AGRIEKONOMIKA
http://journal.trunojoyo.ac.id/agriekonomika
Volume 15, Nomor 1, 2026
DOI: https://doi.org/ 10.21107/agriekonomika.v15i1.33909

Agriekonomika has been accredited as a scientific journal by the Ministry of Research-Technology and Higher Education Republic of Indonesia: ***No. 23/E/KPT/2019*** *SINTA 2*

Identifying Leading Commodities for Regional Development in Transmigration Areas: Evidence from Muaro Takung-Kamang Baru, Indonesia

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Received: March 2026; Accepted: March 2026; Published: April 2026

ABSTRACT

Transmigration areas often experience economic problems associated with a lack of dominance of lead commodities to encourage local growth. This research is interested in finding the lead commodity of Muaro Takung-Kamang Baru, Sijunjung Regency, to support the development of the transmigration area. A descriptive quantitative method was used with the Location Quotient (LQ) analysis (comparative advantage), Shift-Share analysis (competitive advantage), and SWOT analysis in developing an evidence-based policy strategy. The 2018-2023 regional production and economic data were examined. The findings of both LQ and shift-share analyses revealed oil palm as the dominant commodity of Muaro Takung with both comparative and competitive advantages. Palm oil is the major contributor to the local plantation sector, but it too has its constraints: standards of product quality that are less than optimal, farmers' productivity, and lack of access to capital. The commodity itself is an important driver in the regional economy with an integrated upstream–downstream supply chain stretching from Fresh Fruit Bunch production to refined products, which creates significant employment locally. The advancement of oil palm as a superior commodity could become the catalyst for the growth of the transmigration area. However, it is necessary to adopt systemic solutions to overcome structural and institutional barriers, to strengthen the infrastructure and farmers' capacities, and also to establish industry clusters through Porter's Diamond Model. Local authorities are expected to take over CPO production facilities on the ±2,000 ha of land given for that aim and support farmer institution development as well as partnership with investors and environmental sustainability. Enhancing the upstream–downstream supply chain to support the comparative and competitive advantage and added value of the region is crucial for sustainable economic development in transmigration areas.

Keywords: leading commodity, location quotient, oil palm, transmigration area

INTRODUCTION

Transmigration in Indonesia, as it is today, focusses on developing new economic growth centres from local potentials. The new transmigration policy stresses that relocation of people is not all there is to transmigration but also the integrated development of target areas. The Muaro Takung transmigration region, located in Kamang Baru Subdistrict West Sumatra is one national priority out of 45

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p-ISSN 2301-9948 | e-ISSN 2407-6260

areas that selected for the development to become a new business centre. With some 2,000 ha of available land and good stakeholder support, this region is intended to provide a strong input in regional economic development during the next two decades. It is expected to make the new growth zone in Sijunjung Regency, which is based on President's vision to develop from the marginal areas (Nawacita/ Asta Cita) and also relate with Ministry of Transmigration scope program, 5T.

Promotion of the leading commodities in transmigration areas is strongly related to national policy direction. Transmigration areas have been declared integrated economic growth centers, through utilization of the better local potential, improvement in infrastructure, and enhancement of community capacity. The Ministry for Transmigration adds that the land and labour supply in transmigration regions constitutes a comparative advantage, which is why development of regional economies is so important in increasing welfare of transmigrants (Kementerian Transmigrasi, 2025).

The development of migration cultivation areas always as referring to the commodity leading identification which is used subsequently as basis for determination of growth cores location from regional potential. A leading-commodity based development model may serve as guide to determine the direction of policy interventions, reinforce upward and downward linkages, and induce multiplier effects in the transmigration areas (Idrus, 2016). Methodologically, the integration of Location Quotient (LQ) to analyze comparative advantage and Shift-Share Analysis to evaluate relative growth dynamics has been useful to identify regional priority commodities (Mulyono & Khursatul, 2016). In addition, combining quantitative techniques with multi criteria based methods such as AHP has improved the objectivity of determining priority commodities in migration villages (Indika et al., 2025). In the case of Sijunjung Regency, it is presented that competitive analysis on agricultural sector expressed that commodities have both contribution and growth experience differences, which contributes to different development priority on region (Saputra et al., 2023). Comparative studies in other areas also emphasize the role of constant sector between periods as regional advantage validation (Suryantini et al., 2017).

The identification of leading commodities is generally conducted by measuring regional comparative advantage and sectoral competitiveness through a combination of Location Quotient (LQ), Shift-Share analysis, and strengthened priority assessment methods (e.g., FAHP/GRM) to determine the most strategically developed commodities (Heldayani et al., 2022; Marina et al., 2024; Nurlaela & Abdullah, 2025; Resi et al., 2024). Numerous studies demonstrate that LQ is effective as an initial screening tool for identifying base commodities and can be integrated with Shift-Share analysis to capture growth dynamics and regional competitiveness (Amalia, 2025; Nurlaela & Abdullah, 2025; Prihantini & Rahmayana, 2024). Within a regional development framework, findings on leading commodities are subsequently directed toward strategies for strengthening value chains, promoting downstream processing, and improving regional economic performance (Koylal et al., 2024; Koylal & Kuang, 2023; Marina et al., 2024). In transmigration areas, this underscores the importance of linking leading commodities with regional development strategies and resource governance, including plantation commodities such as oil palm, which play a significant role in economic transformation and sustainability policies

(Hariyanti et al., 2024; Hidayat et al., 2018; Leinbach, 1989).

The LQ technique effectively filters basic commodities for regions, whereas the DLQ should be seen as a procedure for assessing the dynamism and evolution of these "base" sectors across time (Nurfani & Dewanti, 2020). The composite of LQ and Shift-Share analysis differentiates between growth influenced by sector structure (industry mix impact) and local competitive effects, rather than automatically prioritising major but non-competitive commodities (Nurlaela & Abdullah, 2025). This technique could be enhanced with additional performance metrics to build quantitative strategies for creating innovative flagship items (Marina et al., 2024). To determine the priority of interventions, both LQ and SSA can be integrated with FAHP for the evaluation of commodity options through multi-criteria assessment (Resi et al., 2024), or utilised to compare downstream and cluster development pathways regarding competitive and comparative advantages (Wibisono et al., 2019).

