

# Household Economic Analysis on Pig Farms in East Flores Regency East Nusa Tenggara Province

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**Abstract**— Objectives of the research were to analyze contribution of pig farms to the household economic and factors influence the farms income. Data were collected since December 2018 until May 2019 in Bantala Village Lewolema Sub-district East Flores Regency East Nusa Tenggara Province. A hundred farmer categorized in farm scale of I, II, and III was selected as respondents based on purposive sampling. The data, then, were analyzed by applying descriptive analysis and multiple regression. The result shows that average percentage of income contribution to the pig farms household economic of scale I, II, and III were 43.33%, 53.98%, and 61.72%, respectively. Further, average percentage of total income contribution to the economic household was 54%. Factors influence dominantly influence the economic household income are number of pig owned, farms income without the income of pig farms, and non farm income; while factors that significantly have no influence to the economic household income are the farmers' age and range of land use in agriculture.

**Keywords**— Pig farms, economic household, influence factor.

## I. INTRODUCTION

Sub sector of animal is one of the main contributor to income since running animal farms to produce the animal commodities become an alternative job. The job, then, has an ability to contribute a high profit, provide employment for community and decrease unemployment. The reasons are based on the people daily needs in meat for food. Therefore, the role of animal sub sector become important and strategic indicated by the increasing of demand and consumption per capita of animal products.

Household is a production unit, so the household will maximize profit as well as household consumption unit in order to maximize utility. Concerning the villages pig farm households, the profit and the consumption can not be separated, because these two aspects are unity in the household economic. Input price and wage will influence patterns of household production and consumption. Therefore, the production will influence decision to consume through the influence of household total income and cost.

In community animal farms, a farmer usually has function as decision makers whose effort to decide an effective and efficient decision in running and managing his animal farm. The criteria of the community animal farm are: 1) little number of animal owned, 2) more household labors, 3) heritant technology used, and 4) improperly management in resources utilisation and farmers' skill include animal own level and low productivity. The low quality of men resources, particularly the farmers in the community described by a long

interval birth, low carcass quality, low growth, and high number of pre weaning mortality (Ly, *et.al.* 2010).

The pig farm has been being as a part of community tradition in East Nusa Tenggara (NTT) Province include the East Flores Regency. The pigs are raised in a heritantly tradition as the main requirement in cultural rituals and ceremonies, wedding gift (*belis*), and family feasts. These facts are supported by pig statistical data in Indonesia which NTT has the highest population of pigs and the population always increase. The statistical data shows that the fluctuation pigs population in NTT in period of 2012-2016 were 1,957,252 heads in 2012, it decreases to 1,751,805 heads in 2013, and it increases to 1,755,058 heads in 2014, then it becomes 1,812,449 heads in 2015, and it reaches 1,817,717 heads (BPS Dirjen PKH, 2017). Based on the data of the pigs population growth in NTT, it is found that level of consumer demand in pigs and porks is very high, therefore commonly the pig farm is the main farm of NTT community and particularly in East Flores Regency pig is the advantage commodity.

The pig farm households' income in the East Flores Regency can not be separated from production factors namely land, animals, consumption, and labours. Those factors are unity in increasing the farmers' income. According to the statistical data in 2017, the pig population in the regency always fluctuate. The data showed that the pig population was 162,111 heads in 2012, then it increased to 163,638 heads in 2013, and it decreased to 72,502 heads in 2014, but it increased again to 170,476 heads in 2015, then, it drastically declined to 96,772 heads in 2016 and a steady increased to 99,936 heads in 2017. The population fluctuation due to the pork demand is higher than that of the pig production. Therefore it is needed to evaluate by analysing: "Household Economic of Pig Farms Income and Influencer Factors. The research objectives are to analyze the contribution of the pig farms to the economic household and factors influence the pig farms' income in increasing economic household income in East Flores Regency East Nusa Tenggara Province.

## II. METHOD OF RESEARCH

### A. Location and Time

The research is conducted in Bantala Village, Lewolema Sub-district, East Flores Regency East Nusa Tenggara Province based on the reason that the village is a centre of pig farms development. Data were collected in period of December 2018 to May 2019.

