KOLOKIUM STATISTIK DAN *SCIENTIFIC* POSTER 2019

IDENTIFYING SURVEY LOCATION USING GIS: A CASE STUDY ON MALAYSIA EMPLOYMENT SURVEY IN OIL PALM PLANTATION, 2018

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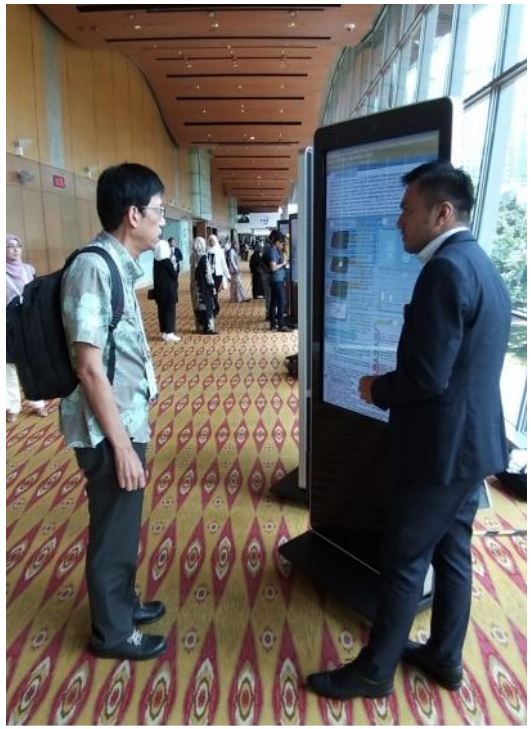

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PRESENTATION OUTLINE

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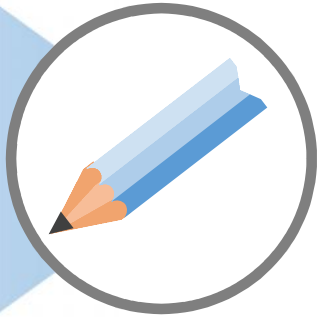


INTRODUCTION

INTRODUCTION

In most household surveys, samples were drawn by two stage stratified sampling in which the first stage was the EBs. For each selected EB, the samples of living quarters (LQs) will be selected using the systematic sampling.

However, for the Malaysia Employment Survey in Oil Palm Plantation, 2018, the statistical unit for the survey were oil palm plantation workers and not targeting the households.

In this survey, EBs are divided into two categories for plantations which are Main EBs (MEB) and Paired EBs (PEB).

GIS will locate the MEBs. Whereas all adjacent EBs will be identified as PEBs.

However, for sample of smallholdings, only EBs contained the smallholdings will be identified.

MOTIVATION & OBJECTIVES

- Due to duplication and availability issue, other methods were being considered in identifying the location of the selected plantations and smallholdings in order for the enumerators to carry out the survey.

- The samples of workers in this sector can only be selected after the locations are identified.

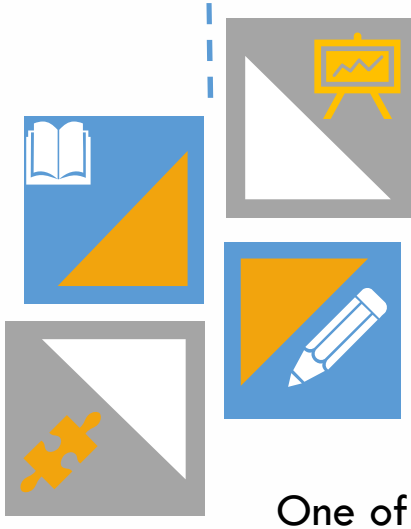
- To conduct matching processes between the registered lands with the EBs in MSAR, work will be carried out by the application of GIS Analysis Techniques which involves proximity analysis and overlaying analysis techniques.

LITERATURE REVIEW

LITERATURE REVIEW

Cheng et al. (2007) –
It is suggested that the multi-layer maps and visualized spatial and non-spatial data can be used to find the optimal solution for the location identification problems.

