

Research Article

Palm-Oil And Livestock Integration Strategy To Attain Increasing Income And Well-Being

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Abstract. The potential for integration of oil palm farmers and cattle is a model of rural economic development that relies on land resources, the role of the family and the government organizations to increase income and community welfare. By relying on primary data on 297 community respondents of farmers and ranchers who were processed using warpPLS version 6.0, it was found that the estimation model was able to explain the relationship between standard of living to increase in income, and standard of living to welfare of 31% and 17.5%. Likewise, the relationship between productivity variables on increasing income and productivity on people's welfare can be explained by the values of 52.1% and 20%. Thus, this strategy can be used as a policy basis for rural economic development in Indonesia which has relatively the same characteristics.

Keywords: *Integration, Agriculture, Livestock, Income, Well-being*

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1. Background Study

Palm oil and livestock integration constitute strategy income enhancement and to overcome the scarcity of quality cattle feed. Indonesia has 14.4 million palm oil plantation hectares, and 4.4 million belong to the public or community. Currently, the area of palm oil integration covered an area of 132,000 hectares. Spread over 15 provinces with a livestock population of 66,000 heads or the equivalent of two leaders per hectare. In fact, a feedlot industry grew up, which developed by medium and large palm oil plantations.

According to Lismawati (2016), the integration has a positive impact on increasing the economic region of Langkat, Be marked by an increase in employment by 114,447 people or 22.66%, As well the livestock subsector contribution enhancement by 177.81 billion or 3.85% toward Gross Region Domestic Product (GRDP) of the agricultural sector. This figure provides an interpretation that the integration of oil palm and livestock has an opportunity for households to step up the standard of living and emit them from the status of a needy family (BPS, 2015).

The agricultural sector productivity has linkages with other economic sectors. It is also a fact household in rural areas and depends on agriculture lives most on the poor. The link of agriculture with the livestock sector denotes the agriculture economic ecosystem. Since livestock constitutes a productive agriculture asset in fertilizers and soil nutrients, its dung can be used as cost-effective and sustainable fertilizers. The water retention capacity of organic fertilizers also has the effect of reducing the risk of soil erosion (Nilsson and Backman, 2017)

One might argue geography has a causal role in determining how household well-being develops over time. With this view, geographic externalities arising from local public goods, or local private goods giving, require that living in an area of rich natural resources means that households should move out of poverty. The availability of natural capital and human resources greatly influences household productivity. Nature and the environment have given way to how rural households can compensate for crop shortages and reduce fluctuations in consumption (Reardon & Delgado, 1992).

Based on the data, Selayang Baru village, Selesai sub-district, Langkat district in 2019 was 3,821 people, the number of oil palm farmers was 489 people, 152 people were livestock farmers, and the rest were freelance or contingent laborers. The number of pre-prosperity is 161, and only 51 are classified as prosperous families III-Plus (Self-esteem needs). The pre-prosperity arises since the level of income less than 10.000 rupiahs per day. The data describes that the number of low-income families is relatively denoted as contingent workers. Prosperous I (Basic Needs), Prosperous II (Psychological Needs), and Prosperous III (Development Needs) constitute combined workers, breeders, and oil palm farmers.

This research focuses on the strategy of increasing the income of rural communities through agriculture and livestock integration. In practice, revenues diversification can be realized society to be palm-oil farmers and breeders or farmers able to reduce maintenance costs and plantation losses by utilizing livestock. Farming is described as an effort by rural communities to process production factors (land, labor, and capital) to obtain maximum income. In contrast, community husbandry activities are an effort to breed and fatten livestock to receive optimum payment. Integrating the two will encourage the community's income to be higher, and cross-subsidies can be carried out to cover operational costs.

The study applies structural equations to measure the relationship between the variables of a standard of living, farming, productivity, income, and welfare. Using relevant indicators to determine each of the selected indicators influences each of the construct variables and if its influence ultimately indicates an increase in income and well-being? Thus, it's expected to be material for consideration for decision-makers since the development of this integration program requires endorsement from the local government to equip farmers and ranchers with adequate knowledge even if necessary to provide educational support and field guidance. Even if needed, the local government, to improve the community's standard of living, provides calf assistance for people who are willing to switch professions from factory workers to cattle breeders.

