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Household Economics Analysis of Mina Mendong Farmers (Case Study in Wajak Village – Malang Regency)

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Abstract
Mina mendong farming is an agricultural activity which combines fish farming with crop cultivation in the rice fields mendong. Mina mendong farming is very important for farmers with small land area or middle and lower economic in the Wajak village. For the farmers, it can be optimize land use and reduce the risk of farming because it produces more than one output. The objectives of this research are: (1) analyzing the factors that affect the production of mina mendong; (2) analyzing the contribution of mina mending farming income to the revenue of farmers' households. This research is use econometric model of mina mendong farmers' households' economy into simultaneous analysis model. The result shows that the factors affecting farm production is the use of fertilizers, the quantity of seeds mina mendong fish, and the use of pellets mina mendong. The income of mina mending farming contributes to the revenue of farmers' households amounting 61.54 percent.
Keywords: mina mendong, mendong, fish, income, revenue, household economic

1. Introduction

An invention in fields using the efficiency technology can be the strategy to optimize irrigates rice fields and increasing the income of farmers. It can do by changing the farming system from the monoculture into the farming diversification, which is applying the mina *mendong* technology. Mina *mendong* farming is an agricultural activity which combines fish farming with crop cultivation in the rice fields *mendong*.

Mina *mendong* farming is should be applied in farming activity. The main reason is because this activity produce two outputs or two harvesting; the *mendong* and the fish which increasing the income. Besides, this cultivation have a good point that is complementary. It is said complementary because if there is a failure in harvesting the *mendong*, the farmers still have the fish to cover the financial loss, and otherwise.

Nowadays, the request towards *mendong* and *nila* fish is high. According to the data, around 70% of Tasikmalaya's handicraft material which is *mendong* is filled from Wajak District (The Government of Tasikmalaya 2009). Besides, the Citizen Germination Unit (*UPR – Unit Pembenihan Rakyat*) *Sumber Mina Lestari* (2012), the consumption of *nila* fish in Malang Regency today is 25,000 ton/year. Seeing this factors; *mendong* and *nila* fish, is hoped that the farmers can increase both their production and income is higher than before. Lokollo (2001) states that most of village man is the subsistence farmer or producing their own needs, but it is no more exist. In the reality, those farmer is sell their product to buy their own need which is by nature is consumptive or other food needs. Those factors become the main reason for the researcher to do the research about economy of *mina mendong's* farmers. The objectives of this research are: (1) analyzing the factors that affect the production of mina *mendong*; (2) analyzing the contribution of mina *mendong* farming income to the revenue of farmer's households in Wajak Village, Wajak District, Malang Regency.

2. Research Method

This research is done in Wajak Village, Wajak District, Malang Regency. Determining the location is purposive, because the village is applying the mina *mendong* activity.

Census is used to determine the sample of mina *mendong* farmers in Wajak Village, Wajak District. There are 31 people as the mina *mendong* farmers in this village. Therefore, there are 31 respondents for this research. Those farmers have applied the mina *mendong* cultivation.

There are two kinds of data in this research; primary and secondary. Primary data is obtained by doing interview to mina *mendong* farmers about mina *mendong* activity, households' expending, and the income. Secondary data is obtained from village office, Agricultural Department, District office and Agricultural Extension Bureau to complete and strengthen the primary data.

Mina *mendong* farming has two outputs; first is *mendong* and the second is *nila* fish. Both are different commodity, and also different production which can not builts as one. Therefore, the production of *mendong* and *nila* fish in equation comprehend model must be the same to acquire the same rate of production. To obtain the same production from fish and *mendong* is by count up the revenue from the output for each and using money (rupiahs) as the equation of production. The output price is the price of *nila* fish. This research is use econometric model of mina *mendong* farmers' households' economy into simultaneous analysis model.

2.1 Specification Model

The specification model in this research is divided into 3 blocks. The first block is the production of mina *mendong* which contains 4 equations. The second block is of mina *mendong* farmers' revenue which contains 2 equations. The third is of mina *mendong* farmers' income which contains 4 equations.

