



VERIFICATION ON-SITE SURVEY THROUGH GIS AND REMOTE SENSING APPLICATION AT SELECTED RUBBER AREA OF PENINSULAR MALAYSIA

Mohd Hafiz Mohd Hazir &
Tuan Mohamad Tuan Muda

Malaysian Rubber Board

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29 Sep - 01 Oct, 2015

INTRODUCTION



Independent Rubber Smallholders On-site Survey Report

Smallholders



- 95% shares of natural rubber producers
- Rubber Smallholders
 - any grower's plant rubber below or equal to 40 hectares of land
- Independent Rubber Smallholders
 - own land, effort and not bind with any agencies or organisation.



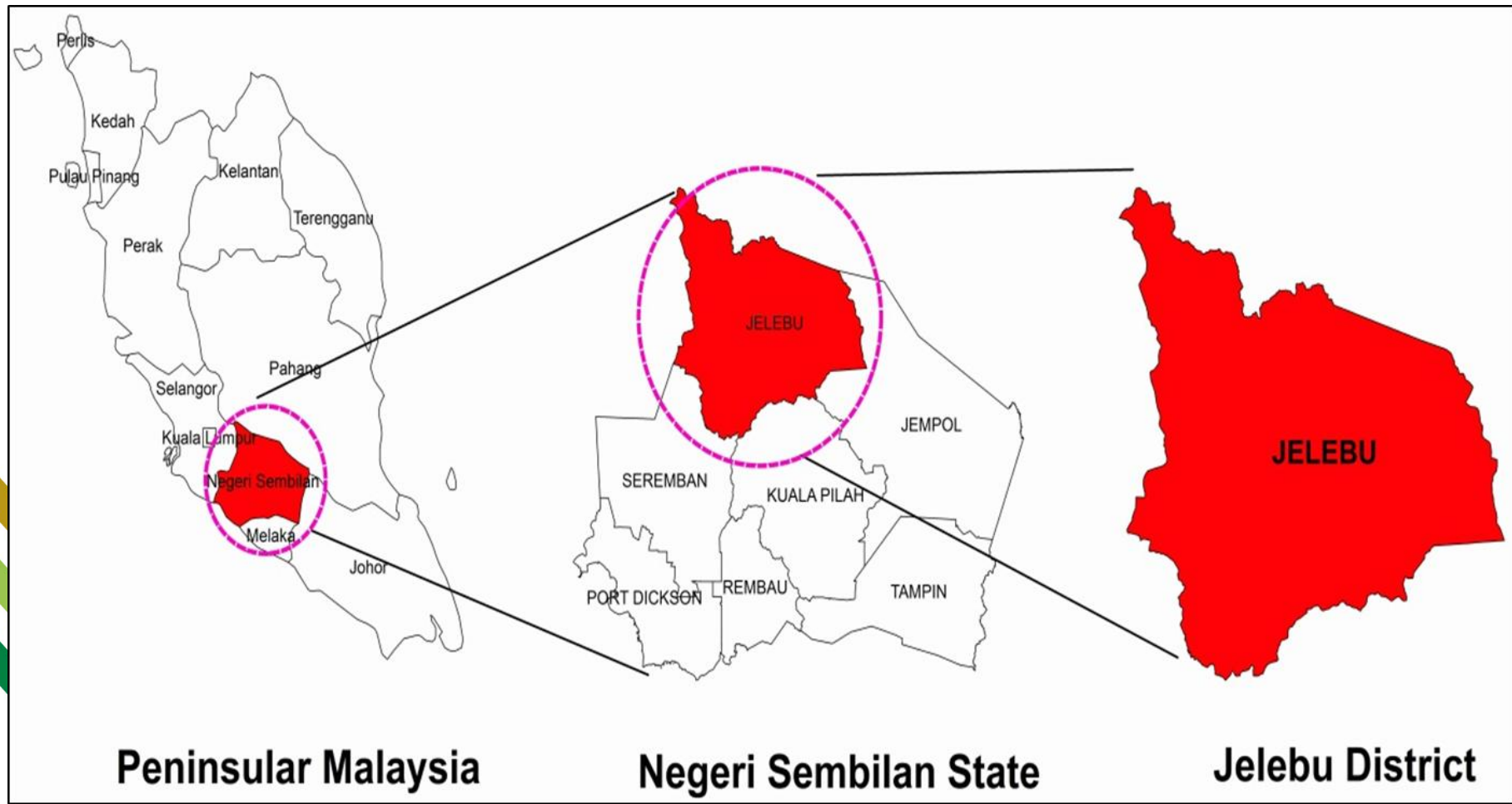
- The aim of this survey was to determine how well smallholders accept and use technology recommended by the MRB
- The integration with spatial information is needed to confirm the area, current status, and monitoring program

Objectives



- To verify on-site survey information
- To identify location of independent rubber smallholder farm
- To utilize geospatial technology in management of on-site survey information of independent rubber smallholders

Study Area



Jelebu district, Negeri Sembilan

METHODOLOGY



Rearrangement and Data Cleaning

LGM Independent Smallholders Survey 2012



Join Spatial Based on Unique Parcel Identifier Code

Independent Smallholders data (Excel)

NDCDB Cadastral



Data Rectification and Analysis

Independent Rubber Smallholding Map

Independent Rubber Smallholders Data



Verification of Independent Smallholders Data

Independent Rubber
Smallholding Map

Dept. of Agriculture Land Use Map 2010 &
Department of Town and Country Planning Land
Used Map 2012



Data Updating and Monitoring

Independent Rubber
Smallholding Map

Google Earth Application, LANDSAT 8 2014
Imagery & SPOT 5 2014 Imagery

Data



- 2012 MRB Independent Smallholders Survey
- 2014 NDCDB Cadastral (JUPEM)
- Land Use Map 2010 (Department of Agriculture)
- Land Use Map 2012 (Department of Town and Country Planning)
- Landsat 8 (USGS)
- SPOT 5 (ARSM)

Identification of Land Parcel Number/ Lot Number from 2012 LGM Independent Smallholders Survey Database

	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	No. Rekod Kel	No. Gerak				Daerah		Mukim	Kampung	No. Lot	Luas (Hek)	Guna Tana		
3175	3698	414	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	2610	4.82	GETAH	PEMILIK & PENGUSAHA
3176	17564	329	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1592	2.73	GETAH	PEMILIK & PENGUSAHA
3177	15599	5595	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	28	2.84	GETAH	PEMILIK & PENGUSAHA
3178	42203	1678	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1239	1.94	GETAH	PEMILIK & PENGUSAHA
3179	15633	328	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1591	2.84	GETAH	PEMILIK & PENGUSAHA
3180	597	174	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1492	9.05	GETAH	PEMILIK & PENGUSAHA
3181	350	1635	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1208	10.73	GETAH	PEMILIK & PENGUSAHA
3182	17311	213	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1487	2.75	GETAH	PEMILIK & PENGUSAHA
3183	472	1640	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1222	2.5495	GETAH	PEMILIK & PENGUSAHA
3184	2083	389	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	5458	1.02	GETAH	PEMILIK & PENGUSAHA
3185	17053	532	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1616	2.77	GETAH	PEMILIK & PENGUSAHA
3186	19875	434	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1932	2.59	GETAH	PEMILIK & PENGUSAHA
3187	34132	525	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1617	2.16	GETAH	PEMILIK & PENGUSAHA
3188	18252	1657	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1233	2.68	GETAH	PENGUSAHA
3189	20746	477	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1619	2.55	GETAH	PEMILIK & PENGUSAHA
3190	71404	676	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1902	1.2	GETAH	PENGUSAHA
3191	15668	231	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1506	2.84	GETAH	PEMILIK & PENGUSAHA
3192	17560	244	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1519	2.73	GETAH	PEMILIK & PENGUSAHA
3193	42984	1651	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1216	1.9	GETAH	PEMILIK & PENGUSAHA
3194	9393	220	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1495	3.54	GETAH	PEMILIK & PENGUSAHA
3195	9310	277	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1553	3.56	GETAH	PEMILIK & PENGUSAHA
3196	13394	1897	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1508	3.06	GETAH	PENGUSAHA
3197	70288	592	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1905	1.21	GETAH	PEMILIK & PENGUSAHA
3198	31984	278	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1554	2.28	GETAH	PENGUSAHA
3199	13539	189	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1464	3.04	GETAH	PEMILIK & PENGUSAHA
3200	2731	333	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1596	2.8328	GETAH	PEMILIK & PENGUSAHA
3201	16897	246	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1821	2.78	GETAH	PEMILIK & PENGUSAHA
3202	42649	526	5	N.SEMBILAN	501	JELEBU		50107	Pertang	-	1618	1.92	GETAH	PEMILIK & PENGUSAHA

