



Teak, Rubber and Agroforestry

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NASA LCLUC Science Team Meeting
November 8, 2011

Smallholder plantations ...

... as part of an agroforestry farm system

Secondary title:

“Observations and evidence of smallholder teak and rubber plantations in Northeast Thailand”

Presentation

- ✿ Inpang Community Network (and three farmer groups) - Teak
- ✿ Inpang Community Network Rubber
- ✿ Rubber Plantations in Nakhon Phanom Province

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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 information.

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

	Thailand, SE Asia
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(CO ₂ e) - 2009	44,808
Estimated annual sequestration rate (tCO ₂ e/ha/yr)	10.62
Estimated total carbon sequestration - 15 years (tCO ₂ e):	46,164

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



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Site ID	Area (Ha.)	Owner	More
IN-TH_001	12.76	Thanakom Promburom	See details
IN-TH_013	4.36	Nintha Chuni	See details
IN-TH_015	0.68	Reanthong Thokaewkheaw	See details



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

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Projec Summary Data Project Carbon Offset

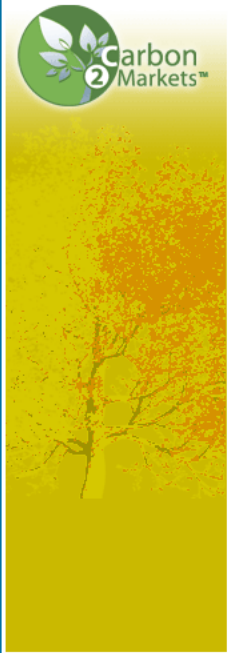
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Small Scale Agroforestry Development in Thailand

Site: IN-TH_013 / Plot: IN-TH_013_01 Return to: Project Page > Site IN-TH_013

Map Satellite Hybrid Terrain

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- 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 below the map.

Legend Symbols

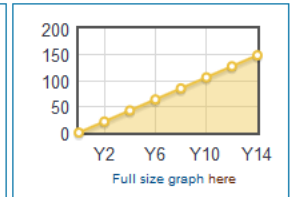
Corner Point of Sample Plot

Agroforestry Site

Plot ID: IN-TH_013_01

Project ID	IN-TH_013
Agroforestry Site ID	20x25
Plot Dimensions (meters.)	500
Plot Area (m2)	17.0570
Corner point Coordinate (Latitude in DD)	103.8510
Corner point Coordinate (Longitud in DD)	68
Total Trees	7.86
Baseline Carbon in Plot (tCO2)	

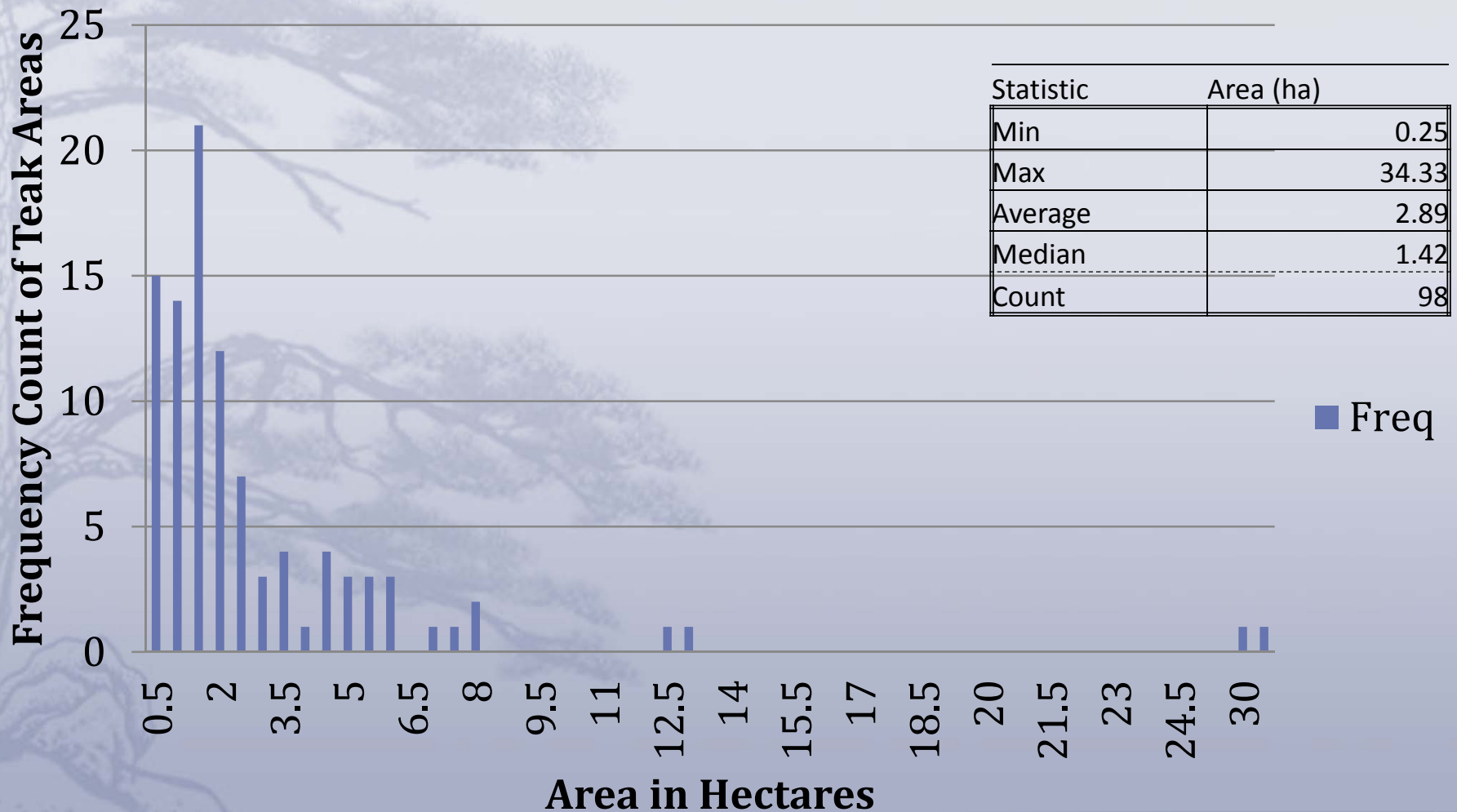
Ex ante year by year (tCO2) See graph in the right panel →



[Generate a report](#) with the most updated information for this plot.

