Report from Lao PDR

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Ministry of Natural Resources and Environment

Open Seminar for
JICA's Study on Data Collection survey on
the Basin Management and Environmental Conservation in Mekong River Basin
9 August 2019
JICA Head Office, Tokyo, Japan

Agenda

1. Introduction
2. Water Resources Management in Lao PDR
3. Challenge and Strategy toward Forestry Conservation
4. Expectation/ Comment on the Result of the Study Project

1. Introduction

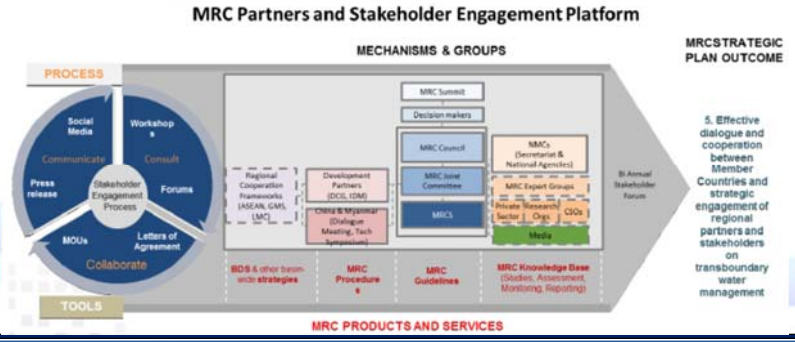
- The Lao People's Democratic Republic (Lao PDR) has abundant water resources. The Mekong river is the main river and 90 percent of the country is located in the Mekong river basin
- About 25 percent of the Mekong river basin is located in the Lao PDR, which contributes 35 percent of the Mekong's total flow.
- There are about 39 main tributaries in the Mekong river basin and the main ones that have their largest catchment area in the Lao PDR such as Nam Ou, Nam Ngum, Nam Theunkading.
- For planning purposes, the Lao part of the Mekong river basin is divided into 32 sub-basins.

2. Water Resources Management in Lao PDR (National Perspective)

Prior 1975	1975-2000	2000-2011	2011-Present
- Traditional management /practice - No clear institutions and specific legislations on IWRM	- Water and water resources law, 1996 - Mekong Agreement 1995 - Local knowledge and some regional and international applied	- IWRM principle introduced - Water Resources Coordination Committee and its secretariat established - Water Resources and Environment Agencies established 2007 (including Department of Water Resources) - Integrated River Basins Planning - Local knowledge + regional + international experiences	- Ministry of Natural Resources and Environment established 2011 (Dept of Water Resources) - Water & water resource law revised & approved (May 2017) - Water Resources Sub-sector working group established - Expand IWRM into 10 priority river basins - Technical guidelines developed - Up scale local knowledge + regional + international experiences

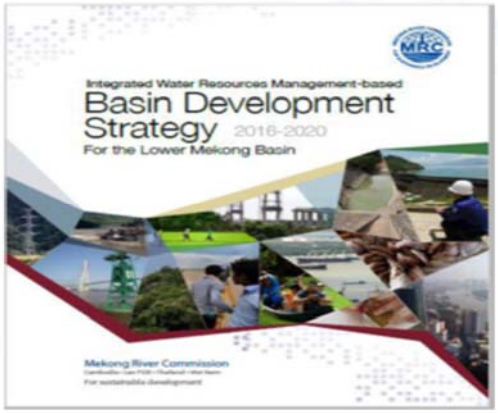
2. Water Resources Management in Lao PDR (Regional Perspective)

- MRC Established by international treaty – the 1995 Mekong Agreement
- Highest level of commitments from Prime Ministers (2010 2014 & 2018 Summits), yearly ministerial meetings (MRC Council), heads of departments meetings twice yearly (JC), regular technical meetings and
- broader stakeholder forums (basin planning, climate change, fisheries, etc)



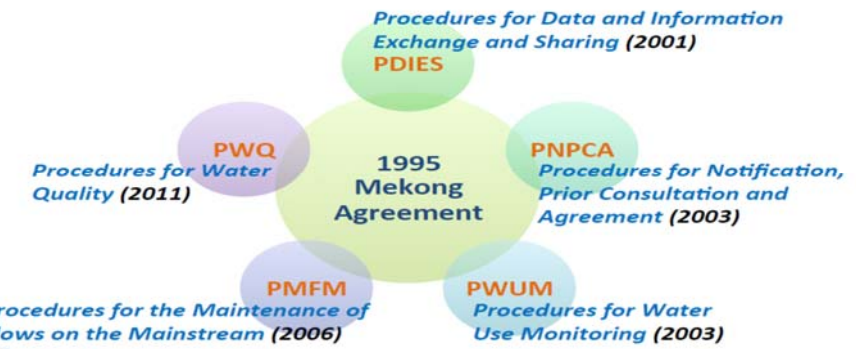
2. Water Resources Management in Lao PDR (Regional Perspective)

- MRC is only one with agreed basin-wide Basin Development Strategy and forthcoming basin strategies for climate change, fisheries, navigation, hydropower, environment, etc
- Identifies development opportunities, risks, and priorities for development and management of water resources in the region through joint actions and projects



2. Water Resources Management in Lao PDR (Regional Perspective)

- **MRC is the only one with comprehensive Procedures framework for managing the basin**



2. Water Resources Management in Lao PDR (Regional Perspective)

- **MRC has the most extensive and sound knowledge base about the Mekong: monitoring, assessments, guidelines since 1957**

3. Challenge and Strategy toward Forestry Conservation

Challenges:

- Lack of land use planning and coordination among stakeholders.
- Incomplete sets of regulations for forest classification.
- Need to link forest classification at macro and village level.
- Complex factors behind deforestation and forest degradation.

3. Challenge and Strategy toward Forestry Conservation

Target based on forest strategy.

- To improve quality of existing forested area, which are about 70% of the total land area, by naturally regenerating up to 6 million ha and planting trees up to 500,000 ha in unstocked forest area as an integral part of a rural livelihood support system encompassing stable water supplies and prevention of natural disasters.
- To provide a sustainable flow of forest products for domestic consumption and to generate household income through sale and export, thus contributing to livelihood improvement, fiscal revenue and foreign exchange earnings whilst increasing direct and indirect employment.
- To preserve the many species and unique habitats, which are, for different reasons, threatened both within the country and elsewhere.
- To conserve environment including protection of soil, conservation of watershed and climate.

4. Comment on the Result of the Study Project

Result of Forest Cover Assessment 2015

- The proportion of forest cover is 46.7% in 2015 There has been 6.5% increase in forest cover between 2010 and 2015, which equals to 1.29% annual increase.
- Simultaneously, the potential forest cover has decreased by -7.8%.
- Country level standard error of sampling is 0.60, which means that with 95% confidence the current forest cover is between 45.54 - 47.90%.
- The forest cover increase has been rapid in all regions: Southern 1.7%/year, Central 1.2%/year and Northern 1.2%/year.
- Again, the growth of forest cover has been mainly due to decrease of potential forests, which has been fast in all regions: Southern -2.4%/year, Central -1.8%/year and Northern -0.8%/year.
- The main difference in regional changes is in permanent agriculture category, which has increased in Southern (1.3%/year) and Central (0.6%/year) regions, but remained stable in Northern (0.0%/year) region

