UNIVERSITI PUTRA MALAYSIA

FARMERS' LEVEL OF KNOWLEDGE AND PERCEPTION TOWARDS EMPOWERMENT PROGRAM IN JAMBI, INDONESIA

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By

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Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfillment of the Requirement for the Degree of Master of Science

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the Degree of Master of Science

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Chairman : Fatimah Mohamed Arshad, PhD
Institute : Agricultural and Food Policy Studies

Among the oil palm supply chain participants, the smallholders are relatively at a disadvantage because of their small farms, low production and other structural problems. An empowerment program is one of the effective measures to improve their economic status. An understanding of perception on empowerment program will help the policy makers to design an effective empowerment program. The study has three objectives which are: to examine the socio-economic profile of oil palm smallholders and their perception and awareness to embrace empowerment program provided by one of the local NGOs named Yayasan Setara Jambi; to examine the association between socio-economic profile of the farmers and their perception towards empowerment program; and to identify the determinants of the oil palm farmers' participation in training for the empowerment program.

Structured questionnaire and face-to-face interview data collection method were employed to obtain the primary data from 194 oil palm smallholders in Tanjung Jabung Barat, Jambi Province, Indonesia. Descriptive analysis is used to profile the respondents and describe their skills and awareness to adopt the empowerment program.Logistic-regression is used to gain information on the determinant of smallholders' readiness to participate in the empowerment program.

The study shows that the majority of smallholders (61.3 %) are about under 45 years old, obtained low level of education, earn income less than Rp 4,300,000 per month, mostly are beginners in oil palm farming and average farm size is 2.75 ha. Majority of the respondents perceive knowledge on Good Agriculture Practices (GAP) as desirable and NGO's performance as beneficial. However, they give low ratings to the proposition of farmers' group activities. The level of economic empowerment is still very low.

Furthermore, the results of study show that among the socio-economic variables, only monthly income and farming size are significantly related to perception of theirs

towards empowerment program. In order to ensure an effective empowerment program, the farmers must achieve a higher level of productivity to enhance income.

Logistic regression analysis indicates that knowledge and activities variables have significant effect on the probability of farmers' participation on the training related with the empowerment program. Income is the major determinant of farmers in involving the training on empowerment program. These results are useful inputs to the government as well as institutions that are responsible in providing empowerment program to the smallholders.

ANOVA statistics show that income and farm size variables are positively related with the empowerment program. This indicates that the more monthly income the farmers have and the bigger size of the farm belonging to the farmers, the more they are empowered. It also suggests that the policy maker should focus on improvement of the economic condition of the farmers to enhance their income. Furthermore, the positive relationship between farm size and perception of farmers towards empowerment program suggests the need to institute farmers' organization such as cooperatives so that small and fragmented farms can be coordinated to achieve a reasonable farm size, hence economies of scale and hence better bargaining power.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

TINGKAT PENGETAHUAN DAN PERSEPSI PETANI TERHADAP PROGRAM PEMBERDAYAAN DI JAMBI, INDONESIA

Oleh

NOVYANDRA ILHAM BAHTERA

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Diantara peserta rantaian bekalan kelapa sawit, petani secara relatif adalah terpinggir kerana saiz ladang yang kecil, pengeluaran yang rendah dan masalah struktur lain. Program pemberdayaan merupakan salah satu strategi yang efektif untuk meningkatkan status ekonomi mereka. Suatu pemahaman terhadap persepsi ke atas program pemberdayaan akan membantu penggubal polisi untuk melaksanakan program pemberdayaan yang efektif. Kajian ini memiliki tiga objektif iaitu: untuk meneliti profil sosio-ekonomi petani kelapa sawit serta persepsi dan kesedaran mereka untuk menyertai program pemberdayaan yang disediakan oleh salah satu NGO tempatan yang bernama Yayasan Setara Jambi; untuk menguji hubungan antara profil sosio-ekonomi petani dengan persepsi mereka terhadap program pemberdayaan; dan untuk mengenal pasti penentu daripada penyertaan petani kelapa sawit didalam pelatihan berkaitan dengan program pemberdayaan.

Soalselidik berstruktur dan pengumpulan data melalui temuduga bersemuka digunakan untuk mendapatkan data primer daripada 194 orang petani kelapa sawit di Tanjung Jabung Barat, Provinsi Jambi, Indonesia. Analisis deksriptif digunakan untuk memperlihatkan profil responden serta menjelaskan kebolehan dan kesedaran mereka untuk mengikuti program pemberdayaan. Regresi logistik digunakan untuk mengenalpasti penentu daripada kesediaan petani untuk menyertai program pemberdayaan.

Kajian Kajian menujukkan bahawa sebahagian besar (61.3%) petani berumur 45 tahun ke bawah, memiliki tingkat pendidikan yang rendah, berpendapatan kurang daripada Rp 4,300,000 setiap bulan, baharu menceburi peladangan kelapa sawit dan purata saiz ladang ialah 2.75 ha. Majoriti daripada responden bersetuju dengan amalan pertanian yang baik dan berhasrat untuk turut serta program pemberdayaan NGO. Bagaimanapun, mereka memberikan nilai yang rendah kepada kegiatan gabungan kelompok. Tingkat pemberdayaan ekonomi pun juga rendah.

Kajian mendapati pendapatan bulanan dan saiz ladang menujukkan perkaitan yang signifikan dengan persepsi terhadap program pemberdayaan. Untuk memastikan program pemberdayaan yang efektif, produktiviti petani perlu ditingkatkan untuk mendapatkan pendapatan yang lebih tinggi.

Analisis regresi logistik menunjukkan bahawa variabel pengetahuan dan aktiviti memberi impak signifikan ke atas kebarangkalian penyertaan petani dalam pelatihan yang berkaitan dengan program pemberdayaan. Pendapatan telah dikenalpasti sebagai penentu ke atas penglibatan petani dalam pelatihan mengenai program pemberdayaan. Dapatan ini adalah input penting kepada kerajaan dan juga institusi yang bertanggung jawab didalam menyediakan program pemberdayaan kepada petani.

Statistik ANOVA menunjukkan pendapatan dan saiz ladang mempunyai hubungan positif dengan program pemberdayaan. Ini bermakna semakin tinggi pendapatan bulanan yang petani peroleh, semakin besar saiz ladang yang dipunyai oleh petani, semakin tinggi juga mereka diberdayakan. Ini juga menunjukkan penggubal polisi sepatutnya memberi tumpuan kepada strategi untuk meningkatkan pendapatan. Hubungan positif yang signifikan antara saiz ladang dan persepsi petani terhadap program pemberdayaan mencadangkan supaya organisasi petani dilaksanakan terutama koperasi untuk memboleh petani mengkordinasikan ladang yang kecil dan yang dapat disatukan untuk mendapat faedah skala ekonomi disamping meningkatkan kuasa tawaran mereka.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfillment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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Declaration by Members of Supervisory Committee

This is to confirm that:

- the research conducted and the writing of this thesis was under our supervision;
- supervision responsibilities as slated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) are adhered to.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
BPS	*Badan Pusat Statistik* or "Central Agency on Statistic"
CPO	Crude Palm Oil
FFB	Fresh Fruit Bunches
GAP	Good Agriculture Practices
Gapoktan	*Gabungan Kelompok Tani* or "farmer groups"
NGO	Non-Governmental Organization
RoG	Rate of Growth
RSPO	Roundtable on Sustainable Palm Oil
YSJ	Yayasan Setara Jambi

Exchange rate as at Nov, 2015

1 USD = Rp 13,000

Source: www.xe.com

CHAPTER 1

INTRODUCTION

1.1 Introduction

Historically, palm trees were brought from West Africa. This perennial tree was first introduced in Indonesia by the colonial government of Netherlands Indie in 1848. There were four oil palm seedlings brought from Mauritius and Amsterdam and planted in the Bogor Botanical Gardens. Oil palms started to be cultivated and grown commercially in 1911, when the pioneering effort of oil palm plantations in Indonesia was made by Adrien Hallet, a Belgian who had learned a lot about oil palm in Africa. Since then, the oil palm plantations in Indonesia began to grow from 70,000 ha in 1961 to 7,080,000 in 2013 (FAOstat, 2015).

