

Mitigation Strategy in Overcoming KUINI Supply Chain Risk in Barito Kuala District

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Abstract. Generally, the distribution channel of the Kuini commodity supply chain has many risks, such as short product shelf life, unclear price certainty, uncertain weather factors and others. The purpose of this study is to produce a strategy to minimize the risk of each member of the Kuini Anjir supply chain in Barito Kuala Regency. Specifically, the purpose of this research is to identify various supply chain risks, analyze the supply chain members with the highest risk, and know how to evaluate supply chain risks. The analytical tools used are Analytical Network Process (ANP) and Weighted Failure Mode and Effects Analysis (WFMEA), as well as SWOT analysis. Identification of kuini fruit supply chain risks, namely problem clusters (increasing quality and added value, increasing productivity, ensuring supply continuity, increasing income), actor clusters (farmers, collectors, and retailers), risk clusters (quality, production, price, supply, environment and transportation). Judging from the problem, improving the quality and added value of kuini fruit is a top priority, which is 35.7369%. In terms of risk, the risk that becomes the main priority in the kuini fruit supply chain is price risk of 37.3228%. From the actor's perspective, the actors who are most at risk in the kuini fruit supply chain are farmers at 63.1415%. The results of the WRPN calculation, the order of risk from the first to the easiest is price, production, supply, quality, transportation, and the environment. Evaluation of supply chain risk shows that apart from price risk, five other risk factors out of the six risk factors can be tolerated. The SWOT analysis diagram shows the position of the Kuini Anjir fruit supply chain is in quadrant III (turn-around strategy), so the business strategy focuses on minimizing weaknesses, in order to get better opportunities.

Keywords: Risk, Supply Chain, Kuini Anjir, ANP, WFMEA

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I. INTRODUCTION

Government through the *leading sector* related carries out various policies and strategic plans to develop agriculture. One of the goals is to increase the added value and competitiveness of food and agricultural products with the aim of increasing commodities that have added value, are competitive in meeting market needs (Ministry of Agriculture, 2015).

Barito Kuala Regency is a district that has a very wide tidal area in South Kalimantan. In line with the vast potential of tidal land, Barito Kuala Regency has various superior horticultural commodities. One of the leading horticultural commodities in Barito Kuala Regency is the production of Kuini Anjir fruit. Based on data from the Performance Report of the Food Crops and Horticulture Office of Barito Kuala Regency in 2019, the number of Kuini Anjir production from 2015 to 2019 has an increasing trend.

Tidal swamp land is marginal land on mineral soils and peat soils with various types of overflow. This land still has the potential to be developed, the potential is based on the characteristics of the land and its overflow in various regions in Indonesia is still wide (Sunaro, 2014).

In general, Kuini Anjir commodities have the same characteristics as other agricultural products, namely: 1) the fruit is easily damaged; 2) harvesting which is highly dependent on climate and season; 3) various sizes and qualities; and 4) its production spread in various locations. As a result of the characteristics of these products, they indirectly affect the production, quality of Kuini Anjir's products, price and supply instability, as well as the environment, market and various other factors. All of these factors are risks that must be borne by members of the Kuini Anjir supply chain.

Anjir is an area in the Barito Kuala Regency. According to the monograph, Anjir is classified as a tidal swamp land. The Anjir area also stores the germplasm of the *Mangefera* Group, namely (*kuiniMangefera odorata*) which has the advantage of being resistant to fruit caterpillars, tolerant of soil acidity (Apriliani *et al.*, 2018).

The added value and various challenges in Kuini Anjir's marketing are the cause of the importance of increasing competitiveness of the Kuini Anjir commodity supply chain, so it is necessary to identify risks, assess

risks, and mitigate supply chain risks. An arrangement for supply chain risk in the form of supply chain risk management will be needed if the priority of Kuini Anjir's supply chain risk is known. Risk management refers to planning, monitoring and controlling activities based on information generated by risk analysis activities (*The Chartered Quality Institute, 2010*).

Risk can be defined as the result of a negative event that has the possibility of occurring and results in a number of losses (March and Shapira, 1987). The risk weighting of each actor in the supply chain needs to map the material flow in the supply chain (Mc. Cormack *et al.*, 2008). The results of the mapping are the stages of the material flow process and the risks that accompany the material flow. The risk weighting of each actor in the supply chain for each commodity is carried out using the Risk Index. The components considered in risk weighting with a risk index are the added value provided by each actor, the value of the consequences that each actor has and the probability of failure of each event in each actor (Marimin and Maghfiroh, 2010).

