



Farmers Behavior in Rice Farming Risk Mitigation

We Ati Mega Daeng Malebbi¹, Mahyuddin¹, Syahriadi Kadir¹

¹Agribusiness Study Program, Graduate School, Hasanuddin University, Makassar, Indonesia

Article History	Abstract
Received: 12 May 2023 Revised: 05 Sept 2023 Accepted: 12 Sept 2023	<p><i>The rice farming sub-sector is an important source of income for rural communities, however rice farming contains many risks which result in a decrease in production that cannot be controlled, therefore farmer behavior is an important factor in preventing and controlling farming risks that may occur. In this regard, this research will focus on knowing the behavior of farmers in mitigating the risk of rice farming. The research method used is a qualitative method with data collection in the form of interviews with predetermined sources. The results showed that the behavior of farmers who were assessed based on knowledge, attitudes and skills in risk mitigation had been carried out well starting from production, environmental and price risks and the role of institutions consisting of the Food Crops, Horticulture, Plantation and Food Security Services, extension workers and farmer groups which The TPHPKP Office also participates in risk mitigation where in terms of monitoring post-harvest price fluctuations and pest control supervision is going well, but the problem is the occurrence of practices that are detrimental to farmers and unpredictable weather changes resulting in the risk of crop failure.</i></p>
CC License CC-BY-NC-SA 4.0	Keywords: Behavior, Farmers, Institutional, Mitigation, Risk, Farming

1. Introduction

Indonesia is known as an agricultural country with most of the population working in agriculture. As an agricultural country, Indonesia has vast agricultural land, of course, and diverse and abundant natural resources. In an agrarian country, agriculture has a very important role both in the sector of fulfilling basic needs, besides that agriculture plays a major role in boosting the social sector, the economic sector and trade (Setyadi, 2017).

According to (Wadu et al., 2019) the agricultural sector, especially the food crop sub-sector such as rice farming, is a source of income for rural communities. Even so, the implementation of rice farming contains many risks which result in a decrease in production, some of which cannot be controlled. Agricultural business is a business that is always characterized by yield variability or high risk. Unlike other businesses, in agriculture, farmers cannot predict the results they will receive later.

Data obtained at the Office of the Food Security Service, Agriculture and Horticulture Office of South Sulawesi Province, from 2021 to 2022 there has been an increase of 4.92%. Where rice production in 2021 will reach 5,090,637 tons. In 2022 it will increase to 5,341,021 tonnes (BPS Sulawesi Selatan, 2022).

South Sulawesi province is one of the largest provinces out of 5 provinces in Indonesia as a national rice barn in Indonesia. Regencies that have contributed to making South Sulawesi a national rice granary include the districts of Soppeng, Sidrap, Wajo, Bone and Pinrang. In particular, in the area of South Sulawesi, there are 21 regencies and 3 cities which are rice production areas with a large enough land area. Of the 21 regencies, Soppeng, Sidrap, Wajo, Bone and Pinrang have the greatest potential and other regions, namely Gowa, Soppeng, Jeneponto, Bantaeng and others.

Based on (BPS Soppeng Regency, 2022) Soppeng Regency is one of the 24 regencies/cities in South Sulawesi Province with the capital Watansoppeng. Soppeng area has an area of about 1,500 km² with

an altitude of 5 to 1,500 meters above sea level. Lalabata District is one of the Soppeng areas which was used as a research location. Lalabata District has an area of 96 km² which is divided into 3 village areas and 7 sub-districts. The area of agricultural land in Lalabata District is 8,766 hectares, consisting of 3,589 hectares of paddy fields and 5,177 hectares of non-rice fields. The paddy fields consist of 3,589 hectares of irrigated rice fields and 20 hectares of rainfed rice fields. Non-agricultural land in Lalabata District covers 19,033 hectares (BPS Soppeng Regency, 2021).