Converted to Unique Parcel Identifier (UPI)
standard

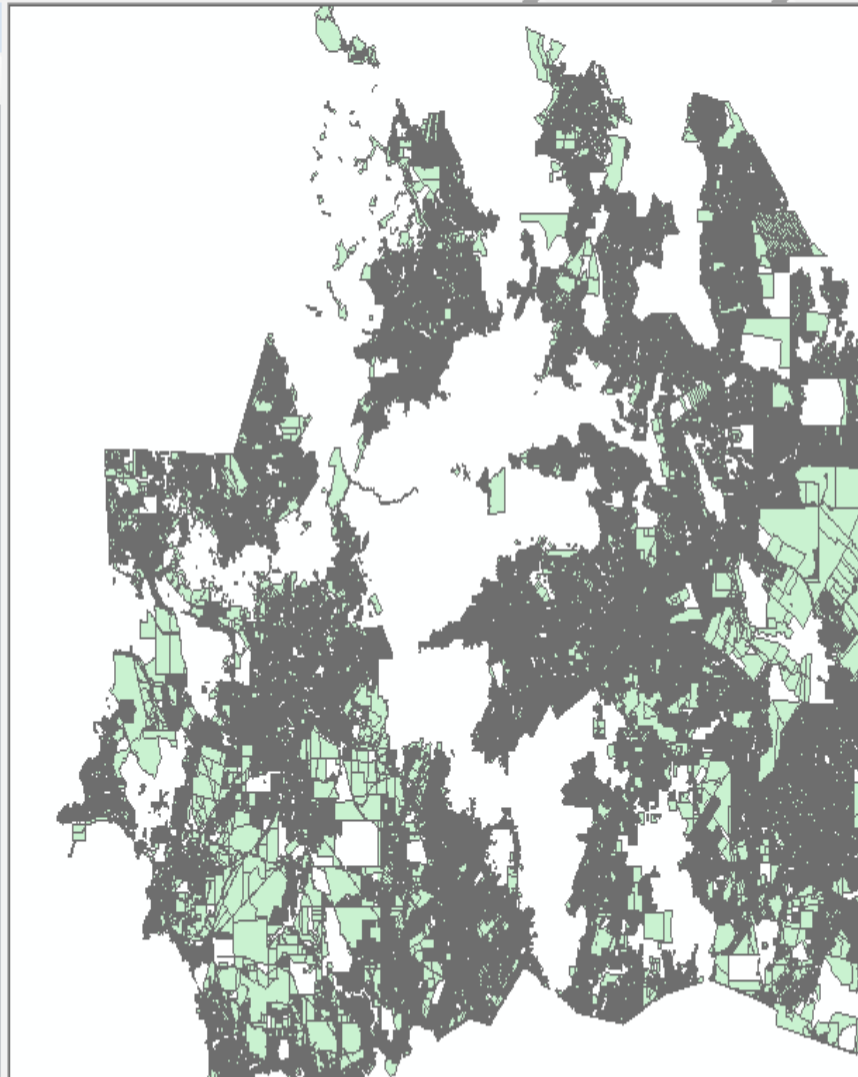
	E	F	G	H	I	J
1	NO_GERAN	KAMPUNG	LUAS_HEKTAR	STATUS_LOT	STATUS_RESPONDEN	KOD_UPI
2	185	GLAMI LEMI	2.428	GETAH	PEMILIK & PENGUSAHA	050101000000026
3	190	TEMELANG	2.43	GETAH	PEMILIK	050101000000027
4	508	GELAMI	1.41	GETAH	PEMILIK & PENGUSAHA	050101000000066
5	401	SG. ROTAN	2.4787	GETAH	PEMILIK & PENGUSAHA	050101000000066
6	67662	TITI	1.7174	GETAH	PEMILIK & PENGUSAHA	050101000000247
7	1566	BEMBAN	1.0522	GETAH	PEMILIK & PENGUSAHA	050101000000275
8	539	TEMELANG	2.428	GETAH	PEMILIK & PENGUSAHA	050101000000334
9	135	GELAMI	1.2142	GETAH	PEMILIK & PENGUSAHA	050101000000369
10	19233	GELAMI LEMI	5.767	GETAH	PEMILIK & PENGUSAHA	050101000000524
11	53	-	2.0341	GETAH	PENGUSAHA	050101000000540
12	837	GLAMI LEMI	1.227	GETAH	PEMILIK & PENGUSAHA	050101000000547
13	72142	TITI	1.5378	GETAH	PEMILIK & PENGUSAHA	050101000000556
14	188828	GELAMI	0.61	GETAH	PEMILIK & PENGUSAHA	050101000000564
15	21853	GELAMI	7.4867	PERTANIAN	PEMILIK & PENGUSAHA	050101000000606
16	21853	GELAMI	7.4867	PERTANIAN	PEMILIK & PENGUSAHA	050101000000606
17	21853	GELAMI	7.4867	PERTANIAN	PEMILIK & PENGUSAHA	050101000000606
18	72705	-	1.75	GETAH	PEMILIK & PENGUSAHA	050101000000611
19	72705	-	1.75	GETAH	PEMILIK & PENGUSAHA	050101000000611
20	69606	GELAMI	1.6744	GETAH	PEMILIK & PENGUSAHA	050101000000677
21	5248	TITI	2.025	GETAH	PEMILIK & PENGUSAHA	050101000000683
22	70185	GELAMI	2.1802	GETAH	PEMILIK & PENGUSAHA	050101000000685
23	1426	-	2.1263	GETAH	PEMILIK & PENGUSAHA	050101000000700
24	69614	GLAMI LEMI	2.069	GETAH	PENGUSAHA	050101000000703

Digital NDCDB Cadastral contain UPI Information

Table Of Contents

Layers

Lot_Kadaster_NSembilan_2014



Identify

Identify from: <Top-most layer>

Lot_Kadaster_NSembilan_2014

- DC0040
- DC0040
- DC0040
- DC0040

Location: 83,660.922 17,131.158 Mete

Field	Value
LOT	16319
MUKIM	03
NEGERI	05
NO_FAIL_UK	
OBJECTID	155929
PA	PA37579
SEKSYEN	000
Shape	Polygon
SHAPE_area	40811.12791
SHAPE_len	878.287682
STATUS	65
UPI	0507030000016319

Identified 37 features

Create Features

<Search>

There are no templates to show.

on Tools

Select a template.

