Journal of Entrepreneurship, Business and Economics
ISSN 2345-4695
2021, 9(2), 72–95

THE RELATIONSHIP BETWEEN OIL PALM EXPANSION AND INCOME INEQUALITY IN INDONESIA, MALAYSIA, THE PHILIPPINES, AND THAILAND: INTERNATIONAL TRADE INSIGHTS

Albert Hasudungan [1], Dewa Gede Sidan Raeskyesa [2]
[1] *Department of Business Economics, School of Business and Economics, Universitas Prasetiya Mulya, Indonesia*
[2] *Advanced Studies Program, Kiel Institute for The World Economy, Germany*
E-mail: albert.hasudungan@pmbs.ac.id
Received May 2021; accepted August 2021

Abstract
This study aims to explore the relationship between the expansion of oil palm plantations and income inequality in Indonesia, Malaysia, Thailand, and the Philippines. The relationship was investigated using panel data analysis from 2000 to 2019. The results indicate a mixed effect of palm oil expansion on inequality, in which land use for oil palm farming has a significant and negative effect on income inequality as measured by the Gini Index. However, fertilizer consumption and yield in oil palm activities have positive relationships with income inequality. This suggests the importance of supporting equal access to both financing and capacity building. Lastly, this study presents scenarios with and without government intervention.

Research paper

Keywords: Palm Oil; Expansion; Inequality; International Trade; Data Panel

Reference to this paper should be made as follows: Hasudungan. A., & Raeskyesa, D. G. S. (2021). The Relationship between Oil Palm Expansion and Income Inequality in Indonesia, Malaysia, the Philippines, and Thailand: International Trade Insights. *Journal of Entrepreneurship, Business and Economics*, *9*(2), 72–95.

Introduction

Oil palm plantation has produced the most consumable vegetable oil globally (Gaskell, 2015). Palm oil offers more efficient ingredients for food and cosmetics, and thus the producers of consumer products have selected it as a raw material (Gaskell, 2015). In Southeast Asia, crude oil palm has been driving a significant export share for the area economy. In 2019, according to the Food & Agricultural statistics[1], the three largest oil palm producers in Southeast Asia were Indonesia, Malaysia, and Thailand. These countries supply more than 50 percent of palm oil to global markets.

Nonetheless, these oil palm plantation producers across Asia relied more on area expansion to boost their production (Gaskell, 2015). As a consequence, oil palm expansion could take over the land used for swidden plots by traditional farmers and thereby influence their livelihood (Dressler et al., 2017). This comes as no surprise, as palm oil brings great growth and investment to countries such as Indonesia in the Southeast Asian region (Tee et al., 2020; Pacheco et al., 2017; OECD, 2017). However, several studies have highlighted the expansion of activities related to the inequality issue (Hall, 2011; Li, 2015; Rhein, 2015). Inequality is an important development indicator (Seers, 1969) for most countries, and it motivates them to become higher-income countries and increase their productivity (Paus, 2017).

The explanation above motivates this study to investigate the factors that can influence inequality from oil palm expansion in the most significant

[1] See: http://www.fao.org/faostat/en/

oil palm producers in Southeast Asia: Indonesia, Malaysia, the Philippines, and Thailand. The determining factors follow previous case studies to include land use, and non-land uses factors (Bou Dib et al., 2018; Kubitza & Gehrke, 2018; McCarthy, 2010). This study enriches these discussions by elaborating on the comparative advantage consideration of a country's productivity and the real effective exchange rate on non-land use consideration. Based on the international trade realms, those countries' productivity and real effective exchange rate can affect economic well-being in their participation in international economics (Blanchard, 2016; Krugman et al., 2015).

While some past agrarian studies enlighten the significance of land enclosure for oil palm plantation to rural inequality, this research found that the land-use expansion does not necessarily contribute to inequality in those largest producer's oil palm countries. However, with capital-intensive oil production, producers have a diverse capability to access fertilizer and boost their productivity. Hence those gaps correlate with more inequality. In this global value chain oil economy, government intervention still, to some extent, correlates with lower inequality. Hence, this study found the relevance of the government intervention to address inequality from the oil palm development on that respective world's producer countries.

Literature Review

This study investigates the factors that determine the oil palm inequality in the fourth largest southeast Asian countries. Our study contributes to elaborating comparative advantage consideration of country's productivity and real effective exchange rate on non-land use consideration in the oil palms of Southeast Asia. In comparing the export share to international trade, Blanchard (2016) states that the land is the natural capital that can expand production. In oil palm plantations, the effect of land use expansion for oil palm plantations on inequality sparked debate. The opposing views suggest that some oil palm expansion overtook rural farms and exposed some poor to landlessness (Pichler, 2015). Hence, this can cause more inequality (Santika et al., 2019).

In contrast, other studies show different results. For instance, Kubitza et al. (2018) remind the significant participation of smallholder farmers in oil palm plantations in Indonesia. Those smallholder farmers reaped the monetary benefit of smallholding oil palm participation (Bou Dib et al., 2018; Kubitza et al., 2018). In expediting the research, Bou Dib et al. (2018) found non-significance of land use expansion to inequality. In his explanation, while farmers can lose their land for oil palm plantations, those who relied on non-farm production faced more job opportunities (Bou Dib et al., 2018). Those non-farm households are the poorest in the case study in Jambi (Bou Dib et al., 2018). Gatto et al. (2015) also assert the weak relationship between land use and inequality.