**B. Research Materials**

The data, then, were collected using interview techniques based on prepared questionnaires. Number of sample is 100 farmer classified into three economic scale of the pig farms as follow: scale I with the number of pig owned is  $\leq 5$  UT covers 50 farmers, scale II for 5-10 UT covers 30 farmers, and scale III for  $\geq 10$  UT covers 20 farmers. The samples are selected by applying purposive sampling with criterias the farmers have been raising the pigs for more than five years and they are members of the village farmers group.

**C. Research Methods**

The data, then, are tabulated and analysed. Further, the data are analysed by applying method of income analysis and analysed using econometrics model approach continued with descriptively analyses. Net income of the raising pig activities can be counted based on the following formulation (Hartono, 2011):

$$\pi = TR - TC$$

where:  $\pi$  = Total Income or profit gained by the pig farmers (IDR/year), TR = Total Revenue of the pig farmers (IDR/year), TC = Total Cost spend by the pig farmers (IDR/year).

Total income of the pig farm contributes to the farmer households' income is counted based on an equalisation formula of village income structure (Nurmanaf, 1989) as follows:

$$I = \sum Pi + \sum Npi$$

where: I = Total Income of Household, Pi = Income gained from agriculture sector number - i, Npi = Income gained from non agriculture sector number-i.

Farm income is the difference value between Revenue and Expenditure, while the non farm income is gained from wage of each employee in employment market, therefore by combining with other income, the total income of the household is formulated as follows:

$$I = (P_{qi} Q_i - P_{xi} X_i) + W + V$$

where I = Household Income,  $P_{qi}$  = Price of agricultural output number-I,  $Q_i$  = Amount of agricultural output number - i,  $P_{xi}$  = Price of agricultural input number-i,  $H_i$  = Amount of agricultural input number - i, W = Off-farm Income, V = Others Income (non work).

The factors influencing the economic household income can be seen by applying a Model of Econometrics Approach based on Multiple Linear Regression Analysis using SPSS 13 software (*Statistical Package for Social Sciences*). The Multiple Linear Regression Analysis is applied to evaluate the influence among more than one predictor variables (independent variables) towards dependent variable and to help the user in inputting more than one predictor variables with an estimator model

(Kumanireng, *et al.*, 2015). The model is described as follows:

$$\hat{Y} = a + b1X1 + b2X2 + b3X3 + b4X4 + b5X5 + b6X6 + b7X7 + b8X8 + b9X9 + b10X10 + \mu$$

where:  $\hat{Y}$  = Income of the Pig Farmers influencing vary factors in raising pigs (Rupiah/year), a = Intercept Coefficient (constant), b1 b2 b3,,,b10 = Coefficient of Regression, X1 = Amount of family members (person), X2 = Age of Pig Farmers (year), X3 = Amount of Pig Owned in Animal Unit (AU), X4 = Farmers' experience in raising pigs (year), X5 = Formal education of the pig farmers (year), X6 = Amount of family member participating in raising pigs (Daily Man Work/hour), X7 = Farm Income of Non Pig Farm (IDR/year), X8 = Off-farm Income (IDR/year), X9 = Labour of family member in the farm (JKSP), and X10 = Range of land use for agriculture (hectare) and  $\mu$  = unresearched variables.

**III. RESULT AND DISCUSSION**

**A. Profile of Pig Farms in Research Area**

In East Flores, the pig farm can not be separated from the community life due to its multi utilities categorized into two advantages namely economical advantages and social cultural advantages. Regarding social cultural needs, pigs play important roles in tradition ceremonies such as wedding and death. Ly (2016) described that the role of the pigs in NTT's community heritably are as follow: Pig is the main requirement in cultural and wedding ceremonies include family feasts as well as social status. The higher the social status of a man or woman, the bigger the wedding gift values. Further, the higher the number of pigs slaughtered, the higher the value of the community feast. These existing conditions are the reasons that pig is a popular livestock in NTT people and particularly in Flores Island community. There is an old proverb in NTT's community: "Feast without pork is flavorless". The proverb shows that the availability of pork is very important in a feast or ceremony.