David Miller (2009) -
The essential parts of GIS implementation to plantation management shall include mapping where accurate verification of estate boundaries can be made, typically revealing discrepancies and areas occupied by others.



Mardouki and Kordzadeh (2016) –
Concluded that GIS are able to locate suitable location for a children-specific store in Bannock County, Idaho.

Cheng, Li, & Yu, (2007); Roig-Tierno , Baviera-Puig, Buitrago-Vera, & Mas-Verdu, (2013) –
One of the considered method can be used is using GIS since many studies found that GIS is very helpful in site location determination. GIS is a computer-based system that used in collection, maintenance, storage, analysis, and distribution of spatial (geographical) data and information.

METHODOLOGY

METHODOLOGY

- The processes involved in identifying sample locations for this survey are as follows:

1

Preparation of the following lists:

i. List of selected samples of plantations and smallholdings;
ii. List of EBs in MSAR; and
iii. List of land title registration numbers by plantations and smallholders from Malaysian Palm Oil Board (MPOB).

Bil	Code	Smallholder	License No.	Address	Postcode	City	State	Status	Ownership	Smallholdings Location					
										Title No.	Lot No.	State	District	Mukim	Plantation Area (ha)
1	SH0055156	TALINGO BIN MANDASA	275310201000	KG. RUMIDI BARUPETI SURAT 167	90107	BELURAN	SABAH	AKTIF	SENDIRI	LA	PT89082483	SABAH	BELURAN / LABUK & SUGU	LABUK/SUGUT	6.07
2	SH0055422	MUNANDAR B TAHIR	275807401000	NO.664, RICH PARK,LORONG IDAMAN 3, JALAN PANTAI	91000	TAWAU	SABAH	AKTIF	SENDIRI	CL	CL103042799	SABAH	TAWAU	TAWAU	4.09
3	SH0055689	JAWINAH BINTI DANSOL	276342601000	D/A IBRAHIM BIN MASDIKJAB. PERTANIAN TELUPID, PETI SURAT 10	89300	TELUPID	SABAH	AKTIF	SENDIRI	LA	PT73081263 KIABAU	SABAH	BELURAN / LABUK & SUGU	LABUK/SUGUT	1.62
4	SH0055956	U TECK ONG	276805301000	W. D. T 429	90009	SANDAKAN	SABAH	AKTIF	SENDIRI	CL	CL20129 SANDALA	SABAH	SANDAKAN	SANDAKAN	2.91
5	SH0056223	WONG BOON KIM	277337501000	P.O.BOX NO.60222	91111	LAHAD DATU	SABAH	AKTIF	SENDIRI	CL.115326773	CL.115326773	SABAH	TAWAU	LAHAD DATU	5.94
6	SH0056489	YONG LEN NYUK	277827001000	W. D. T. 248	90009	SANDAKAN	SABAH	AKTIF	SENDIRI	LA	CL075350597 BT. 20	SABAH	SANDAKAN	SANDAKAN	3.11
7	SH0056756	LIEW NYUK MIN	278338901000	PETI SURAT 61651	91026	TAWAU	SABAH	AKTIF	SENDIRI	CL	CL105365535	SABAH	TAWAU	TAWAU	18.57
8	SH0057023	SHO CHE WAN	278847001000	PETI SURAT 46	90107	BELURAN	SABAH	AKTIF	SENDIRI	CL	CL085320190	SABAH	BELURAN / LABUK & SUGU	LABUK/SUGUT	4.99
9	SH0057289	ABU KASSIM BIN PABUN	279396101000	D/A. ABD. JAYA BIN GEDDEKPEJABAT PERTANIAN, PETI SURAT NO.3	91207	KUNAK	SABAH	AKTIF	SENDIRI	PT2012120043	PT2012120043	SABAH	TAWAU	SEMPORNA	6.07
10	SH0057556	SAKAYAN BIN ALI	279993501000	NO. 58, KG. MUHIBBAH, PERINGKAT 3	91100	LAHAD DATU	SABAH	AKTIF	TANAH NT (NATIVE TITLE)	NT.113044401	NT.113044401	SABAH	TAWAU	LAHAD DATU	4.69

