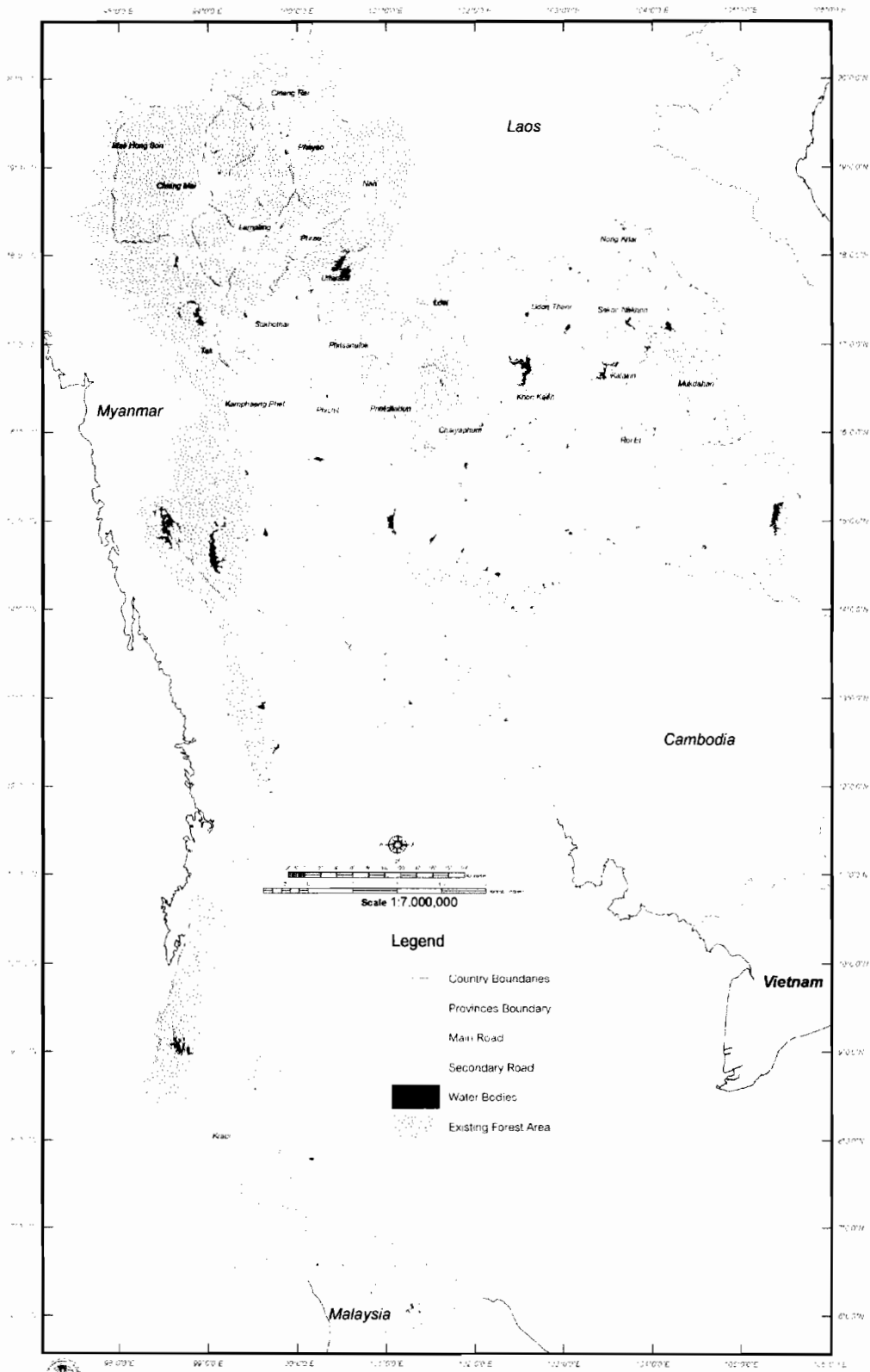


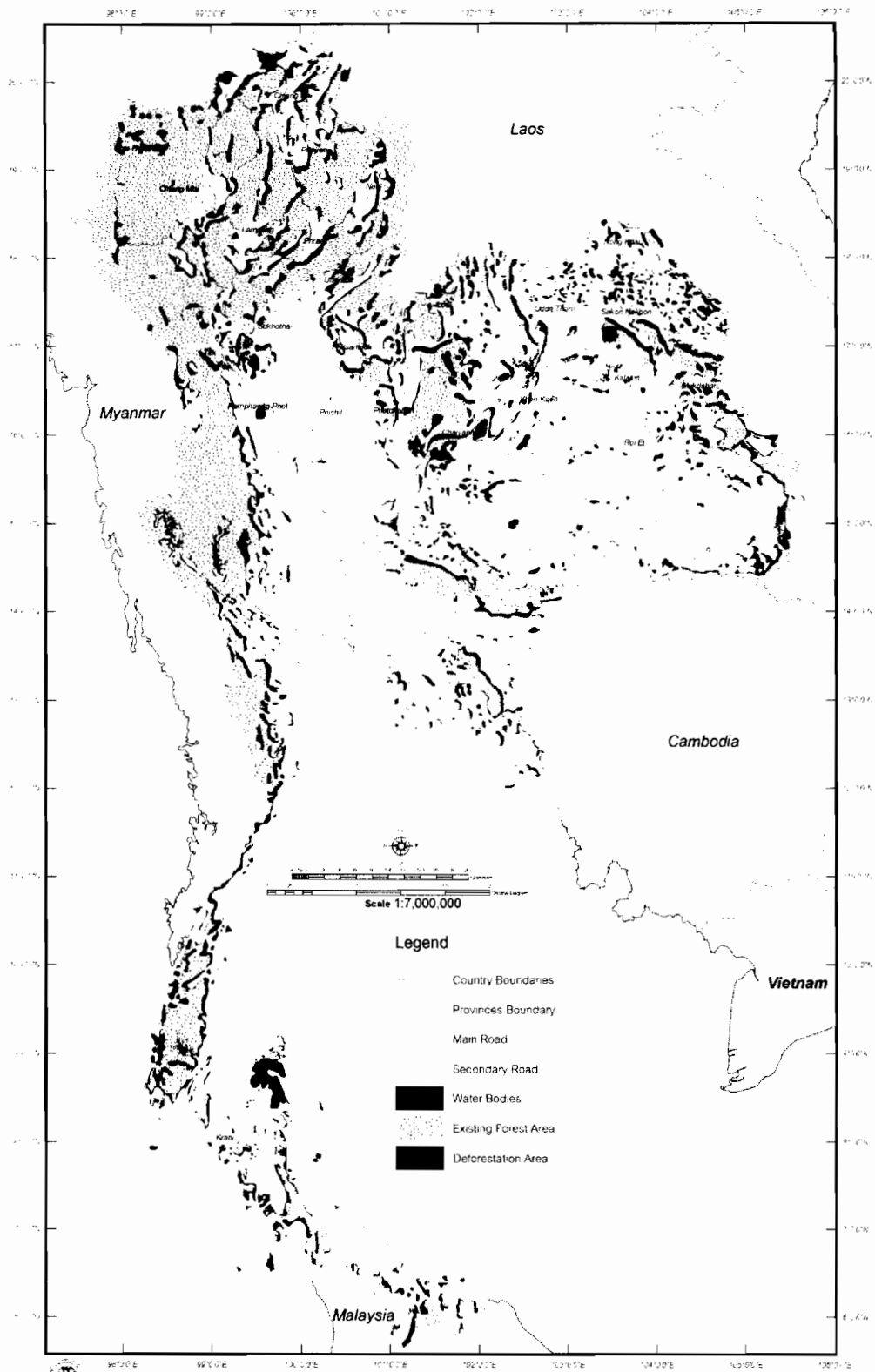
ANNEX

MAP 1: Forest cover, 1989



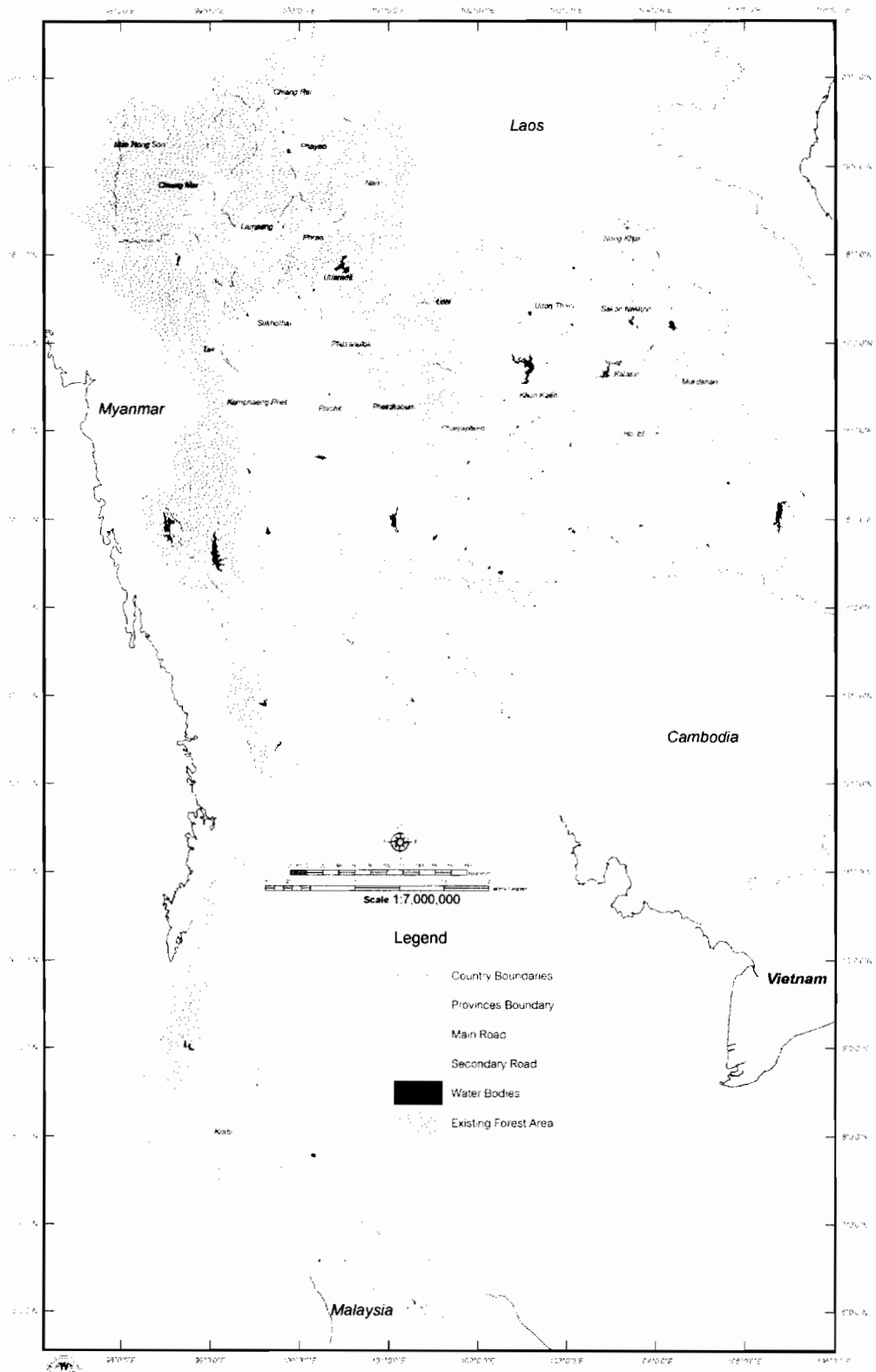
Source: Geoinformatic Division, Dept of National Park Wildlife and Plant Conservation
 Printed: November 2008

MAP 2: Forest cover, 1993 with deforestation between 1989 - 1993



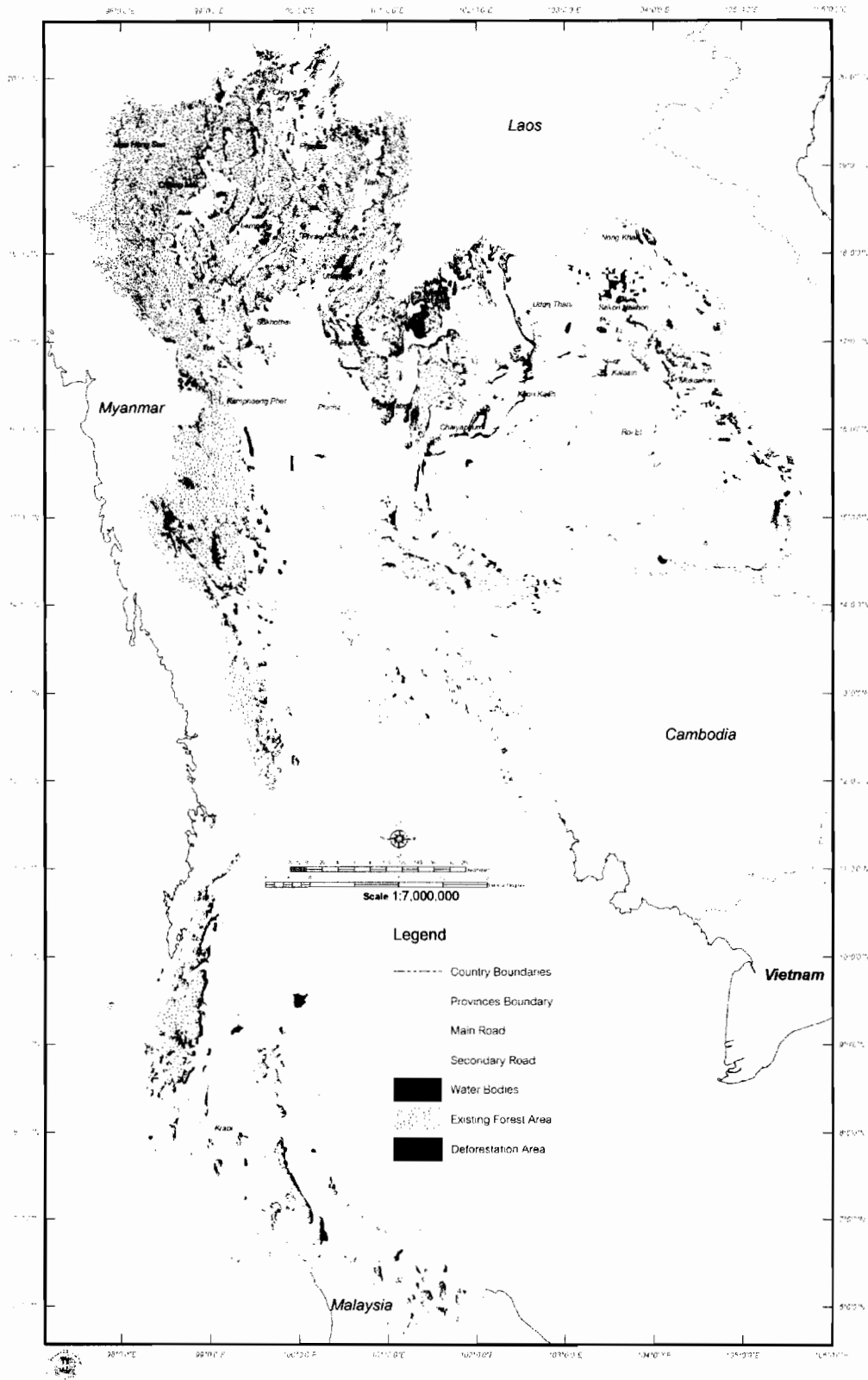
Source: Geoinformatics Division, Dept. of National Park, Wildlife and Plant Conservation
Printed: November 2008

MAP 3: Forest cover, 1995



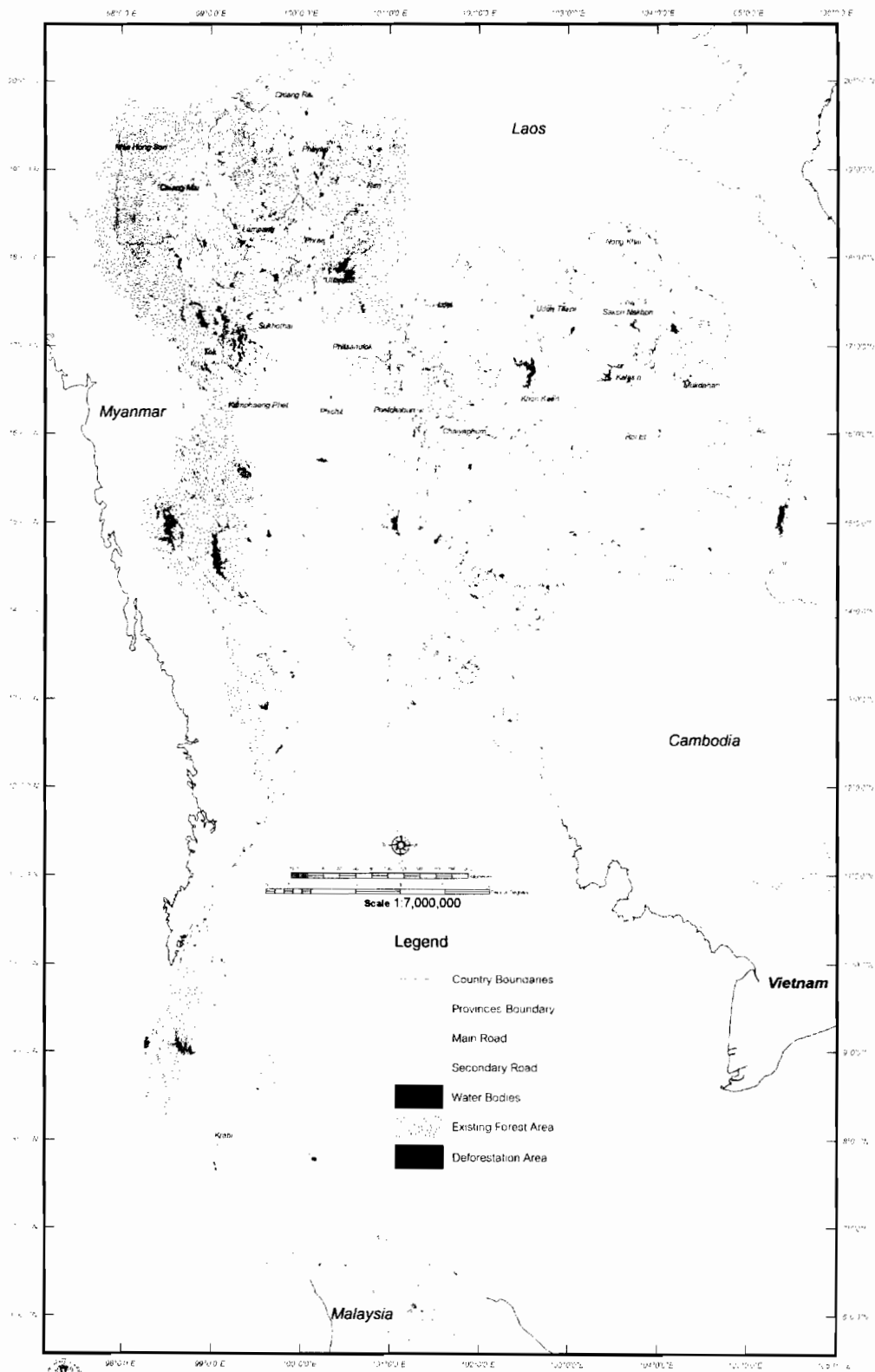
Source: Geoinformatic Division, Dept. of National Park Wildlife and Plant Conservation
Printed: November 2008