In the oil palm global value chain, inequality is also determined by the cost of fertilizer (Bou Dib et al., 2018; Hasudungan & Neilson, 2020; Krugman et al., 2015). Several studies indicate that oil palm plantations generate more capital costs than labor to induce oil palm productivity (BPS-Sumatra-Barat, 2014; Budidarsono et al., 2013; Rhein, 2015). Budidarsono et al. (2013) also find higher capital expenses of oil palm compared to labour. In terms of production costs, the most significant expense is from fertilizer. In comparison, the expense for agricultural input is much more significant from oil palm than from rubber and cacao (see table 1).

Table 1. Per-hectare production costs for oil palm, rubber, and cacao (in thousands IDR & total USD)

Components (per year at minimum cost)	Oil Palm	%	Rubber	%	Cacao	%
Agricultural inputs (total)	1471.16	18.45	273.43	3.16	1075.65	8.60
Seeds	159.56	2.00	104.74	1.21	217.60	1.74
Fertilizer	1168.09	14.65	106.46	1.24	677.30	5.42
Agricultural stimulant	2.55	0.03	2.71	0.03	12.53	0.09
Pesticide	140.96	1.77	59.52	0.68	168.22	1.35
Labour cost structure (total)	2575.26	32.30	4163.1	48.18	7440.16	59.54
Managing land	184.76	2.32	278.1	3.22	556.52	4.45
Cultivating buffer trees	0.41	0.01	0.77	0.01	83.35	0.67
Cultivating plantation crops	43.43	0.54	79.71	0.92	142.10	1.14
Maintaining plantation	512.08	6.42	505.39	5.85	1763.99	14.12
Fertilising	193.62	2.43	39	0.45	247.10	1.98
Controlling insects	53.27	0.67	55.32	0.64	196.80	1.57
Permanent labour	1587.69	19.91	3204.81	37.09	4450.30	35.61
Land rent	2581.58	32.37	2904.83	33.62	2931.59	23.46
Other costs (total)	1344.99	16.88	1299.73	15.04	1048.76	8.4
Equipment rental	146.45	1.84	135.67	1.57	211.54	1.69
Agricultural services	459.91	5.77	40.08	0.46	8.52	0.07
Other expenditures	738.63	9.27	1123.98	13.01	828.70	6.64
Total production costs in IDR	7973.39	100.00	8641.09	100.00	12496.16	100.00
Total production costs in US dollars	570		617.41		893	

Source: BPS Sumatra Barat, 2014 (the estimation is assumed under small-scale comparisons by leasing others' land)

In the oil palm global value chain, oil palm companies own significant monetary capital to purchase fertilizer for their large-scale oil palm value chains (Rhein, 2015). Some of these oil palm companies often create upstream production along their way with a lack of participation from smallholder farmers (McCarthy, 2010). With partnership schemes in some countries in Southeast Asia, for instance, smallholder farmers received a particular amount of monetary benefit from oil palm companies, yet less fertilizer financing is provided to their smallholder farmers (Hall, 2011).

Hasudungan (2018) found that some poor farmers experienced the burden of fertilizer in their participation of the oil palm value chain. While the smallholder farmers are enthusiasts to participate in the upstream oil palm value chain (Euler et al., 2017), a trade-off happens in allocating fertilizer and household consumption (Hamdani et al., 2016; Goodarzi et al., 2018). The effort of enhancing oil palm production has been sacrificed to reduce household consumption (Hamdani et al., 2016).

In connection with expansion performance, according to the Heckscher-Ohlin Model, a country's international trade performance is influenced by what it can most efficiently and plentifully produce (Krugman et al., 2015). Assuming one factor of production, in international trade, Krugman et al. (2015) explained that countries would engage in international trade given the labour productivity on products that they specialized in, as follows:

$$aLc/aLc^* < Pc/Pc^* \quad (1)$$

Among firms engaged in the upstream oil palm value chain, productivity is stimulated by adopting agricultural technology (Kubitza & Gehrke, 2018; Moghadamzadeh et al., 2020). However, in the independent smallholding firms, Kubitza and Gehrke (2018) assert the benefit of labour-saving measures that the oil palm smallholders can adopt within the agricultural technology. Nonetheless, those who cannot adopt them and do not have sufficient funds to access the technology will have drawbacks to boost their agricultural productivity (Kubitza & Gehrke, 2018).

Gaskell (2015) asserts farmers' relative openness to international markets for the international market in observing the oil palm trade. When the cash crops were low, the farmers would be discouraged from selling their cash crops instead of making them for local processing or serving domestic consumption. Hence, fluctuation of international oil palm prices will affect the country's competitive export, but it becomes a consideration of smallholder farmers on their oil palm income. In the asymmetric information of domestic and international prices, some farmers can reap the benefits while others suffer (Gaskell, 2015; Pindyck & Rubinfeld, 2017). In international economics, the comparison of world price and domestic price is shown by the real effective exchange rate (Krugman et al., 2015). Hence, this study intends to explore the relationship of changing real effective exchange rates to inequality.

