Some questions to consider

- What should a farmer ask in order to identify legitimate opportunities?
- Do farmers need to pay to become part of a carbon credit project?
- Does a farmer need to sign over a land title to be a part of a project?

Simple questions

- Who is the project developer?
- What are their credentials?
- Can TGO verify them as legitimate?
- What kind of project is it?
  - A/R, REDD, Agroforestry
- What market is being targeted?
- What are the project criteria?
  - Measurement techniques?
  - Project period?
  - Verification method?
- What is the carbon credit payment procedure
- Is there a project enrollment contract?

Additional information

- Do farmers need to pay to become part of a carbon credit project?

  There could be fees associated with developing the project. For example, costs to GPS farm (project) boundaries and to take field biomass measurements; for preparing new areas for planting and for planting trees.

  However, project developers will often pay these costs themselves in exchange for a % of the future carbon credit sale … OR … a buyer who has already agreed to purchase the future credits will pay for the development and start-up costs

Also….beware

- Does a farmer need to sign over a land title to be a part of a project?

  NO!!!!
  NEVER!!!!

Carbon credit projects are about the carbon stored in biomass and soil. They are not about the LAND where the carbon is being captured and stored. Buyers pay for the ecosystem service of climate mitigation and to offset their own emissions. They are not buying the LAND.

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Carbon 2 Markets™

Globally measuring, monitoring and managing carbon projects.

Mitigation of climate change through Agroforestry
Agroforestry can be an important means for carbon sequestration... More >

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It is possible to simultaneously reduce atmospheric carbon and alleviate poverty... More >

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Global carbon financial markets can benefit from new methods... More >

REDD+
Learn... More >

Carbon2Markets™ is a project of Michigan State University that focuses on combining value chains from carbon credits in the carbon financial markets and agro-forestry products for small holders in developing countries. Carbon2Markets™ provides accurate measurements of carbon sequestration from reforestation and agro-forestry land management activities using high resolution remote sensing data, web-GIS tools, and modeling. Our offset projects have repeat monitoring to ensure long-term storage of sequestered carbon. Our model of project development and monitoring enhances the ground measurements with measurements from earth observing satellites.

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Site Map • Site Credits

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http://www.carbon2markets.org/content.cfm?m=33&id=33&startRow=1&mm=0

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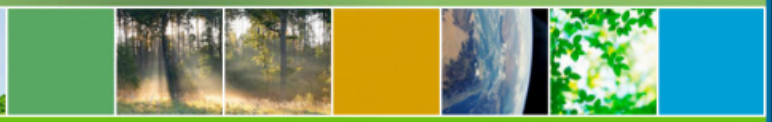
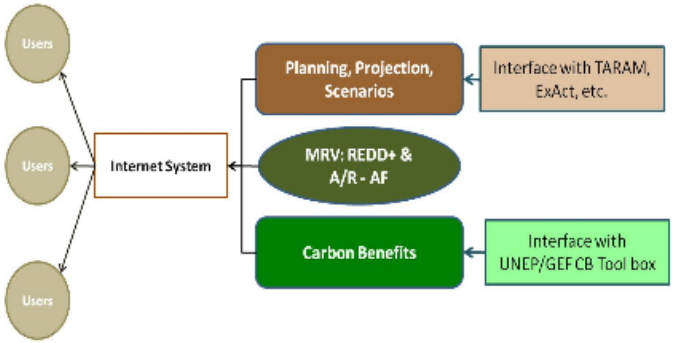


Projects

The Carbon2Markets program at Michigan State University is establishing protocols and systems to support Measurement, Reporting and Verification (MRV) in the context of both REDD+ (Reduced Emissions from Deforestation and Degradation) and carbon sequestration projects that focus on Reforestation and Agro-Forestry. The diagram below shows the general schema for our systems while the chart below it provides an overview of basic functionality.

Carbon Sequestration Projects **REDD+ Projects**



1. Merge ground data with satellite data to multiply human resources, lower costs and cover large areas at multiple time scales

2. Develop and deploy advanced biomass allometry for large scale application carbon stocks and stock changes (fluxes)

3. Provide measurements of forest cover change:
- Include all REDD+ (deforestation, degradation, fire, reforestation, plantations)
- Across all IPCC/FAO forest types (closed, open)

4. Wrap the MRV in GIS-enabled Internet System for reporting and verification; and for project management

5. Use a suite of indicators and metrics for M&E: carbon + environment + biodiversity + social co-benefits

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Publications

Carbon2Markets™ Prospectus
Greening the Globe through Carbon Sequestration
Released August 2007

Amazon Deforestation
A photo essay by Ricardo Funari
Released 2000

Other publications from Carbon2Markets™
Carbon2Markets™ has several publications available on the web through the Global Observatory for Ecosystem Services.

