

## Factors Influencing Household Expenditure of Rice Farmers in Ketawang Village Gondang District Nganjuk Regency



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**ABSTRACT:** This study aims to analyze the factors that affect the household expenditure of rice farmers. The population in this study amounted to 573 farmers. The number of samples is determined by 10% of the population. The samples obtained in this study were 57 and rounded up to 60. The sample was selected by purposive sampling with criteria: farmers who own and cultivate the land. The data processing and analysis method used these tenuous equation 2 SLS with the thing of SPSS. The results showed that the factors that affect the household expenditure of farmers in Ketawang Village are as follows: 1) Food consumption blocks are influenced by disposable income, the number of household members and education investment. 2) Non-food consumption blocks are affected by disposable income, education investment and wife's education. 3) Production investment blocks are influenced by disposable income, education investment and total household consumption. 4) The education investment block is influenced by disposable income and the number of children in school. 5) The health investment block is influenced by disposable income, the number of household members, the wife's age and the husband's age.

**KEYWORDS:** Household; Income; Expenditure

### I. INTRODUCTION

The agricultural sector has a vital role in human life because through activities in the farm sector, and human needs can be met, especially the need for food, clothing and housing. In addition, the agricultural sector is also a source of income for the community, a provider of jobs and has a role in improving people's welfare [1]. Most Indonesian people live in rural areas and work in the agricultural sector; thus, to improve the welfare of the Indonesian people rely on the agricultural sector. East Java Province is the largest rice producer, producing 9.90 million tons of dry milled grain. One of the regencies in East Java is Nganjuk Regency. Nganjuk Regency is a district that produces high rice production. Nganjuk Regency ranks seventh in terms of rice production in East Java. Nganjuk Regency administratively consists of twenty sub-districts, and Gondang Sub-district is the sub-district with the third most significant area of agricultural land. Gondang sub-district consists of sixteen villages. Ketawang Village is one of the Gondang District villages with the second largest land area with rice as the primary commodity.

The household is the smallest economic decision-making unit that will satisfy its needs by consuming several goods and services [2]. Household consumption is generally regarded as the ultimate goal of economic activity, and the level of consumption per person is often seen as the primary measure of the productive success of an economy [3]. Household consumption expenditure is expenditure on household goods and services for consumption purposes. In this case, the household functions as the end user (final demand) for various goods and services available in an economy.

In making expenditures for household consumption, they are faced with several choices, namely household expenditures in the form of food and non-food needs. Household spending is primarily determined by household income because income is an essential factor in determining household expenditures, including family food consumption patterns [4]. Household expenditure, according to Engel's law, states that household income used for food expenditure tends to decrease if the income earned increases. This means that the lower a person's income, the greater the proportion of expenditure on food consumption [5].

### II. REVIEW LITERATURE

#### A. Farm Household

The household is the smallest unit in the wider society. Farmer Households are households that have behaviours related to making decisions on agricultural production, consumption and labour allocation. Farmer households can be seen as a single economic unit which has goals to be fulfilled from the resources they have. As an economic unit with limited resources owned

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by farmer households will maximize the goals to be achieved. The low and uncertain level of income obtained from farming will encourage members of the farming household to look for other ways to obtain additional income to meet household expenditure needs for both food consumption and non-food consumption.

### B. Household expenses

Household consumption expenditures are expenditures made by the household sector to buy various kinds of necessities of life during a certain period. Household sector expenditures are grouped into three categories, namely durable goods, consumables (non-durable) and services. Examples of durable goods are household furniture, vehicles, and houses. Consumables (non-durable) are goods that we consume daily, such as food, beverages, cigarettes, and gasoline, while examples of services are expenditures for education, health, and lawyers.

## III. RESEARCH METHODS

### A. Location Determination

The research was conducted in Ketawang Village, Gondang District, Nganjuk Regency. The primary data in this study were obtained from direct interviews with farmers and questionnaires. The population in this study amounted to 573 farmers. According to Arikunto (2017), if the population consists of or is less than 100, it is taken entirely. However, if the population is more than 100, then 10-15% of the total population is taken. The samples obtained in this study were 57 and rounded up to 60 pieces. The model is determined by purposive sampling with the criteria that farmers are owners and cultivators of the land.

### B. Data analysis

Factors affecting rice farmers' household expenditures were analyzed using the simultaneous equation 2 SLS (Two Stage Least Square) using the SPSS application.