Soppeng is one of the regencies in South Sulawesi province with the capital being Watansoppeng, which is directly adjacent to Bone Regency to the south, east of Wajo district to the north of Sidenreng Rappang district to the west of Barru district. Soppeng Regency has an area of 1,500 km² which is divided into 8 districts. The district that has the widest area is Marioriwawa District with an area of 320 km² or more than one-fifth of the area of Soppeng Regency.

Geographically, Soppeng Regency is located at 4o6'00" - 4o32'00" South Latitude and 119o47'18" - 120o06'13" East Longitude with an area of about 1,500 km² and an altitude between 5 - 1,500 meters above sea level. The temperature in Soppeng Regency ranges from 18.4-34.7 degrees Celsius with air pressure between 994.1-1032.3 millibars. Based on table 2.5, the planting area in Soppeng Regency is 63,933 ha where the most dominant is in Marioriwawa District with a total of 15,023 Ha or nearly 25% of the total. Based on production data, a total of 280,911 tons was obtained in 2021 and of course Marioriwawa District has a larger production, of course, with a total of 64,357 tons.

Rice productivity can be increased to near its potential, but various problems arise along with the emergence of various interests and changing conditions of natural resources. (Suryana et al., 2009) revealed several problems related to lowland rice farming, including: (a) ownership of farming land which is relatively small and scattered and even tends to shrink due to the process of land fragmentation as a result of inheritance systems/patterns, (b) the conversion of paddy fields to other uses as a result of regional economic development for tourism, housing and other sectors, (c) limited discharge of irrigation water in some areas, especially during the dry season caused by competition in the use of irrigation water, (d) limited manpower, especially during the main harvest, so that the need for labor generally comes from outside the region, (e) limited farming capital, so that the productivity achieved is still below its potential productivity and (f) the level of pest attacks which still tends to be high and varies between regions and between planting seasons such as brown planthopper, stem borer, tungro and rats which can be detrimental to farmers.

Farmers in general also lack control over climatic, economic and social conditions in the places where they work. In addition, the influence of pests and plant diseases makes it impossible for farmers to predict the amount of production. However, they have to make decisions, for example the amount of production inputs used (Dillon et al., 2011). Lowland rice is a food commodity that is mostly cultivated by farmers in the Salokaraja Village with a planting season twice a year. The problem faced in lowland rice farming in Salokaraja Village is low production and production fluctuations which indicate production risk. Production risk can be caused by external factors that cannot be controlled by farmers and internal factors that can be controlled by farmers such as management of input use (McConnell & Dillon, 1997). External factors are usually difficult to predict, such as pest attacks and plant diseases, unpredictable weather conditions, such as drought. Almost all sub-districts in Soppeng Regency require an increase in water availability because the demand for water is very large, while the potential for water is small. Provision of raw water is mainly needed for irrigation of rice fields, such as in Lewa District and other sub-districts (Rengganis, 2016).

The main rice farming risks include the frequency of floods, droughts and pest attacks which are currently becoming an increasingly complex problem in an unpredictable climate change situation due to the need to continue to provide sufficient quantities of rice for public consumption. The life of farmers in rural areas is quite close to the subsistence limit and always experiences weather uncertainty, so that farmers do not have the opportunity to apply maximum profit calculations in farming. Farmers will try to avoid failure and not get big profits by taking risks (Sriyadi, 2010).

Various problems faced by farmers as mentioned above become obstacles for them to increase production, income and achieve household food security. These problems are risks that must be faced by farmers in carrying out their farming activities. According to (Soedjana, 2007b), the term risk is

more widely used in the context of decision making, because risk is defined as the opportunity for an adverse event to occur as a result of an action. The higher the level of uncertainty of an event, the higher the risk caused by making that decision. Thus, identification of risk sources is very important in the decision-making process.

