Risk perception and risk reduction efforts of red chili business in Langkat Regency North Sumatera Province

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Abstract. The process of supplying red chili is not fully controlled by the farmers. The main factor that causes it is that the red chili farmers are small-scale farmers whose production decision-making process is thought not handled by a good forecast of production and prices. This is due to the influence of different perceptions of farmers in deciding which farming strategy to use. Therefore, it is necessary to carry out research on the relationship of risk perceptions to risk management strategies for red chili farming in Langkat Regency, North Sumatera Province. The data used are primary data sourced from questionnaires and interviews with 112 red chili farmers in Langkat Regency. The analysis method used is the Pearson Correlation to see the relationship between farm risk management strategies and perception. The results showed that the correlation of the risk perception variable and risk management strategy had a strong, significant and unidirectional effect on the red chili farming.

1. Introduction
Langkat Regency as one of the red chilies producing centres in North Sumatera still has the potential to develop red chili farming, seen from the area of land, the number of harvests and the productivity of red chili farming. Red chili is one of the agricultural products that is easily damaged, the process of planting, growth and harvesting depends on climate, season and skill in cultivation, and yields vary in shape and size, causing the supply chain for agricultural products to be probabilistic, dynamic and prone to disturbances. Supply sustainability is very important, given the high market response to commodity red chilies. Controlling the risks that occur in the supply chain is absolutely necessary in order to meet the quality and quantity expected by consumers.

Theoretically, the size of the allocation of the use of inputs in farming is strongly influenced by the behaviour of farmers in facing production risks [1]. In addition, some of the problems faced in the production of red chilies include a small business scale, low productivity, stagnation in technology, variable quality, low and fluctuating selling prices, lack of market access, and weak farmer institutions [2]. The individual choice to act on the basis of risk, i.e. the farmer's risky behaviour, depends on the individual’s assessment so an important determinant of risky behaviour is risk perception [3]. This is in accordance with the statement [4-6] shows that the risk behaviour of farmer may affect their decision on input usage”.

Factor analysis to determine the variables representing the sources of perceived (perceived) agricultural risk was carried out using a perceived risk score. The three categories for perceived risk are each measured by two items. These three categories represent three of the main sources of
agricultural business risk: marketing risk, production risk, and price risk. In fact, the biggest concern felt by farmers for source of risk is that three categories of the main sources of agricultural business risk [7].

In analysing farmer behaviour, it is important to understand the perceived risk associated with farmer choices in determining the risk management strategy chosen. In this study, using a model to implement a specific risk management strategy to be directly driven by risk perceptions. Research will be carried out related to the effect of risk perceptions in efforts to reduce the risk of red chili farming in Langkat Regency, North Sumatra Province.

2. Materials and methods

2.1. Determination of the research area
Determination of the research area was carried out purposely by considering that Langkat Regency is one of the regions in North Sumatra Province as the centre for producing red chilies, but of the 5 red chilli producing districts, Langkat Regency is among the lowest production, while the land area and productivity can be better than other districts.

2.2. Data collection method the data
Collection method was carried out through primary data collection by interviewing farmers with a structured questionnaire guide. The data collected in relation to this paper includes: farmer household characteristics, control of land and other assets, cropping patterns, farm input and output structures, and household income structure. The aspect related to farmer attitudes is that farmers who like risk and don't like risk. Regarding the choice of farmers in a strategy to reduce risk, there are several options for efforts that are usually carried out by farmers in reducing the risk of farming red chilies.

2.3. Data analysis method
The analysis model used is the Pearson correlation with the following equation:

\[
\text{Correlation} = r_{xy} = \frac{n \sum x_i y_i - \sum x_i \sum y_i}{\sqrt{n \sum x_i^2 - (\sum x_i)^2} \cdot \sqrt{n \sum y_i^2 - (\sum y_i)^2}} \tag{1}
\]

Description :
\( r_{xy} \) : correlation coefficient r Pearson
\( n \) : number of samples / observations
\( x \) : independent variable / first variable
\( y \) : dependent variable / second variable

In research variables are divided into two. Namely the dependent and independent variables. These two terms arise from mathematical logic, where X is expressed as an effect or a cause, while Y is expressed as something that is influenced or as a result.

Independent variable is a variable that causes the emergence or change of the dependent variable, namely the factors that are measured, manipulated or selected by the researcher to determine the relationship between the observed or observed phenomena. In short, the independent variable is a variable whose value can affect other variables. Independent variables are often referred to as predictor, stimulus, input, antecedent or influencing variables. Named as the independent variable because it is free to influence other variables. The independent variable, especially in an experiment, can be manipulated by the researcher. In this case, it is believed that the dependent variable will know the level of change if this variable is prepared first.
3. Results and discussion

3.1. Characteristics of respondents

The characteristics of farmers in Langkat Regency, as well as horticultural crop farmers in Indonesia, have almost the same characteristics (homogeneous). There are several characteristics inherent in horticultural crop farmers in the Langkat Regency, especially in terms of age, education, and agricultural experience. The results of data processing on the characteristics of red chili farmers as respondents in the Langkat Regency can be shown in Table 1 below.

| Information                      | Category                          | Total (Person) | Percentage (%) |
|----------------------------------|-----------------------------------|----------------|----------------|
| Age (Years)                      | 24 - 39                           | 20             | 17.86          |
|                                  | 40 - 49                           | 57             | 50.89          |
|                                  | 50 - 76                           | 35             | 31.25          |
| Education                        | Not School- Junior High school    | 41             | 36.61          |
|                                  | Senior High School                | 63             | 56.25          |
|                                  | Higher Education                  | 8              | 7.14           |
| Duration of Farming (Years)      | 2 - 10                            | 37             | 33.04          |
|                                  | 11 - 20                           | 45             | 40.18          |
|                                  | 21 - 40                           | 30             | 26.79          |

Based on Table 1, it can be seen that in general, red chili farmers in Langkat Regency have an age between 40 to 49 years with the highest percentage of 50.89% of the 112 selected respondents. From the data above, there are also 17.86% of farmers aged 24 to 39 years who are farming red chili as much as 17.86% and 50-76 years old farmers as much as 31.25%. This shows that agriculture in Indonesia, especially in Langkat Regency, tends to be unattractive to youth. There is an assumption that farmers or agriculture are synonymous with farming. This causes youth to be more inclined to look for other jobs besides working in agriculture.