Figure 1: Examples of Selected Plantation List

Bil	Code	Plantations	License No.	Category	Address		Postcode	City	State	District	Plantation Area (ha)
1	OILPALM1771	FELCRA BHD KAW. SUNGAI YEH YEH	503581-602000	FELCRA	MDLD 6968, BANDAR SRI PERDANA,	PETI SURAT 61644,	91100	LAHAD DATU,	SABAH	SEMPORNA	102.06
2	OILPALM1801	FELCRA BHD KOP. SUNGAI MATANGGAR	503627-802000	FELCRA	LOT NO. 6, BGN SEDCO LIGHT INDUSTRIES,	PETI SURAT 487,	90107	BELURAN,	SABAH	LABUK/SUGUT	184.69
3	OILPALM3920	FELCRA BHD KAW. KG. BAMBANGAN	568865-002000	FELCRA	LOT NO. 6, BGN SEDCO LIGHT INDUSTRIES,	PETI SURAT 487,	90107	BELURAN,	SABAH	SANDAKAN	90
4	OILPALM4679	LADANG MESEJ KG. TUKAR	608432-002000	Agensi Kerajaan	KG. TUKAR MESEJ		88100	PITAS	SABAH	PITAS	98
5	OILPALM0380	BINGKOR PROJECT	501438-002000	Agensi Kerajaan	P. O. BOX 2504,		89008	KENINGAU,	SABAH	KENINGAU	353
6	OILPALM1260	LADANG PINAWANTAI	502811-902000	Agensi Kerajaan	PETI SURAT 154		89108	KOTA MARUDU	SABAH	KOTA MARUDU	864.39
7	OILPALM1751	FELCRA BHD KAW. KUDAT	503550-602000	FELCRA	LOT NO.18, TINGKAT 1,TAMAN WTK, FASA 2,	PETI SURAT 256	89108	KOTA MARUDU,	SABAH	KUDAT	607.2
8	OILPALM2294	FELCRA BERHAD KG. KIABAU	504423-802000	FELCRA	PETI SURAT NO. 78	PEJABAT POS TELUPID, 89320 TELUPID, SABAH	89320	TELUPID	SABAH	LABUK/SUGUT	612
9	OILPALM3125	FELCRA BHD. KAW. SIPITANG	528550-002000	FELCRA	PETI SURAT 671		89808	BEAUFORT	SABAH	SIPITANG	313.6
10	OILPALM4827	SKIM NABAWAN	615507-102000	Agensi Kerajaan	[illegible] NABAWAN,SLDB	KM 6, JALAN APIN-APIN, P.O.BOX 2504,	89009	KENINGAU	SABAH	PENSIANGAN	741.41

Figure 2: Examples of Selected Smallholder List

METHODOLOGY

- The processes involved in identifying sample locations for this survey are as follows:

2

Based on the list of selected sample of plantations and smallholders, the land title registration numbers were used as the main reference to identify the survey locations. The Coordinate of the plantations and smallholdings are obtained from the Sabah Lands and Surveys Department website (http://www.jtuwma.net/) using the search box provided.

