green and pleasant. As it is a mass participation of individuals, communities, governmental and non-governmental organization and civil societies, the Forest Department has distributed various kind of seedlings increasingly year after year especially in the dry zone area. Due to the active participation of the peoples, the average annual planting rate is reached more than 17 millions seedling since last decade. Keeping such good momentum, the FD is now preparing to increase the planting rate of one seedling for one person in near future.

### **6.6 Watershed Conservation**

Increased food security calls for sustainable development of agriculture for which timely availability of sufficient fresh water is important. Water flow is largely regulated by forests. Forest conditions in upland watersheds, particularly those of important dams have been improved by planting or natural regeneration or both. Restoration of watershed areas of important dams started in the early 1980s. Excessive removal of vegetative cover, practice of slash and burn system and its shortened fallow period, and overgrazing are major factors causing watershed degradation.

In response to the request by the Ministry of Agriculture and Irrigation, special projects for the rehabilitation of the watersheds of 53 important dams are being implemented by the Forest Department. The total watershed area of the 53 critical dams is about 3.6 million ha with a planting program of 4,856 ha annually.

## VII. Actors, events and structure of REDD-plus of Myanmar

Myanmar is aware of REDD+ as a mechanism to create an incentive for developing countries to protect, better manage and wisely use their forest resources, contributing to the global fight against climate change.

With active participation of the NGOs, line departments and UN agencies, two national level workshops (REDD+ national level workshop in April 2010 and climate change adaptation and disaster risk reduction national level workshop in December 2010) were already organized and a number of at least 50 participated the workshops. The participants were from Ministry of Agriculture and Irrigation, Department of Meteorology and hydrology, Ministry of Transport, Ministry of National Planning and Economic Development, Ministry of Livestock and Fisheries, Ministry of Social Welfare, Ministry of Health, Ministry of Science and Technology and Ministry of Forestry, FAO, UN-Habitat and UNDP, and I/NGOs, FREDIA, BANCA, REAM, Spectrum, World Vision, Food Security Working Group.

In addition, Forest Department and Korea Forest Service (KFS) jointly organized a “Regional level workshops on REDD+” in May 2011 in Nay Pyi Taw. About 80 participants from ASEAN Member States, UN-REDD Programme, representatives from line Ministries, local NGOs and civil societies were attended.

FD facilitates and formed REDD Task Force after REDD+ national level workshop. The current REDD+ Taskforce has an interim mandate to support for development of the Myanmar REDD+ Roadmap and national strategies. However, it is proposed to enlarge the future working arrangements, involving key technical representatives from Forest Department (FD), Dry Zone Greening Department (DZGD) and Myanmar Timber Enterprise (MTE), Department of Environmental Conservation, Ministry of Environmental Conservation and Forestry (MOECAF) and Ministry of Agriculture and Irrigation (MOAI) and Department of Metrology and Hydrology (DMH) for effective implementation of REDD+ readiness.

**Table 12 Current and potential roles of government ministries in REDD+ readiness**

Ministry	Current REDD+ relevant roles	Potential role in REDD+ Readiness
<b>MOECAF (Ministry of Environmental Conservation and Forestry)</b>	<ul style="list-style-type: none"> <li>-Hosts current REDD Task Force</li> <li>-Responsible for national forest estate</li> <li>-Coordinates climate change policies</li> <li>- Drafts Forest laws</li> <li>-Technical climate change policy analysis and recommendations to MOFA for UNFCCC negotiations</li> </ul>	<ul style="list-style-type: none"> <li>-Lead the National REDD Task Force</li> <li>-Coordinate REDD Readiness</li> <li>-Coordinate REDD Strategy and lead Strategy development</li> <li>-Drafting REDD relevant laws</li> <li>- Continue to conduct technical climate change policy analysis and make recommendations to MOFA for UNFCCC negotiations</li> </ul>
<b>MOAI (Ministry of Agriculture and Irrigation)</b>	<ul style="list-style-type: none"> <li>-Agricultural land management</li> <li>-Responsible for forested areas outside of MOECAF designation</li> <li>- Drafts agricultural laws</li> </ul>	<ul style="list-style-type: none"> <li>-Department of Land Reform-responsible for land demarcation during REDD+ implementation</li> <li>- Draft agricultural laws relevant to REDD</li> </ul>

	<ul style="list-style-type: none"> <li>- Carries out land demarcation (Department of Land Reform)</li> <li>-Needs to meet agricultural production targets</li> </ul>	<ul style="list-style-type: none"> <li>-Representation in the National REDD Task Force</li> <li>-Contribute to REDD Strategy</li> </ul>
<b>MNPED (Ministry of National Planning and Economic Development)</b>	<ul style="list-style-type: none"> <li>- Coordinates amongst ministries on development issues</li> <li>-Responsible for meeting national economic and development targets (e.g. poverty reduction targets)</li> </ul>	<ul style="list-style-type: none"> <li>-Representation in National REDD Task Force</li> <li>- Tying in REDD with national development plans/planning process</li> <li>-Contribute to REDD strategy</li> </ul>
<b>MOFA (Ministry of Foreign Affairs)</b>	<ul style="list-style-type: none"> <li>- Represents Myanmar at a political level in UNFCCC negotiations</li> <li>-Coordinates with ASEAN</li> </ul>	<ul style="list-style-type: none"> <li>- Represent Myanmar at a political level in UNFCCC negotiations</li> <li>- Representation in National REDD Task Force</li> <li>- Contribute to REDD strategy</li> <li>- Coordinate and communicate with ASEAN</li> </ul>
<b>MOHA (Ministry of Home Affairs)/Attorney General</b>	<ul style="list-style-type: none"> <li>- Responsible for law enforcement</li> <li>-Administration at state/region level</li> </ul>	<ul style="list-style-type: none"> <li>- Representation in National REDD Task Force</li> <li>- Contribute to REDD strategy</li> </ul>
<b>MOF (Ministry of Finance)</b>	<ul style="list-style-type: none"> <li>-Auditing donor aid</li> <li>-Budget control/Allotment</li> </ul>	<ul style="list-style-type: none"> <li>- Representation in National REDD Task Force</li> <li>-Managing Budget for REDD readiness activities</li> </ul>
<b>MOM (Ministry of Mining)</b>	<ul style="list-style-type: none"> <li>-Management of Mining companies (Private and Government)</li> </ul>	<ul style="list-style-type: none"> <li>- Representation in National REDD Task Force</li> </ul>
<b>MOE (Ministry of Energy)</b>	<ul style="list-style-type: none"> <li>-Oversees biofuel policy and program implementation</li> </ul>	<ul style="list-style-type: none"> <li>- Representation in National REDD Task Force</li> </ul>
<b>MOFL (Ministry of Fisheries and Livestock)</b>	<ul style="list-style-type: none"> <li>-Management of fisheries resources within Mangrove zones</li> <li>-Rural development and livelihoods initiatives within mangrove zones</li> <li>-River management within forested areas</li> </ul>	<ul style="list-style-type: none"> <li>- Representation in National --- --</li> <li>Representation in National REDD Task Force</li> </ul>