Downloads

Carbon2Markets™ project inventory KMZ file
To review more details on some of the more advanced Carbon2Markets™ projects download this KMZ file for your Google Earth thick client.

Featured Projects

Carbon2Markets™ is currently developing and registering several projects in Africa, Southeast Asia and Latin America. Below is a brief listing of a few featured projects. These projects and others can be explored in greater depth using the map above or by downloading this KMZ file. To see an example of a detailed project management and measurement system for one site click here.

Viet Nam

Kien Lao and Cam Son Communes, Luc Ngan District, Bac Giang Province

The project area is located approximately 90 kilometers northeast of the capital city, Hanoi. The landscape Luc Ngan District is a mosaic of paddy rice in the lowlands, Litchi orchards, cassava, soybean and pineapple, and afforestation/reforestation in the upland areas. This Carbon2Markets™ project is centered on community-based agroforestry with Litchi and small-holder afforestation/reforestation (Acacia, Pine, and Eucalyptus) in collaboration with the Vietnamese Ministry of Agriculture and Rural Development.

Access the Luc Ngan Project

Lao PDR

Carbon Offsets Project Thailand(Teak)

Access the MRV system for the small-scale agroforestry carbon offset project in Thailand.

- *283 ha small-holder tectona grandis*
- *Average size 2.9 ha*
- *114 stands in five provinces*
- *98 households*

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http://www.carbon2markets.org/thaiteak/

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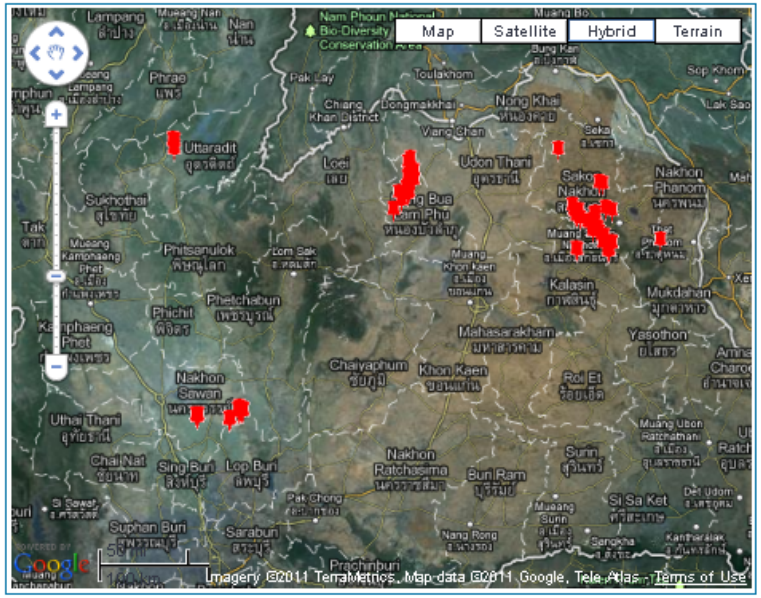
Small Scale Agroforestry Development in Thailand

This is the Carbon2Markets registry and management page for the Thailand small-holder agroforestry carbon sequestration project. The map below shows the current registered project areas. Use the map navigation tools and links to access more detailed site inforrmation.



The *pins* indicate the small-holder teak areas registered in this project. They are replaced by polygons at closer zoom levels. Click on a polygon to view owner and area information and to access a link to more detailed data on any particular site. Use the pull down list to search by Owner or Project ID

Search project information by:

Projec Summary Data | **Project Carbon Offset**

Location	Thailand, SE Asia
Number of registered agroforestry areas:	114
Number of participating small-holders	94
Total registered area (hectares)	289.79
Number of sample plots:	177
Baseline carbon stock(tCO2e) - 2009	44,808
Estimated annual sequestration rate (tCO2e/ha/yr):	10.62
Estimated total carbon sequestration - 15 years (tCO2e):	46,164

Generate a report with the most updated information on the project.