As a means of regional development beyond Java, transmigrasi has to be matched with the promotion of local economic bases and management of operational difficulties (Leinbach, 1989). Regency level shift-share studies in Indonesia have demonstrated that leading sectors may change over time (Khusaini, 2015). Socio-institutional aspect is also problematic, as transmigration experiences affect actors' positions to farmer groups in knowledge-sharing networks (Pratiwi et al., 2022). Furthermore, the role of village community organizations that is supported by the village government can also increase the capacity of transmigration villages (Nurlinah, 2024).

A limited nature of scientific studies on the identification and development of prospective specific forward commodities in transmigration areas is however an open secret. Some of the transmigration areas also have problems with utilising the potentials of local commodities in order to increase the welfare of both migrants and people around them. On the other hand, rich natural resources could form a potential comparative advantage on agricultural and plantation (Baso et al., 2018). In contrast, various constraints including poor infrastructure, low human capital quality, limited availability of new technologies and drowsy economic institutions pose severe roadblocks to the competitiveness of these core commodities. As noted by (Sutikno et al., 2025), many transmigration areas have not yet determined what type of particular leading commodity should be grown, even though they have the land and labor potentials. Regional economic growth is slow and directionless without the exact leading commodities. The lack of economic driver commodities has been identified as one of the basic factors leading to slow local economy independence in other transmigration areas (Seulimeum Transmigration Area, Aceh) based on initial research results (Sutikno et al., 2025). Hence, studies on the identification and development of superior commodities in transmigration areas are important to fill this gap, especially the systematic approaches for commodity identification and relevant strategies development decision in local perspectives.

It is assumed that by a lead-product based development approach, a multiplication occurs in the regional economies. Dominant commodities can generate industrial clusters, absorb labor, enhance transmigrants' incomes and investment. In Muaro Takung, initial evidence shows that the plantation subsector (palm oil primarily) is a highly potential leading commodity (Sebayang et al., 2025). Sijunjung local government prepared 2,000 hectares of land for downstream industry (refinery) oil palm and other leading commodities which evidences strong commitment from the

region to make this transmigration area another new economic pole. In addition, Sijunjung is strategically located in the Sumatra's cross-road corridor (Padang–Riau–Jambi) that is geographically advantageous for market access.

Based on this background, this study aims to: (1) identify the leading commodities of Muaro Takung using Location Quotient (LQ) and Shift-Share analyses; (2) analyze the competitiveness and growth dynamics of the identified leading commodities; (3) evaluate the role of these commodities in the regional economy, including their supply chain linkages; (4) formulate development policies based on SWOT analysis; and (5) design a leading commodity development framework using Porter's Diamond Model.

This research has academic and practical implications. From the academic point of view, this work adds to the existing literature on combined methods (LQ, Shift-Share and SWOT) in regional planning for development in transmigration areas. Pragmatically, the results potentially have input into planners and decision-makers at both central and regional levels in developing an evidence-based policy to improve performance of lead sectors and economic growth in transmigration areas. After the recommendations, which are projected to be in line with field conditions and relevant government programs on sustainable transmigration, are implemented, these areas will gradually grow into competitive, integrated economic centers.

The contribution of this paper should provide input for local and national policy makers in developing sustainable commodity-based development policy for transmigration area, while enriching the literature on rural regional development in Indonesia.

RESEARCH METHOD

Research data and study area

Methodology the research used a descriptive quantitative design. The study was carried out in Nagari Muaro Takung, Sub-District Kamang Baru Sijunjung district of West Sumatra. The area is defined as a transmigration settlement unit with most of its inhabitants carry out agricultural activities such growing oil palm. Nagari Muaro Takung is identified as the center of oil palm production in Sijunjung Regency (Oktaviani et al., 2024), thus it is an appropriate case to study on leading plantation commodities under transmigration. The study was conducted from August to December 2025 in four months, when the revitalization of the transmigration area program was applied.

The data utilized were from primary and secondary sources. Field observations, informal interviews with transmigrant farmers and local officials, and restricted focus group discussions (FGDs) among key local stakeholders provided the main sources of primary information. The secondary data were obtained from authorized agencies, including the Regency Office of Transmigration the Regency Office of Agriculture, Statistics Indonesia (BPS), the Patriot Expedition report and literature. The secondary data consisted mainly of the area under cultivation, production volume and growth rate of various agricultural and plantation commodities at Kamang Baru Subdistrict (especially village Nagari Muaro Takung) in relation to those at the district and provincial levels.

Analytical methods

The analysis was conducted through three methodological stages: (1) Location Quotient (LQ), (2) Shift-Share Analysis (SSA), and (3) SWOT Analysis. Location Quotient (LQ) was employed to identify base sectors or commodities (comparative advantages) in Muaro Takung relative to the reference region. The data used in this analysis are

secondary data covering the time series period from 2015 to 2023. The LQ value was calculated using the classical production-based formula as follows:

$$LQ_i = \frac{(x_i^r / X_{it}^r)}{(x_i^R / X_{it}^R)} \quad (1)$$

Where:
LQ_i= location quotient of sector/commodity i (index)
x_i^r= value of sector/commodity i in region r (local area) (tons)
X_{it}^r= total value of all sectors/commodities in region r (local area) (tons)
x_i^R= value of sector/commodity i in region R (reference region) (tons)
X_{it}^R= total value of all sectors/commodities in region R (reference region) (tons)

Shift-Share Analysis (SSA) was applied to measure competitive advantage and the growth dynamics of leading commodities. Shift-share is a method used to analyze the factors influencing sectoral economic growth in a region by decomposing total growth into three components: (1) National Growth Effect (NGE), (2) Industry Mix Effect (IME), and (3) Regional Competitive Effect (RCE). The general formulation of shift-share is expressed as:

$$\Delta R_i = R_i^t - R_i^{t-1} = NGE + IME + RCE \quad (2)$$

where:
$NGE = R_i^{t-1} \times g^N$
$IME = R_i^{t-1} \times (g_i^N - g^N)$
$RCE = R_i^{t-1} \times (g_i^R - g_i^N)$

