



KINGDOM OF CAMBODIA
NATION RELIGION KING



CAMBODIA FOREST COVER

2016



March 2018

THE MINISTRY OF ENVIRONMENT

General Directorate of Administration for Nature Conservation and Protection

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PREFACE

Cambodia is rich of natural resources. Forest resources in particular, play important roles in ensuring environmental stability, mitigating climate change, contributing to national economic development and poverty alleviation. At the same time, some major challenges in forestry sector are seen as the concerns of the Royal Government of Cambodia (RGC) as such recent decreasing of forest cover due to higher demand of agricultural land along with gradual population growth, and the agro-economy development. In this context, RGC conducted an in-depth reform in natural resource and environment sector, in fact, exchange of protected forest, conservation areas, production forests, and economic land concessions between Ministry of Environment (MoE) and Ministry of Agriculture, Forestry and Fisheries (MAFF) to aim at strengthening management functions of the two ministries in field of conservation and development, improving effectiveness in environmental protection, biodiversity conservation, and sustainable livelihood.

As a result of the above-mentioned reform in its 5th mandate of the RGC, current number of Protected Area (PAs) is increased up to 50 places and a new established biodiversity corridor conservation, together buildup in total area approximately 7.5 million ha, equivalent to 41% of the country territory. Therefore, updating data and information on the country's forest cover is a need.

The primary purpose of this booklet is to provide specific information on the forest cover 2016 of Cambodia, which can be used as a reference in developing plans, formulation of environmental policy, National Protected Area Strategic Management Plan and conservation forest resource, and to provide key activity data for implementation of REDD+ in Cambodia. Information and data represented in this booklet is followed the most recent IPCC's guideline on transparent, completeness, consistency, and accuracy. This data and information is also an additional source to the 2006-2016 forest cover change dataset of PA system, which was published in last August 2017.

On behalf of MoE, I would like to express my high appreciation and congratulations to all management levels of MoE, and particularly to the management of the General Directorate of Administration for Nature Conservation and Protection (GDANCP), the Technical Working Group (TWG) and Development Partners (DPs) for their leadership, efforts, and technical and financial contributions making this publication feasible and available for public. Finally, I would like to declare official launching the booklet for use now.

Phnom Penh, 01 March 2018

SAY Samal
Minister of Environment

ACKNOWLEDGEMENT

We would like to express our profound thanks to H.E. Say Samal, Minister of Environment, and Excellency, Ladies and Gentlemen, the management of the MoE for their physical, moral and mental efforts to develop the Protected Area (PA) forest resources management, protection and conservation policy and strategic plan. In this sense, the “Cambodia Forest Cover 2016” will play important role in providing data and information to inform the development of sustainable management, protection and conservation plan.

We are the technical team, would like to express our particular thanks to General Directorate of Administration for Nature Conservation and Protection, Ministry of Environment (MoE), Forestry Administration, Ministry of Agriculture, Forestry and Fishery (MAFF) and Development Partners including FAO, Japan International Cooperation Agency (JICA), Forest Carbon Partnership Fund (FCPF) and Forest and Forest Products Research Institute (FFPRI) of Japan for their participation to support for the development of the publication.

We strongly hope that your support through this publication will benefit daily or eventual work of many and provides for a reference for future use. We also would like to express our pleasure and thankful for your meaningful and constructive feedback to mend our shortcomings and for improvement of our further publication in the future.

In conclusion, I wish His Excellency Minister, Excellency, ladies and gentlemen – all the management of the MoE and foreign friends a success and May the four gems of Buddhist blessings – longevity, health, security, and strength – be with you.

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ABBREVIATIONS

ACRONYM	FULL WORD
RGC	Royal Government of Cambodia
MoE	Ministry of Environment
MAFF	Ministry of Agriculture Forestry and Fishery
GDANCP	General Directorate of Administrative For Nature Conservation and Protection
FiA	Fishery Administration
FA	Forestry Administration
NFP	National Forest Programme
NFMS	National Forest Monitoring System
REDD	Reducing Emission from Deforestation and Forest Degradation
MRV	Monitoring Reporting and Verification
FRL	Forest Reference Level
SIS	Safeguard Information System
FAO	Food and Agriculture Organization of the United Nations
JICA	Japan International Cooperation Agency
FCPF	Forest Carbon Partnership Facility
FFPRI	Forestry and Forest Products Research Institute, Japan
ITTO	International Tropical Timber Organization
MRC	Mekong River Commission
FRM	Forest Resource Management
GHG	Green House Gas
UNFCCC	United Nations Framework Convention on Climate Change
LU/LC	Land Use/Land Cover

CHAPTER I

General Information

1.1 Introduction

Ministry of Environment (MoE) through technical collaboration with Food and Agriculture Organization of United Nations (FAO), Forest Carbon Partnership Facility (FCPF), Japan International Cooperation Agency (JICA) and Forestry and Forest Products Research Institute, Japan (FFPRI) conducted an assessment of Land use/cover using Geographic Information System (GIS) and Remote Sensing (RS) with satellite imagery for every two year assessment. As a result the assessment shows that for the last 2 years the rate of forest cover change would be further reduced depending on how effective of Royal Government of Cambodia (RGC) has made a reform by issuing necessary actions to strengthen sustainable natural resource management including:

1. A review of Economic Land Concessions (ELCs) with a decision to cancel the current development investment principle by some companies;
2. Establishment of a mechanism to prevent and suppression of natural resources offences;
3. Defining separate authority for conservation from development by having protection and conservation forests transferred to MoE and development projects in ELCs to Ministry of Agriculture, Forestry and Fisheries (MAFF);
4. A National Forum on Protection and Conservation of Natural Resources held on 22nd August 2016 and 2017 formed an important mechanism to strengthen partnership between government and relevant stakeholders in natural resource protection and conservation;
5. Circular #05 dated 22nd September 2016 on taking necessary actions on strengthening Natural Resource Management;
6. Strengthening capacity and expanding the number of park rangers to enhance effective patrol and law enforcement in Protected Area (Pas); and
7. Transfer of function and responsibility to sub-national levels to implement Natural Resource management, protection and conservation policy and strategy.

Moreover RGC had expanded the PAs coverage by designation of a number of new PAs making it to a total number of 51 areas covering 7.5 million ha. The assessment of Cambodia Forest Cover 2016 were produced by the National Technical Working group (GDANCP/MoE, FA/MAFF, FiA/MAFF) and technical assessment by an international expert FAO-UNREDD, JICA-CAMREDD and international academic institute.

1.2 Objectives

The main objectives of the assessment of the forest cover resources is to provide specific information on forest cover resources throughout Cambodia as a source of fundamental information to contribute to development planning and formulation of environmental policy, National Protected Area Strategic Management Plan and conservation forest resource, and to provide key activity data for implementation of Cambodia REDD+.

The assessment has three main objectives:

1. To be update and forest cover map 2016;
2. Assessment land use/cover change 2014-2016 and 2006-2016; and
3. To be use as baseline information for development of Cambodia's forest resource management strategy and action plan and also for Cambodia REDD+ program implementation.

1.3 Forest Reference Level

In accordance with decision 4/CP.15, 1/CP.16, 12/CP.17, 13/CP.19 Cambodia is submitting on a voluntary basis for consideration by the United Nations Framework Convention on Climate Change (UNFCCC) its initial Forest Reference Level (FRL). The report will provide an overview of the data and methodologies to be transparent, complete, consistent, and accurate, and is guided by the most recent Intergovernmental Panel on Climate Change (IPCC) guidance and guidelines (IPCC, 2003a, 2003b, 2006a, 2006b). The submission of a FRL is exclusively for the purpose of obtaining and receiving result base payment (RBP) from Cambodia's REDD+ program implementation.