Example of Unique Parcel Identifier Code

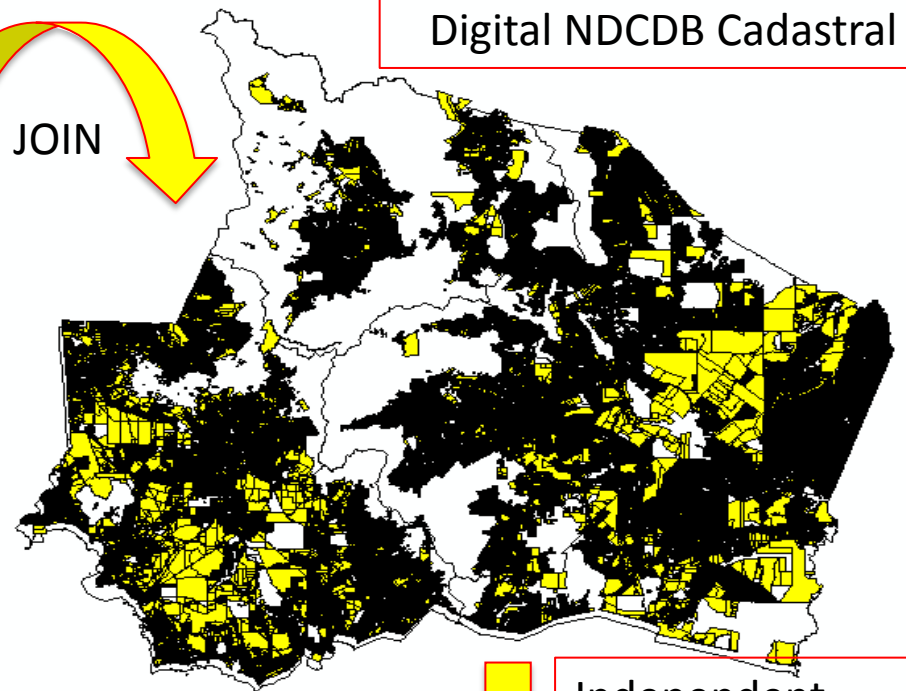


Item	Description	Code
state	Negeri Sembilan	05
district	Jelebu	05
sub-district	Glami Lemi	01
section	Nil	000
Land parcel/ Parcel number	825	0825
UPI	0505010000825	