Regional growth at the higher level is defined as:

$$g^N = \frac{N^t - N^{t-1}}{N^{t-1}} \quad (3)$$

Sectoral growth (i) at the higher-level region (N) is defined as:

$$g_i^N = \frac{N_i^t - N_i^{t-1}}{N_i^{t-1}} \quad (4)$$

Sectoral growth (i) at the lower-level region (R) is defined as:

$$g_i^R = \frac{R_i^t - R_i^{t-1}}{R_i^{t-1}} \quad (5)$$

Shift-share analysis assesses whether commodity production growth in Muaro Takung outperforms (positive effect) growth trends at broader regional levels (district/provincial). Commodities with a positive competitive effect (RCE) are interpreted as having competitiveness or a competitive advantage. The combination of LQ and shift-share analysis is widely applied in identifying regional leading commodities (Mulyono & Khursatul, 2016).

SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis was carried out to propose strategies for the development of major commodities in terms of both internal and external factors. Internal and external factors were identified from the quantifiable data (LQ and SSA) and integrated with qualitative information stemming from field visits and Focus Group Discussions (FGDs). In short, SWOT-analysis being strength, weakness, opportunity and threat was employed. To further explain strategic development consequences, Porter's Diamond Model framework has been specifically used for the most leading commodity. To further elaborate strategic development implications, Porter's Diamond Model framework was specifically applied to the primary leading commodity.

The study is subject to a number of methodological and conceptual limitations in the context of sustainable development. Both the LQ and SSA are essentially descriptive-comparative tools that do not explain cause-and-effect relationships or longer-term structural impacts on regional economies (Mayor & López, 2008; Tregenna, 2009). The LQ and SSA analyses results may be dependent on the reference region used and secondary data quality; thus, variations in the economic structure of the comparison region can affect interpretations about comparative and competitive advantages (Nazara & Hewings, 2004; Pominova et al., 2022). In addition, SSA is usually

static since it just uses two time slices (first and last) and cannot address inter-annual variations or spatial heterogeneity. As pointed out by Artige and van Neuss (2014) and Sheng et al. (2021), decomposition estimates may not be equivalent if models account for temporal variation and spatial context. When applied by development agencies to develop strategies, SWOT analysis involves an element of subjectivity in the identification of internal and external factors (when these are not subject to systematic weighting and robust validation processes (Gürel & Tat, 2017; Helms & Nixon, 2010).

From the point of view of sustainable development, this study has not been fully able to incorporate economic, social and environmental aspects in a quantifiable form. With SWOT analysis, the strategy formulation process has been reported by scholars to be subjected to subjectivity if not checked with multiple stakeholder validation as well as structured weighting mechanisms (Gürel & Tat, 2017; Helms & Nixon, 2010). The stakeholders involved in this study include the Ministry of Transmigration, the Transmigration Office of Sijunjung Regency, the Agriculture Office of Sijunjung Regency, the Food Security Agency of Sijunjung Regency, the Regional Development Planning Agency (Bappeda) of Sijunjung Regency, farmer groups, farmers, and the sub-district and village-level governments of Sijunjung Regency. Also, sustainability outcomes in terms of value-added distribution, supply chain efficiency, institutional governance and environmental impacts are not measured quantitatively, in spite of the sustainable development paradigm advocating for consideration of its various economic, social and ecological aspects within regional planning (Erlinda et al., 2022), including a full-scale evaluation of resilience and competitiveness (Stanickova & Melecký, 2018). Therefore, the results of this study are better situated as a kind of baseline analysis in the context of transmigration area development, which demands more detailed analyses with multidimensional, spatially explicit and sustainable-oriented approaches in subsequent research.

RESULTS AND DISCUSSION

Leading commodity

Tables 1 and 2 show the Location Quotient (LQ) for plantation and food crop commodities, respectively. The LQ studies also agree that oil palm is the leading base sector in Muaro Takung. LQ value of more than one (>1.0) reflects a proportional contribution (or proportionate share) of oil palm production in Muaro Takung is far greater than the average contribution at regency level (Nurlaela & Abdullah, 2025). This is in line with the fact that Muaro Takung is identified as the largest oil palm producer in Sijunjung Regency. Oil palm of this nagari contributes significantly to the regency output as well, with a higher share in oil palm plantation land area. In 2021 the total production of oil palm of Sijunjung regency was approximately 11,011 ha with a volume of approximately 37,429 tons; Muaro Takun is one of that nagari which was producer area (Oktaviani et al., 2024). Sijunjung is actually the third contributor to oil palm in West Sumatera province, showing that this product has a high potential locally.

Rubber also poses LQ which is greater than 1 in Muaro Takung (a secondary base commodity) but has a smaller contribution from oil palm. The area of the rubber plantation is still quite large and many transmigrant communities living in Kamang Baru have depended on planting rubber as their major source of income. Data from local government revealed that total rubber plantations in Sijunjung are around 38,000 ha dominated by smallholders and Muaro Takung; is home to many of them. The presence of these two plantation

commodities as a base sector is also consistent with the findings of reporting from Ministry of Transmigration that revealed 75% of land area in Muaro Takung transmigration areas was allocated for oil palm and rubber plantation (Kementerian Transmigrasi, 2025). Simply put, these two commodities have provided the original impetus to the peripheral economy and underlay transmigrant agricultural development.