1.2 Oil Palm Industry in Indonesia

The oil palm industry is the major force that drives growth of the agricultural sector in Indonesia (World Growth, 2011). In the last three decades, the production of oil palm in Indonesia has drastically increased from 721,172 tons in 1980 to 23,672,000tons in 2012 indicating an increasing of 3,182 % (Figure 1.1). The industry has attracted a significant number of labors and entrepreneurs. The oil palm crop has encroached into the food production sector which is largely small-farm based. This crop is attractive as it provides higher return compared to other crops such as rubber, cocoa, coconut, and paddy (Basiron, 2007).

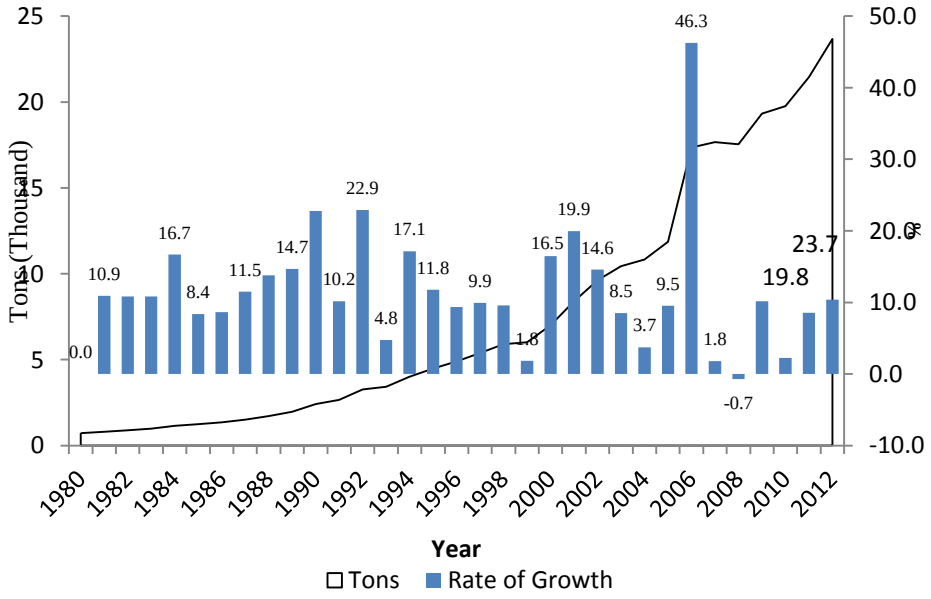

Figure 1.1: Production of Crude Palm Oil in Indonesia ('000 tons), 1980-2012
(Source: FAO stat, 2013)

Table 1.1: Average Annual Growth Rate (%) and Production of CPO (000 tons), Indonesia, 1980-2012

Year	Total Production (000 tons)	Average Annual Growth Rate (%)
1980-1990	721.2-2,412.6	12.9
1991-2000	2,657.6 - 7,000.5	11.4
2001-2012	8,396.5 - 23,672	11.3
1980-2012	721.2-23,672	11.8

Source: (BPS, 2013)

As seen in Table 1.1, the production of crude palm oil (CPO) increased significantly from 721.2 thousand tons in 1980 to 23,672 thousand tons in 2012 with average rate of annual growth (RoG) 11.8 % annually. The production sector appears to go through three major phases: 1980-1990 (introductory phase), 1991-2000 (growth phase) and 2001-2012 (maturing phase).

The average annual rate of growth (RoG) of CPO production in the 'introductory era' of 1980-1990 was 12.9 %, the highest among the three eras. As shown in Appendix 2, the highest annual rate of growth during the period was 22.9 % occurring in 1991-1992. This may be attributed to the huge activity of forest conversion during the stated period (Manurung, 2001). Indonesian government provided plenty of incentives to stakeholders in the oil palm industry, such as the ease in obtaining permission for land clearing and opening of new land to the private large estates (Gingold *et al*., 2012).

Between 1991 and 2000, the average annual RoG was lower at 11.4 %. The production of CPO reached the target set by the government's goal (Casson, 2000). The production increased from 2,657,600 tons in 1999 to 7,000,507 tons in 2000, representing an increase of 163.4 % (Figure 1.1).

The average yearly RoG in the period of 2001 to 2012 was slightly lower at 11.3%. During this period, the policy of the Indonesian government was to develop biofuels as an alternative to fossil-based fuel (Ministry of Industry of Republic Indonesia, 2012). The policy had led to a significant development of the oil palm industry in 2012. As shown in Table 1.1, on average the oil palm industry in Indonesia grew about 11.8 % per year in the stated year. There are two major players in the Indonesian oil palm production sector namely, the smallholders and estates[a]. Oil palm provides a major source of income to the smallholders (Eze& Adiele, 2014). However, the farm practices of the smallholders are far from optimal as they are not exposed to good agriculture practices and relevant production technologies (Feintrenie et al., 2010; Obidike, 2011). This resulted in low productivity level which is much below those achieved by private large estates as demonstrated in Figure 1.2 and Appendix A1.

Figure 1.2 shows that the yield has improved for both large estate and smallholders from 1.7 t/ha and 0.7 t/ha in 2000 to 2.9 t/ha and 1.5 t/ha in 2006 respectively. After

[a]Estate is defined as a plant cultivated by country (national) or large-scale companies with more than 50 ha land area. Source: http://repository.usu.ac.id/bitstream/123456789/17254/4/Chapter%20II.pdf

reducing slightly in 2007, the yield more or less stabilized. Between 2000 and 2013 the yield of smallholders is about 52 % lower than the large estates.

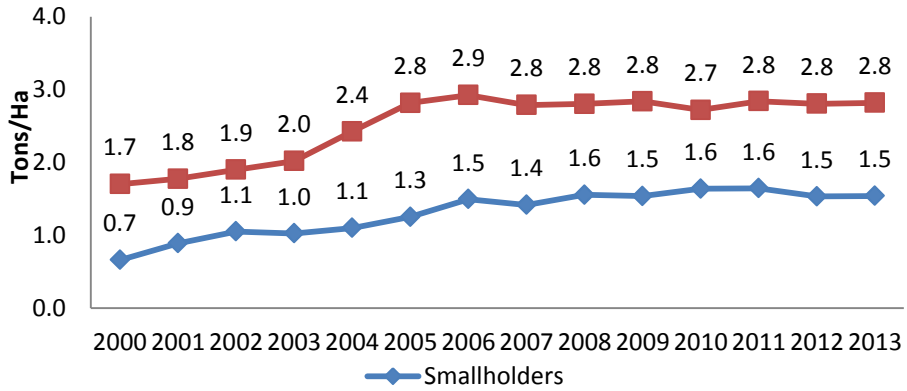

Figure 1.2: Crude Palm Oil Productivity of the Estate and Smallholders (t/ha), Indonesia, 2000-2013
(Source: BPS, 2013)

The land area and production of oil palm of smallholders are shown in Figure 1.3. It can be seen that the land area and production of oil palm for both stakeholders increased gradually from the year 2000 to 2013.

Land area of estates and smallholders increased from 2,991 thousand ha and 1,190 thousand ha in 2000 to 6,171 thousand ha and 4,416 thousand ha in 2013, indicating an increase of 106 % and 271 % respectively, highlighting the factthat both stakeholders in the industry had increased their land area throughout the years.