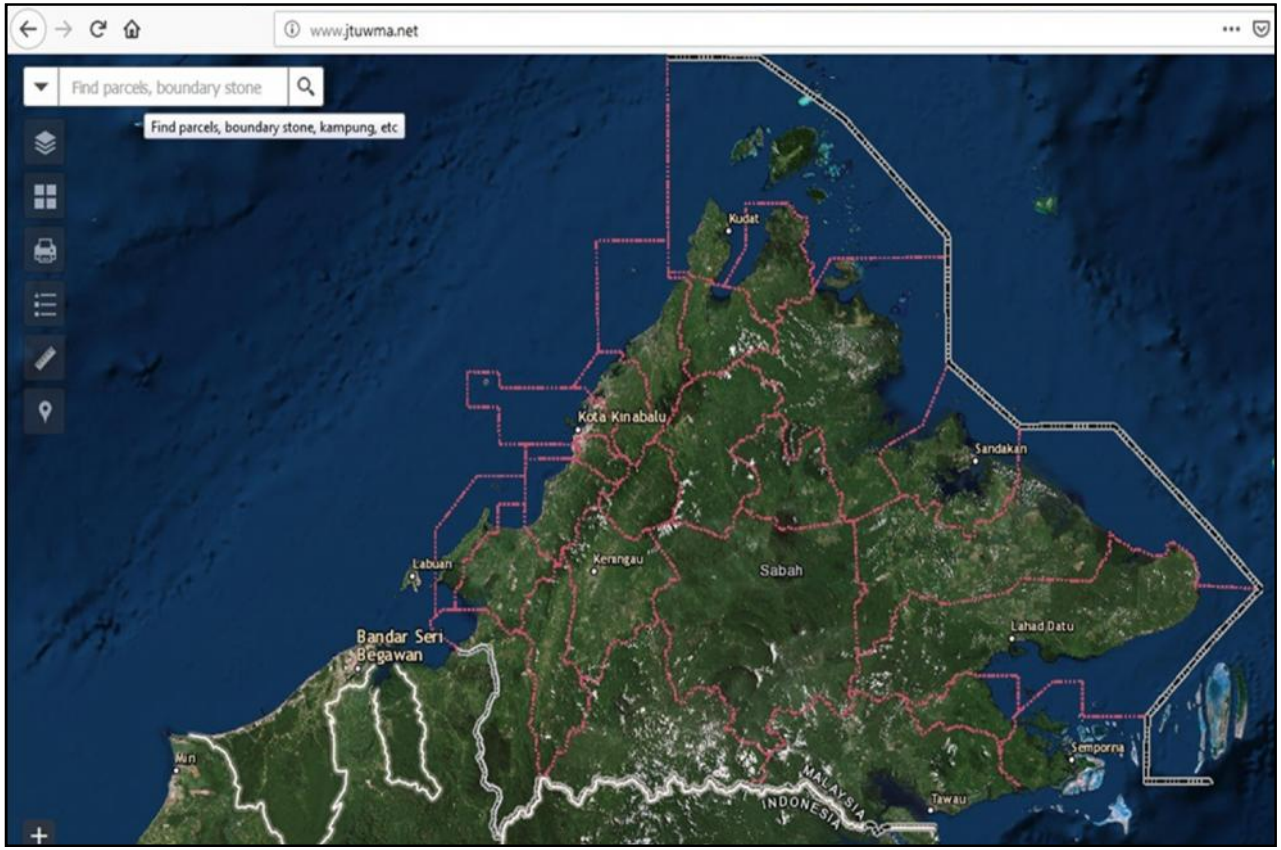


Figure 3: Website http://www.jtuwma.net/

METHODOLOGY

- The processes involved in identifying sample locations for this survey are as follows:

3

Using the coordinates, The Google Earth map can be layered with the EBs polygon which is created through GIS in KML format.