- **Model Formulation**

Rice farmer household expenditure is divided into two: cost for consumption and spending for investment. Consumption expenditure consists of spending on food and non-food consumption. Meanwhile, expenditure consists of production, education, and health investments.

$$PD = PDTR - \text{Tax} \dots\dots\dots (1)$$

Information:

PD : Disposable income (Rp/month)

PDTR : Total Household Income (Rp/month).

- **Consumption Blok**

Food consumption is a function of disposable income, several household members and investment in education. The equation for food consumption is as follows:

$$KP = a_0 + a_1 PD + a_2 JART + a_3 IPEN + \mu_1 \dots\dots\dots (2)$$

Information:

KP : Food consumption (Rp/month)

JART : Number of household members (person)

IPEN : Education Investment (Rp/month)

Non-food consumption is a function of disposable income, education investment, and the wife's education. The equation for non-food consumption includes:

$$KNP = b_0 + b_1 PD + b_2 IPEN + b_3 IP + \mu_2 \dots\dots\dots (3)$$

The expected sign of the expected parameter (hypothesis) is  $b_1, b_3 > 0$ ;  $b_1, b_2 < 0$

Total household consumption is the sum of food consumption and non-food consumption. The equation for total consumption, among others:

$$KT = KP + KNP \dots\dots\dots (4)$$

Information:

KT : Total consumption (Rp/month)

KNP : Non-food consumption (Rp/month)

- **Investment Blok**

Production investment is a function of disposable income, education investment and total consumption. Therefore, the equation for production investment is as follows:

$$IPROD = c_0 + c_1 PD + c_2 IPEN + c_3 KT + \mu_3 \dots\dots\dots (5)$$

The expected sign of the expected parameter (hypothesis) is:  $c_1, c_3 > 0$ ;  $c_2$

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Educational investment is a function of disposable income and the number of children attending school. The education investment equation is as follows.

$$IPEN = d_0 + d_1PD + d_2 JAS + \mu_4 \dots\dots\dots (6)$$

The expected sign of the expected parameter (hypothesis) is  $d_1, d_2 > 0$

Information:

JAS : Number of children attending school (persons)

Health investment is a function of disposable income, several household members, the wife's age and the husband's age. Here is the health investment equation:

$$IK = e_0 + e_1PD + e_2 JART + e_3 UI + e_4 US + \mu_5 \dots\dots\dots (7)$$

The expected sign of the expected parameter (hypothesis) is  $e_1, e_2, e_3, e_4 > 0$

Information:

IK : Health Investment (Rp/month)

JART : Number of Household Members (person)

UI : Wife's Age (Years)

US : Husband's Age (Years)

The total investment of farm households is the sum of production, education, and health investments. Therefore, the total investment equation is as follows:

$$IT = IPROD + IPEN + IK \dots\dots\dots (8)$$

Total expenditure is the accumulation of total consumption with real investment. Therefore, the whole expenditure equation includes:

$$PT = KT + IT$$

Information:

PT : Total Expenditure (Rp/month)

KT : Total consumption (Rp/month)

IT : Total investment (Rp/month)

- **Model Identification Analysis**

After completing the model formulation stage, the next stage is an analysis to predict the model in the form of simultaneous equations. Before making a model estimation, first, identify the model to know the method of using the correct model estimation. The formula used for the identification test according to the order condition is:  $(K - M) (G - 1)$

Information:

K : Number of endogenous and predetermined variables in the model.

M : The number of endogenous and exogenous variables in each equation.

G : Sum of all equations

The criteria for model identification are as follows:

If  $(K - M) = (G - 1)$  : Exactly identified

If  $(K - M) < (G - 1)$  : Unidentified

If  $(K - M) > (G - 1)$  : Overidentified

The model of factors affecting rice farmers' household expenditure in Ketawang Village, Gondang District, Nganjuk Regency, consists of 9 equations, including five structural equations and four identity equations and has 16 variables. It can be seen in table 1 that all equations are overidentified, which means that the model in this study has met the requirements in the simultaneous equation for later estimation. The estimation method used in this study is the Two Stage Least (2 SLS) method. This method is used when the simultaneous equation model is overidentified.

