**RISK BEHAVIOUR ONION FARMERS IN THE DISTRICT ENREKANG**

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**Abstract**

This study aimed to analyze the risk behavior of onion farmers in District Enrekang. A random sample of 75 onion farmers was selected for interviews. The model used to analyze the behavior of risk is a model developed by Kumbhakar (2002). The analysis showed that the average behavior of onion farmers are risk averse to the use of various inputs. In order for farmers to take risks and enhance productivity, strengthening institutions such as farmers' groups or unions as well as enhancing the role of the agricultural extension will be required.

***Keywords* : *risk behaviours , models Khumbakar , onion farmers***

**INTRODUCTION**

The agricultural sector has a significant role in the Indonesian economy, as a source of revenue, a promoter of economic growth and a provider of jobs. In addition, the agricultural sector is also an important provider of raw materials for industry, particularly in the food processing and beverage industry as well as other agro-industries, and is also a major pillar in supporting the country’s food security.

An advantage of the agricultural sector compared to other sectors of the economy is that it is based on domestic resources. In addition, because there are few imported raw materials or inputs, this sector is relatively more resilient to economic turmoil, e.g., monetary, exchange rate fluctuations. The toughness of the agricultural sector was proved during the recent monetary crisis, in which this sector was the largest contributor of foreign exchange. Important components or subsectors of the agricultural sector are food crops, plantation crops, livestock, forestry, and fishery.

Onions are a significant contributor to the horticultural subdivision of the food crops subsector. Several provinces in Indonesia produce onions, such as Central Java, East Java, West Java, West Nusa Tenggara and South Sulawesi. According to the Agency for Agricultural Research and Development (2002), the potential productivity of onion in Indonesia can reach more than 20 tons/ha. (Riyanti 2011).

Enrekang, an onion-producing district of South Sulawesi, has a relatively low productivity, compared to the national average. The low productivity of onion in Enrekang can be seen from how farmers allocate production inputs used in farming. Based on a review of theoretical and secondary data, the low or even declining productivity of onion in Enrekang could be caused by several factors such as the behavior of farmers in the face of production risks affecting the allocation of production inputs.

The risks faced by farmers can be categorized as production risks, price risks, institutional risks, policy risks and financial risks. According to Sriyadi (2010), the largest source of risks is production risks, such as the risk of pests and diseases that cannot be predicted in advance. Further, Sriyadi states that pests and diseases are triggered by changes in the weather, the number of weeds and crop management is not optimum. Such high risks of production have the potential to greatly affect farmer income in a negative way. The amount of risk accompanying potential revenue greatly influences the decision-making of farmers. According to Ellis (1988), the behaviors of farmers toward risks are grouped into three: (1) farmers who avoid risk (risk averse), (2) farmers who are neutral towards risk (risk neutral), and (3) farmers who dare to risk (risk takers).

Kumbhakar (2002) connects production risk, risk selection, and production efficiency, using a model based on Just and Pope, developed from data from a cross-section of fish producers who cultivate salmon in Norway. The results showed that most of the producers are risk-averse. Availability and price of fish feed have the potential to increase the risk of production; use of more skilled human labor can reduce the risk of production, however.

Research conducted by Lawalata (2013) concluded that most of the onion farmers in Bantul were risk averse, even though onion farming is inherently risky. Similar results were shown by Suryadi (2009) about onion and garlic farmers in Karanganyar. The purpose of this study was to analyze the behavior of the risk of onion farmers in Enrekang.

**MATERIALS AND METHOD**

The experiment was conducted in 2015 in the Anggeraja Subdistrict, which is one of the centers of onion production in Enrekang. A total of 75 onion farmers were randomly selected for intervew. The data used were primary data and secondary data. The data collected were tabulated and analyzed as described below. To analyze the efficiency and risk behavior of farmers a model developed by Kumbhakar (2002) was used:



Where:

 is a function of the average productivity

 is a function of the production risk

 is a function of technical inefficiency, and

yi =the amount of onion productivity (kg/ha)

X1 = the number of seeds used (kg/ha)

X2 = the amount of labor used (HKSP/ha)

X3 = the amount of urea used (kg/ha)

X4 = the amount of fertilizer used (kg/ha)

X5 = the amount of insecticides used (kg/ha)

X6 = the amount of herbicide used (kg/ha)

X7 = the amount of fungicide used (kg/ha)

evi = *error term* which shows the uncertainty of the predicted production assuming i.i.d (0, σ)2

eui = technical inefficiency assuming i.i.d (0, σ)2 and u>0, ui are independent of vi.

The expected sign for each parameter > 0;  < 0 or > 0; and  < 0 or > 0. Model estimation was done using maximum likelihood estimation (MLE).