Teak plot size

Frequency Distribution of Teak Area Plot Sizes

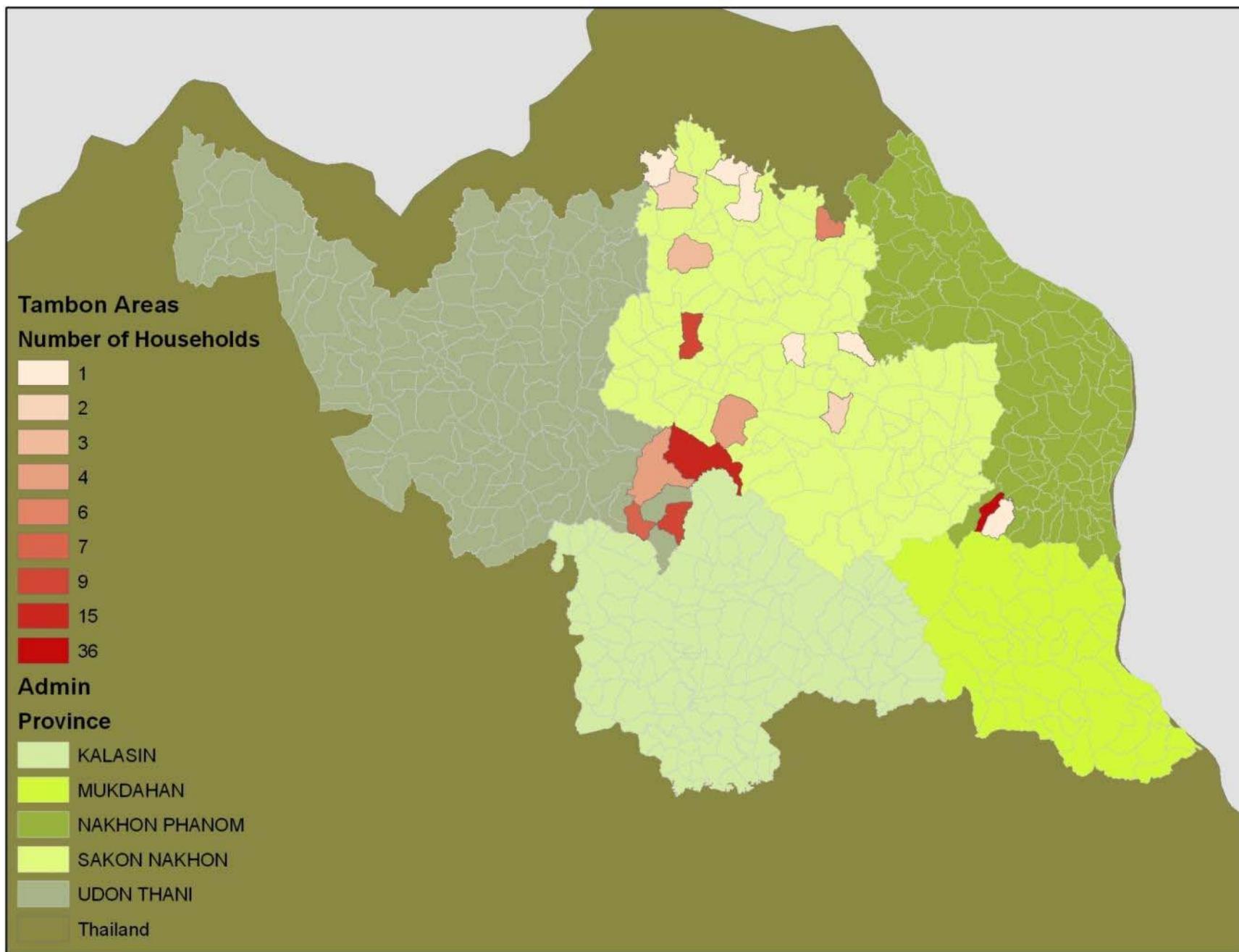


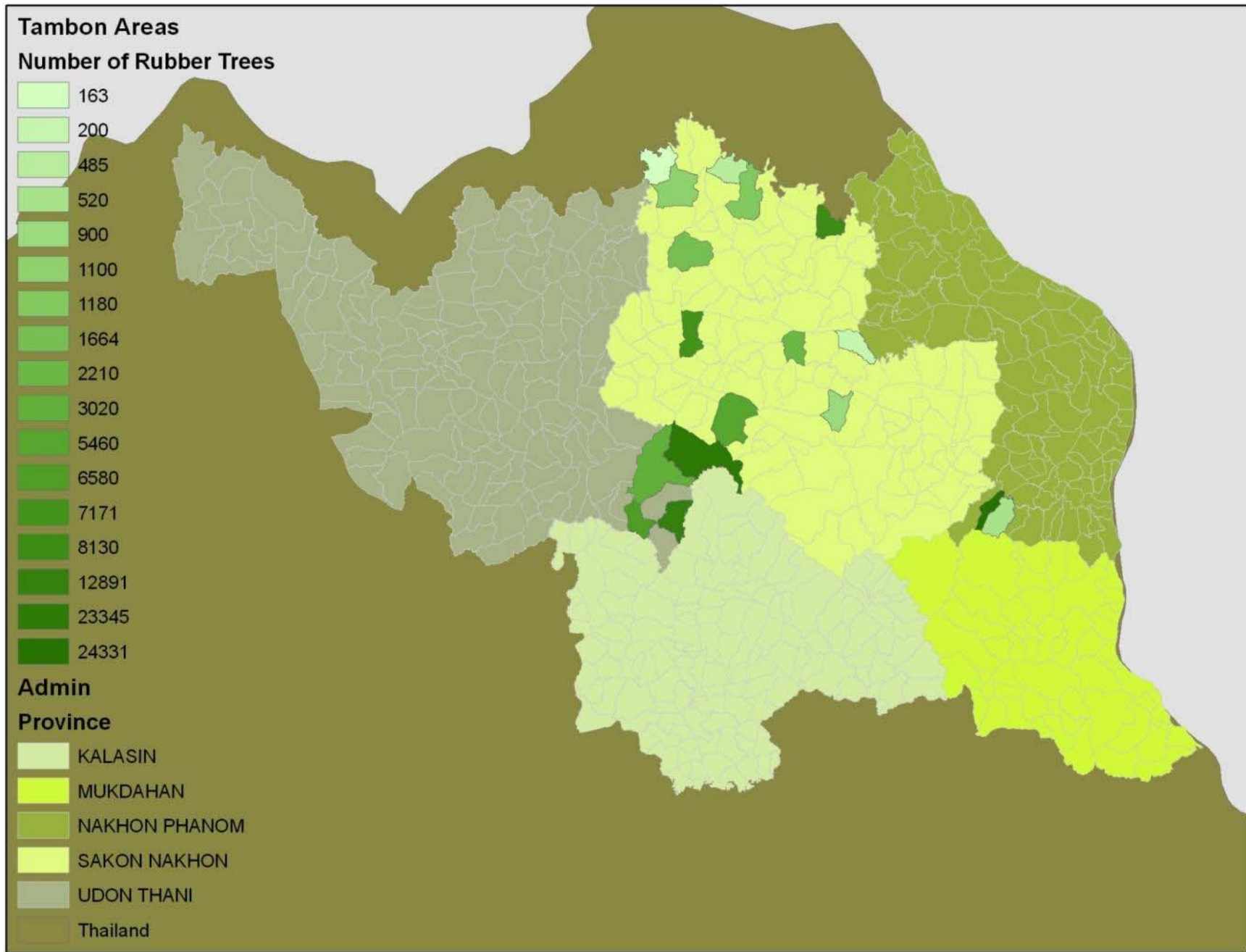
Inpang Carbon Bank -Teak





Household	Number Para R. Trees	Count of species	Household	Number of Para R Trees	Count of species
Miss. Patsarin Sinchakam	540	1	Mrs. Woei Tabaiya	800	1
Miss. Wasana Buycha	370	1	Mr. Bunkong Simong	510	2
Mr. Amnuay Phromnam	2400	1	Mr. Niwet SingPhomma	1700	2
Mr. Amphon Khunyo	1442	1	Mr. Sombat Phothilueang	1200	2
Mr. Bunchan Chueatapra	300	1	Mrs. Kongchai Kruthamin	550	2
Mr. Bunsaeen Thongsila	400	1	Mrs. Nuduean Chueachan	1800	2
Mr. Chakkrawan Phromnam	1140	1	Mrs. Om Sunrat	230	2
Mr. Chanpeng Suratwong	800	1	Mrs. Somphit Noma	1206	2
Mr. Chantu Homtumma	550	1	Mr. Aphaimani Pitsawan	900	3
Mr. Chutuphon Lamo	900	1	Mr. Kasem Daenrat	2730	3
Mr. Ka Naichit	1170	1	Mr. Sai Bunlengsong	675	3
Mr. Kamlid Lamphoti	355	1	Mr. Tanong Ruksaphainai	2750	3
Mr. Kamlit Lampho	300	1	Mrs. Sanchira Prasertkaew	1065	3
Mr. Kin Singha	800	1	Miss. Rotchana Krutpin	856	4
Mr. Kuson Kaewpikun	550	1	Mr. Sawan Chatamat	1350	4
Mr. Kwang Lansai	1700	1	Mr. Lamai Chaitamat	1000	5
Mr. Niphon Pranom	800	1	Mr. Sakchai Tabtimhin	830	5
Mr. Panchawag Puangpala	1100	1	Mr. Thawi Phaengsi	4900	5
Mr. Phong Kiophawan	900	1	Mr. Thonsao Sinchakham	529	5
Mr. Plean Samrannet	1800	1	Mrs. Kanha Kamnio	220	5
Mr. Prasinya Saesi	170	1	Mr. Bunrot Laomak	2758	6
Mr. Sangwon Wongchuen	820	1	Mr. Niwat Bungnam	709	6
Mr. Sombat Wannaun	1103	1	Mr. Samon Siwipan	5310	6
Mr. Somphan Wongwai	800	1	Mr. Sanong Kwangkhwang	465	6
Mr. Somphet Chaemcham	450	1	Mrs. Rom Labpho	518	6
Mr. Suraphon Waiwat	540	1	Miss. Panatda Chueaprasoet	332	7
Mr. Teang Kamtanit	1000	1	Mr. Bunluea Phukhao	1568	7
Mr. Thongchai Phromnam	2300	1	Mr. Peng Phomsiri	944	7
Mr. Thongkham Phankham	2500	1	Mr. Subin Wanchusert	889	7
Mr. Thongtoem Chueatakweg	800	1	Mr. Thongdi Yowaseng	511	7
Mr. Tum Teuagtatong	3000	1	Mr. Wirat Kratumkhan	2171	7
Mr. Waen Chaiprakom	1300	1	Mrs. Bunlam Narapan	634	7