Table 13. Stakeholders Analysis

Institutions	Characteristics	Problem/needs/	Potential	Involvement in the project
<b>Primary Stakeholders</b>				
Local communities (i.e., Oktwin, Yedashe, Phyu, Toungoo, Htantapin communities of Toungoo District) living inside and in the surrounding area of Bago Yoma Region	Highly dependent on natural resources (all forests are State-owned)	Lack of knowledge and skills, low level of awareness about REDD-plus, limited alternative income options Less opportunities to communicate with Government officials	Key player to implement project and conserve forest sustainably.	Involve in the activities related with restoration of degraded forests, establishment of demonstration site for MRV, participatory carbon monitoring, extension activities
Ministry of Forestry	Key element in the whole management of natural forests and planted forests	Weak coordination, limited human resource capacity, limited technology, insufficient infrastructures, weak law enforcement,  Problems of unsustainable management practices, climate change impacts, limited capacity to initiate REDD-plus	-Decision maker  - key player for planning and decision making processes	- Facilitate in the discussion, preparation and formulation of project proposal. Provide general guidelines for overall management.  - Take leading role in implementing and disseminating project outcomes
Forest Research Institute/ Forest Department (Implementing Agency/Executing Agency)	Key element in the technical aspect of whole project	Limited human resources, Limited infrastructure, Limited financial resources, Need to upgrade and technical cooperation	Only institution to conduct forestry related research  Key role in research & educational development in forestry sector	Facilitate discussion, preparation and formulation of project proposal. Take leading role in the dissemination of project findings as lessons learned for other sites. Take leading role in operational activities together with the management of Bago Yoma Region.
Planning and Statistic Division	Key element in the management of whole project	Limited human resources, Limited infrastructure, Limited financial resources, Need to upgrade and technical cooperation	Key role in international cooperation in forestry sector	Project administration, leading role in successful implementation of the project.
<b>Secondary Stakeholders</b>				
University of Forestry, Central	Prominent institution in the	Limited facilities, media, research facilities,	Play important role to produce	Involve in the provision of scientific data. Involve in

Forestry Development Training Centre, Nan Chun Timber Extraction Training centre, Pyinmana Timber Harvesting Training Centre, Myanma Forestry School	development of technologies, methodologies, capacity building centre	limited access to updated information, limited budget to conduct research, limited capable resource persons,	well-trained foresters and staff to manage forests sustainably	the development and promotion of technology required for operational SFM and REDD-plus in the area. Involve in the various assessment and development of monitoring system, resource base inventory etc.
UN agencies (UNDP-Myanmar, UN-REDD, FAO, UN-habitats, Korea Forest Service)	Independent to organize NGOs and to communicate with Government Ministries	Limited REDD-plus planning, lack of linkage with national policy, lack of integration with forestry master plan	Key elements in coordination among relevant stakeholders	Involve in coordination mechanism, provide facilities and supports to the local communities and local NGOs for rural development activities, community forestry, extension activities
Local NGOs (FREDA, BANCA, ECCDI, MERN, ECODEV)	Play important role in the community development, extension and mediation	Lack of facilities, access to formal institutions, lack of resources, Lack of awareness, limited REDD-plus planning, lack of linkage with national policy, lack of integration with forestry master plan	High potential to cooperate with Ministry of Forestry in extension activities, conservation and participatory carbon monitoring	Involve in the community development and income generating activities, continue and expand the existing initiative, sub-contract
<b>Tertiary Stakeholders</b>				
Primary/middle and high schools in the Toungoo Districts	Active participation in environmental conservation	Limited knowledge, low level of awareness about ecosystem services, limited facilities, limited environmental education	High potential, new generation to conserve biodiversity and enhance environmental services	Involve in the extension activities such as public educational talks, poster and environmental exhibition, seminars
Ministry of Agriculture and Irrigation	Key player in preparing landuse plan	Weak coordination and cooperation with other ministries and agencies	Play in high potential involving land use and landuse changes	Involve in agro-forestry, income generating activities for local communities, extension activities
Local authority	Authorized body to monitor and coordinate every affair including forestry-related matters	Limited knowledge, low level of awareness about ecosystem services, limited facilities, limited environmental education	Key element to coordinate relevant Ministries, organizations and stakeholders	Involve in the coordination mechanism among stakeholders

**Note: The author's analysis based on the results of national level REDD+ Workshop (December 2010) and Regional Workshop (May 2011)**

**Table 14 Potential actors to be involved in REDD+ of Myanmar**

Level	Government institutions and agencies	NGOs	Civil Society	Private Sector Associations	Knowledge Institutions	Development Partners
<b>National</b>	<ul style="list-style-type: none"> <li>• Parliament</li> <li>• MOECAF (Ministry of Environmental Conservation and Forestry) <ul style="list-style-type: none"> <li>○ Forestry Department</li> <li>○ DZGD (Dry Zone)</li> <li>○ Department of Environment (new)</li> <li>○ Myanmar Timber Enterprise</li> <li>○ Department of Planning &amp; Statistics</li> </ul> </li> <li>• MOAI (Ministry of Agriculture and Irrigation) <ul style="list-style-type: none"> <li>○ Agricultural Services</li> <li>○ Land settlement and</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• WCS</li> <li>• FREDA</li> <li>• ECCDI/FORM</li> <li>• MERN</li> <li>• BANCA</li> <li>• REAM</li> <li>• SPECTRUM</li> <li>• CARE International</li> <li>• Social Vision Services</li> <li>• Pyo Pin Project</li> <li>• AEGD</li> <li>• Other NGOs (TBC)</li> <li><u>NGO Networks</u></li> <li>• MERN</li> </ul>	<ul style="list-style-type: none"> <li>• Myanmar Women Association</li> <li>• Myanmar Maternal and Child Welfare Association</li> <li>• Veteran Association</li> <li>• Ethnic Group Associations</li> <li>• Media Society</li> <li>• Writers' Association</li> <li>• Social Welfare Association</li> <li>• Religious associations</li> </ul>	<ul style="list-style-type: none"> <li>• Forest Joint Venture(FJV)</li> <li>• UNFCCI (Chambers of Industry)</li> <li>• Timber Merchant Association</li> <li>• Tourism Association</li> <li>• Agro-products Associations</li> <li>• Rice merchants Associations</li> <li>• Forest-products Associations</li> <li>• Bamboo and Rattan Association</li> </ul>	<ul style="list-style-type: none"> <li>• University of Forestry (MOECAF)</li> <li>• Forest Research Institute (MOECAF)</li> <li>• University of Agriculture (MOAI)</li> <li>• CFDDC (Forestry Development Training Centre)</li> <li>• Myanmar Forestry School</li> <li>• Myanmar Timber Enterprise Training School</li> <li>• Mandalay University</li> <li>• Yangon University</li> <li>• DAR (Department of Agricultural</li> </ul>	<ul style="list-style-type: none"> <li><u>Multilateral</u></li> <li>• UNDP</li> <li>• FAO</li> <li>• UNEP</li> <li>• UN-REDD</li> <li>• UNHABITAT</li> <li>• ITTO</li> <li>• INBAR (International Bamboo and Rattan Association)</li> <li><u>Bilateral</u></li> <li>• NORAD</li> <li>• JICA</li> <li>• KOICA</li> <li>• KFS</li> <li>• GIZ</li> <li>• DFID</li> </ul>