Protected Forest Area Change Assessment - Results

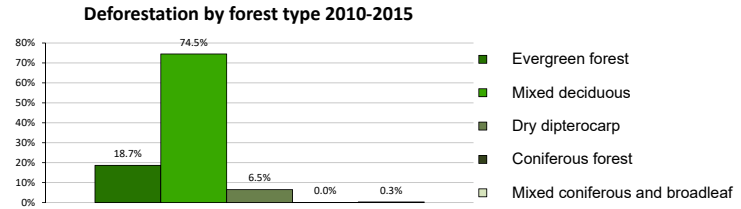
Deforestation Rates

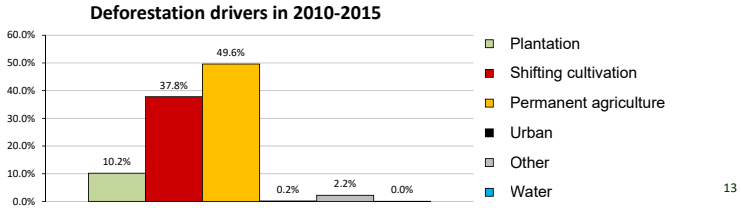
Natural forest	2000-2005	2005-2010	**2010-2015**
Total forest loss in PFA	13073 ha	26706 ha	25169 ha
Annual deforestation rate in PFAs	*Deforestation rate is 0.22 % **lower** in PFAs* ↔		0.30 %
Annual deforestation rate in untreated area			0.52 %

All forest (inc. plantations)	2000-2005	2005-2010	**2010-2015**
Annual deforestation rate in PFAs	*Deforestation rate is 0.09 % **higher** in PFAs* ↔		0.26 %
Annual deforestation rate in untreated area			0.17 %

NOTE! Rubber plantations are expanding outside PFAs and are considered forests by current definition

Deforestation by Forest Type and Drivers





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- **Capacity building and exchange** on how to apply the tools such as modelling tools to support forest and water management
- Need to exchange the forest management practice in the upstream of river
- Need to exchange the coordination mechanism between forestry and water sectors

Thank you very much

Agenda

1. **Introduction**
2. **Water Resources Management in Cambodia**
   - 2.1. Main Rivers and Watershed Classification Map in Cambodia
   - 2.2. Watershed Classification
   - 2.3. Catchment Areas Map in Cambodia
   - 2.4. Map of Forestry Cover 2016 in Cambodia
   - 2.5. Forestry Cover change in Cambodia
3. **Challenge and Strategy toward Forestry Conservation**
4. **Expectation/ Comment on the Result of the Study Project**

1. Introduction

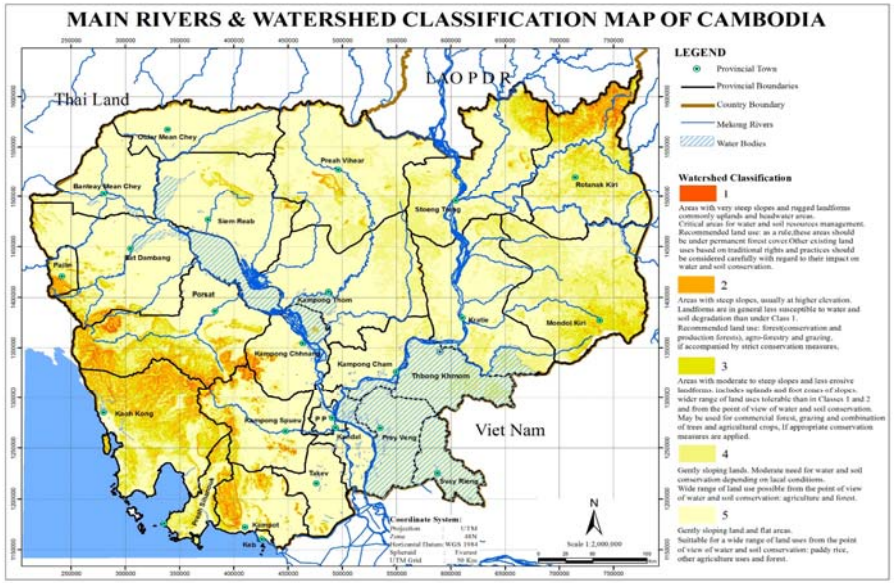
General Information of Cambodia

- Geographic area = 181,035 Km^2
- Forest Cover 2016 = 48.14%
- Municipality = 1 (Phnom Penh) and 24 Provinces
- Population = 16 Million
- Population growth rate = 1.48%
- Avg. GDP growth rate = 7.7%
- GDP per capita 2016 = 1,308USD

2. Water Resources Management in Cambodia

- Basin Areas in Cambodia has 155.000Km2 equal 86% of total areas country and have as such as:
  - Main River (Mekong main river)
  - River/Steng (Se San, Se Kong, Tonlasab, Tenlabasak, and Tonlatoch rivers…)
  - Preak/Stream/o (Preak Te, O Talas, Preak Kreing…)
  - Lake (Tonlasab Lake)

2.1. Main Rivers and Watershed Classification Map in Cambodia

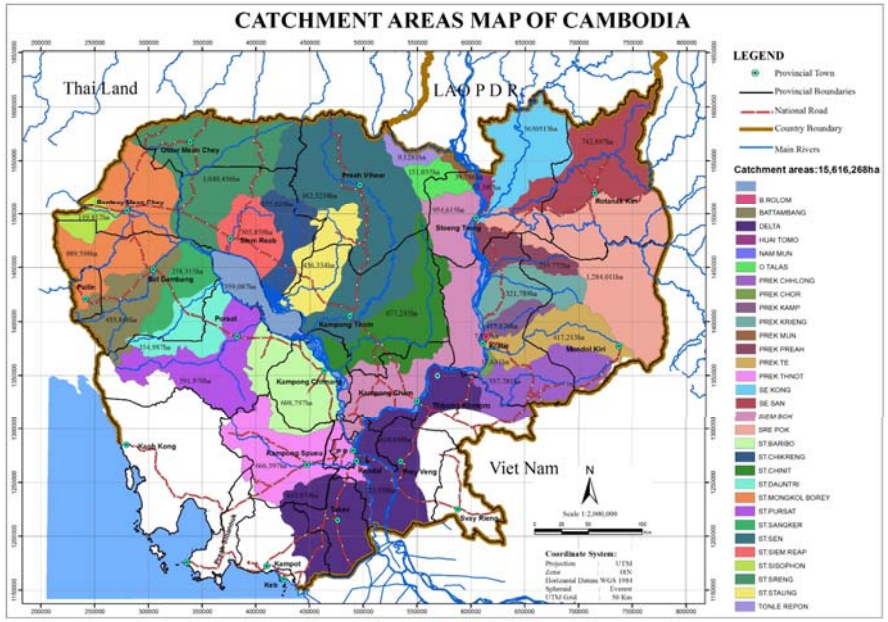


2.2. Watershed Classification

Watershed classes

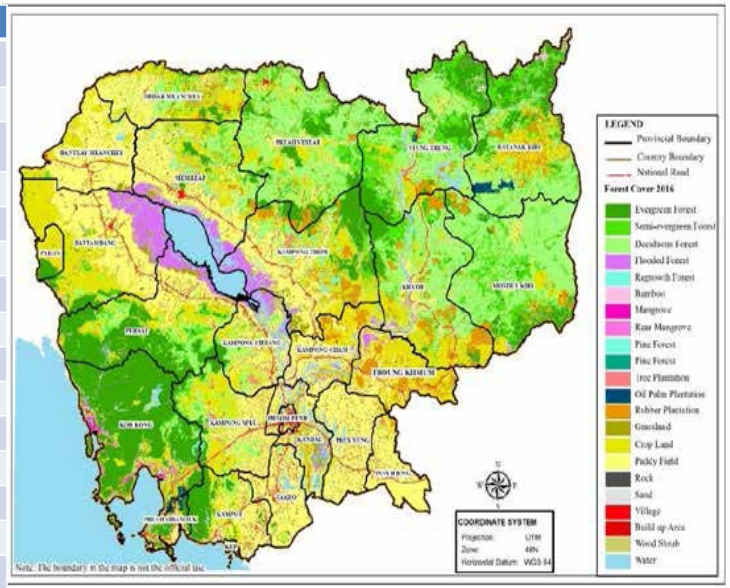
- **Class 1-** Areas with very steep slopes and rugged landforms, commonly uplands and headwater areas.
- **Class 2-** Areas with steep slopes, Usually at higher elevation landforms are in general less susceptible to water and soil degradation then under class1
- **Class 3-** Areas with moderate to steep slopes and less erosive landforms. Includes uplands and foot zones of slopes.
- **Class 4-** Gently sloping lands, Moderate need for water and soil conservation depending on local conditions.
- **Class 5-** Gently sloping land and flat areas.