Cambodia covers a total area of 181,035 km². Cambodia is categorized as a least developed, low-income country. Relative peace and stability over the past decade has brought steady economic growth, averaging between 7 and 10 percent since 1998, leading to substantial reductions in poverty, but also increased pressure on Cambodia's natural resources. Cambodia was able to maintain a relatively high forest cover, with one of the highest levels of forest cover in Southeast Asia. While the current forest cover is still relatively high, Cambodia lost a considerable amount of forest over the last two decades, and the pace of land use and forest conversion has seen acceleration.

Cambodia's initial Forest Reference Level is assessed at 78.953.951 tCO₂/year based on the historical average net emission level from 2006 to 2014 (*Source: Cambodia Initial Emission Reference, 2016*).

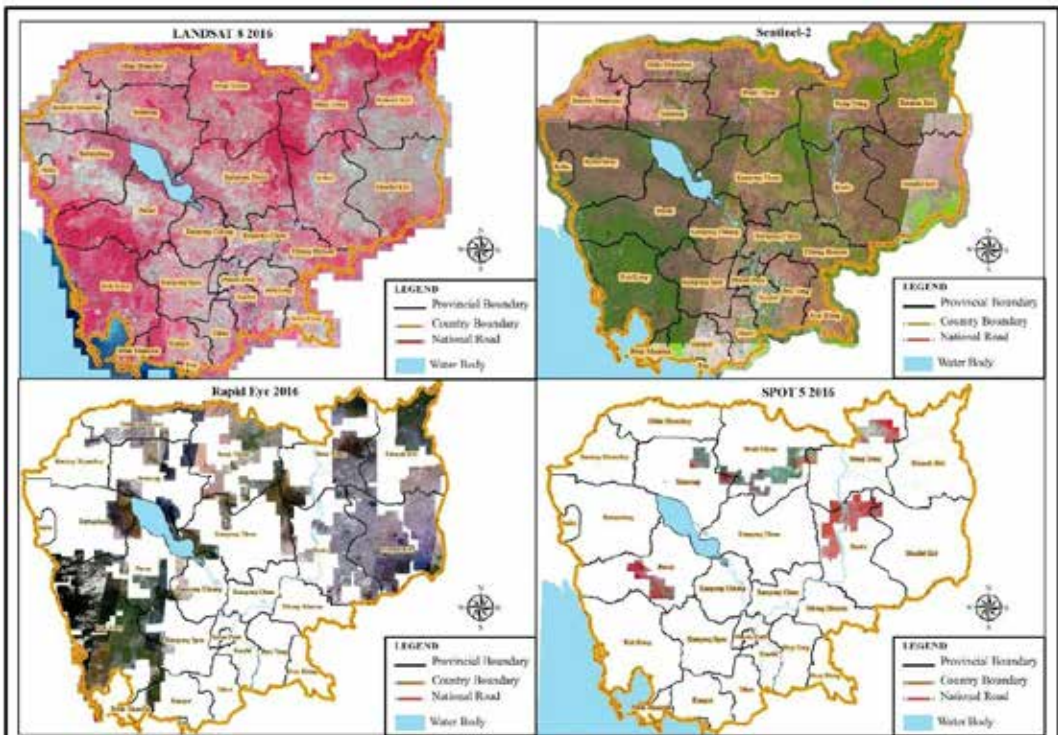
Chapter II

Land use/cover Assessment Methodology

2.1 Satellite Imagery

For the assessment of forest cover 2016 was different satellite imageries, there are including:

- a. Landsat 8 imageries from US government was used for assessing and classification of forest cover in 2016. The technical Geographic Information Systems REDD+ working group of GDANCP downloaded and selected 52 imageries, which cloud free images and capture between October 2015 and May 2016 from USGS website for assessment and classification forest cover 2016.
- b. Sentinel-2 (2016), SPOT5 (2016) and Rapid Eye (2015 and 2016) were used to support accuracy assessment of forest cover 2016 and forest cover change 2014-2016.



Note: The boundary in the map is not the official use.

Figure 1. Satellite imageries used for classification and accuracy assessment of forest cover 2016

2.2 Classification Method

The Segmentation was conducted using eCognition software to generate segment (or polygons) which group's image pixels with homogeneous characteristics of shape, color, compactness and smoothness and Principal component analysis (PCA) were used to extract the potential land cover change 2014-2016. In 2016 land used and land cover mapping, the extracted potential deforestation area were used to identify land use and land cover change of the forest area. Land use and Land cover 2016 were generated within 22 categories, in which forest classes fallen under 13 categories and non-forest were in 9 categories with minimum mapping 5 ha. Steps in assessing land use/cover for 2016 is presented as follows:

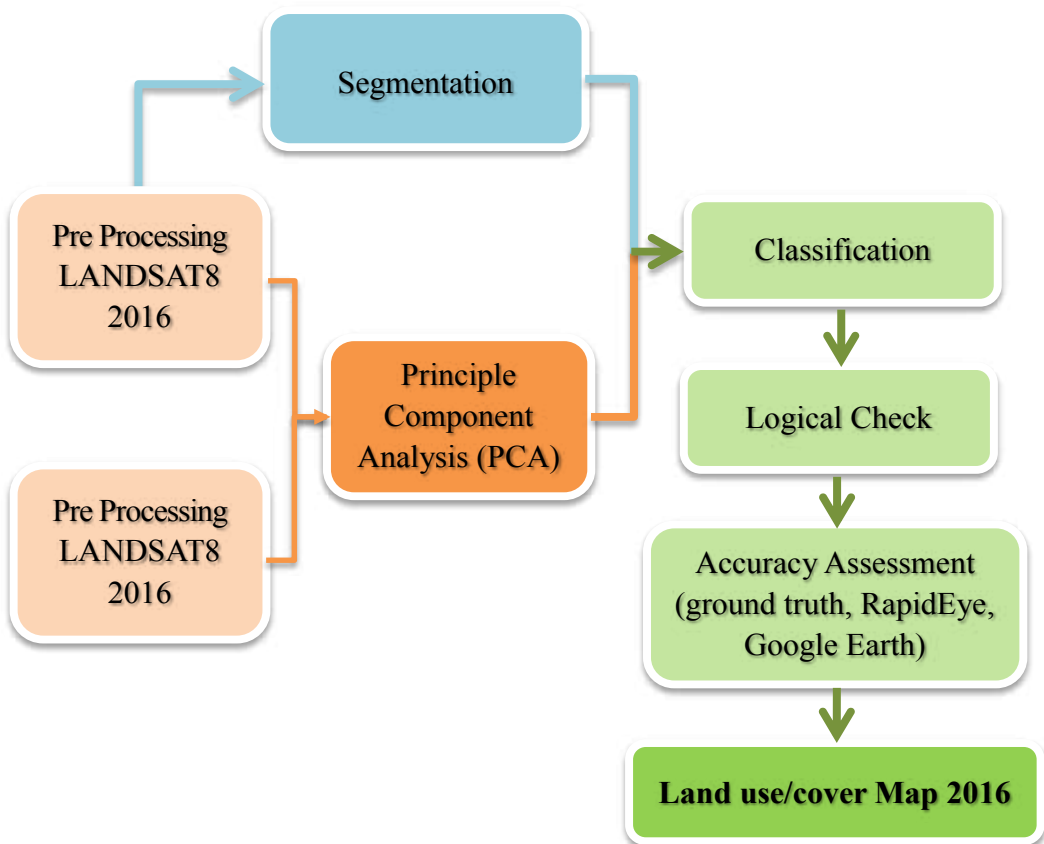


Figure 2: Diagram of implementation staged of Land use/cover map 2016

2.3 Accuracy Assessment

An Accuracy Assessment is a step to verify results from classification of land use/cover assessment to validate accuracy of each category. The accuracy assessment of land use/cover data was carried out into two separate steps through

ground truth and verification of data from RapidEye, SPOT5, and Sentinel-2 and images from Google Earth for verification of land use/cover classification with 1651 verified points covering 25 capital-provinces nationwide.