	<p>record department</p> <ul style="list-style-type: none"> <li>• MNPED (Ministry of National Planning and Economic Development) <ul style="list-style-type: none"> <li>◦ Planning Department</li> </ul> </li> <li>• MOLF (Ministry of Livestock and Fisheries)</li> <li>• MOI (Ministry of Industry)</li> <li>• MOM (Ministry of Mining)</li> <li>• MOE (Monitoring of Energy)</li> <li>• MOT (Ministry of Transport)</li> <li>• MOHA (Ministry of Home Affairs)</li> <li>• Attorney General's Office</li> <li>• MOFA (Ministry of Foreign Affairs)</li> <li>• MOF (Ministry of</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental Technical Working Group</li> <li>• Poverty Alleviation Technical Working Group</li> </ul>	<ul style="list-style-type: none"> <li>• Professional Associations</li> <li>• Women Empowerment Association</li> <li><u>In progress</u></li> <li>• Farmers Association</li> <li>• Student Association</li> <li>• Workers' Association</li> <li>• Red Cross</li> </ul>	<ul style="list-style-type: none"> <li>• Information Technology Association</li> </ul>	<p>Research)</p> <ul style="list-style-type: none"> <li>• State/Region Universities</li> </ul>	<ul style="list-style-type: none"> <li>• SIDA (?)</li> <li><u>Private Foundations</u></li> <li>• None identified</li> </ul>
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	<p>Finance)</p> <ul style="list-style-type: none"><li>• Auditor General</li><li>• MOC( Ministry of Construction)</li><li>• MOE (Ministry of Education)</li><li>• Cross Government Committees<ul style="list-style-type: none"><li>○ Ethnic Group Committee</li><li>○ CDM DNA(Designated National Authorities)</li><li>○ NECC(National Environmental Conservation committee)</li><li>○ NAPA (National Adaptation Plan) Committees</li><li>○ NBSAP (National Biodiversity Strategy Action Plan)</li></ul></li></ul>					
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	<ul style="list-style-type: none"> <li>○ National Poverty Reduction Committee</li> </ul>					
<b>State/ Region</b>	<ul style="list-style-type: none"> <li>• State/ Region Level of Ministry Offices</li> <li>• State/Region Ethnic Ministers</li> </ul>		<ul style="list-style-type: none"> <li>• State/ Region offices of CS groups identified above</li> </ul>	<ul style="list-style-type: none"> <li>• Some of above associations have offices at State and Region</li> </ul>	<ul style="list-style-type: none"> <li>• Technological Universities/ Polytechnics</li> <li>• State/Regional universities may be managed by State/Regional Governments in the future under the decentralization process</li> </ul>	<ul style="list-style-type: none"> <li>• State/Regional offices of development partners</li> </ul>
<b>District/ Township</b>	<ul style="list-style-type: none"> <li>• District level offices of Ministries</li> <li>• District administrative authorities</li> </ul>		<ul style="list-style-type: none"> <li>• Township offices of CS groups identified above</li> <li>• Various township-specific groups</li> <li>• Hometown Associations</li> </ul>	<ul style="list-style-type: none"> <li>• District/Township offices of national associations</li> </ul>	<ul style="list-style-type: none"> <li>• High Schools</li> <li>• Vocational High Schools</li> </ul>	<ul style="list-style-type: none"> <li>• District/Township offices of development partners</li> </ul>

**Note: Potential actors to be involved in REDD+ of Myanmar are results of discussion with 1<sup>st</sup> Mission of UN-REDD Programme (July 2012)**

## 7.1 Elements of REDD-plus in Myanmar

Under the circumstance of global climate change, the term REDD+ is very new for Myanmar as is in other developing countries. Myanmar has realized REDD+ as an innovative concept of adding monetary incentive to forest conservation activities. Regardless of monetary incentive mechanism and technical matters for carbon measures, forest conservation in sustainable manner has been an age-old conventional practice for Myanmar. Thanks to proper management system so called Myanmar Selection System (MSS), about 47 percent of the country area is still forested. UN-REDD Programme identified six elements of REDD+ readiness process as follows:

- i. Management of the REDD+ readiness process;
- ii. Stakeholder participation;
- iii. Implementation framework;
- iv. REDD+ strategy setting;
- v. Reference scenario and
- vi. National monitoring system.

The following table shows the subjective evaluation of current status of readiness preparation in accordance with six components of REDD+ Readiness Process:

**Table 15. Components of REDD+ readiness and current status (1 = VERY HIGH, 2=HIGH, 3=MEDIUM, 4=LOW, 5=VERY LOW)**

1	Management of the REDD+ Readiness process	Status	Remarks
	Establishment of multi-stakeholder information network	3	Already established, needs to strengthen and sustainability
	Establishment of coordination mechanism	3	Already established, but weak, needs to strengthen and sustainability
	Preparation of a REDD+ readiness roadmap	3	Two national workshops already held, need to prepare Roadmap
	Analysis of sectoral approaches to REDD+ (e.g., timber industry; agricultural sector)	4	Needs to conduct research, NCEA conducted some stages eg. INC report
	Other		
2	Stakeholder Engagement		
	Awareness raising – government agencies	3	Only few officials aware about REDD
	Awareness raising – communities	3	Low level of awareness opportunities
	Awareness raising – other (industry, armed forces, etc.)	4	Only few officials aware about REDD
	Preparation/application of FPIC procedures	4	Initial stage of preparation and already start some activities
	Other		

<b>3</b>	<b>Implementation Framework</b>		
	Mainstreaming REDD+ into planning (land use and socio-economic development)	2	Forest Policy and FD management plan is very inline with REDD+, easy to integrate with management plan
	Design of benefit distribution system (including establishment of REDD+ Fund)	4	Have Experiences in CF but needs to explore more
	Strengthening forest governance – community or social forestry development	2	CFIs 1995, Forest Policy 1995, Forest Law 1992, Wildlife Law 1994, Myanmar Agenda 21, Signatory to the Conventions such as CITES, CBD, UNFCCC, UNCCD, ILO
	Strengthening forest governance – law enforcement and reduction of corruption	3	Forest Law 1992, Wildlife Law 1992, Code of Timber Harvesting, C&I for SFM, needs to follow FLEG-T (of Asean) and Lacey Act
	Application of social and environmental safeguards	3	CFIs 1995, Forest Policy 1995, Forest Law 1992, Wildlife Law 1994, National level poverty reduction and rural development programme, Signatory to the Conventions such as CITES, CBD, UNFCCC, UNCCD, ILO
	Other		
<b>4</b>	<b>REDD+ Strategy Setting</b>		
	Analysis of drivers of deforestation and degradation	3	Have reliable data and information, suggested to conduct for specific area to explore major drivers
	Analysis of opportunities to enhance forest carbon stocks (reforestation, rehabilitation, etc.)	1	Reforestation, Afforestation across the countries by Govt and Private, annual planting rate of 32000 ha per year
	Identification of options	2	Many forest rehabilitation and conservation activities including PAS (6.07% of total area)
	Preparation of National REDD+ Strategy, including consultation processes	3	National strategy (draft) already prepared and need to be finalized and adopted.
	Other		
<b>5</b>	<b>Reference Scenario</b>		
	Analysis of past trends in forest cover and forest quality	2	Available RS/GIS images and experts in FD, needs specific image for specific area (potential pilot project area)

	Estimation of biomass equations (allometric equations)	4	Have experimental scale, and some experts but need for comprehensive study for each and every forest types of Myanmar
	Scenario setting for future trends in forest development	4	Needs more discussion and consultation to set scenario
	Estimation of interim reference scenarios	4	Available for generalized reference scenario
	Other		
<b>6</b>	<b>National Monitoring System</b>		
	Strengthening the national forest inventory process	2	Already have but needs to strengthen
	Establishment/capacity building for remote sensing	3	Have some experts but needs new generation for long term
	Development of participatory monitoring techniques	3	Already established CF and needs to develop the capacity of rural community, have CF training centres and training regularly basis
	Data management/capacity building for reporting (link to National Communications)	4	Needs more experts and more new generation for the future
	Other		

Note: Subjective evaluation of the author.