2.3. Catchment Areas Map in Cambodia

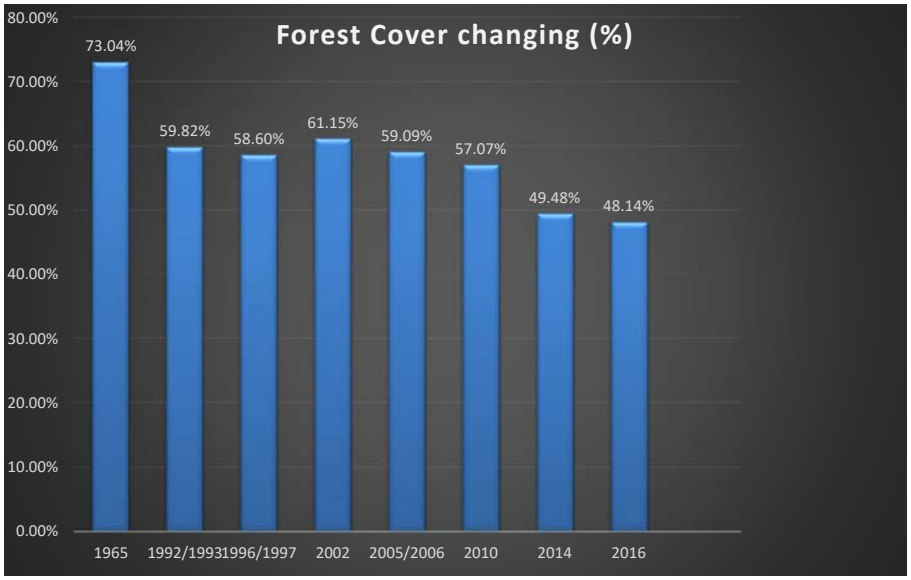


2.4. Map of Forestry Cover 2016 in Cambodia

No	Land Cover Classes	Year 2016	
		Hectare	Percentage (%)
1	Evergreen Forest	2,861,233	15.76%
2	Semi-evergreen Forest	1,071,947	5.90%
3	Deciduous Forest	3,336,349	18.37%
4	Flooded Forest	477,813	2.63%
5	Bamboo	125,398	0.69%
6	Regrowth Forest	196,842	1.08%
7	Pine Forest	8,195	0.05%
8	Tree Plantation	43,122	0.24%
9	Pine Plantation	3,870	0.02%
10	Mangrove	31,226	0.17%
11	Rear Mangrove	25,906	0.14%
12	Oil Palm Plantation	51,276	0.28%
13	Rubber Plantation	509,224	2.80%
Total Forest Land Cover		**8,742,401**	**48.14%**



2.5. Forestry Cover change in Cambodia



3. Challenge and Strategy toward Forestry Conservation

Challenge

- Forest degradation and soil erosion
- Population increasing
- Expansion agriculture land
- Limited capacity and Knowledge among key stakeholders including government agencies on watershed management
- Overlapping roles and responsibility among the line agencies
- Limited national budget

3. Challenge and Strategy toward Forestry Conservation (cont.)

Strategy toward Forestry Conservation

- Capacity building on watershed management
- Awareness raising on the importance of watershed management approach in forest conservation and management
- Piloting watershed management on the ground to draw lessons and experiences
- Integrating watershed management into policy and national development plan

4. Expectation/ Comment on the Result of the Study Project

- Information in the study project are importance for relevant stakeholders include government agencies, especially policy makers to consider for further with watershed management approach
- **Expected JICA and Japan government**
  - Building capacity at national and sub-national levels in watershed management;
  - Building up knowledge sharing network on watershed management within the country;
  - Enhance participation of relevant stakeholders (public, private, community, civil society…) in watershed management development process;
  - Support in-country project development and implementation;
  - Support the development of financial mechanism for long-term planning and implementation.


THANK YOU
អរគុណ!

Report from Thailand

Panut Manoonvoravong
Thai National Mekong Committee Secretariat,
Office of the National Water Resources, Thailand

9 August 2019

Strategies of Water Resources Management

5-year plan (2018 – 2022)

1. 4 pillars of Water security
   - Water Act 2018 for equitable water allocation
   - 20-year water management master plan including mountainous reforestation and agriculture, water way conservation, water quality, and synergized water management btw organizations
   - National Water Committee and River Basin Committee under the hub of Office of the National Water Resources including both national and international water agencies
   - Water Resources Management Innovation in consistent with climate change and environmental awareness

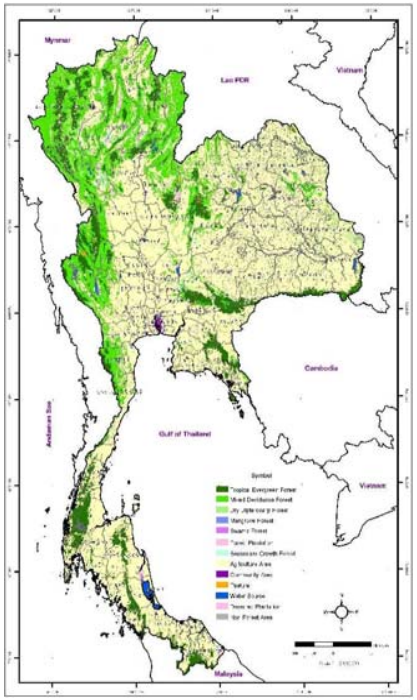
Strategies of Water Resources Management

2. Expansion of Potable water from tabs in 55 economic cities, 82,000 mil m^3 of raw water in reserve, 3,200 mil m^3 water additional supporting rain-fed agriculture, Promoting less water consumption agriculture i.e., dripping irrigation and water saving technology, and developing local water resources strategies

3. Rehabilitation and preservation nation wide water ways and reservoirs, and watershed forest (restoring headwater forest) with living check dams and weirs to retard run off and recharge g.w. storage

Strategies of Water Resources Management

4. Flood and drought management planning for not only normal but also extreme event conditions by integrating cooperation among relevant line agencies, e.g., ad hoc crisis centre establishment



Forest Resource situation in Thailand

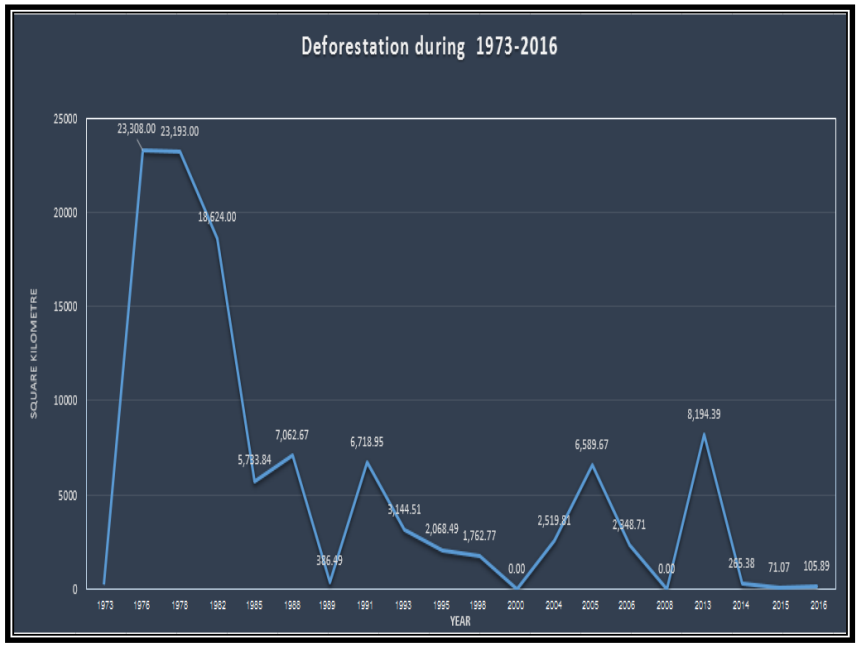
Area of the country:# 51.3 m ha
Forested area: 16.8 m ha
Forest area need to be rehabilitated 3.6 m ha

