# The impacts of oil palm plantations on local and migrant smallholders' incomes



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# The impacts of oil palm plantations on local and migrant smallholders' incomes

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**Abstract.** In Indonesia, oil palm plantations have long affected income levels positively. Furthermore, Indonesia has developed oil palm smallholdings in 1980 to improve rural incomes. The success of this program has attracted other farmers and migrants to further developed oil palm plantations. Those who collaborated with companies were known as scheme smallholdings, while the others are known as independent smallholdings. In general, the lack of professional assistance has caused independent smallholdings to perform lower than the scheme ones. In addition, on average, the migrants also performed better as they were familiar with the collective actions of group activity management. Using as many as 210 and 219 scheme and independent smallholders from the Provinces of North Sumatra, South Sumatra, Jambi and Riau, such assumption were tested using the ANOVA compare means test of the four groups, namely schemed local and migrant, and independent local and migrant. Comparisons between the smallholders' incomes and the Regional Minimum Wages of each province were analysed. The results showed that oil palm plantations have significantly improved the smallholders' incomes in all provinces, although the impacts were observed to be higher for the scheme-migrant smallholders, not only concerning income, but also for productivity and selling price. However, this was likely due to the difference between scheme and independent rather than locals and migrants. This was partly explained due to the collective actions of all migrant-schemed smallholders in both the input purchases and the output sales and around 50% of the local-schemed, while almost all independents did it individually.

## 1. Background

In 1980, Indonesia utilized transmigration programs to spread regional development. People from Java were sent to Sumatra and Kalimantan to start agribusiness. Initially, food crops and horticulture were chosen as agribusiness commodities. However, the results were not as expected and oil palm plantations were then proposed as an alternative. A number of empirical studies show the substantial benefits of the high returns of oil palm smallholdings [1], [2], [3], [4]. A decade later, these transmigration regions appear to be more developed with a higher income per capita than the non-oil palm plantation centres [5]. Since then, transmigration has continued, even after the government program ended, which was shown by the increased in spontaneous transmigration. The latter refers to all kinds of migrations that are not supported by the government transmigration scheme.

The development of oil palm business creates new jobs and raises income not just for big companies, therefore oil palm agribusiness is often considered as inclusive agriculture, although the totality in all of the inclusive components still needs further studies [8]. The massive population inflow requires additional employment opportunities [6], however, compared to seasonal crops such as food crops and horticulture, oil palm plantations require relatively little maintenance and fewer workers. Although per capita incomes of the oil palm plantation centres are higher, their unemployment rates also tend to be higher [5]. Reviews and studies show that development has both disadvantages and advantages for the local populations. Some locals do not easily adapt to the oil palm plantation agribusiness, hence tend to be excluded from the industry. Stakeholders of the oil palm agribusiness need to have good vertical and horizontal coordination. Oil palm production is not directly consumed; therefore, smallholder farmers need to be integrated into the processor/mills and to do so, smallholders need to have a minimum production scale. The average smallholding size is around 2-4 ha, while the minimum land size required to fulfil the minimum requirement as a supplier is generally between 60-80 ha. Otherwise, the smallholders need to sell their Fresh Fruit Bunches (FFB) through traders with lower prices, higher quantities and price fluctuations [9]. These justify the needs for collective actions among the smallholders, which have been shown among the transmigrants once involved in the program. This is also supported by their Javanese culture that in general has a patron-client relationship, whereas in contrast, the local Sumatrans tend to be more individualistic and relatively difficult to coordinate. Such conditions might lead to a decrease in local smallholder incomes. Unlike other topics related to the development of oil palm smallholdings, studies on both local and migrant smallholder incomes are relatively limited [7]. Therefore, this study is conducted to examine the impacts of oil palm plantations on the local and migrant smallholder household incomes.

## 2. Methods

This study was conducted in four oil palm centre provinces, namely North Sumatra, South Sumatra, Riau and Jambi. Data were collected using convenient cluster sampling from 233 local smallholders and 155 ex-transmigrants, covering both the independent and scheme smallholders. Details of the sample distribution are as follows.

**Table 1.**Sample Distribution Based on Location

| Province | Schemed | Independent | Total |
|---|---|---|---|
| North Sumatra | 89 | 124 | **213** |
| South Sumatra | 38 | 28 | **66** |
| Riau | 27 | 23 | **50** |
| Jambi | 39 | 22 | **61** |
| **Total** | **193** | **197** | **390** |