**Table 1. Model Identification Test**

Equality	K	M	G	K - M	G - 1	Keterangan
KP	16	3	9	13	8	<i>Overidentified</i>
KNP	16	3	9	13	8	<i>Overidentified</i>
IPROD	16	3	9	13	8	<i>Overidentified</i>
IPEN	16	2	9	14	8	<i>Overidentified</i>
IK	16	4	9	12	8	<i>Overidentified</i>

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## IV. RESULTS AND DISCUSSION

### A. Factors Affecting Paddy Farmer's Household Expenditure

The simultaneous equation model on rice farmer household economy in Ketawang Village consists of 9 equations. These equations include five structural equations and four identity equations. The structural equations referred to in this study are the food consumption equation, the non-food consumption equation, the production investment equation, the education investment equation, and the health investment equation. The identity equation consists of the disposable income equation, the total consumption equation, the total investment equation and the total expenditure equation. All these equations are estimated by the Two Stage Least or 2 SLS method.

#### Food Consumption

The estimation results in table 2 show that the food consumption equation has an  $R^2$  value or coefficient of determination equal to 0.606. This value indicates that 60.6% of the diversity of food consumption can be explained by the variables in the equation, while variables outside the equation explain the other 39.4%.

**Table 2. Estimation Results of the Food Consumption Equation**

Coefficients						
		Unstandardized Coefficients		Beta	t	Sig.
		B	Std. Error			
Equation 1	(Constant)	38511.472	216860.220		.178	.860
	PD	.173	.023	.640	7.562	.000*
	JART	282573.022	59656.500	.442	4.737	.000*
	IPEN	-.138	.098	-.132	-1.413	.163
F-Stat : 28,68						
R <sup>2</sup> : 0,606						
Description: significant at the level of (*) $\alpha= 5\%$ , (**) $\alpha= 10\%$ , (***) $\alpha= 15\%$						

Source: Primary data processed, 2022

Disposable income has a positive and significant effect on the household food consumption of rice farmers. If disposable income increases, household food consumption will also increase. An increase in disposable income can increase rice farmers' household food consumption expenditure by enabling households to buy various types of food that cannot be purchased at the previous level of disposable income. Keynes's theory also explains a relationship between current income and current consumption. In other words, the income owned by the household at a particular time will affect the consumption made by humans at that time. If disposable income increases, consumption will also increase, and vice versa. This is in line with the results of Sisca's research (2019) entitled "Household Consumption Patterns of Pir-Trans Oil Palm Farmers in Hang Tuah Village, Perhentian Raja District, Kampar Regency". The results showed that the income of oil palm farmers was positive and significant to food consumption. Income is an essential factor in determining the family's food consumption pattern. If income increases, food consumption will be more diverse, especially the consumption of foods that contain high nutrients.

The number of household members positively and significantly influences household food consumption. This is in line with Zebra, Astri's research (2019) under the title "Analysis of Factors Influencing Food Consumption Patterns of Vegetable Farmers' Households in Kampar Regency". The results showed that the number of household members positively and significantly affected the proportion of food expenditure. Furthermore, the positive sign of the coefficient on the number of household members indicates that the relationship between the number of household members and food expenditure is directly proportional. That is, the more the number of household members, the price of food consumption will also increase.

On the other hand, educational investment has a negative and insignificant effect on the household food consumption of rice farmers. The study results align with Saini's research (2019) with the title "Analysis of Income Structure, Consumption Patterns and Welfare of Vegetable Farmers' Households in Siak Regency. The research results show that education investment is a variable that has no significant effect on the allocation of household food expenditures for farmers.

#### Non-Food Consumption

The estimation results in table 3 show that the non-food consumption equation has an  $R^2$  value or coefficient of determination, which is 0.384. This value indicates that 38.4% of the diversity of non-food consumption can be explained by the variables in the equation, while variables outside the equation explain the rest.

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Disposable income has a positive and significant effect on household non-food consumption. The positive sign in the coefficient shows that the relationship between disposable income and non-food consumption is directly proportional. The greater the disposable income, the greater the expenditure for non-food consumption. Farmer household income can be measured by the spending that has been made. If the price of non-food consumption is significant, household life will be more prosperous. This is similar to Engel's law which states that when household income is higher, the income allocated to food consumption is low or decreases. The spending pattern that shifts from food to non-food has an elasticity of demand, namely low food consumption and high demand for non-food consumption. This situation can be seen in households whose food consumption is maximal enough to be used to meet non-food needs or investments.