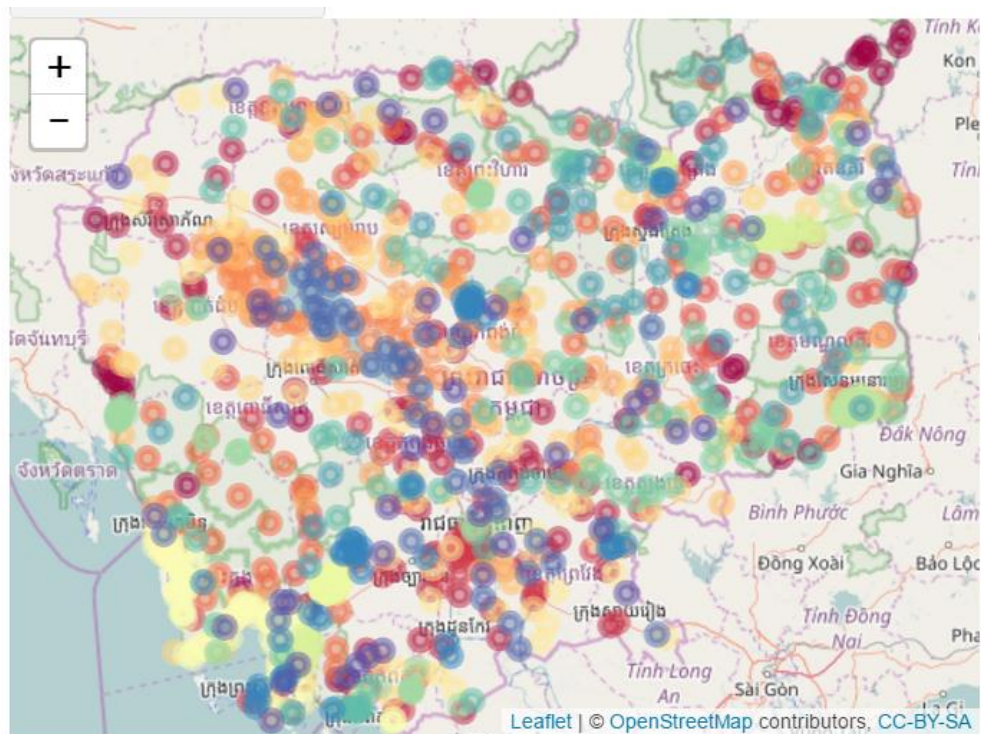


Figure 3. Location of verified data on reliability of land use/cover data for 2016

Accuracy Assessment was done in collaboration with national and international experts including from FAO-UNREDD, JICA-CAMREDD and international universities with the Overall Accuracy 87.48 % for the forest cover data 2016.

For Accuracy Assessment of land use/cover change data for 2014-2016 the Overall Accuracy 90%.

Chapter III

Results of Land use/cover Assessment

3.1 Current updated land use/cover 2016

a. Result of national land use/cover assessment

According the assessment 2016, the results shows that forest land cover an area of 8.742.401 ha, equivalent to 48.14 % of the country's total land area, **(the results from the assessment included rubber plantation, palm oil plantation and other perennial crops)** as provided in map and statistical data below.

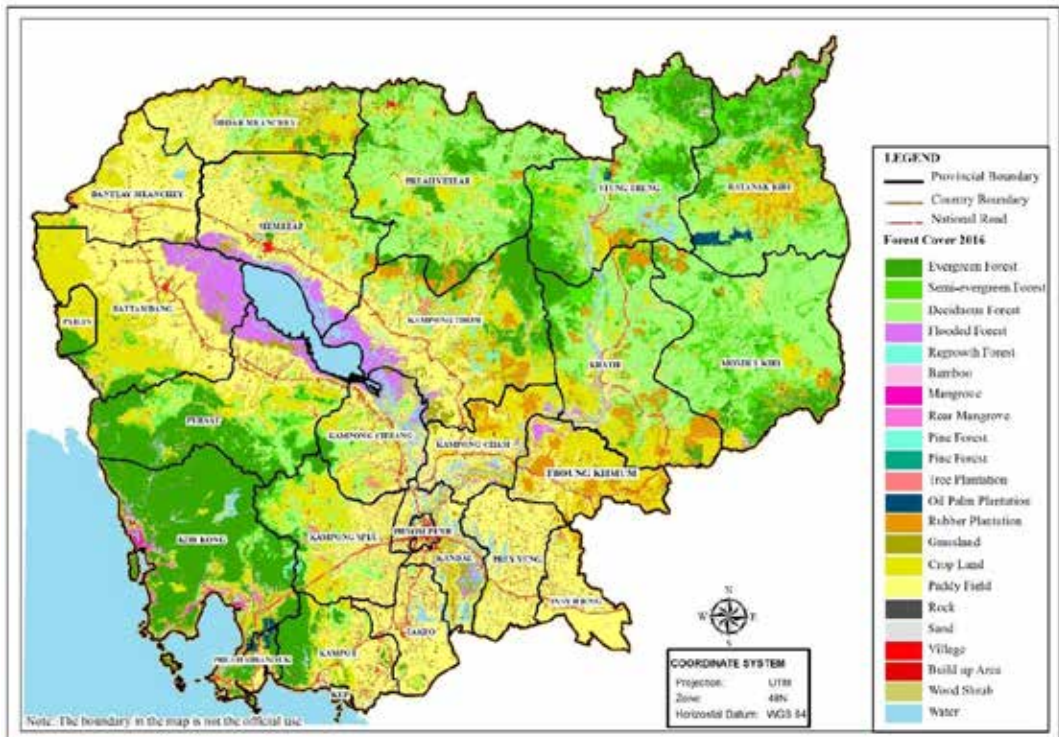


Figure 4. Map of national land use/cover 2016

Table 1. Statistics of National land use/cover 2016

No	Land Cover Classes	Forest Land Cover	
		Hectares (Ha)	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	Regrowth Forest	196,842	1.08
6	Bamboo	125,398	0.69
7	Mangrove	31,226	0.17
8	Rear Mangrove	25,906	0.14
9	Pine Forest	8,195	0.05
10	Pine Plantation	3,870	0.02
11	Tree Plantation	43,122	0.24
12	Oil Palm Plantation	51,276	0.28
13	Rubber Plantation	509,224	2.80
Total Forest Land Cover		8,742,401	48.14
14	Grassland	341,132	1.88
15	Crop Land	3,017,435	16.62
16	Paddy Field	4,221,407	23.24
17	Rock	1,100	0.01
18	Sand	41,245	0.23
19	Village	352,987	1.94
20	Build up Area	42,930	0.24
21	Water	783,860	4.32
22	Wood Shrub	616,177	3.39
Total Non-Forest		9,418,273	51.86
Grand Total		18,160,674	100.00