## 7.2 Preparation of REDD+ readiness in Myanmar

Indeed, Myanmar has long history of Forest legislation and systematic forest management. Burma Forest was enacted in 1902. In order to reflect the present political, social, ecological and economic situations, it was replaced by the new Forest Law in 1992. Likewise, the Wildlife Protection Act could be enacted in 1936 and it was replaced by Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law in 1994. Myanmar Selection System (MSS) has been principle forest management system since 1856 and sustained timber production is the basic concept of the system. It is a selection-cum-cultural system and selective cutting has been done with least negative impacts to the environment and remaining forests. Therefore, all forest related legislations and systematic forest management practices have been over 100 years in experience in Myanmar.

Nowadays, REDD+ become an important mechanism not only to reduce emissions from deforestation and forest degradation and to enhance forest carbon stocks, but also to enjoy co-benefits such as increasing biodiversity, stabilizing water regulation, poverty reduction and rural development. In order to reflect the changing global trend including REDD+, Forest Department of MOECAAF has formed a REDD+ Core Unit which is composed of experts of relevant subject matters of REDD+ and forestry sector. There are 21 members from various Divisions including Forest Research Institute, Planning and Statistics Division (RS/GIS and Inventory), Training and Research Development Division, Natural Forest and

Plantation Division, Nature and Wildlife Conservation Division, Extension Division and University of Forestry. Core Unit is Chaired by Director of Forest Research Institute (FRI) and Deputy Director of Planning and Statistic Division serves as a Secretary. With the director supervision of Director General of the Forest Department, the Core Unit has been working for the development of REDD+ readiness activities.

The team was encouraged to find that many enabling conditions for REDD+ readiness are already in place in Myanmar, or are in the process of development. These include:

### 7.3 Forest Management and Policy

- **REDD+ Task Force:** A REDD+ Task Force was established in 2010, and meets at monthly intervals, albeit thus far including only staff from the Ministry of Environmental Conservation and Forestry (MOECAF). The current REDD+ Taskforce has an interim mandate to support for development of the Myanmar REDD+ Roadmap. However, it is proposed to enlarge the future working arrangements, involving key technical representatives from Forest Department (FD), Dry Zone Greening Department (DZGD) and Myanmar Timber Enterprise (MTE), MOECAF and Ministry of Agriculture and Irrigation (MOAI) and Department of Metrology and Hydrology (DMH) for effective inter-agency cooperation
- **Land-use and Socio-economic Development Planning:** There is a clear recognition at the highest levels of government that past top-down planning processes are inappropriate. Since July 2011, the MNPED has switched to broadly bottom-up planning, with responsibilities devolved to Townships, Districts and Regions/States. The inter-ministerial Land Scrutiny group, chaired by the Minister of MOECAF, has been formed with a presidential mandate to devise national-level regulations for land-use planning. At State/Region, District, and Township levels, Land-use Advisory Committees are to be established, which will include civil society and private sector representatives, although in many locations these committees still do not exist. There are also Agricultural Oversight Committees, consisting of representatives of sector ministries, which meet once a month or more often during the rainy season to resolve land-use conflicts. Civil society engagement has been actively sought on reform of the planning process, and recommendations from the Land Core Group, and the Food Security Working Group are forthcoming.
- **Community Forestry Instruction revision:** There is widespread acknowledgement that the Community Forests Instruction of 1995 (CFI, 1995) requires revision. These were developed to address the omission of community forests from the Forest Law of 1992. Currently amendments to the Forest Law are being drafted by FD, which will include clearer reference to CF, and the technical content of the CFI is being reviewed. Although external consultation is not being explicitly sought in these processes, suggestions from the Environmental Technical Working Group (ETWG) are being submitted through informal channels.
- **Private Sector investment in forestry:** The government recently relaxed previously strict controls of ownership of teak plantations, leading to a spurt in private sector-supported plantation establishment. The Korean International Cooperation Agency

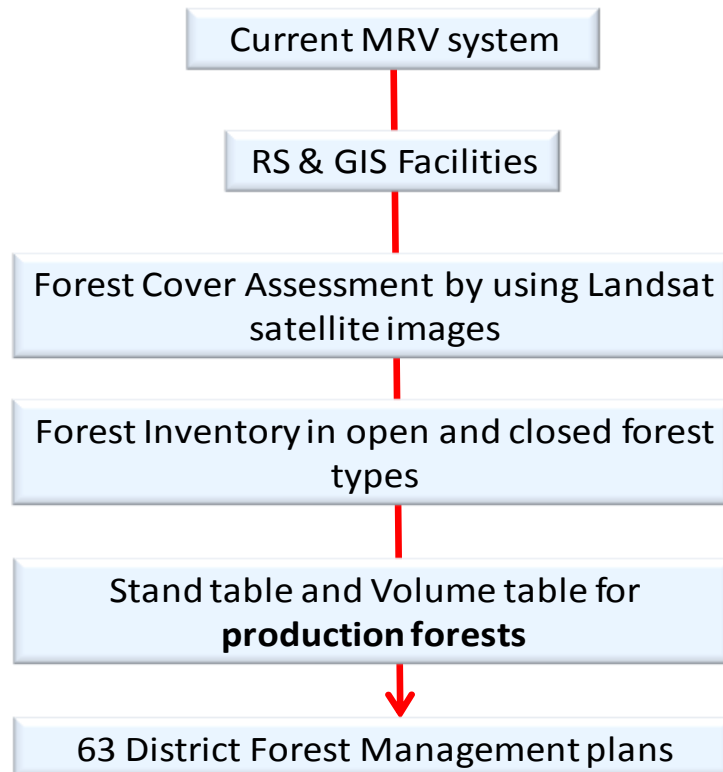
(KOICA) recently initiated a project to improve rehabilitation capacity of the deforested Nyaung U region through private sector involvement.

- **Forest Law Enforcement:** Prosecution of serious forest crimes is apparently highly effective, with a reported 100% conviction rate of crimes referred to the prosecution service in the District visited by the team (Thaungngu District) during 2011.
- **Overall:** The current period of transition in policymaking, planning and stakeholder participation suggests that this is the ideal time for a UN-REDD-supported REDD+ Readiness programme to make a significant impact.

#### **7.4 National Forest Monitoring System and Forest Reference Emission Levels/Forest Reference Levels (RELS/RLs)**

##### *Remote Sensing and GIS*

- Remote sensing and GIS (RS/GIS) are essential tools for 1) the monitoring and assessment of forest cover and forest cover change and 2) the generation of national-level activity data for the forestry sector, to support the development of the national greenhouse gas inventory.
- Levels of awareness, expertise and experience in RS/GIS in the Forest Department are considerable, with the Remote Sensing and GIS Section of the Planning and Statistics Division being headed by two Assistant Directors and hosting a team of 20 RS/GIS analysts in a specialized lab containing 22 computer stations and cartographic printing hardware.
- International support to the RS/GIS Section dates back to the 1990s, with image classification support received from JICA. Contemporary international support is received from JICA, the International Centre for Integrated Mountain Development (ICIMOD) and the Government of India.
- Forest cover maps are produced by the RS/GIS Section and are passed to the National Forest Inventory (NFI) Section to inform their sampling.
- Forest cover change assessments have been completed, for specific target regions of the country, from 1990-2000-2005-2010.
- RS/GIS Section is promoting the use of freely-available satellite imagery (e.g. Landsat) for land cover mapping and land-use change analyses, which is the same approach recommended by FAO/UN-REDD.
- The RS/GIS Section has close links to the University of Forestry, which teaches a graduate course in RS/GIS and there is therefore a steady stream of technical experts.