Transformation Data to Map

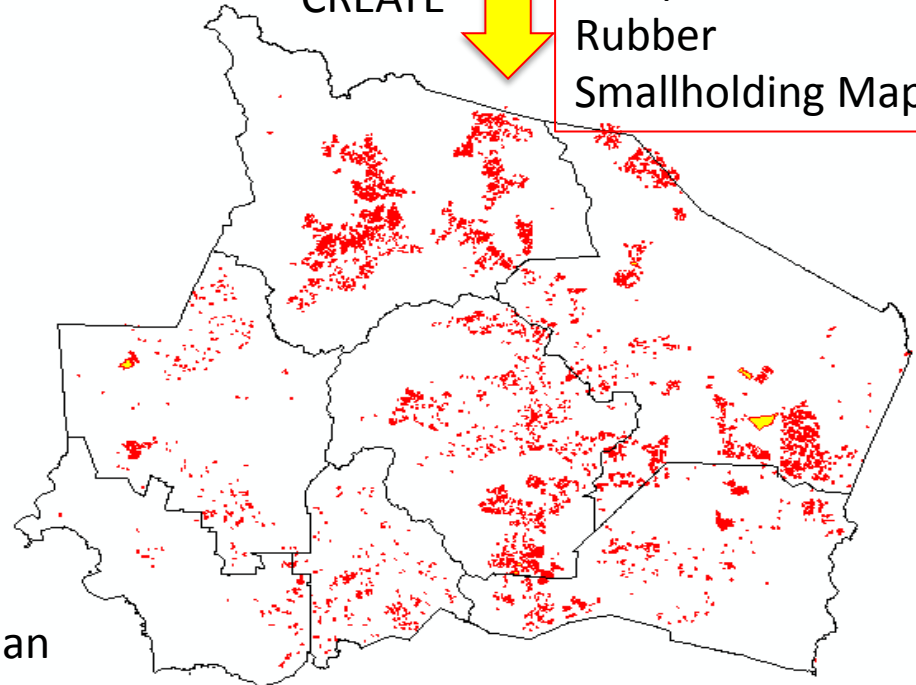
Digital NDCDB Cadastral

JOIN



CREATE

Independent Rubber Smallholding Map

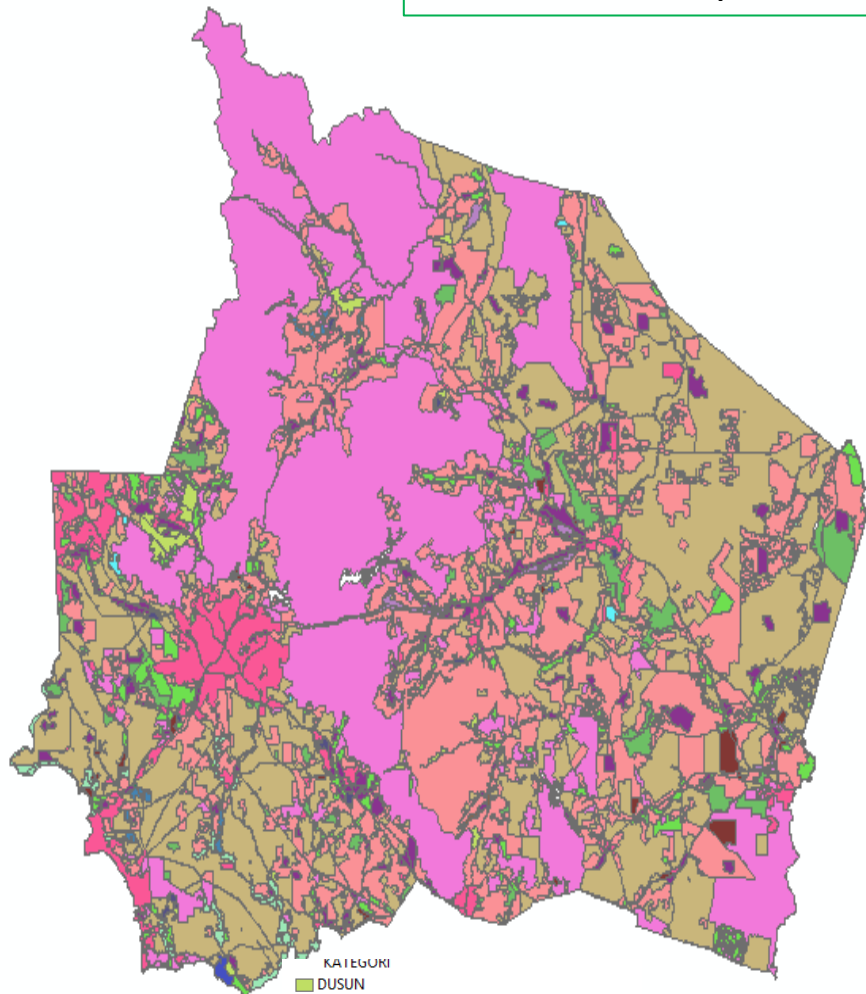


2012 LGM Independent Smallholders Survey Database

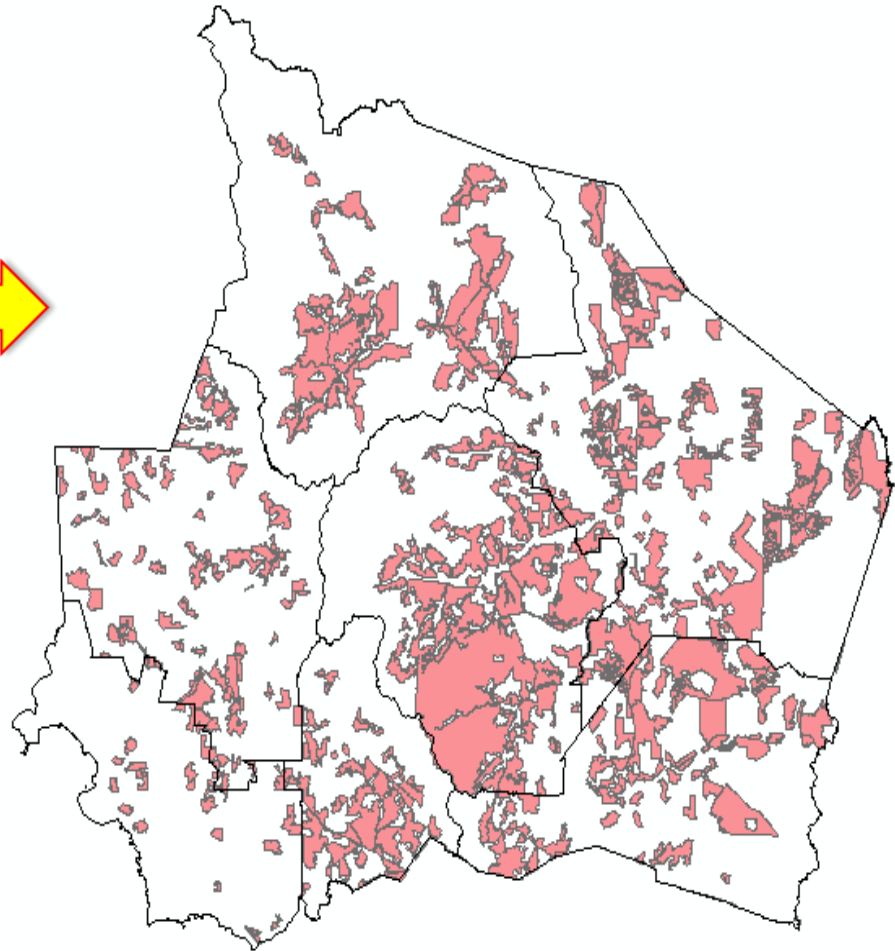
	C2_Daerah	C2_Parlimen	C2_Dun	C2_Mukim	C2_Kampung	C2_NomborLot	C2_NomborLain	C2_Nombor
2	JELEBU	JELEBU	CHENNAH	KENABOI	KG. ORANG ASLI		R.O.A	R.O.A
3	JELEBU	JELEBU	CHENNAH	KENABOI	KG. ORANG ASLI		R.O.A	R.O.A
4	JELEBU	JELEBU	PERTANG	PERTANG	KG. KERANGAI	1033		4651
5	JELEBU	JELEBU	CHENNAH	TERIANG HILIF	KG. SERI JUNTAI	3338		2453
6	JELEBU	JELEBU	CHENNAH	TERIANG HILIF	KG. LAKAI			
7	JELEBU	JELEBU	PERTANG	PERTANG	KG. BARU PERTANG	1600		206
8	JELEBU	JELEBU	PERTANG	PERTANG	KG. BARU PERTANG	1589		719
9	JELEBU	JELEBU	PERTANG	PERTANG	KG. BARU PERTANG	2148		519
10	JELEBU	JELEBU	PERTANG	PERTANG	KG. KERANGAI	1184		344
11	JELEBU	JELEBU	KLAWANG	HULU TERIAN	KG. TERIANG	1396		53782
12	JELEBU	JELEBU	KLAWANG	KUALA KLAWANG	KG. SARIN	1708		229
13	JELEBU	JELEBU	KLAWANG	KUALA KLAWANG	KG. ULU JELEBU	731		494
14	JELEBU	JELEBU	KLAWANG	KUALA KLAWANG	KG. ULU JELEBU	2006		26
15	JELEBU	JELEBU	KLAWANG	KUALA KLAWANG	KG. KUALA KLAWANG	122		348
16	JELEBU	JELEBU	KLAWANG	KUALA KLAWANG	KG. ULU JELEBU			
17	JELEBU	JELEBU	PERTANG	PERTANG	KG. PETASEH	2314		513
18	JELEBU	JELEBU	PERTANG	PERTANG	KG. PETASEH	2315		976

Negeri Sembilan

Land Use Map 2010 (Department of Agriculture)



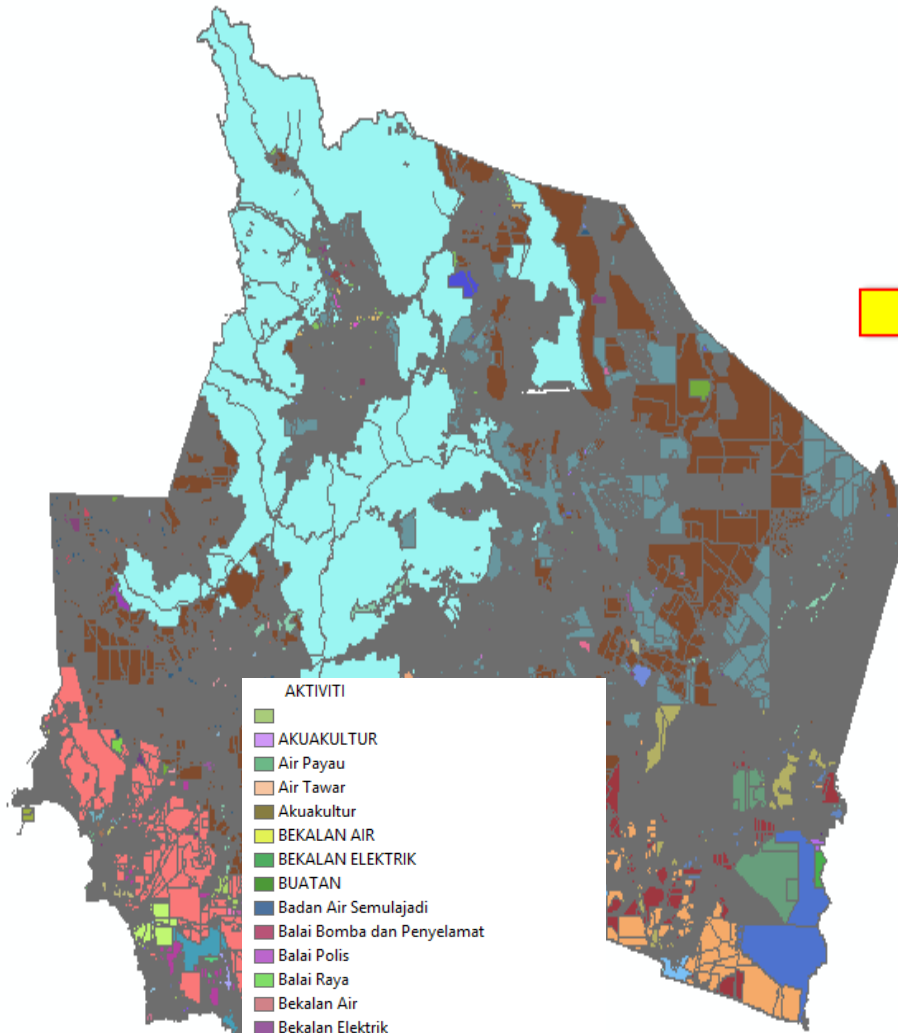
- KATEGORI
- DUSUN
 - GETAH
 - HUTAN
 - HUTAN PAYA DAN BUYAU
 - JALAN RAYA DAN LEBUH RAYA
 - KAWASAN CERANG
 - KAWASAN TERNAKAN (AKUAKULTUR/AYAM/ITIK)
 - KEBUN SAYUR-SAYURAN / FLORIKULTUR
 - KELAPA DAN KOKO
 - KELAPA SAWIT
 - KUARI / BEKAS KUARI
 - LOMBONG DAN BEKAS LOMBONG
 - PADI
 - PELBAGAI TANAMAN
 - PERBANDARAN, UTILITI DAN YANG BERKAITAN
 - PERKEBUNAN CAMPUR
 - RUMPUT TERBIAR/LALANG