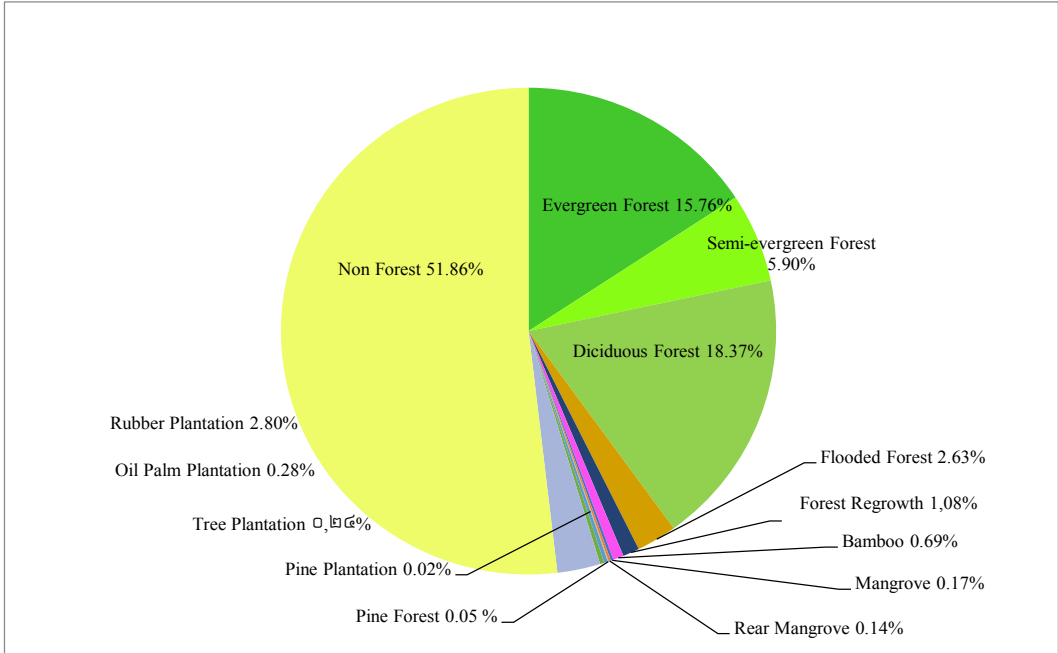


Figure 5. National Land use/cover rate in 2016

b. Result of land use/cover assessment for REDD+ Program

Forest cover 2016 extends over 8.181.901 ha, equivalent to 45.05 % of country's area as provided for in the chart and table below:

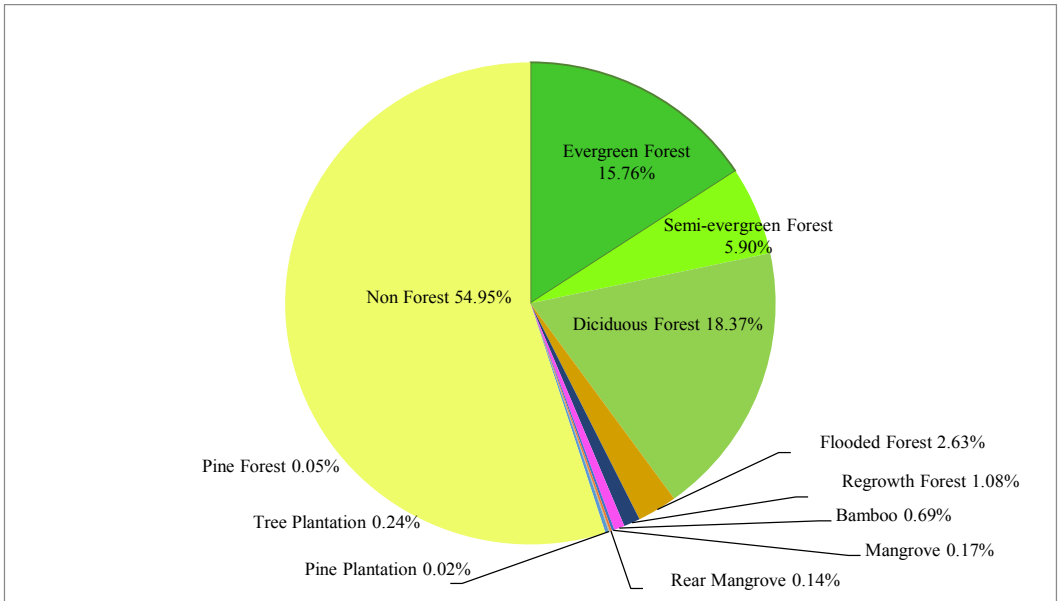


Figure 6. Land use/cover rate in 2016 for Cambodia REDD+

Table 2. Statistics of land use/cover 2016 for Cambodia REDD+

No	Land Cover Classes	Forest Land Cover	
		Hectares (Ha)	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	Regrowth Forest	196,842	1.08
6	Bamboo	125,398	0.69
7	Mangrove	31,226	0.17
8	Rear Mangrove	25,906	0.14
9	Pine Forest	8,195	0.05
10	Pine Plantation	3,870	0.02
11	Tree Plantation	43,122	0.24
Total Forest Land Cover		8,181,901	45.05
12	Oil Palm Plantation	51,276	0.28
13	Rubber Plantation	509,224	2.80
14	Grassland	341,132	1.88
15	Cropland	3,017,435	16.62
16	Paddy Field	4,221,407	23.24
17	Rock	1,100	0.01
18	Sand	41,245	0.23
19	Village	352,987	1.94
20	Build-up Area	42,930	0.24
21	Water	783,860	4.32
22	Wood Shrub	616,177	3.39
Total Non-Forest		9,978,773	54.95
Grand Total		18,160,674	100.00

3.2 Land use/cover change between 2014-2016

a. Result of national land use/cover change

The rate of forest cover change from 2014 to 2016 was changed from 49.48 % in 2014 to 48.14 % in 2016 respectively with the average annual change 0.67 % equivalent to 121.328 ha compared to the country's total land area.

Table 3. Statistical of national land use/cover change 2014-2016

No	Land Cover Classes	Forest Land Cover				Change	
		2014		2016		2014-2016	
		Ha	%	Ha	%	Ha	%
1	Evergreen Forest	2,973,903	16.38	2,861,233	15.76	-112,670	-0.62
2	Semi-evergreen	1,108,320	6.10	1,071,947	5.90	-36,373	-0.20
3	Deciduous Forest	3,480,532	19.17	3,336,349	18.37	-144,183	-0.80
4	Flooded Forest	481,078	2.65	477,813	2.63	-3,265	-0.02
5	Regrowth Forest	228,560	1.26	196,842	1.08	-31,718	-0.18
6	Bamboo	130,678	0.72	125,398	0.69	-5,280	0.03
7	Mangrove	33,002	0.18	31,226	0.17	1,776	0.01
8	Rear Mangrove	25,906	0.14	25,906	0.14	0	-0.00
9	Pine Forest	8,196	0.05	8,195	0.05	-1	0.00
10	Pine Plantation	3,709	0.02	3,870	0.02	160	0.00
11	Tree Plantation	44,289	0.24	43,122	0.24	-1,167	0.00
12	Oil Palm Plantation	33,297	0.18	51,276	0.28	17,979	0.08
13	Rubber Plantation	433,694	2.39	509,224	2.80	75,530	0.41
Total Forest Land Cover		8,985,164	49.48	8,742,401	48.14	-242,764	-1.34
Total Non-Forest		9,175,510	50.22	9,418,273	51.86	242,764	1.34
Grand Total		18,160,674	100.00	18,160,674	100.00		