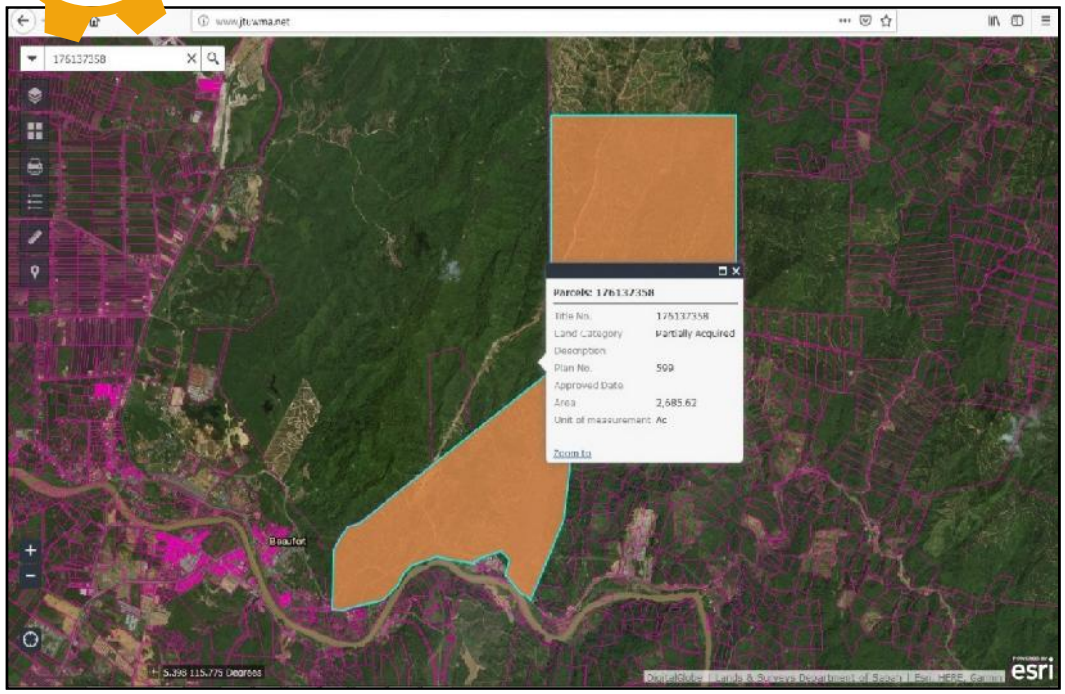


Figure 4: Website http://www.jtuwma.net/

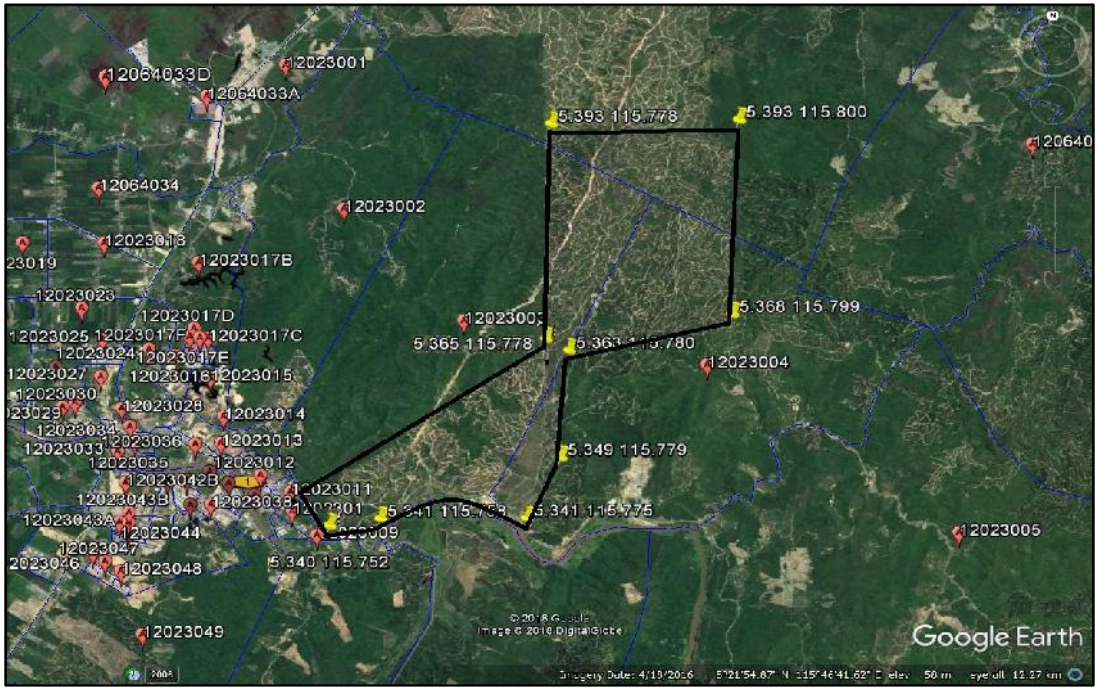


Figure 5: Google Earth (KML format)

METHODOLOGY

- The processes involved in identifying sample locations for this survey are as follows:

4 For sample of plantations, the EBs which touches the boundary of the particular land title is listed as a MEB. All adjacent EBs will be identified as potential PEBs. Only one PEB will be chosen using simple random sampling method for each MEB.