Table 1.
Location Quotient (LQ) of Plantation Commodities in the Kamang Baru Transmigration Area, Sijunjung Regency, 2015-2023

Komoditi	2015	2016	2017	2018	2019	2020	2021	2022	2023
Karet	0.69	0.58	0.43	0.65	0.43	0.45	0.45	0.46	0.44
Kelapa	0.37	0.31	0.30	0.42	0.23	0.32	0.32	0.33	0.31
Kelapa Sawit	1.98	1.62	1.31	1.18	1.32	1.33	1.33	1.33	1.30
Kopi	0.48	0.43	0.18	0.04	0.24	0.25	0.25	0.21	0.21
Lada	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
Kakao	0.54	0.40	0.32	0.51	0.35	0.34	0.34	0.35	0.35

Source: BPS, 2025 (processed)

Table 2.
Location Quotient (LQ) of Rice and Secondary Food Crops in the Kamang Baru Transmigration Area, Sijunjung Regency, 2015-2023

Komoditi	2015	2016	2017	2018	2019	2020	2021	2022	2023
Padi	0.86	0.91	0.96	0.97	0.93	0.92	0.79	0.78	0.75
Jagung	3.68	3.08	2.95	1.87	2.19	1.83	2.58	2.94	2.89
Kacang Hijau	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kacang Tanah	4.88	4.02	2.21	0.55	1.62	2.84	2.11	3.26	1.17
Kedelai	2.59	0.00	0.00	0.75	0.77	0.00	0.00	0.00	0.00
Ubi Jalar	0.00	0.00	0.00	0.00	1.19	1.61	0.00	0.00	0.00
Ubi Kayu	3.20	0.19	0.31	0.55	0.68	1.07	0.51	0.54	0.51

Source: BPS, 2025 (processed)

The value of LQ on rubber also has a value of more than 1 in Muaro Takung, which show to be the secondary base commodity around this area (second counter), but its contribution with lower than oil palm. The rubber estate is still quite wide, and it used to be a source of income for many transmigrant families in Kamang Baru. The total area of land devoted to rubber plantation in Sijunjung amounted to about 37,875 has (Basuki, 2015) and it is mostly on smallholder farmers with a big contibution from Muaro Takung. The existence of these two plantation commodities oil palm and rubber as base sectors correlates with reports from the Ministry of Transmigration that 75% of land in the Muaro Takung transmigration area is dedicated for oil-palm and rubber plantations (Kementerian Transmigrasi, 2025). That is to say, these two commodities have become the lifeline of local economy and the basis of transmigrant farmers' livelihood.

Table 2 shows marked differences between rice and maize. Since 2015–2023, rice in the Kamang Baru area has never been categorised as a basic commodity. LQ value of rice constantly was less than 1, decreasing from 0.97 in 2018 to 0.75 in 2023. This means that the rice produced in the transmigration area is minimal compared to its contribution at a regional level (e.g., Sijunjung Regency and West Sumatra Province). In short,

Kamang Baru is not a rice producing area; possibly, the transmigrant farmers do not own large areas of paddy field and irrigation system that enable them to grow rice on a large enough scale.

Unlike what could be expected, maize comes out as a highly competitive top commodity, being LQ in most of the years far greater than 1. Maize LQ dropped temporarily but remained high through this period. The LQ had been 3.68 in 2015, signifying an outsized dominance; subsequently it fell to 1.87 in 2018 and then rose once more to around 2.9 by approximately the year of 2022–2023. LQ values above 2 in most of the period imply that Kamang Baru played a significant role in driving maize production within the reference region. The fluctuation can be read in the following way: during the early transmigration years, Kamang Baru had an extremely high percentage of maize yield, presumably other regions did not have extensive contour on steep sloping areas. Shrinking of LQ for 2015–2018 might arise from other regions experiencing a higher growth in maize production (thus, diminishing the relative proportion share being held by Kamang Baru) or as an indication of stagnation in that area. The succeeding increase in 2018 reflects a revived growth of production in Kamang Baru, or rather a deceleration in other areas, which reinforces its comparative advantage on maize toward 2023.

Growth and Competitiveness Analysis (Shift-Share)

Results of the shift-share analysis for plantation and food crop commodities are shown in Tables 3 and 4 respectively. On the whole, these shift-share together confirm oil palm as the winner in regional output growth. The net growth of the planted oil palm in Muaro Takung is positive and highly significant. The regional differential shift of competitive advantage on oil palm is positive, which means that growth in local production of oil palm exceeds the average growth at regency and provincial levels. This would indicate a competitive advantage of the vicinity certain factors on the spot (e.g., soil fertility, transmigrant farmer's plantations management and access to market) encourage faster oil palm growth in Muaro Takung compared to elsewhere. Such a rapid development has been also indicated by the increasing pattern of oil palm plantation area and production in Sijunjung Regency for recent years. Favorable CPO prices in the analysis years encouraged farmers to increase their planted areas and more intensively maintain plantations with a focus on productivity.

For rubber, the shift-share estimates are more casual. The differential shift measured perhaps a bit less than the provincial average is generally stagnant or somewhat lowerand" negative d and t-shift of interest? for rubber. Rubber plantation acreage is quite large, but yields and production expansion have been limited by a number of factors. The primary bottleneck is the international market 'price' spikes of natural rubber has remained relatively low in recent years, making farmers unwilling to further increase production. It is interesting to note that an investment proposal for rubber processing factory in Sijunjung was withdrawed indicating downstream industrial development constraints. As a base commodity, the competitive growth performance of rubber is not yet very promising (despite its relative advantage) which necessitate innovation to avoid stagnation.

Rice production growth is also stable, but its growth rate remains slower than the regency average given the scarce land expansion. The results of the shift-share analysis for rice are a positive industry mix effect, which represents overall growth in the agricultural sector, and an (overall) slightly negative regional competitive effect, implying that Muaro

Takung does not have a clear advantage in production increase compared to other subdistricts. The growth of maize in the same manner is restricted by lack of land and farmers' engagement with oil palm planting. This is not unusual, as some commodities have high LQ values, but also slow or negative actual growth indicating productivity or dynamic competitiveness issues (Nurlaela & Abdullah, 2025).