Sustainability of supply is very important, given the high market response to tropical fruit commodities. Risk control of the risks that occur in the supply chain is absolutely necessary in order to be able to meet the quality and quantity expected by consumers. The risks that occur in Kuini Anjir's supply chain include risks that occur from the production process carried out by farmers until the fruit reaches consumers. The risks that occur cause separate losses for each member of the supply chain. Financially, the investment and maintenance costs incurred in cultivating Kuini Anjir must of course be balanced by producing the expected rate of return. The purpose of risk management is to minimize losses and increase opportunities, or opportunities. If it is seen that there is a loss, risk management can cut the chain of the loss event, so that the domino effect will not occur (Simanjuntak, 2013).

In general, this study aims to produce a mitigation strategy design that can minimize the risk to each member of the Kuini Anjir supply chain in Barito Kuala Regency. Specifically, the purpose of this study is to identify various supply chain risks, analyze the supply chain members with the highest risk, and find out how to evaluate and mitigate Kuini Anjir's supply chain risks in Barito Kuala Regency.

II. METHOD

The research location is Anjir Muara District, Barito Kuala Regency. The determination of this location was determined *purposively* with the consideration that Anjir Muara District is a district that has the highest planting area and production of Kuini Anjir commodity in Barito Kuala District. The type of data in this study consisted of two types of data, namely secondary data and primary data. Secondary data in this study were sourced from relevant agencies such as the Department of Food Crops and Horticulture and the Central Bureau of Statistics of Barito Kuala Regency, as well as literature from journals and books, to support this research. While primary data is data sourced from direct interviews with respondents with the help of research instruments in the form of questionnaires.

Analyzing the risks that occur and looking for supply chain members who have the greatest risk in the Kuini Anjir supply chain distribution channel in Barito Kuala Regency, the methods are used *Analytical Network Process (ANP)* and *Weighted Failure Mode and Effects Analysis (WFMEA)* (saaty, 2005).

Failure modes that have a higher RPN are assumed to be more important and are given a higher priority for corrective action than those with a lower RPN (Surendro and Yaumi, 2012). Risk evaluation is to compare the level of risk that has been calculated at the risk analysis stage with the standard criteria used. The variable output value, namely WRPN, is used to represent priorities for corrective actions with a scale of 1-250, which are categorized into five interval classes described in Table 1.

Table 1. Risk categories based on WRPN

Output Value	Risk Risk Category	Control
1 – 50	Very Low	Accept
50 – 100	Low	Accept
100 – 150	Medium	Avoid
150 – 200	High	Mitigation
200 – 250	Very High	Mitigation

Source: *The Chartered Quality Institute, 2010*

III. RESULTS AND DISCUSSION

3.1 Supply Chain Distribution Kuini

Channels fruit distribution channels in Barito Kuala Regency are implemented through five structures distribution, namely:

1. Distribution Structure I
Farmers → Traditional Market

In the distribution structure I, the harvests obtained by farmers from the land are directly sold to traditional markets located in Barito Kuala Regency. Kuini fruit sales are carried out in district markets, sub-district markets, and on the edge of district highways. In this distribution, only 1 person is involved, namely the farmer who is in direct contact with consumers.

2. Distribution Structure II

Farmers → Retailers

In distribution structure II, farmers harvest and sell to retailers. In this distribution, farmers do not have direct contact with consumers so that further sales activities are carried out by retailers.

3. Distribution Structure III

Farmers → Traders → Traditional Markets

In distribution structure III, collector traders who buy harvests from several farmers then sell them to traditional markets located outside Barito Kuala Regency, such as selling to Banjarmasin, Banjarbaru, Martapura, Pelaihari, Hulu Sungai and other areas that are still in the province of South Kalimantan.

4. Distribution Structure IV

Farmers → Traders → Outside the Province

In distribution structure IV, collector traders buy the harvested kuini fruit from farmers as well as distribution channels in distribution structure III. However, the area where the sale of kuini fruit is carried out by collectors is outside the area of South Kalimantan. In general, the sale of kuini fruit by collectors in the IV distribution is carried out in the Province of Central Kalimantan such as the Palangkaraya, Sampit, Kapuas, and so on.

5. Distribution Structure V

Farmers → Traders → Retailers

In distribution structure V, it is almost the same as distribution structure III, except that the collectors get the kuini fruit from the farmers' harvest. Then the collectors do not directly sell them to consumers, but sell them to retailers in the districts in South Kalimantan.