MAP 4: Forest cover, 2000 with deforestation between 1995 - 2000



Source: Geoinformatic Division, Dept. of National Park, Wildlife and Plant Conservation
Printed: November 2008

MAP 5: Forest cover, 2005 with deforestation between 2000 - 2005



Source: Geospatial Division, Dept. of National Park Wildlife and Plant Conservation
Printed: November 2006

MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT (MNRE) THAILAND

**REDUCING EMISSIONS FROM DEFORESTATION AND FOREST DEGRADATION
IN THE
TENASSERIM BIODIVERSITY CORRIDOR (BCI PILOT SITE)**

AND

**NATIONAL CAPACITY BUILDING FOR BENCHMARKING AND MONITORING
(REDD Readiness Plan)**

Submitted to
THE FOREST CARBON PARTNERSHIP FACILITY (FCPF)

Proposal by Department of National Parks, Wildlife and Plant Conservation (DNP)
and Royal Forest Department (RFD)
December 9, 2008

Executive Summary

Thailand ratified the UNFCCC on December 28, 1994 and the Convention came into effect in the country three months later in March 1995 and signed the Kyoto Protocol on 2 February 1999, ratifying it on 28 August 2002. The establishment of Thailand's Greenhouse Gas Management Organization (TGO) and approval of the National Strategy for Climate Change Mitigation by Cabinet provides the framework for undertaking measures to reduce emissions, including those from deforestation (REDD). In its Initial National Communication to UNFCCC (2000), Thailand has benchmarked carbon emissions, including those from land use change and forest. Based on the national policy on forest conservation and reforestation, it is expected that the carbon sequestration rate in Thailand would increase, resulting in lower net emissions. If the trend for emissions between 1990 and 1994 is maintained, CO₂ emissions from land use changes and forestry could drop from 59 Tg in 1994 to about 51 Tg by 2010 and 46 Tg by 2020.

By 2006, the total forest cover in Thailand was estimated at 15.865 million ha, representing over 30% of the total land area of 513,000 Km² or 51.31 million ha compared to 1961, which had an estimated forest cover of about 27 million ha, covering over 53.3% of the country. The deforestation rate estimated between 2000 and 2005 is at 1.07%, which is higher than what has been so far assumed at 0.73% in the period 1991-1998. While earlier the main drivers of deforestation were shifting cultivation, agriculture, and logging, in recent years it has been dams, road construction and land settlements.

The REDD Readiness Mechanism will assist Thailand to enhance its capacity to develop a national reference scenario for REDD, adopt a national REDD strategy to reduce emissions and at the same time conserve biodiversity while enhancing livelihoods of forest-dependent peoples and forest dwellers. However, going beyond REDD Readiness, Thailand has already been implementing forest restoration programs over the last decade and has gained experience and some success in slowing down rate of deforestation. Therefore, Thailand proposes to pilot an ER program in particular in the Tenasserim Biodiversity Corridor site, which goes beyond national capacity building for referencing and MMV.

Apart from capacity building for national REDD Readiness and carbon cycle assessments, focus of REDD implementation in the Tenasserim Biodiversity Corridor will be on the following:

- Participatory multi-stakeholder consultations for REDD;
- Channeling financial resources to local people through Village Funds for livelihood improvement;
- Participatory benefit sharing and providing benefit streams to forest adjacent dwellers;
- Undertaking zonation and providing user rights to local people to improve livelihoods and protect the ecosystem, thereby linking livelihood interventions to deforestation avoidance; and
- Undertaking restoration of degraded forest areas and enabling sequestration of carbon by using long rotation indigenous species.

Lead responsibility for REDD implementation lies with DNP, which will act in collaboration with RFD, DMC and others. However, emphasis will be given to multi-stakeholder participation in the implementation process. In the Tenasserim Biodiversity Corridor, a project consisting of measures for livelihood improvement, land use planning, restoration and local capacity building has already been initiated through the support of the Greater Mekong Subregion Biodiversity Conservation Corridor Initiative in 2006. Experience gained so far and lessons learned will be of great value to REDD implementation under the current proposal.

It is expected that REDD implementation will have by 2012, the following major outputs:

At National Level:

- (i) A comprehensive REDD Readiness Plan by August 2012;
- (ii) A REDD national strategy;
- (iii) Potential for carbon sequestration (carbon cycle assessments) from different forest ecosystems;
- (iv) Updated emissions data (2006) from land use change and forest (LUCF) as compared with baseline of 1994, and projections to 2020;
- (v) A national referencing scenario with measurement, monitoring and verification mechanisms in place at national and local institutional levels (RFD/DNP and regional offices).

At Biodiversity Corridor level in the Tenasserim:

- (i) Livelihood improvements (cash and non-cash benefits) for about 7,000 households (including 4,438 from existing four clusters) of local population living adjacent to forests in the corridor area;
- (ii) Restoration with native species of at least 5,000 ha of degraded forest and denuded land in designated zones around protected areas and reserve forest land creating carbon sequestration zone and additional 5,000 ha of enrichment planting;
- (iii) Establishment of up to 5,000 ha of livelihood plantations in buffer zones using fast growing, short rotation species for use by beneficiary households;
- (iv) Provision of start up seed capital for 20 Village Funds (in addition to current existing ones under BCI Pilot Site project) bring the total to 40 VFs and establishment of functioning revolving fund mechanisms linked to income generating activities and environmental protection; and
- (v) Payment of performance-based cash incentives to households through Village Fund mechanism for protection of up to 10,000 ha of intact forests and maintenance of restored/rehabilitated forest areas (thus reducing deforestation).

The total cost of the proposed REDD interventions is estimated at US\$13.74 million, of which the Tenasserim BCI Upscaling has the largest share, US\$10.5 million or 76% of the total estimated costs. The projected period of implementation is between mid 2009 – end 2012.

Acronyms Used

ADB	Asian Development Bank
ASEAN	Association of South East Asia Nations
BC	Biodiversity Corridor
BCI	Biodiversity Corridor Initiative
CBO	Community Based Organization
CC	Climate Change
CDD	Community Development Department
DMC	Department of Marine and Coastal Resources
DNP	Department of National Parks, Wildlife and Plant Conservation
ER	Emission Reduction
FAO	Food and Agriculture Organization
FIO	Forest Industry Organization
FR	Forest Reserve
Gg	kilo ton
GHG	Greenhouse Gas
GIS	Geographic Information Systems
GMS	Greater Mekong Subregion
IGA	Income Generating Activity
IPCC	Intergovernmental Panel on Climate Change
M&E	Monitoring and Evaluation
MDG	Millennium Development Goal
MNRE	Ministry of Natural Resources and Environment, Thailand
MMV	measuring, monitoring and verification
NMVO	Non-Methane Volatile Organic Carbon
NOx	Nitrogen Oxide
NP	National Park
NRF	National Reserve Forest
NRM	Natural Resource Management
NTFP	Non-timber Forest Product
PA	Protected Area
PBSA	Participatory Benefit Sharing Agreement
PMU	Program Management Unit
RECOFTC	Regional Community Forestry Training Center
REDD	Reducing Emissions from Deforestation and Forest/Land Degradation
RETA	Regional Technical Assistance
RFD	Royal Forest Department
TA	Technical Assistance
TAO	Tambon Administration Office
THB	Thailand Baht
Tg	mega ton
TGO	Thailand Greenhouse Gas Management Organization
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
VF	Village Fund
WS	Wildlife Sanctuary

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I. BACKGROUND

1. Thailand ratified the UNFCCC on December 28, 1994 and the Convention came into effect in the country three months later in March 1995. Thailand signed the Kyoto Protocol on 2 February 1999 and ratified it on 28 August 2002. Thailand's Greenhouse Gas Management Organization (TGO), approved by Cabinet on 15 May 2007, was established as an autonomous governmental organization with the specific purpose of addressing the problem of GHG emissions. The National Strategy for Climate Change Mitigation was approved by Cabinet on 22 January 2008. These actions provide the framework for undertaking measures to reduce emissions and undertake activities to mitigate and adapt to anticipated climate change impacts. Thailand supports the idea of reduced emissions of carbon from deforestation and forest degradation (REDD)¹ and has proposed establishment of a voluntary fund for payments towards supporting REDD. Any payment for reduced emissions from deforestation should bring with it future obligation to maintain the forest.²

2. Thailand has already implemented or is in the process of implementing several projects on forest restoration, rehabilitation of degraded forest area in natural forest, forest area monitoring, land resource management with land tenure clarification, carbon cycling assessments, and local level participatory stakeholder consultations and livelihood improvement in the Tenasserim Biodiversity Corridor³ area to name a few. These on-going project activities are highly relevant to the REDD proposal elaborated in this document and the submission will build on on-going achievements and lessons learned so far. Another important project is that related to forest resource mapping with detailed surveys and sample plots for a national forest information database.⁴

A. Carbon Emissions in Thailand including Land Use Change and Forest

3. The Office of Environmental Policy and Planning submitted in 2000 *Thailand's Initial National Communication under the United Nations Framework Convention on Climate Change* through the then Ministry of Science, Technology and Environment, and now called the Ministry of Natural Resources and Environment (MNRE). This initial National Communication (NC) sets out Thailand's contribution to international efforts to address climate change issues, as a non-Annex I country.

4. Using the 1996 Revised IPCC Guidelines, gross emissions of CO₂ were estimated at 241 Tg (megatons) in 1994. Taking into account the amount of carbon sequestered through reforestation activities and the re-growth of natural vegetation on abandoned land, total net CO₂ emissions were estimated at 202 Tg. The energy sector accounted for more than half of gross CO₂ emissions in 1994 (Figure 1).

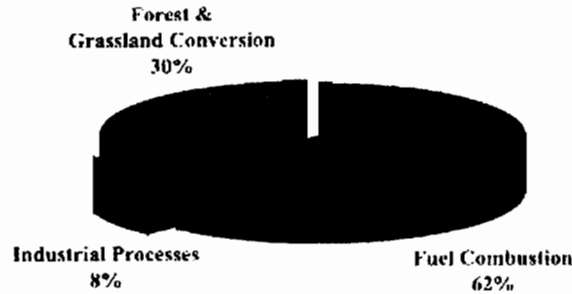
¹ UNFCCC, Subsidiary Body for Scientific and technological Advice. Twenty-sixth session, Bonn, 7-18 May 2007. Submission of the Kingdom of Thailand on reducing emissions from deforestation in developing countries. Paper No. 18, p. 81

² Thailand is among the 39 tropical and sub-tropical countries that have expressed interest in the Forest Carbon Partnership Facility (FCPF) launched by the World Bank.

³ The Biodiversity Conservation Corridor Initiative (BCI), initiated in 2006, is a project of Greater Mekong Subregion (GMS) facilitated and supported by the Asian Development Bank (ADB) and the Governments of Finland, Netherlands and Sweden across five countries of the GMS; in Thailand it is being implemented in the Tenasserim bordering with Myanmar

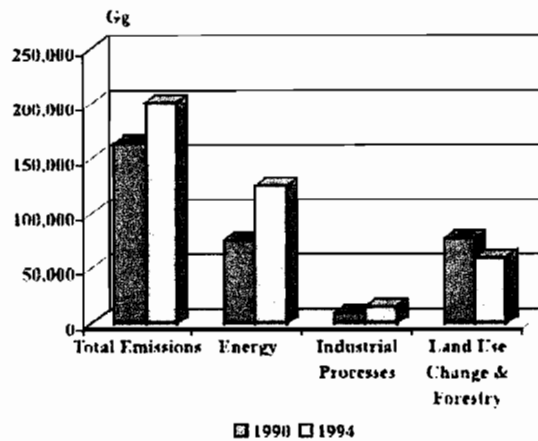
⁴ Project titled 'To Establish a National Monitoring Information System for the Effective Conservation and Sustainable Management of Thailand's Forest Resources' (PD 195/03 Rev.2 (F)) supported by ITTO.

Figure 1: Share of CO₂ emissions by Source

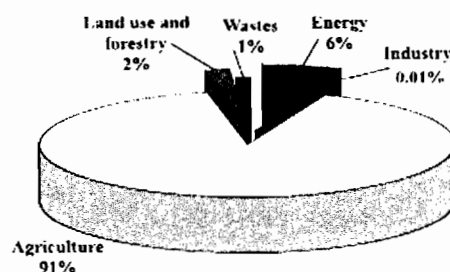


5. Compared to 1990, CO₂ emissions from forestry and land use changes declined while those from the energy supply sector increased (Figure 2).

Figure 2: Share of CO₂ emissions by Source, 1990 and 1994



6. Total Methane (CH₄) emissions in Thailand were estimated at 3,171 Gg in 1994. About 91 percent of emissions were from agriculture. Of this, approximately 73 percent were from rice cultivation, especially the main-season crop, and 22 percent were from enteric fermentation. Land use change and forestry sector activities emitted about 60 Gg of CH₄, while solid waste disposal and wastewater treatment generated about 35 Gg in 1994 (Figure 3).

Figure 3: Share of CH₄ emissions by Source, 1990 and 1994

7. Thailand also produced approximately 56 Gg of N₂O in 1994, almost all of which came from agriculture. Agricultural soils emitted about 35 Gg, while manure management in the livestock sector emitted about 19 Gg. Other minor sources were the energy supply sector, land use change and forestry.

8. Other GHG emissions estimated for 1994 were NO_x, CO and NMVOC. The emissions were 287 Gg, 555 Gg and 2,513 Gg, respectively. The energy sector was the main source of NO_x emission (95 percent). The industrial process was almost the only source of NMVOC emissions (94 percent). Land use changes and forestry were the main CO emitters (94 percent).

9. In terms of global warming potential (GWP) in 1994, Thailand emitted approximately 286 Tg of CO₂ equivalent. The amount was marginal, compared to the world total. Of this total, CO₂ contributed about 71 percent while CH₄ and N₂O contributed about 23 and 6 percent respectively (Table 1).

Table 1. Main Greenhouse Emissions in Thailand, 1994 (Gg)

Greenhouse Gas	Emissions	GWP	CO ₂ equivalent	Percent to total
CO ₂	202,458.05	1	202,458	70.69
CH ₄	3,171.35	21	66,598	23.25
N ₂ O	55.86	310	17,317	6.06
Total			286,373	100.00

10. **Projections** of GHG emissions were performed in selected sectors. Based on assumed GDP growth rates, final energy demand was projected to increase from 48.4 mtoe in 1995 to 68.7 mtoe by 2010, and further to 92.2 mtoe by 2020. These projections result in CO₂ emissions of 282 Tg in 2010, and 475 Tg in 2020.

11. Regarding the forest sector, predicting change in forest cover was difficult. However, based on the national policy on forest conservation and reforestation, it is expected that the carbon sequestration rate would increase, resulting in lower net emissions. If the trend for emissions between 1990 and 1994 is maintained, CO₂ emissions from land use changes and forestry could drop from 59 Tg in 1994 to about 51 Tg by 2010 and 46 Tg by 2020.