Mr. Wanu Wutthisan	1326	1	Mrs. Tha Thatchanda	1220	7
Mr. Wichai Kammungkun	900	1	Mr. Bunchan Phunaphet	1084	9
Mr. Wichean Saensi	900	1	Mr. Sab Wanchuprasoet	2024	9
Mrs. Boeng Saensi	170	1	Mr. Sab Wanchusoet	1709	9
Mrs. Chanhom Wongso	560	1	Mrs. Phetsi Chonsit	1425	9
Mrs. Chomyong Ukham	1753	1	Mr. Buasri Sudthai	92	11
Mrs. Dokmai Lanphoti	300	1	Mrs. Lampai Cheabchanda	430	11
Mrs. Kleam Lamphoti	300	1	Mr. Pichit Singgam	1545	12
Mrs. Lampun Sabkham	420	1	Mr. Thongkhan Saenthui	558	13
Mrs. Langma Laosuwan	700	1	Mrs. Sangat Phumali	1200	13
Mrs. Langma Namdaung	700	1	Mr. Tua Khanla	595	15
Mrs. On Theangtrong	608	1	Mr. Bunhom Phromun	3479	16
Mrs. Paibun Thabaiya	350	1	Mr. Saeng Thongkam	823	18
Mrs. Poem Chueatapra	440	1	Miss. Mukda Praso	4963	21
Mrs. Samrong Liopha	1440	1	Mr. Wichai Khanla	6450	22
Mrs. Suni Phungdi	683	1	Mr. Han Prakrongpan	1760	23
Mrs. Sut Tamkham	426	1	Mr. Lang Sapa	5228	28
Mrs. Uthai Puangpala	1100	1	Mr. Chalong Phukhae	351	30
Mrs. Wali Kaewsae nmueang	1900	1	Mr. Jongjit Phomsiri	1543	40
Mrs. Wanthong Chikchak	630	1	Mr. Phetpan Chanket	11060	50
Grand Total				138855	560





Inpang Rubber

Data for Small-holder *Hevea brasiliensis* (Rubber) Study in NE Thailand
Inpang Database – Survey conducted 2008
Respondents: n=957 (24% of total Inpang membership)

Number of Households planting *Hevea brasiliensis* n = 104 (11% of survey respondents)
Number planted areas n=114 (some households managing more than one area)

Based on past fieldwork plant spacing is 3 x 5 m (667 trees/ha). Using this estimator – there are approximately 150 ha planted in *Hevea brasiliensis* (927 rai).

Half of the households report they are only planting *Hevea brasiliensis*.
About 15 % of households manage more than 10 tree species including *Hevea brasiliensis*.

Location of households

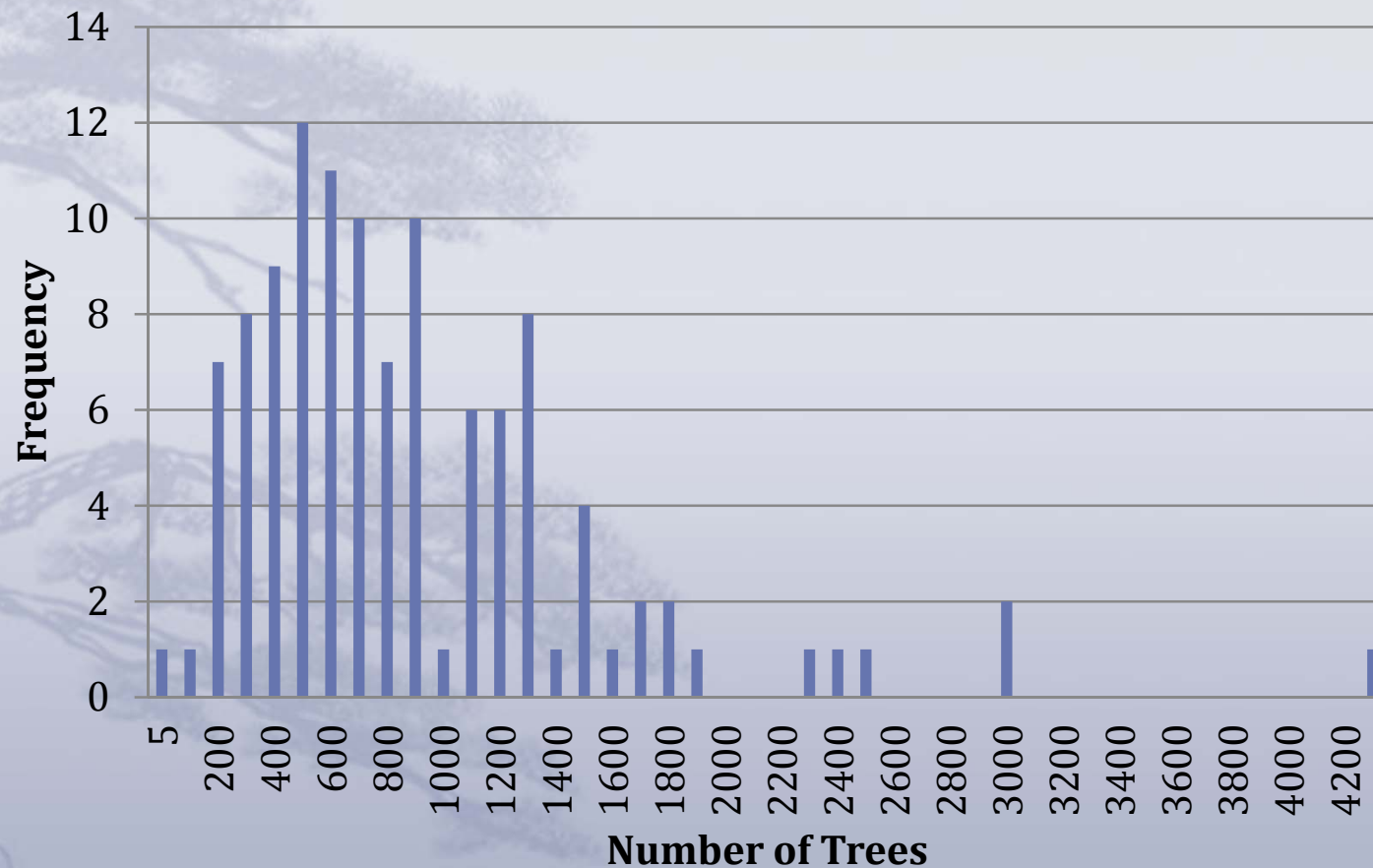
Provinces: Sakhon Nakhon, Udon Thani, Nakhon Phanom (3 of 5 Inpang Provinces – none reported in Kalasin or Mukdahan)