The average monthly income of each group was calculated by the difference between the smallholders' total revenues and total costs. The total revenue accommodated the impact of low and high harvest seasons by weighting the first 3 months of each of the seasons and considered the remaining 6 months as normal. The impact of oil palm plantations on the local and migrant smallholder incomes are descriptively analysed by comparing it with the Regional Minimum Wage (*Upah Minimum Provinsi/UMP*) of each province. The differences of income, land size, productivity and smallholders' selling price between these groups were then further analysed using Analysis of Variance (ANOVA), using the formula:

$$V.R. = \frac{Among\ groups\ means\ square}{Within\ groups\ means\ square}$$

Following [10], 4 variables were included, namely migrant status, land size, oil palm cultivation work experience and FFB price. Author [10] found that the migrant status did not show clear trends in predicting gross monthly income, unlike the other variables. However, they also found that scheme

smallholders received higher incomes due to higher selling prices. Therefore, this study differentiated the cluster between migrants and locals, as well as between scheme and independent smallholders. The average values of land size, productivity, selling price and income of the local and ex-transmigrant smallholders were compared as these were assumed to be influenced by the differences of their collective actions and networking.

## 3. Results and Discussion

Data collected from convenient sampling showed that transmigrant respondents could be found in South Sumatra and Riau, while the local respondents were from North Sumatra, Jambi and Riau. Composition details are as follows.

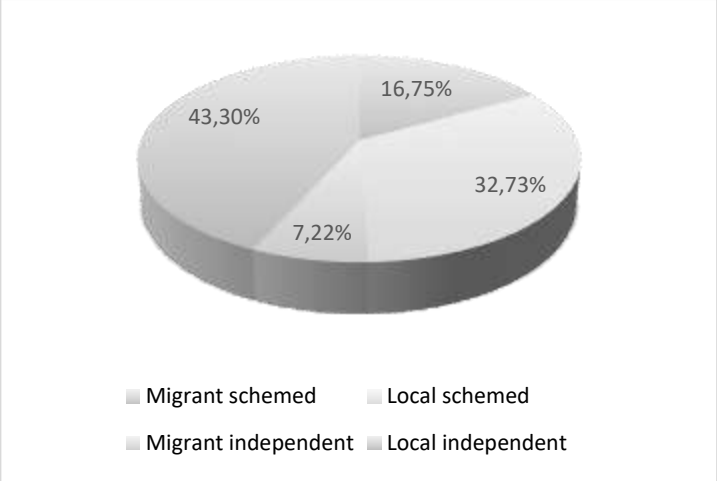


**Figure 1**. Distribution of Samples

The incomes of all smallholder categories in all provinces were higher than the UMP, showing that oil palm plantations have brought positive impacts on both the migrants and the locals. The ratio between smallholders incomes and the UMP could reach as high as 3.66, but even the lowest was still slightly higher than 1 (Table 2). Out of all the smallholders, the independents received the lowest incomes in all provinces as shown below in Table 2.

**Table 2**. Comparison of Scheme and Independent Smallholders Incomes

| Types of smallholders | UMP (IDR/month) | Land size (ha) | Income (IDR/month) | Income/UMP |
|---|---|---|---|---|
| **Migrant schemed** | | | | |
| Riau | 2,460,000 | 2.19 | 9,005,687 | 3.66 |
| Sumsel | 2,595,994 | 2.13 | 6,977,039 | 2.69 |
| **Local schemed** | | | | |
| Sumut | 2,100,000 | 2.87 | 6,856,494 | 3.26 |
| Jambi | 2,234,000 | 3.76 | 7,421,441 | 3.32 |
| **Migrant independent** | 2,595,994 | 3.21 | 6,238,340 | 2.40 |
| **Local independent** | | | | |
| Sumut | 2,100,000 | 2.74 | 4,482,719 | 2.13 |
| Riau | 2,460,000 | 2.09 | 2,592,571 | 1.05 |
| Jambi | 2,234,000 | 2.30 | 4,403,107 | 1.97 |

The transmigrant programs in South Sumatra and Riau were started in 1990 and 1980, respectively. Either the state or private companies have provided training for the smallholders that participated in the transmigration programs. Following this, the farmers might become independent smallholders but with proper training experiences. As a result, both scheme and independent migrants had relatively

higher percentages of trained smallholders than the locals did. On the contrary, most of the second generation or spontaneous migrant smallholders did not receive any training. Therefore, currently 55% and 54% of the scheme and independent migrants had no proper training experiences as portrayed in Figure 2.