Figure 4: Projection of CO₂ emissions 1994 - 2020

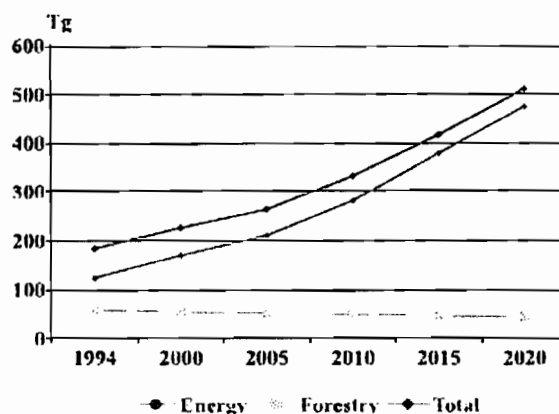
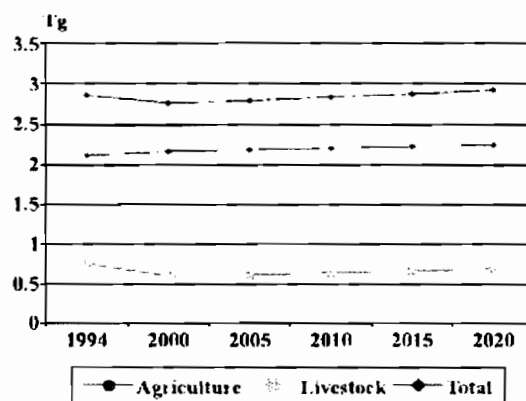


Figure 5: Projection of CH₄ emissions 1994 - 2020



B. REDD Readiness Mechanism

12. The Readiness Mechanism will assist Thailand to enhance its capacity to develop: (i) a national reference scenario for REDD; (ii) adopt a national REDD strategy seeking reduction of emissions and at the same time conserving biodiversity and enhancing livelihoods of forest-dependent peoples and forest dwellers; and (iii) designing and implementing accurate measurements, monitoring and verification (MMV) systems to enable Thailand to report on emissions from deforestation and forest degradation.

C. Piloting Emission Reduction under Carbon Financing Mechanism

13. Thailand has already been implementing forest restoration programs over the last decade and has gained experience and some success in slowing down rate of deforestation. Under the Readiness Mechanism, Thailand proposes to pilot an ER program in particular in the Tenasserim Biodiversity Corridor site, which goes beyond national capacity building for referencing and MMV. In particular, Thailand will endeavor to link up ER implementation to enhance⁵:

⁵ The listing indicates groups and categories of ER support as mentioned in the FCPF, Information Memorandum, June 13, 2008, p. 29-30, which comply with activities proposed by Thailand in this REDD proposal.

- a) **Land tenure and land rights:** Securing land tenure or access rights for forest-dependent peoples and other forest adjacent dwellers known to act as stewards of the forests and who can provide protection against forest encroachment;
- b) **Zoning:** Introduction or expansion, and better enforcement, of forest management plans for more rational use and conservation of forest resources; providing clear zoning for livelihood activities, restoration, and carbon sequestration activities;
- c) **Protected areas:** Strengthening of existing protected areas and extension of existing protected areas in consultation with and agreement of local people;
- d) **Payments for environmental services:** Programs to reward private and public initiatives that reduce emissions from deforestation and degradation directly with cash payments.
- e) **Forest fires:** Improved forest fire prevention and suppression; prevention and suppression of agricultural fires expanding to forest areas; education and awareness campaigns about the use of fires in agriculture, and provision of alternatives to fires, or dissemination of techniques and tools for reducing the impact agricultural fires on forests;
- f) **Reforestation:** Promotion of new plantations, in particular on degraded lands, to meet timber and energy needs and remove pressure on natural forests, including through company-community partnerships;
- g) **Community development:** Programs designed to reduce poverty by raising living standards and supporting alternative livelihoods at the border between agriculture and forests (intensification of agriculture to increase yields and reduce forest encroachment; alternatives to slash-and-burn, including promotion of agroforestry to encourage the retention of trees in agricultural landscapes; support to general and environmental education); and
- h) **Community forestry:** Programs devolving forest management from the government to local communities in the context of contracts providing rights and responsibilities for the various parties.

14. Financial incentives will be directed to where they are needed for Emission Reductions. Thailand government with involvement of local communities, individuals and the private sector, will facilitate provision of carbon revenues (or alternative financing or support) in recognition of their contributions. In on-going projects in Thailand, where mechanisms have been set up for community participation in forest restoration and protection, local communities, individuals and the private sector would be the primary actors implementing the ER Programs and will be the principal beneficiaries of ER payments.

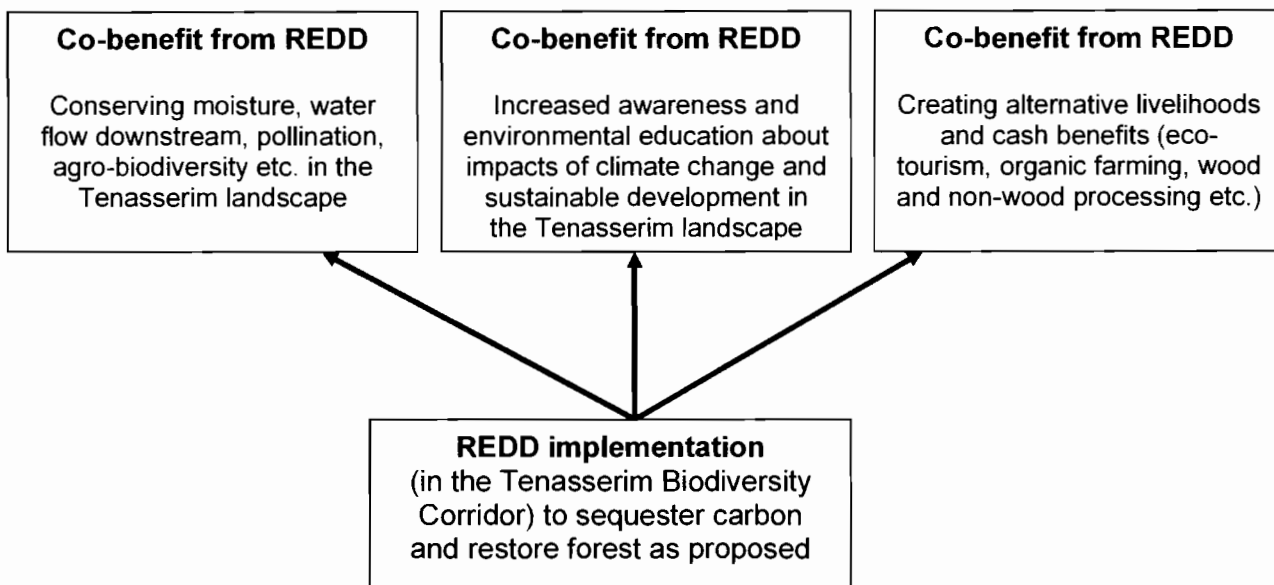
15. Lessons learned from the implementation of ER under the Carbon Finance Program will be widely disseminated not just within Thailand but also regionally among countries of the Greater Mekong Subregion (GMS), with whom Thailand

shares a GMS Economic Program facilitated and supported by the Asian Development Bank (ADB) as well as with Member States of ASEAN.

D. Economic and Ecosystem Co-benefits of REDD

16. It is expected that co-benefits generated from REDD implementation will be in the forestry sector, maintaining ecosystem services, improving environmental health, and creating additional employment.

Figure 6: Co-Benefits of REDD



17. Restoration of forests with long rotation species is expected to increase carbon sequestration potential as well timber volume for commercial use in the future (25-40 years); livelihood plantations with short term rotations are expected to provide cash benefits to poor households as well as revenue at harvesting time (8th year). Conservation of water and water resources and replenishment of spring water as well as rainwater harvesting, will enhance and maintain a vital ecosystem service for people and economic activities such as agriculture. Pollination and promotion of agro-biodiversity, including opportunities to explore establishment and certification of organic farming landscapes within sustainable use corridors (forests connecting two or more protected areas) will enhance spreading of biodiversity outside conservation core areas.

II. SITUATIONAL ANALYSIS

A. The Forest Sector in Thailand

18. Total land area of Thailand is about 513 thousand square kilometers (321 million rai). The country is divided into five regions. Of the total land area, the Northeast and the North each constitutes about one-third. The Central Plain and the South occupy about 13 percent and 14 percent of the total land area, respectively. The remaining 7 percent of the area is in the East. Between 1961 – 1999, forest cover estimates were done using manual methods and GIS/Satellite imagery was not well advanced/used. Hence, forest cover data shown below must be differentiated between data before 1999 and data after 2000. A discrepancy will be noticed in the Table 2 below:

Table 2. Land-use in Thailand 1961-2006

Year	(1) Forest area		(2) Farm holding area		(3) Unclassified (others)	
	(1,000 ha)	%	(1,000 ha)	%	(1,000 ha)	%
1961	27,362.90	53.30	na	na	na	na
1973	22,170.70	43.21	na	na	na	na
1976	19,841.70	38.67	Na	na	na	na
1978	17,522.40	34.15	Na	na	na	na
1982	15,660.00	30.52	Na	na	na	na
1985	15,086.60	29.40	Na	Na	na	na
1986	na	na	20,943.83	40.82	15,525.30	30.26
1987	na	na	20,992.42	40.91	15,712.02	30.62
1988	14,380.30	28.03	21,083.64	41.09	15,847.03	30.88
1989	14,341.70	27.95	21,092.99	41.11	15,876.81	30.94
1990	na	na	21,139.91	41.20	16,173.43	31.52
1991	13,669.80	26.64	21,292.19	41.50	16,349.51	31.86
1992	na	na	21,128.19	41.18	16,688.24	32.52
1993	13,355.40	26.03	21,003.34	40.93	16,956.06	33.05
1994	na	na	21,093.33	41.11	16,969.93	33.07
1995	13,148.50	25.62	21,196.57	41.31	16,966.43	33.07
1996	na	na	21,091.12	41.10	17,131.03	33.39
1997	na	na	20,977.22	40.88	17,303.70	33.72
1998	12,972.20	25.28	20,862.96	40.66	17,476.31	34.06
1999	na	na	21,014.62	40.95	17,399.25	33.91
2000	17,011.08	33.15	20,991.35	40.91	13,309.09	25.94
2001	na	na	20,969.60	40.87	14,239.79	27.75
2002	na	na	20,942.72	40.81	13,357.71	26.03
2003	na	na	20,909.12	40.75	13,391.31	26.10
2004	16,759.10	32.66	20,876.85	40.69	13,675.56	26.65
2005	16,100.13	31.38	20,909.12	40.75	13,391.31	26.10
2006	15,865.26	30.92	20,846.51	40.63	13,705.89	26.71

Source: (1) Forestry Statistics of Thailand, RFD 2007, (2) and (3) Agricultural Statistics of Thailand, 2007

19. From 1989 – 1993, when use of GIS data and satellite image information and technology assisted in improving information processing, most of the intensive deforestation had occurred in Northeast and the North of Thailand. Between 1995 and 2000, deforestation continued to occur in pockets of areas in the North and the Northeast. By 2006, the total forest cover in Thailand was estimated at 15.865 million ha, representing over 30% of the total land area of 513,000 Km² or 51.31 million ha compared to 1961, which had an estimated forest cover of over 50% of total land area. After submission of the Initial National Communication in 2000 by Thailand to

the UNFCCC, covering 1990-1994 data, the mapping (benchmarking) of forest cover and areas deforested using GIS technology has been produced for the years: 1995, 2000, and 2005 (see Table 3 below and R-PIN ANNEX 1).

Table 3. Landuse in Thailand, 1995 – 2005

Year	(1) Forest Area		(2) Farm holding area		(3) Unclassified (others)	
	(1,000 ha)	%	(1,000 ha)	%	(1,000 ha)	%
1995	16,596.64	32.06	21,196.57	41.31	16,966.43	33.07
2000	17,011.08	33.15	20,991.35	40.91	13,309.09	25.94
2005	16,100.13	31.38	20,909.12	40.75	13,391.31	26.10

20. In 1995 more than 41 percent was used for agriculture and about 32 percent was forests. By 2005, the land use of the country was divided between agriculture or farm holding land (over 40%), forest (over 31%) and unclassified area (over 26%). This pattern is the result of rapid expansion of agriculture on what was previously forest land. It is noteworthy that about a third of the total land remains “unclassified”. This includes urban and peri-urban areas, infrastructure, etc, but also degraded areas, which were in the past under the forest cover.

21. There are two main types of forests in Thailand: (1) evergreen forest and (2) deciduous forest. The **evergreen forest** is subdivided into the tropical evergreen forest, the pine forest, the mangrove forest and the beach forest.

- (1.1) **Tropical evergreen forest** is found all over the moist part of the country. This type of forest is also subdivided into the tropical rain forest, the semi-evergreen forest and the hill evergreen forest.
 - (1.1.1) **Tropical rain forest** is characterized by a very rich flora and very dense undergrowth. This type of forest is commonly found in the Southern and the Eastern regions where rainfall is above 2 000 millimetres. It is also found along rivers and/or in valleys in other parts of the country. The predominant species (the top store species) are, for example, *Dipterocarpus spp.*, *Hopea spp.*, *Lagerstroemia spp.*, and *Shorea spp.* whereas the lower storey species are bamboos, palms and rattans.
 - (1.1.2) **Semi-evergreen forest** is scattered all over the country where the rainfall is between 1,000-2,000 millimetres. The predominant species are *Dipterocarpus spp.*, *Hopea spp.*, *Diospyros spp.*, *Azalia spp.*, *terminalia spp.*, and *Artocarpus spp.* The main undergrowth species consist of bamboos and rattan.
 - (1.1.3) **Hill evergreen forest** is found on the highlands (above 1 000 metres from the sea level) where the climatic condition is the humid subtropical type. The presence of mosses and lichens on trees and rocks is the indicator of this forest type. The predominant species are oaks (*Quercus spp.*) and chestnuts, (*Castanopsis spp.*, and *Lithocarpus spp.*).
- (1.2) **Pine forest** has two species of tropical pines, *Pinus merkusii* locally called Son Song Bi (the two-needle pine) and *P. kesiya* locally called Son sam Bi (the three-needle pine). *P. merkusii* is found in the northern and the western part of the Central region, where the soil is poor (grave) lateritic and podzolic. *P. kesiya* is found only the highlands of the Northern and Northeastern regions.
- (1.3) **Mangrove forests** occur along the coastal areas of the Eastern, Central and Southern regions. The mangrove forest is scattered along the estuaries of rivers and seashores where the soil is muddy and influenced by the tide. The predominant species are *Rhizophora spp.*, *Xylocarpus spp.*, *Avecennia spp.*, *Bruguiera spp.*, and *Nypa spp.*

- (1.4) **Beach forests** occur along the sandy coastal plains especially in the eastern coast of the Southern region. The main species in this type of forest are *Diospyros spp*, *Croton spp*, *Lagerstroemia spp* and *Casuarinas pp*.

22. **Deciduous forest** is characterized by the presence of deciduous tree species and is commonly found throughout the country. It is broadly subdivided according to the species composition into the mixed deciduous forest (with and without teak) and the dry dipterocarp forest.

- (2.1) **Mixed deciduous forest** is commercially among the most valuable forest of Thailand. In the Northern Region, this type of forest is called the teak forest with *Tectona grandis*, *Xylia kerrii*, *Pterocarpus macrocarpus*, *Azelia xylocarpus* and *Dalbergia spp* (rose wood) as dominant/common species.
- (2.2) **Dry dipterocarp forest** is commonly found in the dry area (rainfall below 1 000 millimeters) with sandy or gravely lateritic infertile soils. The predominant species are mainly *Dipterocarpaceae* such as *dipterocarpus tuberculatus*, *D. obtusifolius*, *Shorea obtuse*, *S. sidmensis* with the presence of *Dalbergia spp*, *Lagerstroemia spp*, *Terminalia spp* and other species

23. The area of the main forest types in 2000 comprised of:

Table 4: Forest Type, Thailand and area, 2000

Forest ecosystem	Km ²	1,000 ha
Tropical rain evergreen forest	15,448.85	1,544.89
Semi-evergreen forest	22,903.16	2,290.32
Hill evergreen forest	14,327.04	1,432.70
Pine forest	462.08	46.21
Swamp	560.79	56.08
Mangrove forest	2,452.55	245.25
Beach forest	124.96	12.50
Mixed deciduous forest	87,444.74	8,744.47
Dry deciduous forest	18,569.52	1,856.95
Bamboo forest	1,503.50	150.35
Plantation	1,966.72	196.67
Eucalyptus Plantation	1,510.28	151.03
Rehabilitated forest	2,836.59	283.66

24. In 2007, the country has about 2.5 million hectares of forest plantations (about half of which are rubber plantations). Rubber planting has been actively promoted by the Government since the 1960s and the total area reached 1,906 million hectares in 2005 and 2.377 million hectares in 2007 of which 75% is found in the Southern region, 10% in the Eastern region and 14% in the Northeast region.