17 different Tambon, District, Provincial areas

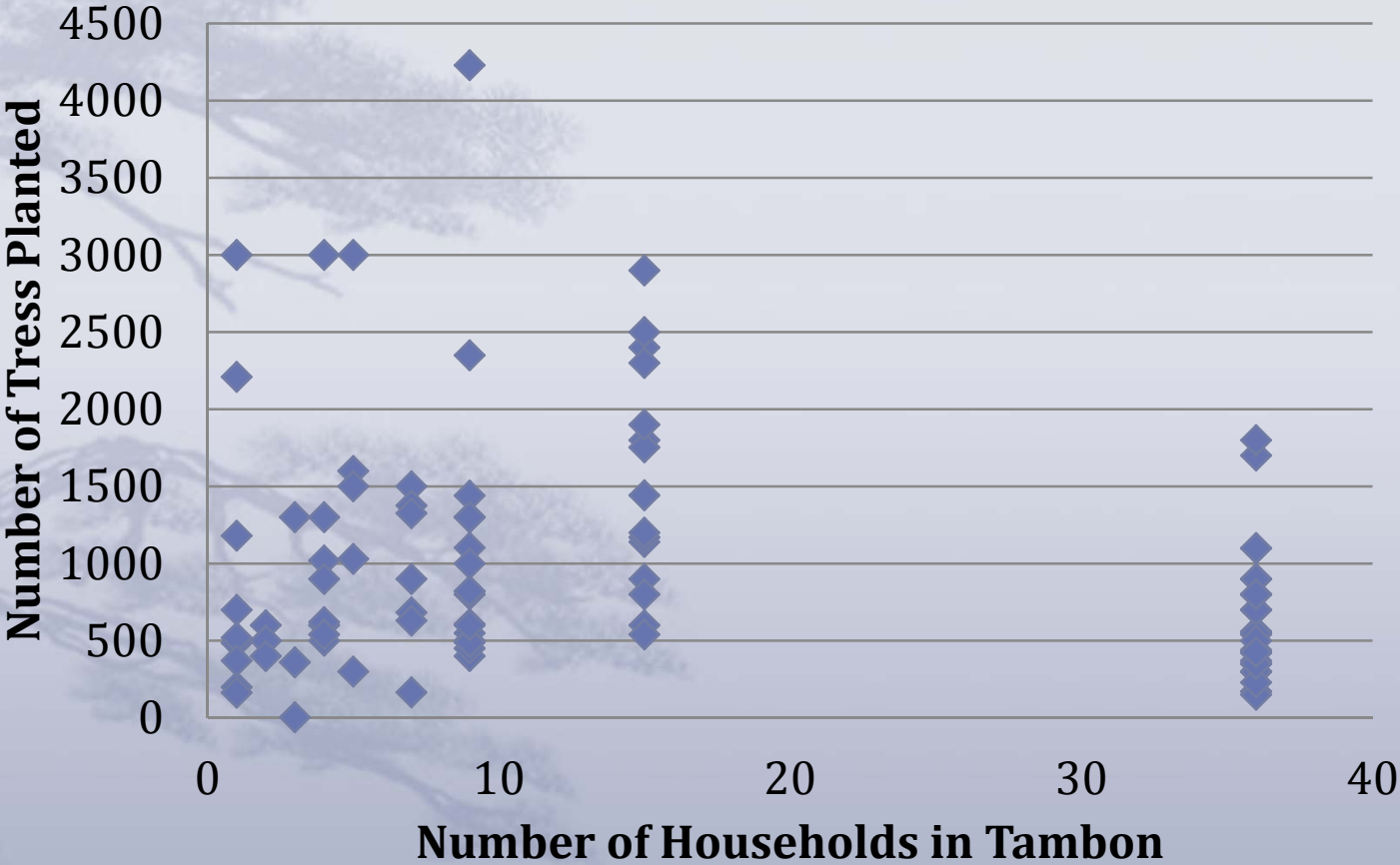
* One respondent with no location information in the database

# of Sp.	Freq	%
1	53	50.96%
2	7	6.73%
3	5	4.81%
4	2	1.92%
5	5	4.81%
6	5	4.81%
7	8	7.69%
8	0	0.00%
9	4	3.85%
11 - 50	15	14.42%

Frequency Distribution of Number of Rubber Trees Planted by Reporting Household



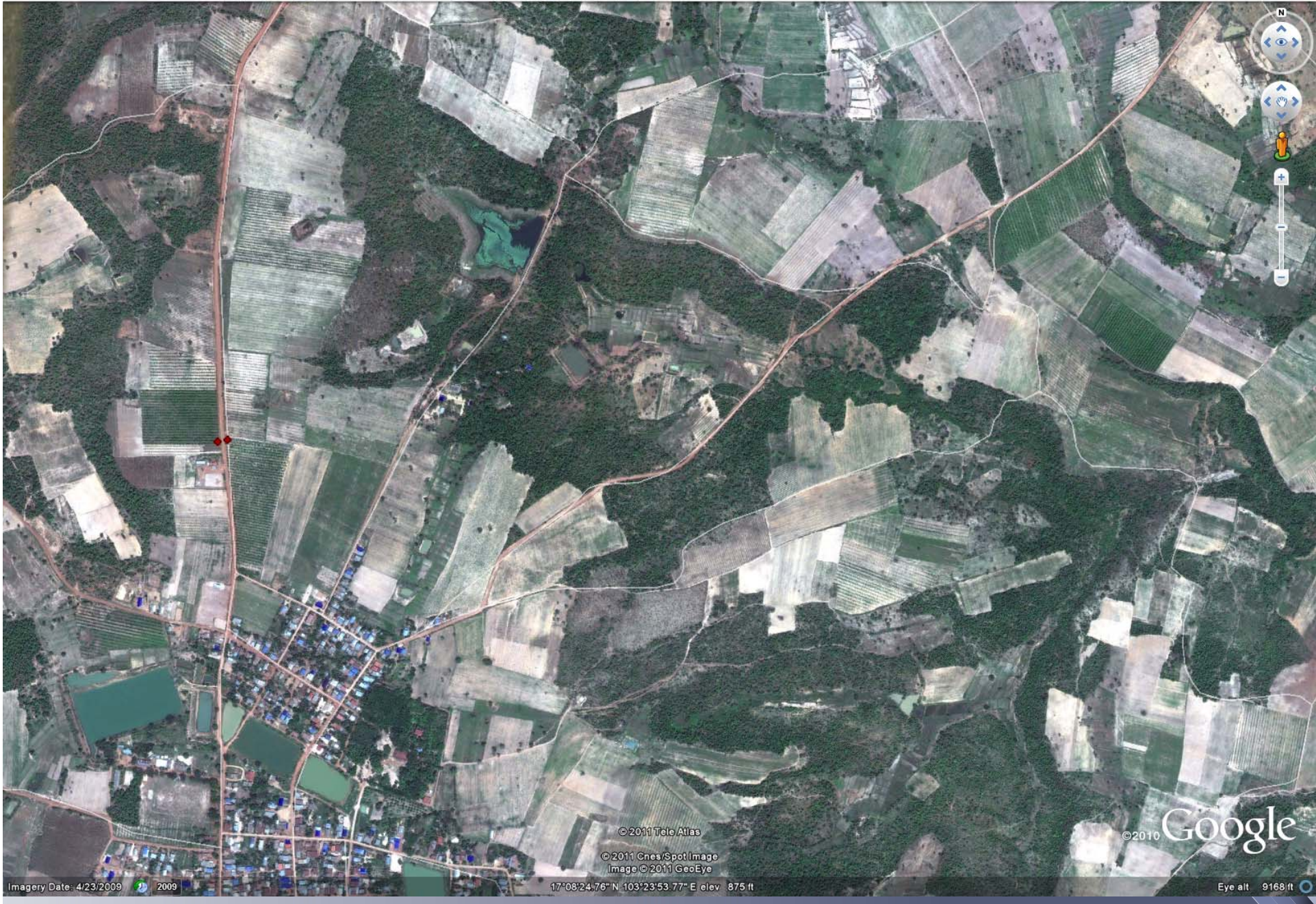
Number of Trees Planted Per Reporting Household in Each Tambon



Inpang Rubber – July 2011

* Diverse landscape

- * Small-holder rubber plantations and ...
- * Cassava, sugar cane, soybean, rice (annual crops)
- * Teak, Fruit trees orchards (Mango, guava, dragon fruit)
- * Remnant forest, community forests, secondary forests
- * Degraded lands, shrub-land
- * Settlement areas, water bodies (fish pond, reservoirs)
- * ... and intercropping with Rubber trees.



