Agrimor 7 (1) 10-17
Jurnal Agribisnis Lahan Kering - 2022
International Standard of Serial Number 2502-1710

The Relevance of Farmers' Socio-Economic Conditions in Decision Making in Integrated Crops-Livestock Patterns in Pringgabaya District, East Lombok Regency

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Article Info

Article history:
Received 08 July 2021
Revised from 26 July 2021
Accepted 18 January 2022

DOI:
https://doi.org/10.32938/ag.v7i1.1408

Keywords:
Dry land;
Farming;
Integrated livestock crop system.

Abstrak

Integrated crops-livestock systems is a farming concept that consists of several subsystems. One subsystem with another subsystem has a mutualism symbiotic relationship, where each subsystem benefits from each other. The purpose of this study was to analyze the socio-economic factors of farmers that influence farmers' decision making in using an integrated farming pattern that produces optimally. The research method was a quantitative approach with multiple regression analysis. Determination of research respondents was done by "random sampling", where the respondents used in this study were 68 respondents. East Lombok Regency. The results showed that the variables that had a significant effect on the decision to apply the optimal pattern in integrated crop-livestock farming were the variables of land area, capital, number of workers and income. While the variables that have no effect are education, age, experience of plant farming and experience of livestock farming.

1. INTRODUCTION

East Lombok Regency has great potential to be developed. Agricultural potentials in East Lombok include commodities of rice, corn, soybeans, peanuts, cassava, sweet potatoes, green beans, onions, garlic, chili, eggplant and tomatoes. The plantation sub-sectors in this area include cloves, cashew nuts, cocoa, cotton, deep coconut, robusta coffee, pepper, and tobacco. The northern area is a fertile agricultural area and is the slopes of Mount Rinjani with an altitude of 3,726 meters above sea level. This area is very potential for agro-industry development. Meanwhile, the southern area is a dry land area with relatively low rainfall, but the area is very potential for the development of agricultural commodities. The development of the livestock sub-sector is directed at increasing the population and livestock production to meet the people's consumption needs for nutritious food, in addition to increasing the income of farmers, the growing livestock population in East Lombok is cattle, buffalo, horses, goats, while for types of poultry are native chickens, broilers, and local ducks.

The development of agriculture and animal husbandry has proven to be very good for regional economic development (Nursan & Septiadi, 2020). In general, there are still many farmers who run farming on the small land. In East Lombok Regency, there are still many dry land areas that have not been processed optimally. In a year, there are many farmers who only run one planting season, after that they are stopped. In fact, if farmers are encouraged to think and act more creatively, it is still possible for this dry land to be further utilized for livestock development. This livestock development is not only done partially, but can be carried out in an integrated manner with crop farming.

The crop-livestock integration system is an integrated farming activity that is very efficient and has become part of the farming culture of the Indonesian people (Septiadi et al., 2021). This agricultural concept combines several subsystems, such as subsystems of households, land, crops, and livestock that are integrated with each other. One subsystem with another subsystem has a mutual symbiotic relationship. Each subsystem is mutually beneficial and take benefits from others. This explanation is reinforced by De Moraes et al., (2019) which stated that an integrated crop-livestock system is a planned system that involves temporal and spatial interactions at different scales with the exploitation of animals and plants in the same area, simultaneously or intermittently and in rotation or succession. De Moraes et al., (2014) used the adjective “harmony” to refer to crops and livestock coexisting on the same farm, a different concept from crop rotation. Despite the existence of different approaches, common benefits of integrated farming include reduced costs and risks, increased efficiency of land and machinery use, increased diversity, mitigation of greenhouse gases, reduced crop disease and weed incidence and increased profits and incomes (de Faccio Carvalho et al., 2010; Bell and Moore, 2012; Ryschawy et al., 2012). All these aspects are considered in the modern concept of intensive and sustainable integrated agricultural production (Doré et al., 2011). Common benefits of integrated farming include reduced costs and risks, increased efficiency of land and machinery use, increased diversity, mitigation of greenhouse gases, reduced crop disease and weed incidence and increased profits and incomes (de Faccio Carvalho et al., 2010; Bell and Moore , 2012; Ryschawy et al., 2012). All these aspects are