Table 5. Rubber Plantation in Thailand

Region/Province	area (ha)		
	2005	2006	2007
Southern region	1,602,449.44	1,764,796.48	1,791,962.08
1. Prachuabkirikhan	6,588.00	11,908.80	13,831.52
2. Chumporn	64,092.64	72,486.24	73,446.24
3. Ranong	17,070.88	19,300.00	20,100.00
4. Surathani	280,799.36	289,222.88	292,825.76
5. Nakhon Si Thammarat	102,295.20	218,886.72	224,129.28
6. Phanga	102,295.20	104,068.32	105,348.32
7. Phuket	17,594.40	16,840.96	16,317.60
8. Krabi	93,808.32	96,343.52	97,623.52
9. Trang	206,521.12	209,861.60	209,490.08

Region/Province	area (ha)		
	2005	2006	2007
10. Pattalung	81,910.56	84,064.00	86,145.76
11. Songkhla	222,057.76	227,028.32	231,041.92
12. Satool	42,632.32	45,197.60	46,369.76
13. Yala	163,405.44	164,250.08	167,430.08
14. Pattani	44,549.44	46,052.80	47,137.12
15. Narathiwat	156,828.80	159,284.64	160,725.12
Eastern region	209,561.44	237,493.44	242,413.76
16. Chonburi	21,621.28	27,996.80	28,305.76
17. Chachoengsao	12,308.64	17,957.28	18,074.56
18. Rayong	89,664.32	96,407.52	98,712.96
19. Chantaburi	52,678.40	58,365.76	59,160.00
20. Trat	31,677.60	34,578.72	35,692.32
21. Srakaew	1,611.20	2,187.36	2,468.16
22. Northeastern region	94,450.08	246,339.68	342,912.96
Total	1,906,460.96	2,248,629.60	2,377,288.80

Source: Rubber Research Institute of Thailand website (<http://www.rubberthai.com/>)

Search date: 28 November 2008

25. Thailand's primary sources of industrial wood are plantation forests, non-forest trees, agricultural tree crops (particularly rubberwood) and imports. The country produces significant quantities of sawn timber, wood-based panels and paper. Furniture manufacturing is an increasingly important industry. As a result of the logging ban, imports of logs, sawnwood, short and long-fibre pulp and recovered paper are important constituents of Thailand's wood processing sector. Thailand is one of the world's leading importers of tropical sawnwood. Nevertheless, the domestic wood industry is unable to meet the country's needs because of shortage of raw material. The household sector uses about 20 million tonnes of wood annually for woodfuel, which is met by local supplies (from home gardens, woodlots and public forests). However, there is a shortage of woodfuel in the industrial sector, which requires about 6.5 million tonnes annually. Thailand's rapid economic growth (in early 2004 about 8 percent and among the fastest in the Asia and the Pacific Region) challenges the forestry sector to find ways to combine national economic growth with needs for forest conservation and environmental development. Recently, Thailand has been cooperating closely with Cambodia to control illegal trade of timber from Cambodia.

Table 6. Plantation area by sector in Thailand

Year	Public Sector all spp. (ha) 1	Private / Farmer holdings			Total (ha)
		Other spp. (ha) 2	Rubber (ha) 3	sub total (ha)	
1992	522.77	169.00	na	169.00	691.77
1993	854.59	9,576.00	na	9,576.00	10,430.59
1994	1,185.05	20,974.00	na	20,974.00	22,159.05
1995	1,412.96	33,702.00	na	33,702.00	35,114.96
1996	1,526.41	51,957.00	na	51,957.00	53,483.41
1997	1,906.98	56,415.00	na	56,415.00	58,321.98
1998	2,099.89	59,613.00	na	59,613.00	61,712.89
1999	2,426.15	65,866.00	na	65,866.00	68,292.15
2000	2,636.84	70,862.00	na	70,862.00	73,498.84
2001	2,862.90	78,301.00	na	78,301.00	81,163.90
2002	3,121.35	87,266.00	na	87,266.00	90,387.35
2003	3,239.16	97,505.00	na	97,505.00	100,744.16
2004	3,382.58	107,785.00	na	107,785.00	111,167.58
2005	3,875.13	143,780.00	1,906,460.96	2,050,240.96	2,054,116.09
2006	4,191.51	155,712.00	2,248,629.60	2,404,341.60	2,408,533.11
2007	4,485.87	157,265.00	2,377,288.80	2,534,553.80	2,539,039.67

Source: 1. Forestry statistics of Thailand, RFD 2007; 2. Farmer plantation database, RFD 2008; 3. Rubber Research Institute of Thailand website (<http://www.rubberthai.com/>)

26. Expansion of plantations by Forest Industry Organization (FIO) is currently estimated to be 187,000 ha planned for 2008.

Table 7. FIO Plantation Area (2008)

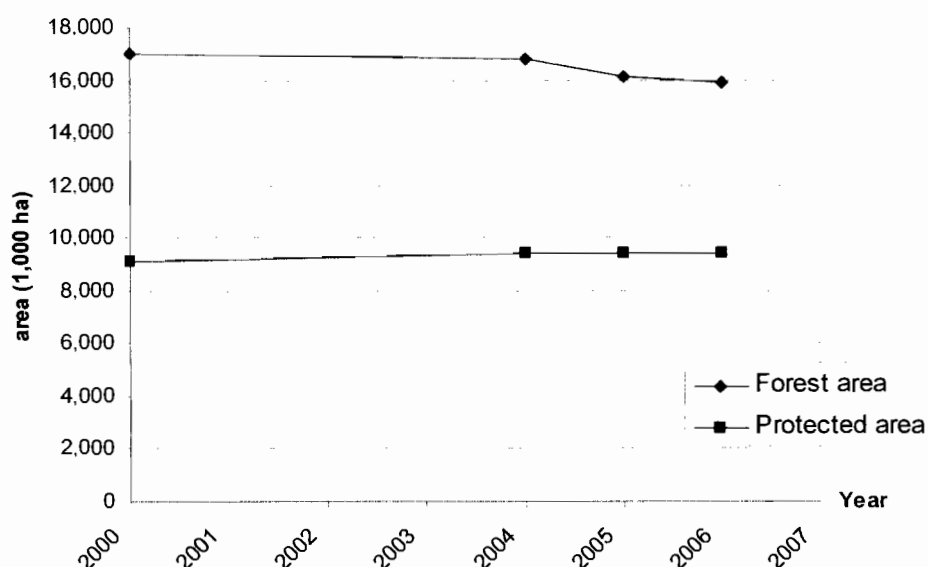
Species	Area	
	Rai	Ha
Teak	578,102.72	92,496.44
Teak mixed with others	24,897.11	3,983.54
Mixed Deciduous spp.	329,339.10	52,694.26
Eucalytus spp.	200,955.72	32,152.92
Para Rubber	34,498.55	5,519.77
Total	1,167,793.20	186,846.93

Source: Business Plan for 2008, Forest Industry Organization (January, 2008)

27. A network of parks and reserves encompasses about 17 percent of the total land area. By 1999, 56 percent of the existing forest areas had been declared national conserved forests. The existing 227 protected areas⁶ amount to 11.3 mill. ha and they are under the management of the Department of National Park, Wildlife and Plant Conservation (DNP). At least five million people⁷, the approximate number of actual forest dwellers in Thailand, are critically dependent on non-timber forest products (NTFP). Non-timber forest products include a large number of plant and animal products. The most important NTFP are bamboo, rattan, lac, bee products and medicinal plants.

⁶ Excluding botanical gardens and arboreturns. The PA system is relatively fragmented and individual areas vary in size, habitat and conservation condition. In many areas degradation of the conservation values is ongoing from local agricultural encroachment, infrastructure and tourism development, illegal logging and substantial illegal wildlife trade

⁷ Various source give estimates for forest dependent people ranging from 2 to 5 million people

Figure 7: Forest area and Protected area in Thailand

B. Deforestation and Degradation: national benchmarks (2006)

28. In 1961, the total forest area of Thailand was about 27 million ha. covering over 53.3% of the country. Subsequently, forest areas were encroached for the purpose of slash-and-burn, shifting cultivation, land resettlement, dam and road construction, land reform for agriculture, etc. From 2000 onwards the forest area has been assessed from LANDSAT-5 interpretation imageries at the scale of 1:50,000, while the earlier assessments were made using imageries of 1:250,000. Due to the change of scale and method of calculation⁸ a new benchmark was established for forest area. The current forest cover is estimated at 15.8 million ha (2006).

Table 8. Landuse 2000 - 2005

Year	(1) Forest area		(2) Farm holding area		(3) Unclassified (others)	
	(1,000 ha)	%	(1,000 ha)	%	(1,000 ha)	%
2000	17,011.08	33.15	20,991.35	40.91	13,309.09	25.94
2001	Na	na	20,969.60	40.87	14,239.79	27.75
2002	Na	na	20,942.72	40.81	13,357.71	26.03
2003	Na	na	20,909.12	40.75	13,391.31	26.10
2004	16,759.10	32.66	20,876.85	40.69	13,675.56	26.65
2005	16,100.13	31.38	20,909.12	40.75	13,391.31	26.10

29. The deforestation rate estimated between 2000 and 2005 is at 1.07%, which is higher than what has been so far assumed at 0.73% in the period 1991-1998.

Table 9. Deforestation rate in Thailand 2000 – 2005

Period		Deforestation rate**		
From	to	'000 ha/yr	'000 Km ² /yr	%
1991	1998	99.66	1.00	0.73
2000	2005	182.19	1.82	1.07

** calculated from RFD statistics, 2007

⁸ Any pixel containing an element of tree cover was included as a whole in forest/area (Charupatt, pers.comm.).

C. Drivers / Causes of Deforestation and Land Degradation

30. Thailand's forest resources have been subjected to continuing pressure and devastation. Between the 1960s and the 1980s, forest resources were reduced by shifting cultivation, land resettlement, dam and road construction and conversion to agricultural use. Demand for land for subsistence farming, commercial agriculture, physical infrastructure, tourism and other uses remains high.

31. Thailand banned all commercial logging in natural forests in 1989 and has instituted supporting measures to protect the remaining forests and to promote private-sector involvement in forest management and plantations. Nevertheless, deforestation and forest degradation have continued, and efforts to combat forest loss remain a leading issue in the country. From 1990 to 2000 forest cover decreased at an annual rate of 0.7 percent.

32. Forest fires are another main cause deforestation. Although this is mainly used as a slash and burn practice as well as for land preparation, most widely practiced in the North, the total area of forest burned is on the decline.

Table 10. Forest area burned by fire classified by region, Thailand (ha)

Year	Northern	Northeastern	Central	Southern	Total
1999	11,793.28	10,912.96	5,528.00	894.40	29,128.64
2000	13,315.52	7,677.92	4,908.00	686.40	26,587.84
2001	11,266.40	11,113.44	3,550.88	1,050.24	26,980.96
2002	15,903.20	13,718.72	5,285.12	5,635.52	40,542.56
2003	7,141.60	4,956.00	2,782.24	883.84	15,763.68
2004	18,509.28	8,551.84	3,798.88	1,421.44	32,281.44
2005	10,803.68	9,756.80	6,120.96	3,602.72	30,284.16
2006	4,229.76	3,341.12	844.00	206.72	8,621.60
2007	8,764.32	6,272.64	3,035.84	710.56	18,783.36

Source: Fire Forest Control Division, Forest Protection Office, DNP (2008)

Figure 8: Forest destroyed by fire

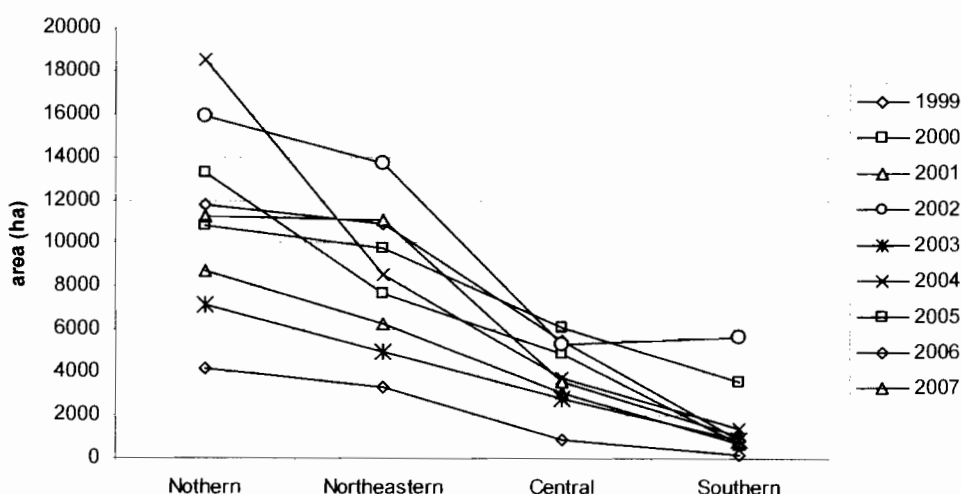
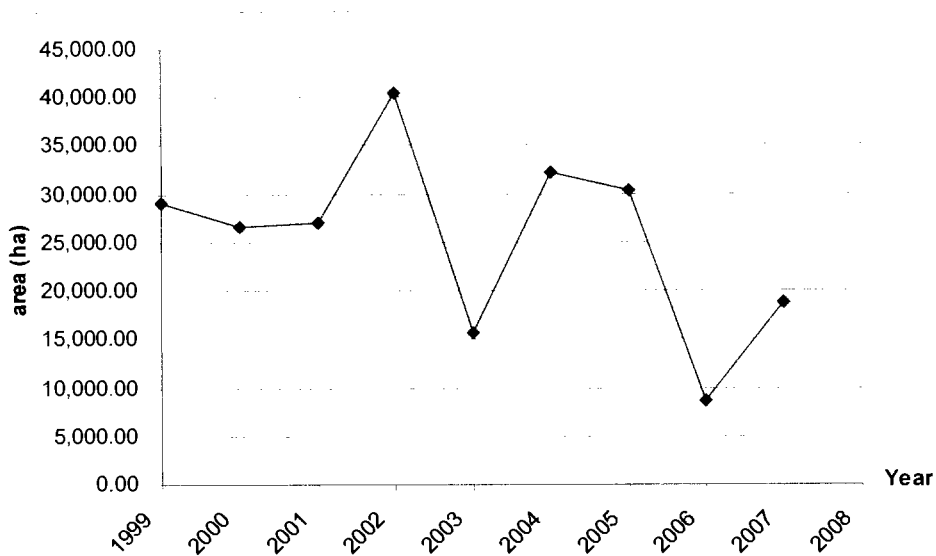


Figure 9: Total Forest Area destroyed by fire

D. Institutional capacity and constraints in forest management

33. The Ministry of Natural Resources and Environment (MNRE) has mandate over forest management and all the departments are under the supervision of MNRE, which has the under it the following offices/departments:

- (i) *Office of Natural Resources and Environment Policy and Planning* develops the natural resources and environmental enhancement and conservation management plan and policy.
- (ii) *Pollution Control Department* regulates supervises, directs, co-ordinates, monitors and evaluates rehabilitation, protection and conservation of environment quality.
- (iii) *Department of Environment Quality Promotion* carries out research, development training, public awareness, development of environment technology, natural resources and environment.
- (iv) *Royal Forest Department.*
- (v) *The Department of National Park, Wildlife and Plant Conservation.*
- (vi) *Department of Marine and Coastal Resources.*
- (vii) There are two state enterprises in the forestry sector: *Forest Industry Organization (FIO)* involved in reforestation, teak plantation, sawmilling, and development of forest villages. FIO's subsidiary *Thai Plywood Company Ltd.* Produces plywood and other wood products.

34. The Royal Forest Department (RFD) was founded in 1896 in Thailand to consolidate the exploitation of forests. As a result, the ownership and control of all forests were transferred from the feudal chiefs to the Government. In 2002, RFD consisted of three Departments: Royal Forest Department (RFD), National Park, Wildlife and Plant Conservation Department (DNP) and Department of Marine and Coastal Resources (DMC). All these departments are now under the supervision of MNRE.

35. RFD is responsible for forests outside protected areas, while DNP manages Protected Areas. DMC performs resource management of marine of coastal flora and fauna, including mangrove forests, through conservation and rehabilitation. The following agencies are also dealing with forests.

36. In addition, some important functions of forest development are with the Ministry of Agriculture and Cooperatives (MOAC), which has the following offices/departments:

- (i) *Land Development Department* – A division of this Department is responsible for land use planning. Several categories of forestry land uses are included in its land use related work;
- (ii) *Agricultural Land Reform Office* – Large number of the state forest land are being declassified and turned over to this office for distribution to the farmers;
- (iii) *Office of Agricultural Economic* collects statistics and conducts economic studies concerning agricultural crops, including forestry information;
- (iv) *Rubber Estate Welfare Fund Office and Rubber Estate Organisation* are responsible for development of rubber plantations; and
- (v) *Office of Marketing Organization for Farmers* is a possible alternative to developing markets for forest products.

37. Other relevant Ministries and agencies are as follows:

- (i) *Ministry of Interior*: The day-to-day operations of the province and district forest officers of RFD are supervised by the office of the Governor of the different provinces, which are under the Ministry of Interior's Local Administration Department. The Natural Resources and Environmental Crime Division of the Police Department assists in forest protection and control of illegal activities.
- (ii) *Ministry of Industry and Ministry of Commerce* are responsible for promoting forest-based industries and their internal and overseas trade.
- (iii) *National Economic and Social Development Board (NESDB)* prepares and promotes the National Economic and Social Development Plans on a five-year cycle, formulates the policies to implement the plans and assesses the progress of forest development programs to ensure their consistency with the plan.

38. The main constraint is a fragmented role and responsibility for national level monitoring and reporting between RFD and DNP. This could be put under one joint unit responsible for REDD MMV. Capacity strengthening in carbon measurements and scenario referencing as well as climate change impacts are needed to enhance skills in MNRE, ONEP, RFD and DNP.