**B. Analysis of Pig Farms Household Economic**

The result shows that percentage of pig farms income contribution as economic household income of scale I, II and III are 43.33%, 53.98% and 61.72%, respectively (Table 1). Analysis result of economic household in each scale figures that the pig farms of scale II and III have a relatively high contribution to the household economic income. This fact related to the farmers of scale II and III since they sell their pigs in any phase of age, such as phases of starter, grower and finisher, while the famers in scale I only selling their pigs in finisher phase (Table 2).

TABLE 1. Average and Percentage of Income Sources of Pig Farmers (IDR/Year/Respondent), Year of 2018

No	Income Sources	Scale I		Scale II		Scale III	
		IDR	%	IDR	%	IDR	%
1	Pig Farms	12,118,000	43.33	17,571,336	53.98	25,495,000	61.72
2	Farms without Pig Farms	8,925,000	31.91	7,586,667	23.31	7,103,000	17.20
3	Non Farm	6,925,000	24.76	7,393,000	22.71	8,710,000	21.09
	Amount	27,968,000	100	32,551,003	100	41,308,000	100

Source: Primary Data Analysed, 2019

The highest average of the household economic income contribution is the farm without pig farms. This existing condition refers to the sources of the household economic income namely commodities of coconuts and cashew nuts. However, these two commodities also have important contribution to the pig farms. Actually, the pig farmers utilise those two commodities by-products for pigs feed, such as *tapo kuha*, *keki*, and *tapo neli* from coconut oil processing and *tapo wa'i* as well as *tapo kuwir* from coconut copra processing, include *kajut wua* from the cashew nut by-products. *Tapo kuha* is coconut pulp, *keki* is coconut meal, *tapo neli* is waste water of coconut oil processing; while *tapo wa'i* is coconut water and *tapo kuwir* is coconut shoot as by-products of copra processing. Then, *kajut wua* is cashew nut pseudo fruits.

TABLE 2. Average Number of Selling Pigs (Head/Year/Respondent), Year of 2018

Phase of Pigs	Pigs Sold (AU)					
	Scale I	%	Scale II	%	Scale III	%
Starter	0.16	6.56	21.86	93.10	30.65	89.05
Grower	0.02	0.82	0.06	0.26	1.05	3.05
Finisher	2.24	91.80	1.5	6.39	2.27	6.60
Swine	0.02	0.02	0.06	0.26	0.45	1.31
Amount	2.44	100	23.48	100	34.42	100

Source: Primary Data Analysed, 2019.

Table 2 describes that the more the pigs raised, the more the pigs sold. Table 2 also shows that the scale I and II farmers categorised as combination farms comprise breeding and fattening farms. However, main of the scale III farmers tend to run fattening farm that sell the pigs more than one year old. In

view of economic aspect, the farmers in scale I need a relatively high feed cost and other production costs. In contrast, the scale II and III farmers are more efficient in spending production cost because they sell their pigs in various phases of ages. This facts are relevant to the statement of Sembiring (2016) that percentage of production cost for feed in a pig farm reaches 60-80%. This constraint can be overcome by running a combination pig farms namely breeding and fattening farms. In case of unyield the finisher pigs, but the farmers need cost for sustaining the pig farms and household investment or any other need of household economic sufficiently, they can sell their pigs in the phases of starter, grower, or finisher and *vice versa*.

C. Net Income of Pig Farmers

Net income of the pig farmer households is the difference value between the households revenue and expenditures. Total revenue of the pig farmer households covers the pig farms income, the farms without the pig farms income, and off-farm income. In contrast, total expenditures of the pig farmer households consist of the household production cost, household consumption cost, education cost, and any other cost spent by family members to support the community socio cultural activities.

There are two components of production cost in the pig farms namely variable and fixed costs. The variable costs comprises the cost of breeding, castration, vitamin injection or vaccination, medicine, and feed. In addition, the fixed cost comprises the cost of pigshed, tools and appliance in pig shed.

TABLE 3. Average of Production Cost on Pig Farms (IDR/Year/Respondent), Year of 2018.