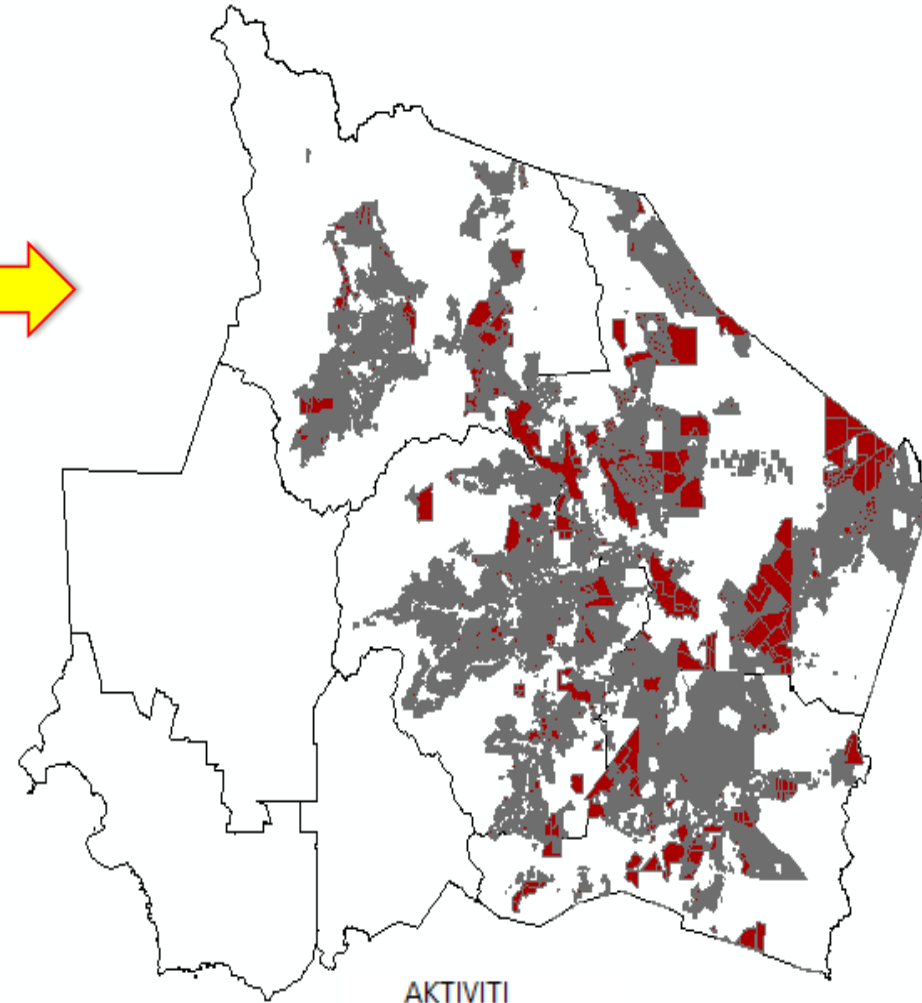
GETAH

Rubber Land Use

Land Use Map 2012 (Department of Town and Country Planning)



- AKTIVITI
- AKUAKULTUR
 - Air Payau
 - Air Tawar
 - Akuakultur
 - BEKALAN AIR
 - BEKALAN ELEKTRIK
 - BUATAN
 - Badan Air Semulajadi
 - Balai Bomba dan Penyelamat
 - Balai Polis
 - Balai Raya
 - Bekalan Air
 - Bekalan Elektrik
 - Bekalan Gas
 - Belukar
 - Belukar/Semak
 - Berat
 - Buatan
 - GETAH
 - Getah
 - Dewan Orang Ramai
 - Dewan Serbaguna Awam
 - Gelanggang Permainan
 - Gereja
 - HUTAN DARAT
 - Ultra-Darat



- AKTIVITI
- GETAH; Getah

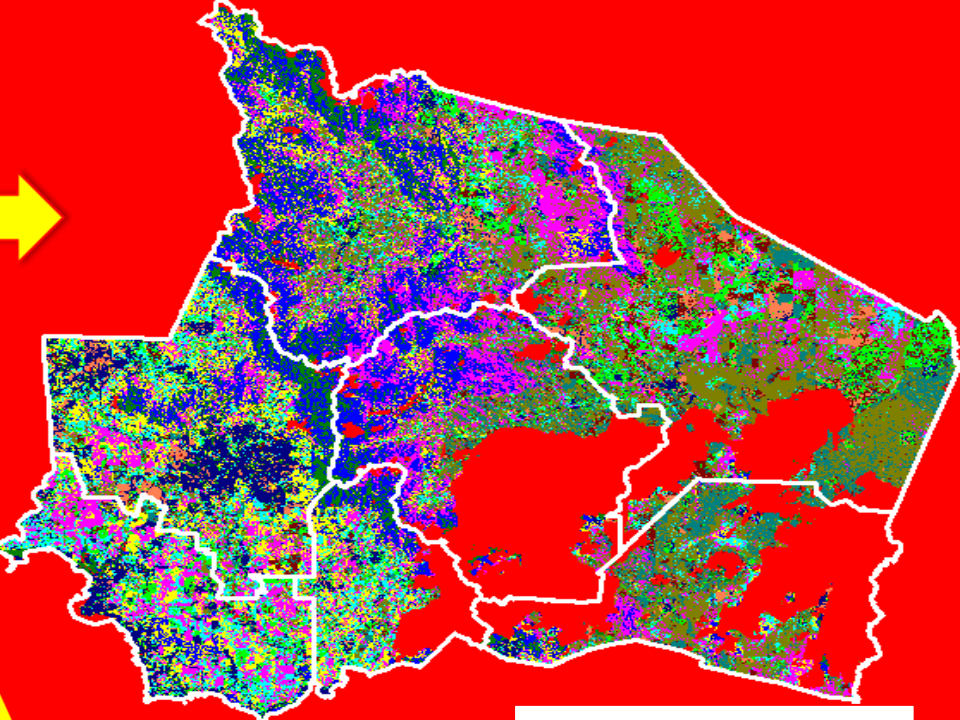
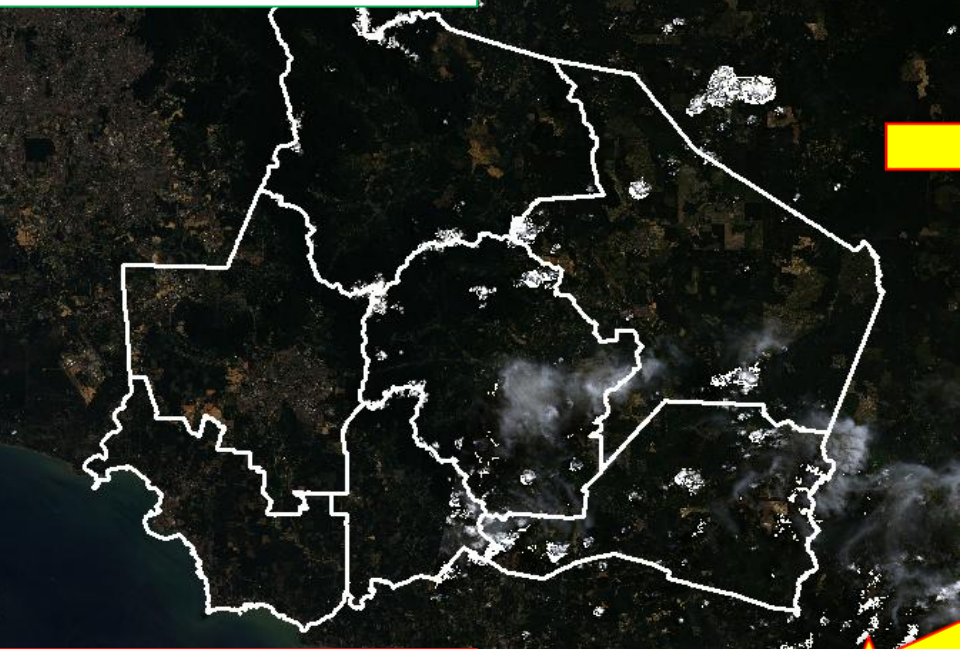
Rubber Land Use