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Imagery Date: 4/23/2009 2009

17°08'24.76" N 103°23'53.77" E elev 875 ft

Eye alt 9168 ft



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Image © 2011 GeoEye

Imagery Date: 4/23/2009 2009

17°08'28.65" N 103°25'23.74" E elev 824 ft

Eye alt 9168 ft



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Imagery Date: 4/23/2009 2009

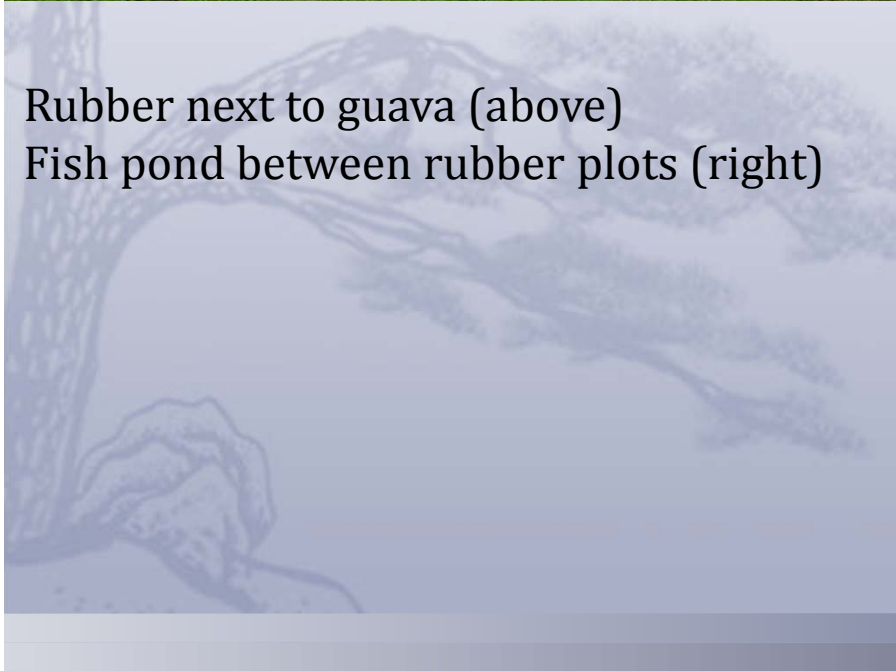
17°06'39.24" N 103°27'12.63" E elev 796 ft

Eye alt 9113 ft



Rubber monocrop (above)
Rice intercropped with rubber (right)



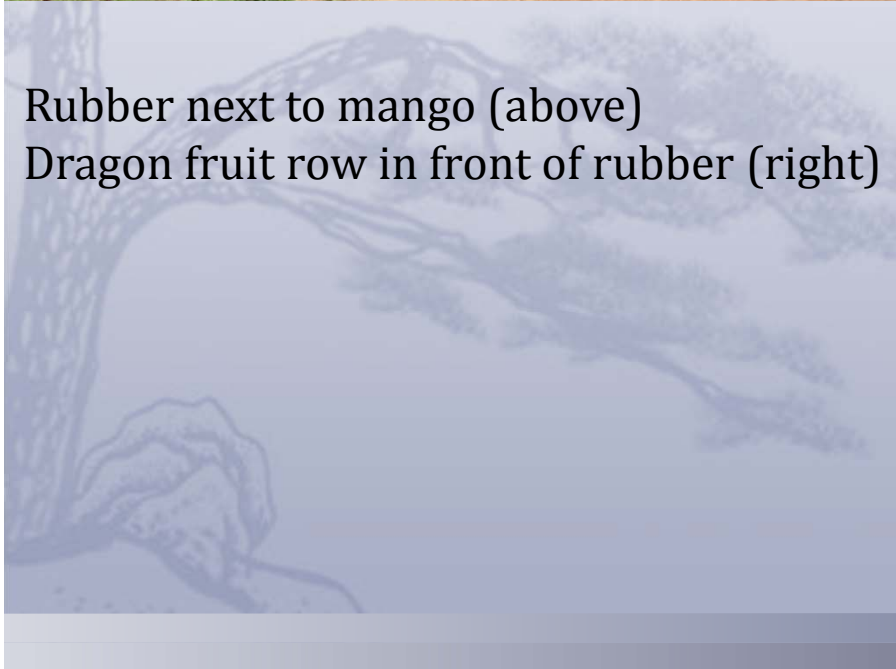


Rubber next to guava (above)
Fish pond between rubber plots (right)

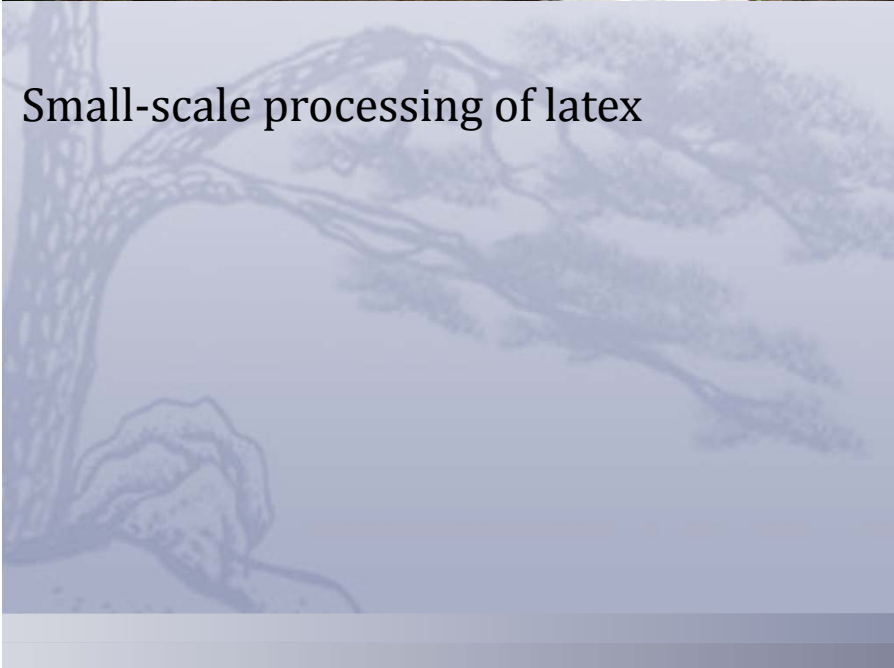
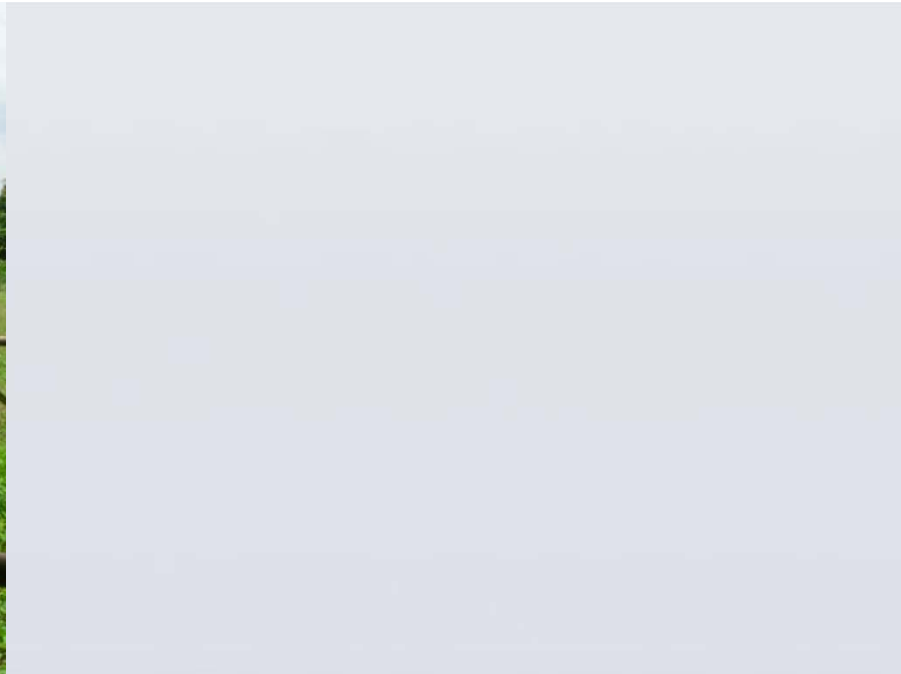