E. On-going activities / projects in the Forest Sector relevant to REDD

39. Some of the on-going programs, projects and activities most relevant to REDD are:

- a. An ITTO project titled 'To Establish a National Monitoring Information System for the Effective Conservation and Sustainable Management of Thailand's Forest Resources' (PD 195/03 Rev.2 (F)) to the amount of US\$ 1.060 million. Among the project's most important outputs will be establish a national forest resources monitoring information system to provide change and trend data on timber and non-timber forest resources. The project's immediate achievement has been an unbiased independent data showing the currently reported national

total forest area statistic of 33.66%; and national tree volume, biodiversity and other attribute statistics have been obtained, which were not previously available. A follow up ITTO project PD 376/05 Rev.2 (F,M) aims to develop methods to increase the accuracy of tree volume and other attributes for small areas (sub-districts) for tree resources outside forest;

- b. An ADB funded Biodiversity Conservation Corridor Initiative project under the GMS Core Environment Program with an estimated USD 1.4 million investment in the Tenasserim BCI Pilot Site and feasibility study of the Khao Yai - Dong Phrayayen Forest Complex. The BCI has five components: (i) poverty reduction (ii) land management regimes; (iii) ecosystem restoration; (iv) capacity building; and (v) sustainable financing. The project was initiated in 2006 and the first phase is expected to finish in 2009; an upscaling of BCI activities is planned. DNP is managing the project and it has gained sufficient experience with community involvement to start pilot REDD activities under the Carbon Financing Component of FCPF;
- c. Ngao Model Forest – A Partnership in Support of Sustainable Forest Management supported by the Canadian Model Forest Network (2008-2009)
- d. An ITTO project titled 'Contribution to Forest Rehabilitation in Thailand's Areas Affected by the Tsunami Disaster' (PD 372/05 Rev.1 (F)) to the amount of US\$ 790,020. Among the project's most important outputs will be the rehabilitation of 1,250 ha damaged by the tsunami and the elaboration of plans for long-term community-based coastal forest rehabilitation in pilot areas of the provinces of Krabi and Pang Nga. The project will promote the use of bamboo in house construction and furniture to replace mangrove wood. The Danish Government is supporting rehabilitation of biodiversity and ecosystem functions of protected areas affected by the tsunami catastrophe with responsibilities and outcomes of sustainable management shared among all stakeholders.

III. CURRENT POLICY / LEGAL FRAMEWORK

A. Relating to Forestry and Protected Areas

40. The first explicit goal for forest conservation was set up in the 1st National Economic and Social Development Plan (NESDP) of 1961. In this plan, the target of forest cover was set at 50% of the total land area. At that time it was estimated that 53.33% of the country was under forest cover. Between 1964 and 1992, the Ministry of Agriculture and Cooperatives issued over one thousand Ministerial Regulations (decisions) declaring almost half of the country as National Reserve Forests (NRFs). At that time, 23.6 million ha (46% of the total area) had been gazetted as NRFs.

41. The main objective of Thailand's first comprehensive National Forest Policy, 1985 was to maintain forest area at 40 percent of the total land area, with 15 percent set aside for conservation and 25 percent for production purposes. As a result of floods and landslides in Southern Thailand in 1988, the Ministry of Agriculture and Cooperatives was authorized to impose on January 17, 1989 a ban on all timber extraction from natural forests. The Government increased the percentage of the conservation forest from 15% to 25% in the 7th NESDP (1992-1996).

42. In line with the efforts to slow deforestation, the government submitted a request for assistance from the donor community to launch a Forestry Sector Master Plan (FSMP). The exercise began in 1991, assisted by the Asian Development Bank and the Finnish International Development Agency (FINNIDA). The lead institution was the Royal Forest Department. FAO provided data and technical reviews. □The FSMP was completed in 1993 but has not yet been endorsed or accepted by Government. In order to resolve long term disputes concerning utilization of resources in NRFs, the Cabinet approved in 1992, the classification of NRFs into 3 zones: (i) conservation zone (28%); (ii) economic zone (16%); and (iii) agricultural zone (2%). Relocation of forest dwellers was also launched in the Northeast Thailand from 1991 -1995. At the same time, the drafting of the Community Forest Bill was initiated in 1992. The RFD was also given a new mandate and restructured by Royal Decree of October 22, 1992 to undertake extension rather than protection and it started work with local communities. One of first pilot projects initiated in 1992 on buffer zone management was in Huay Khakaeng Wildlife Sanctuary, which is now part of the Western Forest Complex (WEFCOM) that makes up the northern part of the Tenasserim Biodiversity Corridor (pilot REDD proposed herein).

43. The 8th NESDP (1997-2001) set out objectives to ensure that utilization of natural resources is counter-balanced by rehabilitation and protection programs, promoting effective management. The Plan set a target of rehabilitating and protecting forest area that is no less than 25% of the total area of the country and to promote natural resource management systems for community forest and participation of local people and communities. In 2001, the Action Plan of Delineation of Powers to Local Administration Organizations was approved by Cabinet and passed by the National Assembly and an action plan initiating community forest activities and forest fire control was launched by RFD with local administration organizations in FY 2003.

44. The 9th NESDP (2002 – 2006) continued with maintenance of 25% of forest as conservation area and set targets such as establishing class 1 watershed areas as protected areas, providing opportunities in the management of community forest for the local communities, recognize community rights, promulgate the community forest act, and establish a network of local administration organizations, NGOs and communities to participate in management of natural resources and community forest. It also called for at least 200,000 ha to be maintained as mangroves. By 2004, the total mangrove area (before Tsunami in Dec 2004) was estimated to be 233,307 ha and by 2007, the total area of mangrove forest had reached 237,218 ha. The 10th NESDP (2007 – 2011) sets a target of maintaining at least 33% of the total area under good forest cover, of which 18% should be protected area; the target for restoration of protected areas is set at 464,000 ha.

45. Towards end of 2002 Thailand's government forestry institutions have been restructured, with more than 7,000 Royal Forest Department staff transferred to the Natural Resources and Environment Ministry to form the DNP and DMC. The Bureaucratic Restructuring Act 2002 has left 1,100 staff in the Royal Forest Department, which retains the role of promoting forestry to boost national revenues. The reduced Royal Forest Department also retains responsibility for enforcing the Forestry Act, the Forest Reserve Act and the Forest Plantations Act, and will also enforce the Community Forest Bill when it is enacted.

46. The most significant recent political development in Thailand has been the 1997 Constitution, which contains a number of innovative provisions with respect to conservation and sustainable use of natural resources. These include the right of traditional communities to participate in management, maintenance, preservation and

exploitation of natural resources; promotion and encouragement of public participation in the preservation, maintenance and balanced utilization of natural resources. The Constitution clearly notes the rights of civil socialites in managing natural resources and the roles of actors⁹.

47. The 1999 Decentralization Act declares the mission to delegate public services to local administrations between 2002 – 2011. The government's action plan on the decentralization of community forest development and forest fire control to Tambon (subdistrict) Administration Organizations (TAOs) was started in FY 2003.

48. The 1994 Tambon Council and Tambon Administration Organization Act, which empowers TAOs for economic, social and cultural development. These responsibilities include protection and maintenance of natural resources and environment of the locality.

49. The Government of Thailand has established stringent laws toward the protection and conservation of forest areas including water and biodiversity. Presently, there are following five main Forestry Acts:

- (1) Forest Control Act, 1941 concerns logging operations and non-wood forest products collection, transportation of timber, and non-timber products and, sawn wood production as well as forest cleaning.
- (2) National Park Act, 1961 covers the determination of the National Park land, National Park Committee, as well as protection and maintenance of the National Park.
- (3) National Reserved Forest Act, 1964 includes the determination of National Reserved Forest, control and maintenance of the National Reserved Forest.
- (4) Wildlife Preservation and Protection Act, 1992 establishes provisions for the National Wildlife preservation, establishment of Protection Committee and identification of 15 species of reserved wildlife.
- (5) Forest Plantation Act, 1992 covers the determination of reforestation and land registration of private reforestation right, ownership and exemption from royalty on forest products from reforested areas.

50. Besides the provisions for heavy penalties under these Acts, other provisions have been made to ensure that any crime or illegality in the field of forestry and wildlife is effectively controlled and convicted. As a whole, there are more than 20 laws and a number Cabinet decisions for forest and resource management. Under Section 39.23 of Forestry Act, 1941, whoever moves the timber or forest products shall have a transit (moving) pass issued by the competent officer in accordance with the terms specified in the ministerial regulations.

B. Relevant national development plans and programs

51. Over the last four decades of national development all parties in Thai society have had to continuously adjust to changing socio-economic situations. The First and Second National Economic and Social Development Plan (NESDP) (1961-1970) emphasized economic growth through the diversification of investment in infrastructure, including road, electricity, and water supply networks. Despite achieving an impressive record of economic growth, both income distribution and the quality of life of the people in the rural areas deteriorated. Hence, the Third Plan (1971-75) gave more attention to social development, the reduction of the population growth rate, and income distribution. During the Fourth Plan period (1976-1980),

⁹ Article 46, 56, 59, 69, 79 and 290.

political uncertainty and an energy crisis ensued, bringing about severe deficits in balance of trade and current account. As a response, the Fifth and Sixth Plans (1981-1990) emphasized economic stability, structural adjustment and poverty eradication. A subsequent worldwide economic recovery brought about rapid expansion of the economy, causing it to overheat. The Seventh Plan (1991-1995) subsequently began the shift to a sustainable development paradigm which emphasizes maintaining a sustainable level of economic growth, stability, improving income distribution, developing human resources, and enhancing the quality of life and the environment.

52. The Eighth NESDP (1996-2000) continued change I development concept, shifting from a growth orientation to people-centered development. The well-being of the people was considered the final measure of success; economic improvement was viewed only as a means toward this goal. The planning process has also been shifted from a compartmentalized to a more holistic approach, which enable all stakeholders in the society to participate in the national development planning process. However, due to the Asian economic crisis (1996-1998) there was a need to revise the plan, which more attention given to economic stabilization, provision of social protection and economic structural adjustment.

53. The economic crisis generated many negative impacts on the quality of life which have not yet been duly addressed. Poverty and income disparities have worsened. In addition, unemployment has also increased. The rapid deterioration of natural resources and the environment has also given rise to more social conflict. Despite all of these shortcomings, the Eighth Plan's emphasis on participation was a major step toward the mobilization of Thai people to play a more active role in the process of national development. This is evident in the increased levels of political activism, networking among people's organizations and public-private partnerships, which all serve as a strong foundation for the future development of the country. The collaborative efforts have not only led to the identification of shared vision and development strategies for Thailand's future, but also to a significant degree of consensus to adopt the "philosophy of sufficiency economic" introduced by the King. It stresses the middle path, moderation and due consideration in all manner of conduct, as the guiding framework for national development.

54. Thailand's strategic framework for addressing its national development challenges from 2007 to 2011 is the 10th National Economic and Social Development Plan. This consists of five strategies. The first is human and social development, with an emphasis on education and developing a learning-based society. It is grounded in the need to increase Thailand's productivity and competitiveness in the global economy. The second is strengthening the economic foundation of local communities. The third is restructuring the national economy to achieve productivity gains, promote domestic and foreign investment, and increase competitiveness. Infrastructure development, capital market development, and energy efficiency improvements are core elements of this strategy. The fourth is sustainable development through protection and sound management of the environment and natural resources. The fifth strategy is good governance for sustainable, long-term economic growth and development.

C. Synergy with cross sectoral development policies and programs¹⁰

55. Thailand's MDG-plus target of reducing the proportion of poor people to below 4% (based on the national poverty line) by 2009 focuses on the need to address the persistent disparities among regions and population groups. In this regard, the Government's support for poverty reduction and improving child and maternal health includes targeted programs in the northeast, the remote highland areas of the north, and the three predominantly Muslim southern provinces. The Government has earmarked funds and designed programs to address the needs of disadvantaged groups, including orphans, the elderly, people with disabilities, and ethnic minorities. Greater decentralization of service delivery to local authorities and NGOs is also improving the targeting, tailoring, and monitoring of individual programs.

56. Implementation of the 10th National Plan aims to achieve balanced, inclusive, and sustainable development while upholding the principles and practice of good governance. Thailand is making progress toward this MDG by integrating the principles of sustainable development into its country policies and programs, although it will be difficult to reverse the loss of environmental resources. If Thailand is to achieve sustainable development it needs to pursue a balanced approach to economic growth that is anchored in sound environmental management, energy efficiency, and renewable energy.

57. Synergies can be sought between REDD and environmental management, energy program in general and health interventions in the North and Northeast, whereby REDD can be seen as an income enhancing supplementary program.

¹⁰ This section is based on information contained in ADB's Country Partnership Strategy. Thailand (2007 – 2011). April 2007

IV. PROPOSED APPROACHES FOR REDD IMPLEMENTATION IN THAILAND

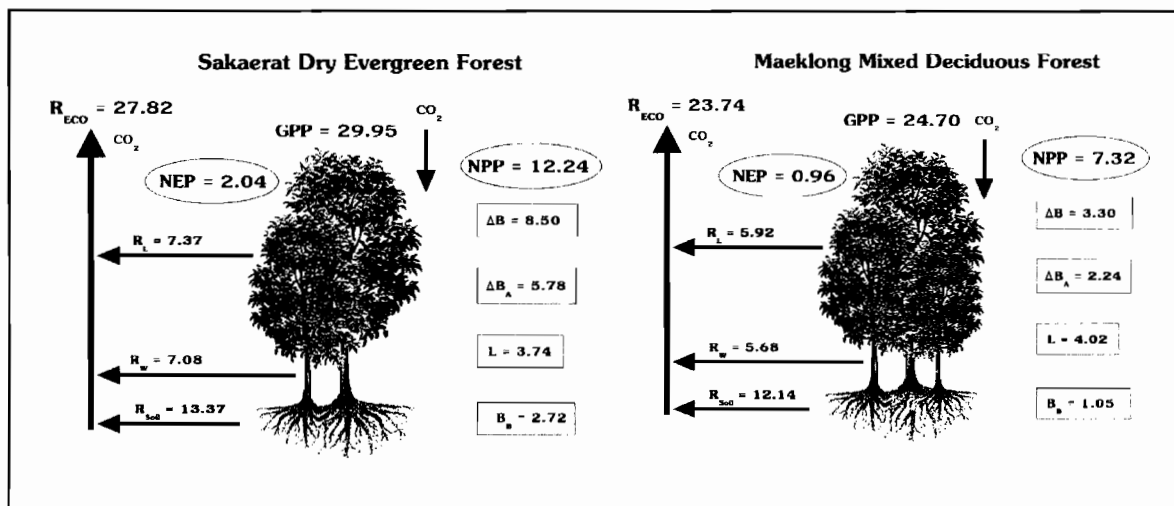
A. Capacity Building for REDD Readiness Plan Implementation

58. The national level lead agencies RFD and DNP will be coordinating the REDD implementation for building up national reference scenarios and updating with accuracy the current data base and mapping of forested and deforestation areas. It will also carry out or facilitate a wide range of multistakeholder REDD consultations with stakeholders at national, provincial, and district/sub-district and village levels. It REDD coordinator will be in charge of overseeing the development of the national REDD strategy and its adoption by the Government.

B. Carbon cycle assessments and research in the Forest Sector

59. The forest ecosystem in Thailand consists of a high diversity in dominant tree species depending on topography and climatic factors. Each forest type has potential for CO₂ sequestration depending factors like dominant tree species, human disturbance, etc. During 2003 to 2006, preliminary research on CO₂ sequestration of forest ecosystem was conducted by the Office of Forest and Plant Conservation Research, National Park, Wildlife and Plant Conservation Department in two locations: dry evergreen forest at Sakaerat Environmental Research station, Nakhon Ratchasima Province, and a mixed deciduous forest at Maeklong Watershed Research Station, Kanchanaburi province.

Figure 10: Carbon cycling in the Sakaerat dry evergreen forest (DEF), Nakhon Ratchasima



61. Results from the first site in Sakaerat show that CO₂ sequestration in Dry evergreen forest, which has a tree density of 1,177 trees/ha sequesters 109.49 t CO₂/ha/yr. Quantities for respiration were about 101.96 t CO₂/ha/yr. As a consequence, remaining carbon stock was 7.53 t CO₂/ha/yr or 2.04 tC/ha/yr. In the second site, CO₂ sequestration and respiration in mixed deciduous forest were 90.57 and 87.06 tCO₂/ha/yr respectively. This forest can sequester a carbon stock of about 3.51 tCO₂/ha/yr or 0.96 tC/ha/yr. It is important to verify whether sequestration potential has been accurately calculated and this kind of research needs to continue in other forest types as well for complete data on CO₂ sequestration of forest types in Thailand. The objectives of such a study would be to (i) monitor carbon changes in forms of biomass increment and litter production; (2) to determine the ecosystem

carbon dioxide (CO₂) gas exchanges including uptakes and release by plants as well as emissions from soils; and (3) compare their potential as carbon sinks in terms of net ecosystem production (NEP). Development of photosynthesis modeling and respiration measurement techniques is also required to obtain more accurate carbon accounting.

C. Participatory multi-stakeholder consultations for REDD

62. Thailand will involve key national and international scientific and political stakeholders in the discussion of issues related to Readiness. The REDD coordinator will provide opportunities of multi-stakeholder consultations to improve the REDD strategy by identifying the drivers of deforestation, defining solutions for deforestation and solutions for a fair and adequate financial distribution mechanism, and providing a process-based mechanism to take different views into account. The country-led Readiness process will inform relevant stakeholders about the substance and meaning of REDD, the IPCC Good Practice Guidance, how capacity building and positive incentives for REDD could benefit the country and specific stakeholder groups within it, and transform rural livelihoods and forest protection.

63. The national level REDD coordinator will identify affected stakeholders; work with relevant stakeholders on the preparation of a consultation and communication plan that will define the procedures and mechanisms for stakeholder consultation prior to the implementation of Readiness activities. The plan would involve responsibilities, a system for voicing grievances and disclosing policies throughout the Readiness process, in particular for the setting of REDD strategies and operational framework for REDD. Special attention will be given to forest-dependent indigenous peoples and other forest dwellers, in the debate on concrete solutions for reducing deforestation and degradation.