Selected Scenes of Satellite Imagery

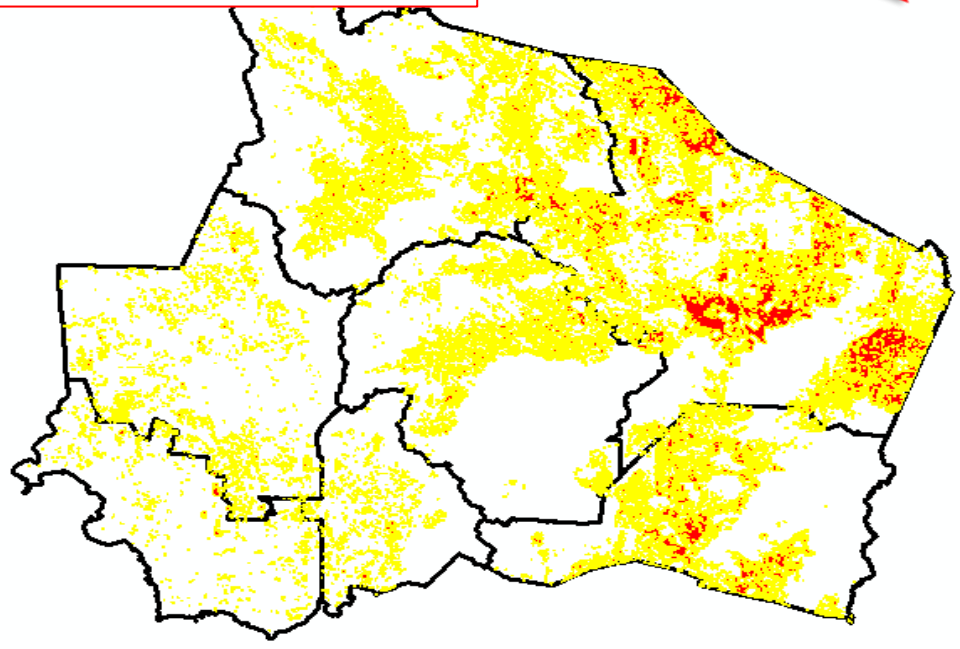


Type	Scene ID	Acquisition date	Cloud Cover (%)
Landsat 8	LC81270582014083LGN00	24 March 2014	0
	LC81270582014115LGN00	25 April 2015	10
	LC81270582014067LGN00	8 March 2014	10
SPOT 5	SPOT5_o271344pansharp_2 0141028_AB	28 October 2014	30