5 For Smallholders, the EBs which touches the boundary of the particular land title is listed as selected EBs.

METHODOLOGY

- The processes involved in identifying sample locations for this survey are as follows:

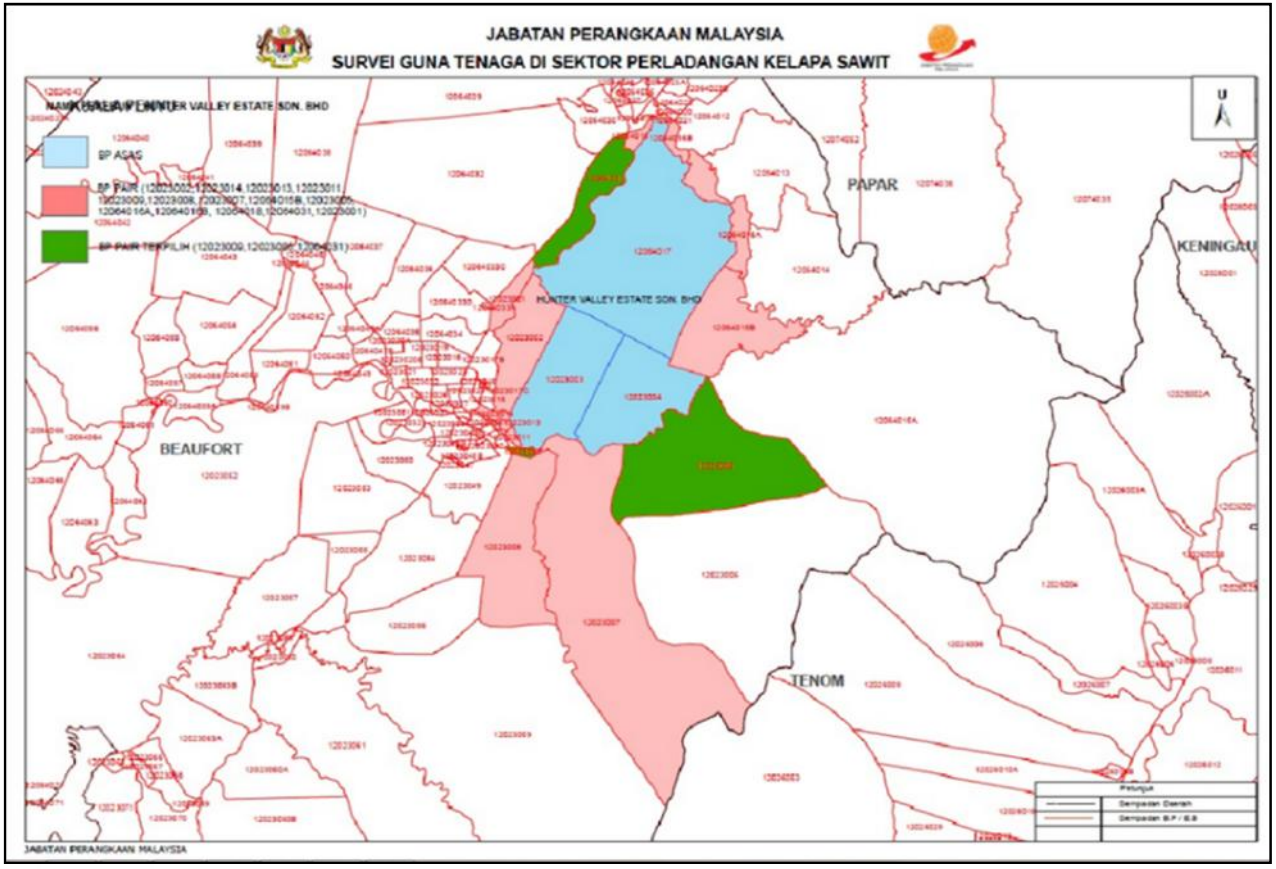


Figure 6: EBs boundaries in GIS output

In this example in Figure 6, the selected plantation falls in three (3) EBs which in blue.