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http://www.carbon2markets.org/thaiteak/

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Site Map

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http://www.carbon2markets.org/thaiteak/thai_teak_site.asp?ID=IN-TH_006

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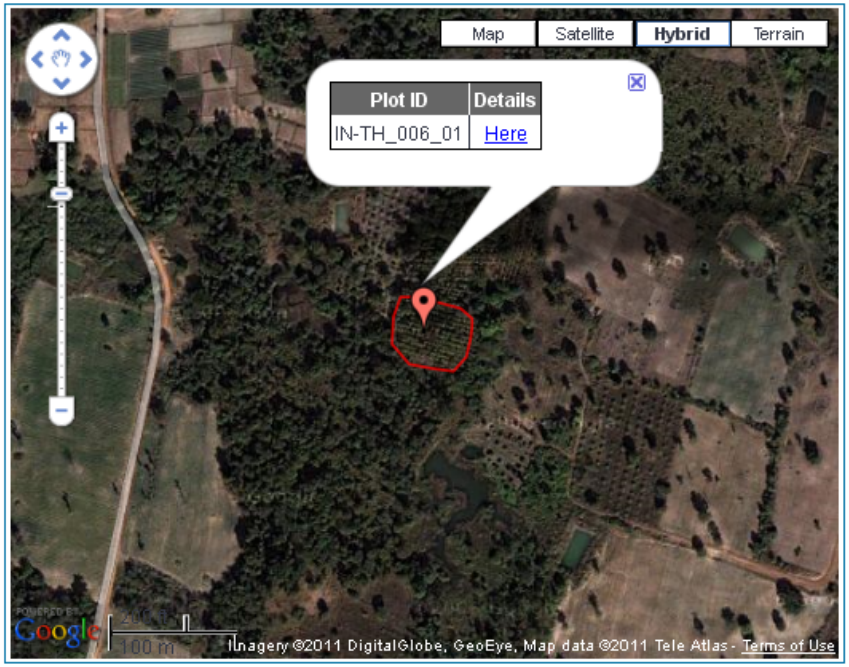
Small Scale Agroforestry Development in Thailand

Site: IN-TH_006

Return to Project Page



How to:

- Navigate with the map controls (zoom in/out, pan) or select map type at the top right.
- Click once on the Sample Plot balloon to access plot level information and tree data.
- Detail information about this agroforestry site is listed in the tabs below the map.

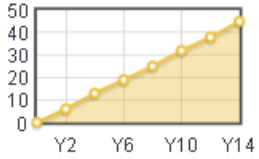
Legend Symbols

Corner Point of Sample Plot

Agroforestry Site

Site Information | Plot Details | Baseline Carbon Stock | Carbon Sequestration

Project ID	
Agroforestry Site ID	IN-TH_006
Area (hectares)	0.30
Land Use in 1990	Cassava
Tree Species	Tectona grandis
Year Planted (AC)	1993



Ex-Ante Carbon Sequestration

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http://www.carbon2markets.org/thaiteak/thai_teak_plot.asp?plot=IN-TH_006_01&site_ID=IN-TH_006

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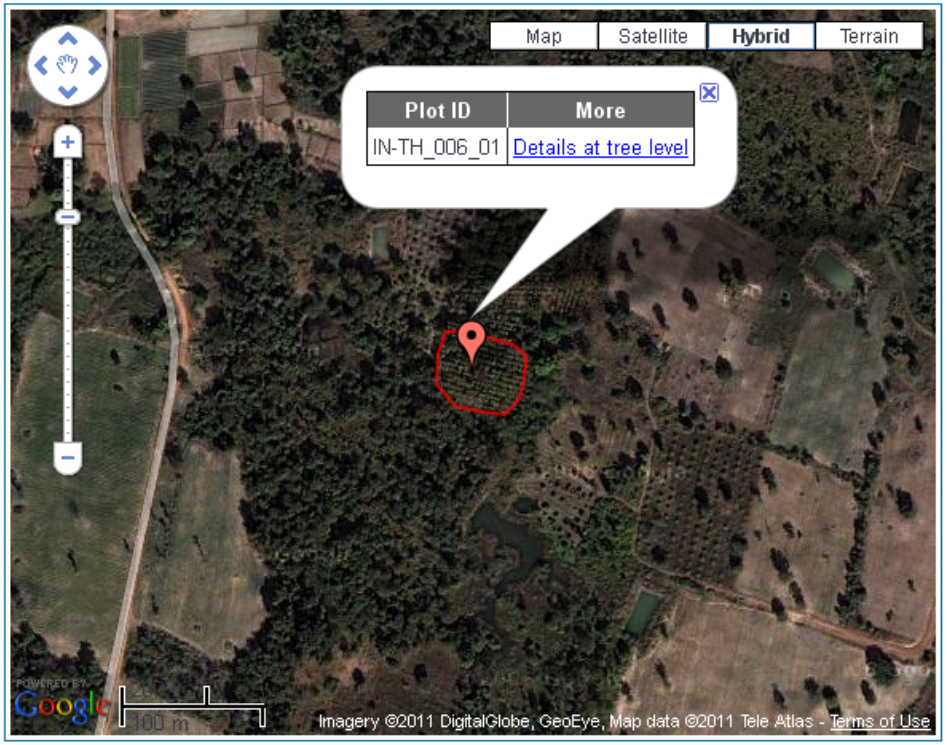
Small Scale Agroforestry Development in Thailand