National Forest Policy#(1985) targeting#~~73#~~% (20.5 m ha)
Conservation Forest 25 %
Economical Forest 15 %

Since the logging was banned in 1989
Existing forest area in 2010 was 33.09 %
(7.36 m ha to achieve national target)

Reserved Forest (7.5 m ha)
Conservation or protected forest (7.6 m ha)

103 national parks
84 forest parks
55 wildlife sanctuaries
56 non-hunting areas
16 botanical gardens
55 arboreta



Causes of Deforestation

- Land prices
- Land productivity
- Crop prices
- Off-farm employment and income
- Forest accessibility
- Wood demand and prices
- Population growth

Challenge and Strategy toward Forestry Conservation

- The cooperation between communities and government on forest management #
- Community-based river basin development and conservation
- Sanctuary and agricultural area management
- Constructing check dams for soil and water conservation in forest and agricultural areas
- Founding community organisations for forest conservation and reforestation
- Training and capacity building for people and youth on value and benefit of forest including promoting forest conservation

Propositions for Further Collaboration with JICA

- Land stability analysis and imagery technology development for economic plantation (e.g., teak, rosewood, etc.)
- DNA identification of rosewood to prevent further illegal logging and DNA database management for economic plantation
- Support REDD+ Project in Thailand
- Research studies on the proper ways to rehabilitate existing degradation forests

Thank you

Open Seminar
Basin Management and Forest Conservation in Mekong River Basin
- Challenge toward Climate Change Strategy through Partnership -

Report from Viet Nam

Truong Hong TIEN
Deputy Director General of Viet Nam
National Mekong Committee
9 August 2019

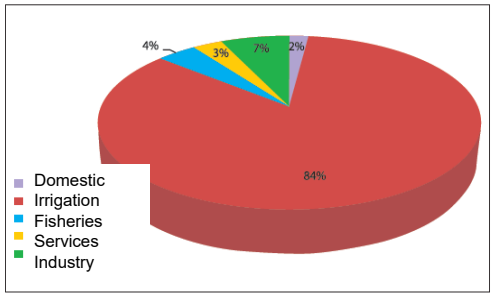
Agenda

1. Introduction
2. Water Resources Management in Viet Nam
3. Challenge and Strategy toward Forestry Conservation
4. Expectation/ Comment on the Result of the Study Project

1. Introduction

- Natural Area : 331,690 km²
- Population (2019) : 97,943,000 – the 15th in the world
- Climate: tropical monsoon
- Annual average rainfall: 2,050mm (90% in rainy season)
- Total average annual surface water: 830 bill.m³ (60% generated outside the country)
- Dense river network with 2,360 rivers more than 10 km length, of which two big rivers (Red and Mekong rivers)
- About 3,600 reservoirs and dams with various sizes. Total active storage: 37 bill.m3 (about 4.5%)
- Total potential exploitable reserves nearly 60 bill. m³ per year.

WATER RESOURCES USAGE



Distribution of Water Usage by Sector
Source: State of Environment 2010

In Vietnam, 70% of water for daily life comes from surface water and 30% from ground water.

2. Water Resources Management in Viet Nam

Basic Regulation:

- *- Law on Water Resources updated in 2012 replacing the Law on water Resources 1998*
- *Law on Environment protection (updated in 2014)*

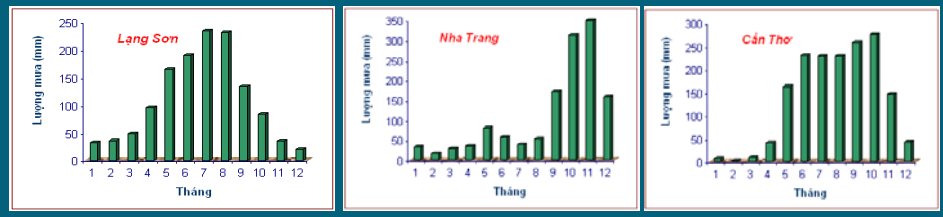
Other key Regulations

- *Decree No 142 on sanction of administrative violation in water and mineral fields*
- *Decree No.102/2008/ND-CP on collection, management, exploitation and use of natural resources and environment data and information*
- *Decision No. 182/QĐ-TTg approving National Action Plan on Improving management, protection and integrated utilization of WR for the period 2014-2020*
- *Decision No. 81/2006/QD-TTg National Water Resources Strategy towards the year 2020*
- *Circular No. 27/2014/TT-BTNMT on Groundwater Exploitation Registration, Exploitation, Extraction and Use of Water Resources and Discharge of Wastewater into Water Sources*
- *11 inter-reservoirs operation rules in main river basins*
-

The LWR provides provisions on basic survey, strategy and planning of water resources; Protection of water resources; Exploitation and use of water resources; the prevention, combat against the harms caused by water; Finance for water resources; International relations on water resources; Responsibility of water resources management; the Specialized inspection and settling disputes on water resources; and implementation.

Challenges for Water Resources

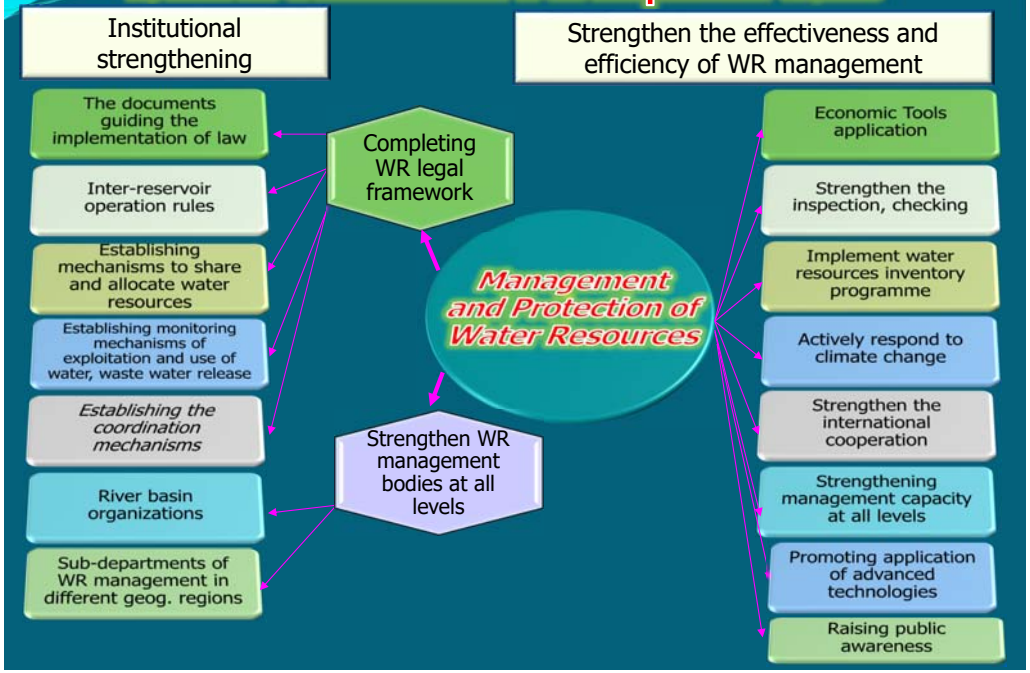
1. *Uneven distribution (temporal - most of annual rainfall occurs during 4-5 months in rainy season, account for 75-85% of the annual rainfall volume and spatial - 600 mm to more than 5000 mm);*
2. *Impacts of climate change;*
3. *Impacts of water exploitations in the upstream (outside Vietnam territory; 2/3 total flow come from other countries);*
4. *Impacts of social-economic development, population growth and poverty.*