3.2. Identification of Kuini Fruit Supply Chain Risks The

results of the literature study and previous research, as well as discussions and questions and answers with several competent experts in order to obtain an ANP framework to identify risks that occur in the kuini fruit supply chain distribution channel in Barito Kuala Regency. The ANP structure is shown in Figure 7.

This structure consists of 3 clusters:

1. Problem Cluster: The supply chain risk management issues of current commodities that are of concern in this study are: Improved quality and added value of quinine, increased productivity of quinine, guarantee of stable supply continuity, and increased income.
2. Risk Cluster: Alternative risk factors identified from the results of in-depth interviews with experts and the results of literature studies are the risks of quality, production, price, supply, environment, and transportation.
3. Actor Cluster: Actors who play a role in the supply chain of this commodity consist of: Farmers, Collectors, and Retailers.

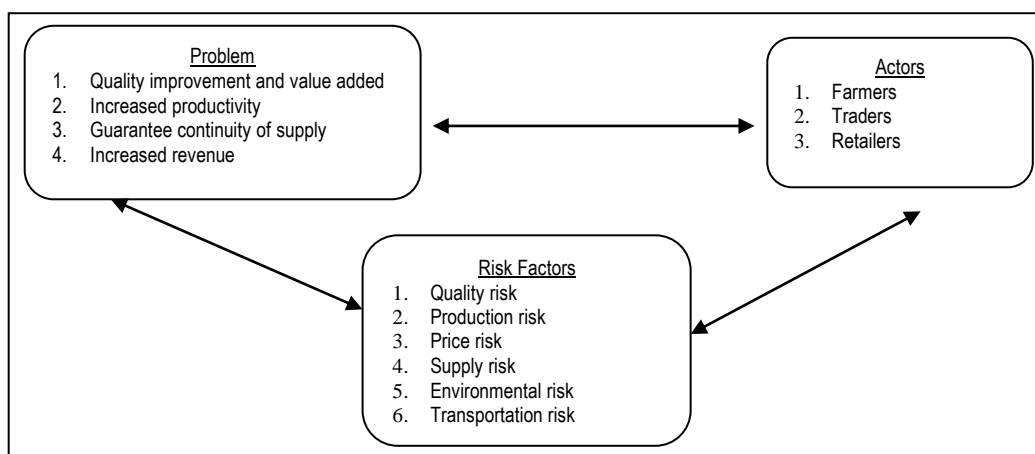


Figure 1. Concept of Kuini Fruit ANP StructureKuini Fruit

3.2.1. Problems inSupply Chain Risk ManagementKuini Fruit

- a. ImprovingQuality and Added Value

Farmers as the main producer of Kuini fruit must produce fruit that conforms to standards recognized by all parties to ensure consumer satisfaction. So far, farmers have relied on experience alone to determine starting from the picking age, maturity level and how to pick the kuini fruit. For this reason, there is a need for an assessment of the pre-harvest technology package, so that the kuini fruit meets good fruit quality standards. In addition, kuini fruit has only tended to be marketed in the form of fresh fruit. Rarely seen kuini fruit marketed in the form of derivative products. Post-harvest processing of the kuini fruit should be required to produce derivative products in order to increase the added value of the kuini fruit.

b. Increase in Kuini Fruit Productivity The

use of healthy seeds with high production potential does not mean having to choose expensive seeds. Pay attention to the suitability of seeds that match the typology of the area. Appropriate and meticulous cultivation and care techniques for kuini plants can also increase productivity. Controlling pest organisms with the principle of integrated pest control (IPM) by prioritizing the use of natural controllers is much better than using chemical pesticides. Besides being environmentally friendly, it will usually be more economical. In addition, the same thing that must be considered is the method of harvesting and post-harvest handling. The right harvest schedule in the right way can significantly increase production.

c. Guaranteed Continuity of Stable Supply

Guaranteed continuity of supply is affected by the availability and harvest time of the fruit. This needs to be balanced with a guarantee of continuity of supply from the production centers of kuini fruit in Barito Kuala Regency so that it can meet consumer needs.

d. Increased Income The

price of kuini fruit at the farmer level ranges from Rp. 500, - to Rp. 700, - / fruit at harvest time, while the price at the retailer level ranges from Rp. 1,000 to Rp. 1,500 / seed depending on the size of the fruit. When viewed from the selling price and demand, this fruit commodity still has the potential to increase income for each member of the supply chain. Various kinds of risks in the supply chain that cause the quality and quantity of fruits in Indonesia in general are not fully in accordance with consumer preferences and the quantity has not been able to meet the needs of the market. Thus, it affects the level of income received by all members of the supply chain.