Additionally, institutional parameters, such as government efforts to provide access to infrastructure and primary education, determine the local capabilities to engage in the oil palm economy (Krishna et al., 2017). Government expenditures to enhance physical and social infrastructure affect the oil palm business. Extending the infrastructure thus shortens oil palm shipments (Kubitza et al., 2018). When connecting to international trade, Krugman et al. (2015) recommend distinguishing the effect of international trade on welfare using pure market mechanisms and government intervention. Applying those suggestions, the models are simulated without and with government intervention. Hence, the first model scenario will be

$$\delta = f\ (F, L, a, REER) \qquad (2)$$

where δ refers to income inequality, F is fertilizer consumption or use, L is land use, a stands for agricultural yield (productivity), and REER is the real effective exchange rate. If the scenario to include government expenditure (**g**) is considered, the alternative model will be as follows:

$$\delta = f\ (F, L, a, REER, g) \qquad (3)$$

Data

The data for this study is sourced from FAO Statistics, World Bank Statistics, and International Financial Statistics (IFS). The data sample covers the annual period from 2000 to 2019, consisting of Malaysia, Indonesia, the Philippines, and Thailand (80 samples).

In this study, inequality is represented by the Gini index. The Gini coefficient measures the deviation of income distributions of individuals or households in a particular country (The World Bank, 2013). In this Gini index, 0 stands for distributed income, while 100 represents absolute inequality. The reason to use the Gini index is not only due to its ability to provide a suitable summary of the degree of inequality but also to fulfil one of the standards of inequality measurement, which is the Transfer Principle (Farris, 2010;

Haughton & Khandker, 2009; Trapeznikova, 2019). This basis is essential when one would like to make a comparison across countries.

In addition, the data of land use, fertilizer consumption, and agricultural yield (productivity) is extracted from FAO statistics. The Real Effective Exchange Rate (REER) data comes from the International Financial Statistics (IFS). In IFS, REER was estimated by weighting the nominal exchange rate, domestic consumer price index, and foreign consumer price index of major trading partners (IMF, 2019).

Methodology

This study uses a data panel approach to observe the correlation between land-use and non-land-use factors on economic equality. According to Greene (2012), this model elaborates on the individual samples and time series into aggregate equations. When the equation generalizes the heterogeneity of individual samples (i) and (t), the model is identified as the pooled panel regression, as is written below:

$$Y_{it} = X_{it}'B + \alpha + \varepsilon_{it} \quad (4)$$

In equation (4), X_{it}' is the matrix of independent variables (k) and their time series (T) or T x k matrix, and B is the beta estimator for each independent variable (k x 1). For each individual (i) and time-period (t), the model estimates intercept (α), which are homogenous over the individual and time period.

Group heterogeneity exists by conjoining the different individual groups across time series periods (Greene, 2012). There are several heterogenic forms on the data panel model. Firstly, there are different estimated intercepts for each group, as written below:

$$Y_{it} = X_{it}'B + \alpha_i + \varepsilon_{it} \quad (5)$$

Moreover, when the heterogeneity over the individual error exists, the random effect accommodates it by adding the individual variance, u_i, in the model. This model is a random-effects model:

$$Y_{it} = X_{it}'B + \alpha_i + \varepsilon_{it} + u_i \quad (6)$$

This study conducts the Hausmann test to examine a suitable econometric model. The Hausmann test is deployed to observe the heterogeneity on the individual group intercept or heterogenic error over the individual in the panel equation system (Greene, 2012). The Hausman test can assist in selecting the fixed effects, random effects, or pool regression model. With the *per se* individual variable, the matrix panel data is transformed into the scalar equation as follows:

$$y_{it} = x_{1it}'b_1 + .. + ..x_{nit}b_n + b_o + \varepsilon_{it} \quad (7)$$

In equation 7, n shows the number of independent variables, including the control variable. This study observed the effects of the growth of the respective independent variables on the Gini coefficient. The regression will first examine the free market scenario in which the government interventions are minimal and insignificant in international trade (Feenstra & Taylor, 2017), as follows:

$$\log(\delta_{it}) = \beta_0 + \beta_1 \log(\alpha_{it}) + \beta_2 \log(Land_{it}) + \beta_3 \log(Fer_{it}) + $$
$$+\beta_4 \, log(REER_{it}) + \varepsilon_{it} \quad (8)$$

α stands for the oil palm productivity, land is the land use for oil palm, Fert is fertilizer consumption, and REER is the real effective exchange rate.

