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Increasing Liquidity of SSDM-Based Red Chili Farmers through Agricultural Insurance

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Abstract

Red chilies have good demand prospects but still have problems. Apart from the fact that production is seasonal, so it often faces crop failure, it also experiences fluctuating prices, there is no certainty of selling, weak market access and risks are interrelated. In this regard, research has been carried out in Garut Regency, West Java, which is one of the development of red chili clusters. This paper has the aim of looking at the linkages of risks that occur and proposing policy scenarios in mitigating possible risks. This research was designed qualitatively and quantitatively with a case study method through a soft system dynamic methodology (SSDM) approach. The results showed that the risks that occur in the red chili agribusiness cluster can be indicated in the production risk, market risk, and institutional risk which are interrelated and have an impact on financial risk. The simulation results of the implementation of policy scenarios through agricultural insurance on red chili commodities increased farmer liquidity of about 20 percent starting from the 292nd day.This has a tendency for red chili farmers to mitigate risks. Meanwhile, the application of insurance is currently limited to rice commodities.

Keywords: Red Chili Agribusiness, Production Risk, Market Risk, Agricultural Insurance

1. Introduction

It is important to develop the agricultural sector, even though during the last decades the growth of this sector is parallel with several other dynamics and has complex and diverse phenomena (Santeramo F.G, 2021). The same applies to horticulture, which often experiences price fluctuation and occurs every year, especially at the beginning of the rainy season, including in this case the red chili commodity (Hariyani, et al, 2017).

Red chili is one of the horticultural commodities that has a tendency to increase production, but has high price fluctuations (Andayani, et al, 2016). The total production of red chilies is still lower than potential productivity due to weather constraints (Haryiani, N et al, 2017). The agricultural sector in Indonesia is prone to risks due to climate change (Boer & Suharnoto, 2014), including red chilies. Even though red chilies have good demand prospects, this commodity still faces many obstacles in its cultivation, such as often facing the risk of crop failure, lack of certainty of selling. , fluctuating prices, weak market access, unable to meet the Bank's technical requirements. This indicates that in red chili farming there are risks that are interrelated (Andayani, et al, 2020), so that the agricultural sector needs treatment in plant growth through effective applications (A Walaa, et al, 2020)

The agricultural sector is always considered to be a business activity that has a tendency towards various risks (Ghalavand, 2012). Farmers are required to have the ability to control risks and uncertainties caused by climate change through capital, mastery of technology and skills which are still constrained until now. Agricultural characteristics have uncertainty about agricultural products (Du Yilong, 2018). Climate change has a negative impact on the agricultural sector (Mashiza, 2019). Different cultivars and ensuring that are not affected by environmental conditions is one strategy that is needed even though it is long, expensive, and complex (Sidiq Y, et al, 2020). Fruit farmers in the United States also experience various risks due to climate change (Tsyr et al, 2018). Price and production risks are also high for horticulture (Hasan F, et al, 2016).

The agricultural sector plays an important role in the rural economy (Wardhana D, et al, 2017). Bank Indonesia took the initiative in developing red chili peppers in West Java, especially in Garut district, which is one of the centers for red chili production in West Java. The cluster aims to reduce costs, create innovation, and increase productivity so that it can manage various risks due to limited resources (Teekasap, 2009). Clusters are also an important factor in understanding the effect of intermediaries in increasing small producers in the development of agricultural economic clusters (Ramirez M, et al 2018).

Seeing this condition, farmers are required to have the ability to control risks and uncertainties caused by climate change through capital, mastery of technology and skills, which are still constrained until now. The choice of risk management strategy must be appropriate because it can

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affect the cost of agricultural production and resource allocation (Vigani, M et al, 2019). Likewise, marketing choices for red chilies are influenced by transaction costs as well as price risks (Pham et al, 2020). Agricultural insurance is a form of risk management to protect losses in agriculture and can be used as a tool to spur rural development and modernization in the agricultural sector (Nnadi et al, 2013). With agricultural insurance, cocoa farmers in Nigeria can be saved from losses due to crop damage (Falola, et al, 2013). The government implemented insurance starting from 2015 to reduce the impact of agricultural risks even though it was limited to rice crops, but the level of farmer participation was still low despite the imposition of subsidies (Dadang, M, 2019).