considered in the modern concept of intensive and sustainable integrated agricultural production (Doré et al., 2011). Common benefits of integrated farming include reduced costs and risks, increased efficiency of land and machinery use, increased diversity, mitigation of greenhouse gases, reduced crop disease and weed incidence and increased profits and incomes (de Faccio Carvalho et al., 2010; Bell and Moore , 2012; Ryschawy et al., 2012). All these aspects are considered in the modern concept of intensive and sustainable integrated agricultural production (Doré et al., 2011).

The concept of integrated agriculture is very suitable as an effort to improve the welfare of farmers and the regional economy. This is supported by the opinion of Aryana et al., (2016) which states that the Provincial Government of Bali focuses on agricultural development through the Integrated Agricultural System program to support the welfare of farmers. The concept of Integrated Agriculture is not only suitable for farmers with large land areas, this concept is also relevant to be applied to farming with a narrow land scale. In line with this opinion are the results of research (Indrayani & Hellyward, 2015) which stated that a small farmer in Jembrana Bali with land ownership of only about 0.84 hectares is able to allocate resources optimally in implementing the concept of integrated agriculture. The farmer is able to carry out farming activities with the concept of integrated agriculture well, as indicated by the results of the analysis that show the optimal production solution in accordance with the observed behavior. The farmer earns a maximum income of up to IDR 26,041,250 per year. This finding is important as a reference and encouragement for farmers and local governments in the development of integrated agriculture, because there are still many farmers in East Lombok who have limited land, but on the other hand there is a large and untapped dry land area.

The advantages of an integrated farming system are also able to reduce the costs that must be incurred for crop and livestock farming, because some inputs for crop farming production such as fertilizers can be obtained at almost no cost, namely by utilizing livestock feces which are processed into organic fertilizer. In addition, livestock farming production inputs can also be accessed by utilizing plant farming waste in the form of grass (Ilham and Saliem, 2016). The concept of integrated agriculture shows an overview of the concept of agriculture that is economical and environmentally friendly. So far, some of the limitations of farmers in doing farming are related to the problem of limited availability of production inputs and the high cost of inputs. The next limitation is the environmental pollution due to the use of chemical fertilizers. The presence of an integrated farming system is a solution to these limitations. The livestock farming system integrates all components of the agricultural business so that no waste is wasted, is environmentally friendly, and can expand sources of income and reduce the risk of failure (Ugwumba, 2010).

This finding is in line with the results of the study (Khurniyah et al., 2019) which stated that implementation of the integration system of beef cattle and cocoa plants can reduce farm production costs and livestock business costs because the production inputs of the two farms are feed ingredients. The availability of farm grass waste and the fertilizer for cocoa plants is also come from cow dung waste. Farmer's income on the integration system pattern of beef cattle on cocoa plants in Boalemo Regency has good progress where the R/C ratio value of cocoa plants has increased in income by 23.48%, while the increase also occurred in cattle business income by 2.39 %. Likewise, research conducted by Dananjaya (2020) revealed that the integrated cropping pattern between goat farming and coffee farming can increase the income of livestock farmer groups. The result of this integration has proven to increase farmers' income.

The success of a farming business is generally influenced by technical factors and socio-economic factors. Lumbantoruan et al., (2014) revealed that describing these socio-economic factors include farmer's age, education level, experience in farming/breeding, number of family dependents, and level of farmer/breeder generation.

Empirically there is some literature that examines farmers' decision making in conducting farming activities on certain commodities, including the research of Apriyani et al., (2018) which discusses the factors that influence the decisions of banana farmers in Lampung, then also found research from Ranchman et al., (2014) which examines the factors that underlie the decision making of cabbage farmers and cabbage farming development strategies in Bondowoso Regency, as well as the research of Mita et al., (2018) which examines income analysis and the factors that influence the decision making of rice seed breeding farming in Pesawaran Regency. Based on some of these issues, studies that discuss farmers' decision making in integrated crop and livestock farming patterns have not been found, so references related to these issues are still limited.