In another perspective, Bronkhorst et al. (2017) found government intervention spending to enhance smallholder replanting and infrastructure development for oil palm development. The second model will include government expenditure as a control variable (γ). Hence, the equation is as follows:

$$\log(\delta_{it}) = \beta_0 + \beta_1 \log(\alpha_{it}) + \beta_2 \log(Land_{it}) + \beta_3 \log(Fer_{it})$$
$$+\beta_4 \, log(REER_{it}) + \beta_5 \, log(\gamma_{it}) + \varepsilon_{it} \quad (9)$$

In this study, the real effective exchange rate (REER) was obtained by domestic currency against weighting foreign currencies of the trading partners and then multiplying that with the domestic index price and foreign price, as follows:

$$\text{REER} = \prod_{i}^{n} \left[\left(\frac{e}{e_i}\right)\left(\frac{P}{P_i}\right)\right]^{W_i} \quad (10)$$

In that equation, e stands for domestic currency, P is domestic price, I is foreign trading partners, and w stands for the weighted geometric average. Since REER is collected from international financial statistics, in their terms, the higher the REER, the more expensive the export and cheaper the import[2].

[2] See more on IMF Statistics notes: http://datahelp.imf.org/knowledgebase/articles/537472-what-is-real-effective-exchange-rate-reer

Hence, increasing the REER indicates a loss of trade competitiveness for that respective country to their foreign trading partners.

Results

From a comparative advantage perspective, a country's factor in exporting their commodities relies on the relative productivity of their competitors in the global market (Feenstra & Taylor, 2017; Krugman et al., 2015). Figure 1 shows that Indonesia and Malaysia had a much greater oil palm production than Thailand and the Philippines.

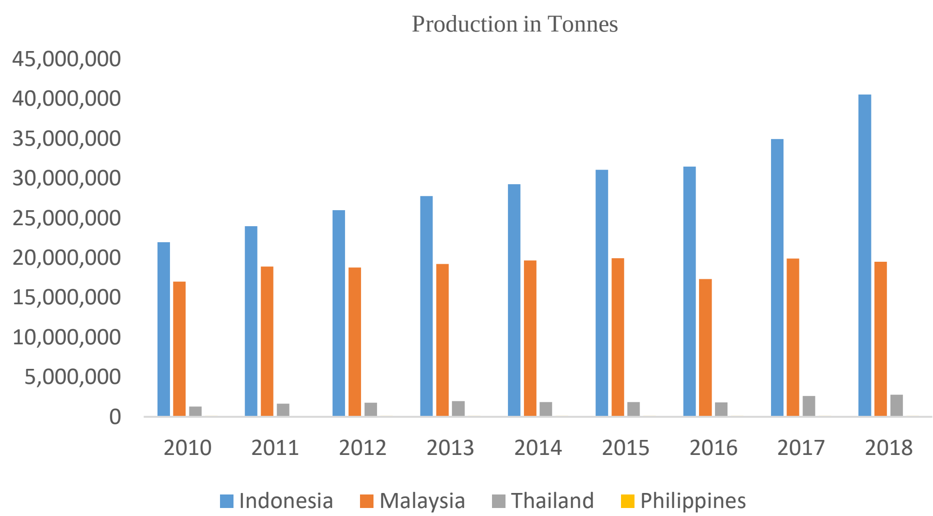

Figure 1. Oil Palm Production in Fourth Largest Southeast Asian Countries

Source: FAOStat (http://www.fao.org/faostat/)

However, Thailand has the most efficient boosting of the productivity of oil palm countries' producers. Thailand posits twice as much as the productivity of the total regional Southeast Asia productivity (see Fig. 2). However, producing the largest world's crude oil palm (CPO), Indonesia has the bottom rank on the agricultural productivity of that oil palm countries producers in Southeast Asia.

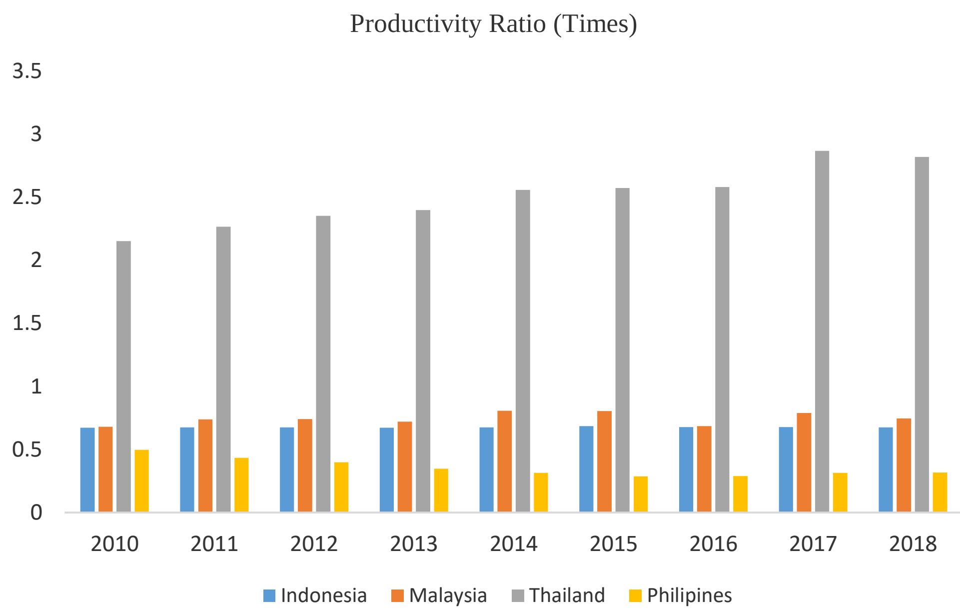

Figure 2. Country productivity to Regional S.E. Asia (average)

Source: Authors' calculation from data FAOStat (http://www.fao.org/faostat/)

When scrutinizing the oil palm land use data, Indonesia has the biggest production capacity because of the largest land expansion for oil palm plantation, as shown in Fig. 3.