The results of the preliminary study explain that the collaboration that has occurred since 2011 in the Garut cluster has not provided satisfaction to all parties involved, and the low supply of red chili from farmers through cooperatives in the industry indicates that there are various risks, one of which is the risk of production.

Based on the phenomena and description above, the cluster has the potential to develop red chili commodity, but in reality there are still many problems due to indications of various risks. For this reason, researchers have conducted research with the following problem formulations: (1) how is the risk relationship that occurs in the Garut red chili agribusiness cluster, (2) the proposed scenario through agricultural insurance can increase farmer liquidity so that it can mitigate the risks that occur. The emphasis of this research is to understand the risks and mitigations of the red chili commodity from the integration of stakeholders at the network level in order to improve cluster performance which is practically a scientific learning tool while methodologically using the soft system dynamic methodology (SSDM) approach in assessing agricultural problems, while ever The SSDM approach is carried out in the field of manufacturing and the social security problems of citizens and poverty (Teekasap, 2009), (Rodriguez, 2011).

2. Methodology

This research was designed in a descriptive qualitative and quantitative manner with a case study method and was carried out in Garut Regency, West Java. The determination of informants was done purposively. In analyzing the risk linkages that occur in the Garut red chilli agribusiness cluster and proposing risk mitigation scenarios that occur, it is used with systems thinking, namely soft system dynamic methodology (SSDM). SSDM can be said to be a combination of two methodologies, namely system dynamics (SD) and soft system methodology (SSM), which can study complex social problem situations in systemic intervention (Rodriguez and Caceres, 2009). This model will be used as part of an intervention in improving existing systems or designing new systems (Pidd, 2004).

In the SSDM approach, the steps are: (1) stage to understanding unstructured problems through a rich picture in understanding the phenomena that occur and this is part of the SSM process, (2) stage to problem transformation and express it through CATWOE analysis, (3) stage to build a system dynamics model from existing phenomena and describe it in each sub-model with its various possible behaviors, (4) stage to compare stage number (4) and stage (7) by emphasizing in the observation and validation of each root cause and solution, (5) stage to determining the feasible or desirable change to improve the problematic behavior, (6) stage to building a dynamic model for solving problem situations which are in stage (4) to change real-world behavior through a simulation model which can be done by changing its parameters or structure, (7) stage to looking at the root of the mass solving orientation to change properly what is desired by CATWOE analysis through the transformation process, (8) stage to the implementation of the desired changes or changes that are feasible to be implemented, (9) and (10) stage to learning points prepared for study and reflection of time to time and future interventions (Rodriguez-Ulloa, 2004).

3. Results And Discussion

3.1. Understanding Unstructured Problems throughThe Rich Picture

The description of all red chili agribusiness cluster activities can be seen clearly in the following rich picture which includes actors, stakeholders, namely farmers, farmers groups, Heinz ABC industry, BRI Bank, USAID, Cagarit cooperatives. The activity process starts from the meeting of the actors, planning the planting schedule, providing input, cultivating red chili, harvesting and post-harvest activities including sorting to selling red chili for traditional markets and structured markets, which are indicated by arrows as a series of activity processes on picture. In the process of activities, many obstacle were found including the large number of crops that were rejecting, crop failure, resulting in fluctuations in production. Various obstacles are symbolized in the image with an oval shape, and subsequently various risks occur. The results of the mapping in this image were carried out through external validation by conducting focus group discussions.