The use of production inputs can increase risk and reduce risk (Asche & Tveterås, 1999). Previous studies have shown that the use of inputs such as land area has an effect on the risk of rice production. This means that increasing the area of land to a certain extent will increase the risk of rice production, but other factors do not affect the risk (Rama et al., 2016). Nonetheless, the use of other inputs such as increasing land area, organic fertilizers, and pesticides can reduce the risk of lowland rice production (Suharyanto et al., 2015). Other studies have revealed that Phonska fertilizer and other fertilizers are risk-increasing factors, while liquid pesticides can reduce the risk of rice production (Dewati & Waluyati, 2019). From the findings of previous studies it was predicted that fluctuations in production and low productivity of paddy rice were caused by several factors using inappropriate inputs. (Saptana et al., 2010) revealed that one of the duties of a farmer as a manager in his farming business is to manage the risks he may face. The behavior of farmers in responding to the production risks of rice farming needs to be studied in order to identify the behavior of farmers who cause risks and the behavior of farmers who are able to overcome the risks of rice farming. Therefore, the authors are interested in identifying the risks of further rice farming in Soppeng District, which is dominated by irrigated land and rainfed land.

2. Methods

This research uses a qualitative approach with a case study method. Case study is research in which the researcher explores a particular phenomenon (case) at a certain time and activity (program, event, process, institution or social group) and collects detailed and in-depth information using various data collection procedures over a certain period. This research will be conducted in Salokaraja Village, Lalabata District, Soppeng Regency, South Sulawesi Province. The choice of location for this study was based on the consideration that the research area is one of the areas that has the most professional farmers in Lalabata District and one of the rice-producing areas in Soppeng Regency so that it has the potential to observe farmer behavior in mitigating the risk of rice farming. Data collection techniques used in this study were observation, in-depth interviews and documentation. Data analysis techniques used in this study are Data Reduction, Data Display, and Data Verification

3. Results and Discussion

Farmer Behavior in Agricultural Risk Mitigation

Rice production is one of the important agricultural sectors in Indonesia, where rice farmers are the main pillars in increasing production and people's welfare. However, rice production often experiences high risks, such as natural disasters, pest and disease attacks, climate change, and price fluctuations in the market. Therefore, it is necessary to mitigate the production risks of rice farmers to reduce the impact of these risks and increase the productivity of agricultural businesses. The following are the results of interviews with 2 (two) key respondents who are rice farmers in the Lalabata Village, Salokaraja District, Soppeng Regency:

Table 1. Identity of Informant I located in Lalabata Village, Salokaraja District, Soppeng Regency

Identity of the Informant	
Name	Anto
Age	45 Years
Land	18 Ha
Commodities	Rice
Ownership Status	Farmer Owner
Farmer Group	Veteran

Based on the results of interviews with one member of the Veterans farmer group and owning a total land area of 35 hectares. As many as 18 hectares of his land are used for rice farming activities and 17 hectares are used for other horticultural farming, such as carrots and cabbage. The seeds used by Mr. Anto for rice farming are Generation 3 rice seeds or better known as G3.

The type of land used in Mr Anto's farming activities is in the form of gardens. The land suitable for planting rice is upland with loose, humus soil, so it is better before planting, tillage is carried out by plowing or turning the soil over to make it more loose. Manure is mixed in soil processing activities so that the nutrient content in the soil can be fulfilled. The rice planting calendar is adapted to the climate. Climate is very influential on the success of rice farming. The time for planting rice is mid-February when it starts to rain and harvesting is done in mid-May or early June, usually adjusted to the price of rice in the market. If the price in May is high enough, the harvest will be carried out immediately, but if the price is still low, the harvest will be postponed to the following month.

The cropping pattern used for rice farming is a monoculture cropping pattern, the choice of this cropping pattern was deliberately made so that rice maintenance is not complicated and avoids competition for nutrients from rice plants with other horticultural crops. Rice plants cannot be cultivated continuously on the same land because of a lack of nutrients in the soil, so they must be interspersed with other horticultural crops.