**Figure 9. Flow chat of forest monitoring system in Myanmar**

### **7.5 National Forest Inventory**

- The national forest inventory (NFI) is the key tool for generating country-specific emission factors (i.e. estimates of greenhouse gas emissions from forest land as a result of human activities), which will inform the compilation of the greenhouse gas inventory for the forestry sector.
- Myanmar has a long history of forest measurement and inventory activities. Modern-era NFI activities began in the 1980s, with the support of FAO.
- From 1982-2003, the NFI was based on a systematic sampling approach using an inverse L-shaped plot. Of the total 9,800 sampling units, 2,845 were designated as permanent sample plots – with the objective to re-measured these permanent ones every five years. The planned NFI cycle period was 10 years.
- Due to budgetary constraints, in 2003 the NFI was redesigned to reduce sampling intensity, and based on the sampling of closed and open forest; the method now incorporates a rectangle sample plot. Data collection is targeted at priority forest areas, with the aim of completing two districts per year. 800 temporary sample plots are assigned to each district. Data variables collected are focused on growing stock. In parallel to the NFI, tree selection marking for logging purposes is carried out every year at the national level.
- A separate Forest Inventory Database Section has a team of 10 inputting NFI data into spreadsheets.

## **7.6 Forestry Research**

- The Forest Research Institute (FRI) employs 57 research staff and has eight field research stations across the country. The FRI hosts a soil science laboratory (capable of assessing soil carbon content) and wood drying facilities. Research staff have derived biomass figures for 54 tree species. The FRI currently has extensive capacities and is well-staffed, but knowledge of REDD+ is limited.

## **7.7 Greenhouse Gas Inventory/National Communication**

- The National Communication to the UNFCCC Secretariat is the means through which countries communicate their national greenhouse gas inventory reports, including emissions and removals from the forestry sector.
- Myanmar recently completed and submitted its Initial National Communication (INC) to the UNFCCC, which was the result of a UNEP-funded project begun in 2008 (Myanmar joined negotiations under the UNFCCC in 2005). The base year for the INC was 2000.
- Default values from the IPCC's global Emissions Factor Database (EFDB) were used to compile the forestry sector inventory; and the 2006 IPCC Guidelines for National Greenhouse Gas Inventories were followed for the compilation of the inventory report.
- A project proposal is being prepared to compile the Second National Communication.

## **7.8 Stakeholder engagement**

- There have been a number of previous cross-Ministry coordination efforts which could provide lessons learnt and working models for the REDD+ readiness process. These include the formation of the National Adaptation Plan, the National Biodiversity Strategy Action Plan and the work of the National Environmental Conservation Committee.
- NGO coordination mechanisms, such as the ETWG, already exist in Myanmar and could provide important channels for stakeholder engagement during the REDD+ readiness process.
- Some of the key national and international NGOs relevant to the REDD+ readiness process are well networked with MOECAF and other government agencies, paving the way for potentially strong communications across the government and NGO sectors.
- The MOECAF has recently demonstrated a willingness to recognize Indigenous Peoples' rights, for example, by acknowledging the right to Free, Prior and Informed Consent.
- Though civil society associations are fewer in number than in many other countries in the region, the sector appears to be expanding rapidly. It is encouraging to see that many of the civil society associations already in place are represented at both the national, state/regional and district/township level, often with some degree of government involvement or representation. Engagement with these civil society associations will be vital for a successful REDD+ readiness process, particularly ethnic group, religious, women's and farmers' associations.
- It was not possible to get a detailed overview of the private sector stakeholders relevant to the REDD+ readiness process during the scoping mission. However a number of important private sector associations within the forestry and land-use sector were identified, which will be important to engage with early in the REDD+ readiness process.

- Though small in number, the knowledge institutions that do exist have substantial technical capacity considering the limited external resources they have at their disposal (as shown in the 'National Forest Monitoring System and Forest Reference Emission Levels/Forest Reference Levels' section above). These institutions can play a number of key technical roles in the REDD+ readiness process.

## 7.9 Capacity Development

- There is substantial existing capacity (in Government as well as civil society), at individual level but also within specific organizations/institutions; of particular importance is the fact that much of this has been a truly endogenous CD process with limited external support (or interference!)
- The general atmosphere is one characterized by optimism, positive momentum, and opportunities for positive change; in the context of REDD+, the overall reform in the country provides entry points for linking CD efforts with other ongoing reform and change initiatives. More specifically:
  - The mission observed 'change agents' who are committed and energetic, but, just as importantly, that the leadership (in MOECAAF) appears to give space and encouragement
  - On the part of Government, there appears to be a genuine openness to engaging with civil society and other stakeholders, and exploring mechanisms for constructive engagement
  - On the side of development partners, the national reform process means a number of new programs and initiatives are being formulated—this provides entry points for seeking synergies (and perhaps economies of scale) with REDD+
- Within MOECAAF/Forestry Department, the mission observed that there is capacity to perform 'business as usual' functions, such as implementing annual work plans along the main activity areas and in accordance with instructions issued by HQ
- Also within MOECAAF/FD, the communication between HQ and district offices appears to be regular and reasonably effective (for example, through monthly FD journal), with good collaboration and joint efforts for achieving targets

### 7.9.1 Key Challenges

Whilst these numerous positive conditions are laudable, inevitably some key challenges remain. These include:

### 7.9.2 Forest Management and Policy

- **Private Sector investment in forestry:** Decision making on investment, at least for plantation establishment, does not require consultation with local stakeholders, and this has led to subsequent conflicts. FD guidelines on approval for licenses require substantial improvement, including decentralization of decision making, inclusion of stakeholder consultation and revision of criteria on forest quality suitable for plantation establishment.

- **Community Forestry:** CF has largely been confined to reforestation of degraded land. There has been little effort to extend the concept to natural forest areas, and formalizing handover procedures in Unclassed Forest areas in coordination with Departments of Agriculture and Land Settlement and Records.
- **Local communities and commercial forestry:** Indications that up to 80% of the income of some forest-dependent communities may stem from the trade in illegally-harvested forest products suggest that there is room for more formal involvement of local people in forest product value chains, including timber.
- **Livelihood conflicts:** Animal feed is a limiting factor in rural livelihoods, particularly in the dry zone. Forests are a key source of animal fodder, and exclusion of local stakeholders has led to conflict.
- **Forest Law Enforcement:** Despite the effectiveness of current enforcement procedures, the number of forest crimes is very high, and it appears that in forest-dependent communities, villagers are obliged to break the law in order to earn income. Therefore some rationalization of forest laws and regulations would seem to be necessary, such that there is a strong focus on serious crimes and some relaxation of the law concerning local usage.
- **Overall:** Improvements in the “rule of law” are required to effectively address drivers. Gains through improved planning, participation, and technical improvements in forest management are vulnerable to being undermined through *ad hoc* top-down decisions at the highest level.