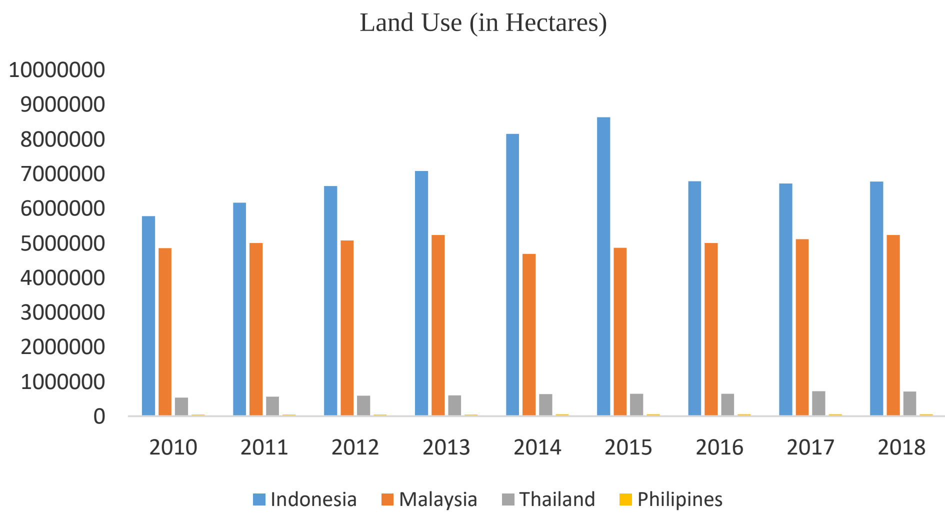

Figure 3 Land Use for Oil Palm (in Hectares)

Source: FAOStat (http://www.fao.org/faostat/)

To further expedite the determining factors of inequality, a panel of econometric data is devised to investigate which variables significantly impact inequality. There are several assessments to find a robust econometric model. Firstly, by examining several heterogeneity tests (including the Hausman test), it is concluded that pool ordinary least square is the best econometric model (Croissant & Millo, 2018). From the following Table 2, the insignificant P-value of the heterogeneity test advocates pooled the OLS model, with a P-value above 5% on Breusch Pagan and Pooling Test.

Afterwards, the pooling OLS regression is then assessed as in Table 2, when government intervention is omitted as the control variable. In the free global market scenario, inequality is significantly influenced by fertilizer consumption and land use. This means that the larger the fertilizer consumption in oil palm production, the higher the inequality.

Table 2. Panel (Pool) data estimation in a free market scenario

Dependent Variable: Log (Gini Index)		
Variables	Coefficient (significance)	Standard Error
Intercept	5.1356361* (0.000)	0.8651358
log(Land)	-0.0420273* (0.000)	0.0070747
log(Fertiliser)	0.0480192* (0.0001)	0.0118604
log(REER)	-0.0985459 (0.3695)	0.1088865
log(Yield)	-0.0865730 (0.1218)	0.0550570
R-square	0.73183 (73.18%)	
Adjusted R-square	0.71159 (71.16%)	
Pooling Test (Pooling vs. Fixed)	F stat: 1.4374, P-value: 0.1749	
Breusch Pagan (Random vs. Pooling)	Chi-square: 0.92217, P-value: 0.3369	

Source: estimated with R, (*) significant at 5%

However, in Southeast Asia, the study revealed that government intervention is involved in agriculture. For instance, some governments in Southeast Asia assisted smallholder farmers with social infrastructure and replanting assistance (Sheil et al., 2009). As shown in Table 3, R-square and adjusted R-square improves as the government expenditure is included as the control variable in that equation system.

Table 3. Panel (Fixed-effect) data with government expenditure

Dependent variable: Log(Gini Index)		
Variables	Coefficient (significance)	Standard Error
log(Land)	-0.052576 (0.0000)*	0.006871
log(Fertiliser)	0.059757 (0.0003)*	0.014820
log(REER)	-0.055106 (0.6167)	0.109091
log(Yield)	0.136499 (0.0254)*	0.058384
log(Gov)	-0.132643 (0.0006)*	0.035166
R-square	0.8772 (87.72%)	
Adjusted R-square	0.79412 (79.41%)	
Pooling Test (Pooling vs. Fixed)	F-stat = 2.7412; P-value: 0.005501	
Hausmann Test	Chi-square = 108.59; P value: 0.000	

Source: estimated with R, *) significant at 5%

This table shows that more land use for oil palm expansion reduces inequality with or without government intervention. In several agrarian references, oil palm plantation carries intense drawbacks to the poorest households. For instance, Colchester et al. (2006) argued that the oil palm expansion would benefit the corporate agribusiness in the land dispossession of the poorest one. Hence, those who fight against the corporation will lose any access to diversify their livelihood (Colchester et al., 2006). However, in another stance, Cramb and Curry (2012) argued that oil palm is not exclusive to wealthy agribusiness, but smallholder farmers can participate in oil palm plantations by mobilizing their resources. They, for example, diversify their income to have the financial capability to participate in their term (Cramb & Curry, 2012). Hence, smallholder farmers contribute to converting their subsistence agricultural land into oil palm land to improve their livelihoods (Euler et al., 2017).