Based on the results of the questionnaire using the *Analytical Network Process* (ANP) obtained pairwise comparisons between problems in the supply chain and will be seen which has the greatest influence. The results of priority processing, show that improving the quality and added value of kuini fruit is a top priority in the supply chain problem of kuini fruit, which is 0.357369. This is due to the short durability of the kuini fruit so that it can reduce the quality of the fruit, while there is no post-harvest processing on the kuini fruit so it cannot increase the added value of the kuini fruit. The value of the weight of the problems faced in other kuini fruit supply chains, namely; increase in productivity by 0.254257; an increase in revenue of 0.210001 and a guarantee of continuity of supply by 0.178372.

3.2.2. Risk Factors in the Kuini Fruit Supply Chain

Based on the results of previous research and the results of observations and discussions with competent experts, in this study identified six risk factors, namely:

1. Quality Risk, is the risk caused by lack of knowledge or errors in pre-harvest knowledge, and Kuini fruit storage is not good, so it can reduce the quality of the kuini fruit.
2. Production Risk, is the risk caused by the incompatibility of the production process.
3. Price Risk is the risk posed by price fluctuations that are influenced by competitor prices for similar products, excess supply, distortion of price and supply information, inflation, rupiah exchange rate and bank interest rates.
4. Supply Risk, is the risk posed by the diversity of quality, harvest time, and which affects the amount of supply availability.
5. Environmental risk is the risk posed by natural disasters and social, cultural and political conditions.
6. Transportation risk is the risk posed by inadequate infrastructure, security during transportation, uncertainty of delivery and long haul distances.

Based on the results of the questionnaire using the *Analytical Network Process* (ANP) to determine the priority risk factors in the kuini fruit supply chain. The results of priority processing, show that the risk that has the most influence as a whole and becomes the main priority in the kuini fruit supply chain is price risk of 0.373228. Price risk is the biggest risk that can be caused by price fluctuations that cannot be predicted by every member of the supply chain who plays a role in marketing kuini fruit, especially during the main harvest. In addition, there is an excess of supply where the amount of kuini fruit offered is very large compared to consumer demand, which tends to be less. The existence of fluctuations in the price of kuini fruit may be caused by inflation, the rupiah exchange rate and bank interest rates as well as distortions in price and supply information.

Another risk that is the risk with the second largest weight is production risk, which is 0.181717. Production risk is caused by limited production capacity, this is closely related to seasonal production so that at certain times the quantity of kuini fruit is quite limited, even in 3 years. Recently, this kuini fruit no longer only bears fruit once a year, but there are interrupting kuini fruits that are produced.

The risk with the next weighted amount is supply risk, which is 0.145816. This quality risk is due to the large quantity of kuini fruit supply which tends to be at the time of the main harvest, at other times it is only an interlude. Apart from the fact that the supply is only large during the main harvest season, the diversity of quality due to different shapes, aromas, tastes and sizes can also be a supply risk. Next is the environmental risk of 0.109123; quality risk is 0.105866 and transportation risk is 0.081374.

3.2.3. Risk Analysis of Supply Chain Actors Kuini Fruit Supply

chain risk analysis is used to help understand the position of members in the supply chain so as to increase competitive advantage. Risks are identified based on an assessment of pairwise comparisons between risk alternatives for each member of the supply chain.

1. Farmers

Based on the results of priority processing, price risk has the highest priority value of 0.37745 so that price risk has an important influence among the five other risks that occur to farmers. Price risk is the main risk accepted by farmers, this can be due to fluctuations in the price of the kuini fruit they produce, distortion of price information and supply received by farmers also causes this to happen, so that farmers cannot predict prices in the future.

Other risks have a weighted value, respectively, namely production risk of 0.28978; environmental risk of 0.13361; transportation risk of 0.09641; quality risk is 0.0682 and supply risk is 0.03455. The CR value is 0.02613, which means the assessment is considered consistent because the CR value is <0.1.

2. Collecting Traders

Based on the results of priority processing, supply risk has the highest priority value of 0.44998 so that supply risk has the most important influence among the five other risks that occur to collecting traders. Supply risk is the main risk accepted by collectors, this can be due to the fact that the kuini fruit marketed by collectors has a variety of quality so that collectors need to sort it out before marketing the kuini fruit. In addition, because the kuini fruit is a seasonal product, the uncertainty of the availability of the kuini supply must be borne by the collectors.