Besides that, the production facilities used by Mr. Anto are in the production of rice seeds, fertilizers, pesticides and alsintan. The seeds used are staple seeds derived from G2 derivatives (basic seeds) or a higher class, which are then used to plant rice plants on their farming land. These seeds are self-cultivated starting from G0 seeds which are the initial seeds, which become derivatives to become G3 seeds so that these seeds are superior. The price per kg for the G3 seeds was purchased by Mr. Anto for Rp. 27,000/kg. So that in 18 Ha. Mr. Anto used 7,000 kg of G3 seeds (3rd generation) with a total price of Rp. 189,000,000.

The fertilizer used by Mr. Anto in his farming is 1,300 kg of manure for 18 ha with the price of one sack or the equivalent of 50 kg of manure, which is Rp. 14,000 purchased outside the city by entrusting or ordering to collectors who want to buy their rice production. So the total price is Rp. 364,000. Apart from that, Mr. Anto also used ZA and Phonska fertilizers which he bought at the farmer's shop for Rp. 100,000/kg ZA and Phonska for Rp. 135,000/kg which is used when the rice reaches one month old. The total ZA and Phonska used by Mr. Anto is 1,300 kg of ZA, so the price is Rp. 130,000,000, while the total Phonska used was 700 kg, so the total price was Rp. 94,500,000.

Mr. Anto used a fungicide in the form of Tanzeb because the rice plants he planted were attacked by a fungus on the leaves of the plants. The fungicide used by Mr. Anto is as much as 12 kg at a price of Rp. 60,000/kg. So, the total price of the overall fungicide used by Mr. Anto is Rp. 720,000 In addition, Mr. Anto uses gromoxone or herbicides to eradicate weeds during land clearing. The amount of gromoxone used by Mr. Anto is 90 liters at a price of Rp. 50,000/liter so that the total price of gromoxone used by Mr. Anto is Rp. 4,500,000.

The mechanization tool used by Mr. Anto is a tractor. The tractor used for land preparation is rented by Mr. Anto for Rp. 600,000 per 1 hectare for two planting seasons so if it is 18 hectares, then the costs incurred by Mr. Anto are Rp.10,800,000. In addition, the tools used are also a hoe and a ruler for beds that are used to make beds with planting patterns when you want to plant rice plants. The tools in the form of hoes, which are used to make the beds, are brought by the workers themselves.

Table 2. Identity of Informant II located in Salokaraja Village, Lalabata District, Soppeng Regency

Identity of the Informant	
Name	M. Zaid Karim
Age	60 Years
Land	1 Ha
Commodities	Rice
Ownership Status	Farmer Owner
Farmer Group	Veteran

Based on the results of the interviews, it can be seen that the area of land owned by several farmers who are the informants in this study is quite large which can certainly affect the risks of farming that will be faced. The wider the land, the greater the risks that must be faced. The following are some of the effects of land area on farming risk:

Risk of Losing Investment: The larger the land area, the greater the investment issued. Farmers who have a large area of land must pay more to buy seeds, fertilizers, pesticides, and others. The risk of losing investment is also greater if bad weather or pests and diseases attack plants. **Risk of Harvest Failure:** The wider the land, the greater the risk of crop failure. Farmers with large plots of land are more vulnerable to natural disasters such as drought, floods or other extreme weather. In addition, pests and diseases can also spread more quickly over large areas of land. **Resource Limitation Risk:** Farmers with large land areas must manage resources more effectively and efficiently, such as water and fertilizer, in order to achieve optimal results. If resources are limited, the risk of crop failure is even greater.

Farmer Behavior

One of the factors that influence the risk of rice farming is the behavior of the farmers themselves in managing their business. Behavior is a state of mind (thinking, arguing, behaving, and so on) to respond to situations outside of a particular subject. This response can be positive (without action) and active (with action). Benjamin S. Bloom and his friends developed Bloom's Taxonomy in 1956. Bloom's Taxonomy classifies educational goals into three domains: cognitive, affective, and psychomotor.