Secondly, increasing fertilizer consumption will increase inequality in oil palm producer countries in Southeast Asia, according to the panel regression results. One might assume that fertilizer utilization determines the consumption behaviour of the smallholder farmers. As stated by Hamdani et al. (2016), there is a rivalry relationship between the costs of fertilizers and household consumption both in food and health (Hamdani et al., 2016).

As a capital-intensive monoculture, oil palm requires a much higher amount of nitrogen-based fertilizer to sustain and increase its yield (Sheil et al., 2009; Salamzadeh & Arbatani, 2020). While in Southeast Asia, the governments have provided some agricultural assistance, it was found that the abundant use of fertilizer represented a high personal agricultural expense. This occurred because 50 per cent of immature fruit production relies on a high amount of fertilizer (Sheil et al., 2009). This, of course, requires more access to financing. Bou Dib et al. (2018) argued that, while farmers with better access to financing and land can adapt well to oil palm cultivation, this does not prevail for those with limited access to financing. To maintain smallholding plots, those adopters must use some of their own household funds to purchase fertilizer. Krishna et al. (2017) found that oil palm adopters allocated some of their income from off-farm labours to invest in oil palm cultivation.

Nonetheless, poor households have limited income sources, mainly dependent on sharecroppers or day labourers with rubber and oil palm cultivation skills (Krishna et al., 2017). Hence, they will reduce their consumption expenses to allocate some of their income to their smallholding plots. As a result, Krishna et al. (2017) indicated uneven economic livelihood impacts from oil palm adoption, consistent with this regression result.

Furthermore, when government expenditures are not included, the agricultural yield has not significantly affected oil palm plantations under the assumption of a free market scenario in international trade (see Table 2). Nonetheless, in reality, some national governments in Southeast Asia have intervened to provide replanting assistance to smallholders and spend their money improving the infrastructure (Bronkhorst et al., 2017; Sheil et al., 2009). Therefore, government expenditure has significantly reduced income inequality.

Nonetheless, enhancing agricultural yield requires smallholder farmers to apply efficient cultivating practices. For instance, Lee et al. (2014) indicated that higher oil palm yield could be reached in the hands of well-managed smallholder farmers who can adopt good agricultural technologies. In addition, different capacities to adopt oil palm exacerbates inequality (Euler et al., 2017). This research confirms the findings of previous studies that, while agricultural yield increases, it is concentrated with smallholder farmers with better agricultural management farming practices in Southeast Asia. Hence, it may be crucial to reduce this disparity by providing extended smallholding capacities to manage their oil palm fields.

Conclusion

In general, for some countries in ASEAN, the expansion of the agricultural sector has been associated with a negative relationship with income inequality. In other words, the higher growth in the agricultural sector reduces income inequality (Raeskyesa, 2020). This study analyses the expansion of the agricultural sector explicitly in the context of palm oil. The research intends to discover the effect of oil palm expansion on inequality. Expansion here consists of land use, fertilizer usage (consumption), and yield, valued at the real effective exchange rate. The scenarios consider cases with or without government expenditure as the control variable.

The results indicate a mixed effect of oil palm expansion on inequality in the four largest oil palm producers in Southeast Asia. In some agricultural studies, smallholders converted their subsistence fields into oil palm plantations (Bou Dib et al., 2018; Cramb & Curry, 2012; Krisnawatiet al., 2019). To some extent, in this study, the larger the land used for oil palm, the lower the inequality. Hence, the participation of smallholders through land use has a significant effect on decreasing inequality. Nonetheless, with the substantial expense of fertilizer, some poorer households must allocate their household expenses for such costs, while the richer ones reap substantial alternative investment with their diversified income, as in previous research (Krishna et al., 2017). This study found that expanding fertilizer is associated with greater income inequality.

Furthermore, previous research underscores the different capabilities of smallholder farmers to adopt agricultural technology and capital-intensive cash crop cultivation (Bou Dib et al., 2018; Sheil et al., 2009). This study reveals that increasing oil palm yield is associated with more inequality. Hence, from the domestic productive capabilities, land expansion and fertilizer are important determinants in influencing inequality. From the comparative advantage perspective, relative real effective exchange rate fluctuation does not significantly impact inequality. However, as the basis of product efficiency, agricultural yield determines the change of inequality in these four producer countries.

This study suggests that to strengthen equal welfare from the oil palm boom, equal access to financing and more diversified income is required so that the more impoverished farmers can uplift their standard of living. In addition, while oil palm is a capital-intensive cash crop, capacity building and giving access to the poorer farmers to adopt agricultural technology will significantly enhance their smallholding cash crop productivity.

Acknowledgement

The authors would like to thank the two reviewers for their helpful comments and the support from the Research Office from the School of Business and Economics Universitas Prasetiya Mulya.