Other risks have a weighted value, respectively, namely price risk of 0.23832, environmental risk of 0.11238; transportation risk of 0.08993; quality risk is 0.07168 and production risk is 0.03771. The CR value is 0.06246, which means that the assessment is considered consistent because the CR value is <0.1.

3. Retailers

Based on the results of priority processing, price risk has the highest priority value of 0.36753 so that price risk has the most important influence among the five other risks that occur to retailers. Just like farmers, price risk is also experienced by retailers. This can be caused by unpredictable price fluctuations of the kuini fruit, in addition to the existence of similar products that are able to become competitors of the kuini fruit.

Other risks have a weighted value, respectively, namely supply risk of 0.27018; quality risk of 0.19415; environmental risk of 0.07992; transportation risk is 0.05152 and production risk is 0.03669. The CR value is 0.06325, which means that the assessment is considered consistent because the CR value is <0.1.

Based on the results of the questionnaire using the *Analytical Network Process* (ANP) obtained pairwise comparisons between actors in the supply chain and will see which has the greatest influence. The results of priority processing, show that the most influential actor as a whole and the most risky actor in the kuini fruit supply chain is the farmer of 0.631415. This is because only farmers bear losses if the production yields are small due to cultivation mismatches or unpredictable natural factors such as natural disasters, pests and diseases that cause crop failure, and almost all farmers have not insured their agricultural land.

The ANP method used in the calculation of the comparison of problem weights, risks and actors in the kuini fruit supply chain has shown that the main problem faced is improving quality and added value, the main risk faced is price and the supply chain members who are most at risk are farmers. The ANP method was developed on the basis of the interdependence relationship between several components, therefore the components have an attachment to each other.

The main problem faced in the kuini fruit supply chain is the guarantee of quality improvement and added value. Kuini fruit has only been able to survive for a while before the quality decreases and cannot be consumed, while so far there has been a lack of processing efforts that can increase added value and produce derivative products from kuini fruit. Due to the low quality and durability of the kuini fruit, the price of the kuini fruit tends to fluctuate as well. Seeing that price is the main risk faced in the kuini fruit supply chain, the member who has the greatest risk weight on price is the farmer.

3.3. Kuini Anjir Supply Chain Risk Analysis Risk

analysis is carried out to distinguish acceptable minor risks from major risks, and to provide data that will assist the evaluation and risk control phase. The risk assessment stage is assisted by the *Weighted Failure Mode and Effects Analysis* (WFMEA) method. The three components of *severity*, *occurrence*, and *detection* are multiplied by the weight of the risk, resulting in the value of *Weighted Risk Priority Numbers* (WRPN) (Surendro and Yaumi, 2012). The results of the risk assessment from experts' opinions using FMEA for Siam Banjar oranges are presented in Table 2.

Table 2. Results of FMEA Calculation of the Kuini Anjir fruit supply chain

Risk Factors Risk	Variables	Severity	Occurance	Detection	RPN
Quality	Seasons and uncertain weather	6	3	4	72
	Technical knowledge low cultivation	5	2	3	30
	Inadequate storage facilities	5	5	4	100
	Pests and diseases	6	4	3	72
Production	Limited production capacity	5	6	4	120
	Inefficient production process	5	5	5	125
	Use of simple technology	5	4	5	100
prices	Inflation	3	3	4	36
	Rupiah exchange rate and bank interest	3	3	4	36
	Price fluctuations	7	5	6	210
	Distortion of price and supply information	6	5	5	150
Supply	Diversity in supply quality	5	6	5	216
	Uncertainty in supply availability	6	6	6	150
Environment	Natural disasters	6	3	6	108
	Social conditions, culture, politics	4	2	3	24
Transportation	Damage to infrastructure	6	3	4	72
	Travel insecurity	5	3	4	60
	Availability of transport time	5	3	3	45
	Long haul distance	5	3	4	60

Source : Pe primary data, 2021

processing The results of data processing *Failure Mode and Effect Analysis* (FMEA), in the Kuini Anjir fruit supply chain distribution channel, show that in quality risk, the element of the *Risk Priority Number* highest (RPN) is inadequate storage facilities of 100. At risk In production, the element of the highest RPN is an inefficient production process of 125. In price risk, the element of the highest RPN is price fluctuation of 210. In supply risk, the element of the highest RPN is uncertainty of supply availability of 216. In environmental risk, the element of RPN the highest was natural disasters of 108. Meanwhile, for transportation risk, the element of the highest RPN was infrastructure damage of 72.