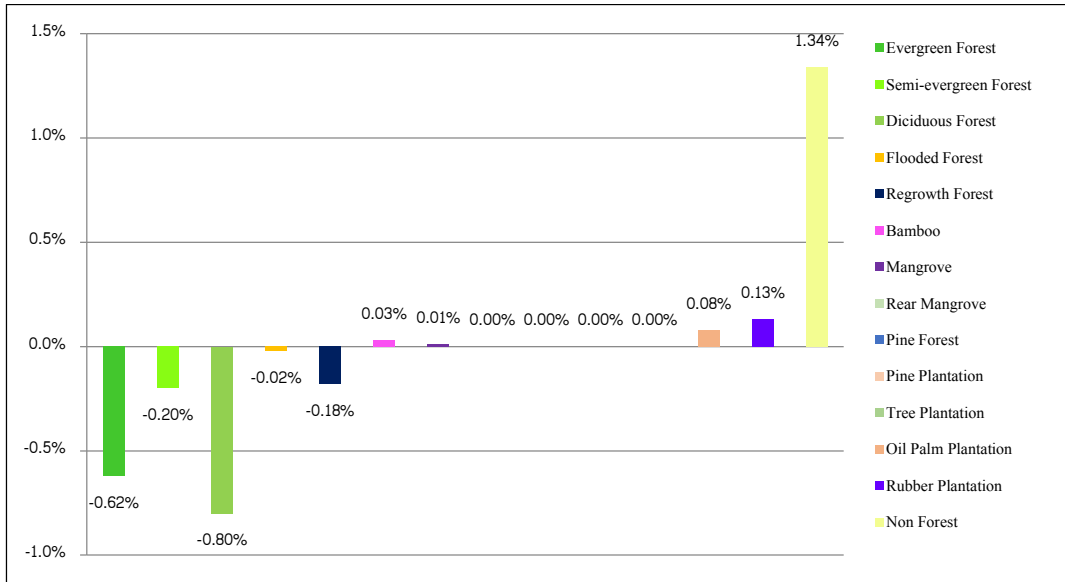


Figure 7. Graph of national land use/cover change 2014-2016

The above graph shows that between 2014 and 2016 the most significant change in forest cover types are: deciduous forest 0.80%, evergreen forest 0.62%, semi-evergreen forest 0.20 %, and regrowth forest 0.18 %.

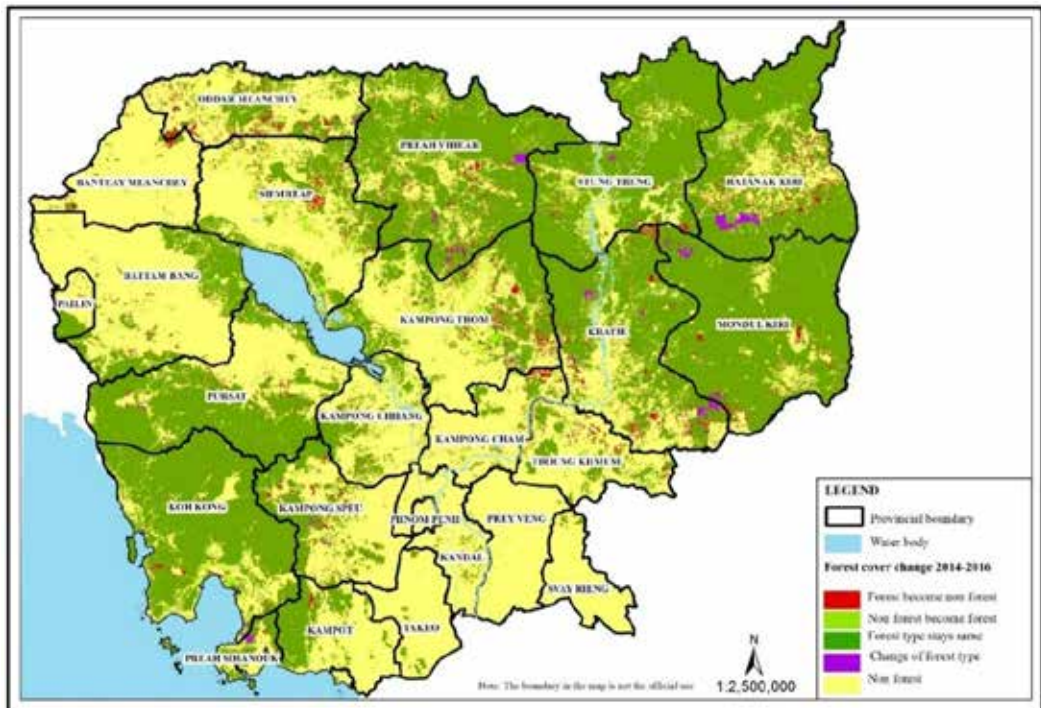


Figure 8. Map of national land use/cover change 2014-2016

b. Result of land use/cover change for Cambodia REDD+

The land use/cover change rate for 2014-2016 was changed 46.90 % in 2014 to 45.05 % in 2016, with an average annual change at 0.92 % equivalent to 168.136 ha of country's total land area. Detailed results are presented in the tables of statistical data and map below.

Table 4. Statistics of Land use/cover change 2014-2016 for Cambodia REDD+

No	Land Cover Classes	Forest Land Cover				Change	
		2014		2016		2014-2016	
		Ha	%	Ha	%	Ha	%
1	Evergreen Forest	2,973,903	16.38	2,861,233	15.76	-112,670	-0.62
2	Semi-evergreen	1,108,320	6.10	1,071,947	5.90	-36,373	-0.20
3	Deciduous Forest	3,480,532	19.17	3,336,349	18.37	-144,183	-0.80
4	Flooded Forest	481,078	2.65	477,813	2.63	-3,265	-0.02
5	Regrowth Forest	228,560	1.26	196,842	1.08	-31,718	-0.18
6	Bamboo	130,678	0.72	125,398	0.69	-5,280	0.03
7	Mangrove	33,002	0.18	31,226	0.17	1,776	-0.01
8	Rear Mangrove	25,906	0.14	25,906	0.14	0	0.00
9	Pine Forest	8,196	0.05	8,195	0.05	-1	0.00
10	Pine Plantation	3,710	0.02	3,870	0.02	160	0.00
11	Tree Plantation	44,289	0.24	43,122	0.24	-1,167	0.00
Total Forest Land Cover		8,518,173	46.90	8,181,901	45.05	-336,273	-1.85
Total Non-Forest		9,642,501	53.10	9,978,773	54.95	336,273	1.85
Grand Total		18,160,674	100.00	18,160,674	100.00		

