Risks Identification of Pontianak Citrus Farming in Sambas District West Kalimantan

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Abstract

Farmers always faced agricultural risks. The current condition of Pontianak Citrus plants in Sambas District has a very large risk, especially Pontianak Citrus farmers in Sambas District generally have narrow land and limited capital. The objectives of this study were to identify agricultural risks and risks scores at farm households based on the perception of Pontianak Citrus farmers. The study was conducted on 2018 in Sambas District. Primary data obtained directly from the field. To obtain these data using observations and direct interviews with questionnaires to 150 of Pontianak Citrus farmers in 5 Sub district in Sambas District. The analysis methods used in this study were qualitative descriptive. The results showed that based on farmers' perceptions, the agricultural risks included production risks, market risks, human risks, institutional risks and financial risks. The highest impact of the risks on farm was the production risk, mainly influenced by pests and diseases. Risk management strategies implemented by farmers were through the use of inputs. Meanwhile, if there was a failure that interfered with family income and the sustainability of farming, farmers would choose to use the income from off-farm work, or to borrow from other parties as a manifestation of risk management strategies.

Keywords: - agricultural risk, Pontianak Citrus, farming

1. Introduction

In Indonesia, the agricultural sector in general is a leading sector. Recorded more than 50% of Indonesia's population dependent on this sector, not only provides food alone but also the agricultural sector provides substantial employment. The agricultural sector is also known to have provided 48 million jobs, providing the raw materials industry as well as providers of raw material exports of both raw and processed.

The agricultural sector has a large role in food supply in order to realize food security. For horticultural crops, Indonesia has 323 horticultural commodities, consisting of fruits, vegetables, biopharmaceuticals and ornamental plants. Besides national leading commodities, regional superior commodities are also developed adjusted to regional and national market demand.

Citrus are one of the leading horticultural commodities that have long been cultivated in Indonesia. Citrus commodities grow and develop in several regions and each has its own according to differences in climate and environmental factors. In Indonesia there are several types of Citrus such as Pontianak Citrus, Medan Citrus, and Malang Citrus. Each group has an advantage that is difficult to compare which is superior.

West Kalimantan Province or more precisely Sambas District is one of the centers of Citrus production in Indonesia. The Citrus that was developed was Pontianak Citrus (*Citrus nobillis var. Microcarpa*).

Pontianak citrus is a small part of the many citrus species that are well known and widely cultivated. Pontianak citrus is a member of the tangerine group which has the scientific name *Citrus nobilis*. It has the name *Jeruk Siam* because this orange comes from Siam (Thailand) (Barkah, 2020).

The development of Pontianak Citrus planting area often experienced ups and downs, Pontianak Citrus had experienced a peak in 1993 with a planting area of 19,481 hectares, harvested area of 13,762 hectares, and total production reached 196,019 tons. In 1994 total production decreased to 185,687 tons due to a decrease in planting area. Drastic decline in production in 1997 was 26,578 tons or down 85.68% compared to 1994. The decline of Pontianak Citrus production is due to a monopoly system in marketing which results in falling prices or selling values so that farmers pay less attention to their Citrus plants. As a result, Citrus plants are attacked by various diseases, such as Fusarium, Diplodia and other diseases. Besides that, it is suspected that there is CVPD which attacks farmers' Citrus plants, especially in Sambas District (Food Crops Department, 2003).

As happened to all agricultural commodities, especially those cultivated by farmers, the main

problem is the problem of production and marketing (Kurniati, 2012). Production risk includes the nature of farming which is always dependent on nature supported by risk factors because the use of input factors (such as chemical fertilizers that are not according to recommendations) and pest and disease attacks, leads to high opportunities for production failure, thus accumulating in the risk of low income received by farmer.

The current condition of Pontianak Citrus plants in Sambas District has a very large risk, especially Pontianak Citrus farmers in Sambas District generally have narrow land and limited capital. Limitations in land area and capital constraints have caused the use of production inputs such as fertilizers and other inputs to be incompatible with the needs of Citrus plants. In the end it affects the development of harvest area, production and productivity of Citrus.