Issues of WR management framework

1. *Lack of an integrated and multi-purpose approach in water exploitation and use*
2. *Incomplete legal system for water resources management and inadequate organisation and management capacity in water resources*
3. *Lack of mechanisms and policies, especially economic and financial policies in water resources*
4. *Lacking information and data on water resources and constraints on information sharing*

Management and Protection of Water Resources towards Sustainable Development Goals

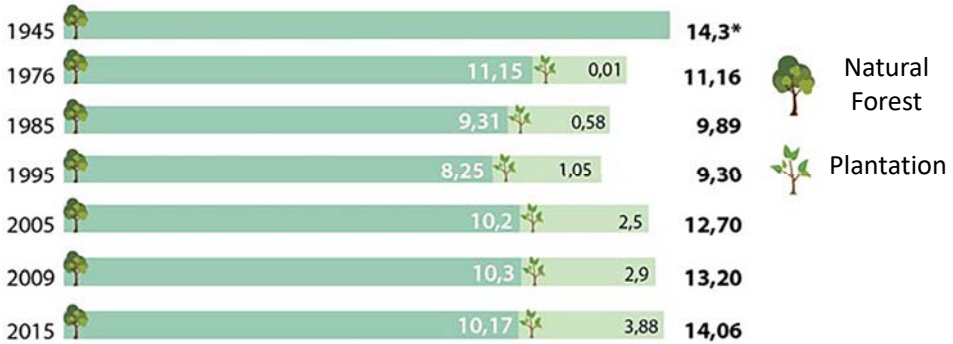


3. Challenge and Strategy toward Forestry Conservation

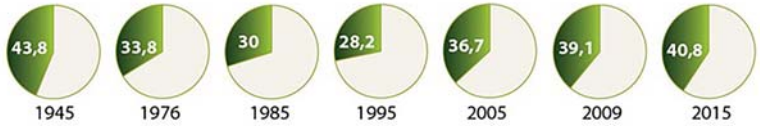
Overview

Overview

Total Forest Area Mil. Ha



Forest Cover (%)



Challenges toward Forestry Conservation

- Population increase, free migration continues
- Using agricultural and forestry land less effective, creating constant pressure on forests to expand agricultural land;
- Increasing demand for forest products is putting pressure on forest resources and the environment, especially for natural forests. Currently, the demand for forest products is exceeding the sustainable supply capacity of the forest.
- Suitable land area for for high productivity forests is very limited and fragmented;

Challenges toward Forestry Conservation…

- Conflicting between fast, comprehensive and sustainable development requirements with limited resources of the forestry sector (human resources, infrastructure, capital, management level, etc.);
- The importance of the forestry sector has not been fully, objectively and equitably evaluated, thus affecting the planning of investment and industry development policies.

Strategy toward Forestry Conservation

- Establish, manage, protect, develop and sustainably use 16.24 million hectares of land planned for forestry;
- Increase the percentage of forested land to 42-43% by 2010 and 47% by 2020;
- Ensuring greater participation of all economic sectors and social organizations in forestry activities to contribute to increasing socio-economic development and ecological environment protection, biodiversity conservation, providing environmental services, poverty reduction, improving living standards for rural mountainous people and contributing to maintaining national security and defense.

4. Expectation/ Comment on the Result of the Study Project

- Products of the project like maps, reports, tools, database should be embedded into MRC Database
- Pay more attention on sedimentation
- Capacity building: for staffs of MRCS and member countries.

Thank you!

Open Seminar
Basin Management and Forest Conservation in Mekong River Basin
- Challenge toward Climate Change Strategy through Partnership -

Report from Myanmar

Mr. Soe Myint Oo
Watershed Management Division
Forest Department
9 August 2019

Agenda

1. Introduction
2. Water Resources Management in Myanmar
3. Challenge and Strategy toward Forestry Conservation
4. Expectation/ Comment on the Result of the Study Project

1. Introduction

Country Profile

➢ **Location**
- **Latitudes = 9° 58′ to 28° 29′ North**
- **Longitudes = 92° 10′ to 101° 10′ East**

➢ **Area**
- **Total land area = 676,577 km²**
- **Length (north to south) = 2,090 km**
  Maximum width (west to east) = 805 km

➢ **Climate**

- **Temperature**

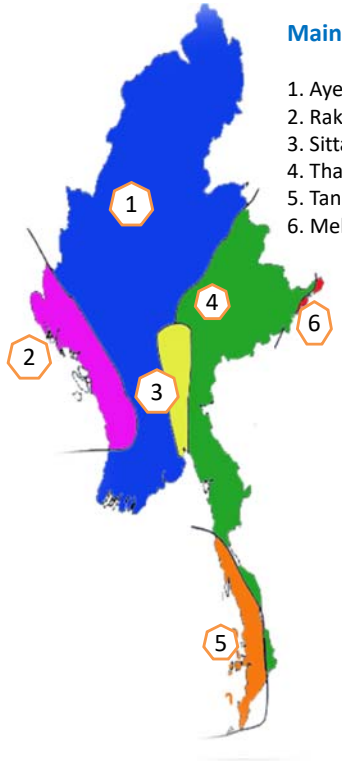
25° C to 33° C (Rainy Season)
10° C to 25° C (Cold Season)
32° C to 38° C (Hot Season)
43° C (Maximum Temperature)

Rainfall

Minimum rainfall = 500 mm
Maximum rainfall = 5, 000 mm

Population
- **51.6 million (2014 Census)**
- **Over 100 Ethnic groups**

- Water resource is essential for the development Life Support System.
- Myanmar is a country that rich in water resources.
- Yearly, the amount of water flowing through main rivers is 876 million cubic feet.
- There are so many good opportunities for the country's water resources development so that the current water usage amount is 45 million cubic feet which is 5 % of the total water draining.
- Ministry of natural resources and environmental conservation systematically manage watershed forests that plays important role in the development of water resources.



Main Watershed areas in Myanmar

1. Ayeyarwaddy, Chindwin River Basin
2. Rakhine Coastal Region
3. Sittaung River Basin
4. Thanlwin River Basin
5. Taninthayi Coastal Region
6. Mekong River Basin

Sr.	River basin name	Catchment area (km^2)	Run off (km^3)
1.	Chindwin	115300	141,29
2.	Ayeyarwady (Upper)	193300	227,92
3.	Ayeyarwady (Lower)	95600	85,80
4.	Sittaung	34400	41,95
5.	Rivers in Rakhine State	58300	139,25
6.	Rivers in Tanintharyi division	40600	130,93
7.	Thanlwin (in Myanmar)	158000	257,92
8.	Mekong (in Myanmar)	28600	17,63
9.	Bilin river and other rivulets	8400	31,17
10	Bago river	5300	8,02
	Total	737800	1081,88

2. Water Resources Management in Myanmar

Causes and Effects of destruction of Watershed Areas in Myanmar

Two Causes of destruction of Watershed Areas in Myanmar

1. Natural
2. Anthropogenic

1. Natural

Consequences of global climate change;

- Droughts
- Floods
- Extreme in temperature
- Forest fires
- Storms
- Earthquakes
- Untimed storms,
- Changes of ecosystems and natural environments

Causes and Effects of destruction of Watershed Areas(cont)

2. Anthropogenic

- ❑ deforestation
- ❑ shifting cultivation
- ❑more demand for timber and fuelwood due to population growth
- ❑ Incorrect land use practices
- ❑ development activities
- ❑ mining
- ❑agricultural expansion
- ❑grazing land expansion
- ❑predicted large and rapid increases in ecotourism
- ❑lack of tools for sustainable management
- ❑ others

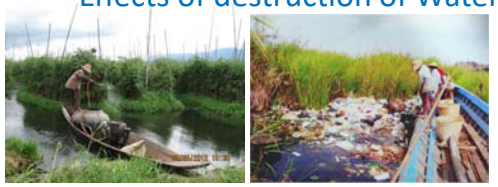
Causes and Effects of destruction of Watershed Areas(cont)