**RESULTS AND DISCUSSION**

*Profile Farmers Respondents*

Some aspects of the farmer respondents discussed below are: (1) the age structure of the farmer respondent sample, (2) education level, (3) amount of experience, (4) the number of family members, and (5) the area of ​​land cultivated.

*Age*

Age is one factor that affects a person's ability to work and their productivity. There is an increased ability to work with increasing age, to a point, but which generally decreases at some later point. Age has an influence on the maturity of thinking and physical ability in managing a business (Nurhapsa, 2013). The age distribution of farmer respondents can be seen in Table 1. As seen in this table, 98.67% of the respondent farmers in Anggeraja are mostly located in the productive age range, which suggests that onion growing is still a fairly vibrant sector.

Table 1. The distribution of farmer by age at onion farming in district Anggeraja, Enrekang

|  |  |  |
| --- | --- | --- |
| **Age (years old)** | **Number** | **Percentage** |
| 15- 25  | 2 | 2,67 |
| 26 - 35 | 28 | 37,33 |
| 36 - 45 | 29 | 38,67 |
| 46 - 55 | 15 | 20,00 |
| 56 > ke atas | 1 | 1,33 |
| **Total** | **75** | **100** |

*Level of Education*

 Higher levels of education help farmers help understand and accept new innovations available to them. Education can also be considered as an investment vehicle for helping improve the knowledge, skills, and expertise of the workforce, as human capital allowing working more productively, thereby increasing future income. In addition to formal education, non-formal education can also help farmers in developing their business, helping to train a useful pattern of thinking and the technical skills of a farmer. The distribution of respondents by level of education can be seen in Table 2. As seen in this table, the education level of respondents farmers was mostly high school educated, 38 people (50.67%), while 21 people (28.00%) had an elementary education.

Table 2. The distribution of farmer respondents by the level of education in onion farming in District Anggeraja, Enrekang.

|  |  |  |
| --- | --- | --- |
| **Level of Education**  | **Number** | **Percentage** |
| Not Elementary School  | 2 | 2,67 |
| Elementary School  | 21 | 28,00 |
| Junior High School  | 8 | 10,67 |
| Senior High School  | 38 | 50,67 |
| Diploma | 2 | 2,67 |
| Bachelor | 4 | 5,33 |
| **Total**  | **75** | **100** |

*Onion Farming Experience*

 Onion farming experience is the length of the respondent farmers have cultivated onion in years. Experience is one of the determining factors in the success of farming. There is a tendency that the longer one manages a farm, one knows more about farming is done and will also tend to adopt the newer farming technology. The distribution of respondents by farming experience is given in Table 3. As can be seen in this table, 94.67% of farmers had experience in growing onions above 5 years.

Table 3. Distribution of Farmer Respondents by the Farming Experience in onion farming in district Anggeraja, Enrekang

|  |  |  |
| --- | --- | --- |
| Farming Experience (year) | Number | Percentage |
| 1 - 5 | 4 | 5,33 |
| 6 - 10 | 20 | 26,67 |
| 11- 15 | 16 | 21,33 |
| 16 - 20 | 12 | 16,00 |
| 21 – 25 | 11 | 14,67 |
| >25 | 12 | 16,00 |
| **Total** | **75** | **100** |

*Number of Family Members*

 The number of family members in a household indicates the magnitude of the burden borne by the family. However, the number of family members can also help the family economy, because their labor can be utilized in a variety of activities, as well as onion farming. The distribution of respondents by the number of family members are shown in Table 4. As can be seen in this table, 57 farmers respondents (76%) had as many as 4–6 family members in their household, showing, to some extent, farmer respondents have few constraints in terms of availability of labor in farming.

Table 4. Distribution of farmer respondents by the number of family members in onion farming in district Anggeraja.

|  |  |  |
| --- | --- | --- |
| Number of Family Members (people) | Number | Percentage |
| 1 - 3 | 12 | 16,00 |
| 4 - 6 | 57 | 76,00 |
| 7 - 10 | 6 | 8,00 |
| **Total** | **75** | **100** |

*Area of Farming Land*

 The amount of available land is certainly one of the main factors influencing production. Here, farming land area refers to land controlled by the respondent farmers. The average size of land owned by the farmer respondents is 0.74 ha, which rather small and can become an obstacle in increasing the production capacity of farming. The distribution of responses can be seen in Table 5.