Components of Production Cost	Scale I		Scale II		Scale III	
	IDR	%	IDR	%	IDR	%
<b>Variable Costs</b>						
- Breeding Cost	681,039	29.01	709,300	16.76	945,760	13.13
- Castration Cost	247,059	10.52	452,140	10.69	607,128	8.43
- Injection Cost	201,280	8.57	403,611	9.54	601,290	8.35
- Medicine and Vaccination Costs	69,269	2.95	148,193	3.50	341,802	4.74
- Feed Cost	155,521	6.62	1,123,901	26.56	2,530,194	35.12
Total Variable Costs	1,354,168		2,837,145		5,026,174	
<b>Fixed Cost (Deppreciation/year)</b>						
- Swine	138,888	5.56	194,301	3.33	331,710	2.66
- Feed & Drink Appliance	40,000	1.60	80,000	1.37	120,000	0.96
- Cart	120,000	4.80	120,000	2.06	120,000	0.96
- Plastic bucket	21,417	0.86	39,834	0.68	511,351	4.10
- Feed spatula	2,000	0.08	2,000	0.03	4,000	0.03
- Chopper	300,000	12.01	300,000	5.14	300,000	2.41
- Broom stick palm / Sapu lidi	2,100	0.08	3,400	0.06	5,000	0.04
- Shovel /Sekop	25,000	1.00	25,000	0.43	25,000	0.20
- Water hose/ Selang air	50,000	2.00	50,000	0.86	50,000	0.40
- Hoe	35,307	1.41	40,128	0.69	50,220	0.40
- Big knife/Parang	50,000	2.00	50,000	0.86	50,000	0.40
- Tofa	30,380	1.22	42,149	0.72	45,010	0.36
- Sprayer	80,000	3.20	80,000	1.37	80,000	0.64
- Rope	10,000	0.40	10,000	0.17	5,000	0.04
- Pigshed	57,210	2.29	294,004	5.04	378,022	3.03
- Pigshed Renovation	31,510	1.26	63,270	1.09	103,477	0.83
Total Fixed Cost	993,812		1,394,086		2,178,790	
Total Production Cost	2,347,980	100	4,231,231	100	7,204,964	100

Source: Primary Data Analysed, 2019

Percentage of feed cost in the components of variable costs is the highest one in total production cost of the pig farms occurs in the farms of scale II and III, they are 26.56% and 35.12%. It is relevant to the statement of Sembiring (2016) that the percentage of production cost of pig farms for feed is 60-80%. In contrary, the pig farms of scale I is different from the explanation of Sembiring (2016) that the highest of production cost of pig farms is feed cost. The reason is the farmers of scale I can utilise agricultural waste for feed. Therefore, the average percentage of production cost in pig farms on scale I in the research area is lower than that of the scale II and III. In fact, the average percentage of feed cost in the component of variable cost as a part of total production cost of scale I is 6.62%, while breeding cost reaches 29.01% and it is the highest average percentage of fixed cost components in total production cost.

TABLE 4. Average of Net Total Income of Pig Farm Economic Households (IDR/Year/Respondent), Year of 2018

Scale of Farms	Revenue (IDR/year)	Expenditures (IDR/year)	Net Income (IDR/year)
I	27,968,000	11,697,061	16,270,939
II	32,551,003	13,721,589	18,829,414
III	41,308,000	16,970,676	24,337,324

Source: Primary Data Analysed, 2019

Net total income of pig farm economic households in the research area on each scale (Table 4) shows that the bigger the scale of pig farms, the bigger the net income annually. The increasing of the net income supports the increasing of the total income as shows by the increasing of starter selling number. Further, concerning household expenditures, the higher the number of pig population raised, the higher the expenditures in the pig farms. Table 4 figures that the average of total net income of the pig farm economic households gained by the pig farmers on scale I, II, and III are IDR. 16,270,939; IDR.18,829,414; and IDR. 24,337,324, respectively.

**D. Income Contribution of Pig Farms towards Total Income of Respondent Household Economic**

In this reaseach, contribution means contribution of the pig farms in the research area which covers 100 pig farmers.The

pig farms in the Bantala Village is done by the farmers in order to gain a household economic income. Besides, the farmers also gain their income from farm commodities such as chasew nut, coconut, cocoa, candle nut, horticulture, and raise other animals. They also gain their income from their job as civil servant, etc. The house hold total income based their come of the pig farms, non pig farms, and non farm income.