Based on this description, the researcher wants to explore issues related to the socio-economic factors of farmers that determine the decision making of cropping and livestock patterns in an integrated farming system. Thus, the purpose of this study was to analyze the socio-economic factors of farmers that determine the decision making of cropping and livestock patterns in integrated agriculture on dry land in East Lombok Regency.

2. RESEARCH METHODS

The research was conducted in Pringgabaya District, East Lombok Regency. East Lombok Regency is the area that has the largest area on Lombok Island and has the most pumped wells for farming irrigation. Pringgabaya sub-district was chosen in this study because it has the largest dry land area and has quite a lot of farmers. Respondents in this study were farmers who farmed crops and livestock, the number of respondents was determined by "quota sampling" as many as 68 farmers divided into two villages in Pringgabaya District, namely 34 farmers in North Pringgabaya Village and 34 farmers in Gunung Malang Village. Meanwhile, the determination of respondents at the research location was carried out by "random sampling". The selection of respondents was determined by considering that in North Pringgabaya Village and Gunung Malang Village there are many farmers who carry out integrated crop and livestock farming activities. .

The research method used in this study is a quantitative approach. The analysis used is multiple regression analysis with the logistic regression analysis (Gujarati & Porter, 2009). The variables used in this study are the independent variable and the dependent variable.
Mathematically, the regression equation can be written as follows:

$$Y = a + b1X1 + b2X2 + b3X3 + b4X4 + b5X5 + b6X6 + b7X7 + b8X8 + \varepsilon$$

Information:
Y = Decision to use cropping pattern
Y = 1, farmers apply optimal cropping pattern (1st, 2nd and 5th cropping patterns)
Y = 0, farmers do not apply optimal cropping pattern (3rd, 4th, and 6th cropping pattern)

X1 = Land area (hectare)
X2 = Capital (Rupiah)
X3 = Number of workers (day work of people/HKO)
X4 = Income (Rupiah/Month)
X5 = Crop Farming experience (years)
X6 = Livestock Farming experience (years)
X7 = Education level (years)
X8 = Age (years)
ε = error term
a = constant
b1- b8 = Regression coefficient

To estimate the multiple linear regression equation, it is necessary to perform statistical tests. Among them are; The coefficient of determination test (R-Square), F-Statistics Test, and T-Statistics Test.

3. RESULTS AND DISCUSSION

Socio-economic factors that influence farmers' decisions in choosing cropping patterns and livestock

In this study, socio-economic factors that are thought to influence farmers in the selection of cropping patterns and livestock include factors of land area, capital, income, number of workers, farming experience, education level, and age. The results of data analysis can be presented in the following table:

Table 1. The results of the regression analysis of socio-economic factors that influence farmers' decisions in choosing the optimal cropping pattern

Variable	β	z-stat	P-value
Intercept	-3.995034	-1.531768	0.1256
Land area (X_1)	-2.154999	-2.172942	0.0298*
Capital (X_2)	1.68E-07	2.537235	0.0112*
Number of Workers (X_3)	0.002459	2.003442	0.0451*
Income (X_4)	2.96E-07	2.792024	0.0052*
Farming experience (X_5)	-0.011228	-0.245732	0.8059
Livestock Experience (X_6)	0.150403	1.005891	0.3145
Education Level (X_7)	-0.115029	-0.235597	0.8137
Age (X_8)	0.041262	0.967486	0.3333
LR-Statistic	56.09920		
Prob(LR statistic)	0.000000		
McFadden R-squared	0.601119		
Prob. Chi-Sq(8)	0.603200		

*Significant at the level: 5 percent; Source: data processing results (2020)

Based on the regression analysis of socio-economic factors that influence farmers in the selection of cropping patterns and livestock, it can be identified that all independent variables have a significant effect on farmers' decisions in choosing cropping patterns. This is evident from the results of the regression analysis where the Prob (LR statistic) (0.000) < from (0.05). Based on the results of the analysis also shows the value of McFadden R2 of 0. 601119 meaning that as many as 60.11 percent of the variables included in the model together have a significant effect on farmers' decisions in selection of cropping patterns and livestock. The remaining 39.89 percent is influenced by other variables that are not included and the model. Based on the Godness of fit test analysis, the value of Prob. Chi-Sq(8) is 0.603200 > 0.05, meaning that the model can be said to be fit, where the model is able to predict the value of the observations.