A person's behavior in agribusiness can be measured from the aspects of: 1) Production technical behavior, namely: farming; 2) Agribusiness management behavior, namely: agribusiness planning, utilization of natural resources, increasing efficiency, increasing productivity and improving the quality of results; 3) The behavior of agribusiness system relationships, namely: collaborating with other agribusiness companies and becoming informative communication (Suparta, 2001). Changes in behavior include aspects of knowledge, skills and mental behavior so that they are able to carry out changes in their farming to increase production, income and family welfare. Behavior change is achieved by emphasizing agricultural development programs with a sustainable agricultural extension process. The process of changing behavior is required so that targets change not only because of knowledge but also changes in skills and mental behavior that lead to better work (L. Setiana, 2005).

According to (Sunaryo, 2019) human behavior is not formed by itself, but is influenced by several factors. In general, human behavior is influenced by four factors, namely; (a) Needs, humans have basic needs that must be met every day. Humans have five basic needs according to Maslow (1970), namely physiological/biological needs, security needs, love and being loved, esteem needs and self-actualization needs. The level and type of needs cannot be separated from one another. Although physiological needs are the most dominant needs for human survival; (b) Motivation, is the driving force to achieve certain goals, both consciously and unconsciously. Motivation can arise from within the individual or the environment. The best motivation is motivation that comes from within oneself (intrinsic motivation) not environmental influences (extrinsic motivation); (c) Stimulating and reinforcing factors, behavior can be supported by the existence of stimulating and reinforcing factors. To increase motivation to behave can be done in four ways, namely: giving gifts or rewards in the form of appreciation, praise, prizes, and others; by conducting healthy competition or competition; by clarifying goals or objectives or creating intermediate goals; can by informing the success of activities that have been achieved so as to motivate to be more successful; (d) Attitudes and beliefs, a person's attitude greatly influences his behavior, both positive and negative.

In addition to the four factors above, there are several other factors that also influence a person's behavior. These factors include endogenous, exogenous and learning processes. These three things play an important role in the formation of one's behavior. First, endogenous or genetic factors or what is commonly termed heredity, namely the basic conception or capital for the development of the creature itself. Genetic factors come from within the individual. Some of these genetic factors, including race, gender, physical characteristics, personality traits, innate talent and intelligence. Second, exogenous factors are factors that come from outside the individual. Some things that include exogenous factors are environmental, educational, religious, social and economic, cultural, and other factors. Third, the learning process, which is a form of synergy mechanism between heredity and environmental factors in the framework of behavior formation.

According to Lawrence Green in (Notoatmodjo, 2007) human behavior is influenced by two main factors, namely, behavioral factors (behavior causes) and factors outside of behavior (non-behavior causes). Furthermore, the behavior itself is formed from three factors, namely:

Predisposing factors, which include knowledge, attitudes, beliefs, values and so on; (1) Knowledge, if the process of adopting behavior is based on knowledge, awareness and a positive attitude then the behavior will be lasting (long lasting) rather than behavior that is not based on knowledge; (2) Attitude, is a predisposition, (a state of being easily influenced) towards a person, idea, or object. There are three components of attitude namely: affection which is a feeling component, cognition which is a person's evaluative beliefs and behavior which is an attitude related to a person's tendency to act towards someone or certain things in a certain way; (3) Enabling factors, which include the physical environment, the availability or absence of work safety facilities or means, for example the availability of supporting tools, training and so on; (4) Reinforcement factors which include laws, regulations, supervision and so on.

The behavior of farmers in rice farming in Salokaraja, Lalabata District, Soppeng Regency is seen from 3 (three) aspects, namely knowledge (cognitive), attitude (affective) and skills (psychomotor). These three aspects determine whether farmers have applied the right principles in managing farming from on farm to post harvest. Some aspects that must be known and carried out by farmers in Salokaraja Village, Lalabata District, Soppeng Regency which are in accordance with the principles of good agriculture, starting from land preparation (selection and land management), seed preparation (seed treatment, seed sowing) planting, replanting, fertilizing, irrigation, pest and disease control, harvesting, and post-harvest storage.