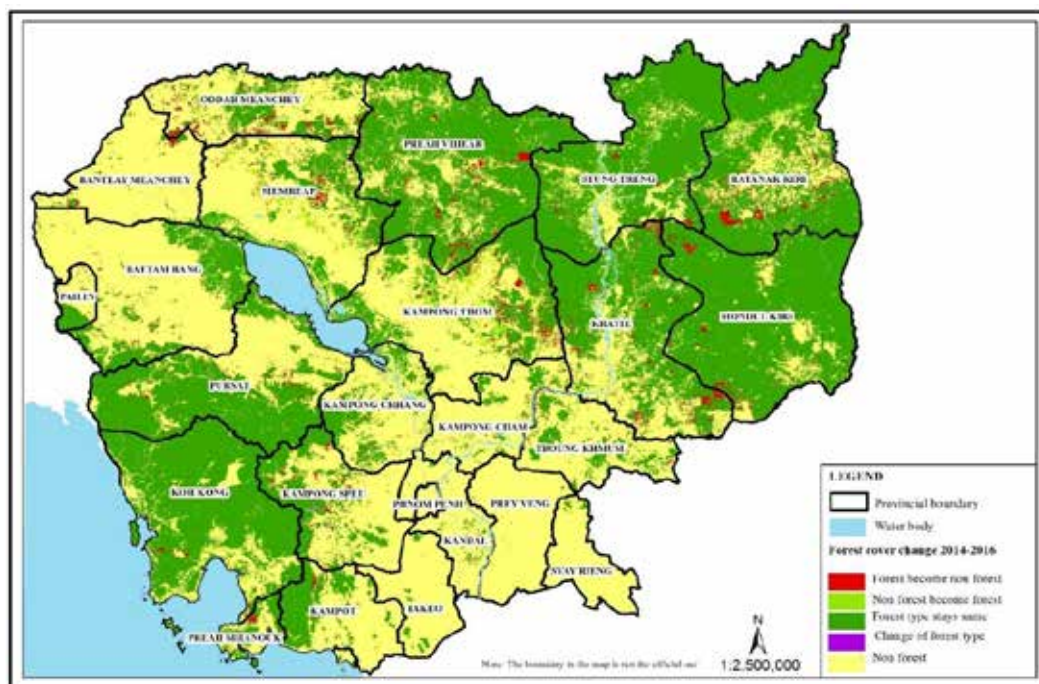


Figure 9. Map of land use/cover change 2014-2016 for Cambodia REDD+

Table 5. Statistical of land use/cover change 2006-2016 for Cambodia REDD+

No	Land Cover Classes	Change 2006-2010		Change 2010-2014		Change 2014-2016		Change 2006-2016	
		Ha	%	Ha	%	Ha	%	Ha	%
1	Evergreen Forest	-136,346	-0.75	-600,022	-3.30	-112,670	-0.62	-849,038	-4.67
2	Semi-evergreen	-62,324	-0.34	-282,797	-1.56	-36,373	-0.20	-381,494	-2.10
3	Deciduous Forest	-115,020	-0.63	-1,017,865	-5.60	-144,183	-0.80	-1,277,068	-7.03
4	Flooded Forest	-73,350	-0.40	-42,927	-0.24	-3,265	-0.02	-119,542	-0.66
5	Regrowth Forest	33,218	0.18	-20,781	-0.11	-31,718	-0.18	-19,281	-0.11
6	Bamboo	1,093	0.01	-253	0.00	-5,280	0.03	-4,439	-0.02
7	Mangrove	-617	-0.01	1,559	0.01	1,776	0.01	-834	-0.01
8	Rear Mangrove	-148	0.00	-1,464	-0.01	0	-0.00	-1,613	-0.01
9	Pine Forest	0	0.00	0	0.01	-1	0.00	38	0.01
10	Pine Plantation	11	0.00	3,699	0.02	160	0.00	3,870	0.02
11	Tree Plantation	-26,333	-0.15	27,074	0.15	-1,167	0.00	-425	0.00
Total Forest Land Cover		-379,815	-2.09	-1,933,738	-10.85	-336,273	-1.85	-2,649,826	-14.59

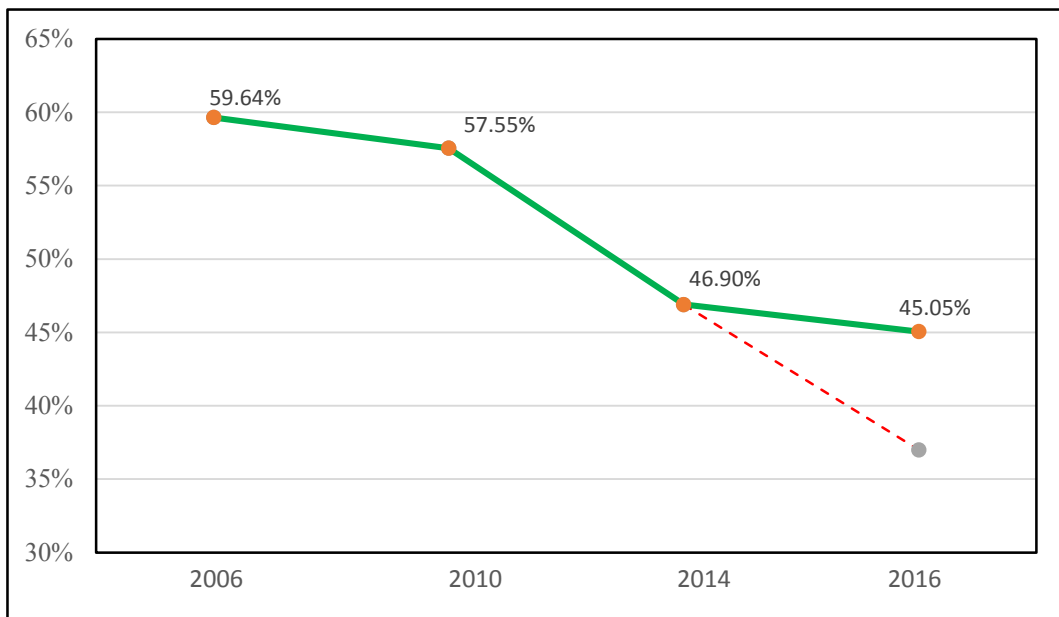


Figure 10. Land use/cover change 2006-2016 for Cambodia REDD+

According to above figure the rate of forest cover change from 2006 to 2010 is 2.09%, with an average annual change 0.52% compared to the country’s total land area, however the change rate drastically increases for the period 2010 to 2014, about 10.65 %, with an average annual rate 2.66 % compared to the country’s total land area.

However, the current assessment of forest cover in 2016 has shown that the forest change rate from 2014 to 2016 is 1.85%, with an average annual value of 0.93 % compared to the country’s total land area. Meaning that the rate of forest cover loss is lower compared to the same for the duration of 2010 – 2014. This was due to the effective reform in forest management by government as well as participation by local community, armed forces and authorities at all levels to prevent forest offences.

3.3. Forest cover change statistics from 1965-2016

From 1965 until now, Cambodia has been conducted 8 national forest cover assessments. The assessments were made at different stage for 27 years between 1965 and 1992/93 for the country fall into civil conflict for almost three decades, giving heavy pressure on forest resource use and only from 1993 through to 2014 when regular assessments were made at an average 4 years interval. Moreover, now Cambodia had participated with international community to implement REDD+ program, therefore, data on forest cover becomes even more important in natural resource management planning and in support of the process to review, monitor and evaluate forest cover for Cambodia REDD+ implementation for which forest cover is assessed in every two years.