Furthermore, the results of the partial analysis for each independent variable (X) that affect farmers' decisions in choosing cropping patterns include land area, capital, income, number of workers, experience in farming crops, experience in raising livestock, education level, and age. The explanation of the partial regression analysis can be described as follows.

a. Land Area (X_1)

From the results of data analysis in Table 1, it is found that the area of arable land has a negative sign (relationship) with a regression coefficient value (β1 = 2.154999), and has a significant (significant) effect. This is evidenced by the magnitude of P-Value 0.0298 < 0.05. This means that every increase in the area of arable land by one unit (1 hectare) with the assumption that other factors are considered constant will cause farmers to think more about implementing a cropping pattern that is in accordance with land conditions, so that with an increase of 1 ha of land, the opportunity for farmers in choosing the optimal planting pattern decreases of 2.154999. This can be understood because of the large risks faced by farmers in Pringgabaya District due to constraints in water availability and poor mastery of plant cultivation techniques (plant pest management) so that farmers will be very careful in choosing cropping patterns, especially crop cultivation such as onions, corn, chilies and tomatoes. This result is in line with research by Aksari et al., (2021) which states that land area has a significant influence on farming development with a negative sign.

This result is different from that expressed by Usboko & Fallo (2016); and Utari et al., (2019) which revealed that land area has a positive and significant effect on farmers' decisions. In this case the land is seen as an asset (wealth) of farmers. The wider the area of arable land owned will increase the confidence of farmers in the income that is expected to be received. Where every additional land area will increase farmers' opportunities in implementing ideal farming patterns according to farmers' plans, so it is expected to increase farm production and farmers' welfare. The results of this study indicate that more land is needed that can be cultivated by farmers in order to be able to carry out optimal farming patterns. This result is in line with research (Dariah & Heryani, 2014) that land conditions in East Lombok are dry land areas that are still extensive and have not been used properly. Government will and policies are needed in distributing land to increase community farming activities. Thus the output of agricultural production will increase, and have a direct impact on increasing production output and local government income.

b. Capital (X2)

Capital variable is one of the socio-economic factors that influence farmers' decisions in selecting cropping patterns where capital is a cash outlay issued by farmers in the production process. Based on the results of the analysis in Table 1, it was obtained information that the capital variable had a positive effect with the regression coefficient value (β2 = 1.68E-07) and had a significant (significant) effect where the P Value 0.0112 < 0.05. This means that each additional capital at a certain level is one unit while other factors are considered to continue to cause an increase in farmer decisions in choosing the optimal cropping pattern. This means that statistically the capital variable affects farmers' decisions in choosing the optimal cropping pattern. These results are in line with the research of Hermawan and Andrianyta (2013) which shows that capital has a positive and significant effect on increasing farm production. The findings of this study indicate that the additional capital encourages farmers to apply technology optimally so that their farming productivity increases.

The limited capital owned by farmers can be an obstacle in the implementation of their farming, thus influencing farmers' decisions in choosing the optimal cropping pattern, as well as the types of plants to be cultivated. Based on the results of the analysis in Table 1 that capital provides a positive value so that it can increase the chances of farmers choosing the optimal cropping pattern, the increase is statistically real so that the proposed hypothesis can be accepted. Communities in Pringgabaya Sub-district who have large enough land and sufficient capital choose plants that can generate promising income with commodity market shares that are accepted quickly by the market. In this regard, Soekartawi (1986) explained