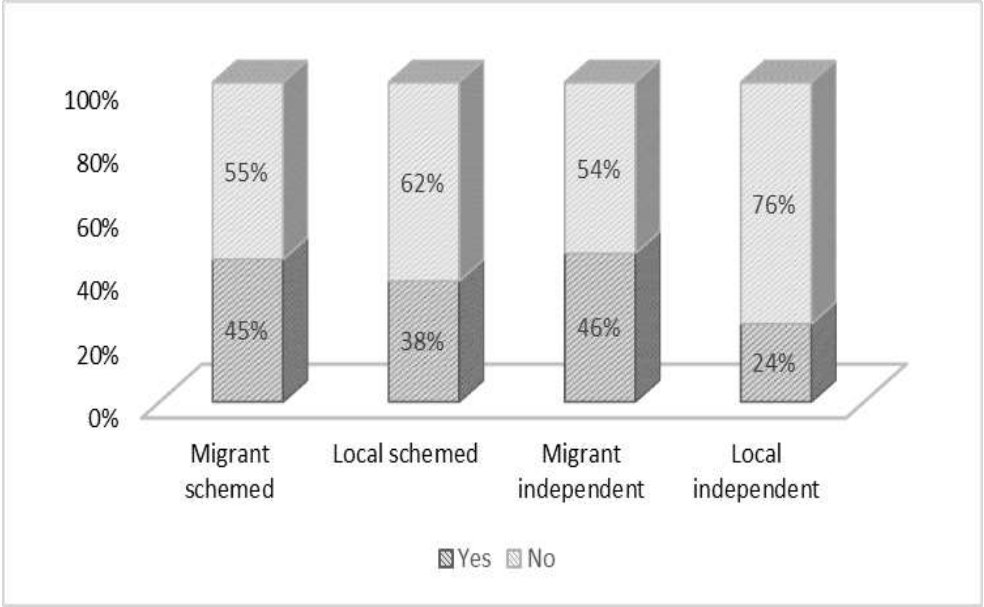


**Figure 2**. Smallholder Training Experiences

Similarly, both scheme and independent local smallholders also had low level of formal education, where only 40% of the scheme and 34% of the independent smallholders, had completed their senior high school, while the migrants showed higher proportions, 52% for the scheme and 63% for the independent migrants (Figure 3).

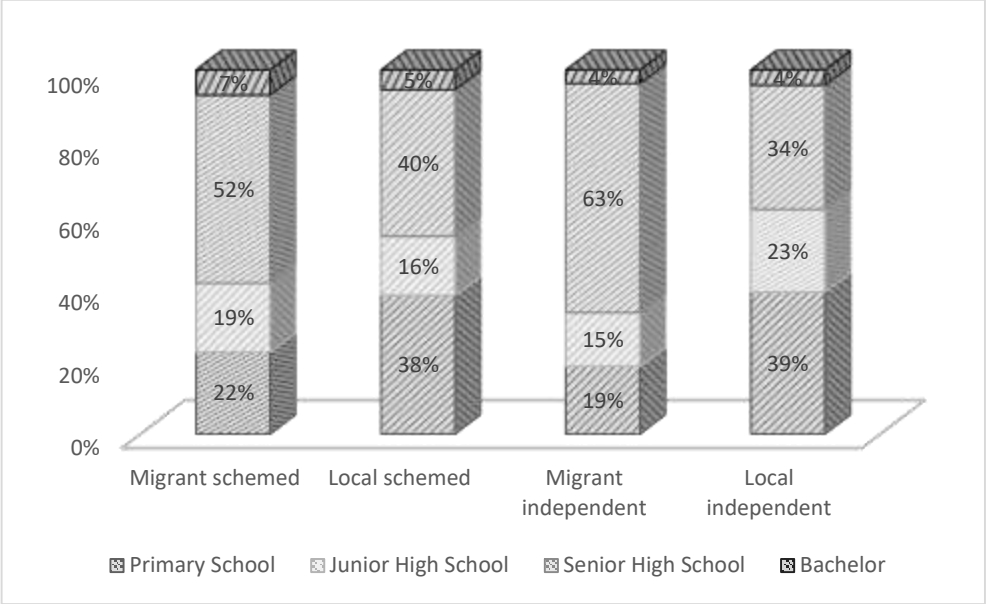


**Figure 3**. Smallholders' Level of Education

The data showed that on the average, migrants and local smallholders were in their 40's (Table 3), with local smallholders slightly older with a broader range of age. However, the migrant smallholders had more experiences in running oil palm plantations than the local smallholders. Both had wide ranges of experiences; some still very new and have not even started their first harvest, while some already manage their 2nd oil palm trees' cycle. Details are as follows.

**Table 3**. Smallholders' Age and Experience

| | | **Migrant schemed** | **Local schemed** | **Migrant independent** | **Local independent** |
|---|---|---|---|---|---|
| Age (year) | Min | 29 | 22 | 29 | 21 |
| | Max | 68 | 76 | 63 | 84 |
| | Average | 45 | 47 | 46 | 48 |
| Experience (year) | Min | 4 | 2 | 4 | 3 |
| | Max | 30 | 37 | 29 | 56 |
| | Average | 22 | 17 | 23 | 16 |

Transmigrants received their land from the government, which was 2 ha for the farming area and 1 ha for housing. However, some of the transmigrants left and sold their land to those who stayed, which caused variations in the total land sizes belonged to the migrants. In addition, most transmigrants enjoyed sufficient incomes to save up and purchased more land from the locals.