Given the many risks of farming, Pontianak Citrus farming should receive special attention to minimize risk. In addition to known ways of proper management of risks in the farming in Pontianak Citrus farming, it is necessary from the current study to identify the risks of farming, looking for approaches in anticipation of the risks.

2. Literature Review

The bottleneck for agribusiness sector in Indonesia is the existence of variety of risks. Various types of agricultural risks must be addressed and managed by farmers. This risk is further exacerbated by factors such as yield and price uncertainty, weak rural infrastructure, imperfect markets, climate change, natural disasters and the lack of risk prevention instruments such as credit and insurance. Addressing these issues of risk and vulnerability in agricultural production and marketing systems requires an understanding of cross-cutting issues and different approaches to managing risk (Panda et al., 2012).

The five general types of risk in agriculture are as follows Komarek et al. (2019):

i. Production risks stem from the uncertain natural growth processes of crops and livestock, with typical sources of these risks related to weather and climate (temperature and precipitation) and pests and diseases. Other yield-limiting or yield-reducing factors are also production risks such as excessive heavy metals in soils or soil salinity.

ii. Market risks largely focus on uncertainty with prices, costs, and market access. Sources of volatility in agricultural commodity prices include weather shocks and their effects on yields, energy price shocks and asymmetric access to information are additional sources of market risk. Other sources of market risk include international trade, liberalization, and protectionism as they can increase or decrease market access across multiple spatial scales. Farmers' decision making evolves in a context in which multiple risks occur simultaneously, such as weather variability and price spikes or reduced market access (Holden and Shiferaw, 2004; Harvey et al., 2014 and Lazzaroni and Wagner, 2016).

iii. Institutional risks relate to unpredictable changes in the policies and regulations that effect agriculture (Harwood et al., 1999), with these changes generated by formal or informal institutions. Government, a formal institution, may create risks through unpredictable changes in policies and regulations, factors over which farmers have limited control. Sources of institutional risk can also derive from informal institutions such as unpredictable changes in the actions of informal trading partners, rural producer organizations, or changes in social norms that all effect agriculture. Farmers are increasingly supported by and connected to institutions, especially as farm production becomes more market focused.

iv. Personal risks are specific to an individual and relate to problems with human health or personal relationships that affect the farm or farm household. Some sources of personal risk include injuries from farm machinery, the death or illness of family members from diseases, negative human health effects from pesticide use, and disease transmission between livestock and humans (Antle and Pingali, 1994; Lopes Soares and Firpo de Souza Porto, 2009; Masuku and Sithole, 2009; Arana et al., 2010 and Tukana and Gummow, 2017). Health risks are a major source of income fluctuation and concern for farmers (Dercon et al., 2005). Farmers often cope with the interconnectedness of personal and institutional risks; for example, divorce or death of a husband can lead to the appropriation of land or livestock, due to institutional risks created by customary laws (Meinzen-Dick et al., 2014). In the literature, the words "personal", "human", and "idiosyncratic" generally refer to the same type of "personal" risks we considered.

v. Financial risk refers to the risks associated with how the farm is financed and is defined as the additional variability of the farm's operating cash flow due to the fixed financial obligations inherent in the use of credit (Gabriel and Baker, 1980 and de Mey et al., 2016). Some sources of financial risk include changes in interest rates or credit availability, or changes in credit conditions.

3. Methodology

This study was a case study on Pontianak Citrus commodity in Sambas District of West Kalimantan province. Location selection is done purposively, that is based on the consideration of the limited study, especially the funding and time constraints, and the location is one of the centers of Citrus production in Indonesia. This study was a descriptive qualitative research to describe the risks of Pontianak Citrus farming that was conducted in April to August 2018.