2. Literature Study

Increasing the productivity of the agricultural sector has traditionally been an important opportunity for income generation and poverty alleviation in developing countries (Johnston & Mellor, 1961). It is a fact that most of the pre-prosperity households live in rural areas and depend on agriculture, combining small-scale food farming and livestock with a range of activities related to agriculture. Diversification of agriculture with livestock is an effort for village communities to increase income by other sources of income from non-agricultural activities (Nilsson, 2017). Livelihood diversification is defined as the process by which rural households build an increasingly diversified portfolio of activities and assets to survive and improve their living standards. Therefore, empirical analysis of the concept of diversification has been assessed from the perspective of assets, income, or activities (Ellis, 2000). Diversification farming creates increased agricultural incomes, jobs, reduces poverty, and conserves valuable land and water resources. Several micro-level studies support the above proposition (Ryan & Spancer, 2001).

According to Sudarmanto (2020), systematic efforts are needed to improve the dignity of the poor and underdeveloped by encouraging, motivating, raising awareness, and developing potential. This concept is a value orientation that influences and improves people's quality of life (Zimmerman, 2000). The idea reflects a way of development that is people-centered, participatory, empowering, and sustainable. The effectiveness of empowerment activities will be seen from improving the quality of life through increasing family income. According to Pigou (1960), welfare is identical to income as measured by money and people's purchasing power (willingness to pay). Some researchers mention it the standard of living, well-being, or quality of life (Ferguson, 1981; Martin, 2006). If welfare or quality of life is a normal goods, then every individual attempt to keep it; the higher the level of satisfaction, the greater the family's performance to achieve it.

Meanwhile, Stiglitz, Sen & Fitoussi (2011) state that quality of life is a broader concept than economic production and living standards. Quality of life includes a complete set of factors that affect what we value in life beyond the material side. These better living conditions are more concretely often referred to as improving people's living standards or improving people's welfare. Thus, improving the living standard is considered a goal to be achieved through the community development process.

Likewise, Mosher (1966) argued that the primary goal of rural development is not agricultural growth but raising the quality of life of farmers, partly relying on family income. The standard of living, which is often identified with welfare, the emergence of awareness that development is not enough to increase its growth with many inputs, but rather the more important output is the quality of life. According to the OECD (1982), indicators of living standards include income, housing, environment, social, health, education, and employment opportunities. Meanwhile, Mubyarto (2005) asserted the welfare of his family is the goal of farmers. Increasing income should be achieved and fulfilled the need for living goods, namely by adding up all the revenue obtained from their agricultural business.

According Soekartawi (2006), farming income compares production and selling price; operating costs are all expenditures to produce a unit of revenue. Income is the difference between revenues and expenses. According to Gustiyana (2004), Farming income can be divided into First gross income, which is income earned for one year, which be calculated from the sale or exchange of producing products valued in rupiah, based on the unit weight price at the crop. Second, net income is all income earned by farmers in one year minus production costs during the production process. Production costs include the actual cost of labor and the real cost of production facilities. Distribution of income, among others: (1) costs have not deducted gross income, (2) net income means income after deducting cost, and (3) Management income, the deduction from the total output with total input.

3. Research Methodology

This study uses a quantitative approach, research data obtained from 297 respondents based on an appropriate questionnaire the research objectives. Tabulated and processed by partial least squares software to explain the relationship construct inter variables. The number of the sample has been appropriate with the requisite of WarpPLS standard. The scale of questionnaire technic uses 1 to 4, which means strongly disagree and strongly agree. There are five variables used in this study: standard of living, farming, productivity, income, and welfare (Hartono, 2007; Solihin, 2013). Testing of the entire model to observe the model as a whole. The values used as standards fit model indicators are APC (average path coefficient) and ARS (average R-squared) significant ($p < 5$ and the value of full colinearity VIF (variance inflation factor) below 3.3 (Solihin , 2013).

Reliability testing is carried out to ensure that the research instrument used presents the measurement of the concept consistently without any bias. (Hartono, 2008). Cronbach's Alpha

value of 0.50 to 0.60 is considered a sufficient value for reliability. A variable can be more reliable if it has Composite Reality above 0.60 or close to number 1. Likewise, with the Validity test, a measuring instrument is valid if it can measure its purpose in a real and correct way. The validity test in this research is constructed validity, consisting of convergent and discriminant validity (Hartono, 2008).