D. Channeling resources to beneficiaries through CBOs and VFs

64. Resources secured under REDD proposal for pilot activities have to be channeled to beneficiaries at village level, who are the true guardians of the ecosystem. Without active participation of village dwellers living adjacent to NPs and FPs, enforcement and patrolling by NP and FR authorities will be insufficient to provide effective protection and establish sustainable use of ecosystem resources. The REDD program strategy aims at channeling resources directly to those community based organizations (CBOs) or village groups, which have already received inputs and some technical assistance from the BCI pilot site project under ADB RETA 6289 or similar on-going programs and projects in the Tenasserim Biodiversity Corridor, such as the Royal Princess's Project. It is proposed that REDD pilot implementation will provide three financing streams directly to CBOs, which: (i) are covering households and based in local communities that are adjacent to National Park and Forest Reserve areas in the Tenasserim Biodiversity Corridor; (ii) are "registered" with local authority bodies and confirmed as "eligible" by the BCI project management; (iii) have opened and are operating an account; (iv) are wide enough in their charter and mandate to allow undertaking of diverse income generating activities (IGAs) and not restricted to a single sub-sector (e.g. bee-keeping only); (v) are involved in land or farm based activities; and (vi) have received or will receive technical assistance to manage micro-credit operations through competent service providers engaged by BCI project management.

E. Participatory benefit sharing and benefit streams

65. Given the importance of imparting benefits to local communities and enabling them to sustainably manage the ecosystem resources, it is essential to implement approaches that provide incentives to local communities under REDD. It is proposed that REDD pilot implementation in the Tenasserim Biodiversity Corridor will provide three financing streams directly to selected local communities and households that live adjacent to National Park and Forest Reserve:

- a) Direct grant of \$10,000 to selected Community Based Organizations (CBOs)¹¹, whose “eligibility/readiness” to receive this grant for establishing a **Village Fund with revolving mechanism (VF)** for Income Generating Activities (IGAs) is “**confirmed**” by BCI project management based on results of TA currently being provided in the pilot site through RECOFTC;
- b) Financing of cash-based fast growing (with 8 years rotation) **livelihood plantations** for participating households, using an equity and benefit sharing model that allows households to plant up to 5 ha of degraded land currently under jurisdiction of government and local authority agencies in the Tenasserim Biodiversity Corridor and providing “user rights” based on **Participatory Benefit Sharing Agreements (PBSA)** that allow cash payments for planting and maintenance and sharing of revenue accrued at harvest at a ratio of 70:30, whereby 70% goes to participating households and 30% flows back to the Village Fund (revolving fund) under “a” above for replanting;
- c) Cash payments for replanting of degraded areas closest to the PA and FR with a belt of indigenous species that have longer rotation periods (15-25 years or more) and provide co-benefits of ecosystem services, biodiversity, and **carbon sequestration** to mitigate against anticipated negative impacts of climate change.

F. Zoning of Protected Areas and Forest Reserves for livelihood access

66. Land is scarce and burgeoning populations are hungry for land. Yet it is difficult to continuously provide land by degazetting current mandated land use from protection to production. Existing national parks and forest reserves may have already identified zones within their mandated areas; these need to be reviewed in the light of increasing pressure for land. The REDD strategy proposes to promote the concept of zoning within and adjacent to National Parks and Forest Reserves in the Tenasserim BC area as a pilot measure, whereby the “core area” of protection should have, where technically feasible, at least three belts or zones to buffer the core area as follows:

- b) **Zone 1 (fuelwood-agroforestry zone)**: a narrow strip of land for fuelwood and fruit tree plantations immediately adjacent to settlements, where the eligible CBOs are engaged in IGAs, providing each household access to fuelwood and fruits; this agro-forestry strip could contain fruits and species such as: *Calamus siamensis* Becc, *Thyrsostachys siamensis* Gamble, *Syzygium cumini* (L), Skeels, *Cassia siamia*, *Azadirachta indica*

¹¹ CBO has been used here as a generic name; in Thailand these groups are referred to as Village Associations or Farmer Group.

- c) **Zone 2 (livelihood zone):** a wider strip of land adjacent to the fuelwood strip (zone 1) but moving inwards towards the protected area, that provides land for undertaking cash-based livelihood plantations by participating households, using the equity and benefit sharing model that allows households to plant up to 5 ha of degraded land with fast growing trees and quick rotation periods; in this zone, *Eucalyptus*, *Pterocarpus macrocarpus* Kurz, *Cassia fistula* Linn., *Azelia xylocarpa* (Kurz), Craib, *Melia azedarach* L., *Acacia catechu* (L.f.) Willd.
- d) **Zone 3 (carbon zone):** the widest strip of degraded land closest to the “core area” that can be replanted with indigenous trees, restoring the natural forest and ecosystem connectivity and which can be described as the “carbon” zone for sequestering carbon over a longer period of time. Carbon stocks can be estimated using this zone as well as the natural forest in the core area. In this zone, the following species or species mix could be considered: *Hopea odorata*, *Azelia xylocarpa* (Kurz) Craib, *Wrightia arborea* (Dennst.)Mabb. *Dipterocarpus alatus* Roxb., *Terminalia bellirica* (Gaerth.) Roxb.

G. Linking livelihood interventions to deforestation avoidance under REDD

67. By linking replanting of degraded forests in Protected Areas for sequestering carbon and paying cash for planting and maintenance activities (such as fire management and forest protection), climate change mitigation activities can be linked to livelihoods improvement. It is important to test the REDD concept at local community level also for protection of existing forest stands using cash payments for deforestation avoidance, where intact natural forest still stands adjacent to the selected communities and settlements in the Tenasserim BC area, cash payments of \$70¹² per ha per year will be offered to households through the CBOs for protection of these intact forest patches/trees. Payments will be performance based: 100% protection deserves 100% payment; in addition, if CBOs engage in additional voluntary plantation outside the PA, they will be entitled to receive an additional bonus of \$50 per ha; these payments will be limited to a three year period after which the CBO and the settlement adjacent to this intact forest will be expected to protect it voluntarily as the Village Fund (VF) should have brought about additional livelihood benefits.

H. Carbon sequestration through forest restoration and afforestation

68. In Zone 3 (carbon zone) as mentioned above, cash payments for reforestation (CC mitigation) can be provided to households and CBOs living in areas adjacent to PA or FR to restore degraded forest land closest to the “core area” by planting with indigenous trees, thus restoring the natural forest and ecosystem connectivity. This can be described as the “carbon” zone for sequestering carbon over a longer period of time. This carbon zone can also be designed/created in other areas of the district/Tambon that lie in the vicinity of the Protected Areas. Moreover,

¹² This amount should not be based on value of trees but rather the community contribution to maintaining and protecting forests as a common and public good; thus payments are being made as an incentive initially for protecting the ecosystem for a period of 3 years but should be phased out as village level patrolling costs are met from the proceeds of the VF (revolving fund) and voluntary community contributions. While payments should be household based, these must be made out by CBOs once mandated organizations certify intactness of forest (i.e. work done) as payments must be performance based.

cash based afforestation activities could be undertaken around schools, public buildings, along highways etc.

I. Climate change awareness and disaster preparedness at local level

69. Anticipated impacts of climate change could already be affecting large areas of Thailand in the form of recurring dry periods or intensive periods of incessant rainfall. There are already increasing incidences of landslides in the upper elevations and flash flooding downstream. It is important to undertake climate change adaptation activities that range from identifying vulnerable and high risk areas, such as marginal and steep slopes of land that are now being used for settlements and agriculture in some communities, raising awareness about climate change impacts, identifying adaptation measures that will require policy decisions and stricter enforcement of laws and bye laws as well as infrastructure modifications and investments, such as water harvesting technology, and capacity building measures relating to disaster preparedness. There is potential to extend the use of environmentally friendly technologies (such as sun driers for processing food, micro-hydro to generate on farm electricity, and small wind driven turbines) covering a larger number of households.

V. FOCUS OF REDD IMPLEMENTATION

A. National Capacity Building for REDD MMV

70. Funds received under the REDD Readiness Mechanism will be used by the RFD and DNP, coordinated at national level, to collect and update forest sector data and compare with recent historical emission levels, identify reference scenarios using appropriate models, assess data on carbon emissions from forest sector and update/compare with projections documented in the Initial National Communication to UNFCCC, assess drivers of deforestation, carry out multi-stakeholder consultations, prepare a REDD national strategy and discuss/disseminate widely before adopting it at national level, and build capacity to enhance measurement, monitoring, and verification at national level and local levels.

B. Carbon Cycle Assessments and relevant research

71. A representative sampling of Thailand's forest types will be taken to carry out experiments and calculate emissions and assess carbon cycles. Results will feed into the reference scenarios to be developed at national level.

72. Hotspots of deforestation and pressure on forests (drivers) will be identified and mapped with detailed information and possible strategies to mitigate pressure on forests. Data on carbon emissions will be tagged to hotspot maps to monitor case by case improvement or deterioration of site conditions.

C. Emission Reduction in Tenasserim Biodiversity Corridor

73. In the BCI pilot site in the Tenasserim, which has already received inputs and TA under the GMS BCI Pilot Site interventions between 2006-2008¹³, funding under REDD will enable communities and village clusters to undertake restoration work, provide positive incentives to local communities to undertake: (i) livelihood plantations as buffers to core natural forest areas; (ii) restoration of degraded forest areas with indigenous and long rotation species providing long term carbon sequestration potential. It will also provide models of protection and positive incentives in terms of cash payments to maintain and protect forests by village level patrolling. Possible zonation scenarios in the Tenasserim Biodiversity Corridor are:

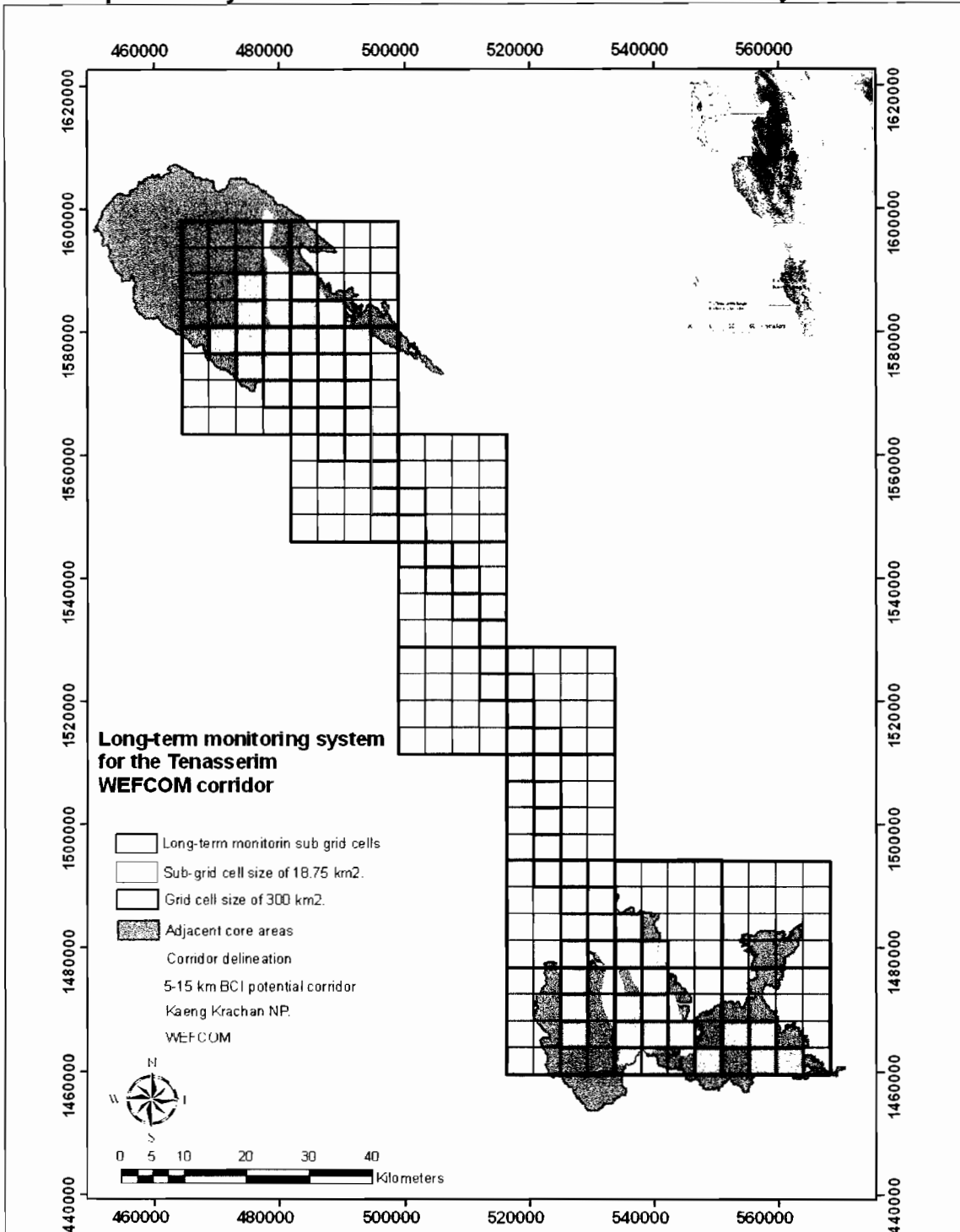
Table 11: Zonation scenarios in Tenasserim Biodiversity Corridor

Area	Zoning	Description	Sq.km	Ha	%
I	Zone 1: Agroforestry and Zone 2: Livelihood plantations/forest	Buffer zone (Sustainable use zone), area is composed of 0%-1% of forest cover (with human dominated activities in 73 sq.km)	234.00	23,400.00	19.63
II	Zone 3: Carbon Sequestration (with option of Zone 2)	Restoration zone, comprising 2%-50% of forest cover	195.00	19,500.00	16.36
III	Zone 3: Carbon sequestration	Natural regeneration zone, comprising >51% and <80% of forest cover	113.00	11,300.00	9.48
IV	Deforestation Avoidance Incentives	Maintenance zone, comprising >80% of healthy forest cover	650.00	65,000.00	54.53
		Total	1,192.00	119,200.00	100.00

Source: GMS BCI Project, DNP Thailand / WCS, Thailand 2008

¹³ ADB RETA 6289. GMS Core Environment Program and Biodiversity Conservation Corridors Initiative supported by the GMS countries, the Asian Development bank and the Governments of Finland, Netherlands, and Sweden.

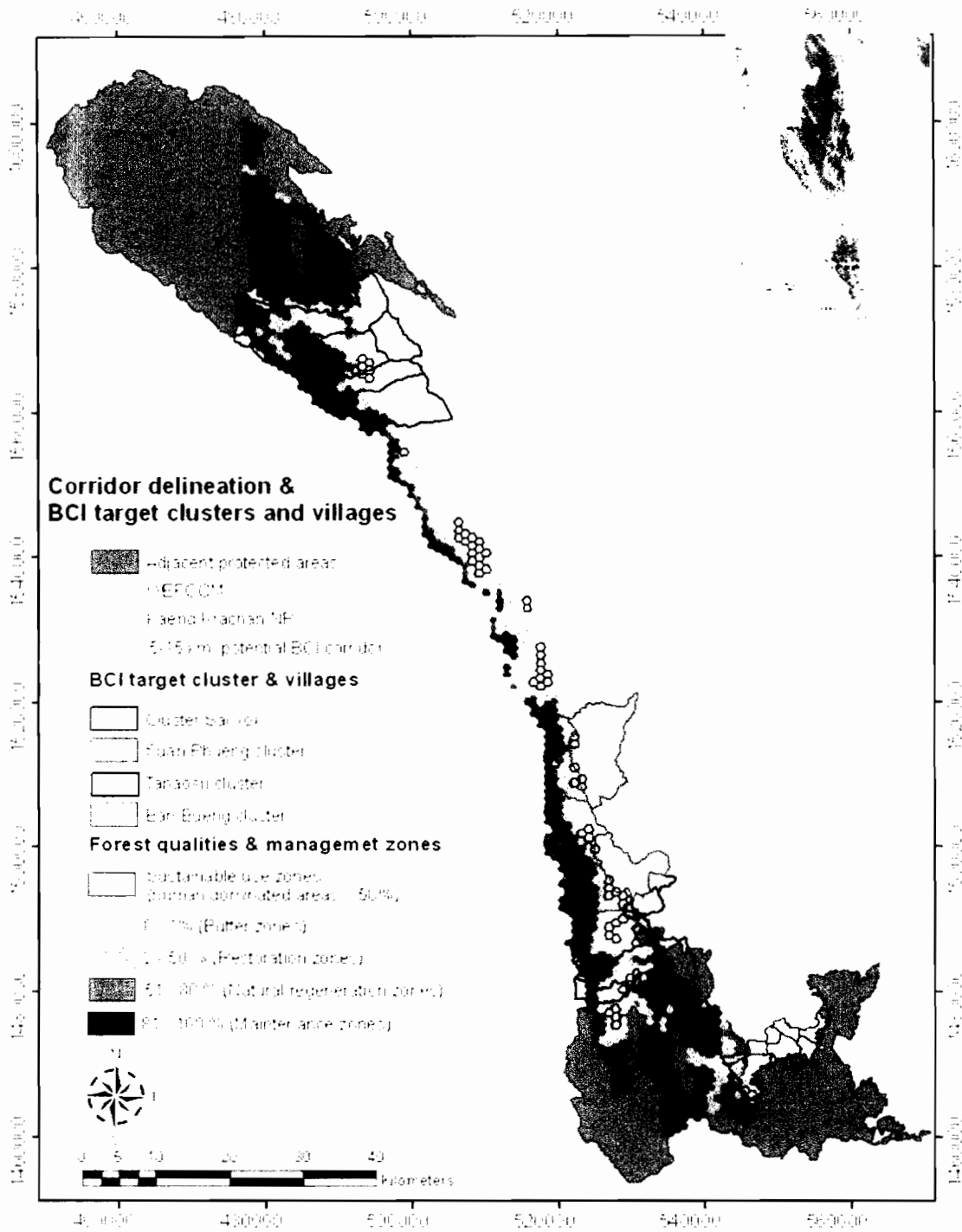
Map 1: Survey Grids for Zonation in Tenasserim Biodiversity Corridor



Source: GMS BCI Project, DNP Thailand / WCS, Thailand 2008

74. In the BCI Pilot Site, an updated, rough vegetation map in the Tenasserim WEFCOM corridor was used for GIS analysis with visual interpretation of satellite image (Landsat TM5 band combination 4 5 3 : R G B with resolution 30*30 m. imaged in 2006). In the map above, out of a total of 146 grids, 97 or 66.44% were explored in terms of: verifying new vegetation types using information from intensive survey in wet season; determine environmental factors; forest types, slope, elevation, topology, distance to stream and road, distance to village, and other ecological factors.