Specification model of the production of Mina *Mendong* (QMM) have four equation, firstly is Mina *Mendong* Households Employing (TKDMM) the equation may be expressed as

$$TKDMM = a_0 + a_1\ UPH + a_2\ JART + u_1 \quad (1)$$

Where:
UPH = wage (Rp)
JART = number of people in family (person)

Secondly is total Mina *Mendong* households employing (TKPMM) the equation may be expressed as

$$TKPMM = TKDMM + TKLMM \quad (2)$$

Where:
TKDMM = Mina *Mendong* Households Employing (HOK)
TKLMM = Mina *Mendong* Outside Employing (HOK)

Thirdly is Mina *Mendong* Fertilizer Utilizing (PPTMM), the equation may be expressed as

$$PPTMM = b_0 + b_1\ LHMM + b_2\ BPDD + u_2 \quad (3)$$

Where:
LHMM = Area of Mina *Mendong* (Ha)
BPDD = Education Fee (Rp/month)

Fourthly is the production of Mina *Mendong* (QMM), the equation may be expressed as

$$QMM = c_0 + c_1\ LHMM + c_2\ TKPMM + c_3\ PPTMM + c_4\ BBTMM + c_5\ PLTMM + u_3 \quad (4)$$

Where:
LHMM = Area of Mina *Mendong* (Ha)
TKPMM = Total Mina *Mendong* Households Employing (HOK)
PPTMM = Mina *Mendong* Fertilizer Utilizing (kg)
BBTMM = Mina *Mendong* Fish Seeds (item)
PLTMM = Pellet Mina *Mendong* (kg)

Specification of Mina *Mendong* farmers revenue (TRRTG) have 2 equation, firstly is Mina *Mendong's* Income (KUMM) the equation may be expressed as

$$KUMM = QMM - (CIPS*HIN) - BPMM \quad (5)$$

Where:
CIPS = Fish for Own Needs (kg)
HIN = Fish Price (Rp/kg)
BPMM = Cost Production of Mina *Mendong* (Rp)

Secondly is Mina *Mendong* farmers revenue (TRTTG), the equation may be expressed as

$$TRRTG = KUMM + TROF + TRNF \quad (6)$$

Where:
TROF = Off Farm Income (Rp)
TRNF = Non Farm Income (Rp)

Specification model of Mina Mendong Farmer's Income (INCOME) have four equation, firstly is Total Consumption Cost (BPGN) the equation may be expressed as

$$BPGN = (CSRLB*PPDI) + (CNSRL*PNSRL) \quad (7)$$

Where:
CSRLB = Cereal or Rice for Consumption (Kg)
PPDI = Price of Cereal or Rice (Rp/Kg)
CNSRL = Non Cereal for Consumption (kg)
PNSRL = Price of Non Cereal (Rp/Kg)

Secondly is Total Cost for Non Consumption (BNPGN), the equation may be expressed as

$$BNPGN = BPDD + BERG + BJAS + BKES + BL \quad (8)$$

Where:
BPDD = Education Fee (Rp)
BERG = Energy Cost (Rp)
BJAS = Service Cost (Rp)
BKES = Health Care (Rp)
BL = Others (Rp)

Thirdly is Total Cost for Mina *Mendong* Farmers Households, the equation may be expressed as

$$BRTG = BPGN + BNPGN \quad (9)$$

Where:
BPGN = Total Consumption Cost (Rp)
BNPGN = Total Cost for Non Consumption (Rp)
Fourthly is Mina *Mendong* Farmers' Income (INCOME), the equation may be expressed as

$$INCOME = TRRTG - BRTG \quad (10)$$

Where:
TRRTG = Mina *Mendong* Farmers Revenue (Rp)
BRTG = Total Cost Mina *Mendong* Farmers Households (Rp)

2.2 Identification Model

Sumodiningrat (1999) states there are several points in identification model that have to pay attention to it, such as (a) number of current endogenous variables in the model ; (b) number of current endogenous variables in every equation; (c) number of predetermined variables in the model and (d) number of predetermined variables in every equation.

Table 1 Identification Result in Equation Model

Equation	Variety of Equation	K	k	m	K-k	m-1	Note
TKDMM	Model	30	3	10	26	9	*over identified*
TKPMM	Identity	-	-	-	-	-	-
PPTMM	Model	30	3	10	27	9	*over identified*
QMM	Model	30	6	10	24	9	*over identified*
KUMM	Identity	-	-	-	-	-	-
TRRTG	Identity	-	-	-	-	-	-
INCOME	Identity	-	-	-	-	-	-
BRTG	Identity	-	-	-	-	-	-
BPGN	Identity	-	-	-	-	-	-
BNPGN	Identity	-	-	-	-	-	-

Identification model is used to determine the agreement parameter of the simultaneous equation model. If the equation or model result is over identify, the econometric technique should be use 2 SLS (Two Stage Least Square) to estimate the parameter. Characteristic of over identify when equation model show that $K - k > m - 1$, where:

- K is total variable in the model (endogen variable and pre determined variable)
- k is total endogen variable and pre determined variable in equation which identify
- m is total equation or total endogen variable in the model

2.3 Estimation model

The identification result in equation model shows that the equation is classified to over identify and to estimate the model is using the appropriate econometric technique which is 2 SLS (Two Stage Least Square).