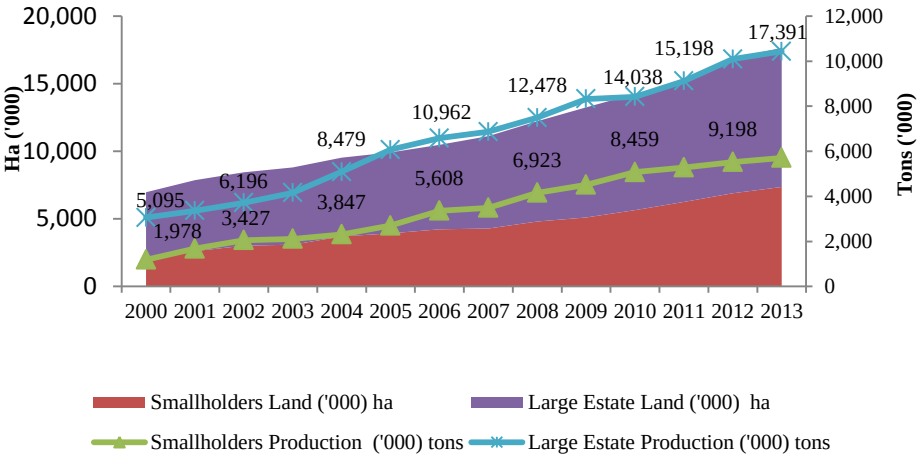

Figure 1.3: Area (‘000 ha) and Production (‘000 tons) of Oil Palm in Indonesia, 2000-2013
(Source: BPS, 2013)

The production of CPO for both estates and smallholders increases from year to year. Figure 1.3 shows that the production of estates' CPO increased from5,095 thousand ha in 2000 to 17,391 thousand ha in 2013 (an increase of 341.3%). The production of CPO in the smallholder sector indicates aremarkable increment from 1,978 thousand in 2000 to 9,505thousand in 2013 indicating an increase of 480.3%.The share of estate in the land area was estimated at 41.7% in 2013 while its share in the production of CPO was about 35.3%. On the other hand, the smallholders' land area was estimated at 58.3% in 2013 whereas its share in the production of CPO was about 64.7% in 2013.

1.2.1 Oil Palm Industry in Sumatera, Indonesia

Sumatera provides the potential for the development of oil palm plantation as it has vast land and labor supplies. Table 1.2 illustrates that in 2013, the area for oil palm plantation was dominated by Sumatera, accounting for 62.6 % or almost two-third of the total oil palm area in Indonesia. At the same time, Sumatera produced 68.9 % of the total production of oil palm in Indonesia. This indicates the importance Sumatera in the Indonesian palm oil economy.

Table 1.2: Land Area ('000 ha), Production of Oil Palm ('000 tons) and Yield (t/ha) by Region, Indonesia, 2013

Region	Land Area (000 ha)	Land Area (%)	Production (000 tons)	Production (%)	Yield (t/ha)
Sumatera	6,624.6	62.6	17,933.6	68.9	2.7
Jawa	32.7	0.3	50.4	0.2	1.5
Kalimantan	3,483.8	32.9	7,320.3	28.1	2.1
Sulawesi	336.8	3.2	563.9	2.2	1.7
Maluku-Papua	108.5	1.0	147.3	0.6	1.4
Total	**10,586.4**	**100**	**26,015.5**	**100**	**2.5**[a/]

Note: a/ is national average
(Source: Directorate General Estate of Jambi Province, 2013)

The Province of Jambi alone accounted about 721 thousand ha of oil palm plantation in 2013 or 10.9% of the total land area in Sumatera. The total land area of oil palm in Jambi was the fourth (4^{th}) biggest in Sumatera after Riau, Sumatera Utara and Sumatera Selatan. Jambi produced more than 1.7 million tons of oil palm in 2013, accounting for 9.7% of total production in Sumatera. The oil palm production of Jambi province was also the fourth largest among the ten provinces in Sumatera after Riau (6.38 million tons), Sumatera Utara (3.97 million tons) and Sumatera Selatan (2.49 million tons). Based on this data, it is clear that Jambi province is an important production area of oil palm in Sumatera.

Table 1.3: Land Area of Oil Palm ('000 ha) and Production ('000 tons) by Province, Sumatera, 2013

Province	Land Area ('000 ha)	Land Area (%)	Production ('000 tons)	Production (%)
Riau	2226.6	33.6	6,384.5	35.6
Sumatera Utara	1276.3	19.3	3,975.4	22.2
Sumatera Selatan	941.1	14.2	2,492.9	13.9
Jambi	721.4	10.9	1,718.3	9.6
Aceh	393.8	5.9	654.8	3.7
Sumatera Barat	373.3	5.6	930.1	5.2
Bengkulu	309.1	4.7	802.0	4.5
Bangka Belitung	192.8	2.9	504.6	2.8
Lampung	170.9	2.6	433.8	2.4
Kepulauan Riau	19.3	0.3	37.2	0.2
Total	**6624.6**	**100**	**17,933.6**	**100**

(Source: Indonesia Directorate General of Estates 2013)

1.2.2 Oil Palm Industry in Jambi, Indonesia

The oil palm plantation had become a major source of income to the population of Jambi(Minsyah, 2005). Oil palm plantation areawas the second largest cultivated area after rubber. In 2012, the expansion of oil palm plantation had reached 609,950 ha as compared to a mere 302,152 ha in 2002 indicating an increase of 102% (Figure 1.4).

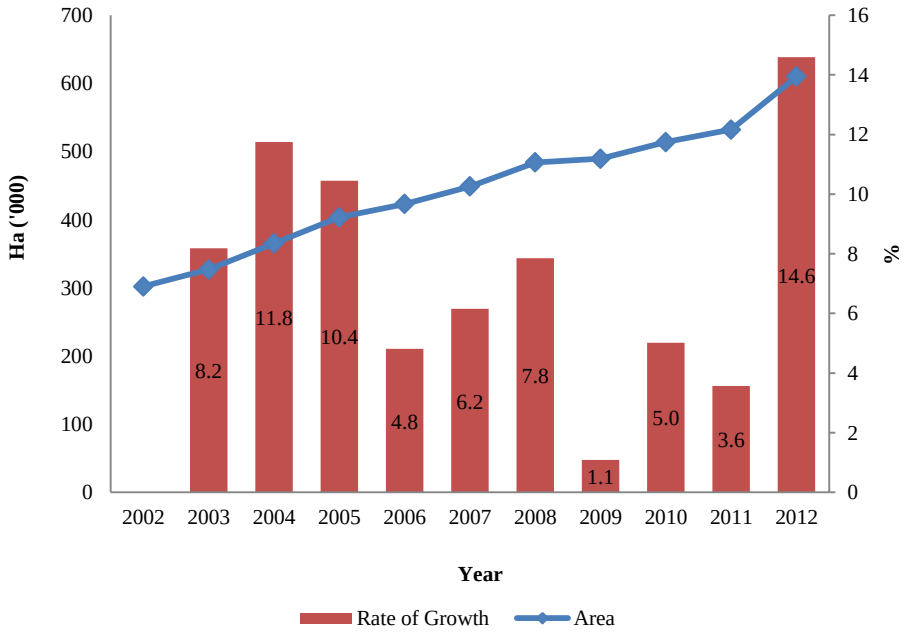

Figure 1.4: Area under Oil Palm ('000 ha) in Jambi, 2002-2012
(Source: Directorate General Estate of Jambi Province, 2013)

There are three types of plantation in the oil palm industry of Jambi; the smallholdings, national and private large estates. Each actor differs in terms of farm size and production. Figure 1.5 shows that in 2012, the smallholder plantations in Jambi dominated the oil palm land area, occupying 415,733 ha or 68.2 % of the total plantation area. The national and private large estatesaccounted for 3.1 % and 28.8 % (18,623 ha and 175,594 ha)respectively. According to the regulations of the Ministry of Agriculture, private large estates has to provide 20 % of oil palm land area to smallholders (2007, p. 6). This explains the dominance of smallholders in the oil palm land area.

