The Potential of Livestock Farming in the Agricultural Income Structure of Rural Farmers

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ABSTRACT

In addition to foodstuff farming by most Indonesian farmers are also raise livestock whether cattle, goats, sheep or even poultry. While agricultural areas decrease over time, livestock should play greater role in improving the welfare of farmer's household. The aims of this study were to determine the contribution of livestock farming income and the potential of livestock farming in the agricultural income structure of rural farmers. The research was conducted in rural areas at Yogyakarta Province. Survey methods were used in this study and interviews were conducted on 211 farmers. Data were analyzed by income and cost analysis and multiple linear regression analysis. The result showed that the income of livestock rising contributed 31.58 % to the total of agricultural income. Based on multiple regression analysis showed that the total of agricultural income jointly ($P \leq 0.01$; $R^2 = 0.630$) was influenced by controlled land (X_1), length of education (X_2), number of family member (X_3), the number of the livestock raised (X_4) and the income of livestock raising (X_5). Partially the controlled land (X_1), the number of the livestock raised (X_4) and the income of livestock raising (X_5) were to have positive and very significant influence ($P \leq 0.01$) on the agricultural income of the farmers. It can be concluded that livestock farming was a branch of agriculture farming and has a very real potential to increase agricultural income of the farmers.

Keywords: The potential of livestock farming, Agricultural income of farmers, Foodstuff farming, The welfare farmer's household.

INTRODUCTION

Most of Indonesian people get their earnings on the agriculture sector, and they are as smallholder farmers. Those indicate that smallholder farmers are important for the household welfare of the most Indonesian people.

According to Soekardono, (2017) the household of Indonesian farmers had very small controlled land which is less than 0.5 Ha, so the welfare of household Indonesian farmers were low. More over it could be explained that around 60 % household of Indonesian farmers only had controlled land less than 0.5 Ha. Even in the areas which had done agriculture intensively (such as Java, Bali and Lombok) the average of agriculture controlled land only 0.3 Ha. With the limited of the controlled land, the agriculture productivity would not meet agriculture household welfare. In general therefore agriculture household carry out diversification of farming horizontally or vertically. Horizontal diversification is mostly done in rural area that is integrated crop-livestock system.

According to De Leeuw et al (1999) in smallholder systems, which dominated tropical agriculture, livestock were important because they produced much more than food: they provided direct cash income; they were assets capital ; they produced manure used as fertilizer and fuel; and they may be a source of power for transport and cultivation.

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Nevertheless one function, the production of livestock product for human food, is often the primary reason for keeping livestock, whether by pastoralists to meet their subsistence needs in arid and semi arid regions, or by peri-urban smallholder farmers as a source of income from product livestock sales.

Therefore the objectives of this research were to determine the contribution of livestock farming income and the potential of livestock farming in the agricultural income structure of rural farmers.

MATERIALS AND METHODS

Sample of Research

The samples of this research were farmers who have controlled land to cultivate and also keep livestock. The samples of 211 farmers were taken by purposive sampling.

Data Analysis

Some analysis methods were used. Each was described as following.

(1) Analysis of cost and income (Soedjana,2007)

π = TR – TC
   = TR − (VC + F)
   = Py.Y – Px.X – F

π: Total of agricultural income
TR: Total revenue from the integration of crop farming + livestock farming
TC: Total Cost of the integration of crop farming + livestock farming
VC: Variable Cost
F   : Fixed Cost
Py: The price of output
Px: The price of input
Py. Y: Total Revenue (TR)
Px.X + F = Total Cost (TC)

(2) To prove that the factors affect to agricultural income, multiple regression analysis was done (Greene, 1993). Factors used in the research were controlled land (X_1), length of education (X_2), number of family member (X_3), the number of the kept livestock (X_4) and the income of livestock raising (X_5).

The formula used to know the factors influencing the agricultural income was:

$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4 X_4 + b_5X_5$

Y: Total of agricultural income (IDR/year/farmer)
X_1: controlled land (m2)
X_2: length of education (year)
X_3 the number of family member (person)
X_4: the number of the livestock raised (AU, according to Njuki et al., 2011)
X_5: the income of livestock raising (IDR/year)
a: Constanta
$b_1....b_5$= regression coefficient

RESULTS AND DISCUSSION

Based on income and cost analysis the income of livestock raising contributed 31.58 % to the total of agricultural income. It indicated that livestock farming was a branch of agriculture farming.

From Table 1 it could be seen that the value of R^2 was 0. 630 It was indicated that 63.00 % of the variance of total agricultural income was influenced by controlled land (X_1), length of education (X_2), number of family member (X_3), the number of the livestock raised (X_4) and the income of livestock raising (X_5), while 36..90 % was influenced by variables outside the model. The result of multiple regression analysis showed that the agricultural income can be explained jointly and very significant ($P \leq 0.01$) by controlled land (X_1), length of education (X_2), number of family member (X_3), the number of the livestock raised (X_4) and the income of livestock raising (X_5).

Table1. The result of multiple regressions analyze

Variable	Coefficient regression	Significance
Constanta	2805359.434	0.760
Controlled land	1966.359	0.000
Length of education	568518.853	0.372
Number of family member	-610805.571	0/732
The number of the livestock raised	1962182.649	0.000
The income of livestock raising	0.226	0.001

R^2 : 0.630
F : 72.479 (P≤ 0.01)

Partially, the controlled land (X_1), the number of the livestock raised (X_4), and the income of livestock raising (X_5) were to have positive and very significant influence ($P \leq 0.01$) on the agricultural income of the farmers.

Actually the results of this research are identical to the former findings those are Mubyarto (1986), said that the more land controlling will be influence positively to the number of product that will increase the income of farmers.; Kitalyi et al said, (2005) beyond their role of providing food and inputs for agriculture, livestock are important as savings or investments for the farmers, and provide security or insurance through various ways in different production systems. Livestock allow what economists call "consumption smoothing", because they provide food for almost the whole year and because they can be sold to buy food and other necessities at any time of year; unlike crops, which are highly seasonal. Crop harvests do not necessarily coincide with needs for cash. Livestock are an excellent way of accumulating wealth over the year or even over generations in systems where other investment opportunities may be few or untrustworthy. Many remote areas populated by livestock-keepers have no banking systems, and in many countries livestock have been a better investment than bank accounts in unstable and depreciating national currencies. Livestock act as an insurance against droughts that plague many dry–land areas, although livestock themselves are extremely vulnerable to drought. Much literature exists on this and related questions such as: For agro-pastoralists and dry-land mixed farmers, whether livestock really are an important buffer stock (Fafchamps et al., 1998). For livestock keepers,

what are the best strategies in the face of looming drought (selling or retaining livestock) and how are these strategies affected by real-world variations in marketing opportunities and external action (Morton and Barton, 2002).

According to Soedjana, (2007) some principal risks in a farming systems include production risk, business and financial risk, and destruction risk. From these principal risks, by using functional benefit, calculation integrated farming system between crops and animal has a minimum risk.

More over Lemaire et al (2014) suggested increasing diversity local integration of cropping with livestock systems, the systems will achieve economic, sociological, ecological, energy, environmental, and biogeochemical synergies and efficiencies.

CONCLUSION

It can be concluded that livestock farming was a branch of agriculture farming and has a very real potential to increase agricultural income of the farmers.

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