In terms of the level of formal education, most of the respondent farmers in Langkat Regency were high school graduates with a percentage of the total number of respondents of 56.25%, while 36.61% were respondent farmers with junior high school education and only 7.14% were graduates of tertiary institutions. The relatively low level of education does not always mean a lack of knowledge. However, high formal education will play a very important role in the ability to analyze various situations, insight into thinking and the use of the latest technology.

| Information                      | Category   | Total (Persons) | Percentage (%) |
|----------------------------------|------------|----------------|----------------|
| Perceived Risk                   | Low        | 89             | 79.46          |
|                                  | Medium     | 22             | 19.64          |
|                                  | High       | 1              | 0.89           |
| Risk Management Strategy         | Not Apply  | 91             | 81.25          |
|                                  | May Apply  | 2              | 1.79           |
|                                  | Apply      | 19             | 16.96          |

Most of the farmers as much as 40.18% are farmers who cultivate red chilies between 11 to 20 years, the remaining 33.04% who have farming experiences under 10 years and as many as 26.79% of
respondent farmers who have experience in red chili farming over 20 years. Judging from the percentage of farming experience, it shows that farmers in Langkat Regency already have sufficient experience in farming. So it can be said that farmers already have sufficient experience and knowledge about agricultural risks.

Based on the results of field research conducted on red chili farmers in Langkat Regency, it was found that the risk perceptions of red chili farmers towards several risk statements such as price risk, income risk, marketing risk and financial risk, the farmers argue that the risk perception on average never occurs in their red chili farming. As many as 79.46% of respondents from 112 petanai respondents so that the risk management strategies obtained from these farmers tend not to do or apply any strategy, namely as many as 81.25% of respondent farmers because red chili farmers in Langkat Regency think that there has never been a risk that is worrying in the red chili farming carried out.

3.2. Perceptions of risk on risk management strategies

Based on the results of the Pearson Correlation data analysis performed using SSPS, the following results are obtained:

| Table 3. Descriptive statistics of data risk perceptions against risk efforts |
|-----------------|---------|---------|------|
| Perceptions     | 2.57    | 0.531   | 112  |
| Strategy        | 2.70    | 0.762   | 112  |

| Table 4. Correlation results of risk perceptions against risk efforts |
|-----------------|-----------------|--------|
| Perceptions_X1  | Strategy_X2     |       |
| Perceptions_X1  | Pearson Correlation | 0.611** |
|                 | Sig. (2-tailed)  | 0.000 |
|                 | N                | 112    |
| Strategy_X2     | Pearson Correlation | 0.611** |
|                 | Sig. (2-tailed)  | 0.000 |
|                 | N                | 112    |

**. Correlation is significant at the 0.01 level (2-tailed).

From the table above, it can be seen that the Pearson correlation coefficient is 0.611 **. This means that the magnitude of the correlation between the Risk Perception variable and the Risk Management Strategy is 0.611 or strong because it is close to number 1. The two-star sign (**) means that the correlation is significant at the significance level of 0.01 and has the possibility of two directions (2-tailed).

Based on the existing criteria, the relationship between the two variables is significant because the significance value is 0.000 <0.001. (If there is no two-star sign, the significance is automatically 0.05). The relationship between the two variables has two directions (2-tailed), which can be unidirectional (positive) and unidirectional (negative).

See the direction of the correlation between two variables. The direction of correlation is seen from the number of positive or negative correlation coefficients. Because the correlation coefficient number is positive, namely 0.611; then the correlation of the two variables is unidirectional. It means that if the value of the Risk Perception is the value of the management strategy will be high as well.

In conclusion: The correlation between perceptions and risk management strategy variables is strong, significant and unidirectional (positive)

3.3. Relationship of perceptions of risk and farm risk management strategies risk

Perceptions of risk management strategies are made through statements on a five scale from 1 - 5 (very unlikely - very likely). The perceived risk score is calculated by multiplying the score from the
perceived probability. In the correlation test conducted, perceived risk has a significant positive effect on farmers' decisions in determining the strategy to be carried out in red chili farming, this is in accordance with statement [8] where the perceived risk (risk perception) will significantly and positively affect the intention to implement risk reduction strategies.

4. Conclusions
Farmers' perceptions have a positive and significant effect on the Risk Management Strategy of Red Chili Farming, where objective perceptions of farmers influence farmers' decisions in determining the efforts made. To increase effectiveness policy implementation is necessary taking into account different levels of perception against policies in red chili farming with optimize the role of members in the group peasants accompanied by accompanied intensive and participatory socialization local government commitment.

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Acknowledgements
We would like to thank the DRPM Ministry of Research, Technology and Higher Educations an institution that has been funding in this research through the 2020 Masters Thesis Research scheme with contracts No. 219 / UN5.2.3.1 / PPM / KP- DPRP / 2020. In addition to the Research Institute of Universitas Sumatera Utara, which has contributed morally and materially.