## VIII Process for the preparation of National REDD+ Strategies (Draft)

First National Level Workshop on Reducing Emissions from Deforestation and Forest degradation (REDD) was jointly organized by the Forest Department of the [Ministry of Environmental Conservation and Forestry](#) and United Nations Development Programme (UNDP-Myanmar) on 9th November 2010 at the Ingyin Hall of Forest Department in Nay Pyi Taw, Myanmar. The workshop was attended by the representatives from the [Ministry of Environmental Conservation and Forestry](#), Ministry of Agriculture and Irrigation, Ministry of Live Stock and Fisheries, Ministry of Education, Ministry of Health, Ministry of Home Affairs, Legal Institution, FAO, UNDP, UN-HABITAT and also representatives from local non-governmental organizations, and the invited guests totaling 56. The objectives of the first National Level Workshop were as follows:

- (a) To inform all relevant stakeholders about the REDD-plus;
- (b) To built capacity and to improve awareness raising of Forest Department staffs and relevant stakeholders about REDD-plus;
- (c) To establish the coordination mechanism among stakeholders including government ministries, UN agencies such as UNDP, FAO, UN-HABITAT, NGOs and local communities; and
- (d) To present enabling conditions in implementing REDD-plus as well as opportunities and constraints

In addition, second National Level Workshop was also jointly organized by the Forest Department of the [Ministry of Environmental Conservation and Forestry](#) and United Nations Development Programme (UNDP-Myanmar) from 10-11 November 2010 in Forest Department, Nay Pyi Taw, Myanmar. The objectives of the first National Level Workshop were as follows:

- (a) To built capacity and to improve awareness raising of Forest Department staffs and relevant stakeholders about REDD-plus;
- (b) To strengthen the coordination mechanism among relevant stalkholders for REDD-plus readiness;
- (c) To discuss and identify possible financial supports for capacity building for REDD-plus readiness; and
- (d) To formulate the future programme related to REDD-plus readiness in Myanmar.

Major outputs of the Second Workshop were as follows:

- (a) To build the capacity of [Ministry of Environmental Conservation and Forestry](#) and relevant stakeholders in REDD-plus readiness;
- (b) To find every possible means and ways to secure project financing for capacity building;
- (c) To establish REDD-plus demonstration plot for capacity building for measuring, reporting and verification (MRV) of carbon stock and REDD-plus related matters
- (d) To promote international cooperation to accelerate capacity building and aware raising of REDD-plus;
- (e) To include REDD-plus in the mainstream of national forest management plan; and
- (f) To prepare REDD readiness roadmap and REDD-plus national strategy through workshops and consultation meetings

In addition, Regional Level Workshop on REDD-plus was also organized in cooperation with Korea Forest Service (KFS), UNDP (Myanmar office) and UN-REDD Programme. Regional level workshop is schedule was held from 12 to 13 May, 2011 in Nay Pyi Taw, Myanmar. The main objective was to formulate REDD-plus readiness roadmap and REDD-plus National Strategy in consultation with all relevant stakeholders and UN-REDD programme. The Regional Workshop was attended by representatives from Government Ministries, ASEAN Member States (AMS), Korea Forest Services, UN-REDD Programme, UNDP, FAO, UN-HABITAT, Wildlife Conservation Society (WCS), Japan International Cooperation Agency (JICA), local authorities, NGOs and invited guests totaling of 65. The main objective of the REDD-plus Regional Workshop were:

- (a) To formulate REDD-plus national strategy and roadmap;
- (b) To inform the current status of REDD-plus readiness in Myanmar;
- (c) To learn and share experiences of REDD-plus readiness activities among ASEAN member states;
- (d) To discuss about potential financial mechanism for REDD-plus readiness in Myanmar.

With the technical assistance of UN-REDD Coordinator, basic framework of REDD-plus roadmap and National Strategies were identified.

### 8.1 National REDD+ Strategies (Draft)

National REDD+ strategies have been identified as one of the outputs of the National level workshops on REDD+ held in Myanmar. The followings are the REDD+ roadmap (Phase Approach) for the implementation of REDD+ readiness and the National REDD+ Strategies (Draft) of Myanmar:

#### Phase I: Preparation Phase

- ❖ Need assessment, data collection, awareness raising, capacity building, policy review, formulation of REDD+ Roadmap and National Strategies

#### Phase II: Readiness Phase

- ❖ Awareness raising, capacity building, pilot activities, policy adjustment, formulation and adoption

#### Phase III: Implementation Phase – beyond 2020


No.	National REDD+ Road Map	Time Frame									
		1 <sup>st</sup> Year		2 <sup>nd</sup> Year		3 <sup>rd</sup> Year		4 <sup>th</sup> Year		5 <sup>th</sup> Year	
		1 <sup>st</sup>	2 <sup>nd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>		
1	Phase I										
2	Phase II										
3	Phase III										

Table 16

Strategy		Major tasks	Remarks
<b>Strategy 1: Tackling deforestation and forest degradation</b>	1.1.	Analyze major drivers of deforestation and forest degradation	
	1.2.	Develop more effective conservation and management of Permanent Forest Estate (PFE)	
	1.3.	Develop more effective management of planted forests and enhance forest carbon stock	
	1.4	Stabilization of shifting cultivation	
	1.5	Integrate forestry with rural development programme	

<b>Strategy 2: Developing enabling policies</b>	2.1	Establish institutional mechanism	
	2.2	Clarify and ensure legal carbon and land tenure right	
	2.3	Establish quantifiable national forestry emissions reduction targets	
	2.4	Develop long-term policy on payment for Ecosystem Service (PES)	
	2.5	Ensure REDD-plus social and environmental safeguard	
	2.6	Adjust or formulate the policy and action plan to support REDD+	
<b>Strategy 3 Strengthening Forest Governance</b>	3.1	Establish National REDD+ Committee/REDD National Working Group	
	3.2	Integrate/mainstream REDD+ into sectoral plans	
	3.3	Establish equitable benefit distribution system	
	3.4	Develop technical and institutional guidance to implement REDD+	
	3.5	Strengthen law enforcement and anti-corruption scheme	
<b>Strategy 4. Establish MRV System and Set Reference Emission (REL) at the National level</b>	4.1	Analysis of past trends in forest cover and forest quality	
	4.2	Develop biomass allometric regression equations of various forest types	
	4.3	Measurement of baseline carbon stock at the national level (sub-national level) with appropriate MRV tools	
	4.4	Establish MRV system at national level (sub-national level)	
	4.5	Implementation of pilot project for MRV and REL	
<b>Strategy 5 Strengthen institution, building capacity and raising awareness about REDD+</b>	5.1	Development of infrastructures for REDD+	

	5.2	Establishment of multi-stakeholders coordination mechanism	
	5.3	Building capacity of all relevant stakeholders	
	5.4	Implementing Free, Prior Informed Consent	
	5.5	Promote REDD+ through information, education and communication (IEC)	
	5.6	Enhancing learning exchange	
	5.7	Sustaining government and non-government cooperation	
<b>Strategy 6 Ensuring stakeholder consultation and engagement</b>	6.1	Organizing series of consultation with the participation of all relevant stakeholders	
	6.2	Preparation/application of Free Prior Informed and Consent.	
	6.3	Application of social and environmental safeguards.	
	6.4	Promote community forestry and social forestry.	
	6.5	Design benefit distribution system.	
<b>Strategy 7. Securing sustainable financing for REDD+</b>	7.1	Implementing multilateral and bi-lateral approaches for sustaining financing (diverse long-term funding mechanism)	
	7.2	Seeking immediate donor funding for REDD+ readiness	
	7.3	Pursuing equitable and reasonable benefit sharing among stakeholders	

## 8.2 On-going REDD+ projects in Myanmar

There are four bilateral on-going REDD+ projects in Myanmar supported by different organizations. These projects are as follows:

### Project 1:

Project title	Mitigation of climate change impacts through restoration of degraded forests and REDD-plus activities in Bago Yoma Region, Myanmar
Supporting organization	Korea Forest Service (KFS), the Republic of Korea