In analysing and discussing the issues in this study requires data that consists of primary data and secondary data. Primary data obtained directly from the field. To obtain these data using observations and direct interviews with questionnaires to 150 of Pontianak Citrus farmers in 5 Sub district in Sambas District. Secondary data are obtained by searching literary study of literature, documents, journals and research reports, and magazines and scientific papers related to research problems and also through internet media.

In this research, agriculture is an economic activity in high-risk businesses and highly uncertain. Agriculture sector is vulnerable to various risks that may impact on the fluctuation of the income of farmers (Djunaedi, 2016). Risks in agricultural enterprises divided as a business risk and financial risk (Hardaker et al., 1997). Risk management means identifying the risks and options, and then evaluate, select and implement the measures. Business risk management means "knowing the business," and do so in a way that skilled. Which include the business risk is the risk of production, price risk or market risk, institutional, and human or personal risk.

Descriptive analysis is used to describe the results of research that includes the number of farmers, the results of the respondents' questionnaires are related to the risks of Pontianak Citrus in Sambas District, West Kalimantan. As for data processing using Microsoft Excel for Windows 2007 software. Descriptive statistics is a statistical method used to depict or describe data that has been collected into an information (Sugiyono, 2004). Descriptive statistics that describe or depict data already collected as it is without any intention to make inferences that apply to public or generalization (Suharyadi and Purwanto, 2008). Some examples of descriptive statistics that often arise are tables, charts, graphs, and other magnitudes in magazines and newspapers (Walpole, 1993). With descriptive statistics, collection of data obtained will be presented with a concise and tidy and can provide the core information from existing data set. The data that have been obtained in this study, both primary and secondary treated descriptively in the form of frequencies, percentages, scores, and cross tabulation as at tool for evaluating the performance of farmers with a simple analytical tool and is quite good, effective and efficient in separating the major problems faced by farmers.

4. Finding and Analysis

4.1 Characteristic of Respondents

Based on the Table 1 can be viewed in general, about 88% of the total number of respondents selected were males, but also there are 12% of the respondents were women. 18 women become farmer because her husband had died and some are caused by divorce, but all of these female respondents are members of farmer groups.

Average age of farmer respondents were over 30 years old. This indicates that agriculture in Indonesia, especially in Sambas District tend not enthused by the youth. The notion that the farmer or the farm was identical to the work of cultivation and poverty. This causes the youth are more likely to find non agriculture work.

Table 1: Characteristic of Pontianak citrus farmers in Sambas district.

	Category	Respondent	Percentage (%)
Sex	Male	132	88.00
	Female	18	12.00
Age (years old)	31-40	21	14.00
	41-50	49	32.67
	51-60	34	22.67
	>60	46	30.67
Education	Not have formal education	34	22.67
	SD/MI (aged 6-12)	67	44.67
	SMP (age 13-15)	21	14.00
	SMA (age 16-18)	28	18.67
Land area	<0,5 ha	95	63.33
	0,5 - 1,0	37	24.67
	>1,0 ha	18	12.00
Farming experiences	<5 years	31	20.67
	5 - 10 years	52	34.67
	>10 years	67	44.67

Education levels are still relatively low, does not necessarily mean lack of knowledge. However, formal education can be a real role in the ability to

analyse various situations, insightful thinking and utilization of latest technology.

4.2 Farmers Perception on Risks of Pontianak Citrus Farming

Based on interviews with a number of farmers in Sambas District. We obtained the perception of farmers about the risks of Pontianak Citrus as follows Figure 1.

The picture below shows how the perception of farmers based on the relative importance of various risks. Production risk is the most influential risk of all, followed by marketing risk, financial risk, human risk and the social and legal risks. The risks most often faced by farmers is the production risk mainly from pests and diseases and the climate or weather such as rain and drought. Marketing risk is also a dominant risk primarily due to frequently changes in product prices and the expensive distribution of commodities because of transportation costs are expensive due to inadequate infrastructure and also often monopolized by large employers. Financial risk is dominated by weak capital of farmers and farmers' lack of access to capital itself.