Convergent validity was evaluated using the loadings factor criteria with a value of more than 0.50 and the average variance extracted (AVE) with a value exceeding 0.50. With this value, it is obtained that the probability of convergent indicators is more significant, which is above 50% (Solihin, 2013). Discriminant validity has the principle that the same constructs should have a high correlation. The parameter measured compares the roots of the AVE of a construct that should be higher than the correlation between the latent variables by looking at the cross-loading (Solihin, 2013).

The hypothesis will be accepted if the p-value <0.05. The path coefficient value is used to determine the direction of the correlation. A positive correlation indicates a relationship between constructs and vice versa. The research model will also be tested by looking at the value of the coefficient of determination (R^2). This value explains the variation of the dependent variable. The value of R^2 is between the values of zero to one. If the value is zero, then it cannot explain the variation on the dependent variable (Santoso, 2020). In contrast, if it is worth one, then the independent variable explains one hundred percent of the take on the dependent variable.

The questionnaires distributed in this study were 300 questionnaires. Accessed questionnaires are 297 questionnaires. Education level of respondents 15.48% SD; 58.90% Junior High School; and 25.52% SMA, while the number of oil palm farmers is 64.64%; breeders 28.95%; and workers as much as 6.41%.

4. Research Result

Table 1. Research Model Test

Description	Value	Ideal
Average path coefficient (APC)	P<0.001	<= 0,05
Average R-squared (ARS)	P<0.001	<= 0,05
Average adjusted R-squared (AARS)	P<0.001	<= 0,05
Average block VIF (AVIF)	1,278	<= 3,3
Average full collinearity VIF (AFVIF)	1.399	<= 3,3
Sympson's paradox ratio (SPR)	0.857	1
R-squared contribution ratio (RSCR)	0.995	1
Statistical suppression ratio (SSR)	1	>= 0,7
Nonlinear bivariate causality direction ratio (NLBCDR)	0.5	>= 0,7

Source : primary data processed, 2021.

According to Table 5 above, could be seen that each value in APC (P=0.001), ARS (P<0.001), AARS (P<0.001), AVIF(1.278), AFVIF(1.399), SPR (0.857), RSCR (0.995), SSR (1) and NLBCDR (0.5) in this study have met the ideal criteria and the model used in this study is fit.

4.1. Realibility Test

Reliability testing aims to ensure that the research instrument used can present measurement concepts consistently without any bias. The results of the data processing show the following results:

Table 2. Realibility Test

Composite reliability coefficients		Cronbach's alpha coefficients	
THIDUP	0.831	THIDUP	0.675
UTANI	0.816	UTANI	0.650
PTIVITAS	0.893	PTIVITAS	0.813
KJAHTERA	0.748	KJAHTERA	0.516
INCOME	0.824	INCOME	0.679

Source : primary data processed, 2021.

The basis used in the reliability test is the value of Composite reliability coefficients and Cronbach's alpha coefficients above 0.5. The results in table 4.6 above indicate that the questionnaire instrument in this study has met the reliability test requirements. This validity test shows the suitability of each indicator with the theories used to define a construct (Hartono, 2008). The validation test criteria use the loadings factor criteria (cross-loadings factor) with a value of more than 0.50 and the average variance extracted (AVE) with a value exceeding 0.50 for the convergent validity test and the discriminant validity test using the ratio of the root of the AVE with the correlation between variable. The construct AVE value should be higher than the correlation between latent variables (Solihin, 2013). The results of the validity test show the following results:

Table 3. Combined Loadings and Cross-Loadings Factor

	THIDUP	UTANI	PTIVITA	KJAHTERA	INCOME	P value
TH1	0.981	0.012	0.001	0.002	-0.063	<0.001
TH2	0.975	0.032	0.011	0.027	-0.092	<0.001
TH3	0.274	-0.157	-0.045	-0.104	0.554	<0.001
UT1	-	0.322	-0.098	0.045	-0.210	<0.001
	0.179					
UT2	0.017	0.956	-0.076	-0.027	0.022	<0.001
UT3	0.044	0.937	0.111	0.013	0.050	<0.001
PT1	-0.051	0.012	0.922	0.038	-0.355	<0.001
PT2	0.119	0.042	0.660	-0.108	0.807	<0.001
PT3	-0.033	-0.041	0.968	0.037	-0.212	<0.001
KS1	0.008	0.077	-0.106	0.958	-0.074	<0.001
KS2	0.033	-0.252	0.089	-0.048	0.019	0.201
KS3	-0.007	-0.090	0.111	0.954	0.076	<0.001
PN1	-0.061	-0.281	0.360	-0.033	0.773	<0.001
PN2	-0.034	0.137	-0.195	0.250	0.740	<0.001
PN3	0.088	0.140	-0.162	-0.192	0.828	<0.001

Source : primary data processed, 2021.