To get more accurate and sustainable results from the previous risk assessment stages, the weight of each risk was calculated using the calculation. *Weighted Risk Priority Number* (WRPN). WRPN calculation results are presented in Table 3.

Table 3. Results of the calculations WRPN Kuini fruit supply chain Anjir

risk	ANP (W)	rating	RPN	Rating	WRPN	Rating
Quality	0.105866		5274	4	29.01	4
Production	0.184594		2345	3	63.68	2
Price	161.23	11	432		0.373228	1
Supply	53.37	3	366	2	0.145816	3
Environment	0.109123	4	132	6	14.40	6
Transportation	0.081374	6	237	5	19.29	5

Source: primary Data Processing , 2021

The results of the calculation before and after weighting on the Kuini Anjir fruit commodity show that there is a slight difference in the order of risk. The results of the calculation of the RPN before being weighted, the first risk is price, the second risk is production, the third risk is supply, the fourth risk is quality, the fifth risk is transportation, and the sixth risk is the environment. Meanwhile, the results of the RPN calculation after being weighted (WRPN), the first risk is price, the second risk is production, the third risk is supply, the fourth risk is quality, the fifth risk is transportation and the sixth risk is the environment. To get a more accurate calculation, it is necessary to consider the weight value for each of these risk factors, so that because of this, there is a difference in the rankings generated from RPN to WRPN.

3.4. Kuini Anjir Supply Chain Risk Evaluation Risk

evaluation is carried out by comparing the level of risk that has been calculated at the risk analysis stage with the standard criteria used. The results of the risk evaluation are presented in Table 4.

Table 4. Results of the fruit supply chain risk evaluation Anjir Kuini

Risk	WRPN	Risk Category	Control
Quality	29.01	Very Low	Receiving
Production	63.68	Low	Receive
Price	161.23	High	Mitigation
Supply	53.37	Low	Received
Environment	14.40	Very Low	Accepting
Transportation	19.29	Very Low	Accepting

Source: Primary data processing, 2021

Based on the evaluation of the chain risk shows that five of the six risk factors can be tolerated. But there is one other risk factor, namely the price risk factor that needs attention for mitigation actions. Of the six risks, three of them are included in the very low category, namely, quality risk, environmental risk and transportation risk. The risk category based on the WRPN value sourced from *The Chartered Quality Institute* in 2010 the value of the three risks is included in the very low category because the WRPN value of each risk is in the 0-50 interval so that risk control is accepted. In addition, two of them belong to the low risk category, namely production risk and supply risk, both of these risks are included in the low category because the WRPN value is in the 50-100 interval so that risk control is carried out by accepting the risk. Meanwhile, price risk is included in the high category risk because it has a WRPN value of 161.23, price risk is in the medium category because the WRPN value is in the 150-200 interval so that risk control is mitigation action. To create a distribution channel for the Kuini Anjir fruit supply chain with minimal risk, it is necessary to do various ways to minimize the level of risk that will occur.

3.5. Kuini Anjir Fruit Supply Chain Mitigation Strategy

As an effort to develop a strategy in supply chain management of Kuini Anjir fruit, a SWOT analysis was carried out, by identifying internal factors (IFAS) and external factors (EFAS). In the calculation of IFAS and EFAS, the weight and data processing is carried out *rating* on each factor (IFAS and EFAS).

Table 5. Calculation of IFAS

No	Code	Strength(S)	Weight	Rating	Score
1	S1	Has available capital	0.065	2	0.13
2	S2	Characteristics of a typical product of Kuini Anjir fruit	0.105	4	0.42
3	S3	Anjir kuini fruit is quite attractive to the public	0.065	2	0.13
4	S4	Farmers who are experienced in the technical cultivation of Anjir Kuini	0.095	3	0.285
5	S5	Land fertility suitable for Kuini Anjir plant	0.105	4	0.42
6	S6	Government support for Anjir Kuini as one of the leading horticultural products through various assistance and counseling	0.085	3	0.255
Subtotal			0.52	18	1.64
No	Code	Weakness(W)	Weight	Rating	Score
1	W1	No promotion	0.03	4	0.12
2	W2	Production still uses simple technology	0.04	3	0.12
3	W3	Uncertainty in supply availability	0.09	4	0.36
4	W4	Inadequate storage facilities	0.09	4	0.36
5	W5	Current production capacity is still limited	0.045	3	0.135
6	W6	Diversity of supply quality	0.04	3	0.12
7	W7	Fluctuations in the price of Kuini Anjir fruit	0.145	4	0.58
Subtotal			0.48	25	1.795
TOTAL			1	43	-0.155

Source: Primary data processing, 2021

Based on the data presented in Table 5, it shows that the overall score for the internal factor of weakness (*weaknesses*) is greater than the internal factor of strength (*strengths*). The total internal score obtained is the subtotal score of strengths minus the subtotal score of weaknesses resulting in a value of -0.155.