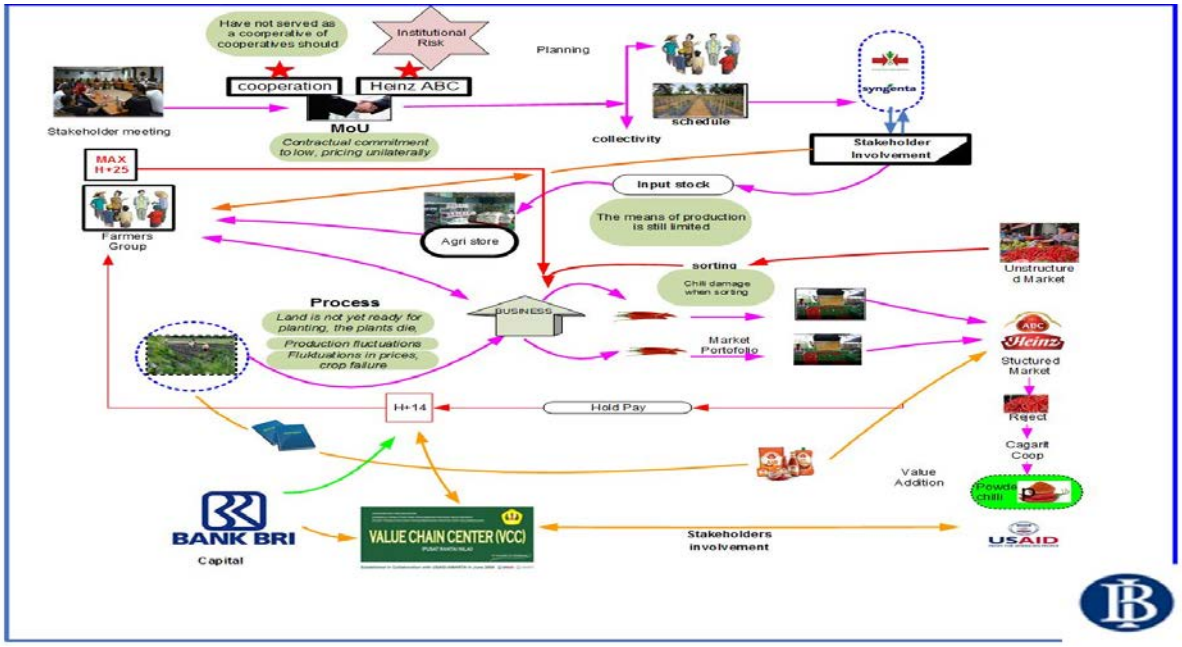

Figure 1. Rich Picture of Red Chili Agribusiness Cluster

3.2. Transformation of Problems through CATWOE Analysis

Based on the problems in the cluster, a CATWOE analysis was made in transforming events through observation and dialogue with stakeholders, looking at the relationship between the roles of actors, values and norms (Checkland and Scholes, 1990).

Formulation of Transformation (T)

T: increasing liquidity of red chili farmers through risk mitigation.

CATWOE analysis is as follows: Customer; C (beneficiaries): farmers in the red chili cluster, Actors; A (actors who carry out the transformation): farmer group association, cluster member red chili farmers, cooperative, Transformation; T (change): increase the liquidity of red chili farmers through risk mitigation, weltanschauung; W (meaningful perspective): multistakeholder collaboration in supporting risk mitigation, Owners; O (party that might stop the transformation process / user): farmer group association, cluster member red chili farmers, cooperative, Environmental; E (environmental constraints): farmer skills, climate anomalies, access to information and technology.

3.3. Building a System Dynamics Model in the Elaboration of each Sub Model Production Risk Sub Model

In Figure 2, can be seen from the growth stage to the production activities that indicate a risk. The structure of death due to the effects of climate anomalies occurs during the growing period, and there is also death due to fusarium wilt and anthracnose attack about 50% during the production period and damaged chili peppers or physical defects occur around 10%. This red chili plant is very susceptible to weather, pests, and diseases.