TABLE 5. Average of Pig Farmers Income in Contribution to Economic Household (IDR/Year/Respondent), Year of 2018

Source of Income	Amount of Income (IDR)	Percentage (%)
Pig Farms	18,394,779	54.19
Farms of Non Pig Farms	7,871,556	23.19
Non Farm	7,676,000	22.61
Total Income of Household	33,942,334	100.00

Source: Primary Data Analysed, 2019

Average of pig farmers income contribution to the household economic is 54.19% with the income value is IDR. 18,394,779 of total household income value of IDR. 33,942,334 annually. The pig farms contribute 54,19% toward the household economic income, it means the pig farms contribution relatively high to the household economic income. Therefore, the pig farms income can be spent to fulfill family needs such as cost of maintenance, education, etc. This condition is supported by the explanation of Woel (2014) that the income is a real revenue of all family members contribute to the family needs both together and personally in the household.

**E. Factors Influence the Pig farms in the Research Area**

Based on the equalisation of Multiple Linear Regression (Table 6), it can be seen that influence of constanta values (X1), (X2), (X3), (X4), (X5), (X6), (X7), (X8), (X9) and (X10) toward (Y) in pig farms at Bantala Village Lewolema Sub-district East Flores Regency is 4.954. It shows that if the independent variables (variable X) is zero or nothing, therefore the household economic income of the pig farms value is 4.954. It means although without influence of constant variables (X1,X2,,X10) the pig farmers still can gain their household economic income in pig farms (Y).

TABLE 6. Result of Multiple Linear Regression of Independent Variable

Model		Coefficients <sup>a</sup>	sig
1	(Constant)	4.954	.000
	X1 (Number of Family Member)	.085	.381
	X2 (Age of Pig Farmers)	-.052	.582
	X3 (Number of Pig Raised)	.491	.000***
	X4 (Experience of Raising Pigs)	.096	.265
	X5 (Education Level of Pig Farmers)	.043	.643
	X6 (Number of Family Members Participate in Raising Pigs)	.028	.773
	X7 (Farms Income of Non Pig Farms)	.725	.000***
	X8 (Income of Non Farm)	.718	.000***
	X9 (Time Allocation of Family Members)	.004	.952
	X10 (Range of Agricultural Land Use)	-.012	.831
F arithmetic	23.856		
F Table	1.94		
t Table	1.661		
Note	significant on the level of $\alpha = 0,05$		

Source: Primary Data Analysed, 2019

Coefficient regression value of each independent variable which dominantly influence towards household economic income (Y) is as follow: 1) Coefficient regression of pigs owned number (X3) is 0.491, it means if (X3) increases, so do the (Y), because the (Y) will increase to IDR. 0.491. The higher the (X3) the higher the (Y) gained by the farmers from pig farms. In other words, each addition of (X3) value, it will increase (Y) at 49.1%, in this case it is assumed that other variables are constant. 2) Coefficient regression of non pig farms income (X7) is 0.725, it means if (X7) increases, therefore the pig farmer household economic income (Y) will increase to Rp. 0.725. The higher the (X7) the higher the (Y) or every addition of (X7) it will increase (Y) to 72.5%. It is assumed that other variables are constant. 3) Coefficient regression of non farms income (X8) is 0.718, it means if (X8) increases, then (Y) will increase to Rp. 0.718. The higher the (X8) the higher the (Y) gained by the pig farmers or each addition of (X8) it will increase (Y) to 71.8%. In this case, it is assumed that other variables are constant.

#### *F. Influence of Pig Farmers Age (X2) to the Variable of Household Economic Income (Y)*

Result of hypothesis test shows that variable of pig farmers age (X2) insignificantly influence to the income of pig farm economic households (X2) in Bantala Village. The evidence is shown by the result of multiple linear regression is -0.052 while the level of significancy is 0.05. Therefore, the significancy value is  $0.582 \leq 0.05$  so the decision is accept H0 and reject H1. It means the variable of of the pig farmers age significantly has no influence to the household economic income of pig farms although a part of the pig farmers are in productive age with the age range is 30-64 years. This result is supported by a statement of Hartono (2010) that the productive age is an age when a person can do any productive activity efficiently so he/she can gain an income to develop his job or farm by adopting technology. On the other hand, the result of analysis shows that a part of the pig farmers is not in productive age since they are older with the age range is 65-73 years. Soekartawi (2002) mentioned that the old farmers are fanatics to tradition and it is difficult to change their mind, way of thinking, way of working and way of living to develop their farm by adopting new or latest technology. Those old farmers has an apathic attitude towards a new technology.