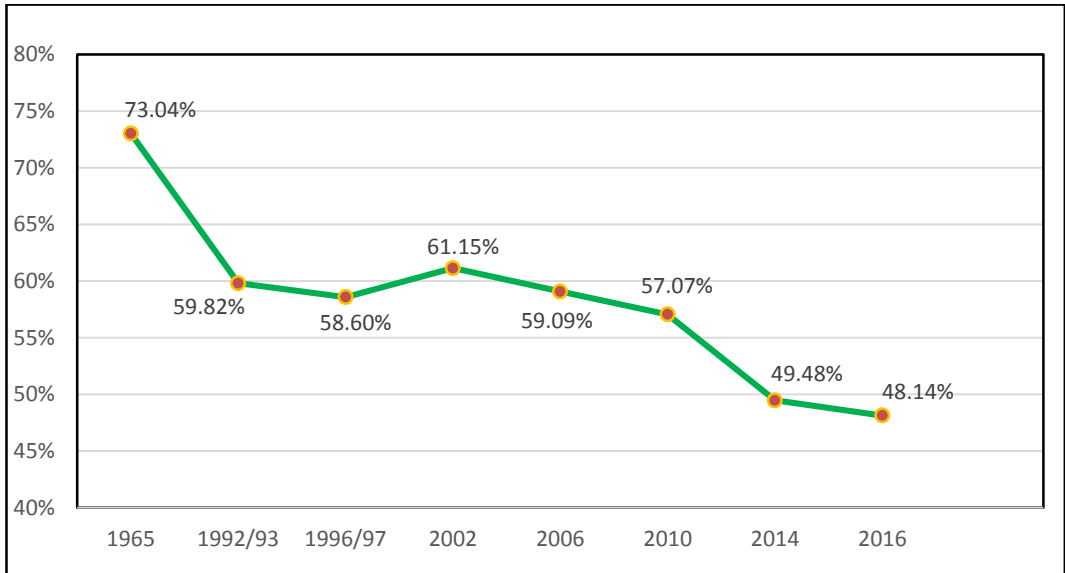


Figure 11. Rate of forest cover change statistics from 1965-2016

From the chart above it shows that the forest cover for the duration of 1965 - 2016 has declined by 24.9 % compared to the overall country area. Many underlying causes responsible for the decline include civil war, population increase, need of land for agricultural production, and other key factors.

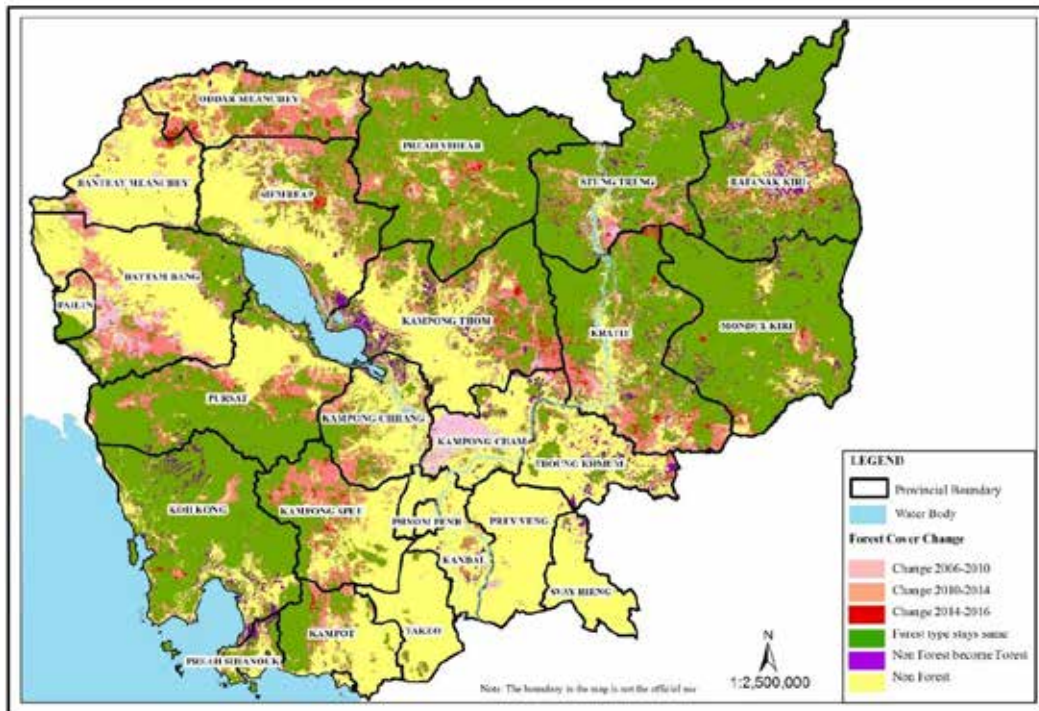


Figure 12: Map of National Land use/cover change 2006-2016

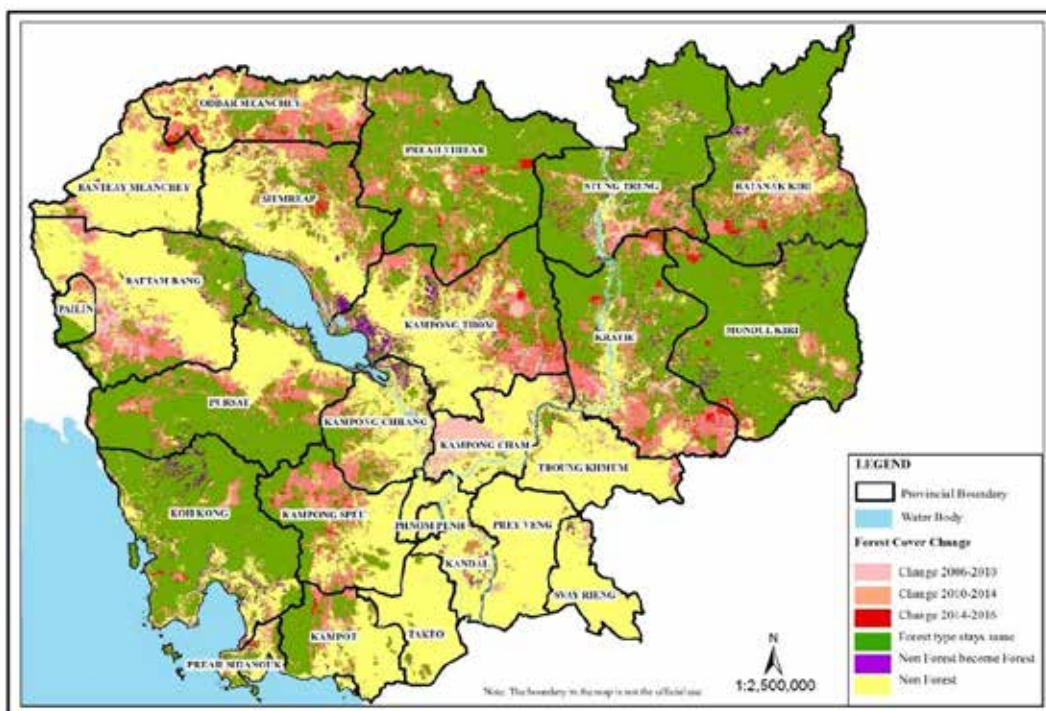


Figure 13. Map of Land use/cover change 2006-2016 for Cambodia REDD+

Chapter IV

Conclusion

The 2016 forest cover assessment is produced by the national technical working group (GDANCP/MoE, FA/MAFF, FiA/MAFF) with technical supervision provided by international expert team from FAO-UNREDD, JICA-CAMREDD and selected international universities. The results show that the country's forest cover is about 8.742.401 ha, equivalent to 48.14 % of the country's total area, and the average annual loss rate from 2014 to 2016 is about 0.67 %, equivalent to 121.328 ha compared to the total country's area.

It is projected that for the next 2 years the rate of forest cover loss would be further reduced depending on how effective is the implementation of the government's reform on PA management and conservation as well as participation by local communities, armed forces and authorities at all levels to prevent forest offences. In the sense, MoE will continue its tasks and responsibility as well as collaborate with development partners agencies and relevant stakeholders for environmental protection, natural resource protection, biodiversity conservation and sustainable development for the sustainable environment and natural resources.