Research (Lestari, 2017) farmers consider risk to be something that can harm farming, but the impact can be prevented and reduced and results in conclusions that farmers' perceptions of the risks of organic rice farming are good. This means that farmers can first identify potential risks that can occur and then prepare concrete steps in mitigating these risks if they do occur so that farmers can be said to have prepared. This is also supported by research conducted by (Ratnasari, 2017) which states the behavior of farmers in facing risks and uncertainties using a game theory approach, the results obtained are that farmers who apply conventional technology fall into the criteria maximax (optimistic behavior), regret (behavior with the highest degree of caution) and lapalace (behavior with the greatest degree of regret).

Based on the results of observations, farmers can see the potential for risks in the Knowledge (cognitive) aspect, where land selection and preparation greatly determines the success of rice farming. The type of land used in Mr Anto's farming activities is in the form of gardens. The land suitable for planting rice is upland with loose, humus soil, so it is better before planting, tillage is carried out by plowing or turning the soil over to make it more loose. Manure is mixed in soil processing activities so that the nutrient content in the soil can be fulfilled. The rice planting calendar is adapted to the climate. Climate is very influential on the success of rice farming. The time for planting rice is mid-February when it starts to rain and harvesting is done in mid-May or early June. Based on farmer statements that were collected, farmers have knowledge about land selection. Farmers know that planting requires careful preparation in selecting paddy fields and should not use chemicals. Farmers also know that choosing land must be in a place where it is possible to get an adequate supply of water, this is in line with research conducted (Suharyanto et al., 2015) which states that the real effect on lowland rice production is land, seeds, N fertilizer, P fertilizer, organic fertilizer, labor, planting season and land status. This means that any addition or reduction of these production factors will increase paddy rice production.

Furthermore, the selection of quality seeds also affects production risk. The seeds used by farmers are staple seeds derived from G2 derivatives (basic seeds) or a higher class and type GB119, which are then used to plant rice on their farm land. These seeds are self-cultivated starting from G0 seeds which are the initial seeds, which become derivatives to become G3 seeds so that these seeds are superior.

Furthermore, fertilization of rice plants after basic fertilizer is carried out with further fertilization at the age of 21-28 days and at the age of 45-50 days. The fertilization process is by spreading it in the

grooves/between plants then covering it with thin soil and then watering it. Then planting time The best planting time in upland areas such as Soppeng is in sunny conditions. Before it is ready to be planted, the seed tubers must be stored for at least three months. Its function is to find out which rice seeds can germinate well, because rice tubers have a dormancy period. The period of dormancy is the time when a plant stops growing or the development of a plant is no longer active due to various factors, be it mechanical, physical, environmental or chemical conditions.