Map 2: Landuse cover in Tenasserim Biodiversity Corridor



Source: GMS BCI Project, DNP Thailand / WCS, Thailand 2008

75. In the BCI pilot site in the Tenasserim, activities have been undertaken in four selected clusters covering 20 villages with each cluster consisting of five villages to carry out participatory consultations about project activities such as promotion of income generating activities and alternative livelihoods, function of specific village funds under the BCI project that are linked to conservation, land use, forest restoration, and capacity building. Consultation meetings with village leaders and Tambon administration discussed establishment of Village Funds and priorities for alternative livelihoods. The BCI project is providing technical assistance (training and advice) to implement priorities like production of natural material based toiletry,

medicinal, and souvenir products. A series of consultations on proposed extension of Saiyok NP was done with villagers and Tambon officials to come up with agreed demarcation.

76. The estimated total population in the clusters is 12,453 comprised of 4,438 households, the majority of whom identify themselves as Thai, including significant numbers of ethnic minorities. The largest ethnic group is Karen, comprising about one-third of the population in the Tanaosri Cluster (Queen Sirikit Indigenous Plant Study Center) and the Suanphueng Cluster (Princess Sirindhorn Natural Study Center). Mon and Burman ethnic groups are 4% in the Princess Sirindhorn Study Center and Saiyok National Park respectively. Small groups of Laotians, Chinese and Indians are spread across the site.

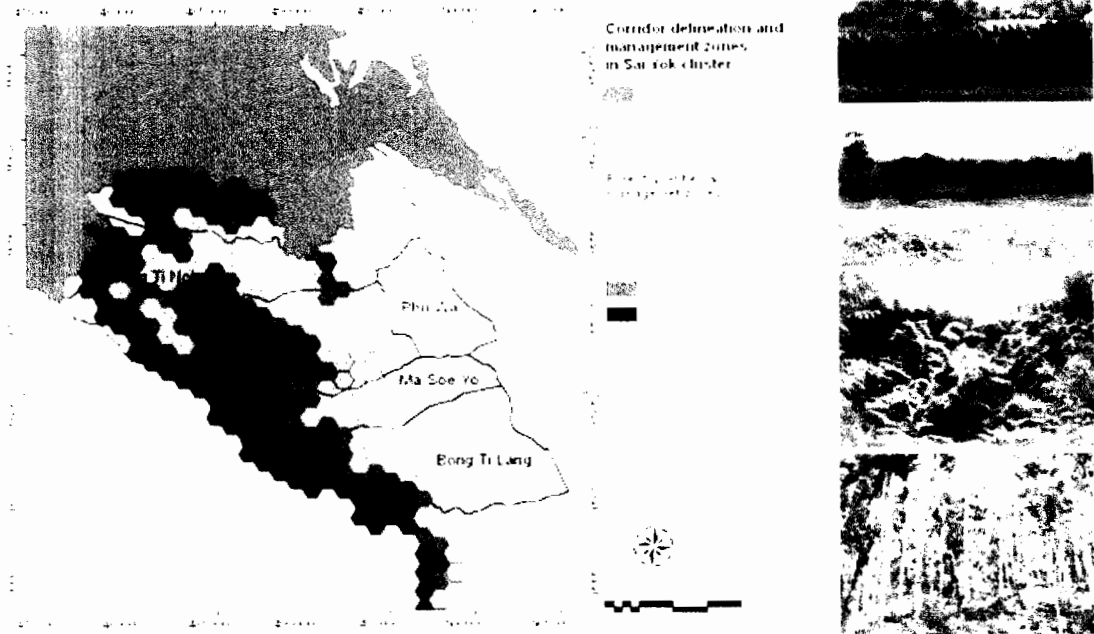
Table 12: Village Clusters in Tenasserim Biodiversity Corridor

Village	No.	Sub-District	District	Province
Tanaosri Cluster - Queen Sirikit Indigenous Plant Study Center (5 villages)				
1. Ban Tha Makham	2	Tanaosri	Suan Phueng	Ratchaburi
2. Ban Huay Muang	3	Tanaosri	Suan Phueng	Ratchaburi
3. Ban Huay Haeng	5	Tanaosri	Suan Phueng	Ratchaburi
4. Ban Huay Namnak	6	Tanaosri	Suan Phueng	Ratchaburi
5. Ban Bohwee	4	Tanaosri	Suan Phueng	Ratchaburi
Suan Phueng Cluster - Princess Sirindhorn Nature Study Center (5 Villages)				
6. Ban Thung Fhak	2	Suan Phueng	Suan Phueng	Ratchaburi
7. Ban Phapok	3	Suan Phueng	Suan Phueng	Ratchaburi
8. Ban Thamhin	5	Suan Phueng	Suan Phueng	Ratchaburi
9. Ban Huay Phak	7	Suan Phueng	Suan Phueng	Ratchaburi
10. Ban Tako Lang	8	Suan Phueng	Suan Phueng	Ratchaburi
Ban Bueng Cluster - Thai Prachan National Park (5 Villages)				
11. Ban Pong Krathing	1	Ban Bueng	Ban Kha	Ratchaburi
12. Ban Punam Ron	4	Ban Bueng	Ban Kha	Ratchaburi
13. Ban Dongka	9	Ban Bueng	Ban Kha	Ratchaburi
14. Ban Huay Makrud	10	Ban Bueng	Ban Kha	Ratchaburi
15. Ban Phuhin	13	Ban Bueng	Ban Kha	Ratchaburi
Sai Yok Cluster – Sai Yok National Park (5 Villages)				
16. Ban Ton Mamuang	7	Wang Kra Chae	Sai Yok	Kanchanaburi
17. Ban Bongti Noi	8	Wang Kra Chae	Sai Yok	Kanchanaburi
18. Ban Chai Thung	9	Wang Kra Chae	Sai Yok	Kanchanaburi
19. Ban Bongti Lang	2	Bong Ti	Sai Yok	Kanchanaburi
20. Ban Thung Ma Sue Yoh	4	Bong Ti	Sai Yok	Kanchanaburi

77. The clusters show varying status of forest cover as well as degradation with a mix of evergreen, deciduous and bamboo. The area was logged in the early 70s and 80s and now the connectivity has become fragmented between Saiyok National Park in the North of the corridor and Kaeng Krachan in the South. The maps below show examples from Saiyok as well as the Thaiprachan clusters. The photos show status of degradation in the forest.

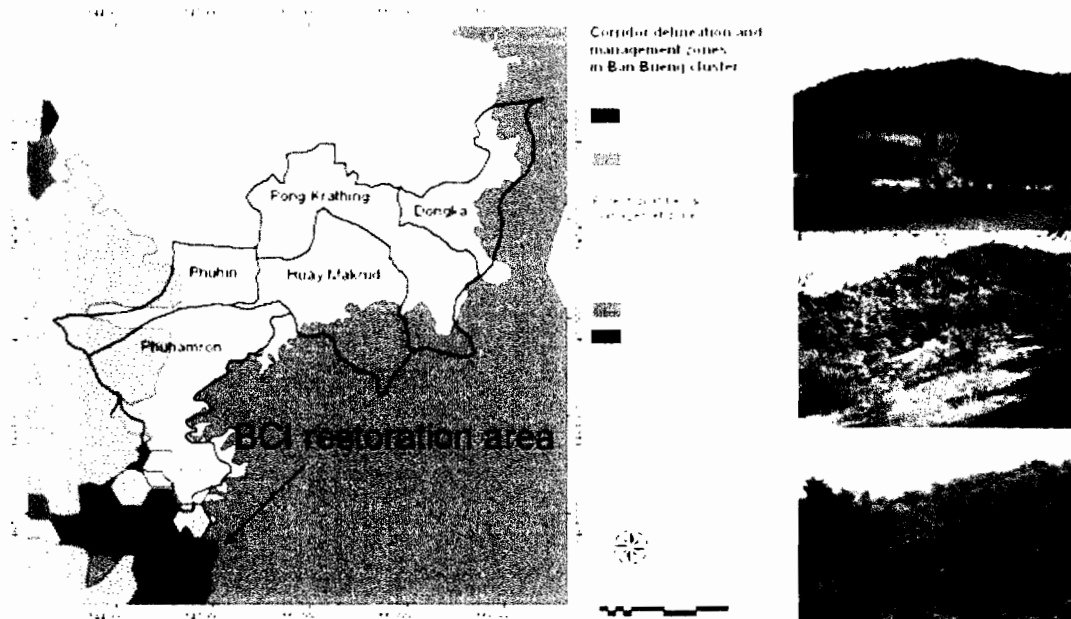
Map 3: Saiyok Cluster Land use cover in Tenasserim Biodiversity Corridor

SAI YOK CLUSTER



Map 4: Ban Bueng Cluster Land use cover in Tenasserim Biodiversity Corridor

BAN BUENG CLUSTER



78. In the Thai Prachan National Park, areas have been surveyed and selected species planted in Ban Ka District on the left bank of Phachi River connecting Thai Prachan National Park and Maenam Phachi Wildlife Sanctuary. The target is approx.

1,000 rai (approx. 160 ha). 150,000 seedlings were raised by villagers using 12 indigenous species at two nurseries:

- 1) Rattan (*Calamus siamensis* Becc.) 20,000 seedlings
- 2) Bamboo (*Thyrsostachys siamensis* Gamble) 40,000 seedlings
- 3) *Terminalia bellirica* (Gaerth.)Roxb.10,000 seedlings
- 4) *Acacia catechu* (L.f.) Wild. 5,000 seedlings
- 5) *Cassia fistula* Linn. 15,000 seedlings
- 6) *Dabergia cana* Graham ex Kurz 10,000 seedlings
- 7) *Alstonia scholaris*(L.)R. Br. 10,000 seedlings
- 8) *Archidendron clypearis* (Jack)Nielsen 12,000 seedlings
- 9) *Pterocarpus macrocarpus* Kurz 2,000 seedlings
- 10) *Wrightia arborea* (Dennst.)Mabb.10,000 seedlings
- 11) *Lagerstroemia loudonii* C. Presl Teijsm. & Binn. 10,000 seedlings
- 12) *Lagerstroemia calyculata* Kurz 6,000 seedlings.

79. The target for forest restoration with indigenous species in identified degraded areas (gaps) was set at 1,250 rai¹⁴ (approx. 200 ha). Species selection in the restoration area was based on the study of forest structure in area and consideration of dominant species such as *Pterocarpus macrocarpus*, *Oroxylum indicum*, *Azelia xylocarpa*. Additionally, alternative species selection was based on the need of local people for use as food bank species (e.g. *Thyrsostachys siamensis* Gamble, etc.). All seedlings were produced in the village nurseries while DNP supported the nursery establishment by investing some additional budget from DNP for the materials. The seedlings are bought by the project from the villagers for the restoration at the price of 2 BHT/seedling, thus providing cash input to beneficiaries.

D. Planning other potential sites and corridors for REDD implementation

80. In addition, the REDD Readiness Plan will focus on identifying other potential sites for REDD implementation. These are: (i) Upper Nan Watershed, (ii) Mae Ping-Om Koi watershed, (iii) Huai Tak Man and Biosphere Reserve, (iv) Phanom Dongrak – Pha Tam Forest Complex, (v) Dong Phrayayen – Khao Yai Forest Complex.

¹⁴ 6.25 rai = 1 ha.

VI. EXPECTED OUTPUTS

A. At National level

81. By end 2012, investments under a REDD readiness mechanism are expected to achieve in Thailand the following outputs:

- (i) A comprehensive REDD Readiness Plan by August 2012;
- (ii) A REDD national strategy that has undergone wide participatory, multi-stakeholder consultations and is adopted by government by Dec 2012;
- (iii) Potential for carbon sequestration (carbon cycle assessments) from different types of natural forest in Thailand (carbon sink) during dry and wet seasons including differentiation between mature, old growth forests and plantations;
- (iv) Updated emissions data (2006) from land use change and forest (LUCF) as compared with baseline of 1994, and projections to 2020;
- (v) Updated information and data at national level on deforestation and land use change by types of forest ecosystem affected, and by administrative regions; immediate causes of deforestation and underlying drivers; updated forest cover and land use maps with comparisons between 1995, 2000, 2005, and 2010;
- (vi) A national referencing scenario with measurement, monitoring and verification mechanisms in place at national and local institutional levels (RFD/DNP and regional offices).

B. At the Tenasserim Biodiversity Corridor level

82. By end 2012, investments under REDD in the Tenasserim Biodiversity Corridor under the REDD readiness mechanism or Carbon Emissions Reduction program are expected to achieve the following outputs:

- (i) Total amount of estimated carbon sequestration per ha/year in the 70 km connecting corridor and in the two forest complexes: Western Forest Complex (WEFCOM) and Kaeng Krachan Complex;
- (ii) Livelihood improvements (cash and non-cash benefits) for about 7,000 households (including 4,438 from existing four clusters) of local population living adjacent to forests in the corridor area;
- (iii) Restoration with native species of at least 5,000 ha of degraded forest and denuded land in designated zones around protected areas and reserve forest land creating carbon sequestration zone and additional 5,000 ha of enrichment planting;
- (iv) Establishment of up to 5,000 ha of livelihood plantations in buffer zones using fast growing, short rotation species for use by beneficiary households;
- (v) Demarcation of 5,000 ha of land for agro-forestry and provision of funds to households enabling them to grow fruits, NTFPs (rattan), fuelwood etc.;

- (vi) Provision of start up seed capital for 20 Village Funds (in addition to current existing ones under BCI Pilot Site project) bring the total to 40 VFs and establishment of functioning revolving fund mechanisms linked to income generating activities and environmental protection;
- (vii) Payment of performance-based cash incentives to households through Village Fund mechanism for protection of up to 10,000 ha of intact forests and maintenance of restored/rehabilitated forest areas (thus reducing deforestation);
- (viii) Assessment of potential for sale of CERs from forest to voluntary carbon market; and
- (ix) Updated information and data from Tenasserim Biodiversity Corridor fed into national level on deforestation and land use change by types of forest ecosystem affected and updated forest cover and land use map with comparisons between 1995, 2000, 2005, and 2010.

C. Embedding REDD Thailand into Greater Mekong Subregion (GMS) and ASEAN

83. A dedicated REDD website will be launched by DNP/RFD and linked to TGO Thailand. Results and lessons learned from REDD readiness mechanism and interventions in the Tenasserim Biodiversity Corridor will be shared among GMS countries partnering in the GMS Biodiversity Conservation Corridor Initiative¹⁵ as well as with ASEAN member states. The findings and recommendations for REDD implementation will be widely disseminated for general public consumption (in a user friendly version) as well as technical documents will be on the website for downloading.

VII. PROGRAM PHASING

A. REDD Phase I (July 2009 – Dec 2012)

84. The current proposal covers the period July 2009 – December 2012 which will provide a sufficient period to put in place the National REDD Strategy and the REDD Readiness Plan. By end of 2012, it is also expected that a clear financing modality for REDD will be agreed within the framework of Kyoto beyond 2012.

B. REDD Scaling Up Phase (Jan 2013 – Dec 2015)

85. The National REDD Readiness Plan and the REDD Strategy will provide guidance for scaling up REDD interventions in Thailand. In particular, experience gained and lessons learned from implementation of REDD interventions in the Tenasserim Biodiversity Corridor will be ready for adaptation and upscaling in other regions of Thailand such as the North and Northeast.

86. By end of 2012, it is expected that the REDD Readiness Plan will also be accompanied by a REDD investment plan covering the period 2013-2015.

¹⁵ Cambodia, PR China with Yunnan and Guangxi provinces, Lao PDR, Myanmar, and Viet Nam.

VIII. IMPLEMENTATION SET UP AND COORDINATION

A. National program coordination and monitoring

87. National REDD program coordination will rest with the DNP/RFD joint REDD program implementation unit with a REDD advisory working group of technical experts. The REDD program coordination unit at central level will also house the REDD MIS and data focal point for up-to-date information on forest resources, deforestation, emissions and carbon sequestration.

88. The REDD national program implementation unit (R-PIU) will liaise with regional offices of DNP/RFD and establish functionality, improve capacity and build local level REDD competence and databases in the regional offices.