Project duration	24-11-2011 to 23-11-2012 (one year) November 2012 to November 2013 (project extension for one more year)
Implementation agency	Planning and Statistics Division and Forest Research Institute, Forest Department (REDD+ Core Unit)
Project objectives	<ul style="list-style-type: none"> <li>❖ To initiate pilot activities for restoration of degraded forests and conservation of ecosystem for mitigating climate change impacts and supporting sustainable forest management ;</li> <li>❖ To measure baseline carbon stocks and set reference scenario of carbon emissions through a reliable MRV system focusing on REDD+ readiness; and</li> <li>❖ To strengthen capacity and enhance awareness of FD Staff and relevant stakeholders in REDD+ readiness and ecosystem conservation.</li> </ul>
Major project activities	<ul style="list-style-type: none"> <li>❖ Awareness raising about REDD+, climate change and forests</li> <li>❖ Capacity building and development of MOECAAF and relevant stakeholders</li> <li>❖ Rural development activities as an initial step of formulating performance based benefit distributing system</li> <li>❖ Demonstration on enhancing forest carbon stock with people's participation (establishing community woodlot, arboretum, forest conservation)</li> <li>❖ Measuring, reporting and verification (MRV) and carbon measurement according to IPCC guidelines</li> <li>❖ Forest inventory and forest cover change assessment (ground check, RS/GIS)</li> <li>❖ Research on major drivers of deforestation and forest degradation (District level as an initial step of conducting national level)</li> </ul>

### Project 2:

Project title	Myanmar REDD+ Readiness Assessment with the technical support of UNREDD Programme and RECOFTC (9 months) (It needs to be approved by the Norwegian Government for the financial supports to UNREDD Programme and RECOFTC.)
Supporting organization	Norwegian Government, UN-REDD Programme and RECOFTC (technical support to the Forest Department of MOECAAF)
Project duration	9 months (proposed duration, not yet approved the exact time frame)
Implementation agency	Planning and Statistics Division and Forest Research Institute, Forest Department (REDD+ Core Unit)
Project objectives	<ul style="list-style-type: none"> <li>❖ To support the formulation of REDD+ roadmap and National REDD+ Strategies</li> </ul>
Major project activities	<ul style="list-style-type: none"> <li>❖ Supporting in stakeholder consultation processes</li> <li>❖ Reviewing the existing REDD+ related (sectoral) policies, laws, regulations, documents and practices</li> <li>❖ Facilitating the formulation of of REDD+ roadmap and National REDD+ Strategies through working groups which are composed of representatives of relevant government ministries, NGOs, academia and research insitutions</li> </ul>

**Project 3.**

Project title	The study on the strengthening methodological and technological approaches for reducing deforestation and forest degradation within the REDD implementation framework: application in Myanmar (1 year) (2012-2013)
Supporting organization	Asia Air Survey Co.Ltd., from Japan. Technical Cooperation and Capacity Building Programme
Project duration	12 months (2012 -2013)
Implementation agency	Planning and Statistics Division and Forest Research Institute, Forest Department (REDD+ Core Unit)
Project objectives	<ul style="list-style-type: none"> <li>❖ To strengthen RS/GIS capacity of staff of FD in order to support REDD+ readiness process</li> <li>❖ To demonstrate the preparation of carbon mapping in selected areas</li> <li>❖ To share and exchange knowledge and experiences regarding REDD+ readiness activities</li> </ul>
Major project activities	<ul style="list-style-type: none"> <li>❖ Organizing RS/GIS training in Myanmar (20 participants) and in Japan (3 Myanmar participants)</li> <li>❖ Organizing REDD+ workshop in Myanmar</li> <li>❖ Conducting survey (socio economic, forest cover and growth, community forestry activities) in Nyaung Shwe and Kalaw Townships</li> <li>❖ Developing carbon mapping of some selected areas (eg. Community forests and some areas of Nyaung Shwe township)</li> </ul>

**Project 4.**

Project title	Capacity building for developing REDD-plus activities in the context of sustainable forest management
Supporting organization	International Tropical Timber Organization (ITTO)
Project duration	3 years project (2012-15)
Implementation agency	Planning and Statistics Division and Forest Research Institute, Forest Department (REDD+ Core Unit)
Project objectives	<ul style="list-style-type: none"> <li>❖ To strengthen the individual capacity and institutional capacity to implement REDD+ in Myanmar</li> </ul>
Major project activities	<ul style="list-style-type: none"> <li>❖ Capacity development programme</li> <li>❖ Institutional development programme</li> <li>❖ Pilot activities of REDD+ in Toungoo District</li> </ul>

## **IX National Biodiversity Safeguard**

### **9.1 National Biodiversity Asset**

Conservation of biological resources primarily wildlife, wild plants and pristine forests has traditionally been prioritized at the national level. Wildlife conservation in Myanmar dates back to 1860 when King Mindon set up a wildlife sanctuary of nearly 7100 ha. The Elephant Preservation Act (1879), the Wild Bird and Animals Protection Act (1912), the Wildlife Protection Act (1936) were the earliest legal tools for Biodiversity safeguard in Myanmar. The 1995 Myanmar Forest Policy stipulates to form a network of naturally protected areas 5% of the country's landmass and intended up to 10% in the long run. As of 2011, 29 wildlife sanctuaries and 6 national parks accounting for 14631.53 square miles has been established across the country and further 7 areas of 72784.73 square miles are under the process of PAS formation and thus total area of PAS amounted to 6.7% of the total land area. The richness of biodiversity in Myanmar is estimated at over 20,000 species and of which about one fourth is endemic species. This magnitude of biodiversity asset is will helpful for biodiversity safeguard in REDD mechanism.

### **9.2 National Strategy on Biodiversity Conservation**

The National Forest Master Plan for 30 years (2001-02 to 2030-31) emphasizes, in chapter 9, current status, objectives and programs on biodiversity conservation in Myanmar. National Biodiversity Strategic Action Plan (NBSAP) has also been developed through a series of national workshops and consultation processes. Some salient points noted in the master plan with regard to develop National Strategic Plan are as follows, and those are in general in conformity with requirements for REDD-plus.

- ❖ Collection baseline data on genetic diversity and species diversity by 2016-17
- ❖ Collaboration with relevant ministries death with environmental and resource management, including cultural heritage and hotel tourism development
- ❖ Institutional strengthening and capacity building of staff
- ❖ Public awareness programme and offering opportunity of public cooperation
- ❖ Gain for Political commitment
- ❖ Law enforcement and flexibility of amendment of law
- ❖ Programme to develop Indigenous medicinal usages
- ❖ Socio-economic development local communities through eco-tourism
- ❖ International and inter-departmental cooperation
- ❖ Establishment of Funds

To safeguard this national biodiversity asset, Environment and Wildlife Division was formed under the Forest Department. So as to enhance the capacity and knowledge of the wildlife staff, in-house trainings and oversea trainings, on-job trainings together with international experts in the field and dispatch for regional and international workshops and seminar are arranged. Various plans and projects including research program, In-situ and

Ex-situ conservation programs, public awareness program, law enforcement program, habitat restoration program, and so on are laid down and conducted not only with its own resource but also with regional and international collaboration.

### 9.3 Collaboration with NGOs and INGOs in Biodiversity Conservation

Now some numbers of local NGOs showing keen interest in environmental and biodiversity conservation arise in Myanmar. Among others Forest Resource and Environment Development Association (FREDA), Biodiversity and Nature Conservation (BANCA), ECCDI, etc are founded by retired high-ranked forest officers. Those NGOs play a key role in sharing national responsibility of biodiversity conservation by executing either their own projects or in collaboration with the FD. Furthermore, they are promising stakeholders in a new mechanism of REDD-plus. Some important international agreements and organizations linked with FD are as follows:

- ❖ Global Tiger Forum
- ❖ UN Convention on Biological Diversity
- ❖ Convention on International Trade in Endangered Species of Wild Fauna and Flora
- ❖ Botanic Gardens Conservation International
- ❖ Cartagena Biosafety Protocol
- ❖ Wildlife Conservation Society
- ❖ Ramsar Convention

Elephants (*Elephas maximus*), tigers (*Panthera tigris*), golden deer (*Cervus eldi*) and crocodile (*Crocodylus porosus*) which are enlisted in CITES Appendix (I) and star turtles (*Geochelone platynnota*) enlisted in CITES Appendix (II) are totally protected in Myanmar and gain much attention for conservation projects from INGOs.