The last is the maintenance stage, maintenance is carried out when planting is complete. When the rice plants are approximately 30 days old, fertilization is carried out using ZA and Phonska fertilizers. In addition, the area around the plants is cleaned by pulling out the weeds around the rice plants. When pests or diseases are seen starting to attack, it is overcome by spraying the plants with a fungicide and not forgetting to also apply fertilizer, this is intended so that the rice plants grow fertile and the fruit is bigger. Based on the results of observations, the level of participation of farmers quantitatively in using organic fertilizers is still relatively low. The results of observations show that the use of organic fertilizers can significantly reduce the risk of lowland rice production, this is presumably due to the use of chemical fertilizers for a long time and in high quantities so that if it is not balanced with the use of organic fertilizers it will have an impact on soil quality and fertility. As the results of research by Ghafar et al., (2011) that by increasing the amount of use of organic fertilizers in the long term will increase production and reduce risks in soybean farming. In terms of efficiency, the use of chemical fertilizers and organic fertilizers can be seen as a waste. However, according to (Saptana et al., 2010) when viewed from a risk management aspect this can also be categorized as an interactive risk management strategy method, because farmers can adjust the addition or reduction of fertilizer according to their perceptions regarding plant nutrient needs. Based on the results of the study showed that the use of pesticides had a significant effect on reducing the risk of lowland rice production. The same thing was also obtained from the results of research (Villano & E, 2006) that the use of herbicide production inputs had an effect on reducing the risk of lowland rice production. In general, lowland rice farmers use pesticides as a preventive action as well as a preventive action. In other words, control decision-making tends to be more directed at anticipating the risk of attack by Plant Destruction Organisms (OPT) and at the same time for actually overcoming these attacks. According to (Saptana et al., 2010) the efficiency of controlling pests actually depends on random events, namely the presence or absence of pest attacks. If there is no attack, the input will not affect production, it might even cause waste and cause resistance and surgerence to certain pests. . The results of observations in the field also show that almost all farmers use chemical pesticides to control OPT attacks, meaning that in facing risks in lowland rice farming, farmers rely more on chemical pesticides, because they are seen as more effective and practical than vegetable pesticides.

The cropping pattern used for rice farming is a monoculture cropping pattern, the choice of this cropping pattern was deliberately made so that rice maintenance is not complicated and avoids competition for nutrients from rice plants with other horticultural crops. Rice plants cannot be cultivated continuously on the same land because of a lack of nutrients in the soil, so they must be interspersed with other horticultural crops. Relevant research was carried out by (Mamondol & Delcen, 2017) which assessed the risk of rice farming can be analyzed through a comparison of cropping patterns where there are differences in production, revenue, production costs, and rice farming income using the System of Rice Intensification (SRI) method and Tablea on farmers in Tonusu Village, Pamona Puselemba District. There are differences in the coefficient of variation of farmers' income using the SRI and Table methods. The higher coefficient of variation in the Tablea method indicates a greater risk to farmer income than the SRI method. The crucial risk in the Tabela cropping pattern is that the seeds are easily washed away during the rainy season, so farmers need to replant the seeds. Besides that, the use of inputs also affects farming risks. Based on the input perspective, the SRI cropping pattern has less risk because soil fertility tends to be better maintained and pest attacks can be suppressed.

Farmer Behavior in Environmental Risk Mitigation

The behavior of farmers in mitigating environmental risks is very important in maintaining the sustainability of sustainable agricultural production and reducing negative impacts on the

environment. Following are some important farmer behaviors based on observations in environmental risk mitigation:

Proper Use of Pesticides and Fertilizers. Farmers must use the right pesticides and fertilizers and according to the recommended doses so as not to damage the environment and affect human health. Excessive use of pesticides and fertilizers can cause water, soil and air pollution, as well as damage to ecosystems. Fertilizer functions to support the growth of the rice itself. Fertilizers used by farmers are manure (derived from livestock urine), ZA fertilizer, and Phonska. Urea is not used because the nitrogen content in the soil in the Salokaraja Village is quite high so the use of urea is unnecessary. To control weeds, farmers use two types of pesticides, namely fungicides and herbicides. Fungicides are pesticides that specifically kill or inhibit fungi that cause disease, while the fungicide used is Tanzeb while herbicides are compounds or materials that are spread on agricultural land to suppress or eradicate plants that cause decreased yields (weeds), the herbicide used is Gromazon.