State or private companies assisted transmigrants when they started the oil palm business as plasma smallholders. In addition, these plasmas also used the recommended inputs supplied by their partner companies (nucleus). With such assistance, their oil palm trees' productivities were satisfactory. After the nucleus-plasma program ended, some were still engaged with big companies as scheme smallholders, while others not. Some participated in both, as they had sufficient land to be developed into scheme and independent smallholdings. Transmigrant partnerships started from land clearing, selecting seeds to be harvested and selling the FFB. Differently, the local partnership in Jambi started after the smallholders had independently cultivated their oil palm trees. Thus, many still used non-certified seeds. Therefore, migrant-scheme smallholders had the highest productivity and selling prices, consequently enjoyed the highest incomes (Table 4). The same intensive partnership model also appeared in the local partnership found in North Sumatra Province. Combined with high land suitability, the local-scheme smallholders in North Sumatra also enjoyed high productivities and selling prices.

**Table 4**. Smallholders' Income, Land Size and Productivity

| | | Migrant-scheme | Local-scheme | Migrant-independent | Local-independent |
|---|---|---|---|---|---|
| Income (IDR/ha/month) | Min | 458.751 | 138.750 | 240.139 | 134.900 |
| | Max | 7.466.406 | 4.686.057 | 3.640.000 | 4.058.417 |
| | Average | 3.575.904 | 2.177.864 | 1.882.681 | 1.603.947 |
| Land size (ha) | Min | 1,00 | 0,60 | 0,50 | 0,30 |
| | Max | 6,00 | 48,00 | 8,00 | 22,00 |
| | Average | 2,16 | 3,15 | 3,21 | 2,60 |
| Productivity (ha/month) | Min | 1,00 | 0,25 | 0,33 | 0,30 |
| | Max | 4,00 | 3,00 | 3,00 | 4,00 |
| | Average | 2,40 | 1,56 | 1,53 | 1,52 |
| Price (IDR/kg) | Min | 1.509,91 | 1.150,00 | 1.200,00 | 1.150,00 |
| | Max | 1.763,09 | 1.670,00 | 1.621,38 | 1.665,00 |
| | Average | 1.611,97 | 1.409,20 | 1.414,16 | 1.435,42 |

The scheme smallholdings attained higher productivities than the independents for both migrants and local smallholders. Although insignificant, the local-schemed received lower prices than the independent smallholders did. This might partly be explained by the composition of the independent

respondents who were mostly from North Sumatra, which in general received a higher price than other provinces. Such condition was supported by the results of the ANOVA Test as follows.

**Table 5**. ANOVA Test results

| | | Sig | | | |
|---|---|---|---|---|---|
| | | Migrant-scheme | Local-scheme | Migrant-independent | Local-independent |
| Income (IDR/ha/month) | Migrant-scheme | | ,000 | ,000 | ,000 |
| | Local-scheme | | | ,641 | ,000 |
| | Migrant-independent | | | | ,667 |
| Land size (ha) | Migrant-scheme | | ,099 | ,382 | ,641 |
| | Local-scheme | | | 1,000 | ,426 |
| | Migrant-independent | | | | ,792 |
| Productivity (ha/month) | Migrant-scheme | | ,000 | ,000 | ,000 |
| | Local-scheme | | | ,915 | ,962 |
| | Migrant-independent | | | | ,781 |
| Price (IDR/kg) | Migrant-scheme | | ,000 | ,000 | ,000 |
| | Local-scheme | | | ,996 | ,156 |
| | Migrant-independent | | | | ,762 |

Table 5 shows that both the migrant and local smallholders' performances significantly differed only between the migrant-scheme and local-scheme, but not between independents of both classifications for all variables, *i.e*., income levels, land size, productivity and selling prices. The migrant-scheme performances differed from the other groups as they have been trained by companies for years and have enjoyed high FFB productivities and qualities, whereas the local-scheme smallholders' partnership did not start from the beginning, thus most were still using uncertified seeds and could not achieve optimum productivities and qualities. Therefore, the local-scheme smallholders' productivities and selling prices were no different from those of the local independents.

## 4. Concluding Comments and Implementations

The oil palm plantations in all four smallholdings' centres appeared to obtain higher incomes than the UMP, indicating that not only migrant smallholders enjoyed the positive impacts of oil plantations, but so do the independent ones. The impacts were not significantly different between the migrants and the local smallholders, the same for the scheme smallholders. Although the average scheme smallholders' land sizes were not significantly different from other groups, their incomes, productivities and selling prices did. Therefore, it could be concluded that the positive impacts of income levels from oil palm plantations development programs were not only enjoyed by the migrants but also by the local smallholders. However, to reach optimum performance, the smallholders required assistance from the exceptional oil palm companies.

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