Annexes

Annex 1. Definition of Forests

National Forest:

Forest is the unit of the natural ecosystem or plantation in the forms of wetland, lowland and dry land which covers by natural stands or plantation trees with a height from 5 meters on an area at least 0.5 hectares with a canopy of more than 10 percent. The plantations such as rubber, oil palm, teak, acacia and eucalyptus and other kinds of trees which fall under the above criteria will also be classified as forests.

REDD+ Program:

Forest under the REDD+ programme refers to a unit of an ecosystem in the form of wetland and dry land, covered by natural or planted vegetation with height from 5 meters on an area of at least 0.5 hectares, and a canopy crown cover of more than 10%.

Areas also included in the REDD+ programme are forest regrowth and areas under afforestation or reforestation. Rubber, oil palm plantations and perennial crops are excluded from this definition.

Annex 2. Description of Land use/cover classes

No	Land cover class	ID	Description
1	Evergreen forest	E	Areas covered by trees maintaining their leaves during the whole year.
2	Semi-evergreen forest	Se	Contain variable percentages of evergreen and deciduous trees.
3	Deciduous forest	D	Comprised of dry mixed deciduous forest and dry Dipterocarp forests
4	Bamboo	B	Areas dominated by bamboo
5	Wood shrub	Ws	Areas dominated by evergreen and deciduous woodland with a height less than 5 meters
6	Mangrove forest	M	Areas dominated by Mangroves i.e. coastal salt tolerant species
7	Rear Mangrove	Mr	Mostly growing in coastal zone after mangrove spp. Salt tolerant species but only infrequent floods
8	Rubber plantation	Rp	Areas currently supporting, and areas reserved for, rubber plantation
9	Flooded Forest	Ff	This forest type is found in Tonle Sap Lake. Most of the forests are low and disturbed. In many cases, there is only a mosaic remaining
10	Forest Regrowth	Fr	<p>Areas of naturally regenerated forest where there are clearly visible indication of human activities such as selective logging, areas regenerating following agricultural land use, areas recovering from human induced fire, etc.</p> <ul style="list-style-type: none"> • Include forest where it is not possible to distinguish whether planted or naturally regeneration. • Include forests with mix of naturally regenerated trees and planted/seeded trees, and where the naturally regenerated trees are expected to constitute more than 50 percent of the growing stock at stand maturity. • Include abandoned forest land and bare land which will regrow into forest within ten years
11	Pine Tree	P	The area dominated by coniferous trees
12	Pine plantation	Pp	The area dominated by pine tree plantation
13	Oil palm	Po	The area dominated by oil palm tree.
14	Tree plantation	Tp	This class includes the following type: teak, eucalyptus, acacia, jatropa and others.
15	Paddy Field	Hr	Paddy field is a flooded parcel of <u>arable land</u> used for growing <u>semiaquatic rice</u> .
16	Crop Land	Hc	This category includes arable and tillage land, and agro-forestry systems where vegetation falls below the thresholds used for the forest land category
17	Grassland	G	Grasslands are characterized as lands dominated by grasses rather than large shrubs or trees. It is crucial that the rainfall is concentrated in six or eight months of the year, followed by a long

			period of drought when fires can occur.
18	Built-up area	Bu	The patch of land with building and construction
19	Village	Bt	The patch of land with houses and garden surrounding house.
20	Rock	R	Land of naturally exposed rocks or strip mines, quarries and gravel pits.
21	Sand	S	In general, land of sand having thin soil or sand including deserts, dry salt flats, beaches, sand dunes.
22	Water	W	Area of fresh and sea water

Annex 3. Provincial Land use/cover statistic 2016

Province	Forest Types					Total Non-Forest (ha)	Grand Total (ha)
	Evergreen Forest	Semi-Evergreen Forest	Deciduous Forest	Other Forest	Total Forest (ha)		
Banteay Meanchey	1,460	2,860	9,437	8,051	21,808	593,011	614,819
Battambang	59,483	16,382	20,075	171,573	267,513	919,697	1,187,210
Kampong Cham	658	59	641	50,923	52,281	402,893	455,174
Kampong Chhang	17,319	5,414	71,913	47,018	141,664	387,797	529,461
Kampong Speu	64,587	21,677	130,065	19,178	235,507	460,964	696,471
Kampong Thom	194,251	14,850	45,948	224,640	479,689	765,074	1,244,763
Kampot	125,764	3,924	27,758	4,970	162,416	309,399	471,815
Kandal	0	0	99	14,644	14,743	341,630	356,373
Kep	1,806	9	0	1,201	3,016	12,157	15,173
Koh Kong	839,938	11,632	24,404	95,247	971,221	240,374	1,211,595
Kratie	100,239	95,364	403,055	136,410	735,068	462,237	1,197,305
Mondul Kiri	131,439	212,341	803,665	67,975	1,215,420	151,472	1,366,892
Oddar Meanchey	50,051	18,639	104,912	16,361	189,963	473,202	663,165
Pailin	29,877	1,454	503	510	32,344	75,367	107,711
Phnom Penh	0	0	0	0	0	37,374	37,374
Preah Sihanouk	48,901	2,579	2	29,432	80,914	68,291	149,205
Preah Vihear	211,737	141,836	698,880	42,019	1,094,472	308,615	1,403,087
Prey Veng	19	0	92	1,613	1,724	474,436	476,160
Pursat	440,528	73,157	138,309	75,625	727,619	430,972	1,158,591
Ratanak Kiri	234,776	173,824	334,555	150,763	893,918	284,542	1,178,460
Siemreap	44,662	23,018	117,679	134,358	319,717	734,732	1,054,449
Stung Treng	261,240	252,779	395,117	62,181	971,317	230,344	1,201,661
Svay Rieng	28	0	0	5,189	5,217	281,608	286,825
Takeo	1,916	0	9,115	2,584	13,615	335,428	349,043
Thbang Khmom	554	149	125	108,844	109,672	383,450	493,122
Tonle Sap	0	0	0	1,563	1,563	253,207	254,770
Total Area (ha)	2,861,233	1,071,947	3,336,349	1,472,872	8,742,401	9,418,273	18,160,674
Percent (%)	15.76	5.90	18.37	8.11	88.14	51.86	100.00

Annex 4. Forest Cover Change data 2014-2016

Forest Type	Year 2016													Total	
	E	Se	D	B	Ff	Fr	M	Mr	P	Pp	Tp	NF	Ha	%	
E	2859768	86	187	85		34		3	2	13	358	113367	2973903	16.4	
Se	97	1070718	553	181		22				1	126	36622	1108320	6.1	
D	134	301	3329012	61		30					2224	148770	3480532	19.2	
B	45	12	34	124194								6391	130678	0.7	
Ff	0				470316							10762	481078	2.6	
Fr	288	22	254	217	1	186494		192			122	40970	228560	1.3	
M	3		36			2	30865	836				1260	33002	0.2	
Mr	1						123	24661				1121	25906	0.1	
P	2								8193			1	8196	0.0	
Pp										3632		111	3743	0.0	
Tp	1		4			2					39281	5001	44289	0.2	
NF	894	808	6269	660	7494	10258	238	214		224	1011	9614397	9642467	53.1	
Ha	2861233	1071947	3336349	125398	477813	196842	31226	25906	8195	3870	43122	9978773	1816067	100	
%	15.8	5.9	18.4	0.7	2.6	1.1	0.2	0.1	0	0	0.2	54.9	100		
Total															

References

- Ministry of Environment, Land use/cover change in Protected Area from 2006-2016
- Forestry Administration, Cambodia Forest Cover 2014
- Ministry of Environment, Lexicon of Climate Change-2017
- Ministry of Environment, Forest Referent Level 2016