Table 3
Shift Share of Plantation Commodities in the Kamang Baru Transmigration Area, Sijunjung Regency

Komoditi	NGE (National Growth Effect)		IME (Industry Mix Effect)		RCE (Regional Competitive Effect)		ΔR_i	
	(ton)	(%)	(ton)	(%)	(ton)	(%)	(ton)	(%)
Karet	1,194	6.41	-584.47	-3.14	680.77	3.65	1,290	6.93
Kelapa	16	6.41	-4.35	-1.71	97.07	38.22	109	42.91
Kelapa Sawit	6,891	6.41	1,858.95	1.73	617.92	0.57	9,368	8.71
Kopi	2	6.41	4.59	12.40	-4.96	-13.40	2	5.41
Lada	0	0.00	0.00	0.00	0.00	0.00	0	0.00
Kakao	17	6.41	-19.52	-7.20	10.16	3.75	8	2.95

Source: BPS, 2025 (processed)

Table 4
Shift Share of Rice and Secondary Crops in the Kamang Baru Area of Sijunjung Regency

Komoditi	NGE (National Growth Effect)		IME (Industry Mix Effect)		RCE (Regional Competitive Effect)		ΔR_i	
	(ton)	%	(ton)	%	(ton)	%	(ton)	%
Padi	2,124.75	20.27	730.46	6.97	232.67	2.22	3087.88	29.46
Jagung	1,021.39	20.27	-251.16	-4.98	1,205.47	23.92	1975.70	39.21
Kacang Hijau	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kacang Tanah	5.68	20.27	-31.51	-112.53	-0.87	-3.10	-26.70	-95.36
Kedelai	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ubi Jalar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ubi Kayu	71.15	20.27	-398.75	-113.60	1.80	0.51	-325.80	-92.82

Source: BPS, 2025 (processed)

A case in point is presented by Nurlaela and Abdullah (2025), who found negative shift-share results for several high-LQ commodities in other areas as a result of technological and market constraints. Thus identification of lead commodities need to be followed by trend analysis of actual growth performance for more responsive policy making.

LQ as well as shift-share analysis confirms that the leading commodity in

Muaro Takung is oil palm (comparative and competitive advantage). Rubber is still a key local industry but has to become more competitive. Focussing on rice and alternative crops (maize and horticultural crops) should still be prioritised for diversification, but for primary economic development their function is irrelevant in comparison to plantation commodities. These results are in line with previous reports of the expedition team that found plantation commodities, especially oil palm as predominantly economic potentials, followed by a number of food and horticultural crops.

The attention deserves to be focused on oil palm which becomes the main driving force of economy in Muaro Takung. It is competitive because of the combination of natural resource endowments and strong market pull factors. From a comparative advantage point of view, West Sumatra is known to be the second largest oil palm producer area in Indonesia. Sijunjung District is the third largest area of plantation and contributor in production in the province (Oktaviani et al., 2024). Agroclimatic of Kamang Baru is appropriate for oil palm based to the lowland, with rainfall and soil condition support to maximum growth. In addition the first transmigration project in this region assigned plasma oil palm for transmigrant households, which has set up a historical and social context where farmers used to deal with this commodity. These structural factors provide the root behind oil palm's relative advantage in Muaro Takung over non-transmigration areas.

Regard to the competitive advantage, it was shown by diffrential shift-share analysis that oil palm in Muaro Takung has an increasing growth higher than regency area (positive competitive effect). This indicates the presence of local factors of competitiveness, which include: (a) economies of scale and operational efficiency transmigrant oil palm estates are relatively grouped in particular zones, which facilitate extension service delivery to farmers, distribution of inputs (e.g., fertiliser), harvest collection to improve efficiency relative to scattered estate; (b) adoption of innovative cultivation in responsive government programs or partnership schemes transmigrants farmers tend toward improved practice such as having quality seedlings and applying good fertilisation; increases income also affected by sales at farm gates harvested product is further cared for by PKSs located nearby, market access is ensured. While Muaro Takung does not currently have a processing mill, the drive to and from nearest provinces with mills is not too far away. In addition, investment opportunities for a local processing mill could also empower the farmers' bargaining power; and (d) positive global demand CPO is an important export commodity of Indonesia, with fairly attractive price points. At the global scale, CPO prices were high during 2020–2025 and prompted the expansion of farm-level production because of potential income (Oktaviani et al., 2024).

However, maintaining and improving oil palm competitive advantage requires the resolution of inherent bottlenecks. One major factor is the volatility of prices and policies. At the local level oil palm farmers are still prone to falling Fresh Fruit Bunch (FFB) prices when there is oversupply and export regulations change. For example, DMO policies for CPO had temporarily stifled its export, causing stockpiling and declining FFB prices at farm gate. Such a situation calls for strategic responses such as the strengthening of cooperative institutions to facilitate coordinated marketing in order to enhance collective bargaining powers, and product diversification (such as small-scale processing into cooking oil or similar products). There is another challenge about sustainable agriculture applicability.

Cite: Environmental concerns often become important issues in the oil palm plantation especially on the plantations developed in transmigration areas. Despite absorbing CO_2 and producing O_2 (Oktaviani et al., 2024), imprudent cultivation practices (e.g. non-compliant land clearance) may cause environmental damage. Thus, public governance indicators, for example ISPO and RSPO (Hidayat et al., 2018), will be more urgent to maintain the competitiveness of oil palm compared with sustainability issues (Hariyanti et al., 2024).

Finally, it can be concluded that oil palm in Muaro Takung has a potential competitiveness strength supported by the natural, social and economic aspects. In order to maintain growth momentum, measures are needed to be taken for support in price stabilization, infrastructure improvements and technical extension services. It is potential that well-supported oil palm could still become a leading commodity for local economic development with sustained competitiveness in the wider market regions, and provincial and national level.

The role of leading commodities and the supply chain

Domestic commodities including oil palm and rubber are the mainstay of local economy in Muaro Takung. In contribution to Regional Gross Domestic Product (GRDP), the plantation sector is one of the key sectors in economic of Sijunjung Regency (Saputra et al., 2022). Oil palm plantations especially acting as an economic motor of Kamang Baru Subdistrict. This is evident in several forms such as a rise in monthly income of farmer households, creation of new employment opportunities and development of downstream economic activities in trade and service.