Table 4. Comparison of Roots of AVE With the Correlation Between Variables

	THIDUP	UTANI	PTIVITA	KJAHTERA	INCOME
THIDUP	0.814	-0.402	0.188	0.210	0.011
UTANI	-0.402	0.795	-0.048	-0.067	0.315
PTIVITA	0.188	-0.048	0.861	-0.076	0.510
KJAHTERA	0.210	-0.067	-0.076	0.781	0.085
INCOME	0.011	0.315	0.510	0.085	0.781

Source : primary data processed, 2021.

Table 4 above shows that the square root value of AVE for each construct is greater than the correlation value so that the construct in this research model can still be said to have good discriminant validity. Thus the instrument used in this study has met all the provisions of the validity test.

4.2 Hypothesis Test Results

The level of confidence used in this study is 5%. The hypothesis will be accepted if the p-value <0.05. The results of the partial least square (PLS) calculation are as follows:

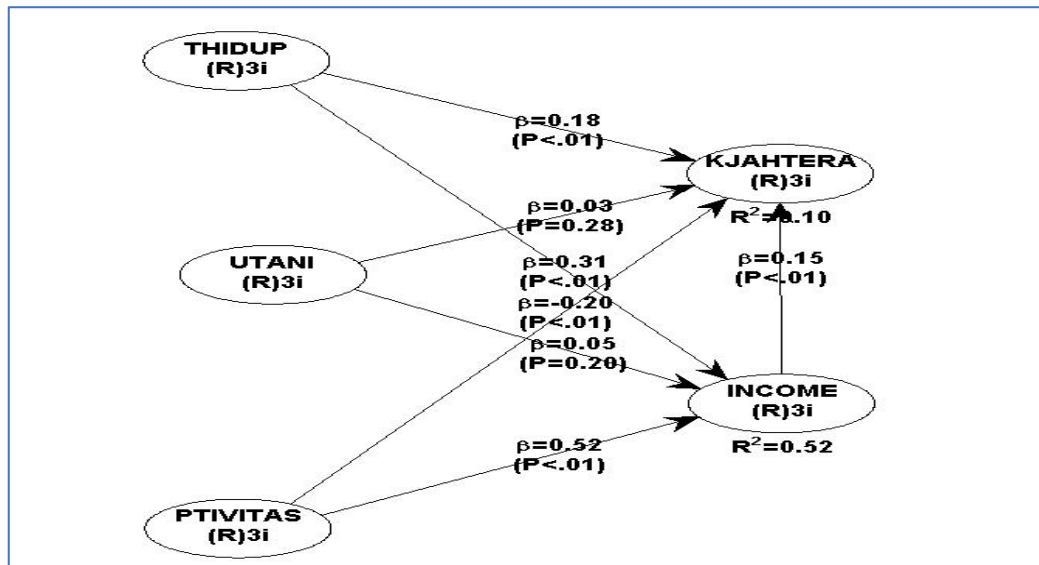


Figure 1. Result of Output Model WarpPls 6.0

From the results of the WarpPls 6.0 output, the results of hypothesis testing can be summarized as follows:

Table 11. Summary of Research Result

	Description	Coefisien	P-Value	Ideal	Result
H1	THIDUP-KJAHTERA	0.175	<0.01	<0.05	Diterima
H2	THIDUP-INCOME	0.310	<0.01	<0.05	Diterima
H3	UTANI-KJAHTERA	0.033	0.28	<0.05	Ditolak
H4	UTANI-INCOME	0.049	<0.20	<0.05	Ditolak
H5	PTIVITAS-KJAHTERA	-0.200	<0.01	<0.05	Diterima
H6	PTIVITAS-INCOME	0.521	<0.01	<0.05	Diterima
H7	INCOME-KJAHTERA	0.154	<0.01	<0.05	Diterima

Source : primary data processed, 2021.