**Table 3. Estimation Result of Non-Food Consumption Equation**

Coefficients						
		Unstandardized Coefficients		Beta	T	Sig.
		B	Std. Error			
Equation 1	(Constant)	218613.536	139245.419		1.570	.122
	PD	.078	.019	.436	3.984	.000 *
	IPEN	.128	.075	.186	1.702	.094 **
	PI	29422.198	14034.794	.238	2.096	.041 *
F-stat = 11,628						
R <sup>2</sup> = 0,384						
Description: significant at the level of (*) $\alpha=5\%$ , (**) $\alpha=10\%$ , (***) $\alpha=15\%$						

Source: Primary data processed, 2022

Education investment has a positive and significant impact on household non-food consumption. The higher a person's education, the more needs must be met. This condition is due to the requirements that must be completed not only for eating and drinking but also for information needs, socializing in the community and recognizing others for their existence. Therefore, education investment is a significant investment. By getting a good education, someone will also get a good job. This study's results are similar to the research results [6] under "Economic Analysis of Household Rice Farmers in Cocoa Farming in Blitar Regency". The results showed that education investment positively affected household non-food expenditures. The higher the educational investment the farmer's household makes, the higher the non-food spending.

A wife's education positively and significantly affects household non-food expenditure. Therefore, for someone who has higher education, the economy will be better, and this will be followed by a more substantial allocation of non-food consumption expenditures to get social recognition from the community. This is to the results of research [7] that the wife's education level (housewife) is the principal capital in supporting the family economy and also plays a role in the preparation of the family diet.

### Production Investment

**Table 4. Result of Estimation of Production Investment Equation**

Coefficients						
		Unstandardized Coefficients		Beta	T	Sig.
		B	Std. Error			
Equation 1	(Constant)	-787250.615	453037.771		-1.738	.088
	PD	.472	.064	.707	7.342	.000 *
	IPEN	-.152	.231	-.056	-.660	.512
	KT	.388	.231	.168	1.681	.098 **
F-stat = 32.493						
R <sup>2</sup> = 0,639						
Description: significant at the level of (*) $\alpha=5\%$ , (**) $\alpha=10\%$ , (***) $\alpha=15\%$						

Source: Primary data processed, 2022

The estimation results in table 4 show that the production investment equation has an R<sup>2</sup> value or coefficient of determination, which is 0.639. This value indicates that 63.9% of the diversity of production investment can be explained by the variables in the equation, while variables outside the equation explain the rest.

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Disposable income has a positive and significant impact on production investment. This means that if households' disposable income increases, the production investment spent by households will also increase. The increase in disposable income can provide more space to allocate some of the income earned as input to agricultural activities that are unique characteristics of farming households. Education investment has a negative and insignificant effect on production investment. This means that the relationship between education and production investment is inversely proportional. That is, when investment in education increases, investment in production will decrease.

Total consumption has a positive and significant impact on the investment in the production of farmer households. That is, when spending on household consumption as a whole increase, the production investment spending made by households will also increase. However, it is different from the research results of Rochaeni, S (2005), which show that total consumption is negatively related and has a significant effect on production investment.

### Education Investment

**Table 5. Estimation Result of Education Investment Equation**

Coefficients						
		Unstandardized Coefficients		Beta	t	Sig.
		B	Std. Error			
Equation 1	(Constant)	-209417.017	147064.581		-1.424	.160
	PD	.046	.025	.232	1.880	.065 **
	JAS	205990.442	84051.657	.303	2.451	.017 *
F-stat = 4,759						
R <sup>2</sup> = 0,145						
Description: significant at the level of (*) $\alpha$ = 5%, (**) $\alpha$ = 10%, (***) $\alpha$ = 15%						

Source: Primary data processed, 2022

The estimation results in table 5 show that the education investment equation has an R<sup>2</sup> value or coefficient of determination, which is only 0.145. This value indicates that the variables can explain 14.5% of the diversity of education investment in the equation, while variables outside the equation explain the rest.

Disposable income has a positive and significant impact on education investment. The higher the household disposable income, the higher the expenditure on education investment. This is in line with a study [8] entitled "Analysis of Factors Influencing Economic Decisions of Rice Farmers' Households in Bangkinang District, Kampar Regency". The results show that the disposable income of farm households positively and responsively influences education investment.

The number of school children positively and significantly affects education investment. The positive sign in the coefficient indicates that the relationship between the number of school children owned by the household is directly proportional to the education investment. This means that the more school children the household has, the more household expenditures will be allocated for investment in children's education. This is in line with a study [5] entitled "Analysis of Household Expenditure Allocation of Rubber Farmers in Bajubang District, Batanghari Regency". The results show that the number of school children is positive and has a significant effect on education investment, meaning that if the number of school children increases by one person, the investment in education will also increase. The greater the number of children attending school, the greater the amount of educational investment that must be allocated by rice farming households from their disposable income.