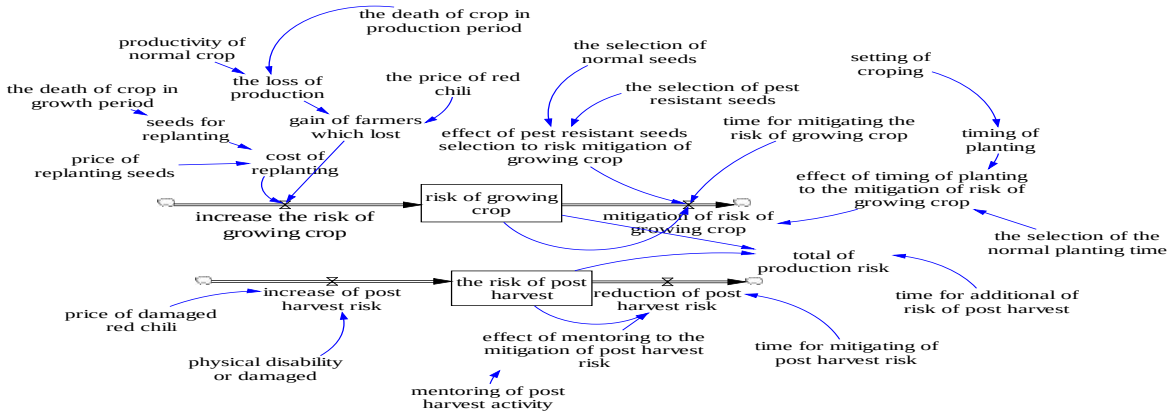

Figure 2. Production Risk Sub Model Diagram

3.4. Market Risk Sub Model

In Figure 3, it can be seen that there is a market risk that is influenced by the price of chili because its availability in the market is determined by production, which has fluctuated frequently due to pest attacks, climate anomalies, and low technology application (Andayani, 2015). The partnership that has existed since 2011 until this research was carried out, has not optimally provided satisfaction for all parties involved. Many commitments to cooperation are still being violated, and this partnership is still far from the expectations of farmers.

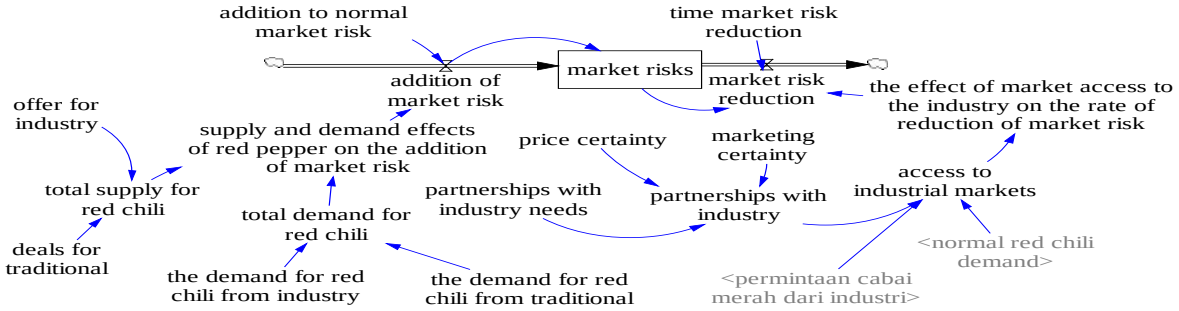

Figure 3. Market Risk Sub Model Diagram

3.5. Behavior Model Behavior Model by Looking at the Behavior of Production and Skilled Farmers of Red Chili

Modeling and simulation results obtained information that the production of red chili tends to increase by showing its dynamic behavior. It can be seen in Figure 4, the simulation results for the 876th day, that the number of skilled farmers continues to increase, driven by the trend of high market demand. However, on day 1095 production decreased due to the influence of climate anomalies which indicate risks, although skilled farmers were not affected by this. In real conditions, this red chili cluster cannot meet the continuity of supply to the industry according to the contractual commitment due to these problems.

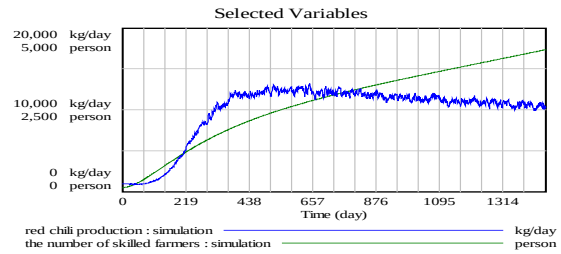

Figure 4. Farmers' Red Chilli Production by Skilled Farmers

3.6. Develop model to change behavior through simulation scenarios proposedPolicyProposedScenario Policy Agricultural Insurance As One Risk Mitigation Alternatives At Red Chili Farmers

Figure 5 illustrates a sub-model with the addition of the agricultural insurance structure. With the compensation or compensation received by farmers, it can be used as capital for the next planting season. The trial implementation of agricultural insurance still needs to be done by expanding the area to provide a complete picture of insurance in Indonesia, and it is also hoped that the application of horticultural commodities should be implemented so that this policy proposal needs to be implemented in red chilies because so far agricultural insurance is still limited to rice commodities.