The leading sector of oil palm has proven to increase farmers and community income of the transmigrants (Oktaviani et al., 2024). In Muaro Takung, under the transmigration project, each family unit basically received 2 ha of area for cultivation. With reasonable productivity levels for mature smallholder plantations (estimated at 15 to 20 tons of FFB per ha per year), farmers earn much higher incomes than those who practise subsistence food crop cultivation. This income flows into enhancing household well-being (e.g. increased educational investment for children, housing-upgrading and productive-asset holding). In addition, successful development of oil palm cultivation has triggered significant local multiplier effects; labor absorption in the harvest season rises with the increased number and productivity of tree groves, distributional activities for FFB by means of transportation (local transport), and contribution to a bigger scale in small retail businesses that provide input goods to farmers. In this sense, oil palm has emerged as a major force for rural economic transformation in the region.

The upstream to the downstream process of the oil palm supply chain in Muaro Takung is explained by Figure 1. At the upstream position, suppliers of production inputs such as certified seeds, fertilizers and pesticides have developed in the vicinity of transmigration area. Farmers receive seedlings from the agricultural office or partner companies, and they can buy agro-inputs (e.g., fertilizers) through local agri-kiosks. Higher demand for oil palm inputs has therefore opened up new business prospects to local providers.

During production farmers oversee oil palm plantations and collect FFB every 10–14 days. The collected FFB is taken into the general processing and refining area. At present, marketing system of FFB in Muaro Takung are through collect rams controlled by local traders or intermediaries as well as direct to them. Thereafter, FFB is delivered to the neighbouring palm oil mills (PKS) located outside the transmigration area (e.g., in Dharmasraya or nearby Sijunjung). At the

mill, FFB is processed to produce Crude Palm Oil (CPO) and palm kernel. CPO is the main downstream product be transported to refinery industries or exported.

Nevertheless, as there is no palm oil mill within the transmigration area, not all value added (upstream profit) can be maintained in local level. In response to this constraint, both local government bodies and private investors have started the development of small-scale agro-industry (including a mini palm oil mill) in or on the periphery of the transmigration site. From an economic perspective, local processing industries would allow to shorten the supply chain, improve efficiency and capture more value added within the regional economy.

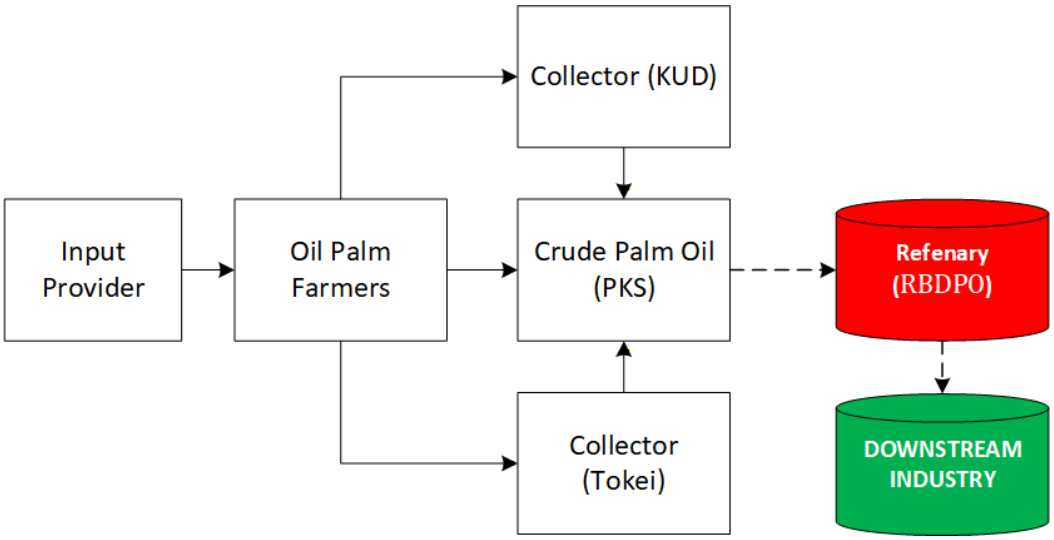


Figure 1.
The supply chain of oil palm commodities in Muaro Takung from upstream to downstream.
(Source: Survey results and author's modifications, 2025)

Downstream, CPO from Muaro Takung's oil palm enters into national and global value chains. Some of the CPO could be processed again into cooking oil, oleochemicals or biodiesel. Therefore, even though it is relatively distant from the outside world, Muaro Takung has been incorporated into global commodity chains. Although this will offer access to wider markets, it also requires the implementation of quality assurance. As a result, the functions of support institutions (cooperatives and village-owned enterprises [BUMDes]) for maintaining the quality of FFB in addition to the oversight of harvest schedules and price bargaining are essential.

Empirically, our interviews of stakeholders is consistent with a more efficient commodity value chain. This would involve better link roads for product movement, formation of collective marketing agencies and forging a sustainable partnership between producers and processing industry. A more robust supply chain would diminish quality losses and dampen price volatility on farm.

Leading products also spur the development of other industries in surrounding area. For example, the production of dried palm kernel feed, converting palm wastes into organic fertilizer and also integrating cattle–oil palm systems are some dependent

industries from oil palms planting. Rubber plantation also helps to develop rubber auctioning market along with the probability of setting-up crumb rubber processing industrial unit in case if there is possibility of producing such volume. Micro and small-medium enterprises, like broom from oil palm fronds, can also be developed.

On account of this, the major commodities serve in nurturing a network-based local economic cluster across upstream and downstream activities. While the local authorities have launched facilitative actions, such as auction markets and training for processing, there is a need to scale them up and incorporate institutional strength.

On the whole, the role of leading commodities in Muaro Takung is strategic: providing additional income to communities, encouraging new economic activities, and positioning transmigration areas into larger regional or global economic systems. The next mountain to climb is how the supply chain bottlenecks are unsnarled so that there's sustainability. Further optimisation of local economic effects would result from improving (developing) the commodity value chain by promoting local palm oil mill, better road infrastructure and farmer entrepreneur partnership. The competitiveness and dynamic would grow even faster for a strategy as this, which would no longer be considering the transmigration area as the place to merely collect the settlers.

Strategi pengembangan komoditas unggulan berbasis SWOT

The results of the identification of internal factors (strengths and weaknesses) and external factors (opportunities and threats) are presented in the SWOT matrix (Appendix 1), which indicates the formulation of an aggressive strategic orientation.