Effects of destruction of Watershed Areas in Myanmar

- ➢ Reduced Surface area of open water
- ➢ Declining water quality
- ➢ Sedimentation of lakeside zones
- ➢ Soil erosion in hillside areas
- ➢ Declining agricultural productivity in lakeside zones
- ➢ Threats to human health
- ➢ Changing water flows
- ➢ Losing natural water supplies and underground water shortage
- ➢ Decreasing Hydropower supply
- ➢ Climate Change

Causes and Effects of destruction of Watershed Areas(cont)

Effects of destruction of Watershed Areas in Myanmar



Water Pollutants

Sediments in Lakeside Zones

Erosion in Hillside Areas of the Watershed

Threats to human health

Increase in Ecotourism

Drought

Conservation and Protection Activities

1. By the Government
2. By the International Cooperation

1. By the Government

a) Conserving the natural forests

b) Establishing plantations

c) Conserving the soil and water

d) Raising awareness

e) Combating illegal logging

f) Conserving biodiversity

a) Conserving the natural forests

Noticing with signboard

Tent for monitoring

Assisted natural regeneration

Distributing cook stoves

b) Establishing plantations

Economic plantation

Watershed plantation

Gap planting

Agro-forestry practices

c) Conserving the soil and water

Contour bunding

Constructing small check dams

Wattling method

Diverting Ditch

d) Raising awareness

Public talk

Extension

Community forestry training

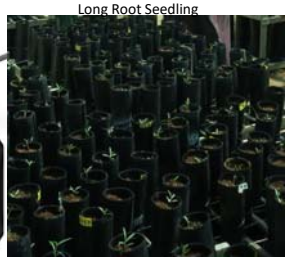
Field works training

2. By the International Cooperation

ID	Name of the Project	Organization	Period
1	Project for Capacity Building for Sustainable Natural Resource Management	JICA (Japan International Cooperation Agency)	2018 - 2023
2	Integrated Water Resources Management Institutional Building and Training	NIVA (Norwegian Institute for Water Research)	2015 - 2018 (Phase I) 2019 - 2023 (Phase II)

1. JICA

Component 1 – Forest Management
- SFM Tools
- Quality Seedling Production
- External fund



Component 2 – Inle Watershed Management
- Baseline survey
- Detailed design
- Implementation
  - Soil conservation
  - Community Forest
  - Dissemination

Component 3 – Biodiversity
- BRC construction
- Initial Operation

Biodiversity Research Centre

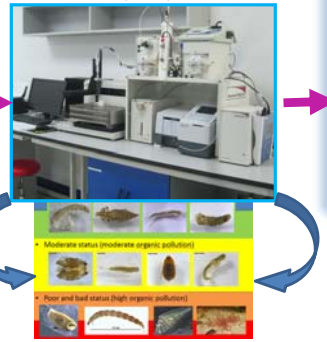
2. NIVA

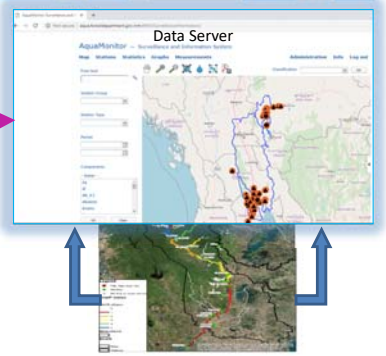
Output 1. Training in IWRM and IWRM tools
Output 2. Establishment of Water Quality Criteria
Output 3. A national Water Quality Laboratory
Output 4. Adaptation of the EU WFD to the Myanmar Administrative Context
Output 5. Performing the water management work tasks in a river system
Output 6. Monitoring activities in *Inlay Lake*
Output 7. Water quality database

https://www.niva.no/en/projectweb/myanmar

Water Sampling

Laboratory Analysis





Priority Issues to be addressed for Water Resources Management in Myanmar

1) Baseline data on the natural and social environment
2) Institutional framework
3) Reduced threat to human health
4) Improved environmental awareness
5) Reforestation in the watershed
6) Biodiversity conservation and fisheries resource management
7) Sustainable agricultural practices
8) Sedimentation and soil erosion mitigation
9) Promotion of sustainable tourism practices

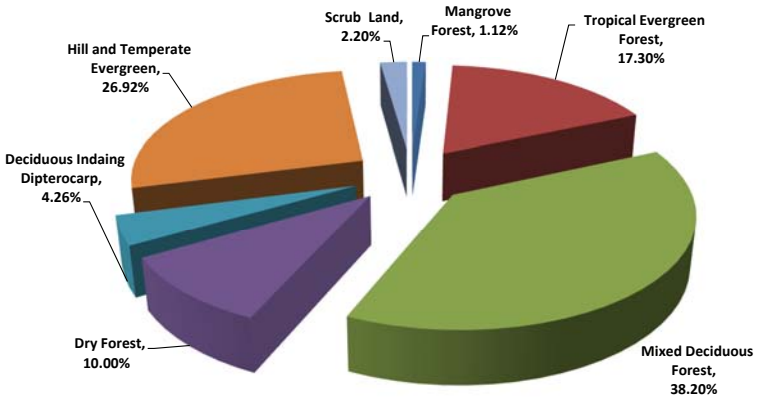
3. Challenge and Strategy toward Forestry Conservation

Current Status of Forest and Forestry

Background Information

- Myanmar is still relatively rich in forest resources and 42.92% of the country area is covered with forests.
- However, the country standing at a place of third most deforestation rate in the world between 2010 and 2015. (FRA 2015)
- Annual deforestation rate : 546 thousand ha (1.7% of 2010 forest area)

Status of Major Forest Types (FRA 2015)



Source: *FRA 2015*



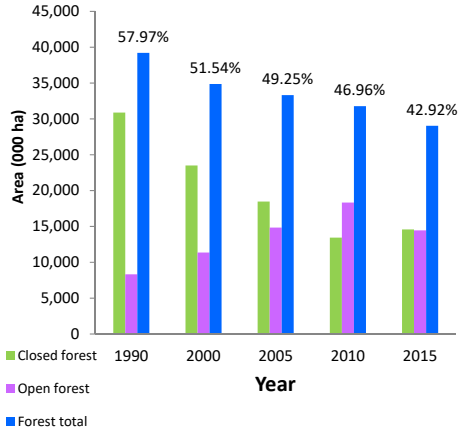

Current Status of Forest in Myanmar

Permanent Forest Estate (PFE)

- Target of Forest Policy 1995
  - Area of Reserve Forest (RF) and Protected Public Forest (PPF) - 30 %
  - Area of Protected Area System(PAS) - 10 %
- Existing PFE
  - Area of Reserve Forest and Protected Public Forest - 168044 km^2 24.83 %
  - Area of PAS(39) - 38,880 km^2 5.75 %

Status of forest cover in Yearly

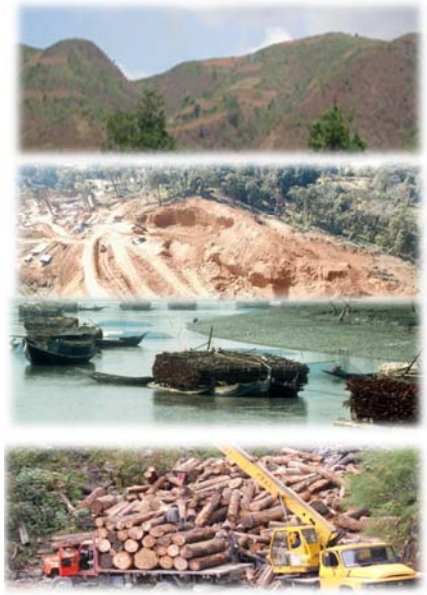
Year	Area (Sq-mile)	%
1990	151,421	57.97
2000	134,626	51.54
2005	128,653	49.25
2010	122,676	46.96
2015	112,127	42.92



4. Periodically Deforestation rate

Period	Annual deforested Area (Sq-ml)	Annual deforested Area (%)
1990-2000	1679.535	1.2
2000-2010	1195.327	0.9
2010-2015	2109.651	1.8