Site: IN-TH_006 / Plot: IN-TH_006_01

Return to: Project Page > Site IN-TH_006



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Legend Symbols

Corner Point of Sample Plot

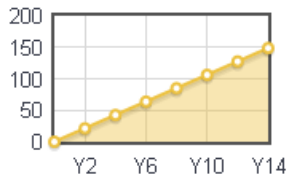
Agroforestry Site

Plot ID: IN-TH_006_01

Project ID	
Agroforestry Site ID	IN-TH_006
Plot Dimensions (meters.)	20x25
Plot Area (m2)	500
Corner point Coordinate (Latitude in DD)	17.2376
Corner point Coordinate (Longitud in DD)	103.9001
Total Trees	85
Baseline Carbon in Plot (tCO2)	12.89

Ex ante year by year (tCO2)

See graph in the right panel →



Full size graph here

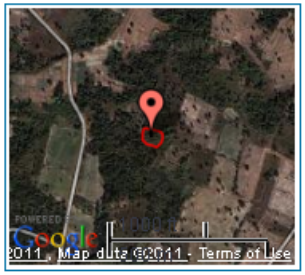
Generate a report with the most updated information for this plot.

Small Scale Agroforestry Development in Thailand

Site: IN-TH_006 / Plot: IN-TH_006_01

Return to: Project Page > Site IN-TH_006

	Tree ID	Height (m)	Circumference (cm.)	DBH (cm)	AG Bio (t)	AG C (t)	BG C (t)	AG CO2e (t)	BG CO2e (t)	TOT CO2e (t)
1	IN1-6-1-1	14	38.60	12.29	0.0448	0.0224	0.08204	0.0110	0.0402	0.12221
2	IN1-6-1-2	12	42.00	13.38	0.0454	0.0227	0.08325	0.0111	0.0406	0.12385
3	IN1-6-1-3	15	42.20	13.44	0.0572	0.0286	0.10491	0.0138	0.0506	0.15551
4	IN1-6-1-4	12	48.00	15.29	0.0592	0.0296	0.10856	0.0141	0.0519	0.16043
5	IN1-6-1-5	13	46.00	14.33	0.0564	0.0282	0.10339	0.0137	0.0501	0.15348
6	IN1-6-1-6	11	35.00	11.15	0.0290	0.0145	0.05315	0.0074	0.0270	0.08018
7	IN1-6-1-7	11	31.70	10.10	0.0238	0.0119	0.04365	0.0061	0.0225	0.06617
8	IN1-6-1-8	14	52.00	16.56	0.0809	0.0405	0.14837	0.0187	0.0684	0.21676
9	IN1-6-1-9	17	41.50	13.22	0.0627	0.0313	0.11492	0.0150	0.0548	0.16976
10	IN1-6-1-10	9	26.00	8.28	0.0132	0.0066	0.02413	0.0037	0.0137	0.03786
11	IN1-6-1-11	16	52.00	16.56	0.0924	0.0462	0.16944	0.0209	0.0768	0.24624
12	IN1-6-1-12	15	41.00	13.06	0.0540	0.0270	0.09906	0.0130	0.0478	0.14684
13	IN1-6-1-13	15	35.00	11.15	0.0395	0.0197	0.07233	0.0098	0.0358	0.10817
14	IN1-6-1-14	16	56.00	17.83	0.1071	0.0536	0.19635	0.0239	0.0877	0.28404
15	IN1-6-1-15	17	61.00	19.43	0.1349	0.0674	0.24724	0.0295	0.1080	0.35523
16	IN1-6-1-16	15	40.50	12.90	0.0527	0.0264	0.09667	0.0128	0.0469	0.14362
17	IN1-6-1-17	15	45.00	14.33	0.0650	0.0325	0.11920	0.0154	0.0563	0.17550
18	IN1-6-1-18	16	48.00	15.29	0.0788	0.0394	0.14450	0.0183	0.0671	0.21161
19	IN1-6-1-19	15	47.50	15.13	0.0724	0.0362	0.13273	0.0170	0.0624	0.19514
20	IN1-6-1-20	17	54.00	17.20	0.1058	0.0529	0.19400	0.0237	0.0869	0.28094
21	IN1-6-1-21	11	32.00	10.19	0.0243	0.0121	0.04448	0.0065	0.0237	0.06819
22	IN1-6-1-22	16	54.00	17.20	0.0996	0.0498	0.18265	0.0225	0.0826	0.26521
23	IN1-6-1-23	13	43.00	13.69	0.0515	0.0258	0.09446	0.0126	0.0462	0.14063
24	IN1-6-1-24	12	41.00	13.06	0.0433	0.0216	0.07935	0.0107	0.0392	0.11856
25	IN1-6-1-25	15	42.00	13.38	0.0567	0.0283	0.10392	0.0137	0.0503	0.15419
26	IN1-6-1-26	12	45.00	14.33	0.0521	0.0260	0.09549	0.0127	0.0465	0.14202
27	IN1-6-1-27	13	38.70	12.32	0.0418	0.0209	0.07661	0.0104	0.0382	0.11482
28	IN1-6-1-28	15	58.00	18.47	0.1077	0.0539	0.19746	0.0240	0.0880	0.28550
29	IN1-6-1-29	15	38.50	12.26	0.0477	0.0238	0.08741	0.0117	0.0429	0.13030
30	IN1-6-1-30	14	39.00	12.42	0.0457	0.0228	0.08374	0.0111	0.0408	0.12452
31	IN1-6-1-31	9	18.50	5.89	0.0067	0.0033	0.01228	0.0021	0.0076	0.01987
32	IN1-6-1-32	12	35.00	11.15	0.0316	0.0158	0.05794	0.0081	0.0297	0.08764
33	IN1-6-1-33	13	49.30	15.70	0.0676	0.0338	0.12396	0.0160	0.0587	0.18265
34	IN1-6-1-34	14	47.00	14.97	0.0662	0.0331	0.12135	0.0156	0.0570	0.17838
35	IN1-6-1-35	15	57.50	18.31	0.1059	0.0529	0.19409	0.0237	0.0870	0.28105
36	IN1-6-1-36	16	46.00	14.65	0.0724	0.0362	0.13278	0.0170	0.0624	0.19520
37	IN1-6-1-37	15	51.50	16.40	0.0850	0.0425	0.15588	0.0195	0.0716	0.22750
38	IN1-6-1-38	15	46.00	14.65	0.0679	0.0340	0.12452	0.0161	0.0589	0.18340
39	IN1-6-1-39	14	50.40	16.05	0.0761	0.0380	0.13943	0.0176	0.0647	0.20409
40	IN1-6-1-40	16	49.00	15.61	0.0821	0.0411	0.15055	0.0188	0.0691	0.21966
41	IN1-6-1-41	15	39.70	12.64	0.0507	0.0253	0.09291	0.0122	0.0448	0.13775
42	IN1-6-1-42	16	63.00	20.06	0.1354	0.0677	0.24821	0.0295	0.1083	0.35649