#### *G. Influence of Raising Pig Number Variables (X3) to the Variable of Household Economic Income (Y)*

Result of hypothesis test shows that the (X3) is very influence to the pig farms household economic income in the research site (Y). It can seen from the analysis result of multiple linear regression with value of t statistic is  $8.388 > 1.987$  t table in accordance with its significancy level of  $\alpha = 0.05$  or its significancy value is  $0.000 < 0.05$ . It means the level of significancy is more than that of significant value gained or  $0.05 > 0.000$ . Therefore the decision is reject H0 and accept H1, it means the (X3) has significant influence to the (Y). Number of raising pigs is very influence to the income of household economic, because the higher the number of pigs

raising, the higher the number of pigs sold. This result is supported by the statement of Prawirokusumo (1991) deals with scale of animals owned that the higher the number of animals owned, the higher the number of animals sold, so it will reduce costs in raising the animals.

#### *H. Variable of Farms Non Pig Farms Income (X7) on Variable of Household Economic Income (Y)*

Result of hypothesis test shows that (X7) is very influence to (Y). The evidence is the result of mutiple linear regression analysis with t statistic  $9.965 > 1.987$  t Table in accordance with its significancy level  $\alpha = 0.05$  or its significancy value is  $0.000 < 0.05$ . It means that the level of significancy is higher than that of significant value resulted or  $0.05 > 0.000$ . Therefore, it is reject H0 and accept H1, it means the (X7) has significant influence to (Y). In this case, the pig farmers can spend their income gained from the farms of non pig farms in running the pig farms and other social economic household needs. This fact is relevant to the explanation of Woel (2014) that the income is an amount of real revenue of all family members contributed to fulfill together and personally needs in a household.

#### *I. Variable of Non Farm Income (X8) to the Variable of Household Economic Income (Y)*

Test result shows that (X8) very influence to (Y). This can be seen on the result of result of Multiple Linear Regression analysis with t statistical value is  $7.844 > 1.987$  t table in accordance with its significancy level of  $\alpha = 0.05$  or significancy value  $0.000 < 0.05$ . It means that the significancy level more than that of significancy value produce or  $0.05 > 0.000$ . Therefore the decision is reject H0 and accept H1, it means that the (X8) significantly influence to (Y), so the non farm income can be used by the farmers to fulfill the pig farm needs as well as household social economic needs This condition is supported by the expalanation of Woel (2014) that income is a real revenue of all famili member contributed to fulfill all family members needs both together and personally in a household.

#### *J. Variable of Agricultural Land Use (X10) in Variable of Household Economic Income (Y)*

Result of hypotesis test gained that variable of agricultural land use (X10) influences significantly to the pig farm household economic income in the research site. The evidence is based on the result of Multiple Linear Regression analysis with the significancy value is -0.012 wahile level of significancy  $\alpha = 0.05$ , therefore significancy value of  $0.05 > -0.012$ , so its decision is accept H0 and reject H1. It means the range of agricultural land use significantly has no influence to the household economic income. This fact is supported by the statement of Jayanata (1992) cited by Hartono (2010) that in developing countries the farm land is narrow or less than one hectare ( $< 1$  ha). In this condition, the farmer households can not fulfill their family life sufficiently. Therefore, the narrow farm land farmers must do other off-farm jobs like labour, industry, etc. In contrary, the pig farmers in Bantala Village

state surely that pig raising is the main job in gaining household economic income.

#### IV. CONCLUSION

##### *In Conclusion:*

1. Linkages between analysis of pig farms economic household in East Flores Regency and decision to raise the pig farms are:
  - a. Average of pig farms economic household income on scale I, II, and III are IDR. 16,270,939, IDR. 18,829,414 and IDR. 24,337,324.
  - b. Percentage contribution of pig farms to the economic household income reaches 54.19%.
2. Factors dominantly influence the economic household income are number of pig owned, farms income without the income of pig farms, and non farm income; while factors that significantly have no influence to the economic household income are the farmers' age and range of land use in agriculture.

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