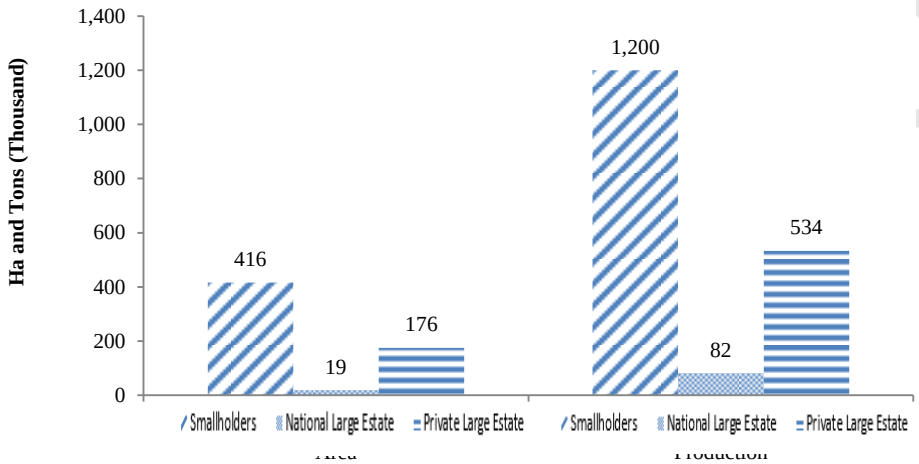

Figure 1.5: Area ('000 ha), Production ('000 tons) and Productivity (t/ha) of Oil Palm by Producer Type, 2012
(Source: Directorate General Estate of Jambi Province, 2013)

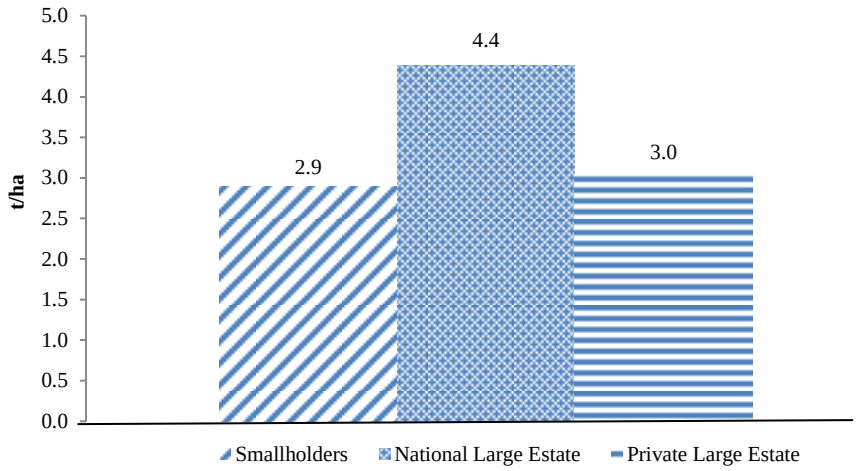

Figure 1.6: Productivity of Oil Palm (t/ha) by Producer's Type, 2012
(Source: Directorate General Estate of Jambi Province, 2013)

In terms of CPO production, Jambi's smallholders produced 1,200,297 tons or 66.1% of total oil palm production whereas the national large estates and the private large estates produced 81,622 tons or 4.5 % and 533,830 tons or 29.4 % respectively in 2012. However, smallholders achieved lower yield of 2.9 t/ha compared to national large estate (4.4 t/ha) and private large estate (3 t/ha) (Figure 1.6). Clearly, the productivity of the smallholder is lower by 28% compared to those achieved by the national and private estates.

There are nineregencies and 2 cities in Jambi. Out of these eleven areas,only 7 regencies are involved in oil palm production. They are: Sarolangun, Merangin, Bungo, Batanghari, Muaro Jambi, Tanjab Timur and Tanjab Barat. Details on the production, land area and productivity of the oil palm sector for these regencies are shown in Table 1.4.

Table 1.4 Area (ha), Production (tons) and Productivity (t/ha) of Oil Palm by Districts, Jambi, 2011

District	Area (Ha)	% of Area	Production (tons)	Production (%)	Productivity (t/ha)
Sarolangun	8,502	6	12,043	4	1.4
Merangin	20,343	15	51,309	19	2.5
Bungo	9,454	7	13,160	5	1.4
Batanghari	6,160	5	7,946	3	1.3
Muaro Jambi	32,424	24	54,425	20	1.7
Tanjab Timur	22,044	16	25,564	9	1.2
Tanjab Barat	28,921	21	49,381	18	1.7
Total	**136,239**	**100**	**277,043**	**100**	**2.0[a/]**

Note: [a/]is Jambi province average
Source: Directorate General Estate of Jambi Province (2013)

As shown in Table 1.4, Tanjung Jabung Baratdistrict (shown therein as 'Tanjab Barat')has the second largest land area of oil palm (28,921 ha) after Muaro Jambi (32,424 ha). Tanjab Barat is the third biggest producer among the seven districts in Jambi with 49,381 tons after Muaro Jambi (54,425 tons) and Merangin (51,309 tons). Tanjab Barat recorded same productivity level as Muaro Jambi at 1.7 t/ha compared to Merangin (2.5 t/ha). It was clear that Tanjab Barat has the economic potential for improving the well-being of actors in the oil palm sector. Hence, this research would focus on the independent smallholders in Tanjab Barat regency.

1.3 Oil Palm Smallholder

The oil palm plantation has becomean income enhancer opportunity for smallholders (Feintrenie et al., 2010). Smallholders were able to improve their well-being and probably their future (Minsyah, 2005). The smallholders were incentivized to seek new ways of production practices (Koczberski&Curry, 2005).However, due to the structural problems at the farm level, majority of the smallholders experienced otherwise (Syahza, 2004).

There are two types of smallholders, namely the independent and the "plasma" smallholders. The following paragraphs discuss the categories of the smallholders and their issues and problems.

1.3.1 Independent and Plasma Smallholders

Smallholders are defined as those working on a plantation of less than 25 ha who account for a significant proportion of palm oil planter in Indonesia which was estimated at 35-45 % (Zoological Society of London, 2014). There are two types of smallholders which are: independent and plasma smallholders where oil palm is their major source of income (World Growth, 2011).

There are differences between the independent and plasma smallholders. The differences lie in the management of the oil palm production, the level of knowledge in relation to agriculture activities and the availability of market access.

First, both smallholders differ in terms of how they manage the oil palm production. The plasma smallholders have better management system of the oil palm production compared to the independent smallholders. The plasma smallholders receive support from the government agencies, business or cooperatives that provide seed stock, fertilizers, pesticides, training, and loans as needed (Vermeulen&Goad, 2006). In contrast, the independent smallholders are self-financed, self-managed, and self-equipped and are not bound to any one mill(Wilmar, 2013). In short, the independent smallholders receive less financial as well as moral support both from government and private large estate compared to the plasma smallholders (Kusni, 2012; Zahri, 2013).

Second, the plasma smallholders are more knowledgeable on agriculture activities than the independent smallholders (Syahza, 2004). Due to the partnership scheme called "Nucleus Estate Schemes" between plasma smallholders and core estate, the plasma smallholders have the right to be guided in order to have more skills on good agriculture practices (GAP) (White, 1997; Zahri, 2013). The plasma smallholders receive considerable technical backing resulting in productivity that is close to that of the private large estates (Vermeulen et al., 2006). On the other hand, the independent smallholders are lacking in technical knowledge particularly on GAP (Papenfus, 2000). Thus, independent smallholders are inefficient and less productive as they do not employ the proper fertilizers, and utilize lower quality seed stock (Rahman et al., 2008).

Lastly, the plasma smallholders have guaranteed market access compared to the independent smallholders. Since there are partnership schemes between private large scale operators and plasma smallholders, the FFB of plasma smallholders sell their product to the private large estates. On the contrary, the independent smallholders are not tied to any scheme with either the private large estate or government agency. However, they have access to the free market to obtain the highest price for their FFBs (Vermeulen & Goad, 2006). Nonetheless they are not able to get a price above what the plasma smallholdersare getting (Handayani et al., 2014). This is largely due to the relatively lower FFB quality of the independent smallholders compared to the production of plasma smallholders (Vermeulen & Goad, 2006). The independent smallholders are often viewed by the mills as unreliable source of FFBs supply (Opijnen et al., 2013).

In conclusion, there are clear differences between the independent smallholders and plasma smallholders in terms of oil palm production's management, GAP knowledge and access to the market. The independent smallholders receive no support on farm management practices while the plasma smallholders are supported by government and companies. Consequently, independent smallholders are economically weak as their income is lower, vulnerable to market forces and limited institutional and supports.

1.3.2 Issues of the Independent Smallholder Sector

There are pertinentissues in the independent smallholder sector that requires policy attention (Azmi and Nagiah, 2012). Some of the issues are: weak smallholder associations (Feintrenie et al., 2010); lack of knowledge on GAP(Vermeulen & Goad, 2006); and poor bargaining power(Zaman, 2009).