that cash capital is an important element that is often the initial consideration in planning a farm. In addition to the necessities of life for farmers and their families, cash capital must be available for the purchase of production facilities, labor costs, costs for livestock, and other costs. Therefore, cash capital can influence farmers' decisions in the implementation of their farming, although in the end the possibility of income to be obtained becomes a strong driver to seek the availability of costs so that the production process can be carried out. The capital used by farmers in Pringgabaya District in agricultural cultivation generally comes from their own capital and comes from external loans. To meet the lack of capital, farmers borrow from various parties, such as borrowing from more capable farmers, BRI Units or with a bonded system. One of the hopes of farmers is that there is assistance from the government to cover the lack of capital. This is because for farmers, capital loans do not even lighten the burden on farmers but still burden farmers with the amount of loan interest given. As well as the existence of a guarantee requirement (if making a loan to a bank) that is included is an obstacle for farmers in the availability of capital. Because many farmers do not have assets in the form of goods or certificates that can be used as collateral. This argument is supported in research by Elly (2008) which reveals that the Government needs to provide capital assistance, counseling, training, and the introduction of superior forage plants that can be planted between coconut trees and open land in an integrated crop-livestock farming pattern in North Sulawesi.

c. Number of Workers (X3)

From the results of data analysis in Table 1, it is found that the variable number of workers has a positive effect on the optimal cropping pattern decision with a regression coefficient value (β3 = 0.002459) and is significant (significant) where P Value 0.0451 < 0.05. That is, if the number of workers at a certain level is increased by one unit (1 person), then farmers will be more effective in carrying out farming and farming production activities will be more optimal. The addition of labor also makes it easier for farmers to distribute labor in carrying out each farming pattern, so that the possibility of farmers' decisions in choosing the optimal cropping pattern is greater. Seeing the results of the analysis obtained specifically for the variable number of workers, the proposed hypothesis can be accepted because the value obtained from the analysis is a positive value and has a significant effect on the 0.05 level of significance. Findings that are in line with the results of this study were also disclosed (Julpanijar et al., 2016) which shows that the use of labor has a significant effect on the income of goat farmers.

d. Income (X_4)

In planning and implementing a farm, the income that can be obtained is a very useful measure to assess the success of the process of combining agricultural resources. Therefore, the amount of income received by farmers can influence farmers in choosing the type of farming activity to be carried out.

From the results of the regression analysis in Table 1, it can be seen that income has a positive effect with the value of the regression coefficient (β4 = 2.96E-07) and is significant (significant) where the P Value 0.0052 < 0.05. That is, if income at a certain level is increased by one unit while other factors will still cause an increase in farmers' decisions in choosing the optimal cropping pattern. So the implication of the value obtained is that the hypothesis of the variable from income is acceptable because the variable income is declared to have a positive effect on farmers' decisions in choosing the optimal cropping pattern. This means that the higher the income, the more flexibility for farmers to plan an ideal cropping pattern, even allowing them to increase or expand their production capacity. These results are in line with research by Aprilianan & Mustadjab (2016); Theresia et al., (2016); Valentine et al., (2019); and Novianti et al., (2019), which revealed that the farmer's income variable had a significant influence on farming.

Based on the research findings, it shows that the income value of farmers only from crop farming without being combined with livestock farming is relatively smaller when compared to the income obtained from integrated crop and livestock farming. This is due to the minimization of input costs for crop farming production using livestock waste. This result is in line with research (Kariyasa, 2005) which states that rice farming which is managed in combination with livestock or using manure is able to produce about 6.9 - 8.8 percent higher than rice farming which is partially managed without using manure. Interesting findings also show that the higher the income, the farmers also have an increase in consumption expenditure. This shows that farmers' expenditures are not well coordinated. The bad thing is that farmers spend more on social activities, especially for donations to community/neighbours' celebration parties. This is because the respondent farmers in the

research location have strong solidarity. This is a bad habit in rural areas from an economic point of view. This activity is economically wasteful and can be a burden to neighbors, friends and other family members. Even the most important thing, for example the allocation of expenditure for family education, is still relatively low. This is related to the fact that there are still many people, especially farmers, whose education level is only elementary school graduates.

e. Crop Farming Experience (X5)