### Health Investment

**Table 6. Estimated Results of Health Investment Equation**

Coefficients						
		Unstandardized Coefficients		Beta	t	Sig.
		B	Std. Error			
Equation 1	(Constant)	-166812.881	37881.142		-4.404	.000
	PD	.009	.002	.381	5.155	.000 *
	JART	35951.826	5721.276	.475	6.284	.000 *
	US	2107.532	1135.889	.197	1.855	.069 **
	UI	1680.642	921.521	.186	1.824	.074 **
F-Stat = 40.644						
R <sup>2</sup> = 0,747						
Description: significant at the level of (*) $\alpha$ = 5%, (**) $\alpha$ = 10%, (***) $\alpha$ = 15%						

Source: Primary data processed, 2022

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Disposable income has a positive and significant impact on health investment. The positive sign means that the relationship between disposable income and health investment is directly proportional. If household disposable income increases, then investment in health will also increase, and vice versa. If farmer households' disposable income decreases, then health investment will also decrease. The number of household members also positively and significantly affects health investment. The more members of the household, the expenditure on household health investment will also increase.

A wife's and husband's age positively and significantly impact health investment. This shows that the body becomes more susceptible to disease as a person ages. Therefore, positive signs on the wife's and husband's ages indicate that health care is very important for household members. This study's results align with the research results [9] under the "Economic Model of Farmers' Household Expenditures". The results showed that the wife's and husband's ages had a positive but insignificant effect on health investment.

### V. CONCLUSIONS

The factors that affect farmer household expenditures in Ketawang Village are as follows: 1) Food consumption block is influenced by disposable income, number of household members and education investment. 2) Non-food consumption block is influenced by disposable income, education investment and the wife's education. 3) Production investment block is influenced by disposable income, education investment and total household consumption. 4) Education investment block is affected by disposable income and the number of children in school. 5) Health investment block is influenced by disposable income, number of household members, wife's age and husband's age.

### REFERENCES

- 1) Martina, & Yuristia, R. (2021). Income and Expenditure Analysis of Rice Farmers' Households in Sawang District, North Aceh Regency. *Journal of Agrica Ekstensia*, 15(1), 56–63.
- 2) Sisca, V. E. W. A. (2019). Household Consumption Pattern Of Pir-Trans Oil Palm Farmers In Hang Buah Village, Perhentian Raja District, Kampar Regency. 2018, 173–186.
- 3) Bonsu, C. O., & Muzindutsi, P.-F. (2017). Macroeconomic Determinants of Household Consumption Expenditure in Ghana: A Multivariate Cointegration Approach. *International Journal of Economics and Financial Issues*, 7(4), 737–745. <https://www.econjournals.com/index.php/ijefi/article/view/3846/pdf>
- 4) Fatimah, N., & Nur Syamsiyah. (2018). Proportion of Household Expenditure of Rice Farmer in Patimban Village, Pusakanagara Subdistrict, Subang Regency, West Java. *Journal Of Agribusiness Insight Scientific Society Thought*, 4(2), 184–196.
- 5) Jannah, R., Elwamendri, & Saputra, A. (2021). Analysis of Household Expenditure Allocation of Rubber Farmers in Bajubang District, Batanghari Regency. *Journal of Agribusiness and Local Wisdom (Jalow)*, 4(2), 98–108.
- 6) Rahman, R. Y. And Y. H. (2019). Farmers Household Economic Analysis on Smallholders Cocoa Farming In Blitar. 12(1), 70–79.
- 7) Fikriman, F., Budiman, F. A., & Afrianto, E. (2020). Socio-Economic Factors Affecting Food Expenditures For Poor Households In Bangko District, Merangin Regency. *Jas (Journal of Agri Sains)*, 4(2), 149. <https://doi.org/10.36355/jas.v4i2.426>
- 8) Rumondang, S., Panjaitan, O., Bakce, D., & Kurnia, D. (2018). Analysis of Factors Influencing Economic Decisions of Rice Farmers' Households in Bangkinang District, Kampar Regency. 13, 85–92.
- 9) Wiratama, A. D. (2021). The Economic Model of Farmers' Household Expenditures (Case in West Bogor District, Bogor City).



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