

Implementation Of Traditional Risk Management As Loss Prevention In Coconut Production Results

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ABSTRACT

In Kalimantan, coconut is one of the main commodities which is a source of community income. This happened, because the characteristics of Kalimantan's soil are very suitable for coconut plantations, so that most of the people have coconut gardens. However, in the process of raising it to make money, there are many risks. These conditions encourage farmers to be able to find solutions, so that coconut products remain a source of income. This study aims to analyze the risks in coconut plantations, which have an impact on selling value/price, economic value, income, to welfare. The research method used is quantitative with regression analysis as a causal estimation tool between variables. The research sample was taken randomly from 150 coconut farmers in the Kalimantan region. The results showed that the risk in the coconut industry is the reduction in the number of trees due to the conversion of mining and other plantations. Then another risk is operational costs that are not balanced with the selling price. This condition is often complained of by farmers, and because they do not have the ability to overcome it, farmers can only reduce the number of production activities, starting from maintenance to distribution.

Keywords: Risk Management, Price, Economic Value, Coconut Plantation, Income

INTRODUCTION

Indonesia is part of the developing countries in the world which makes the top priority for economic development focused on the agricultural sector in economic development. According to Jhingan (2016) emphasized that economies in developing countries are generally focused or oriented to the agricultural sector with low levels of productivity, income, savings and investment. Indonesia is known as an agrarian country which means a country that relies on the agricultural sector both as a source of livelihood and as a support for development. The agricultural sector includes the plantation sub-sector, food crops sub-sector, horticulture sub-sector, fishery sub-sector, livestock sub-sector, and forestry sub-sector. Agriculture is a very dominant sector in people's income in Indonesia because the majority of Indonesia's population work as farmers. However, agricultural productivity is still far from expectations. One of the

factors causing the lack of agricultural productivity is human resources that are still low in cultivating agricultural land and its products. The majority of farmers in Indonesia still use a manual system in processing agricultural land.

The contribution of agriculture to economic development, Todaro (2018), namely; agriculture as an absorber of labor, contribution to income, contribution in the provision of food, agriculture as a provider of raw materials, contribution in the form of capital. Through this conception, it is expected to be able to grow the agricultural sector, so that in turn it can become a new source of growth for the Indonesian economy. especially in terms of achieving the goals of welfare for farmers, providing employment, as a vehicle for equitable distribution of development between regions, as an input market for agro-industry, generating foreign exchange, increasing national income, maintaining resource sustainability. These monthly price developments in the domestic and world markets tend to fluctuate.

Based on data from the Directorate General of Indonesian Plantations in 2017, it provides an explanation in analyzing the required coconut farmer households or including elements of risk that might occur which include price and production risks. Central Kalimantan is one of the provinces in Indonesia which is located on the island of Borneo. Its capital city is Palangkaraya City. Central Kalimantan has an area of 157,983 km². Based on 2010 census, this province has a population of 2,605,274 people, consisting of 1,361,715 males and 1,243,559 females. Central Kalimantan BPS data for 2018 shows the population of this province in 2020 will increase to 2,670,000 (1,385,700 men and 1,284,300 women). The main plantation commodities in Central Kalimantan include rubber, coconut and palm oil. Based on data from the Central Kalimantan Provincial Plantation Service, Central Kalimantan rubber production in 2020 reached 168,039.50 tonnes with an area of 444,709.24 hectares. Central Kalimantan's coconut production in 2020 reached 15,719.03 tonnes with an area of 34,847.04 hectares (Central Bureau of Statistics, 2021).

The household is the smallest unit of the composition of the community group, the household is also the basic joint in fostering and realizing a country. Most farmer households in Indonesia are farmer households with narrow land tenure, Koblianska, et al. (2020) stated that a quarter of the world's population has the status of smallholder

households, most of the population is spread out in developing countries and Indonesia is one of the developing countries.

Seruyan Regency is one of the Regencies in Central Kalimantan Province, Indonesia. The capital of this regency is located in Kuala Pemburan which is a coconut supplier to other regencies in Kalimantan, Seruyan Hilir Timur sub-district is a sub-district that has enormous potential as a coconut supplier in Seruyan district and the provinces in Kalimantan, with an area of planting coconut plantations of 1,873 hectares. As for the East Seruyan Hilir District, 1,231 hectares, Seruyan Raya District, 102 hectares, Hanau District, 181 hectares, Sembuluh District, 27 hectares and the smallest area is Seruyan Tambun District, 6 hectares, all of which are owned by coconut farmers in Seruyan Regency.