Weak farmer organization explains for the poor performance of the independent smallholders. They are largely self-financed, managed, equipped and not bounded to any mill. Individually, each farm is small (an average less than 50 ha), low productivity and hence income (Azmi & Nagiah, 2012). As has been shown in Gyau et al., (2014), farmer organization is a potential institutional vehicle for farmers to improve their position through group farming and marketing. In other words, by working together, the farmers may earn "economics of scale" that may improve their productivity and income.

Another issue of independent smallholders is the lack of knowledge on GAP. Instead of learning about GAP from proper educational program or supervision from authorities, they rely on verbal communication with other smallholders (Yang *et al.*, 2014). The government has given little support to improve their knowledge. In Jambi, theindependent smallholders only receive guidance on GAP from the Estate Department of Jambi Province (Jambi, 2013).

Despite the rapid growth of the oil palm industry in Indonesia, many local communities and smallholders remain poor (Marti, 2008). In fact, the life of most the oil palm smallholders have worsen-off than before they are involved in the plantation (Pichler, 2012). It is perhaps due to too much dependence on oil palm crop as a principle source of income. As stated by Marti (2008), dependence on a single crop commodity increases their vulnerability as their risk is not diversified.

In conclusions, the independent smallholders face weak organization, lack of knowledge on GAP and poor bargaining power. Since the productivity of this group is about half of the large estates, there is a need to improve their well-being and hence the sustainability of the palm oil industry.

1.4 Non-Governmental Organization (NGO)

Martens (2002, p. 282) defines NGO as the formal (professionalized) independent societal organizations whose primary aim is to promote common goals at national or international level. NGO has an important role in fostering autonomous grassroots institution which can make a difference to livelihood and capacities among poor people (Edwards, 1999) as well as increase access to resources (Fonjong, 2001). In Jambi, there is one of the local NGOs concerned with the condition of oil palm smallholders with relation to natural resource management and the impact of expansion of large-scale oil palm plantation (Hivos, 2013). The following passages describe the local NGO in terms of establishment, programs and strategies, and objectives.

1.4.1 Establishment of TheYayasan Setara Jambi

The huge expansion of large-scale oil palm companies and smallholders are impacting the environment (Lee et al., 2014) and social lifeof the community (Marti, 2008). It leads to the conversion of tropical forest habitat into monocultures, negatively affecting the population of forest dependent species such as orangutans, Sumatran elephant and tigers (Sodhi et al., 2010). The loss of biodiversity can be averted if future oil palm expansion is managed to avoid deforestation (Fitzherbert et al., 2008). The social impacts include land dispute (Colchester, 2010), discredited leaders, loss of communities' self-respect, pride and identity, and human right violations (Marti, 2008). Hence, the expansion effort of large-scale oil palm companies and smallholders are in environmentally and socially harmful.

A local NGO named Yayasan Setara Jambi or YSJ[b]is established out of concern on the social and the environmental problems in Indonesia, mainly in Jambi Province (Rukaiyah *et al*., 2014). YSJ's vision is to develop a community which is fair and prosperous that respect human rights and environment. Its mission is to develop the capacity of local community and smallholder in natural resource management by pushing the influence policy and conducting public education for natural resource management and environment which is everlasting, fair, gender perspective and democratic(RSPO, 2014). YSJ has implemented a number of programs and strategies to address those problems.

1.4.2 Programs and Strategies of Yayasan Setara Jambi

YSJ had laid down a number of strategies to address the weaknesses of smallholders association, the lack of knowledge on GAP, and the economic disempowerment of smallholders. YSJ carried out their mentoring activities in Merangin district, Jambi from 2009 to 2012 (Rukaiyah et al., 2014). The aim of the program was to promote sustainable oil palm production so as to empower the independent smallholders (Rukaiyah et al., 2014) through provision of training as an effort to build capacity

[b] Yayasan Setara Jambi has given the permission to the author to share information about their activities in the Jambi area (Interview with the director of YSJ on 12th of February 2014).

(RSPO, 2013). Independent smallholders are not well-organized due to the poor support given by the local government (RSPO, 2013).

In 2013, YSJ embarked on a similar initiative in Tanjung Jabung Barat Regency, Jambi Province, Indonesia (RSPO, 2013). YSJ approached independent smallholders in Tanjung Jabung Barat for the formation of new smallholder association as well as strengthening existing groups (Tanjung, 2014). They also raised awareness for independent small farmers on price of fresh fruit bunches (FFBs), methods to cultivate oil palm plantation correctly, as well as approaches to have well-organized farmer groups. This effort aimed at empowering the poor farmers and promoting self-reliance (Robinson and Riddle, 1995). In short, YSJ provided assistance to the oil palm independent farmers in the hope that the farmers would realize the importance of an organization as a vehicle to improve their economic welfare.

1.5 Problem Statement

Indonesia has become one of the highest global producers and exporters of oil palm (World Growth, 2011). This achievement should have been accompanied by an increase in the welfare of the industry participants including the independent farmers. However, the independent farmers are still living in poverty (Syahza, 2004). Jambi, despite being one of the largest palm oil producing provinces in Sumatera, there are many independent farmers in the area that are poor and unfairly treated by the big scale corporations (Syahza, 2004).

The role of government in shaping the social, political and economic relations has been shifted to the other actors(Hatanaka *et al*., 2005).Governance capacities are inadequate to effectivelycontrol natural resources and impose pertinent regulations. The maintenance of quality standard is largely carried out by the NGOs (Ebeling, & Yasué, 2009).Issues related to the forest and land fire have not been addressed fully by the government (Arifudin, Nasrul, & Maswadi, 2013). To rectify these problems, an empowerment program in raising the awareness of the local community provided by NGO may provide a partial solution.

NGO is able to improvelivelihood and capacity of the unfortunate community (Edwards, 1999). Activities of NGO have had far achieving but varied effect in meeting both practical and strategic to the needy (Fonjong, 2001). However,even though it has conventionally been an article of faith that NGOs are closer to the poor than official donors, it depends on the capacity of the NGOs in implementing its programs (Nunnenkamp et al., 2009). NGOs are not always poverty oriented. NGOsshow to be hesitanttoraise campaigns explicitly encouraging personal behavior change of any type(Laestadius et al., 2014). Hence, it requires a study related to the NGO's role in empowering the recipients in combating the problem they face.

A number of research have been carried out on the role of NGOs in women empowerment, youth empowerment and rural poor empowerment in different countries (Arellano, López, and Petras, 1994; Robinson, 1995; Edwards, 1999; Fonjong, 2001, Nikkhah 2010). However, there are very limited studies that examine the role of NGOs

in the oil palm farmer's empowerment in Indonesia. Hence, this study intends to fulfill the existing gap to provide some policy recommendation to address the poor institution of the independent smallholders.

Empowerment can contribute to the improvement of community development. Many donors and development actors see that empowerment may provide large contribution to development outcomes (Hensen, 2012). Instead of adopting recommendation from others, through empowerment, farmers can make their own decisions rationally to improve their income and hence economic welfare.

This study attempts to answer the following questions:

(i) What is the socio-economic profile of the respondentsin Jambi? ;
(ii) What is the perception of the respondents towards empowerment program;
(iii) What are the relationship between the socio-economic profile and their perception towards empowerment program? ; and
(iv) What are the determinants of the participation of the respondents in the empowerment programs?

1.6 Objectives of the Study

The general objective of this study is to examine the prospect of farmers' involvement in the empowerment program in the Jambi area, Indonesia.
The specific objectives are:

(i) to describe the socio-economic profile of the respondentsin four villages in Tanjung Jabung Barat Regency, Jambi Province, Indonesia;
(ii) to identify the perception of the respondentstowards empowerment program;
(iii) to examine the association between socio-economic profile of the respondentsand their perception towards empowerment program; and
(iv) to identify the determinants of their participation on the empowerment program.

1.7 Justifications of the Study

The oil palm industry has impacted positively on the economic growth of the Indonesian agricultural economy. The last four decades sees an exponential growth of land area and production of oil palm among the private large scale, national large estate and smallholders. The smallholders, however, remain in poor condition with less support from the government, weak famers' association as well as low bargaining power. These issues need to be addressed to alleviate them from low income or poverty level.