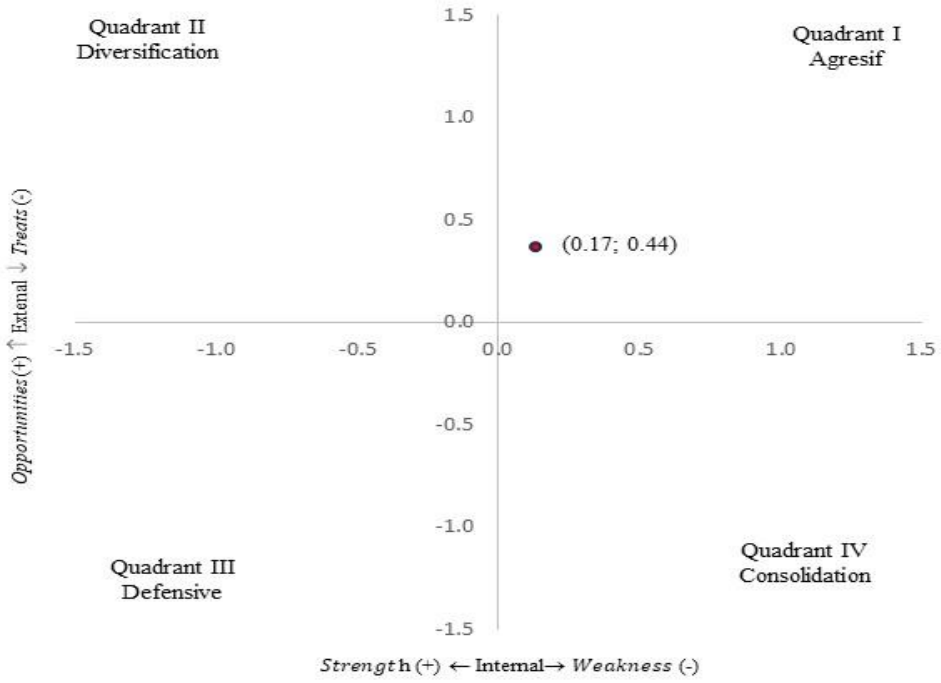


Figure 2.
Quadrant position of oil palm development in Muaro Takung–Kamang Baru, Indonesia.
(Source: Survey results and author's calculations, 2025)

The internal axis (X-axis), representing the balance between strengths and weaknesses, is calculated as follows:

$$X = \text{Strength Score} - \text{Weakness Score}$$
$$= 3.6667 - 3.5000$$
$$= +0.1667$$

The external axis (Y-axis), representing the balance between opportunities and threats, is calculated as:

$$Y = \text{Opportunity Score} - \text{Threat Score}$$
$$= 3.6364 - 3.2000$$
$$= +0.4364$$

The positive values on both the internal and external dimensions position the strategy within Quadrant I, which corresponds to an Aggressive or Growth-Oriented Strategy.

A Quartant I location means that the development strategy should zoom in on taking advantage of external opportunities by using internal potential to stimulate growth and trickle down of development in the oil palm sector. The strategic positioning highlights the pro-active expansion and growth focus factors such as:

a. Down-streaming (i.e., the establishment of a mini palm oil mill /PKS);
b. Building institutional capacity and human resource capacity to enable the rapid integration of downstream processes;
c. Rationalization of land use and further improvement in investment climate; and
d. Leveraging supportive policy frameworks and the global market push for sustainable palm oil products.

This strategic posture underscores the necessity of transforming existing comparative and competitive advantages into sustained regional economic growth through structured industrial deepening and institutional reinforcement.

Cluster Model for Leading Commodity Development Based on Porter's Diamond Framework

The model of cluster development of the leading oil palm commodity in the transmigration area of Muaro Takung–Kamang Baru, Indonesia based on Porter's Diamond Model is as depicted by Figure 3. The core industry (smallholder oil palm plantations) serves as anchor within the cluster node and is linked with its Suppliers, Related and Supporting Industries, Supporting Institutions, and Buyers/ Markets. Each of the parts is interlinked, indicating the systemic associations between cluster characteristics. Environmental stimuli like government support, market demand, and export opportunities as well as sustainability laws are shown encircling the cluster indicating external forces that may facilitate (opportunistic) or inhibit its competitiveness.

The following is a brief description of Figure 3, namely:

a. Core Industry. The smallholder oil palm farms in Muaro Takung are the center of the cluster. This core sector includes oil palm farmers and their oil palm cultivation which is the heart of rivalry and strategic interplay in the cluster (related to Porter's group factor: firm strategy, structure, and rivalry). The performance and competitiveness of such an entry industry directly affects the cluster's overall power.
b. Suppliers. Suppliers may be sources of key factors of production like certified seedlings, fertilizer, and farm machinery/tools and/or skilled labour. These are the actors that guarantee the supply of production factors of a good standard to the core industry (factor conditions in Porter's model). Those suppliers relationships are strong and well coordinated to ensure the timely availability of key inputs, which in turns increase productivity and operational efficiency.