Large remnant forest tree in rubber plantation (left)
Rubber intercropped with Agarwood tree (below)





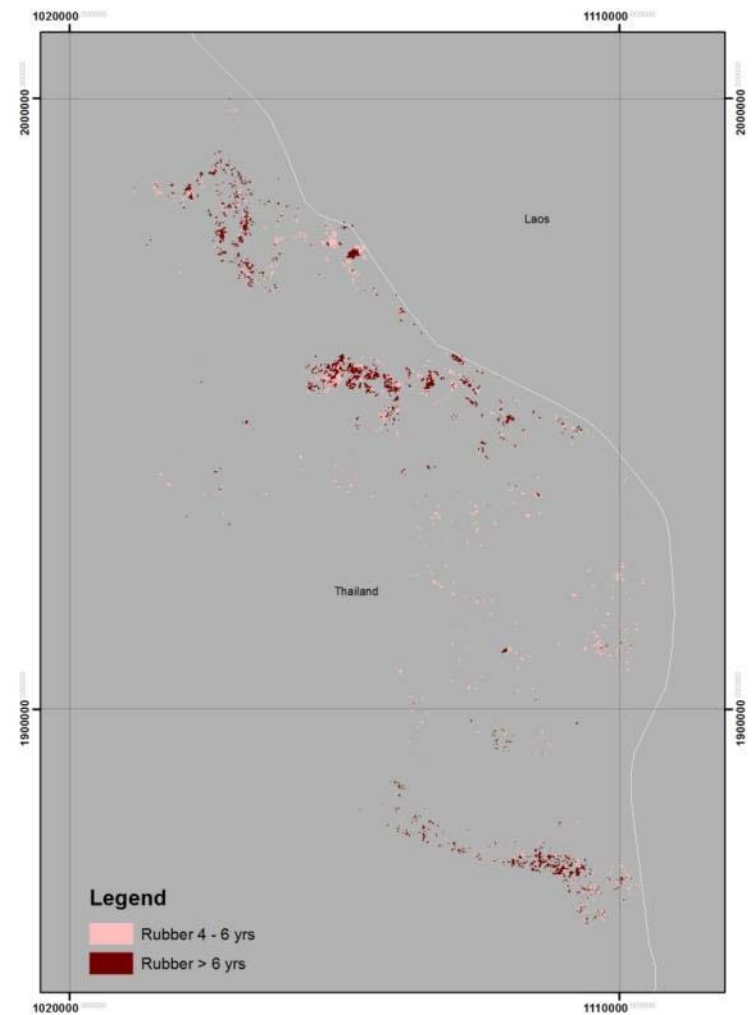
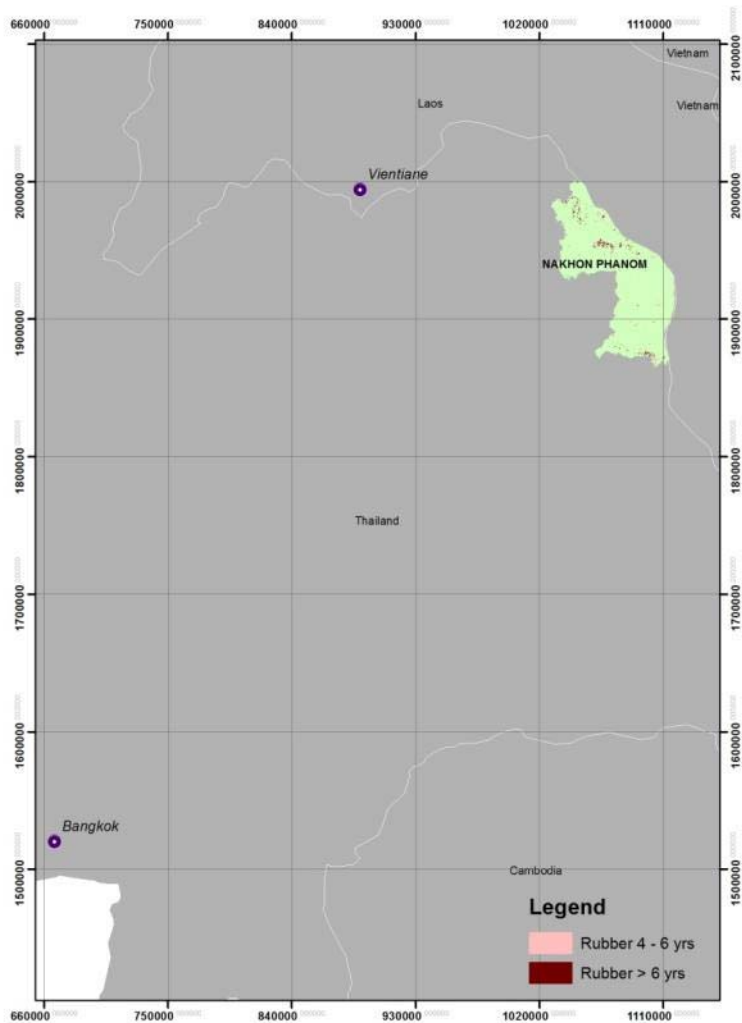
Rubber next to mango (above)
Dragon fruit row in front of rubber (right)