2.4 Regression Model Examination

The examination using the determination coefficient (R_2), F test and t test. The determination coefficient (R_2) value is used to determine the exact rate in model which applies to explain the exogenous variable or the percentage of endogen variable explained by the exogenous variable using regression model. F test is used to find the closeness level between exogenous variable and endogen variable simultaneously. t test is used to find the effect for each variables or exogenous toward endogen.

3. Results and Discussion

The study results divided three, there are (i) factors affecting the employment employing of Mina *Mendong* Households; (iii) factors affecting Mina *Mendong* fertilizer utilizing and (iii) Mina *Mendong* Contribution Income to the Mina *Mendong* Revenue.

3.1 Factors Affecting the Employment Employing of Mina *Mendong* Households

Based on analysis of 2SLS method (Two Stage Least Square) is finds the result for equation the employment employing of Mina *Mendong* households as said as:

Table 2. Comprehend Parameter Result the Employment Employing of Mina *Mendong* Households

Variable	Coefficient	t	Sig. t
Intercept	1,01	0,68	0,50
UPH	0,01	0,29	0,77
JART	0,74	9,84	0,00
F table α 0.01	5,45		
R-Square	0,79		
F	54,97		

The main factor which affecting the employment employing of mina *mendong* households is the number of people in family itself. It gives good impact to the mina *mendong* cultivation. The number of people in family gives regression coefficient around 0.74 percent and 99 percent in confidence level. It means that the more of family number, the more employment for employing. The fact is provides that mina *mendong* is family business, so they help their family. Suprapto (2001) states that family business is depend on the family number or the employment from their family itself.

3.2 Factors Affecting Mina *Mendong* Fertilizer Utilizing

Based on the analysis of 2SLS (Two Stage Least Square) is obtained the rate for equation of mina *mendong* fertilizer utilizing as said as:

Table 3. Comprehend Parameter Result of Mina *Mendong* Fertilizer Utilizing

Variable	Coefficient	t	Sig. t
Intercept	87,68	1,34	0,192
LHMM	322,12	7,12	0,00
BPDD	0,01	0,05	0,96
F table α 0.01	5,45		
R-Square	0,64		
F	25,87		

The main factor which affecting the mina *mendong* fertilizer utilizing is the number of pellets and fish seeds in the process. Those factors give good impact to the mina *mendong* cultivation. The amount of fertilizer in the cultivation gives regression coefficient around 4712.17. It means one kilogram is increase the production rate around Rp 4712.17. The seed fish give the regression coefficient around 161.42, means that one seed is increasing the production rate Rp 161.42. The pellet give regression coefficient around 6887.60 means that one kilogram pellet will increasing the production rate around 6887.60.

3.3 The Mina *Mendong* Contribution Income to the Mina *Mendong* Revenue

The characteristic of household economic of mina *mendong* farmer can be seen from the income that they get. The income itself is not only from mina *mendong* cultivation (on farm) itself but also from off farm and non-farm. How big the contribution income to the revenue can be seen in this table:

Table 5 Mina *Mendong* Contribution Income

Source of Income	Income Average (Rp)	Income Contribution (%)
On Farm	1048508,06	61,54
Off Farm	295161,29	25,24
Non Farm	170967,74	13,22

The main income is from mina *mendong* cultivation and it gives contribution around 61.54 percent to the revenue. It means that the farmer make their daily life dependent on mina *mendong* cultivation (on farm). Those incomes from off farm and non-farm give contribution around 25.54 and 13.22 percent.

However, from 31 respondents not all have off farm and non-farm activity to support them. The characteristic of household economic can be seen in this table:

Table 6. Contribution of Household Economics Income According to Source of Income

Source of Income	Number of Households	Percentage
On Farm	31	100,00
Off Farm	24	77,41
Non Farm	19	61,29

From the table above there are 3 source of income; for family who has on farm activity is 100 percent, off farm activity is 77.41 percent and non-farm activity is 61.29 percent.

4. Conclusions

The result of the study discussed in the manuscript show that the factors which give obvious impact to mina *mendong* cultivation are fertilizer, seeds fish and pellet while area and employment is not give the obvious impact. The mina *mendong* contribution income to the household revenue is around 61.54 percent and the rest which is 25.54 percent and 13.22 percent is come from off farm and non-farm income. It means that mina *mendong* is become the biggest source of income. Recommendation for this research are optimally the main factors which give obvious impact to the cultivation can be the focus of the farmers to increase their production and local government can provide some private or training program to increase the farmers' skill about mina *mendong* cultivation. Beside that, the local government can give fertilizer, seeds fish, and pellet in suitable price which give the obvious impact of mina *mendong* production.

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