Coconut farmers are always faced with risks including production risk and price risk. Indications of production and price risks are shown by the fluctuations in production and prices received by coconut farmers at each harvest. The existence of this production risk causes head productivity to decrease. As for coconut production, the overall productivity of coconut plantations in Seruyan Regency in 2019 was 697.99 tons/year and in 2020 it was 813.13 tons/year (Seruyan BPS, 2021). The main sources of risk that are generally felt by farmers include weather uncertainty, pests and diseases (dead trees) and product price uncertainty (Assefa, et al., 2017). There are several risks faced by coconut farmers which often arise is the uncertainty of coconut prices. There is a risk of reducing coconut stems due to the transfer of functions so that coconut farmer households experience a decrease in income.

THEORETICAL BASIS

Production risk is an opportunity to reduce production results from the expected results. Komarek et al. (2020) define risk as the possibility of an event that causes a loss. Meanwhile, according to Robinson and Barry in Darmawi (2020) stated that there is a difference between the concepts of risk and uncertainty. If the probability of an event can be known by the decision maker, which is based on experience, then this shows the concept of risk. Meanwhile, if the probability of an event cannot be known by the decision maker, this shows the concept of uncertainty. Risk analysis aims to find out how likely the risk will occur and how big the consequences will be from the risk.

According to Darmawi (2020) it is necessary to measure risk, namely to determine its relative importance and to obtain information that will help to determine the appropriate combination of risk management tools to handle it.

Business in agriculture or often referred to as agribusiness is of course inseparable from risks (*risk*) and uncertainty (*uncertainty*). The risks faced are varied. Nelson & Trabelsi (2016) stated that risk factors in the agricultural sector come from production, prices and markets, business and finance, technology, damage, social and legal and human resources. Meanwhile, according to Nelson (2015) sources of risk can be broadly classified into five parts, namely production risk, market or price risk, institutional risk, financial risk, and human resource risk. From some of these risks, there are some risks that are most often faced by farming households, including production risks and production prices.

Robinson and Barry in Pasaribu, et al. (2020), explains that the behavior of farmer households in making decisions is divided into three parts, namely:

1. Farmers who are afraid of the risk(*risk averter*) where this attitude will show the time of various increases(*variance*) then farmers will offset the increase in profits expected to measure the level of satisfaction.
2. Farmers who dare to take risks(*risk prefferen*) where this attitude will show when there is an increase in various profits, the farmer will compensate by reducing the profit that the farmer expects.
3. Farmers who are neutral towards the occurrence of risks(*risk neutral*) where this attitude will show when various increases occur, farmers will increase the expected profit.

The approach used in this research is a farmer household economic model which can be done with a simultaneous equation approach. The farmer household economic model is used because of the relationship between production and consumption in farmer households which have two roles, namely as producers and consumers. Farmer household economic model can be built in a way *separable or recursive*, this is used because production decisions can affect consumption but production decisions are influenced by consumption decisions. Or the economic model of a farm household that is built systematically *non separable* because production decisions influence and are affected by consumption decisions. this is the price variable as an exogenous variable

(*model Separable*), otherwise in the *model non separable*, the price variable as an endogenous variable.

Approaches in analyzing farmer household economic models can be done with simultaneous equations. The equation in this model essentially includes production activities, such as supply of output or production, consumption activities such as demand for consumption goods or expenses, and the allocation of labor such as demand and supply of labor. The equations built in this study were developed according to events that occurred in the field.

METHOD

The population referred to in this study is the total number of households of coconut farmers who run farming in the sub-district of Seruyan Hulu Timur, Seruyan Regency. The total population of coconut farmer households in Seruyan Hulu Timur District is coconut farmer households. The list of farmer households is used as a sample frame, the farmer households in Seruyan Hulu Timur District have the same characteristics (*homogeneous*) then to determine the sample in the study with a simple technique (*simple random*). The number of samples used in this study were 200 coconut farmer households. The number of samples already represents the population of coconut farmer households in the study area. This is in line with what was revealed by Pasaribu et al. (2020) taking a large sample of 200 which statistically has a normal distribution.

In analyzing the factors affecting production faced by coconut farmers, the model production function is used *Just and Pope* this model explains that production is affected by the production function and production risk (Sari, et al., 2020). The production function used in this study is the Cobb-Douglas production function in natural logarithmic form (Nainggolan, et al., 2021).

Furthermore, in this study, standard deviation was used as production risk by looking at the production level in each sample from 4 harvest seasons. The determination of high, low and normal production is based on the distribution of productivity level data from each season for each sample.

