Analysis and Strategy of Good Agriculture Practices (GAP) Cultivation of Rawit Capsicum (*Capsicum frutescens* L.) in Tidore Eastern

ABSTRACT

Farmers in Tidore City of the Islands grow a lot of capsicum frutescens as a horticultural product. Initiatives to increase production and close the production gap between the regions must go hand in hand with the government's efforts to make Tidore Island City a ravit pepper supplier in Northern Maluku. The cultivation technique is one of the reasons for the variance in raw pepper production. The study's goal is to investigate the level of application of Good Agriculture Practices (GAP) in pepper growing in the Eastern Tidore district and the techniques that can be used to affect GAP implementation. The study was conducted in Tidore City Eastern District, Northern Maluku Province. Purposive sampling is a sample-taking approach in which respondents were chosen at random from among 100 farmers, with the criterion of farmers who had been attempting to rawit pepper for more than 5 years. Land location (X1), soil preparation and planting media (X2), seed quality (X3), planting and maintenance (X4), fertilizer (X5), plant protection (X6), pesticides (X7), harvest (X8), post-harvesting (X9), and waste and rubbish handling (X10) are the ten assessment parameters. Descriptive analysis, Likert scale, and SWOT analysis were used to analyze the data. According to the study findings, farmers' grasp of GAP is rather excellent, and the rate of GAP implementation has an average score of 2.70 in the reasonably good category. The S-O strategy, which, with soil fertility, has both the potential to expand the development of horticultural crops as well as the knowledge and skills of farmers sufficiently skilled in chili cultivation techniques, can increase the production of chili rawit in the Eastern Tidore district.

Keywords: SWOT Analysis, Farmers, Good Agriculture Practices

1. INTRODUCTION (ARIAL, BOLD, 11 FONT, LEFT ALIGNED, CAPS)

Capsicum annuum is one of the most economically valuable horticultural crops in the world. The increase in population will be followed by the demand for pepper supplies. Given that rawit is needed by every family, restaurant, and even industry as a food mixer and food spice, Implementation of the principles of Good Agriculture Practice (GAP) as sustainable agriculture by farmers will be different (Dewi et al., 2016). It depends on each farmer's perception of the positive or negative benefits of his business.

Measures to increase production while bridging the interregional gap must come after the government's efforts to make Tidore Island City a supplier of ravit pepper in the Northern Maluku. The region of Oba, North Oba, East Tidore, and North Tidore is the largest pumpkin production hub in the island city of Tidore (BPS, 2022). One of the causes of variation in the production of rawit peppers is the cultivation techniques applied by farmers. As a center of peach production, farmers in this region have different cultivation capabilities among themselves. Crop capabilities are also related to farmers' patterns of communication, both internal and external, including the ability to access information. The obstacles faced by farmers vary, including the price of production inputs such as seeds, fertilizers, pesticides, and other farming feeding equipment that are quite expensive. Information about the good cultivation techniques of the farmer's officers is also limited.

According to the Ministry of Agriculture of the City of Tidore Islands in 2022, East Tidore district has 100 farmers of rawit peppers spread across seven villages, namely Kalaodi, Cobodoe, Dowora, Doyado, Tosa, Mafututu, and Jiko Cobo. The harvest area in 2017 was 11 ha with a total production of 7 tons; in 2018, the harvesting area was 3 ha, where the production amounted to 1.6 tons; and in 2019, it increased to 10 ha with a production of 24.3 tons (BPS, 2022). When compared to the potential production of rawit pepper, the yield of East Tidore farmers is still low. The problem is the capacity to cultivate land, planting on land with an inclination of >8%–30% as an island territory, thus limiting farmers ability to do cultivation (Umasugi et al., 2022). Therefore, the principle of conservation must be applied to the land.

The concept of agriculture suitable for farmers has been published through the Order of the Minister of Agriculture No. 48 of 2009 on the Guidelines for Good Agriculture Practices (GAP) of food crops. (Permentan, 2009). Innovation of GAP by farmers in Kulon Progo of 83% has a positive impact on the production of soybean (Purnamasari et al., 2017). The rate of application of GAP to experienced farmer professions, higher education, large areas, and active following socialization of GAP by the pioneers due to GAP implementation reached 67-95% (Sitorus et al., 2020). The GAP approach to pumpkin cultivation as one of the solutions to sustainable agriculture needs to be extensively studied in order to develop the industry, taking into account the various problems faced by pumpkin farmers (Dewi et al., 2016). Based on this description, research on the application of Good Agriculture Practices (GAP) for Capsicum annuum cultivation to farmers in Tidore Eastern City, Tidore district, should be carried out. The objective of this study is to establish the level of application of Good Agriculture Practices (GAP) to farmers in the East Tidore district and determine the strategies that can be taken to influence the application of GAP among farmers.

2. MATERIAL AND METHODS

The research was carried out in the Tidore Eastern District of Tidore City, Northern Maluku Province. The study was conducted in January–April 2023. Respondents were randomly selected from among 100 farmers, with the criteria of farmers who have been trying to rawit pepper for more than 5 years. Purposive sampling is a sample collection method that is used by a researchers if they have a particular consideration in the sample. The sample was determined to be 30% of the total population of rawit pepper farmers (Dewi et al., 2016; Wakhid&Suciati, 2020).