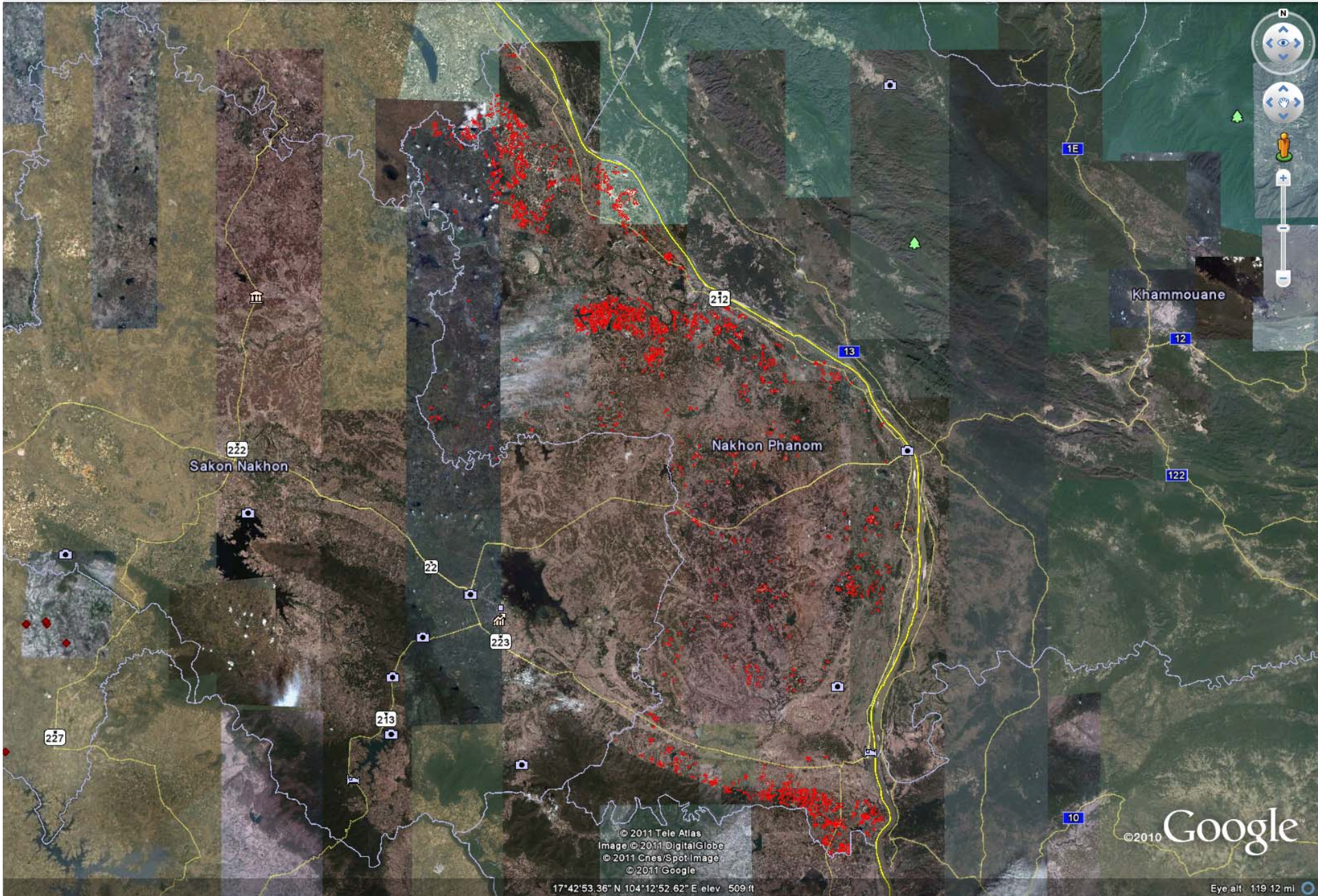


Small-scale processing of latex



Nakhon Phanom: Para Rubber Research Center



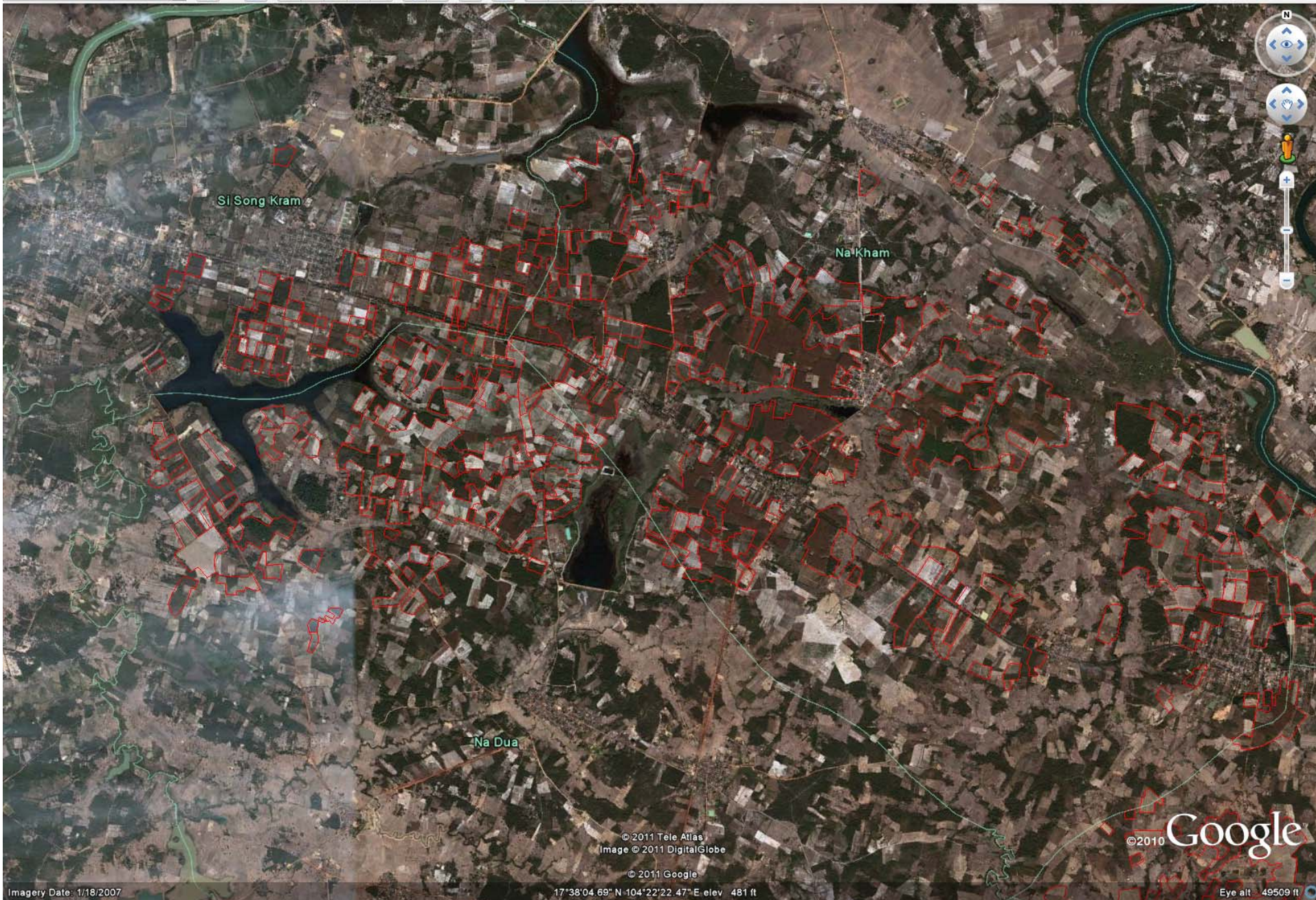


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17°42'53.36" N 104°12'52.62" E elev. 509 ft