While the possible PEBs which are the adjacent EBs are in pink.

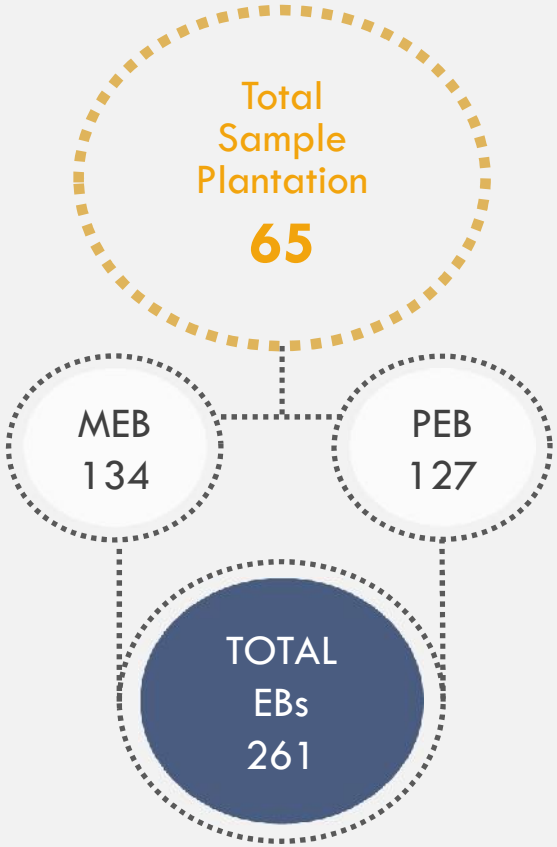
Out of eight (8) possible PEBs, three (3) EBs are selected as PEBs which are in green colour.

The process above will be repeated for all samples of plantations and smallholders that consist of land title registration numbers.

RESULT & DISCUSSION

RESULT

The numbers of selected EBs for Oil Palm Plantations



Using this method, a total of 134 MEBs were identified with 127 PEBs for all 65 selected plantations. The number of PEBs less than the number of MEBs as a result of some MEBs are also PEBs to other selected plantations. A total of 261 EBs were covered to represent the population in oil palm plantations.

GIS is able to identify the location of oil palm plantations provided that the list of plantations or smallholdings selected comes with the land title registration number.