Direct Causes of deforestation



1. Over Exploitation
2. Illegal logging
3. Fuel wood extraction
4. Agricultural land expansion
5. Shifting Cultivation
6. Mining
7. Hydropower/irrigation Dam Construction
8. Urban Development
9. Fish and Shrimp farming/ponds in Mangrove area
10. Natural Disaster such as Cyclone, forest fire, etc

Indirect Causes of deforestation

1. Poverty and limited job opportunity
2. High market demands of forest products
3. Lack of Land use policy in the past
4. Weak monitoring and assessment in natural resource management
5. Limited budget
6. Weak Law Enforcement
7. Ever increasing population
8. Weak coordination among stakeholders
9. Corruption
10. Weak political support

Drivers of Deforestation /forest degradation

Illegal logging in border areas

Problems & Impacts of Deforestation

- **Change in species composition** in the forest, particularly, deforestation and forest degradation leads to significant decline in composition of commercial species like teak.
- **Loss of mangrove forests** increases vulnerability of people living in the costal areas to storm surges (Experience of cyclone Nargis); reduces fishery productivity, intrusion of saline water in paddy fields.
- **Depletion and degradation of watershed areas** leads to increased sedimentation rate in stream, river, reservoir, dam and lake. Consequently, it causes reduction of water holding capacity and impacts on river and lake ecosystem (Inle Lake experience)
- Deforestation causes **habitat loss and fragmentation**. As a result, human-elephant conflict are very frequent experiences in Myanmar.

Problems & Impacts of Deforestation

An increase in the prevalence of drought events:

- Drought years were frequent in the 1980s and the 1990s, and there was a **severe drought in 2010**

Impact on wetland ecosystem (Inle Lake)

- 29 streams flows into the Inle Lake and of which Namlet, Yay Pei, Kalaw, Bilu stream are the major streams. There are 139 springs.
- Source of Bilu chaung hydro power plant
- Rich in biodiversity with endemic fish species, Algae, migratory birds and orchids
- Designated as ASEAN heritage Park in 2013, and one of the tourist attraction sites in Myanmar
- Man and Biosphere (MAB) at UNESCO meeting held in France in June , 2015
- Lowest water holding capacity due to recorded temperatures in 2010 and low rainfall in 2009.
- Socio-economic impacts: drinking water shortage, difficulties in water transportation (by boat), and affects on tourism

Main causes of declining water holding capacity of the Lake

- Deforestation in watershed area
- Reduce in frequency of raining and rainfall in watershed
- High evaporation resulting from high temperature
- Decrease in inflow into the Lake

Problems & Impacts of Deforestation

Inle Lake in 2010

Problems & Impacts of Deforestation

An increase in intensity and frequency of cyclones/strong winds:

- Recent cyclones of note include Cyclone Mala (2006), Nargis (2008) and Giri (2010).
- **Cyclone Nargis** hit the Ayeyarwady Delta in May 2008.
  - ✓ 138,373 people dead
  - ✓ about 4000 schools damaged
  - ✓ 75 % of health facilities destroyed
  - ✓ 269530 acres of farmland damaged (acre)
  - ✓ Affected population 2.4 million
  - ✓ Total damage and Loss 4057 US$ (mil)
- **Cyclone Giri** hit Rakhine State in October 2010, destroying 21,242 houses and affecting at least 224,212 people.

Policy & Legislation and Strategies & planning in forestry sector

Forest Policy and Legislation

Forestry

- Myanmar Forest Policy 1995
- Forest Law 1992
- Forest Rules 1995
- Protection of Wildlife & Wild Plants & Conservation of Natural Areas Law 1994
- Protection of Wildlife & Wild Plants & Conservation of Natural Areas Rules 2002
- Community Forestry Instructions 2016 (revised 1995)
- Forest Law 2019 (revised 1992)

Environment

- Environmental Conservation Law 2012
- Environmental Conservation Rules 2014
- EIA Procedures 2015

Land

- National Land Use Policy (2016)

Myanmar Forest Policy

PROTECTION: of soil, water, wildlife, biodiversity and environment;

SUSTAINABILITY: of forest resources to ensure perpetual supply of both tangible and intangible benefits

BASIC NEEDS: of the people for fuel, shelter, food and recreation;

EFFICIENCY: to harness, in the socio-environmentally friendly manner, the full economic potential of the forest resources;

PARTICIPATION: of the people in the conservation and utilization of the forests;

PUBLIC AWARENESS: about the vital role of the forests in the well being and socio-economic development of the nation.

Strategies & planning in forestry sector

- 30-year National Forest Master Plan (2001-2002 to 2030-2031)
- Forestry Sector Comprehensive Development Plan (2011-2012 to 2030-2031)
- Forest Management Plan (2016-17 to 2025-26) for 68 districts
- National Biodiversity Strategy and Action Plan (adopted in 2012, revised in 2016)
- Myanmar Reforestation and Rehabilitation Programme (2017-2018 to 2026-2027)

INDC

- **Myanmar has submitted INDC to UNFCCC in September, 2015.**
- **By 2030, PFE target is to increase as follows:**
  - ✓ **Reserved Forest (RF) and Protected Public Forest (PPF) = 30% of total national land area**
  - ✓ **Protected Area Systems (PAS) = 10% of total national land area**
- **To increase the number of energy efficient cook-stoves disseminated in order to reduce the amount of fuel wood used for cooking (Approx. 260,000 stoves between 2016 & 2031).**

Actions:

- **Following the implementation plan as set out in the 30-year National Forestry Master Plan (2001-2030)**
- **Implementation of Myanmar REDD+ Readiness Road Map**
- **Participation in EU-FLEGT programme**
- **To implement Comprehensive Plan for Dry Zone Greening (2001-31)**

Activities for addressing deforestation

Extension of PFE

Target in Forest Policy/ INDC	Designated PFE
❖RF+PPF – 30% of total country's area	❖RF+PPF – **24.83%** of total country's area
❖PAS – 10% of total country's area	❖PAS – **5.75%** of total country's area

Management of natural forest

- Myanmar forests are being managed under MSS, exploitation-cum-cultural system
- MSS involved adoption of felling cycle (30 yrs), fixing exploitable girth limit, girdling/green teak marking, selection felling of other hardwood, thinning & improvement felling, enumeration of future yield trees, leaving high quality tree as seed trees, calculating AAC.
- Current AAC is 19,210 trees (32,642 m3) for teak and 592,330 tress (1,174,235 m3) for other hardwood

- **Recognizing significant deforestation rate in the country, following policy measures has been laid down by the Ministry very recently.**
  - **Log Export Ban (since April, 2014)**
  - **Paused timber harvesting in 2016-17& harvest below AAC in following years**
  - **Implementation of National Reforestation Programme**

Reforestation of degraded forest

❖ Government sector (FD)

- FD established a total of 885,619 ha of forest plantation between 1981-2017

Plantation Established by Forest Department (1981-2016)

Plantation type	Area (ha)
Commercial	1,217,395
Watershed	338,909
Industrial	179,121
Village supply	449,586
Total	**2,185,011**

Reforestation of degraded forest

❖ Private sector

Private Forest Plantation(as of March, 2017)

Type of Plantation	Area (ha)
Teak plantation	56,103
Non-teak other hardwood plantation	36,430
Total	92, 533

Community Forestry-CF

Salient points of CFIs (1995)

- **Any land** at the disposal of the state can be alienated as community forests
- **Land tenure** is initially granted for 30 years
- The tenure right is **inheritable**
- Forest products harvested from CF for local use are **tax-free**
- **Seeds and seedlings** needed for the first rotation and **technical assistant** are provided by FD free of charge
- **No restriction** is imposed on the selling and pricing of the surplus forest products

Community Forestry-CF

Consultations for revision of CFIs

- Currently, consultation process for revision of CFIs is on going
- 8 Stakeholder consultation meetings on revised CFIs (Draft) were organized in State/Region Plan to organize validation WS on Revised CFIs in June & July 2016.
- Revised CFIs aims to broaden scope of the CF:
  - ✓ CFIs (1995)>>>limits to small scale or farm level
  - ✓ revised CFIs>>> community-based forest enterprise

Consultation meeting in Ayeyawady Region

Consultation meeting in Yangon Region

Characteristics of Community Forestry in Myanmar

- **Any land** at the disposal of the state can be alienated as community forests;
- **Land tenure** is initially granted for 30 years
- The tenure right is **inheritable**;
- **Forest products** harvested from CF for domestic use are tax-free;
- **Seeds and seedlings** needed for the first rotation and **technical assistant** are provided by FD with free of charge;
- **No restriction** is imposed on the selling and pricing of the surplus forest products

Development of Community Forestry

1995

Forest Policy

People's participation, Public Awareness

Community Forestry Instructions (CFIs)

- Regaining Environmental Stability,
- Addressing basic needs of local communities,
- Supporting the economic development

2001

Forestry Master Plan

Target for about 2.27 million acres of CF by 2030

Present (Revised 1995 CFIs)

About 279,711 Acres of CF have been established.