Table 6. EFAS Calculation

No	Code	Opportunity(O)	Weight	Rating	Score
1	O1	Possibility of increasing purchasing power	0.045	2	0.09
2	O2	Increased population growth which will increase the demand for local fruits	0.055	2	0.11
3	O3	Potential expansion of production area that is still a lot	0.125	4	0.5
4	O4	Potential availability of quite a lot of seeds	0.115	4	0.46

5	O5	Infrastructure is starting to improve	0.065	3	0.195
6	O6	Availability of transportation time and safety of travel	0.065	2	0.13
7	O7 Transport	distance current marketing that is not too far from the existing infrastructure	0.065	2	0.13
Subtotal			0.535	19	1.615
No	Code	Threat(T)	Weight	Rating	Score
1	T1	Uncertain season and weather	0.1	3	0.3
2	T2	Plant pest attack	0.085	3	0.255
3	T3	Lots of similar products	0.165	4	0.66
4	T4	Natural disasters	0.045	2	0.09
5	T5	Inflation	0.035	2	0.07
6	T6	Rupiah exchange rate and bank interest	0.035	2	0.07
Subtotal			0.465	16	1.445
TOTAL			1	35	0.17

Source: Primary data processing, 2021

Based on the data presented in Table 6, shows that the overall score of the external factors of opportunities (*opportunities*) is greater than the internal factors of threats (*threats*). The total score of external factors obtained, namely the subtotal score from opportunities reduced by the subtotal score from threats, resulted in a positive value of 0.17. The score results from internal factors (strengths and weaknesses), as well as external factors (opportunities and threats) can be described in a SWOT analysis diagram to see the quadrant region of the Kuini Anjir fruit supply chain. The SWOT analysis diagram of the Kuini Anjir fruit supply chain can be seen in Figure 2 below.

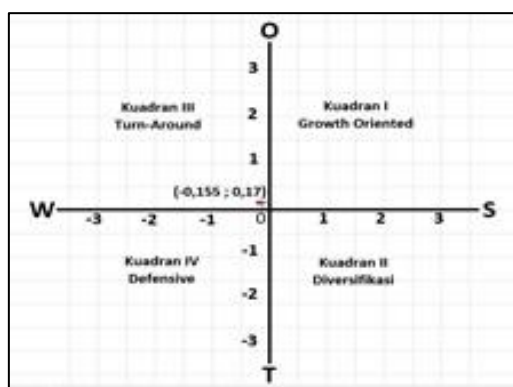


Figure 2. SWOT analysis diagram of the Kuini Anjir fruit supply chain

Based on the data presented in Figure 12 above, it shows that the position of the Kuini Anjir fruit supply chain is in quadrant III (*turn-around strategy*). This shows that the company's opportunities are quite large, but also experience some internal constraints/weaknesses. So the company's strategy focuses on minimizing internal problems (weaknesses), in order to get better opportunities.

To achieve the objectives, several strategies were developed through the SWOT Matrix. This SWOT matrix can produce four possible alternative strategies, namely the SO (*Strengths-Opportunities*) strategy, the ST (*Strengths-Threats*) strategy, the WO (*Weakness-Opportunities*) strategy and the WT (*strategy Weakness-Threats*). The SWOT matrix for the Kuini Anjir fruit supply chain strategy can be seen in Table 7 below.