Farming opportunities are measured based on experience in managing farming. When actual conditions measure the probability of an event being carried out by looking at the frequency of each event in a certain period. Opportunity includes the

quantification of one's uncertainty expressed in numbers 0-1, describing the level of confidence in events that might occur from an uncertain event.

After obtaining the estimation of the equation *variance error* coconut productivity, then the average variance error for each coconut household is calculated, so that this value is used in the model as an exogenous variable. The standard deviation is measured from the square root of the variance value. The mathematical formula for calculating the standard deviation is seen at the value shown from the calculation of the standard deviation which has the same meaning as the variance value.

RESULT

Coconut Production Risks

Coconut farming carried out by household farmers is always faced with risk problems, both production risk and product price risk. The existence of production risk in the management of coconut farming is shown by the variations or fluctuations in production obtained by coconut farming households in each harvest season. The same thing also happens to the risk of coconut prices, where indications of price risk are shown by fluctuations in the price of coconuts received by coconut farming households in each harvest season. Some of the factors that cause production risks that are often faced by coconut farmer households in Seruyan Regency are as follows:

1. Weather and Climate Conditions

Weather and climate conditions are one of the causes of internal risks coconut production. This is because weather changes are increasingly difficult to predict because the weather is no longer in accordance with its normal cycle or it is called a weather anomaly as a result of climate change. The impact of climate change in the form of increasing air temperature, changing rain patterns, and increasing the frequency of extreme climate events will have a direct effect on agricultural production systems. Changes in rain patterns and shifts in extreme seasons are expected to lead to higher rainfall intensity in the rainy season and a longer dry season. Excessive rain is likely to increase erosion, nutrient leaching and landslides. Conversely, a dry dry season will cause drought stress with a long period of time. Climate change, which causes an increase in extreme climate events or climate anomalies, will pose a significant risk to the production and

productivity as well as the quality of the agricultural sector, including the plantation sub-sector (Directorate General of Plantations, 2017).

2. Pests and diseases

Pests and diseases are a source of risk faced by coconut farmers in Seruyan District. The existence of pest attacks can cause a decrease in coconut production which can cause losses to coconut farmer households. According to Efendi et al. (2020), pests of coconut plants which cause considerable losses, among others *Oryctes rhinoceros*; *Sexava* sp., *Artona catoxantha*, *Bronstispa longissima* whereas diseases that are very detrimental to coconut plants are shoot rot disease (PBP), fruit drop disease (PGB) caused by *Phytophthora* sp and coconut wilt disease (PLK) and natuna wilt disease.

3. Flood/Tide

One of the risks of coconut production in Seruyan Regency is flooding/tide. The condition of plantation land and in Seruyan Regency which includes peat land and is located on the coast causes the risk due to flooding / high tides to be higher. The existence of flooding in coconut plantations will cause inundation on coconut trees. Coconut trees that are inundated with water for too long which has salt levels will cause many coconut trees to die. In addition, flood inundation will result in a decrease in soil fertility so that it can no longer be used as land (Purba, et al., 2017).

The production risks faced by household coconut farmers will affect the level of productivity produced in each harvest season (Dahlianawati, et al., 2020). Where are the productivity fluctuations produced by the farmer households which indicate a risk in coconut farming activities. In this study observations were made during 4 harvest seasons, so that from the 4 harvest seasons it can be seen that there were fluctuations in coconut productivity obtained by farmers. From these fluctuations it can be seen that the value of coconut productivity is high, low and normal. High productivity is the highest level of productivity ever obtained by a farming household while operating the commodity in question. Meanwhile, what is meant by low productivity is the lowest level of productivity ever obtained by a farming household while operating the commodity in question. Meanwhile, what is meant by normal productivity is the productivity that is often obtained by farming households during coconut farming. In

detail, the level of productivity and opportunities for coconut farmer households to occur due to production risks.

Based on Table 1, it is known that the highest average coconut productivity ever achieved by a farming household reached 10,896.45 eggs/ha/harvest, while the lowest coconut productivity ever experienced by a farming household reached an average of 6,125.88 eggs/ha/harvest, while Coconut productivity that can be obtained by household farmers is 8,580.48 eggs/ha/harvest. Furthermore, related to the productivity opportunities received by farmer households, it shows that the average chance of getting high coconut productivity is 0.3 or 30 percent, which can be interpreted if a farmer household harvests coconuts 10 times, the frequency of farmer households can achieve high productivity is only two (3 times. Furthermore, the average opportunity for farming households to obtain low productivity is 0.31 or 31 percent and the opportunity for normal productivity is 0.39 or 39 percent. Thus it can be seen that as long as the farmer households are cultivating coconut, the average sample farmer households often obtain normal productivity compared to those with high or low productivity. After knowing the opportunities for high production, normal production opportunities and low production opportunities, it is important to look at the production expectations expected by coconut farming households. The average expectation of coconut productivity is 8,906.22 eggs/ha/harvest.