The experience of farmers in farming crops is one of the socio-economic factors that are thought to influence farmers' decisions in choosing cropping patterns. From the results of data analysis in Table 1, it is found that the area of arable land has a positive effect with the regression coefficient value (β5 = -0.011228) and is not significant where the P-Value 0.8059 > 0.05. This means that statistically the farming experience variable does not affect farmers' decisions in choosing the optimal cropping pattern. This is different from the results of research by Valentine et al., (2019) which showed the opposite result, where farming experience had a significant influence on sugarcane farming decisions.

f. Livestock Farming Experience (X6)

The experience of farmers in livestock farming is one of the socio-economic factors that are thought to influence farmers' decisions in choosing cropping patterns. Based on the results of data analysis in Table 1, it is found that the experience of farmers in livestock farming has a positive sign with a regression coefficient value (β6 = 0.150403) and has no significant effect, where P Value 0.3145 > 0.05. These findings indicate that experience in farming activities has no influence on farmers' decisions in choosing the optimal cropping pattern. So the hypothesis cannot be accepted. The livestock farming experience variable gives a positive and insignificant sign value at an alpha of 0.05. The livestock farming experience factor has no effect because the farmers in this study tend to be conservative and less open to change. The existence of counseling related to the adoption of new technology and counseling on cultivation and integrated crop-livestock patterns is still ignored by some farmers. Farmers maintain farming patterns and cultivation patterns from generation to generation, so they are reluctant to change farming patterns to make them more optimal. Farmers assume that changing cropping and cultivation patterns will be constrained by costs. Farmers also assume that there is no difference in yield between the new cropping pattern and the farming pattern that has been cultivated for generations.

g. Education Level (X7)

Based on the results of data analysis in Table 1, it can be shown that the education level variable has no significant effect on farmers' decisions in choosing the optimal cropping pattern. From the value obtained, the proposed hypothesis cannot be accepted. This is because the level of education of farmers in the majority of research locations is still low. So that it cannot describe the effectiveness of the level of education in the success of farming. The low level of education leads to a tendency for farmers to find it difficult to absorb new information, especially in agriculture, such as low adoption of agricultural technology. Ideally, educational programs, especially for farmers in rural areas, need to be considered to be intensified in order to increase the ability of farmers to absorb new information and improve their farming management.

h. Age (X8)

Based on the results of the regression analysis in Table 1, it is found that the variable after has a positive sign with a regression coefficient value (β8 = 0.041262) and has no significant effect (not significant). This is evidenced by the value of P-Value 0.3333 > 0.05, with this result means that the age variable has no significant effect on farmers' decisions in choosing the optimal cropping pattern so that the hypothesis for the age variable is rejected. Although the effect is not significant on the other hand, the age variable which has a negative sign indicates that the higher the age of the farmer, there is a tendency to maintain habits that have been carried out for a long time and generally have a slow nature in accepting or implementing a new method such as the application of a cropping pattern. Case in point, if the old habitual cropping pattern is inefficient, it is maize (planting season one) – chili (planting season two) – bero+livestock (planting season three). So farmers will find it difficult or reluctant to change to more efficient cropping patterns such as maize (planting season one) - soybean (planting season two) - bero+livestock (planting season three). In connection with the above description, the age is one of the socio-economic factors that influence farmers' decision making in the application of a technology as well as in farming arrangements. The higher the age of farmers, especially those over the range of 25-40 years, they tend to be a bit slower in absorbing or implementing a technology, because they tend to maintain their habits from generation to generation.

4. CONCLUSION

The independent variables which are stated to have a significant influence on farmers' decision making in implementing the integrated crop-livestock farming pattern are the variables of land area, capital, number of workers and income. While the variables that have no effect are education, age, experience of plant farming and experience of livestock farming.

BIBLIOGRAPHY

Aksari, RI, Taridala, SAA, & Mappasomba, M. Socio-Economic Factors Affecting Rice Farmers' Decisions Using Direct Seed Planting Technology (Table) and Without Tools in Ujung Tanah Village, Mare Sub-District, Bone District, South Sulawesi. JIA (Journal of Agribusiness Scientific): Journal of Agribusiness and Agricultural Socio-Economic Sciences, 6(3), 77-82.