Good management of water resources due to the success of agricultural development (particularly rice, corn and soybean development programs) is determined by the availability of water because it is very decisive in production activities. Uncertain climate change conditions (climate anomalies-season shifts, erratic rains, droughts, global warming, etc.) greatly affect various agricultural activities, especially agricultural cultivation, which in turn also affect agricultural productivity. The development of agricultural businesses, the expansion of agricultural areas, the increase in the cropping index demand the provision of water and irrigation infrastructure. Given the importance of water availability to meet the water needs for the development of rice, corn and soybeans, policies in water management are needed that are able to ensure continuous supply of water for farmers' needs to support all agricultural activities throughout the year. Policies that can be implemented in the management of water resources include rain harvesting and surface runoff through modification of the hydrological characteristics of watersheds, which is an alternative for storing water in the rainy season and providing and distributing it so that it does not experience drought during the dry season (Agency for Agricultural Research and Development, 2019). Farmers must use water resources wisely and sustainably to reduce the risk of water shortages during the planting season. They can do good water management by optimizing the use of irrigation technology, water treatment and setting watering schedules. Based on the results of interviews with farmers, the management of water resources is carried out by means of rice farmers in the Salokaraja Village irrigating the paddy fields from springs which are channeled through a device called a sprinkler. Sprinkler irrigation is a method of providing water to the entire land to be irrigated by using a pressurized pipe through a nozzle. This irrigation is very flexible because besides being able to be used to water plants it can also be used for fertilization and treatment and to maintain soil moisture and control climatic conditions to make it suitable for plant growth. Every farmer has the right to get water and is obliged to maintain the availability of water.

Selection of the Right Plants. Farmers must choose plant varieties according to the soil and climate conditions in their area. This can help reduce the risk of crop failure and increase crop productivity in a sustainable manner. **Applying Modern Agricultural Technology** Farmers must apply modern agricultural technologies such as the use of planting and harvesting machines, Geographic Information System (GIS) applications, and precision agricultural technologies to improve production efficiency and reduce environmental impact. **Raising Environmental Awareness.** Farmers need to have environmental awareness and pay attention to the impact of agricultural activities on the surrounding environment. They must participate in environmental training and education programs provided by the government or related institutions.

Farmer Behavior in Mitigating Price Risk

According to Soedjana (2007a) the occurrence of risk in the agricultural sector is caused by several factors, including: price risk associated with the variation and uncertainty of the price received and that must be paid by farmers in purchasing production inputs. The price variation referred to is related to the price level, which can then affect farmers' expectations, government programs, and consumer demand. Paddy prices are very volatile and can change quickly, depending on market demand and supply, environmental factors, and government policies. One of the factors that affect the price of rice is demand and supply. If the supply of rice is higher than the demand, then the price of rice will fall.

Conversely, if the demand for rice is higher than the supply, then the price of rice will rise. Factors such as weather, natural disasters and trade policies can also affect rice prices.

Paddy price fluctuations can greatly affect farmers' income, especially for small farmers who are heavily dependent on rice production as their main source of income. If the price of rice falls, farmers will get less income from their crops. This can cause difficulties for farmers in meeting their needs. To reduce price risk, farmers can take several risk mitigation steps. One strategy that can be implemented is the use of production contracts, where farmers and rice buyers agree on a price before the planting season begins. In addition, farmers can follow commodity markets to obtain information about future rice prices.

Based on the results of interviews with informants, it is known that farmers apply harvest times at certain times, namely when the harvest is carried out in mid-May or early June, usually adjusted to the price of rice in the market. If the price in May is high enough, the harvest will be carried out immediately, but if the price is still low, the harvest will be postponed to the following month, even though in reality after harvest the farmers get a price above the Cost of Production (HPP) but sometimes at certain times the harvest price is above under HPP.

4. Conclusion

The behavior of farmers in rice farming in Salokaraja, Lalabata District, Soppeng Regency is seen from 3 (three) aspects, namely production, environment and selling price. These three aspects determine whether farmers have applied the right principles in managing farming from on farm to post harvest. Some aspects that must be known and carried out by farmers in Salokaraja Village, Lalabata District, Soppeng Regency which are in accordance with the principles of good agriculture, start with production which can be seen from land preparation (land selection and processing), seed preparation (seed treatment, seed sowing) planting, replanting, fertilization, irrigation, pest and disease control, harvesting, and post-harvest storage.

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