Table 7. SWOT Matrix

IFAS/EFAS	STRENGTHS (STRENGTHS)	WEAKNESSES
	Having available capital (S1)	No promotion (W1)
	Typical product characteristics of Anjir Kuini Fruit (S2)	Production still uses simple technology (W2)
	Anjir Kuini fruit quite attractive to the community (S3)	Uncertainty in supply availability (W3)
	Farmers who are experienced in Kuini Anjir cultivation techniques (S4)	Inadequate storage facilities (W4)
	Fertility of land suitable for Kuini Anjir (S5)	Current production capacity is still limited (W5)
	Support government towards Anjir Kuini as one of the superior horticultural products through various assistance and counseling (S6)	Diversity of supply quality (W6)
		Fluctuations in the price of Anjir Kuini fruit (W7)
OPPORTUNITIES (OPPORTUNITIES)	STRATEGY-SO	STRATEGY-WO
Possibility of increasing public	Maximizing capital, human resources and land	Carry out strategies branding and

purchasing power (O1)	resources as well as seeds in the production process to meet consumer needs (S1, S4, S5, S6, O1, O2, O3, O4)	promotionthrough social media such as <i>Facebook, Instagram, WhatsApp</i> and other online social media that can be used to maximize the market (W1, O1, O2)
Increasing population growth which will increase the demand for local fruits (O2) There		
is still a lot of potential for expansion of production land (O3)	Introducing the advantages of Kuini Anjir fruit to regions through direct fruit sales to expand the market by utilizing improved infrastructure (S2, S3, O5, O6, O7)	Increasing added value through diversification of processed products from the Kuini Anjir fruit as well as increasing the shelf life of the product so that it lasts longer (W3, W4, W6, W7, O1, O2)
Potential availability of quite a lot of seeds (O4)		
Infrastructure is starting to improve (O5)		
Availability of transport times and k travel safety (O6)		
The current marketing transportation distance is not too far from the existing infrastructure (O7)	Conducting a partnership model between Kuini Anjir fruit supply institutions (S4, S6, O5, O6, O7)	Implementing production operational management and distribution of standardized supplies to maintain product quality until the hands of consumers (W2, O5, O6, O7)
THREATS (THREATS)Unpredictable	STRATEGY-ST	
		STRATEGY-WT
seasons and weather (T1)	Develop products and facilities by optimizing existing resources to win the competition (S1, S2, S3, S4, S5, S6, T3)	Conducting a price agreement model with partners at supplying institutions so as not to harm each other (W7, T3, T5, T7)
Plant pest attacks (T2)		
Many similar products (T3)		
Natural disasters (T4)		
Inflation (T5)		
Rupiah exchange rate and interest Bank (T6)		

Source: Primary data processing, 2021

IV. CONCLUSION

The conclusions from the results and discussion of this research are:

1. Identification of kuini fruit supply chain risks, namely problem clusters (improvement of quality and added value, increased productivity, continuous assurance uity of supply, income generation), actor cluster (farmers, collectors, and retailers), risk cluster (quality, production, price, supply, environment and transportation).
2. Judging from the problem, improving the quality and added value of kuini fruit is a top priority in the supply chain of kuini fruit, which is 0.357369 (35.7369%).
3. In terms of risk, the most influential risk as a whole and the main priority in the kuini fruit supply chain is price risk of 0.373228 (37.3228%).
4. From the actor's perspective, the most influential actor as a whole and the most risky actor in the kuini fruit supply chain is the farmer with 0.631415.
5. The results of the RPN calculation after being weighted (WRPN), the first risk is price, the second risk is production, the third risk is supply, the fourth risk is quality, the fifth risk is transportation and the sixth risk is the environment.
6. Evaluation of chain risk shows that five of the six risk factors can tolerated. But there is one other risk factor, namely the price risk factor that needs attention for mitigation actions.
7. Based on the SWOT analysis diagram, the Kuini Anjir fruit supply chain position is in quadrant III (*turn-around strategy*), so the business strategy focuses on minimizing internal problems (weaknesses), in order to get better opportunities.
8. The strategy is based on the SWOT matrix:
 - SO Strategy: a) maximizing capital, human resources and land resources as well as seeds in the production process to meet consumer needs; b) introducing the advantages of Kuini Anjir fruit to the regions through direct fruit sales to expand the market by utilizing improved infrastructure; and c) conduct a partnership model among institutions supplying Kuini Anjir fruit.
 - WO Strategy: a) carry outstrategiesbranding and promotionthrough social media such as *Facebook, Instagram, WhatsApp* and other online social media that can be used to maximize the market; b) Increasing added value through diversification of processed products from Kuini Anjir fruit and increasing product shelf-life so that it lasts longer; c) implementing standardized production and supply distribution operational management to maintain product quality until the hands of consumers; and d) increasing the planted area to increase production capacity.
 - ST Strategy: develop products and facilities by optimizing existing resources to win the competition
 - WT Strategy: modeling price agreements with partners at supplier institutions so as not to harm each other.

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