Amir, P., & Knipscheer, HC (1989). Conducting On-Farm Animal Research: Procedures & Economic Analysis.

Apriliana, MA, & Mustadjab, MM (2016). Analysis of Factors Affecting Farmers' Decision Making in Using Hybrid Seeds in Corn Farming (Case Study in Patokpicis Village, Wajak District, Malang Regency). Habitats, 27(1), 7-13.

Apriyani, M., Saty, FM, & Asliana, E. (2019). Factors Affecting Banana Farmers' Decisions in Lampung. In Proceedings of the National Seminar on Agricultural Technology Development (Vol. 2018).

Aryana, AANB, Budhi, MK, & Yuliarmi, NN (2016). The Effect of Farmer Characteristics and the Role of Facilitators on the Success of Simantri in Badung Regency. E-Journal of Economics and Business, 5(4), 689-720.

Bell, LW, & Moore, AD (2012). Integrated crop–livestock systems in Australian agriculture: Trends, drivers and implications. Agricultural Systems, 111, 1-12.

Dananjaya, IGAN (2020). The Effect of Integration of Goat Livestock and Coffee Plants on the Income of Amerta Animal Farmers Group, in Mundeh Village, West Selemadeg District, Tabanan Regency. dwijenAGRO, 10(1), 53-60.

Dariah, A., & Heryani, N. (2014). Empowerment of Sub-Optimal Dry Land to Support Diversification and Food Security Policy. Jurnal Sumberdaya Lahan, 8(3).

De Faccio Carvalho, PC, Anghinoni, I., de Moraes, A., de Souza, ED, Sulc, RM, Lang, CR, ... & Bayer, C. (2010). Managing grazing animals to achieve nutrient cycling and soil improvement in no-till integrated systems. Nutrient Cycling in Agroecosystems, 88(2), 259-273.

De Moraes, A., de Faccio Carvalho, PC, Anghinoni, I., Lustosa, SBC, de Andrade, SEVG, & Kunrath, TR (2014). Integrated crop–livestock systems in the Brazilian subtropics. European Journal of Agronomy, 57, 4-9.

Dewi, RK, & Sudiartini, S. (2005). Socio-Economic Factors Affecting Farmers' Decision Making in Vegetable Sales System. SOCA: Journal of Agricultural Socioeconomics, 1(2), 43839.

Doré, T., Makowski, D., Malézieux, E., Munier-Jolain, N., Tchamitchian, M., & Tittonell, P. (2011). Facing up to the paradigm of ecological intensification in agronomy: revisiting methods, concepts and knowledge. European Journal of Agronomy, 34(4), 197-210.

Elly, FH (2008). Community Cattle Business Development through Cattle-Plants Integration in North Sulawesi. Journal of Agriculture and Agricultural Development, 27(2), 63-68.

Fachruddin, AA (2013) Factors Influencing Tobacco Farmers' Decision Making to Partner with Tarutama Nusantara Agribusiness Cooperative Through Margi Utama Cooperative. [Thesis]. University of Jember.

Gujarati, DN & Porter, DC (2009). Basic Econometrics. McGraw-Hill Irwin

Hermawan, H., & Andrianyta, H. (2013). The role of additional capital on rice farming income in Blitar and Ngawi Regencies, East Java. Journal of Agricultural Technology Assessment and Development, 16(2).

Ilham, N., & Saliem, H. P. (2016). Kelayakan finansial sistem integrasi sawit-sapi melalui program kredit usaha pembibitan sapi. Analisis Kebijakan Pertanian, 9(4), 349-369.

Indrayani, I., & Hellyward, J. (2015). Optimization of production and profit maximization of beef cattle business with cattle-palm integration system in Dharmasraya Regency. Indonesian Journal of Animal Science, 17(3), 187-194.

Julpanijar, J., Hasnudi, H., & Rahman, A. (2016). Analysis of Livestock Business Income in Hinai District, Langkat Regency. Journal of Agrica, 9(1), 9-19.