Legend Symbols

Corner Point of Sample Plot

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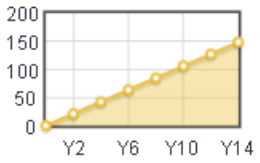


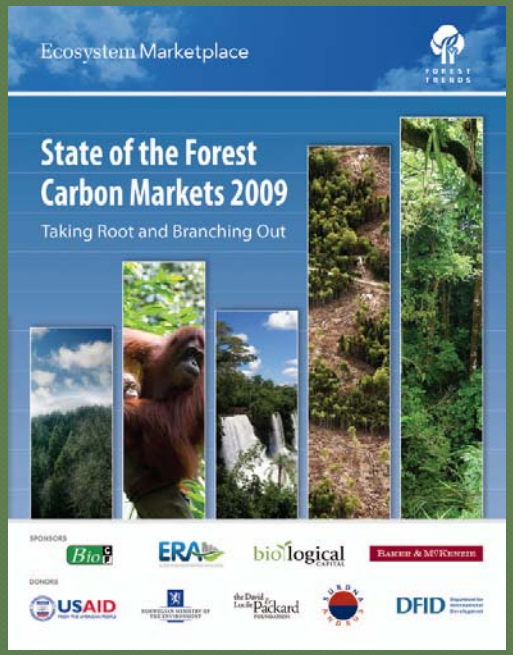
Ex-Ante Carbon Sequestration

Detailed graph here

Thailand's Forest and Agroforest Carbon Credit Potential

Thailand's Potential

- Project Types
  - Small-holder Agroforestry
  - Aforestation/Reforestation
  - IFM: Improved Forest Management
  - REDD+ : Reduced Emissions from Deforestation and Forest Degradation in Developing Countries
- Markets
  - Compulsory Markets
    - UNFCCC CDM A/R
    - NZ ETS
    - New South Wales
  - Voluntary Carbon Markets
    - Over-the-Counter (OTC)
    - CCX → X
  - REDD Finance Mechanisms