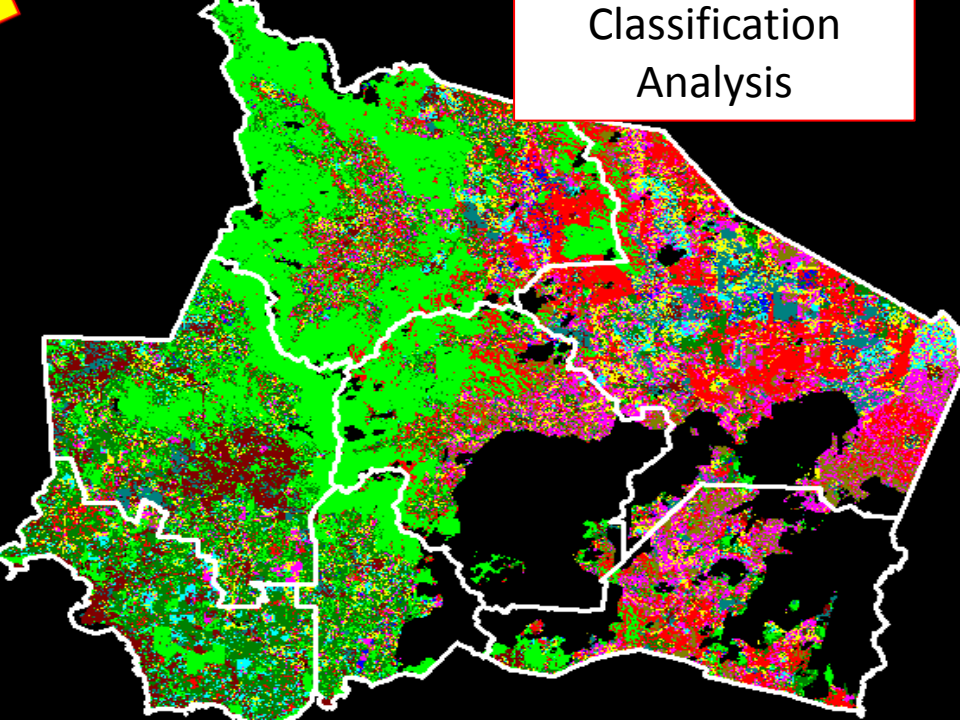
Landsat 8 OLI



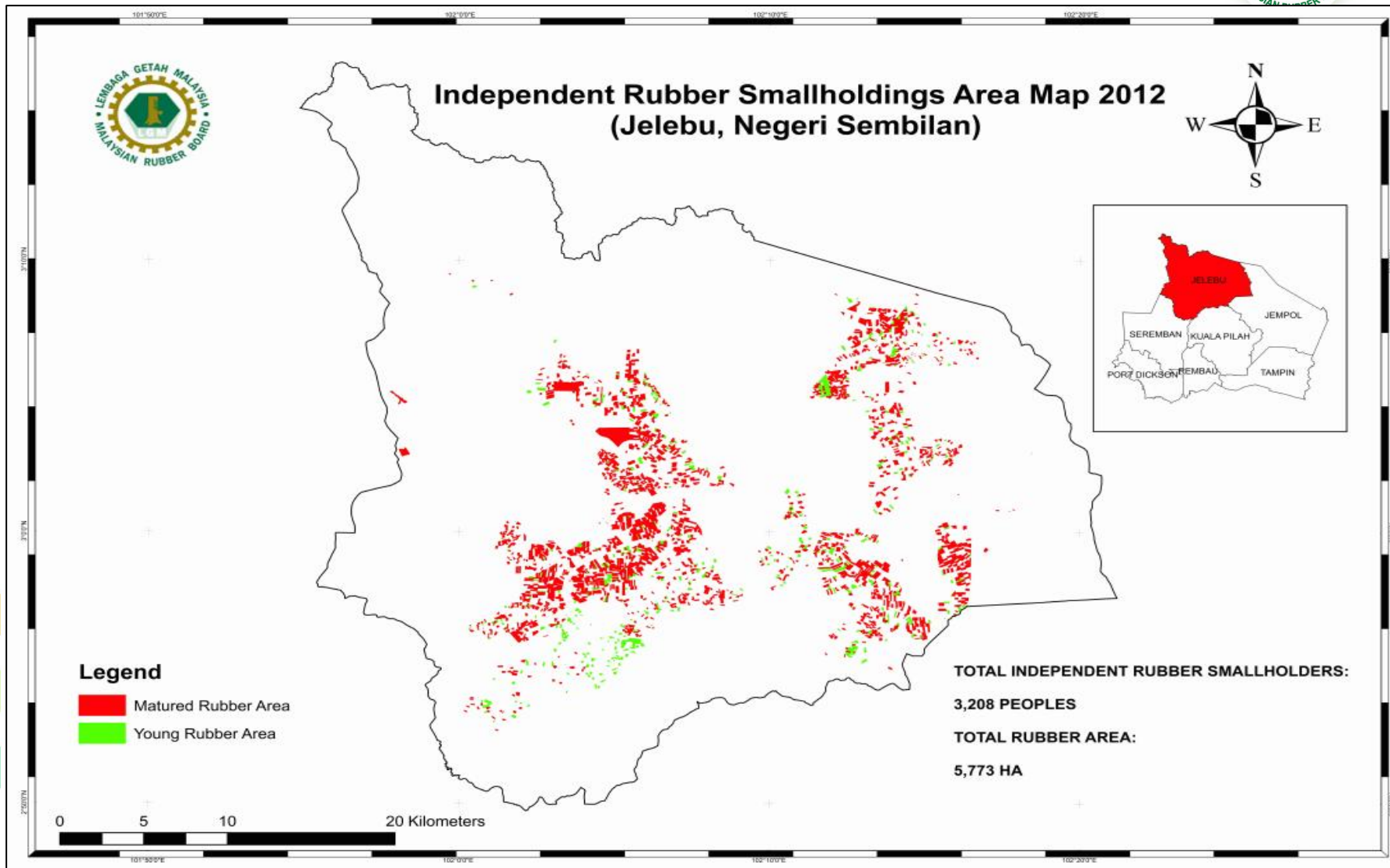
Rubber Area



Classification
Analysis



RESULTS



Jelebu Independent Rubber Smallholding Area Map

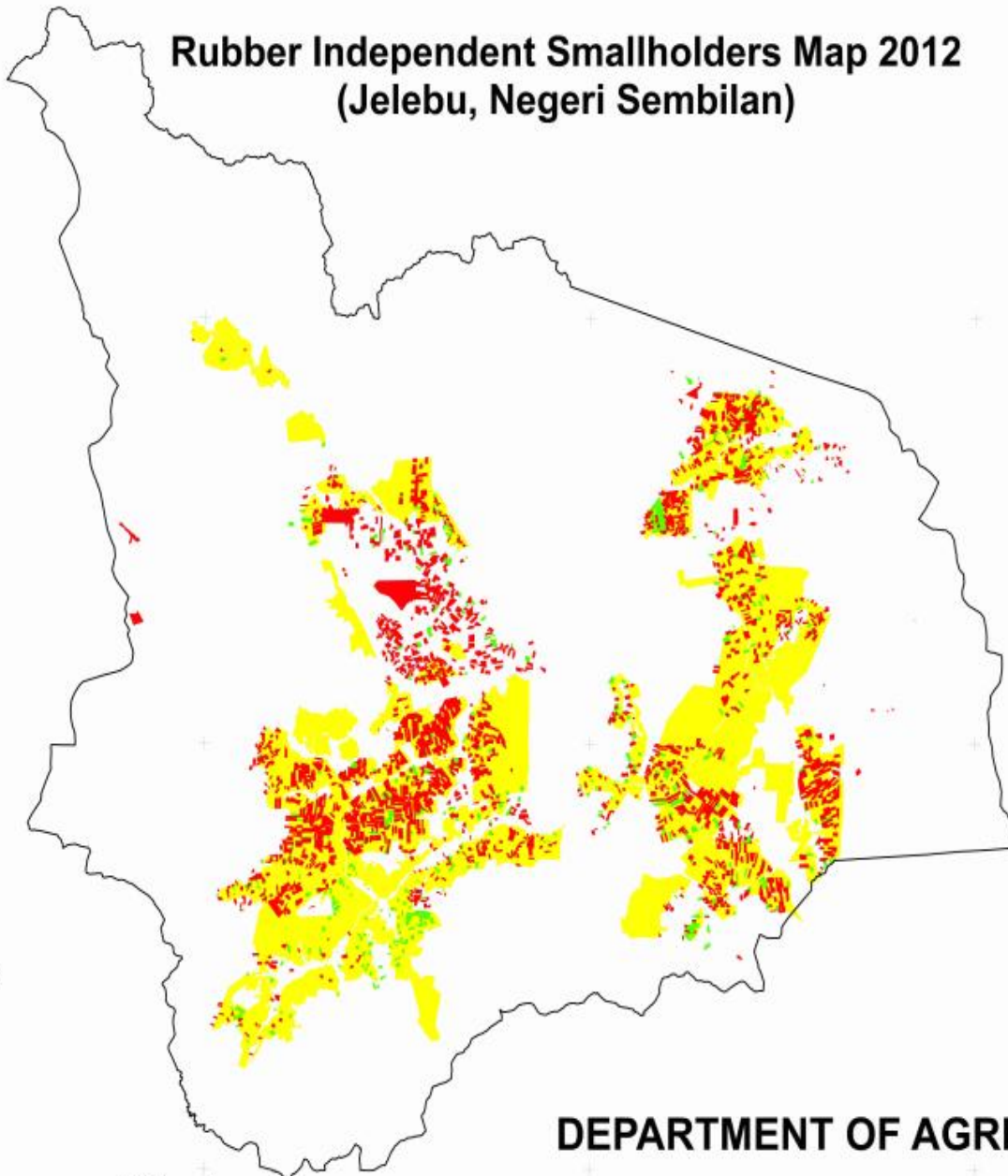
Transformation Jelebu Data from Database to the Map



Description	Independent Smallholders Database	Independent Rubber Smallholding Area Map	Success Rate
Total No. Independent Smallholders	4,397	3,208	73%
Total Area (Ha)	7,672	5,778	75%



Rubber Independent Smallholders Map 2012 (Jejebu, Negeri Sembilan)



**TOTAL INDEPENDENT
SMALLHOLDERS:**

3,208 PEOPLES

TOTAL RUBBER AREA:

5,773 HA

Legend

- Matured Rubber Area
- Young Rubber Area
- Land Use Map 2010

DEPARTMENT OF AGRICULTURE (2010)

0 5 10 20 Kilometers





Rubber Independent Smallholders Map 2012 (Jelevu, Negeri Sembilan)






**TOTAL INDEPENDENT
SMALLHOLDERS:**

3,208 PEOPLES

TOTAL RUBBER AREA:

5,773 HA

Legend

-  Matured Rubber Area
-  Young Rubber Area
-  Town Planning Department 2012

Department of Town and Country Planning

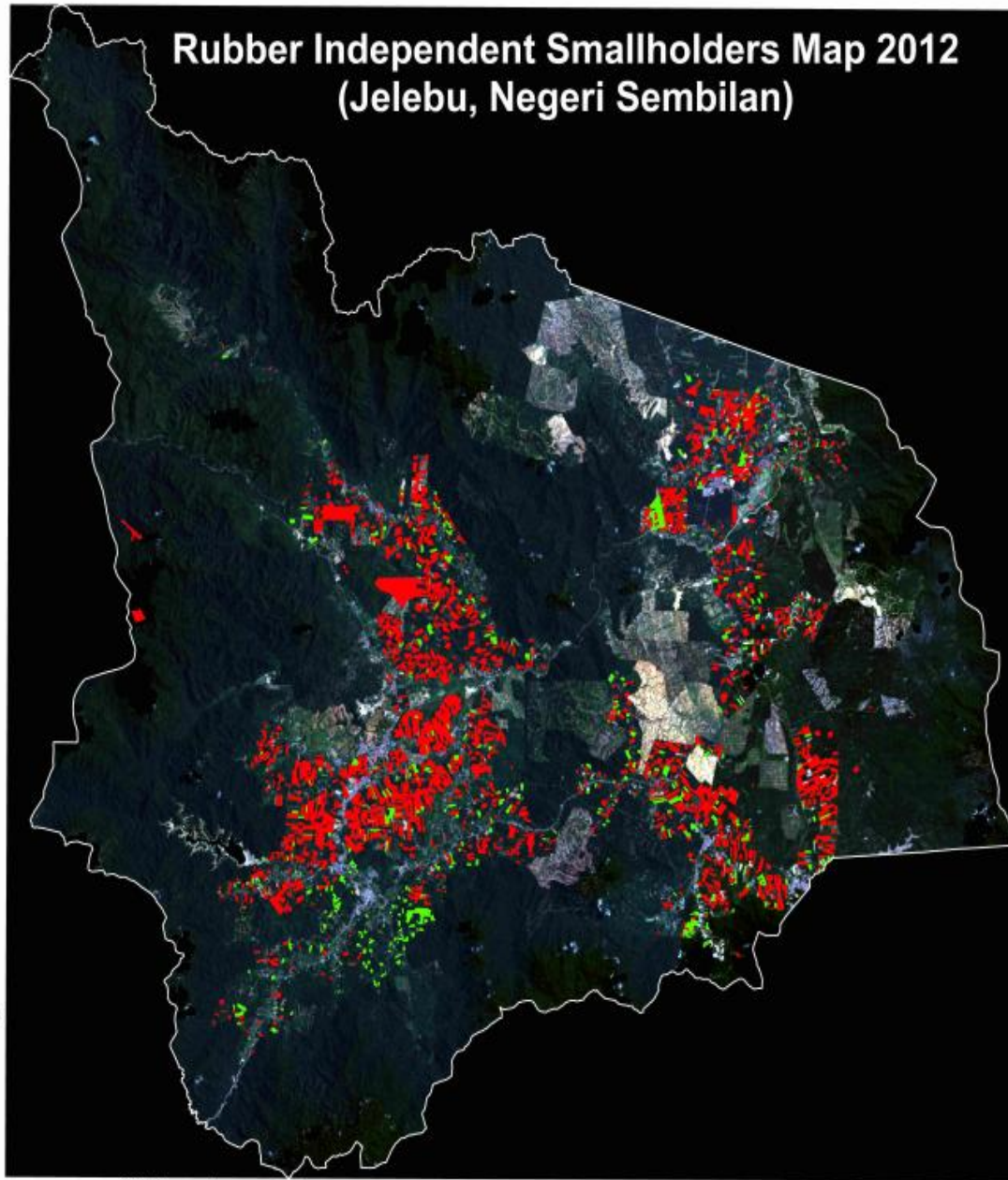
0 5 10 20 Kilometers

3°10'00"N
3°00'00"N
2°50'00"N

101°50'00"E
102°00'00"E
102°10'00"E
102°20'00"E



Rubber Independent Smallholders Map 2012 (Jelevu, Negeri Sembilan)