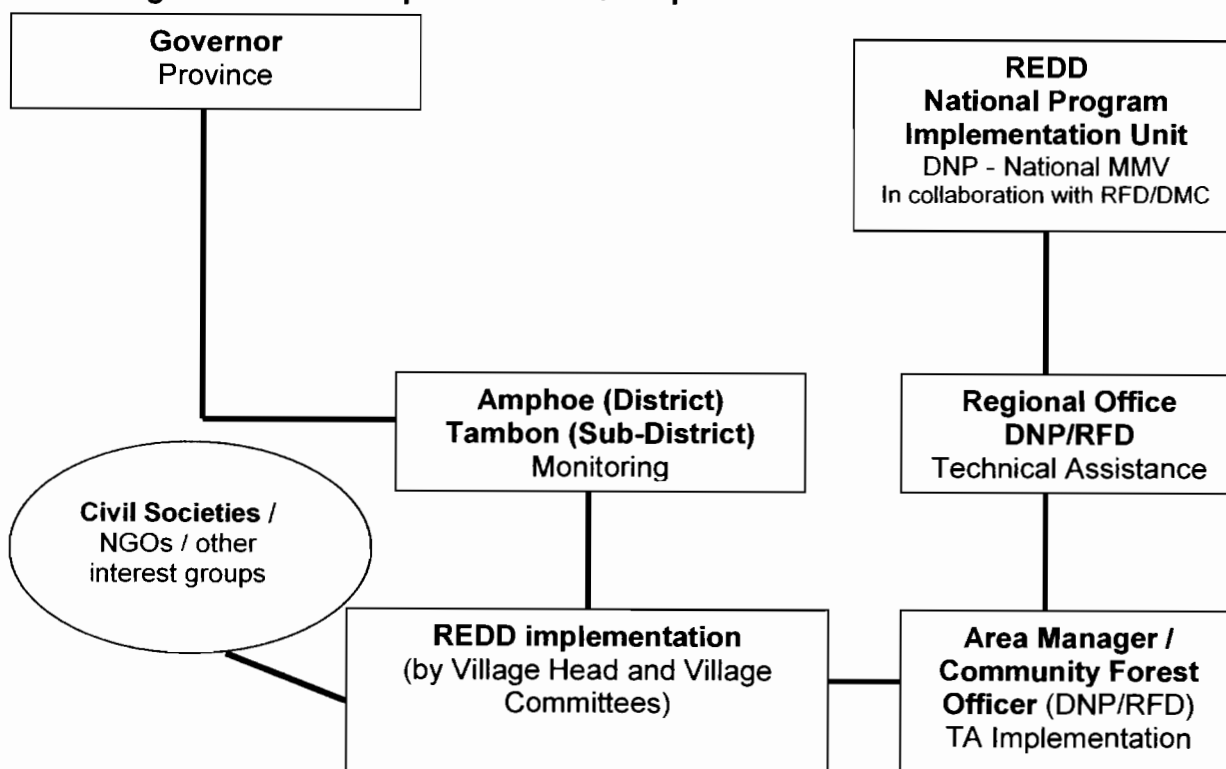
B. Provincial and Tambon level coordination and monitoring

89. The Provincial Governor's Office, district and sub-district (Tambon) administrations will be part of the consultation working group for REDD implementation at local level.

90. A REDD focal point will be responsible in each regional office to coordinate REDD activities in that region. This person must also liaise with Tambon administration and local village heads to provide information, improve awareness about REDD, and where applicable, implement activities.

91. The Tambon Administration will be responsible for collecting data with the assistance of the Area Manager (DNP) or Community Forestry Officer of RFD and feeding into the REDD MIS system. The TAO will also be responsible for liaising with villagers and village heads regarding REDD implementation. Investments under REDD will be reflected in the Tambon development plans as well as the district (Amphoe).

Figure 11. REDD Implementation Set-Up



C. Site level implementation

92. Site level REDD activities will be implemented by Village Heads in conjunction with village committees / working groups, the Tambon Administration and the nearest DNP/RFD administrators (e.g. superintendents of protected areas or community forest officers).

93. As experience shows from the Tenasserim Biodiversity Corridor, a combined team approach spearheaded in terms of awareness raising and mobilization by the Area Manager assisted by technical assistance (RECOFTC), has galvanized local villagers to be actively participating in capacity building for income generating activities, restoration and demarcation.

94. Each village will establish a Village Fund, specific for REDD activities. In the Tenasserim Biodiversity Corridor, 20 villages have set up such Village Fund accounts and are in the process of receiving seed capital for VF. Technical assistance and capacity building is being provided under the BCI Pilot Site project by RECOFTC.

IX. FUND FLOW, ACCOUNTS AND AUDITING

95. Funds will be disbursed by financiers (FCPF) to a REDD Program account maintained by DNP/RFD and administered by the REDD Program Implementation Unit (R-PIU). Annual workplans will be drawn up and approval sought from the REDD Steering Committee. Funds will be disbursed to various actors within the REDD program as per endorsed workplan.

96. Accounts will be maintained by R-PIU and annual external audits will be carried out.

X. PROGRAM MONITORING, REPORTING AND REVIEW

97. Monitoring of REDD program implementation will be carried out by TGO and the financiers with six monthly field and supervision visits.

98. The R-PIU will submit six monthly Technical and Financial reports to the report receiving designated focal point and also submit copies to the TGO and other relevant stakeholders. A user friendly (Thai) version will be provided to the local communities participating in REDD activities.

99. Technical monitoring reports, research results from carbon cycle assessments, updates on emissions and carbon sequestration will be put up on the dedicated REDD website and linked to the TGO.

100. The FCPF/development partners and Thailand (MNRE/TGO) will carry out external mid-term and final reviews in 2010 and 2012.

XI. PROGRAM ASSUMPTIONS AND RISKS

101. The main program assumptions are: (i) local people will continue to participate in the REDD implementation activities at site level; (ii) supportive and conducive policy framework of central government continues to provide incentive for conservation and reforestation and deterrence to deforestation; (iii) Central

government funds incremental costs of REDD program to sustain it in the long term; (iv) Negative and destructive effect of natural catastrophes, landslides, forest fires on restored areas and forests in general remains marginal or can be contained; (v) carbon credits and use of CERs remains in place in the medium to long term; (vi) sufficient financial flows and cash incentives are provided/secured in support of REDD.

XII. REDD PROGRAM REPLICABILITY AND SCALING UP

102. Lessons learned from implementation of REDD in the Tenasserim Biodiversity Corridor as well as from other projects implemented by RFD/DNP will be used for upscaling and replicating REDD program in other parts of Thailand. These lessons will also be shared across the GMS countries to create synergy of approaches and economies of scale in terms of investment within the GMS program.

XIII. ESTIMATED PROGRAM COSTS, INPUTS AND DISBURSEMENTS

103. Thailand's REDD proposal has three main sub-projects. These are: (i) National REDD Readiness and Capacity Building; (ii) Carbon Cycle assessments and related research; (iii) the REDD implementation in the Tenasserim Biodiversity Corridor also known as BCI Upscaling. The Project Management Unit (PMU/DNP) is part of Sub-Project 1 and the Districts/Tambon support is part of the Tenasserim BCI Upscaling.

104. The total estimated costs of all three sub-projects including contingency of 5% amounts to about US\$13.74 million, of which the Tenasserim BCI Upscaling has the largest share, US\$10.5 million or 76% of the total estimated costs.

Table 13. REDD THAILAND BUDGET December 2008 (in US\$)

Budget Lines / Items	Total	%	1	2	3	PMU-DNP	Districts / Sub-districts (Tambon)
			National REDD Readiness Capacity Building	Carbon Cycle Assessments	Tenasserim REDD BCI Upscaling		
1. Specialist Services (TA input, consultants, service providers)	486,000	4	202,000	95,000	162,000	-	27,000
2. Studies / Research / Surveys	356,070	3	260,070	24,000	24,000	24,000	24,000
3. Equipment / Sat images	657,000	5	265,000	308,000	12,000	12,000	60,000
4. Training / Seminars / Meetings	714,000	5	260,000	40,000	107,000	200,000	107,000
5. Printing /Reports/ Publications	70,000	1	-	-	-	70,000	-
6. Program Management / Coordination / M&E	299,400	2	-	-	-	254,400	45,000
7. Beneficiary Payments - Grants to CBOs / Restoration	10,500,000	76	-	-	10,500,000	-	-
Sub-Total	13,082,470	95	987,070	467,000	10,805,000	560,400	263,000
8. Contingency 5%	654,124	5	49,354	23,350	540,250	28,020	13,150
Grand Total	13,736,594	100	1,036,424	490,350	11,345,250	588,420	276,150

105. The beneficiary payments under REDD in the Tenasserim BCI Upscaling Sub-Project consist of the following (Details are provided in the Detailed Budget in Annex 3 of the R-Pin:

Table 14. REDD BCI Tenasserim Upscaling (in US\$)

Beneficiary Activities and cash based payments - Grants	US\$
a) Village (revolving) Fund (VF) - Income Generating Activities 20 new VFs	200,000
b) Revolving Fund (CRF) - Supplement of existing VFs Tenasserim	100,000
c) Livelihood Plantations	2,750,000
d) Agro-forestry / Farm Forestry	350,000
e) land Demarcation / Zoning for with local participation	500,000
f) Deforestation Avoidance payments - REDD (\$50 protection; \$20 performance bonus/ha)	2,100,000
g) Carbon Sequestration (CC) Reforestation with indigenous spp.	4,500,000
Total REDD Tenasserim (without contingency)	10,805,000

REDD THAILAND BUDGET
December 2008 (in US\$)

1

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No. Budget Lines / Items	Total	%	National REDD Readiness Capacity Building	Carbon Cycle Assessment	Tenasserim REDD BCI Upscaling	PMU-DNP	Districts / Sub- districts (Tambon)
1 Specialist Services (TA input, consultants, service providers)	486,000	4	202,000	95,000	162,000	-	27,000
2 Studies / Research / Surveys	356,070	3	260,070	24,000	24,000	24,000	24,000
3 Equipment / Sat images	657,000	5	265,000	308,000	12,000	12,000	60,000
4 Training / Seminars / Meetings	714,000	5	260,000	40,000	107,000	200,000	107,000
5 Printing /Reports/ Publications	70,000	1	-	-	-	70,000	-
6 Program Management / Coordination / M&E	299,400	2	-	-	-	254,400	45,000
7 Beneficiary Payments - Grants to CBOs / Restoration	10,500,000	76	-	-	10,500,000	-	-
Sub-Total	13,082,470	95	987,070	467,000	10,805,000	560,400	263,000
8 Contingency	654,124	5	49,354	23,350	540,250	28,020	13,150
Grand Total	13,736,594	100	1,036,424	490,350	11,345,250	588,420	276,150

A	REDD Readiness+Carbon Cycle+ PMU/DNP	2,115,194
B	REDD BCI Upscaling	11,621,400
C	REDD Readiness without GMS / ASEAN Dissemination	1,915,194

REDD Thailand 2009 - 2012					1	2	3	5	6	
No.	Budget Lines / Items	Descriptor	Qty	Item Cost in US\$	National REDD Readiness	Carbon Cycle Assessments	Tenasserim REDD BCI Upscaling	PMU-DNP	Districts / Sub-districts (Tambon)	SUB-TOTALS
					202,000	95,000	162,000	-	27,000	486,000
1	Specialist Services (Per diems for TA inputs, field Visits etc)									
	a) Carbon Cycle assessment expertise	days	100	200	-	20,000	-	-	-	
	b) Emissions assessment/update Experts Group	days	150	500	-	75,000	-	-	-	
	c) National Database system adjustment/upgrade Expertise	days	60	500	30,000	-	-	-	-	
	d) Database Revision Expertise / contracted staff	days	80	500	40,000	-	-	-	-	
	e) REDD National Strategy Write Up and REDD Readiness Plan	days	90	500	45,000	-	-	-	-	
	f) Carbon Market Specialists / REDD Monitoring, Verification	days	120	500	60,000	-	-	-	-	
	g) Participatory Process and Community Development specialists	days	180	300	-	-	54,000	-	-	
	h) Village Funds for REDD / Micro-Credit specialists	days	170	300	-	-	51,000	-	-	
	i) Forest Restoration / plantation / agro-forestry specialists	days	100	300	-	-	30,000	-	-	
	j) National / Local REDD monitoring consultants	days	90	300	27,000	-	27,000	-	27,000	
2	Studies / Research / Surveys				260,070	24,000	24,000	24,000	24,000	356,070
	a) Survey / Ground Truthing of forest cover by Teams in sample plots (covering 0.1% of total country area of 513,000 sq km)	Sampling	513	390	200,070	-	-	-	-	
	b) Ecological networks and forest connectivity rapid survey	days	120	500	60,000	-	-	-	-	
	c) Monitoring surveys / forest inventory at site level	days	120	200	-	24,000	24,000	24,000	24,000	
3	Equipment				265,000	308,000	12,000	12,000	60,000	657,000
	a) Satellite Imagery with updates	Lumpsum	1	65000	65,000	-	-	-	-	
	b) Database computer (high speed processor) for data processing	Lumpsum	1	23000	23,000	-	-	-	-	
	c) Workstation with standalone capability for data processing	Lumpsum	2	7000	14,000	-	-	-	-	
	d) Data Backup and storage HDD SAN Type 2 TB	Lumpsum	1	63000	63,000	-	-	-	-	
	e) Data Backup and storage HDD SAN Type 3 TB	Lumpsum	1	95000	95,000	-	-	-	-	
	f) Switches and cabling	Lumpsum	1	5000	5,000	-	-	-	-	
	g) Utilizing gas exchange principles to measure the photosynthesis rates of plants (LI-COR 6400)	equip	2	45800	-	91,600	-	-	-	
	h) Simultaneous CO ₂ , H ₂ O Measurements in a Compact Package (LI-840)	equip	2	7500	-	15,000	-	-	-	
	i) Color image analysis system high speed measurement and analysis of leaf area and leaf features (DELTA-T DEVICES, Model	equip	2	23200	-	46,400	-	-	-	
	j) FLUE GAS ANALYZER for measurement O ₂ , CO ₂ , CO, NO, NO ₂ and SO ₂ (TESTO 350-XL)	equip	2	21500	-	43,000	-	-	-	
	k) Constant Temperature Ovens (YAMOTO, Model DKN 912)	equip	2	12900	-	25,800	-	-	-	
	l) Soil moisture logger (Delta-T Model DL6) with 5 Sensors (Delta-T Model ML2X)	equip	2	7700	-	15,400	-	-	-	
	m) Solar radiation logger (Delta-T Model GP1) with 5 Sensors (Delta-T Model OS2)	equip	2	8800	-	17,600	-	-	-	
	n) Set of Automatic Climatic Station (Rain gauge, LSI Model DOA030 Data logger WISCO Model CL23 and ML29)	equip	20	2150	-	43,000	-	-	-	
	o) Height Measurement (Vertex IV)	equip	2	2800	-	5,600	-	-	-	
	p) Distance measurement for plot setup (LEICA DISTO A6)	equip	4	1150	-	4,600	-	-	-	
	q) Office equipment / laptops, fax, mobile phones / printers/ copiers	equip	4	2000	-	-	8,000	8,000	40,000	
	r) Office improvements / fittings	Lumpsum	1	4000	-	-	4,000	4,000	20,000	
4	Training / Seminars / Meetings				260,000	40,000	107,000	200,000	107,000	714,000
	a) Carbon Cycle Assessment Training	lumpsum	1	20000	-	20,000	-	-	-	
	b) Carbon Cycle Assessment Seminar/Workshop	lumpsum	1	20000	-	20,000	-	-	-	
	c) Capacity Building in Remote Sensing/GIS and sampling (25 courses / 60 participants per course /duration 5 days / course)	course	25	2400	60,000	-	-	-	-	
	d) Capacity Building / Advanced for GIS application (8 courses / 5 participants each - of 15 days)	course	8	5000	40,000	-	-	-	-	
	e) National REDD Consultation meetings / workshops (2 days x 40 participants x 8 events)	workshop	8	10000	80,000	-	-	-	-	
	f) Decentralized participatory stakeholder consultations / workshops	workshop	20	3000	60,000	-	60,000	-	60,000	
	g) REDD Readiness Plan consultations with policymakers/lawmakers	workshop	2	10000	20,000	-	-	-	-	
	h) Training on Income Generating Activities (50 participants)	course	5	7000	-	-	35,000	-	35,000	
	i) Village meetings (100 persons per meeting)	meeting	40	300	-	-	12,000	-	12,000	
	j) Dissemination of REDD Results to GMS / ASEAN	workshop	4	50000	-	-	-	200,000	-	
5	Printing /Reports/ Publications				-	-	-	70,000	-	70,000
	a) Printed Reports (glossy with photos) brochures, flyers	lumpsum	1	50000	-	-	-	50,000	-	
	b) Posters in local language/english	lumpsum	1	20000	-	-	-	20,000	-	
6	Program Management / Coordination / M&E				-	-	-	254,400	45,000	299,400
	a) Office Support staff / travel /	month	36	5000	-	-	-	180,000	-	
	b) Office Operations / Supplies	month	36	500	-	-	-	18,000	18,000	
	c) Team meetings	days	36	50	-	-	-	1,800	-	
	d) Steering Committee meetings	days	6	100	-	-	-	600	-	
	e) M&E input by Districts / Sub-Districts (Tambon)	days	36	150	-	-	-	-	27,000	
	f) Regional Offices, DNP/RFD operations / travel	days	36	300	-	-	-	54,000	-	
7	Beneficiary Payments - Grants				-	-	10,500,000	-	-	10,500,000
	a) Village (revolving) Fund (VF) - Income Generating Activities 20 new VFs	lumpsum	20	10000	-	-	200,000	-	-	
	b) Revolving Fund (CRF) - Supplement of existing VFs Tenasserim	lumpsum	20	5000	-	-	100,000	-	-	
	c) Livelihood Plantations	ha	5000	550	-	-	2,750,000	-	-	
	d) Agroforestry/Farm Forestry	ha	5000	70	-	-	350,000	-	-	
	e) Land Demarcation / Zoning for with local participation	ha	5000	100	-	-	500,000	-	-	
	f) Deforestation Avoidance payments - REDD (\$50 protection; \$20 performance bonus/ha)	ha	10000	70	-	-	2,100,000	-	-	
	g) Carbon Sequestration (CC) Reforestation with indigenous spp	ha	5000	900	-	-	4,500,000	-	-	
	Sub-Total				987,070	467,000	10,805,000	560,400	263,000	13,082,470