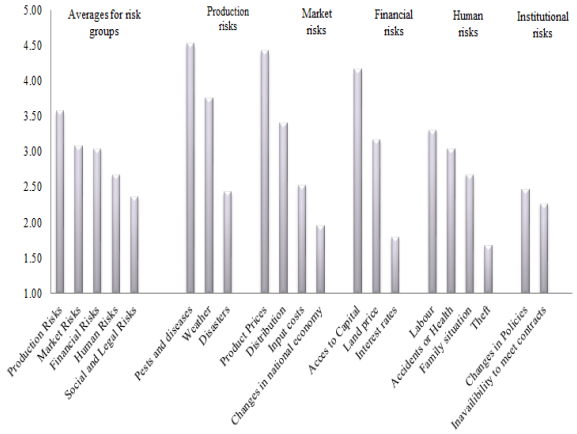

Figure 1: Risk scores in Pontianak Citrus farmers perception - Mean scores on a 5-point scale from very important (5) to not important (1)

A decrease in agricultural production is the main issues that experienced by farmers. The decrease in production was caused mainly by pests and diseases attacks. Pests and diseases is one of the main limiting factor of agricultural production increase. Pests and diseases attacks causing loss and decline in the quality and quantity of agricultural production. Pest and disease usually attack during the rainy season.

Decline in production growth is also caused by other important factors such as global climate change. Various forms of climatic anomalies such as high rainfall during the rainy season and long droughts during the dry season. Natural disasters also often occur as floods and droughts and even fire.

In addition to the price of Pontianak Citrus that are often changed, especially during harvest, so output prices will more lowly. The existence of the long market chain lead the agricultural product prices far below market prices.

Infrastructure is still low, is another reason the distribution of agricultural commodities become more longer. The unavailability of farm roads causing transport costs to market the Citrus production even greater. This is exploited by entrepreneurs who have big capital to purchase agricultural products at farmers' level with low prices and sell with a high price in the market with the aim of gaining a big profit.

While the farmers not knowing the details of the effect of changes in the national economy to their farm. However, farmers felt the impact of the rising of fuel prices followed by the rising prices of production inputs and transport.

The main financial risks identified by the farmers is the capital. Farmers' capital is very limited, it is seen from the ability of farmers to finance their farming. The difficulties of capital experienced by farmers will affect the space of farmers' activities on farm.

Another important financial risk is land ownership. Small land ownership and the occurrence of conversion of land for industrial development and settlement of the land. Small ownership of land, the average farmer seek land under <0.5 ha and the area tends to shrink due to the process of land fragmentation as a result of the system/pattern of inheritance.

Human risk can be seen from the labour which is the important factor of production activities of the agricultural sector. In general, the workforce in the agricultural sector has a low education level, relying on the limited skills, working on their own farms or others.

Although the amount of labour in the agricultural sector were more than the amount of labour in other sectors. But there is a downward trend from previous years. It can be seen simply from the characteristics of farmers. Downward trend is due to the paradigm of thinking with the work that farmers is identical with farming, this traditional way of thinking make young people are not interested working in agriculture. With the trend of decrease in the number of farmers are making labour wage in agriculture is increasing.

Seeing the conditions of the age of the farmers, mostly farmers has over 50 years old. This factor make the decreases of farmers' health, this will reduce the concentration of working which ultimately can lead to accidents at work. This condition is further aggravated by the absence of adequate health

insurance and farmers cannot afford to buy any insurance.

In terms of social and legal risks, some of farmers thought that government policy is not very pro-agriculture, it is seen that the agricultural support infrastructure such as inadequate roads etc. On the other hand, because most farmers have low education levels, so the ability to make a deal is still lacking. However, if there is an agreement between farmers/farmer groups with major employers, the bargaining power of farmers are always in adverse conditions.