Kariyasa, K. (2005). Plant-Livestock Integration System in Perspective Reorientation of Fertilizer Subsidy Policy And Increasing Farmers Income. Analisis Kebijakan Pertanian, 3 (1), 68-80.

Khurniyah, H., Ilahude, Z., & Mukhtar, M. (2019). Income and Business Development Strategy for Beef Cattle Integration in Cocoa Crops in Boalemo Regency, Gorontalo. Journal of tropical galung, 8(3), 176-189.

Lionberger, H.F. (1960). Adoption of New Ideas and Practices. The Iowa State University Press. U.S.A. 164.

Lumbantoruan, N., Tafsin, MR, & Daulay, AH (2014). Relationship of Breeder Profile with Mud Buffalo Livestock Business Income in Lintong Nihuta District, Humbang Hasundutan Regency. Journal of Integrative Animal Husbandry, 3(1), 46-61.

Mita, YT, Haryono, D., & Marlina, L. (2018). Analysis of income and factors that influence the decision making of rice seed breeding farming in Pesawaran Regency. Journal of Agribusiness Science: Journal of Agribusiness Science, 6(2).

Mubyarto. (1985). Introduction to Agricultural Economics. Jakarta: Institute for Educational Research and Economic and Social Information.

Novianti, AS, & Khairati, R. (2019). Analysis of Factors Affecting Farmers' Decisions in Using Certified Rice Seeds in Nagari Sumani District X Koto Singkarak, Solok Regency. JOSETA: Journal of Socio-economics on Tropical Agriculture, 1(2).

Nursan, M., & Septiadi, D. (2020). Determination of Priority for Leading Livestock Commodities in West Sumbawa Regency. JIA (Journal of Scientific Agribusiness): Journal of Agribusiness and Agricultural Socio-Economic Sciences, 5(1), 29-34.

Prawiradiputra, BR (2009). Are there still opportunities to develop integration of crops with livestock in Indonesia? Wartazoa, 19(3), 143-149.

Rachman. N., January. J., Sudarko. 2014. Factors Underlying Decision Making of Cabbage Farmers and Cabbage Farming Development Strategies. Agricultural Scientific Periodic 1(1): xx-xx

Rogers EM, Shoemaker FF. (1971). Communication of innovation. second edition. New York (US): The Free Press.

Ryschawy, J., Choisis, N., Choisis, JP, Joannon, A., & Gibon, A. (2012). Mixed crop-livestock systems: an economic and environmental-friendly way of farming?. Animals, 6(10), 1722-1730.

Septiadi, D., FR, AFU, Ardana, Y. (2021). Optimization of Integrated Farming Production as an Effort to Increase Farmers' Income in East Lombok Regency. Hexagro Journal. 5(1), 1-15.

Soedarmanto, (1994). Agricultural Extension Management. Fakultas Pertanian - Universitas Brawijaya. Malang.

Soekartawi. 1986. Farming Science and Research for Small Farmer Development. Universitas Indonesia, Jakarta.

Theresia, V., Fariyanti, A., & Tinaprilla, N. (2016). Farmers' Decision Making on the Use of Local and Imported Shallots in Cirebon Regency, West Java. AGRARIS: Journal of Agribusiness and Rural Development Research, 2(1), 50-60.

Ugwumba, COA (2010). Environmental sustainability and profitability of integrated fish cum crop farming in Anambra State, Nigeria. Agricultural Journal, 5(3), 229-233.

Usboko, AM, & Fallo, YM (2016). Socio-Economic Factors Affecting Production of Mustard Vegetable Farming in Mitra Timor Farmers Group. Agrimor, 1(03), 60-62.

Utari, DS, Syakir, F., & Siswadi, B. (2019). Analysis of Factors Affecting Farmers' Decisions in Implementing Intercropping Farming Patterns of Red Chili With Hybrid Rawit Chili in Bocek Village, Karangploso District, Malang Regency. Journal of Socio-Economic Agriculture and Agribusiness, 7(1).

Valentine, BD, Kuntadi, EB, & Hartadi, R. (2017). Factors underlying decision making Sugarcane farmers partner with PG. Djatiroto. Journal of Agribest, 1(1).