http://www.foresttrends.org/documents/index.php?pubID2384

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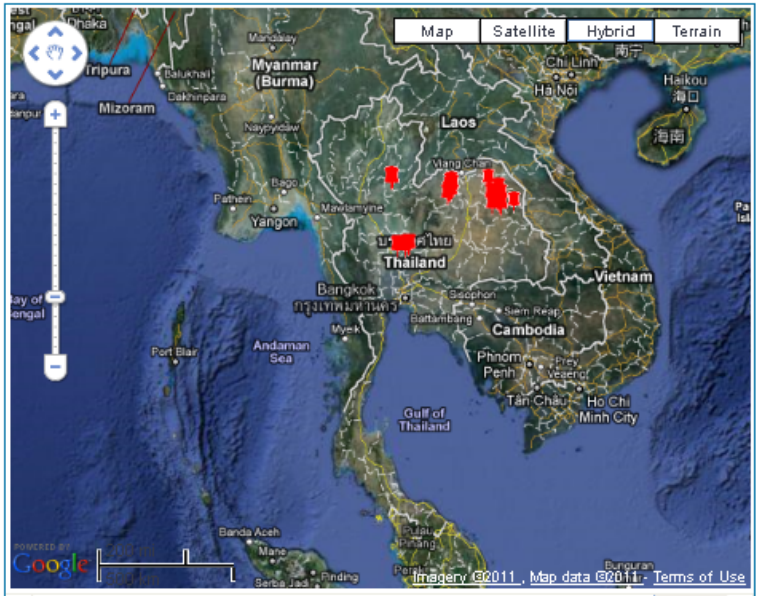

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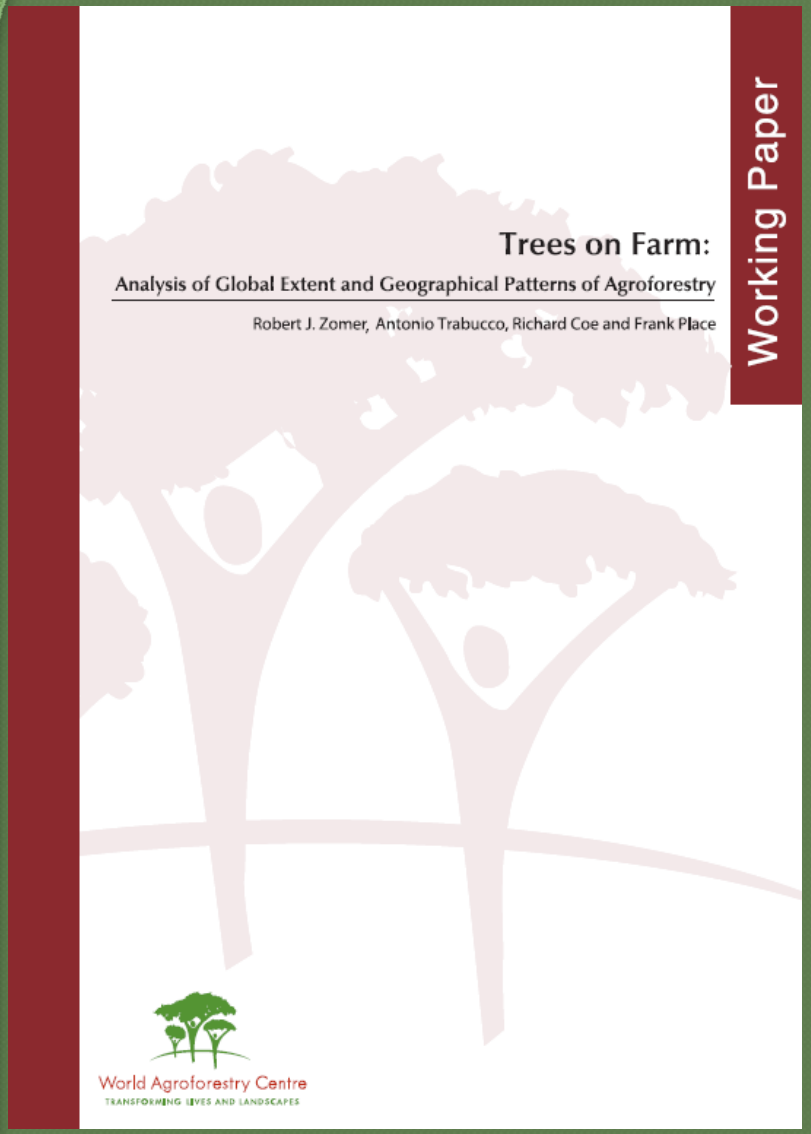
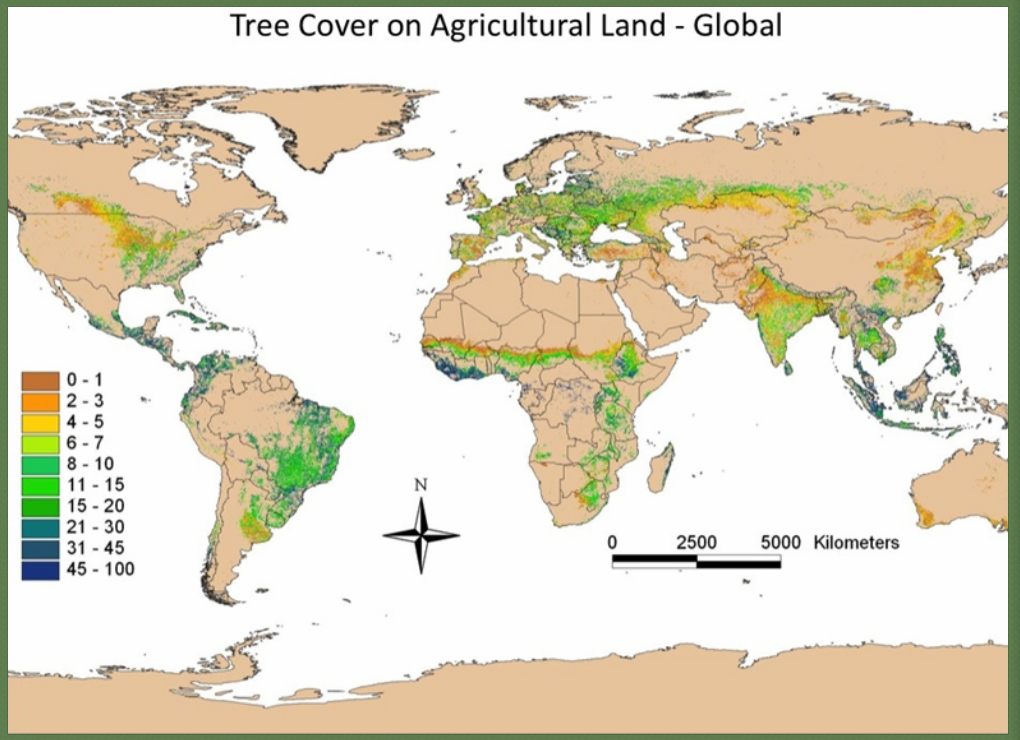
Generate a report with the most updated information on the project.