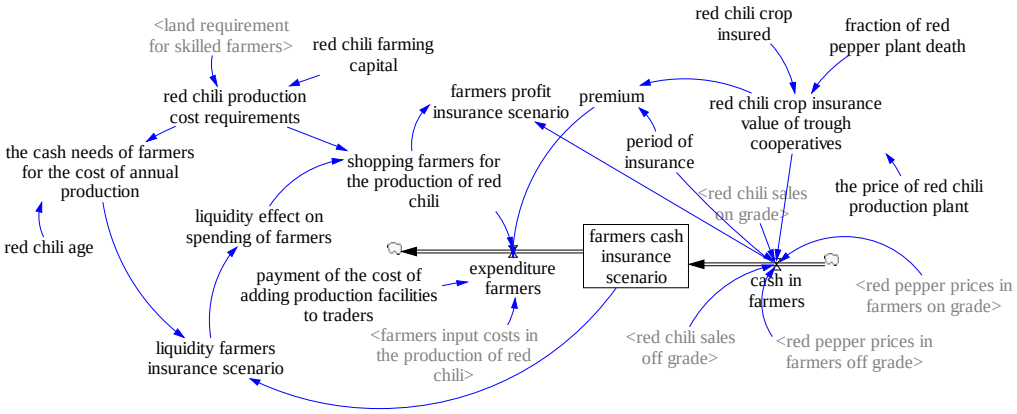

Figure 5. Sub Farmer Scheme of Insurance Scenario

3.7. Impact of the Application of Agricultural Insurance Policy Scenarios

In Figure 6, it can be seen that paying additional insurance premiums does not become a burden for farmers because there is still a guarantee if production failure and will not cause continuous losses for the farmers themselves. It is also seen in Figure 6 on the 292th day that there is an increase in the liquidity of farmers for those who have applied insurance. Farmers will be more effective in reducing losses due to production failure by providing coverage for dead chili plants. Thus, it can be said that farmers who have applied insurance will continue to be able to carry out chili farming in a sustainable manner.

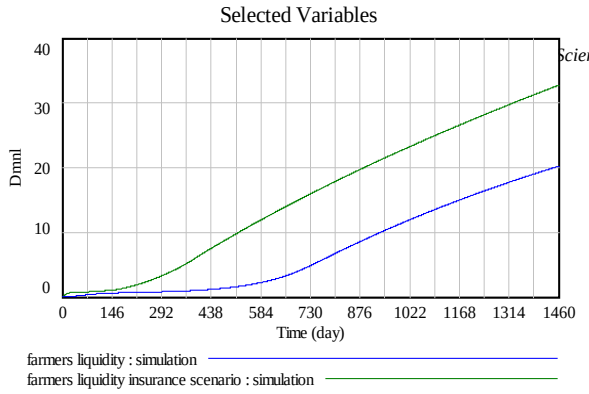

Figure 6. Red Chili Farmers Liquidity of Insurance Scenarios

4. Conclusion

The risks occurring in red chili agribusiness cluster can be indicated in the risks of production, market risk, and institutional risk. These risks are interrelated where production risks and market risks occur due to institutional risks, and the accumulation of these risks has an impact on financial risks.

One of the proposed policy scenarios as an effort to manage risk is agricultural insurance which has an impact on increasing farmers' liquidity of around 20 percent starting from day 292. Farmers will get guarantees if they experience crop failure so that they will be able to continue farming. In addition, the synergy between related parties supported by a better collaboration can provide satisfaction to the various parties involved.

It is necessary to accelerate the implementation of Law No. 19 of 2013 through the allocation of APBN/APBD funds in the form of insurance premium subsidies as a social assistance program in the agricultural sector. It would be much better if the government could also make a pilot application of loss insurance in red chili commodity.

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