**TOTAL INDEPENDENT
SMALLHOLDERS:**

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TOTAL RUBBER AREA:

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Legend

-  Matured Rubber Area
-  Young Rubber Area

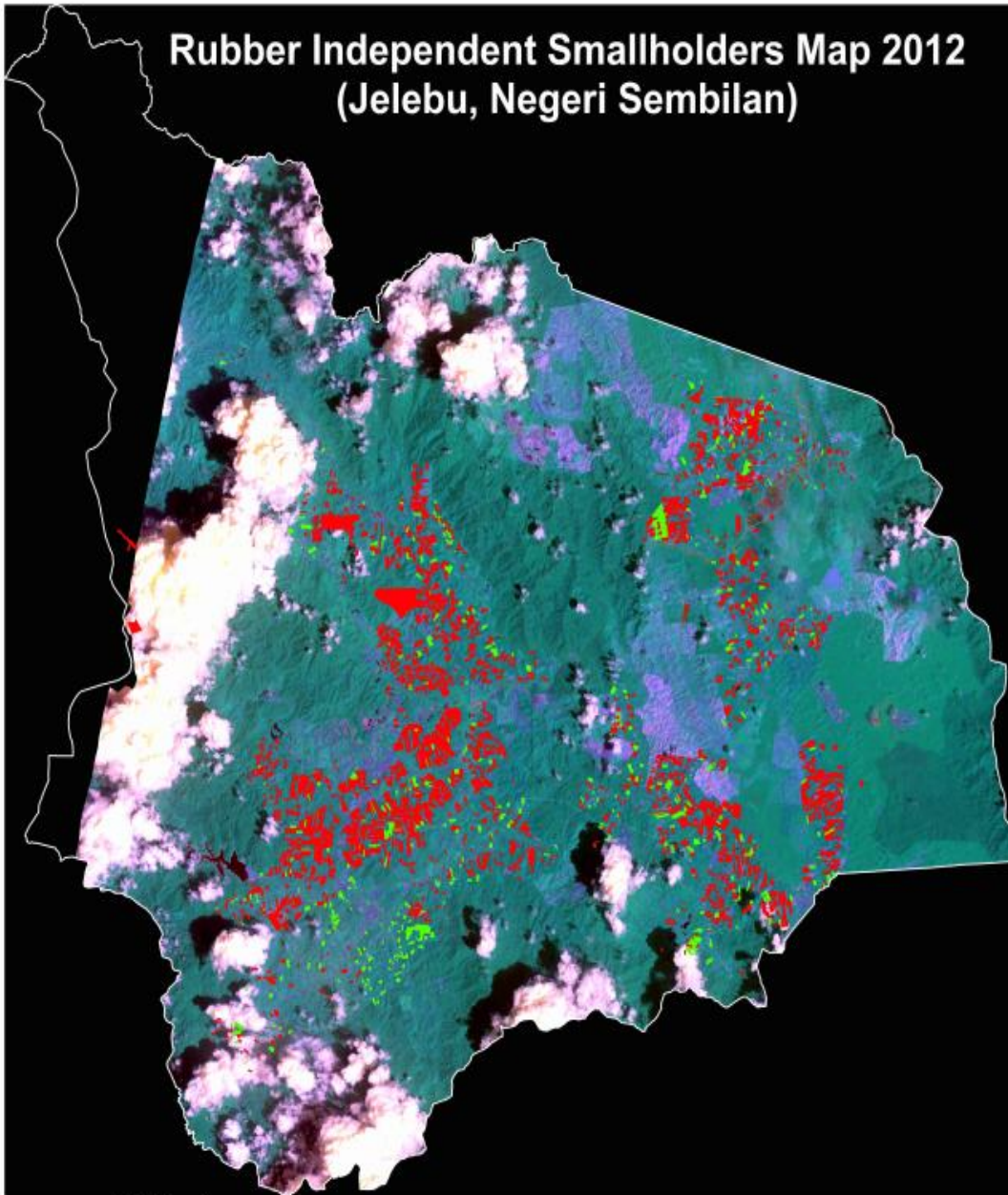
**LANDSAT 8
(2014)**

0 5 10 20 Kilometers





Rubber Independent Smallholders Map 2012 (Jelevu, Negeri Sembilan)





**TOTAL INDEPENDENT
SMALLHOLDERS:**

3,208 PEOPLES

TOTAL RUBBER AREA:

5,773 HA

Legend

-  Matured Rubber Area
-  Young Rubber Area

0 5 10 20 Kilometers

SPOT 5 (2014)

Integrate with Google Earth Pro Application

Search

Search Google Parcel Search (APN)

Search

ex: Pizza near Clayville, NY

Get Directions History

Places

- RRIMINIS Lakai - Z - Copy.jpg
 - RRIMINIS Lakai - Z - Copy...
 - Keratan Rentas
- RRIMINIS Lakai - Z - Copy.jpg
- Field
- AOI MRB
- Projek_ShimaPPT_Johor_09...
- contour_labis3
 - contour_labis3
- PatG_Jelebu
 - PatG_Jelebu
- Temporary Places
 - PatG_Jelebu

Layers Earth Gallery >>

- Primary Database
- Earth Pro (US)
- Voyager New!
 - Happy 10th Birthday, Google
- Edition 1
 - Highlight tour
 - Street View highlights
 - Earth View landscapes
 - 3D cities
 - Satellite imagery updates
- Download
- Borders and Labels

© 2015 Google
Image © 2015 CNES / Astrium
© 2015 Cnes/Spot Image
Image © 2015 DigitalGlobe

Imagery Date: 5/24/2011 2°50'07.90" N 102°07'43.27" E elev. 163 m eye alt. 19.62 km

DC0040	
FID	1281
FCD	DC0040
FNM	Land Parcel or Lot
NEGERI	05
DAERAH	01
MUKIM	07
SEKSYEN	000
LOT	851
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KAMPUNG	-
LUAS_HEKTA	8.157
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STATUS_RES	PENGUSAHA
KOD_UPI	05010700000008:
LUAS_HEK_1	8.1588

CONCLUSION



- The independent smallholders database for Jelebu area was successfully transform to the Independent Rubber Smallholding Area Map.
- The success rates were 73% for total number of rubber independent smallholders and 75% for total rubber area.
- The important outcomes for this study are to increase success rate and getting accurate location, the information on land administrative including land parcel number must precise.
- To get the full independent rubber smallholders area in detail, future tasks include of visiting every Department of Land District and get full land parcel information.

ACKNOWLEDGEMENT



This study was partly conducted under Scientific and Economic Advisory Council project code of S14EST0522 and supported fully by Malaysian Rubber Board. Appreciation goes to Malaysian Centre Geospatial Data Infrastructure (MaCGDI), Department of Survey and Mapping Malaysia (JUPEM) Department of Agriculture (DOA), Federal Department of Town and Country Planning and Malaysian Remote Sensing Agency for sharing data and information. Special thanks go to Extension and Development Division staff and whoever contributed in this study.



Thank You