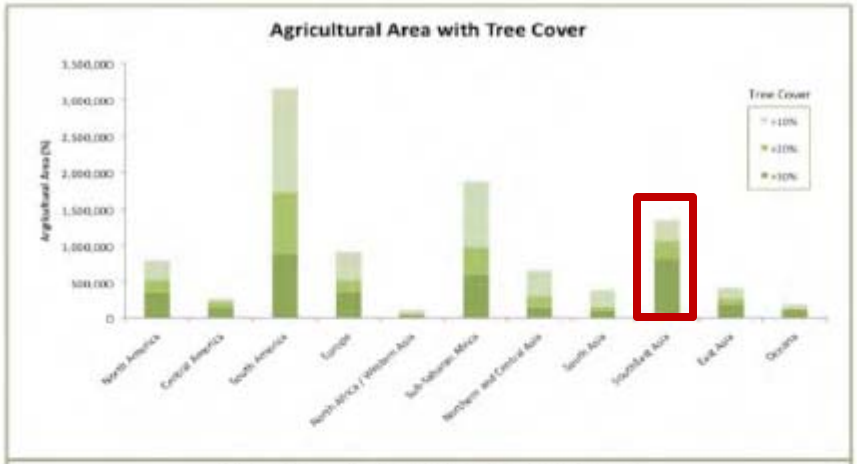
2009

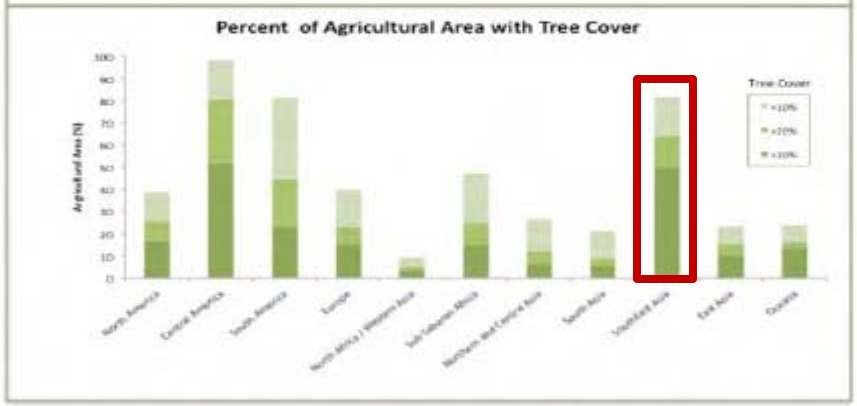




Agroforestry, if defined by tree cover of greater than 10% on agricultural land, is widespread, found on 46% of all agricultural land area globally, and affecting 30% of rural populations. Based on our datasets, this represents over 1 billion hectares of land and 558 million people. Agroforestry is particularly prevalent in southeast Asia, Central America, and South America with over 80% of area under agroforestry.