Table 5. Distribution of farmer respondent by owned farming land area in onion farming in district Anggeraja, Enrekang.

|  |  |  |
| --- | --- | --- |
| Owned Land Area (ha) | Number | Percentage |
| 0,10 – 0.40 | 17 | 22,67 |
| 0,41 – 0,80 | 38 | 50,67 |
| 0,81 – 1,20 | 11 | 14,67 |
| ≥1,21 | 8 | 10,67 |
| **Total** | **75** | **100** |

*Risk Behavior of Onion Farmers*

 In farming, the farmer's decision to allocate inputs is influenced by their risk behavior. Results of the analysis of the risk behaviors of farmers are shown in Table 6. As seen in this table, the average value of θ was -0.560, and the average value of λ was 0.551. These results indicate that the average risk behaviors onion farmers to production inputs are that they are risk-averse. These results are consistent with research conducted by Lawalata (2013), which showed that most of the onion farmers in Bantul were risk averse (risk averse), although onion farming itself is risky. Similar results were shown by Suryadi (2009) in Karanganyar. In contrast, Budiningsih and Pujiharto (2006) showed that as many as 76.666% of onion farmers in the village of Kiki ran, District Jatibarang, Brebes were risked neutral.

Table 6. Behavior Productivity Onion Farmers in district Anggeraja, Enrekang.

|  |  |  |  |
| --- | --- | --- | --- |
| **Production Input** | **Rata-rata θ** | **Rata-rata λ** | **Risk Behavior** |
| Seed | 0,114 | 0,474 | *Risk Taker* |
| Labour | -0,060 | 0,435 | *Risk Averse* |
| Fertilizer Urea | 0,034 | 0,484 | *Risk Taker* |
| Fertilizer Matahari | -0,105 | 0,432 | *Risk Averse* |
| Incecticides | -0,088 | 0,278 | *Risk Averse* |
| Herbicides | -3,793 | 1,302 | *Risk Averse* |
| Fungicides | -0,020 | 0,455 | *Risk Averse* |
| **Average** | **-0,560** | **0,551** | ***Risk Averse*** |

Inputs of seeds and urea fertilizer are risks that onion farmers usually take. This means that the onion farmers behave boldly against risk in allocating inputs of seeds and urea fertilizer. On average, onion farmers is 988 kilograms seed per hectare. A number of onion seeds used per hectare depend on the type/variety, seed size and desired plant spacing. In terms of urea, the average farmer uses as much as 214.3 kilograms per hectare. The amount of urea used does not match or exceed the recommended dose, an average of 187 kilograms per hectare.

In contrast, the behavior of farmers to labor input, additional fertilizers, insecticides, herbicides, and fungicides was risk averse. The average amount of labor (Equal Employment Day Men/HKSP) used by sampled onion farmers, from land preparation to post-harvest is 125.8 HKSP. These results are consistent with research conducted by Hutabarat (1987) (cited in Fauziyah 2010) that showed that most farmers are risk averse in their use of human labor. The same was found in the study of Nurhapsa (2013), who found that the behavior of farmers in Enrekang who grew potatoes, varieties of canola and varieties Kalosi are risk averse in terms labor inputs. In addition, research by Fariyanti (2008) showed that the behavior of potato and cabbage farmers to labor input is risk averse.

Onion farmers in our sample in Anggeraja generally used, as additional fertilizer, solar fertilizer, which is a substitution for KCl. Onion farmers were risk-averse against solar fertilizer inputs, i.e., reluctant or afraid to allocate solar fertilizer inputs. The average use of potassium fertilizers was 174.2 kilogram per hectare; the use of KCl was still below the recommended dose is 220 kilograms per hectare.

Onion farmers were risk averse on the input of insecticides. The average input use of insecticides in the sample was 25.9 liters per hectare. These results are consistent with research conducted by Nurhapsa (2013), which showed that farmers who grow potatoes Kalosi varieties and varieties of canola on the input of insecticides were risk averse.

Table 6 also shows that farmers are risk averse against herbicide and fungicide inputs so that the allocation of the use of herbicide input is still low. The average input use of herbicides in onion farming was 4.3 liters per hectare; the average for fungicides was of 116.6 kilograms per hectare. The dose of fungicide was adapted to the type of fungicide used. The results of this research differ from research conducted by Nurhapsa (2013), who found that the behavior of farmers who grow potatoes, varieties of canola or plant varieties Kalosi in terms of their fungicide input was a risk taker.

**CONCLUSIONS**

Onion farmers in district Anggeraja were mostly at the level of high school education (SMA), an average land area of 0.73 hectares in onion and experience in onion farming experience of over 5 years. The average behavior of onion farmers in Anggeraja, district Enrekang was risk averse. To allow farmers to take increased risks in order to boost productivity and profits it is necessary to increase the role of farmer groups (gapoktan) and the role of agricultural extension.

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