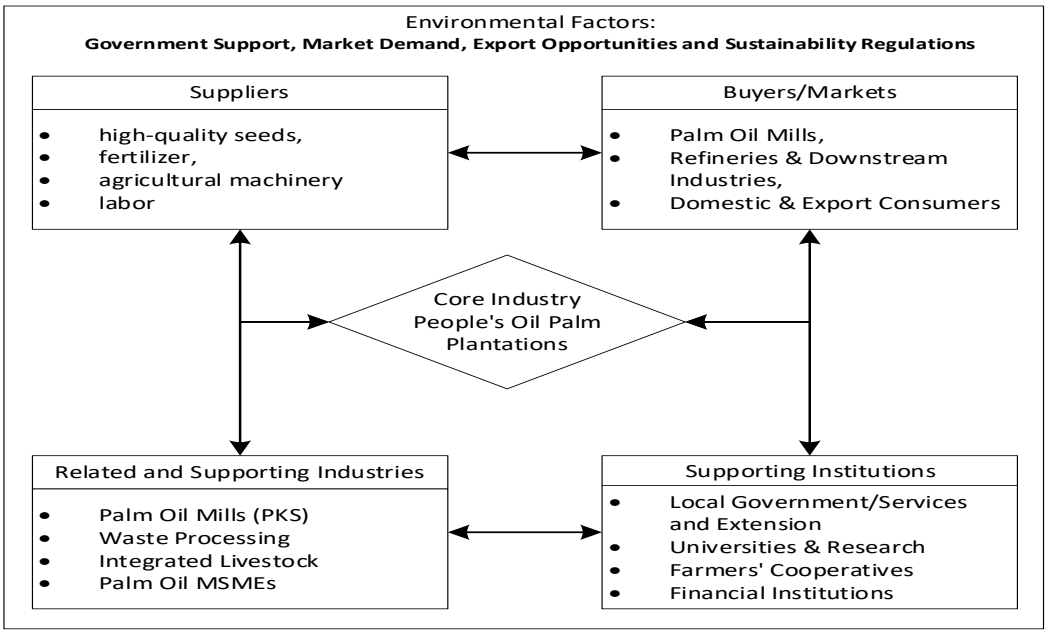


Figure 3.
Development Design of the Leading Oil Palm Commodity in the Muaro Takung-Kamang Baru Transmigration Area, Indonesia
(Source: Survey results, 2025)

c. Related and Supporting Industries. This section covers industries and services related to the processing of oil palm and its by-products. It consists of palm oil mills (PKS) as the main hub industry (with processing facilities such as biomass or compost), and associated with integrated livestock operations which utilising residues for feeding and bedding, to downstream subsector of local micro-, small- and medium-sized enterprises producing derivative products from oil palm. Strong related and supporting industries in the cluster strengthen synergies, raise value-augmenting potential and bring about product diversity (a reflection of the related and sup-porting industries driver in Porter's model).
d. Supporting Institutions. The supporting institutions are government agencies (such as regional agricultural offices and plantation offices), higher education and research institutions (delivering technology innovation and training/disruption), extension officers, farmer groups/ cooperatives, and financial service institutions (banking or microfinance). These institutions build the capacity of farmers, improve access to credit and promote good governance. Their function reinforces the institutional and policy platform for the cluster, which adds up to long-term competitiveness.
e. Buyers and Markets. This factor is indicative of the demand side, i.e., a condition in demand driving clusters. At the upstream, PKS buy FFB from farmers. Post-process products are then transferred to refineries, which refine the CPO for internal consumption and export markets. Favourable demand conditions, both from overseas (as targeting export markets are identified) and domestically, encourage farmers to gain the economies of scale associated with increased production volume by improving quality at the farm level against some knowledge of

demand dynamics here discussed (partly in line with Porter's concept of demand conditions).

f. Environmental Factors. Environmental factors are used in this study to describe the macro environment that affect the business climate of oil palm cluster. The role of government includes: * building a range of support services for clusters conducive to their learning, innovation and upgrading, such as information and communication technologies, training facilities and R&D centres; " creating a set of cluster inputs (subsidies, incentive policies, infrastructure) which can strengthen both the inputs into clusters and linkages between the firms. The attractiveness of the cluster from an economic point of view is additionally supported by high domestic and international demand, as well as export opportunities. On the other hand, sustainability norms (for example: ISPO/RSPO standards and anti-deforestation policies) demand a shift towards environmentally sustainable agribusiness practices. While these external forces are mainly outside the control of cluster actors, they have a noticeable impact on the sustainability and competitiveness of the Muaro Takung oil palm cluster.

Porter's Diamond Model underscores the importance of establishing an integrated oil palm commodity cluster in Muaro Takung–Kamang Baru. Field findings indicate that this framework is effective in identifying areas requiring improvement to enhance the competitiveness of the leading commodity. By strengthening each determinant of the "diamond," oil palm in Muaro Takung is expected not only to maintain comparative advantage but also to achieve sustainable competitive advantage at national and international levels.

The proposed development design culminates in the formation of an integrated oil palm industrial cluster. The core industry (plantation and processing activities) is supported by strong input suppliers, interconnected with related industries (livestock, feed, and derivative enterprises), reinforced by governmental, educational, and financial institutions, and oriented toward domestic and international market demand. If successfully implemented, the Muaro Takung–Kamang Baru transmigration area has the potential to evolve into an agropolitan or agro-based industrial center with strong competitiveness.

Infrastructure development, particularly connectivity and storage facilities, should be prioritized. As emphasized by (Raharja et al., 2021), national oil palm cluster development similarly requires improvements in infrastructure and trade connectivity as key strategic components. Ultimately, the integrated oil palm cluster model in Muaro Takung may serve as a replicable framework for local economic development in other transmigration areas.

CONCLUSION

Oil palm constitutes the leading commodity, exhibiting a comparative advantage as a base sector and a competitive advantage reflected in production growth exceeding the regional average. This commodity functions as a primary driver of the local economy by increasing transmigrant incomes, generating employment opportunities, and strengthening linkages within the downstream supply chain. Nevertheless, its development continues to face structural and institutional constraints, including inadequate infrastructure, limited human resource capacity and farmer institutional development, land tenure and legality issues, as well as volatility in commodity prices. The SWOT

analysis places the development strategy in an aggressive (growth) quadrant, which highlights how critical it is to be able to expand and leverage existing potential by increasing production and processing capacity, strengthening farmer organizations, investing in infrastructure, facilitating access to credit and using sustainable land management practices. The cluster-based approach based on Porter's Diamond Model also shows how important it is to combine factor conditions, technological progress, strengthening processing and supporting industries, and strengthening the roles of government institutions, research and development organizations, and financial institutions to make the oil palm sector more competitive in the long term. With well-planned and helpful policies, oil palm has a lot of potential to be the basis for local development and to help the economy grow in the Muaro Takung–Kamang Baru transmigration area.

ACKNOWLEDGEMENT

Acknowledgments are extended to IPB University and the Ministry of Transmigration for funding this activity under Contract No. 37970/IT3.D11/PM.05/P/T/2025, through the Patriot Expedition Program.

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