References

1. Blanchard, O. (2016). Macroeconomics (7th ed.). Pearson.
2. Bou Dib, J., Alamsyah, Z., & Qaim, M. (2018). Land-use change and income inequality in rural Indonesia. Forest Policy and Economics, 94, 55–66.
3. BPS-Sumatra-Barat. (2014). Berita resmi statistik: struktur ongkos usaha Perkebunan Kelapa Sawit, Karet, dan Kakao Tahun 2014. https://sumbar.bps.go.id/
4. Bronkhorst, E., Cavallo, E., Medler, M., Klinghammer, S., Smit, H., Gijsenbergh, A., & Laan, C. (2017). Current practices and innovations in smallholder palm oil finance in Indonesia and Malaysia: Long-term financing solutions to promote sustainable supply chains. Center for International Forestry Research (CIFOR). https://doi.org/10.17528/cifor/006612
5. Budidarsono, S., Susanti, A., & Zoomers, A. (2013). Oil Palm Plantations in Indonesia: The Implications for Migration, Settlement/Resettlement and Local Economic Development. In Z. Fang (Ed.), Biofuels - Economy, Environment and Sustainability. InTech. http://www.intechopen.com/books/biofuels-economy-environment-and-sustainability/oil-palm-plantations-in-indonesia-the-implications-for-migration-settlement-resettlement-and-local-e
6. Colchester, M., Jiwan, N., Andiko, Sirait, M., Firdaus, A. Y., Surambo, A., & Pane, H. (2006). Promised land: palm oil and land acquisition in Indonesia: implications for local communities and indigenous peoples. Forest Peoples Programme. http://rafflesia.wwf.or.id/library/admin/attachment/books/Land_Acquisition_eng.pdf
7. Cramb, R., & Curry, G. (2012). Oil palm and rural livelihoods in the Asia-Pacific region: An overview. Asia Pacific Viewpoint, 53(3), 223–239.
8. Dressler, W. H., Wilson, D., Clendenning, J., Cramb, R., Keenan, R., Mahanty, S., Bruun, T. B., Mertz, O., & Lasco, R. D. (2017). The impact of swidden decline on livelihoods and ecosystem services in Southeast Asia: A review of the evidence from 1990 to 2015. Ambio, 46(3), 291–310.
9. Euler, M., Krishna, V., Schwarze, S., Siregar, H., & Qaim, M. (2017). Oil Palm Adoption, Household Welfare, and Nutrition Among Smallholder Farmers in Indonesia. World Development, 93(September), 219–235.
10. Feenstra, R., & Taylor, A. (2017). International economics. Worth Publishers.
11. Frank A. Farris. (2010). The Gini Index and Measures of Inequality. The American Mathematical Monthly, 117(10), 851–864.

12. Gaskell, J. (2015). The Role of Markets, Technology, and Policy in Generating Palm-Oil Demand in Indonesia. Bulletin of Indonesian Economic Studies, 51(1), 29–45.
13. Gatto, M., Wollni, M., & Qaim, M. (2015). Oil palm boom and land-use dynamics in Indonesia: The role of policies and socioeconomic factors. Land Use Policy, 46, 292–303.
14. Greene, W. H. (2012). Econometric analysis. Pearson.
15. Goodarzi, S. M., Salamzadeh, Y., & Salamzadeh, A. (2018). The impact of business ethics on entrepreneurial attitude of manager. In Competitiveness in emerging markets (pp. 503-539). Springer, Cham.
16. Hall, D. (2011). Land grabs, land control, and Southeast Asian crop booms. The Journal of Peasant Studies, 38(4), 837–857.
17. Hamdani, H., Yanti, N., Budiwati, N., & Kurniawan, Y. (2016). Analysis of Household Economic Behavior on the Palm Oil Smallholder in South Kalimantan – Indonesia. International Journal of Research in Ariculture and Forestry, 3, 15–25.
18. Hasudungan, A. (2018). Political Ecology of Palm Oil Development in the Kapuas Hulu District of West Kalimantan. https://ses.library.usyd.edu.au/handle/2123/18976
19. Hasudungan, A., & Neilson, J. (2020). Processes of land appropriation for large-scale oil palm development in West Kalimantan, Indonesia. Revista Nera, 23(51), 366–389.
20. Haughton, J., & Khandker, S. (2009). Handbook on Poverty and Inequality. The World Bank.
21. IMF. (2019, March 26). The IMF Updates the Effective Exchange Rates Indices. https://www.imf.org/en/News/Articles/2019/03/26/pr1993-the-imf-updates-the-effective-exchange-rates-indices
22. Krishna, V., Euler, M., Siregar, H., & Qaim, M. (2017). Differential livelihood impacts of oil palm expansion in Indonesia. Agricultural Economics (United Kingdom), 48(5), 639–653.
23. Krisnawati, N. (2019). Assessment of Factors Affecting Cooperatives' Performance in Indonesia: The Case of Credit Union Cooperatives. Journal of entrepreneurship, Business and economics, 7(2), 80-105.
24. Krugman, P., Obstfeld, M., & Melitz, M. (2015). International Economics: Theory and Policy. Pearson.
25. Kubitza, C., & Gehrke, E. (2018). Labor-saving technological change and decreasing fertility rates: The oil palm boom in Indonesia. 30th International Conference of Agricultural Economists.