### 9.4 Indigenous and Local Community Safeguards

Since long time before, Myanmar Forest Act (1902) acknowledged the rights and privileges of local people when ever forest reservation was made. Thus, existing Myanmar Forest Law (1992) has also clearly mentioned in the section 6 (b) as follows:

*“The Minister shall in respect of constituting a reserved forest appoint a forest Settlement Officer to inquire into and determine in the manner prescribed the affected rights of the public on the relevant land and to carry out demarcation of the reserved forest.”*

In line with this legal stipulation, Settlement Officer must issue prior notice on constitution of reserved forest so that local communities and indigenous peoples can ask for their rights and privileges if affected. They can put forward their claims to the Settlement Officer through the respective Township Forest Office. The Local Supply Working Circles in Forest Management Plans at Forest Management Unit level are also formed with the aim of providing basic needs of forest products to local communities and indigenous.

Community Forestry Instruction - CFI (1995) opened a new front for local communities to fully participate in planning and implementing forest activities. According to the CFI, local communities are permitted to establish community forests for 30-years and with extension on performance basic. They have to develop management plan on their own,

with the technical support of the Forest Department and manage their forest themselves until harvesting and their products and benefit sharing. Now community forests (CF) are merging throughout the country. About 102,402 acre (41,458 ha) of community forests have already been established and about 40,000 user members involved by the end of November 2012. (Unpublished, FD 2012). This essence of grass-root level involvement with bottom-up approach starting from drawing up planning and drawing management plan through implementing the activities will reflect very well to the mechanism in REDD+ requirements.

Along with the REDD+ initiative, free prior informed consent (FPIC) process will be started for the active participation of the local communities.

### **9.5 Modifications needed**

The existing national experience and programmes are, as stated earlier principally, aimed at to conserve forests and biodiversity. So do the ultimate aim of the REDD-plus. However the approach of REDD-plus to reach the ultimate aim is designed with financial incentive for conservation activities. It includes financial transaction and measurement of CO<sub>2</sub> products or commodity. As such implications of transaction mechanism, distribution of benefits and technical issues of measuring CO<sub>2</sub> arise. Therefore although REDD-plus is simple in concept but complex in implementation. Accordingly, it is no doubt some modifications in exiting structure and programme are needed to be suited for REDD-plus. Major areas in needs of modification in existing national programme are human resource development, capacity building, law enforcement, credible policy, secure finance and comprehensive master plan.

## **X. Conclusion**

REDD-plus is a major opportunity for tropical forest conservation. Myanmar has recognized that REDD-plus is an innovative concept that can complement ongoing forest policies. Myanmar is also aware of REDD-plus as a mechanism to create an incentive for developing countries to protect, better manage and wisely use their forest resources, contributing to the global fight against climate change. REDD-plus strategies aim to make forests more valuable standing than they would be cut down, by creating a financial value for the carbon stored in trees. Once this carbon is assessed and quantified, the final phase of REDD involves *developed* countries paying *developing* countries carbon offsets for their standing forests. REDD-plus is a cutting-edge forestry initiative that aims at tipping the economic balance in favour of sustainable management of forests so that their formidable economic, environmental and social goods and services benefit countries, communities, biodiversity and forest users while also contributing to important reductions in greenhouse gas emissions.

The COP 15 which was held in Copenhagen, 2009 recognized the increasingly important roles of reducing emissions from deforestation and forest degradation, forest conservation, sustainable forest management, and enhancement of carbon sinks in developing countries (REDD-plus). The FD of Myanmar is very keen to initiative REDD-plus mechanism since about 48% of total country area is forested. Myanmar has very much potential to contribute mitigating climate change by conservation existing natural forests and restoration of

degraded forests across the country.

There are a number of driving forces that impact upon the forest sector and it has to be noted that their impact is collective. Thus, in considering probable scenarios, the focus should be on a limited number of drivers, with the other forces assumed to be constants. Forests are increasingly intertwined with economic, social, environmental, policy and institutional issues such that any changes in society affect forests and vice versa. The Myanmar forestry sector is affected by environmental, technological, economic, social, demographic, and policy/institutional drivers of change (Forest Department 2007).

Some of the key areas include environmental awareness, demand for forest products and forest conversion, energy demand, wood-based industry and infrastructure development (dams, roads, etc.), poverty, and shifting cultivation, transboundary issues, national economic and land-use policy, financing, capacity to manage forests, market access, and law enforcement and combating illegal logging.

Screening of these drivers led to the selection of a limited number considered to be important and yet uncertain in their future trajectory. Of these, demand for forest products and land, energy demand, infrastructure development, illegal logging, transboundary issues, national economic policy, international conventions and capacity to manage forests are expected to improve in the future. Thus, poverty and land-use policy were selected as key drivers of change for Myanmar forest and the forestry sector.

As in many other developing countries, poor people in Myanmar depend heavily on agriculture, forestry and fisheries for their livelihoods and food security. Although the government claimed that average income of the people lies above the local poverty line, relative poverty is manifested especially in rural and remote areas; most of them are close to the forests and engage in shifting cultivation. Without intervention, a vicious cycle of poverty and deforestation would be set in motion — heavy dependence on forests due to poverty, severe deforestation due to heavy dependence on the forests, less income generation due to severe deforestation, and poverty due to lesser income.

Four policy interventions are suggested to alleviate forest poverty: transferring tenure from governments to communities, improving market access, promoting community forestry, and providing communities with payments for environmental services such as the sequestration of carbon or watershed protection (CIFOR 2007). Out of the four policy options, the activity for promoting community forest has been undertaken and activity for improving market access is ongoing but insignificant.

In the context of REDD-plus mechanism, Myanmar, although in its early stage, with her historical successful forest and nature conservation experiences is ready to make concerted efforts in collaboration with regional and international programme to achieve a common goal to combat climate change.

### Abbreviation

AIPP	Asian Indigenous Peoples Pact
CD	Capacity Development
CF	Community Forest(ry)
CFI95	Community Forestry Instructions (1995)
DMH	Department of Metrology and Hydrology
DZGD	Dry Zone Greening Department
EFDB	Global Emissions Factor Database
ETWG	Environmental Technical Working Group
FAO	Food and Agricultural Organization of the United Nations
FD	Forest Department
FRI	Forest Research Institute
GIS	Geographic Information System
ICIMOD	International Centre for Integrated Mountain Development
INC	Initial National Communication
IPCC	Inter-governmental Panel on Climate Change
JICA	Japan International Cooperation Agency
KOICA	Korean International Cooperation Agency
MNPED	Ministry of National Planning and Economic Development
MOAI	Ministry of Agriculture and Irrigation
MOECA	Ministry of Environmental Conservation and Forestry
MRV	Measurement, Reporting and Verification
MTE	Myanmar Timber Enterprise
NFI	National Forest Inventory
NGO	Non-governmental Organization
NSDS	National Sustainable Development Strategy
RECOFTC	Regional Community Forestry Training Centre for Asia and the Pacific (The Centre for People and Forests)
REDD+	Reducing Emissions from Deforestation and Forest Degradation, and the role of Conservation, Sustainable Management of Forests and Enhancement of Forest Carbon Stocks
REL	Reference Emissions Level
RL	Reference Level
RS	Remote Sensing
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change