Only 5 (six) hypotheses were accepted of the seven proposed hypotheses, and two were rejected. The rejected hypothesis has shown the appropriate coefficient direction, but the p-

value in the hypotheses ($H3 = 0.28$ and $H4 = 0.20$) is still above the value of the accepted hypothesis criteria, which is below 0.05. The results showed that the welfare of farmers is strongly influenced by the main factors such as farming and productivity. The results showed that the estimated parameter between the effect of living standards on people's welfare and living standards with income only showed coefficient values of 0.175 and 0.310. This value means that although the hypothesis is accepted, the variable can only explain the relationship between living standards on welfare and income by 17.5% and 31.0%. The results of this study are still in line with research conducted by Astiti and Saitri (2016), which states that Community Welfare is an increase in the standard of living for the better as indicated by an increase in health, education, and economic activity. The results of field observations indicate that the standard of living after land conversion is getting better. Before the existence of oil palm and livestock, they made a living by growing long beans, but the production was not good.

The relationship between farming on community welfare and farming on community income levels shows the coefficient value of each variable is only 0.033 and 0.049, indicating that farming has no effect at all on farmers' welfare and increased income. Therefore, it is natural then that this hypothesis is rejected because it can only explain the relationship between farming and community welfare with income levels of 3.3% and 4.9%. The analysis of respondent data indicates that the number of cattle breeders is more dominant and the majority than oil palm farmers. Characteristics of cattle breeders are those who receive income from maintenance or fattening services alone, not from livestock meat. Furthermore, the relationship between productivity on welfare and productivity on income shows a coefficient value of -0.20 and 0.521.

Those coefficient values can explain the relationship between productivity variables and welfare with a confidence level of 20%, but the relationship between productivity variables and income has a substantial contribution, namely 52.1%. This coefficient value explains to us that productivity is very dominant in encouraging and increasing people's income. Based on the analysis of respondents' data, work experience supports increasing people's income. Generally, oil palm farmers and cattle breeders are looking for workers with experience in farming and superior breeders. This result is in line with research (Sari Ritonga, Triyanto, & Dorliana Sitanggang, 2021), which explains that oil palm productivity positively affects the welfare of oil palm farmers in Promise Village, West Bilah Subdistrict, Labuhanbatu Regency.

In the hypothesis, the relationship between income and welfare variables only shows a coefficient of 0.154. Thus, this variable can explain the relationship only by 15.4%, which is supported by the opinion (Anwar & Setiawan, 2018) that the amount of spending on food will decrease along with the shift and increase in income amount of the expenditure on non-food needs will increase. Of the commodities consumed by the family will have their own satisfaction. In consumption activities, each family is used as a burden or dependent in meeting the needs of all family members so that it is used as a measure of achieving family welfare evenly and intact.

5. Conclusion and Suggestions

The purpose of this study was to examine the potential for integration of oil palm farmers with cattle breeders in the Selayang Baru area, Complete sub-district, Langkat district. This study adopts the theory of regional growth and the theory of natural resources. Historically, regional development has focused on regional development and emphasized physical-natural reasons and environmental considerations, both internal and external. The farmers used to be rubber farmers who did land conversion since the world rubber price continued to decline and

switched to palm oil which was booming in the world market at that time. At the same time, oil palm land is the primary source of nutrition for cattle fattening, so the combination of oil palm farming and cattle fattening becomes a model for the community to improve the family economy. This business is an effort to pass down the family and change the family's economic condition for the better. It can be seen from the level of income and family welfare to move out of the status of a pre-prosperous family to become a prosperous family to a more prosperous family (plus)

6. Policy Recommendations

Community economic empowerment can be done by relying on the community environment sector. Several regions in Indonesia have changed land-use conversion into oil palm plantations. The development of oil palm plantations provides a substantial economic dimension, especially to the rural economy. The ability to contribute is reflected in the absorption of labor and income security. The ability of the agricultural sector to deal with the crisis can also be seen from the condition of the rural economy, where there is no worsening of income distribution in rural areas compared to urban areas. Seeing the vast potential of this, several policy recommendations are highly recommended to increase this activity, including:

- a. Increase the awareness of village officials in carrying out agricultural extension activities, which function to facilitate and motivate the learning process of the main actors and business actors to achieve the objectives of developing human resources (HR) and increasing social capital.
- b. Increasing public knowledge about using standard fertilizers is still low because farmers generally focus more on harvest volume without thinking about fruit quality which can increase selling prices. The use of appropriate fertilizers can improve the quality of oil palm fruit and increase the live weight of livestock, and this greatly affects the selling price and income of farmers.

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