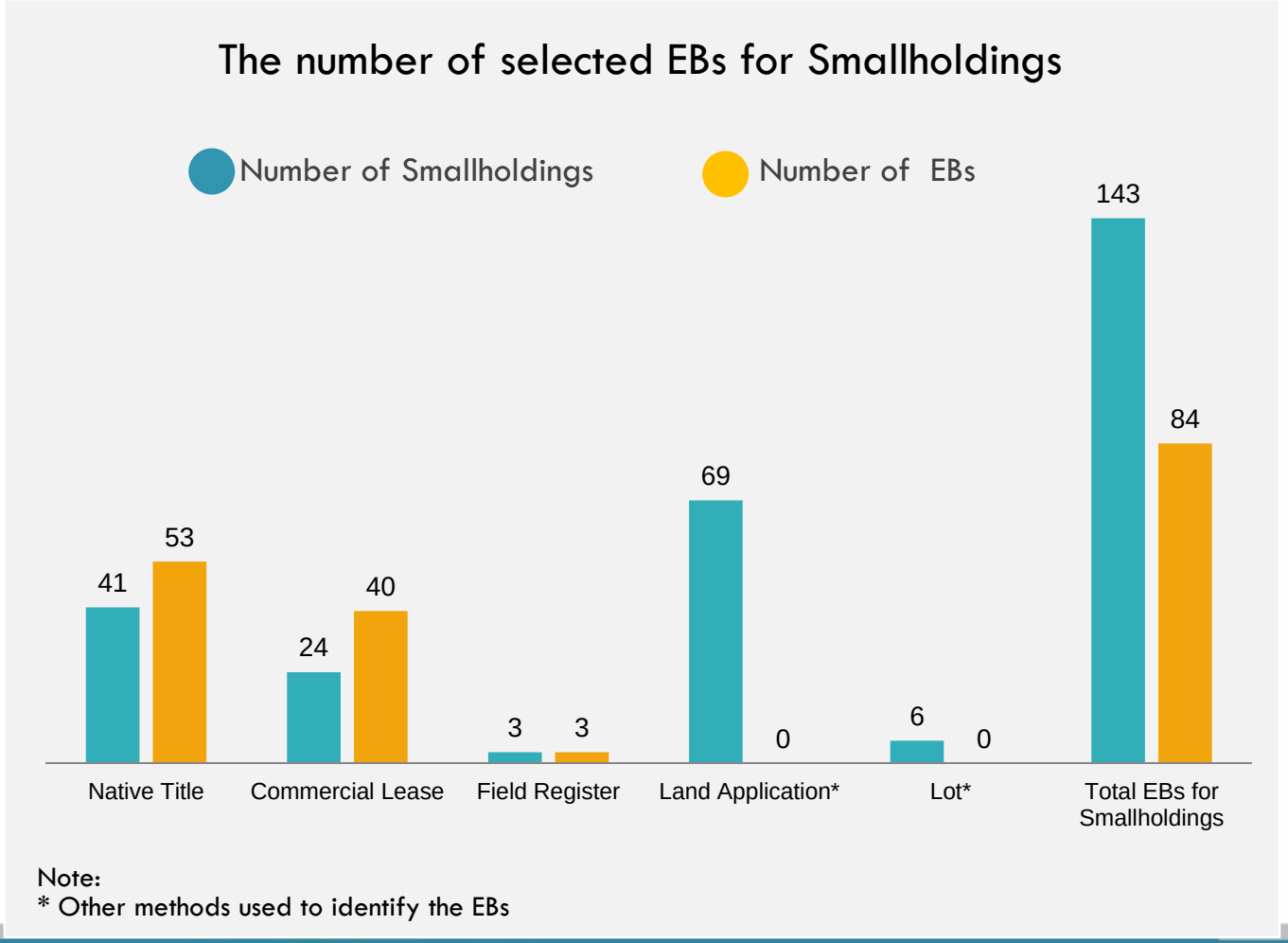
A total of 261 EBs are covered for oil palm plantations in this survey.

RESULT

For sample of smallholders, out of 143 smallholders only 84 EBs can be identified based on the land category.

Meanwhile, 75 smallholders can not be matched through the search application in JTUWMA (GIS).

For unidentified smallholders, another method have been used as an alternative solution to identify the locality of the smallholdings such as reference to the Land Office.



Note:
* Other methods used to identify the EBs

DISCUSSION

1. GIS as tools for effective planning in the other aspects of survey operation such as time management, logistic and number of enumerators.

2. GIS facilitates population settlement identification in the selected EBs to enable the sampling of plantation's workers using Adaptive Cluster Sampling method.

3. Model map for survey areas for the purpose of survey operation can also be obtained using the spatial analysis through GIS and Google Earth.

4. The success of the matching process in identifying the correct EBs are highly depends on the accurateness of the spatial and attributes data in the GIS database

CONCLUSION

CONCLUSION

GIS is a powerful set of tools in current perspective because GIS has the capabilities to provide information about a location. GIS technology helps in simplifying decision making based on its analysis capabilities with spatial data. It is an application developed to provide information through spatial visualization framework that can assist and support decisions taken in the management and use of man-made resources and environment.

Currently, there is a rapid development in geographic information system. The use of Google Earth in this study proved that GIS is able to identify the locality of the samples more accurate and faster compared to conventional method. In addition, the use of this GIS information can also be developed in other application such as a tracking device to facilitate the conduct of survey operation.

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