4.3 Strategies at Farm Households

Management strategies at farm level are more focused on reducing production risk and financial risk. It can be seen in Figure 2 below.

Risk management at farm level is more emphasis on the technical approach in the handling of agricultural risks. To reduce the risk of production or a decrease in the production due to the influence of pests and diseases, farmers are more likely to monitor and to identify the advance of pests and diseases. Control is performed in general by the farmers using pesticides or spraying with insecticides. Changes in the weather causes the perceived limitations of water is greatly reduced, especially during the dry season coupled with the lack of infrastructure, causing farmers have to taking direct of water sources.

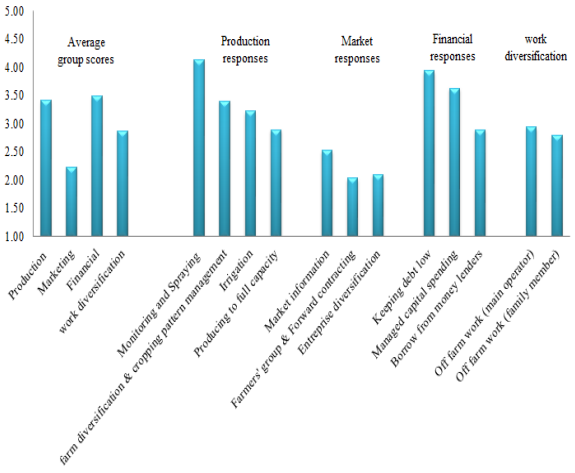

Figure 2: Importance scores of risk management strategies for Pontianak Citrus farmers - Mean scores from very important (5) to not important (1)

One characteristic of the agricultural in developing countries are lack of management and limited capital. The farmers' needs of cash (capital) to finance the farming activities are very prominent in the purchase of fertilizers and pesticides.

Financial problems are one of the major problems for farmers. Capital possession was found to be the starting point for farmers' decision-making in relation to credit use. As long as farmers had their own capital, they tended to avoid using credit, perceiving that credit from any source was risky. Farmers preferred to apply for government credit, rather than from private sources, because it had lower interest rates, a more suitable repayment schedule, and was considered less risky.

Farmers cannot be separated from the burden of debt for everyday life and for the cost of production. The main thing that made the farmers to overcome the financial risk is to keep the debt low, and then try to manage the capital spending. If the cost for daily use and production costs are still lacking, while the capital to meet these needs are limited, farmers will take the loan. Borrowed money that is made for farming or for everyday purposes are usually addressed to the close friend, neighbour and in general to money lenders (tengkulak). Most of the farmer borrow the money to money lenders and pay it at harvest time, which is the money lenders who will buy these products, certainly at a low price.

Risk marketing especially product prices is one major problem. Farmers cannot afford or do not have the power to determine the price. To overcome these farmers generally follow the price information of agricultural products in general. To compensate for farmers' income if they are not getting adequate results or prices, the farmers will diversify their farming. To increase farmers' income and maintain selling prices, some farmers and farmer groups followed the business agreements with employers.

Day by day agricultural land become narrow and not sufficient for households concerned. To obtain sufficient income for farmers' family. Farmers' family generally do additional work outside the farm (off farm).

5. Conclusion

The agricultural risks in Pontianak Citrus farming included production risks, market risks, human risks, institutional risks and financial risks. The highest impact of the risks on farm was the production risk, mainly influenced by pests and diseases. Risk management strategies implemented by farmers were through the use of inputs. Meanwhile, if there was a failure that interfered with family income and the sustainability of farming, farmers would choose to use the income from off-farm work, or to borrow from other parties as a manifestation of risk management strategies. Jobs outside the agricultural sector, such as jobs in the industry of small household, are well known in rural areas. The existence of employment outside the agricultural sector is important for farm households. This relates to the nature of agricultural activities in the field. In

general, farm households need jobs outside the farm to supplement their incomes.

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