The findings of the study are expected to provide some indicators of the importance of empowerment to the smallholders to uplift their welfare and well-being. Secondly, it provides some insights on the roles of NGOs as the agent of empowerment to the marginal farmers in the oil palm economy. These findings are useful inputs to the policy makers in formulating supports to the smallholders as well as facilitating the NGOs in their empowering functions. The study adds to the body of knowledge on the understanding the role of empowerment in addressing income inequality and poverty.

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APPENDICES

Appendix A1

Indonesia: Oil Palm Areas ('000 ha) and Production ('000 tons) 2002-2013

Year	Smallholders						Estate					
	Area		Production		Productivity		Area		Production		Productivity	
	('000) ha	RoG (%)	('000) tons	RoG (%)	(tons/ha) Yield	RoG (%)	('000) ha	RoG (%)	('000) tons	RoG (%)	(tons/ha) Yield	RoG (%)
2000	1,190	-	1,978	-	0.7	-	2,991	-	5,095	-	1.7	-
2001	1,566	31.6	2,801	41.6	0.9	34.4	3,152	5.4	5,598	9.9	1.8	4.3
2002	1,808	15.5	3,427	22.4	1.1	18.4	3,259	3.4	6,196	10.7	1.9	7.1
2003	1,854	2.5	3,517	2.6	1.0	-2.5	3,429	5.2	6,924	11.7	2.0	6.2
2004	2,220	19.7	3,847	9.4	1.1	7.3	3,497	2.0	8,479	22.5	2.4	20.1
2005	2,357	6.2	4,501	17.0	1.3	13.8	3,593	2.8	10,119	19.3	2.8	16.1
2006	2,537	7.6	5,608	24.6	1.5	19.4	3,749	4.3	10,962	8.3	2.9	3.8
2007	2,571	1.4	5,811	3.6	1.4	-5.3	4,102	9.4	11,438	4.3	2.8	-4.6
2008	2,882	12.1	6,923	19.1	1.6	9.8	4,452	8.5	12,478	9.1	2.8	0.5
2009	3,061	6.2	7,518	8.6	1.5	-1.1	4,888	9.8	13,873	11.2	2.8	1.3
2010	3,387	10.6	8,459	12.5	1.6	6.6	5,162	5.6	14,038	1.2	2.7	-4.2
2011	3,753	10.8	8,798	4.0	1.6	0.4	5,350	3.6	15,198	8.3	2.8	4.5
2012	4,138	10.3	9,198	4.5	1.5	-6.7	5,996	12.1	16,818	10.7	2.8	-1.3
2013	4,416	6.7	9,505	3.3	1.5	0.4	6,171	2.9	17,391	3.4	2.8	0.5

Source: BPS, (2013)

Appendix A2

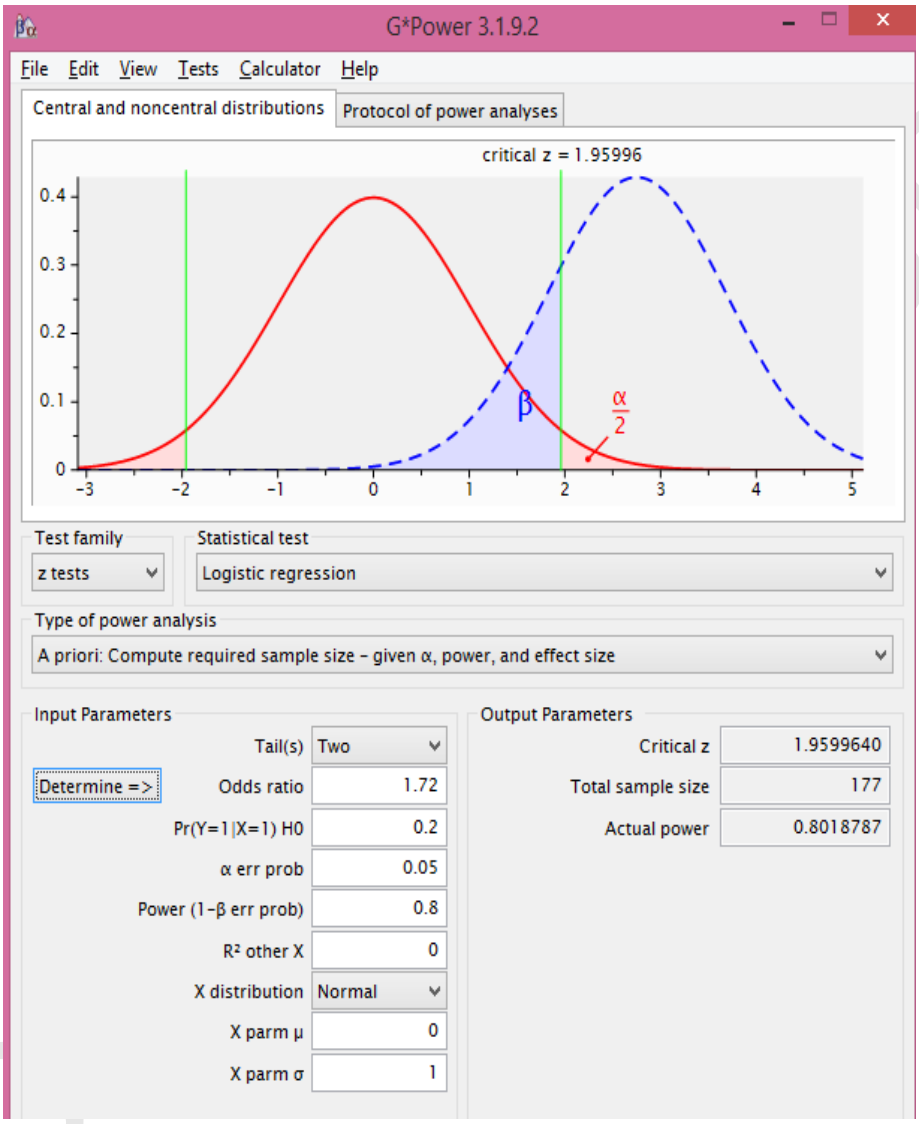
Indonesia: Palm Oil Production (‘000 tons), 1980-2012

Year	('000) tons	RoG (%)
1980	721.2	-
1981	800.1	10.9
1982	886.8	10.8
1983	983.0	10.8
1984	1,147.2	16.7
1985	1,243.4	8.4
1986	1,350.7	8.6
1987	1,506.1	11.5
1988	1,713.3	13.8
1989	1,965.0	14.7
1990	2,412.6	22.8
1991	2,657.6	10.2
1992	3,266.3	22.9
1993	3,421.4	4.8
1994	4,008.1	17.1
1995	4,479.7	11.8
1996	4,898.7	9.4
1997	5,385.5	9.9
1998	5,902.2	9.6
1999	6,011.3	1.8
2000	7,000.5	16.5
2001	8,396.5	19.9
2002	9,622.3	14.6
2003	10,440.8	8.5
2004	10,830.4	3.7
2005	11,861.6	9.5
2006	17,350.8	46.3
2007	17,664.7	1.8
2008	17,539.8	-0.7
2009	19,324.3	10.2
2010	19,760.0	2.3
2011	21,449.0	8.5
2012	23,672.0	10.4

Source: FAOStat, (2013)

Appendix A3

Power Analysis



Appendix A4

Farmers' Level of Knowledge and Perception towards Empowerment Program In jambi, Indonesia

The Institute of Agriculture and Food Policy Studies, Universiti Putra Malaysia with the cooperation of the French Agricultural Research Centre for International Development (CIRAD) are carrying the above study. The purpose of this study is to examine the prospect of empowering the smallholder under the guidance of the YSJ.

By continuing this interview session, you have agreed to participate in this survey voluntarily as well as providing answers to our set of data. You participation is on a voluntarily basis. All information undertaken in this survey is treated CONFIDENTIAL and will be KEPT and PROTECTED. Your response is important to our study and your participation is greatly appreciated. Thank you.

If you need some clarification or further information, please contact us. Your participation and cooperation in the success of this questionnaire is greatly appreciated, thank you.