Challenges in implementation of CF

- More labour and time for site preparation due to thickness of bushes, weeds, climbers etc.
- Illegal cutting in community forests
- Encroachment into community forests for the purposes of agriculture and shrimp farming
- Pest (Stem borer) attack on ***S. apetala*** which is fast growing species

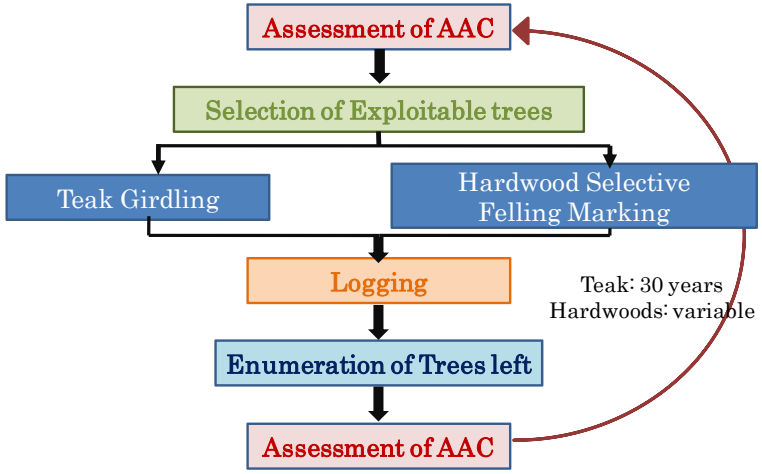
Solutions to overcome the challenges

- Taking technical advice and financial assistance from the project to conduct the site preparation (For instance, Clearing line by line in stead of clear cutting the whole area)
- Setting up of warning sign boards to prevent illegal cutting and encroachment into community forests.
- Announcement of establishment of community forests and making a request to local firewood cutters to avoid encroachment and illegal cutting in community forests
- Education on illegal cutters and making pledge not to commit the illegal cutting again
- Finally, taking action on illegal cutters who do not follow their pledge, with the assistance of FD, Police Department and Local authority.
- Removal of trees attacked by pests and re-establishment of mixed plantations

REDD+

- **Myanmar joined UN-REDD Programme in December 2011**
- **Developed Myanmar's REDD+ Readiness Roadmap through a multi-stakeholder participation process in 2013**
- **Implementation of REDD+ Readiness Roadmap with the support of UN-REDD Programme, ITTO, KFS, RECOFTC, ICIMOD, FFPRI, AAS Co., Ltd etc.)**

Myanmar Selection System - MSS



- **Criteria and Indicators (C&I) for SFM**
  - There are 63 districts (Forest Management Unit-FMU) across the country.
  - 7 Criteria and 73 Indicators were identified for Forest Management Unit (FMU) level.
  - 7 Criteria and 78 Indicators were identified for National level.

Preparation of FLEGT – VPA Process

- According to EU FLEGT Action Plan, Myanmar is now moving forward to involve Voluntary Partnership Agreements –VPA's Partner Country to export Myanmar's timber to EU market since Forest Law, Enforcement, Governance and Trade Workshop held in July 2013, Myanmar.

- On behalf of Myanmar, Ministry of Natural Resources and Environmental Conservation (MONREC) informed to EU to initiate the VPA process starting from "Request for a dialogue on a FLEGT VPA approach" which is a preparation phase in country consensus building.

- In accordance with the bilateral trade agreements between the EU and Myanmar, MONREC is now implementing the information dissemination about VPA to multi-stakeholders for consensus building.

Combating Illegal Logging

- seriously paying attention to combat illegal wildlife trade as well as illegal timber trade that leads to the deforestation, forest degradation and loss of royalties.
- collaborative action between Forest Department, Myanmar Police Force and local administration.
- taking actions against the laws, particularly with Forest Law (1992)
- Collaboration with neighboring countries to combat illegal logging so as to promote legal timber trade.

❖ National Land Use Policy

- **National land use policy has been adopted by Union Cabinet in January 2016.**
- **Objectives**
  - ❖To benefit to the people and country, harmonize land use systems, balance between development and conservation;
  - ❖To protect the land use right of the citizens and
  - ❖To improve land administration system;

Mangrove in Myanmar

Mangrove Conservation

Cooperation with FFI

- Establishment of village firewood plantation
- Conducting surveys on crocodile, fish and birds
- Support for crab cultivation and dissemination of efficient cookstoves
- Awareness and education
- Conducting feasibility study for ecotourism
- Organizing consultation workshop on sustainable tourism development in Bogalay, on 3-6-2014

Mangrove Conservation

Cooperation with JICA

- "**Mangrove Rehabilitation Plan for Enhancement of Disaster Prevention in the Ayeyarwady Delta**" is being implemented (2013-2017)
- Establishment of Mangrove plantation (2852 ac.)
- Construction of cyclone shelter
- Providing training on disaster preparedness

Partnership: key to success

- Deforestation, as a global challenge, can only be addressed by an alliance of partners, from to global level.
- Deforestation and forest degradation result in substantial reductions in forest carbon stocks and increase in emissions
- Deforestation and forest degradation in forestry sector contributes about 20% of total CO2 emission
- Deforestation/ forest degradation and CC issues needs to be addressed together.

Common challenges to address issues:

- Weak policy and strategy framework
- Limited and inconsistent data for planning & policy formulation
- Capacity and financial gaps
- Inadequate coordination at different levels
- Poor socio-economic conditions

Opportunities:

- INDC prepared and submitted to UNFCCC
- REDD+ has been recognized as a mechanism to address CC
- Existing multilateral and bilateral frameworks at international & regional level
- Availability of more financial sources (eg. GCF)

The Way Forward

- Extending Permanent Forest Estate (Reserved Forest+ Public Protected Forests) up to 30% of total country areas while Protected Areas up to 10 %.
- Strengthening SFM and forest governance
- Develop and implement National Reforestation Programme
- Decentralization in forest management through promoting CF, JFM etc.
- Capacity building and institutional strengthening
- Implementation of REDD+ Readiness Roadmap
- Enacting National Land Law
- Developing Timber Legality and Assurance System (Timber Certification)
- Promoting PES and green economy in forestry sector
- Encouraging ecotourism development
- Resource mobilization and developing sustainable financing
- Finalize NCCSAP & Develop CC policy
- **More collaboration with International/ Regional / Local Partners**

4. Expectation/ Comment on the Result of the Study Project

- ✓ Suggestions and comments for the water resources management in Myanmar, from various experts
- ✓ Learning the advanced methodologies in terms of water resources management used by the project
- ✓ Exploring about how the Japan is being managing its water resources
- ✓ Application of affordable good practices of water resources management in Myanmar
- ✓ Seeking for possible future bilateral or multi - lateral collaboration between Japan, Mekong countries and Myanmar in sustainable water resources management
- ✓ Curiosity upon how the final results of the project would contribute in tackling issues and challenges being currently occurred in Mekong river basin