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 mendong 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 mendong 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’ expenditure, 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 builds 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

\[
TKDMM = a_0 + a_1 \text{UPH} + a_2 \text{JART} + u_1
\]  

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

\[
TKPMM = TKDMM + TKLMM
\]  

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

\[
PPTMM = b_0 + b_1 \text{LHMM} + b_2 \text{BPDD} + u_2
\]  

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

\[
QMM = c_0 + c_1 \text{LHMM} + c_2 \text{TKPMM} + c_3 \text{PPTMM} + c_4 \text{BBTMM} + c_5 \text{PLTMM} + u_3
\]  

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

\[
KUMM = QMM - (CIPS*HIN) - BPMM
\]  

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

\[
TRRTG = KUMM + TROF + TRNF
\]  

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

\[
BPGN = (CSRLB*PPDI) + (CNSRL*PNSRL)
\]  

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

\[
BNPGN = BPDD + BERG + BJAS + BKES + BL
\]  

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

\[
BRTG = BPGN + BNPGN
\]
Where:
\[ BPGN = \text{Total Consumption Cost (Rp)} \]
\[ BNPGN = \text{Total Cost for Non Consumption (Rp)} \]

Fourthly is Mina Mendong Farmers’ Income (INCOME), the equation may be expressed as
\[ \text{INCOME} = \text{TRRTG} - \text{BRTG} \]  
\[ (10) \]

Where:
\[ \text{TRRTG} = \text{Mina Mendong Farmers Revenue (Rp)} \]
\[ \text{BRTG} = \text{Total Cost Mina Mendong Farmers Households (Rp)} \]

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.

2.2.1 Table 1 Identification Result in Equation Model

<table>
<thead>
<tr>
<th>Equation</th>
<th>Variety of Equation</th>
<th>K</th>
<th>k</th>
<th>m</th>
<th>K-k</th>
<th>m-1</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>TKDMM Model</td>
<td>Model</td>
<td>30</td>
<td>3</td>
<td>10</td>
<td>26</td>
<td>9</td>
<td>over identified</td>
</tr>
<tr>
<td>TKPMM Identity</td>
<td>Identity</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td></td>
</tr>
<tr>
<td>PPTMM Model</td>
<td>Model</td>
<td>30</td>
<td>3</td>
<td>10</td>
<td>27</td>
<td>9</td>
<td>over identified</td>
</tr>
<tr>
<td>QMM Model</td>
<td>Model</td>
<td>30</td>
<td>6</td>
<td>10</td>
<td>24</td>
<td>9</td>
<td>over identified</td>
</tr>
<tr>
<td>KUMM Identity</td>
<td>Identity</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>TRRTG Identity</td>
<td>Identity</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>INCOME Identity</td>
<td>Identity</td>
<td>-</td>
<td>-</td>
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<td>-</td>
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<td></td>
</tr>
<tr>
<td>BRTG Identity</td>
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</tr>
<tr>
<td>BPGN Identity</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>BNPGN Identity</td>
<td>-</td>
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<td></td>
</tr>
</tbody>
</table>

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 (endogenous variable and pre determined variable)
- \( k \) is total endogenous variable and pre determined variable in equation which identify
- \( m \) is total equation or total endogenous 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 endogenous variable explained by the exogenous using regression model. F test is used to find the closeness level between exogenous variable and endogenous variable simultaneously. t test is used to find the effect for each variables or exogenous toward endogenous.

3. Results and Discussion

The study results divided three, there are (i) factors affecting the employment employing of Mina Mendong Households; (ii) 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:
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:

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:

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

<table>
<thead>
<tr>
<th>Source of Income</th>
<th>Number of Households</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>On Farm</td>
<td>31</td>
<td>100.00</td>
</tr>
<tr>
<td>Off Farm</td>
<td>24</td>
<td>77.41</td>
</tr>
<tr>
<td>Non Farm</td>
<td>19</td>
<td>61.29</td>
</tr>
</tbody>
</table>

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.

References


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