http://www.worldagroforestrycentre.org/downloads/publications/PDFs/WP16263.PDF





Agricultural Area with Tree Cover Greater than 10 to 30 Percent (km2 and % of all agricultural area)

Tree Cover	>10%		>20%		>30%		Agriculture (>0%)
	km²	%	km²	%	km²	%	km²
Region							
North America	800,632	39	528,745	26	346,194	17	2,073,352
Central America	265,057	98	217,731	81	140,165	52	269,503
South America	3,159,991	81	1,726,431	44	887,714	23	3,888,963
Europe	914,122	40	529,438	23	354,654	15	2,301,062
North Africa / Western Asia	105,298	9	58,598	5	38,956	3	1,138,842
Sub-Saharan Africa	1,875,543	47	974,333	25	595,834	15	3,964,972
Northern and Central Asia	657,008	27	299,563	12	160,946	7	2,473,696
South Asia	289,066	24	161,662	9	97,180	6	1,828,926
SouthEast Asia	1,346,888	82	1,059,471	64	826,577	50	1,652,548
East Asia	417,273	23	273,466	15	188,112	10	1,800,445
Oceania	190,466	24	128,487	16	108,202	14	790,875
Global Total	10,121,334	46	5,957,726	27	3,744,514	17	22,183,184

Royal Forest Department/Department of National Parks, Thailand (2009)

ASIA-PACIFIC FORESTRY SECTOR OUTLOOK STUDY II

WORKING PAPER SERIES

Working Paper No. APFSOS II/WP/2009/22

THAILAND FORESTRY OUTLOOK STUDY

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
REGIONAL OFFICE FOR ASIA AND THE PACIFIC

Bangkok, 2009

Table 1. Land-use pattern by region, 2001

Region	Forest	Farmholding land	Unclassified
	%		
North	54.0	26.4	19.6
Northeast	15.0	55.0	30.0
Central	27.1	30.9	33.0
Southern	22.5	43.4	34.1
Total	**31.4**	**40.9**	**27.7**

Source: Based on Agricultural Statistics of Thailand, 2004.

Table 2. Forest cover, 1996-2006

Year	Forest cover	
	1,000 ha	% of the country area
1961	27,369	53.33
1973	22,172	43.21
1976	19,841	38.67
1978	17,522	34.15
1982	15,680	30.56
1985	15,087	29.40
1988	14,380	28.02
1989	14,343	27.95
1991	13,670	26.64
1993	13,355	26.03
1995	13,148	25.62
1998	12,972	25.28
2000	17,011	33.15
2004	16,759	32.66
2005	16,100	31.38
2006	15,865	30.92

Source: Charuppat (1944); DNP (2006); RFD (2007).

Table 4. Plantation area by species in 2000

Species	1,000 ha
Rubber	2,019
Teak	839
Eucalyptus spp	443
Acacia mangium and other *A.* spp	148
Other broadleaved species	541
Pinus merkusii and other *P.* spp	689
Other conifers	148
Total	**4,824**

Source: FAO (2001).

http://www.fao.org/fileadmin/templates/rap/files/APFSOS/2009-22Thailand.pdf

Land Use Pattern and Land Suitability in Thailand

Land Development : A Fundamental of Sustainable Agriculture

Land Resources in Thailand

Land Use Pattern and Land Suitability in Thailand

i. Land use pattern for agriculture in Thailand is approximately 146,942,758 rais or 45.83 % of total Land.

Paddy field	**83,783,756**	**rai**
cash crop	**48,462,508**	**rai**
vegetable	**88,061**	**rai**
Orchards and trees	**14,608,433**	**rai**
Forest reserve	**123,394,201**	**rai**
other such as community, reservoir and bare land etc.	**50,351,991**	**rai**
Agriculture area in each region		
Northeast	**60,238,388**	**rai**
North	**33,392,953**	**rai**
Central&West	**23,405,110**	**rai**
South	**18,187,101**	**rai**
East	**11,719,206**	**rai**

: Land Development Department,2527 , Landuse Planning in Northeast

ii. **Land Suitability** for agriculture, from research of soil properties by using soil map in region level scale 1 : 500,000. It consist of environment factors which can classify in this following

ขอบคุณมากครับ

Questions?