Fatimah Mohamed Arshad (Prof. Datin Dr) Chair person Institute of Agriculture and Food Policy Studies Universiti Putra Malaysia 43400 UPM Serdang, Selangor, Malaysia Tel : +603-89471070 : +603-89432611 fatima@upm.edu.my	**Novyandra Ilham Bahtera** Graduate Student Institute of Agriculture and Food Policy Studies Universiti Putra Malaysia 43400 UPM Serdang, Selangor, Malaysia Tel :+6282284486280/+60166892623 Faks Email:novyandra.ib@gmail.com Email :
Date :1 Sept 2014	

Respondent's Name :_____
Village :_____
Starting time of interview :_____ Finishing time of interview: _____
Note : _____

PART A: Socio-Economic Profile

A1: Information about household

[Definition of household: it comprises of both family members and non-family members who stay together and income, expenditure for food and other daily life's necessities. It also includes family member(s) (ex: son/daughter) who do/does not stay together with the family.

(1) Tribe (mark): 1.Melayu ☐ 2.Jawa ☐ 3.Bugis ☐ 4. Others: (specify……..)

(2) Religion: ☐ Islam ☐ 2.Catholic Christian ☐ 3.Protestant Christian ☐ Hinduism 5. ☐ Buddhaism

(3) Socio-economic profile and composition of the household's content: include family member(s) (ex: son/daughter) who do/does not stay together anymore.

Relationship with the Head of House hold (A)	Family members who does/do not stay together anymore (B) mark (√)	Gender (M/F) (C)	Age (year) (D)	Level of Education (Code) (E)	Marital Status (Code) (F)	Occupation		Number of year(s) of having effort on the oil palm cultivation (year/s) (I)
						Main (G)	Other (H)	
Head of House hold								

Note: Column E: code of level of education; -no formal education, 2-Elementary School, 3- Primary School, 4- Senior High School 5-Diploma, 6- Scholar
Column F: Code of marital status; 1- Married, 2-Widower/Widow

Part B:Plantation Information

B1: Plantation Structure

Types of plant (A)	Harvestable Area (ha) (B)	land ownership (D)	Type of farmer (code) (E)	Access to Agriculture input (F)	Time spent on plantation (day/month) (G)
1. 2.	1. 2.				

Code of Column D: 1. Own-self; 2. Rent
Code of Column E: 1. small-scale owner-cultivators; 2. tenants, either renters or sharecroppers; 3. Agricultural laborer

B2: Loan

Loan (Rp) (A)	term of the loan (B)	Interest rate (C)	financing institutions (D)

B3: Plantation Management

Whether you work in the planta-tion? (A)	Time spent in the plantation's activity (day/ month) (C)	Time spent in the plantation's activity (month/ year) (D)	Location purchase of seeds Code* (E)	Cost of sow pesticide per year (Rp/ha) (G)	Wages' harvesvt (Rp/ton) (H)
				Rp.	Rp.

Code Column A: 1. Yes; 2. No Code E: 1. PPKS; 2. external agents; 3. General Estate of Jambi Province

B 4: Production input costs

production inputs					
	Year 2012/2013	Total			
	Quantity bag / box	Price	Unit	Quantity	Rp
a. Dolomite fertilizer					
b. Urea fertilizer					
c. Ponska fertilizer					
d. Gramoxone toxins					

B5:Activities beside Plantation

Types of activities (A)	time spent (month/year) (C)	Experience (year[s]) (D)	Total of worker(s), if any (E)

Code Column A: 1. Self-Employed; 2. Waged-Employed; 3. Others, Specify _____

Part C: Income

C1: Plantation Income per month

Harvesting (Time [s]/ month) (A)	Harvesting results (ton) (B)	Selling price per ton (Rp) (C)	Market price per ton (Rp) (D)	Total gross income (Rp) (E)	To whom sell FFB and the percentage (%) of it Code (F)
		Rp	Rp		

Code Column F: 1. Middlemen; 2. processing factoryof FFB (with contract); 3. Other, please specify_____

Code Column G: 1. The closest to thefield; 2. Offer price; 3.Followingfarmer groups; 4. Other, specify _____

C2: Non Farm Income

Source of Income(A)	Average income (Rp/month) (B)	Average income (Rp/year) (C)	Note (D)
1			
2			

Code Column A: 1. Self-Employed; 2. Wage-Employed; 3. Others, Specify_____

Part D: Household Expenditure per Month

Expenditure	Cost (Rp)
1. Food, Beverages (ex: Grocery)	
2. Education (ex: tuition fee[s])	
3. Home: (ex: tile repair, plumbing leak)	
4. Utilities (ex: Electricity, Water)	
5. Transportation (ex: fuel, public transport)	
6. Health (ex: go to the hospital, buy medicines in pharmacies)	
Total	

PART E: Involvement of Farmer Groups on the Farmers' Empowerment Program of YSJ

Please answer the following items and mark (√) in the box provided.

1. Village :

_____

2. involvement of the empowerment program of YSJ: 1. Yes ☐
2. No ☐

Part F. Intervention of YSJ on the Effort of Empowering Farmers and Farmer Groups

F1.The main activities of NGO toward the farmers

Mark (1) for yes or (2) for no

1. Assistance farmers and groups ☐
2. GAP Training ☐
3. Plantation fertilizer training ☐
4. Nursery training ☐
5. the use of pesticides and handling of waste pesticide training ☐
6. Harvest training ☐
7. The opening of the plantation training ☐
8. Institutional training ☐
9. Group dynamics training ☐
10. Management training ☐
11. Archiving training ☐
12. Financial training ☐

F2. The level of frequency of YSJ provides extension and training

1	2	3	4	5	6	7
Never	Once in a year	Once in four month	Once in three month	Once in two month	0nce in a month	20 days in a month

1. Assistance farmers and groups	1	2	3	4	5	6	7
2. GAP Training	1	2	3	4	5	6	7
3. Plantation fertilizer training	1	2	3	4	5	6	7
4. Nursery training							
5. the use of pesticides and handling of waste pesticide training	1	2	3	4	5	6	7
6. Harvest training	1	2	3	4	5	6	7
7. the opening of the plantation training	1	2	3	4	5	6	7
8. Institutional training	1	2	3	4	5	6	7
9. Group dynamics training	1	2	3	4	5	6	7
10. Management training	1	2	3	4	5	6	7
11. Archiving training	1	2	3	4	5	6	7
12. Financial training	1	2	3	4	5	6	7

13. When was the last visit of YSJ at this village?

_____

Part G. Knowledge on Good Agricultural Practices

Put a (√) in accordance with the level of your agreement to the following statements:

1	2	3	4	5
strongly disagree	Disagree	Between agree and disagree	Agree	Strongly agree

1. Caring the environment can have positive impact on health	1	2	3	4	5
2. drainage, terracing on oil palm plantations can minimize damage to the soil	1	2	3	4	5
3. I have to avoid erosion (soil erosion) on the river bank	1	2	3	4	5
4. A good fertilization procedures improve the productivity of FFB	1	2	3	4	5
5. I have known how to select the good quality of seeds	1	2	3	4	5
6. Total spray of pesticide has a negative impact on the oil palm plantation	1	2	3	4	5
7. Excessive use of pesticides can have a negative impact on health	1	2	3	4	5
8. To achieve optimal harvest of FFB, nutrient adequacy must be considered	1	2	3	4	5
9. To achieve optimal harvest of FFB, midrib number must be controlled	1	2	3	4	5
10. Soil moisture conditions are one of the factors in determining the optimal harvest of FFB	1	2	3	4	5
11. I understand that land clearing should take into account the location of the springs	1	2	3	4	5
12. without burning the land is one of the good way to clear the land	1	2	3	4	5

Part H. Farmer Groups' Activities

Put a (√) in accordance with the level of your agreement to the following statements:

1	2	3	4	5
strongly disagree	Disagree	Between agree and disagree	Agree	Strongly agree

1. In the organization, it is necessary to have similarities between my goals and farmer groups' goals	1	2	3	4	5
2. I usually communicate with the group members to meet our interest	1	2	3	4	5
3. Each member interdependent in fulfilling business needs	1	2	3	4	5
4. Through well-organized farmer groups, I believe that we can improve the quality of life	1	2	3	4	5
5. Through farmer groups, we can learn some of the skills of each member	1	2	3	4	5
6. Through farmer groups, I will gain more knowledge about the manner of good agricultural practices	1	2	3	4	5
7. farmer groups obtain permission to sell FFB directly (without midlleman) to the FFB-processing factory (mills)	1	2	3	4	5
8. The sales of FFB is coordinated by farmer groups so that farmers get a purchase order for farmer groups archiving	1	2	3	4	5
9. Members of farmer groups can improve income due to have bargain position with mills	1	2	3	4	5
10. It is through farmer groups that members are able to help each other	1	2	3	4	5