Furthermore, after knowing the value of production expectations, then it can be calculated what level of production risk faced by coconut farming households. Measures of production risk faced by farmer households are in the form of variance, standard deviation and coefficient of variation. Value determination *variance* on production risk is calculated manually, as explained in the methodology, based on the sum of the squared difference of the price (high, low and normal) with the expected price, multiplied by the respective probability of the price occurring (high, low and normal). Meanwhile, the standard deviation is measured from the square root of the value *variance*. In this study, the production risk measure used is the standard deviation.

Based on the measurement results of production risk shows that the amount coconut production risk of 1,891.31 eggs/ha/harvest. The high or low level of risk in coconut production faced by households of coconut farmers depends on weather and climate conditions, pest and disease attacks, hydrological conditions (floods), and

coconut plant maintenance activities. Associated with pest control activities that are still minimally carried out by farmers is also one of the causes of the high risk of coconut production at the study site.

Coconut Price Rico

Based on data research, it is known that the average coconut price that is often received (normal price) by coconut farmer households is IDR 1,497/item. Meanwhile, the highest average price of coconut ever received by a coconut farmer household was Rp. 1,984/item and the lowest price ever received by an average coconut farmer's household was Rp. 1,034/item. Judging from the opportunity, the average chance for a coconut farming household to get a high price is 0.37 or 37 percent and the chance to get a low price is only 0.19 or 19 percent.

After knowing the opportunities for high prices, low opportunities and normal opportunities, it is important to look at price expectations or price returns expected by farming households in running coconut farming. Price expectations calculated by multiplying each of these prices by the probability of receiving the price, based on the calculation results it is known that the expected coconut price is IDR 1,617/item, which is almost the same price as the price normally received by coconut farming households. Furthermore, at the level of coconut price risk faced by coconut farmer households in Seruyan Regency, it is Rp. 307.52/item (Table 4). The level of price risk received by farmers is also influenced by the harvest season and weather and climate conditions including hydrological conditions such as floods.

Estimating the Price of One Coconut Palm Tree

In the study it was found that the average age of the farmers' coconut plants was 28.79 years, with the oldest coconut being 46 years old. This shows that the coconut plants in the study area are still classified as productive (<100 years). Based on the distribution, the age of the farmers' coconut plants is dominated by those aged 16-25 years with a percentage of 41.00 percent. While farmers who have coconut plants with age more than 45 years by 1 percent. So that the price of one coconut tree due to the risk of reducing coconut trees, the price of one tree is obtained as follows. Meanwhile, based on Table 12 it is known that the average price of coconuts that is often received (normal price) by coconut farming households is IDR 1,497/item. Meanwhile, the highest average price of coconut ever received by a coconut farmer household was Rp.

1,984/item and the lowest price ever received by an average coconut farmer's household was Rp. 1,034/item. Coconut Rp. 1,497 * 25 seeds = Rp. 37,425/ 3 months (37,425 x 25/tree) x 4 harvest seasons in 1 year, Rp. 149,700 in one year. So that the compensation for logging coconuts is 10,628,700 Compensation, because coconut plants can be harvested for 71 years in the district. The average unit price for coconuts is Rp. 1,497 * (71 years = 852 months)

CONCLUSION

Results in the study It is known that the average age of coconut plants owned by farmers is 28.79 years, with the oldest coconut being 46 years old. This shows that the coconut plants in the study area are still classified as productive (<100 years). Based on the distribution, the age of the farmers' coconut plants is dominated by those aged 16-25 years with a percentage of 41.00 percent. While farmers who have coconut plants with age more than 45 years by 1 percent. So that the price of one coconut tree due to the risk of reducing coconut trees, the price of one tree is obtained as follows. Meanwhile, based on Table 12 it is known that the average price of coconuts that is often received (normal price) by coconut farming households is IDR 1,497/item. Meanwhile, the highest average price of coconut ever received by a coconut farmer household was Rp. 1,984/item and the lowest price ever received by an average coconut farmer's household was Rp. 1,034/item. So that the compensation for logging coconuts is IDR 10,628,700.

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