©2010 Google

Eye alt: 119.12 mi



Si Song Kram

Na Kham

Na Dua

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Imagery Date: 1/18/2007

17°38'04.69" N 104°22'22.47" E elev 481 ft

Eye alt 49509 ft

Nakhon Phanom

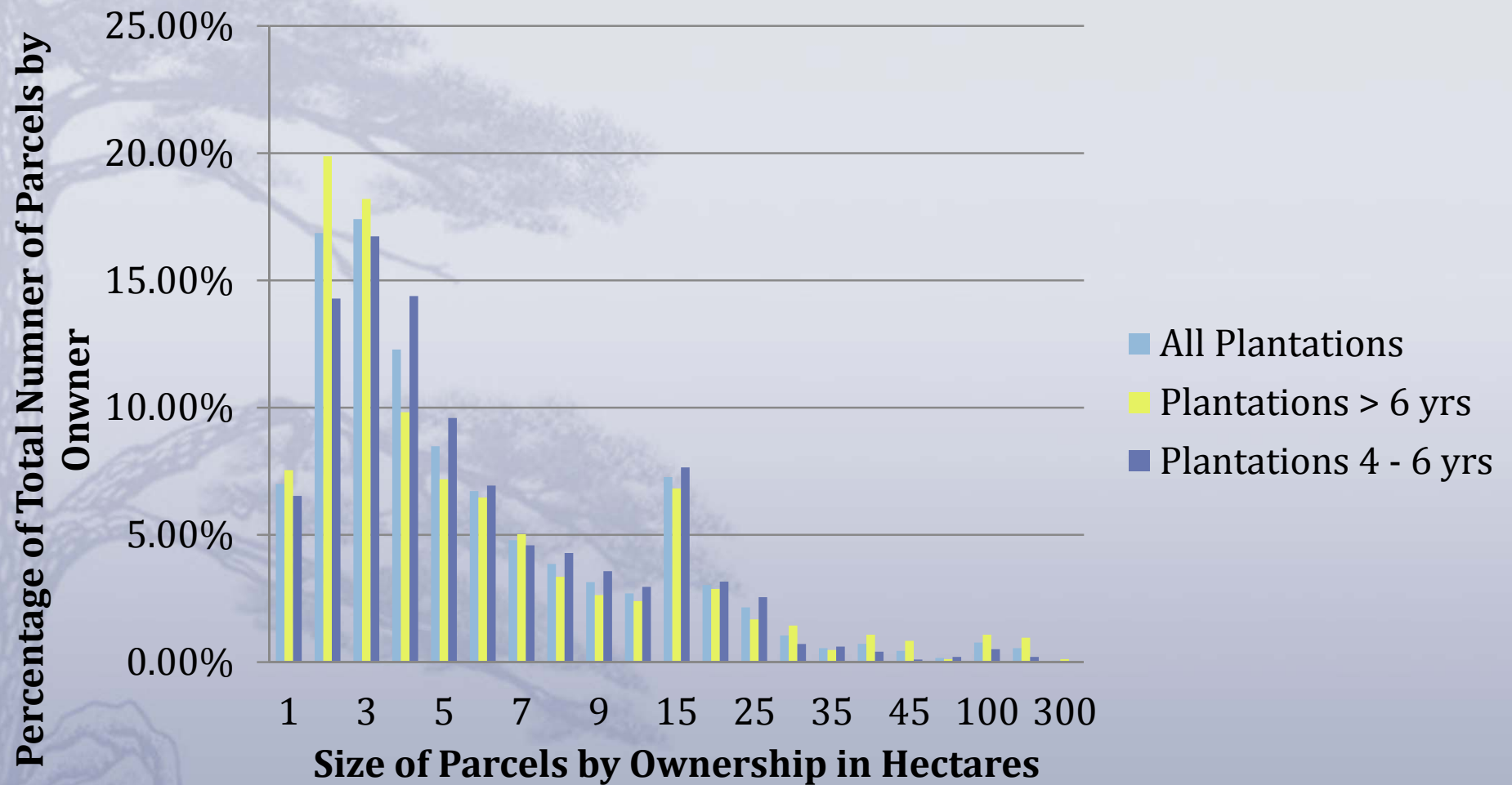
Undissolved Data

<u>CLASS</u>	<u>COUNT</u>	<u>AREA (ha)</u>	<u>% of Total</u>	<u>% of Province Area</u>
4-6 yrs	980	6374.690671	47.48%	1.15%
> 6 yrs	835	7051.21554	52.52%	1.27%
TOTAL	1815	13425.90621		2.41%

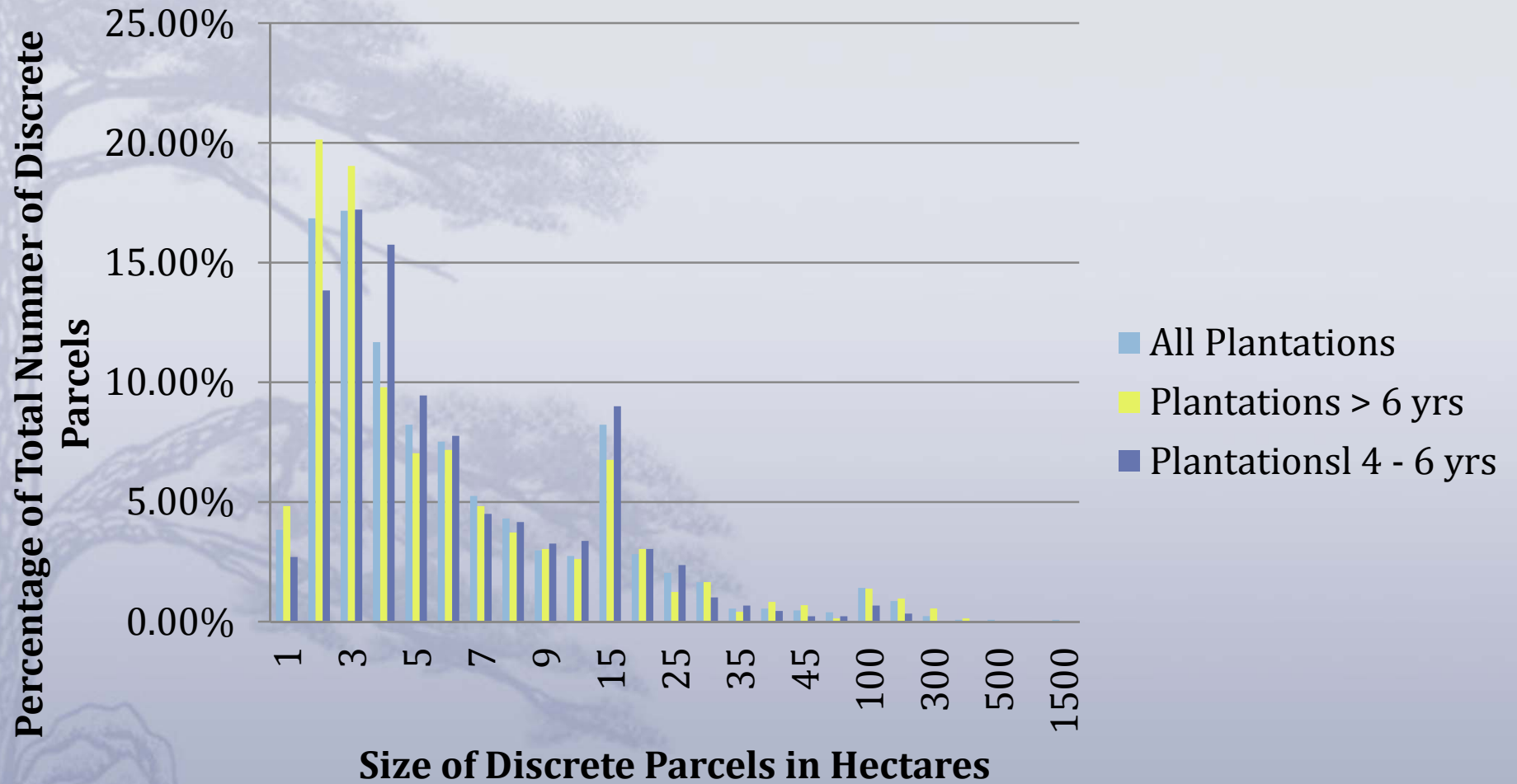
Discrete (Individual) Plantatations

<u>CLASS</u>	<u>COUNT</u>
4-6 yrs	889
> 6 yrs	725
TOTAL	1276

Frequency Distribution of Rubber Plantation in Nakhon Phanom Province



Frequency Distribution of Rubber Plantation in Nakhon Phanom Province



Undissolved Areas

<u>Statistic</u>	<u>Area (ha)</u>
Mean	7.40
Median	3.66
StDev	14.78
Min	<0.00
Max	256.75
Count	1815.00

Discrete Areas

<u>Statistic</u>	<u>Area (ha)</u>
Mean	10.61
Median	4.05
StDev	41.80
Min	<0.00
Max	1186.88
Count	1276.00

Research Support

- ✿ Carbon2Markets, Global Observatory for Ecosystem Services, Forestry Dept., Michigan State University
- ✿ Asia-Pacific Network for Global Change Research (APN)
- ✿ Mahasarakham University, Thailand
- ✿ National Research Council of Thailand

Collaborators & Colleagues

- * Dr. Usa Klinhon, Mahasarakham University
- * Dr. Teerawong Laosuwan, Mahasarakham University
- * Dr. Pornchai Uttarak, Mahasarakham University
- * Mr. Chetphong Butthep, National Research Council of Thailand
- * Ms. Siritorn Dumrongsukit, National Research Council of Thailand
- * Inpang Community Network

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THANK YOU

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