Part I. Economic Empowerment

Put a (√) in accordance with the level of your agreement to the following statements:

1	2	3	4	5
strongly disagree	Disagree	Between agree and disagree	Agree	Strongly agree

1. my farming activity is economically supportedby farmer groups	1	2	3	4	5
2 I am able to buy subsidized fertilizer of the government through farmer groups in installment system	1	2	3	4	5
3 I am able to loan money on farmer groups when I need the help of venture capital	1	2	3	4	5
4 I am able to sell FFB at the market price to the mills so that my income increases	1	2	3	4	5
5. I get the ease of production facilities through farmer groups so I am able to increase the productivity of FFB	1	2	3	4	5
6. Share of net income (SHU) at farmer groups is able to improve people's economic condition at village	1	2	3	4	5
7 Overall, my economic conditions increase due to my involvement with farmer groups	1	2	3	4	5

Part J. local NGO performance

Put a (√) in accordance with the level of your agreement to the following statements:

1	2	3	4	5
strongly disagree	Disagree	Between agree and disagree	Agree	Strongly agree

1 YSJ is one of the institutions that could bring awareness to farmers on good agricultural practices	1	2	3	4	5
2 Farmers' empowerment Program of YSJ is in accordance with the necessities of farmers	1	2	3	4	5
3. Farmers' empowerment program of YSJ is easily followed by farmers	1	2	3	4	5
4. The companion on farmers' empowerment program of YSJ is friendly by interacting with farmers	1	2	3	4	5
5. I get enough knowledge about good agricultural practices through farmers' empowerment program by YSJ	1	2	3	4	5
6 I get a strong result of the strong of farmer groups due to farmers' empowerment program by YSJ	1	2	3	4	5
7 I get an increase in well-being as a result of farmers' empowerment program by YSJ	1	2	3	4	5

PART K: Final Comments and Feedback

1. At this time, I usually do_____

2.In the future, I want to participate again to a similar survey: 1. Yes ☐
2. No ☐
3. Possibly ☐

3.My comment(s)/suggestion(s) on your research is/are_____

4. My comment(s)/suggestion(s) on how to improve farmers' empowerment program by YSJ

_____
_____

Once again, thank you very much for your time

Appendix B1

Factor analysis: Principal Component Analysis

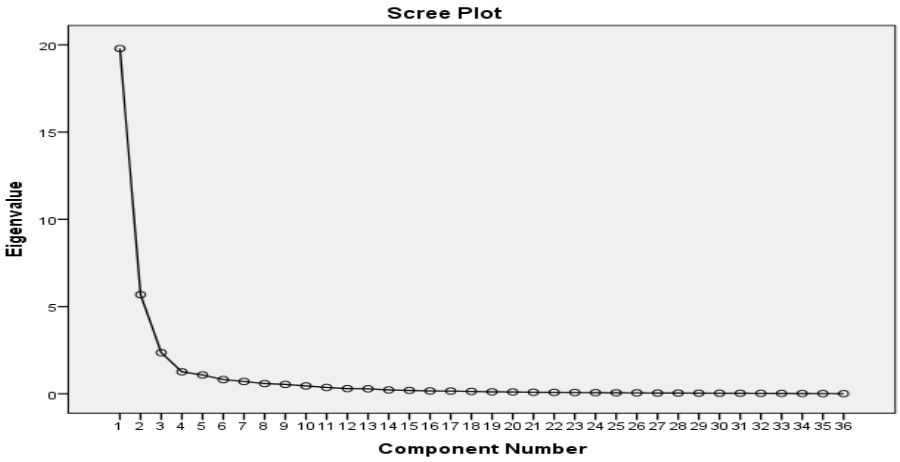
KMO and Bartlett's Test, Total Variance Explained and Scree Plot

KMO and Bartlett's Test

Kaiser-Meyer-Olkin measure of sampling adequacy		.941
Bartlett's test of sphericity	Approx. $\times^2$	11892
	Df	630
	Significance	*P*< .000

Total Variance Explained

Factors	Initial Eigenvalues		
	Total	**% of Variance**	**Cumulative %**
1	19.8	55%	55%
2	5.7	15.8%	70.8%
3	2.4	6.6%	77.4%
4	1.3	3.5%	80.9%
5	1.1	3%	83.9%



Appendix B2

Comparison of eigenvalues between PCA and parallel analysis

Factor number	Actual eigenvalue from PCA	Criterion value from parallel analysis	Decision
1	19.8	1.9	Accepted
2	5.7	1.8	Accepted
3	2.4	1.7	Accepted
4	1.3	1.6	Rejected
5	1.1	1.6	Rejected

Appendix B3

Factor Analysis: Principal Component Analysis

Rotation Results: Kaiser Criterion

Component Matrix

Statements of the Questionnaire	Factor				
	1	2	3	4	5
members are able to help each other to improve our social, economic and environmental condition	.92				
Ability to get ease of production facilities in farmers group	.92				
ability to buy subsidy fertilizer through farmer groups	.92				
We can learn some of skills each member in farmer groups	.92				
The sales of FFB is coordinated by farmer groups	.91				
we can improve the quality of life in farmer groups	.91				
I will gain more knowledge about the manner of good agricultural practices in farmer groups	.91				
I usually communicate with the members of farmer groups	.91				
Improving income due to farmers group has bargaining-position ability with mills	.91				
Each member of farmers group interdependent in fulfilling business needs	.90				
I have the ability to loan money on farmer groups	.90				
farmer groups obtain permission to sell FFB directly	.90	-.32			
Having similarities between my goals and farmer groups' goals	.89				
my farming activity is supported by farmer groups	.89				
Overall, my Economic condition increases or better by involving the activities in farmers group	.88				
midrib number must be controlled	.55	.50	.42		
drainage minimize damage to the soil	.32	.75		-.31	
Caring Environment have positive impact on my health	.38	.75			
Avoid erosion in the surrounding area of my oil palm plantation	.40	.75			
Using proper fertilizer on plantation can improve quantity and quality of FFB	.50	.69			
Nutrient adequacy must be considered to improve the quantity and quality of FFB	.54	.68			
Total spray has negative impact on the quality of oilpalm plantation	.59	.63			
Excessive use of pesticide has the negative impact on health	.57	.62			
Soil moisture conditions are one of the factors in determining the optimal harvest of FFB	.54		.58	.37	
ability to sell FFB at market price	.58				.67

Appendix B4

Factor Analysis: Principal Component Analysis

Rotation Results: Oblimin with Kaiser Criterion

Component Correlation Matrix

Component	1	2
1	1.0	.4
2	.4	1.0

Appendix B5

Factors, items, and Cronbach's alpha

Factors	Items	Cronbach's alpha
(1) ACTIVITIES	*OBPR, CRDNTD, SBSD, MRKNW, FAC, LRSK, INRDPNDT, HLP, QLLF, BRPS, GOAL, COM, LN, SPRT, and ECOINC*	.99
(2) KNOWLEDGE	*ECOINC, AVER, CRENV, MINDMG, GDFERT, NUTAD, TOTSP, EXPES*	.95

LIST OF PUBLICATIONS

Novyandra Ilham Bahtera, Fatimah Mohamed Arshad,& Shaufique Fahmi Sidique(2015).Socio-economic profile and perceptions of smallholders towards empowerment program in Tanjung Jabung Barat, Indonesia.*Proceedings of the 5th Business, Economics and Communications International Conference: Moving ASEAN + 3 and AEC forward beyond 2015organized by the Faculty of Business, Economics, and Communications,* Naresuan University, Thailand, 17-18 August.pp: 115-123.

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Novyandra Ilham Bahtera, Fatimah Mohamed Arshad, Shaufique Fahmi Sidique, Marcel Djama & Asnarulkhadi Abu-Samah. (2016). Thedeterminants of participation in empowerment programs in Jambi Province, Indonesia. *Asia Pacific Journal of Advanced Business and Social Studies*, 2 (2), 54-550.

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