26. Kubitza, C., Krishna, V. V., Alamsyah, Z., & Qaim, M. (2018). The Economics Behind an Ecological Crisis: Livelihood Effects of Oil Palm Expansion in Sumatra, Indonesia. Human Ecology, 46(1), 107–116.
27. Lee, J. S. H., Ghazoul, J., Obidzinski, K., & Koh, L. P. (2014). Oil palm smallholder yields and incomes constrained by harvesting practices and type of smallholder management in Indonesia. Agronomy for Sustainable Development, 34(2), 501–513.
28. Li, T. (2015). Social impacts of oil palm in Indonesia: A gendered perspective from West Kalimantan. http://www.cifor.org/publications/pdf_files/OccPapers/OP-124.pdf
29. McCarthy, J. (2010). Processes of inclusion and adverse incorporation: oil palm and agrarian change in Sumatra, Indonesia. The Journal of Peasant Studies, 37(4), 821–850.
30. Moghadamzadeh, A., Ebrahimi, P., Radfard, S., Salamzadeh, A., & Khajeheian, D. (2020). Investigating the role of customer co-creation behavior on social media platforms in rendering innovative services. Sustainability, 12(17), 6926.
31. OECD (2017). 'OECD-FAO Agricultural Outlook 2017-2026' Series: OECD-FAO Agricultural Outlook, link: https://www.oecd-ilibrary.org/agriculture-and-food/oecd-fao-agricultural-outlook-2017-2026_agr_outlook-2017-en
32. Pacheco, P., Gnych, S., Dermawan, A., Komarudin, H., & Okarda, B. (2017). The palm oil global value chain3: Implications for economic growth and social and environmental sustainability (No. 220; Working Paper)
33. Paus, E. (2017). Escaping the middle-income trap: innovate or perish. ADBI Working Paper Series 685
34. Pichler, M. (2015). Legal dispossession: State strategies and selectivities in the expansion of Indonesian palm oil and agrofuel production. Development and Change, 46(3), 508–533.
35. Pindyck, R., & Rubinfeld, D. (2017). Microeconomics (9th Edition) (9th ed.). Pearson.
36. Raeskyesa, D. G. S. (2020). Sectoral growth and income inequality in ASEAN-5 countries: case of low-middle income economies. Journal of ASEAN Studies, 8(1), 1-13
37. Rhein, M. (2015). Industrial Oil Palm Development: Liberia’s path to sustained economic development and shared prosperity? Lessons from the East. Right and Resource Initiative. http://www.rightsandresources.org/publication/industrial-oil-palm-development-liberias-path-to-sustained-economic-development-and-shared-prosperity-lessons-from-the-east/

38. Salamzadeh, A., & Arbatani, T. R. (2020). Developing a framework for understanding how media entrepreneurs act: An actor-network perspective. In Contemporary applications of actor network theory (pp. 77-98). Palgrave Macmillan, Singapore.
39. Santika, T., Wilson, K. A., Meijaard, E., Budiharta, S., Law, E. E., Sabri, M., Struebig, M., Ancrenaz, M., & Poh, T. (2019). Land Use Policy Changing landscapes, livelihoods and village welfare in the context of oil palm development. Land Use Policy, 87(October 2018), 104073.
40. Seers, D. (1969). The Meaning of Development. IDS Communication 44
41. Sheil, D., Casson, A., Meijaard, E., Van Noordwjik, M., Gaskell, J., Sunderland-Groves, J., Wertz, K., & Kanninen, M. (2009). The impacts and opportunities of oil palm in Southeast Asia: What do we know and what do we need to know? (Issue CIFOR Occasional Paper no. 51). Center for International Forestry Research, Bogor, Indonesia. http://www.cifor.org/publications/pdf_files/occpapers/op-51.pdf
42. The World Bank. (2013). World Development Indicators 2013. hhttp://data.worldbank.org/data-catalog/world-development-indicators
43. Trapeznikova, I. (2019). Measuring income inequality. IZA World of Labor, 462.

Albert Hasudungan currently serves as the Full-time Lecturer of the Department of Business Economics, School of Business and Economics, Universitas Prasetiya Mulya, Indonesia. In his academic duties, he has earmarked his teaching and research dedications in the areas of global sustainability, agricultural economics, and international economics. He has currently undertaken the course convener of the international economics and environmental economics in that university. He earned his Doctor of Philosophy (PhD) degree in Economic Geography, the University of Sydney. He can be reached by email: albert.hasudungan@pmbs.ac.id

Dewa Gede Sidan Raeskyesa is a research assistant at Kiel Institute for The World Economy, Germany. His research interest lies in development economics and globalization. He holds an M.Sc. degree in International Economics and Public Policy from Johannes Gutenberg Universität Mainz and accomplished a postgraduate intensive-training program, called Advanced Studies Program in international economics policy from Kiel Institute for The World Economy; both institutions are located in Germany. He can be reached at: sidan.raeskyesa@ifw-kiel.de