To analyze the extent of GAP application to the cultivation of rawit peppers by farmers in the East Tidore district, the researchers referred to the assessment parameters based on the Regulation of the Minister of Agriculture No. 62 of 2010. The evaluation parameters consist of ten variables, including the location of the farm (X1), soil preparation and planting media (X2), seed quality (X3), planting and maintenance (X4), fertilization (X5), crop protection (X6), pesticides (X7), harvest (X8), post-harvesting (X9), and waste and garbage management (X10). The assessment is made on ten variables; each variable has a sub variable of thirty-nine (Ministerial Regulation No. 62, Year 2010). The sub variables analyzed are descriptively twenty-five of the cultivation activities carried out on open land with a fertilizer of less than 30% (X1.1), land free of poisonous waste (X1.2), meaning that there is no industrial activity or other activity around the site of the plant that uses toxic waste, soil conservation measures (X1.3), or the use of human waste for plant fertilization (X5.1), meaning that fertilization activities do not use human dirt, animal dirt, or urine before use in fertilizing (X5.2), meaning that the fertilizing activity does not use animal dust or should be processed prior to use.

Data collection in this study is done by distributing a questionnaire to each respondent. The basics for interpreting the mean value used in this study refer to the interpretation of the score. Thus, the criteria for describing the average value obtained by each sub variable

depend on the assessment parameters within the GAP. Each respondent's answer was analyzed using SPSS 22 software.

The model analysis used is descriptive statistical analysis (Ashari et al., 2017). In the analysis of the Likert scale, there are two forms of questions: the positive question form to measure the positive scale and the negative question form to measure the negative scale. Positive questions are scored 5, 4, 3, 2, and 1, while negative questions are scored 1, 2, 3, 4, and 5 (Pranatawijaya et al., 2019). The likert scale is T x Pn (T = total number of respondents voting and Pn = selection of likert shortage numbers). The applicationlevel category using the Likert scale is presented in Table 1. SWOT analysis (Benzaghta et al., 2021) was used to formulate strategies to influence the implementation of Good Agriculture Practices (GAP) in rawit pepper cultivation by farmers in East Tidore district. This SWOT analysis is also based on logic that aims to maximize opportunities and analyze weaknesses. External analysis is carried out by identifying the opportunities and threats to the cultivation of rawit pepper in East Tidore district. Opportunities (O) as well as threats (T) are external analyses of the opportunity and threat that can be identified through economic, social, cultural, demographic, environmental, competitors, government, and technology factors. This SWOT analysis is based on logic that can maximize the strengths of internal factors and opportunities emerging from outside, but at the same time can minimize elements of internal weaknesses and anticipate interference factors or potential external threats. (Benzaghta et al., 2021). The SWOT matrix is presented in Table 2.

Table 1. Category GAP application level

Scale Range	Category
1-1,8	Not good
> 1,8-2,6	Poorly
> 2,6-3,4	Good sufficient
> 3,4-4,2	Good
> 4,2-5,0	Very good

Table 2. SWOT matrix

Eksternal / Internal	Strengths	Strengths
Opportunities	**S-O Strategies** Create a strategy that uses the power to take advantage of opportunities	**W-O Strategies** Create a strategy that minimizes weakness to take advantage of opportunities
Threats	**S-T Strategies** Create a strategy that uses power to address threats	**W-T Strategies** Create a strategy that minimizesweaknesses and avoiding threats

3. RESULTS AND DISCUSSION

3.1 GAP Application Analysis Results Based on Likert Scale

Results of analysis using a Likert scale against 14 (fourteen) sub variables according to the GAP guidelines presented in Table 3

Table 3. Results of GAP Variable Likert Scale Analysis

Variable (X)	Scale Range	Number of Scores Average	Category
X_1	> 2,6-3,4	3,40	Good sufficient
X_2	> 2,6-3,4	3,03	Good sufficient
X_3	> 1,8-2,6	2,47	Poorly
X_4	> 2,6-3,4	2,67	Good sufficient
X_5	> 2,6-3,4	2,75	Good sufficient
X_6	> 2,6-3,4	3,06	Good sufficient
X_7	> 1,8-2,6	2,42	Poorly
Total Average Score		**2,70**	**Good sufficient**

Info: soil preparation and planting media (X1), seed crop (X2), planting and maintenance (X3), fertilization (X4), plant protection (X5), harvest (X6), and post-harvest (X7).

Based on the data, Table 3 shows that the variable average score is 2.42–3.40, with a scale range of >1.8–2,6 and >2.6–3.4 in the poor category, which is quite good. This indicates that the farmers of pepper rawit in the preparation of the soil and the medium of cultivation already quite well meet the standards of GAP. Before carrying out the planting activities, farmers first do good ground preparation with spraying using herbicides to eradicate the weeds that are in the field of planting, which can also be done by piracy. The seed quality variable (X2) has an average score of 3.03 with a fairly good category. This indicates that the seeds used by some farmers have a fairly good germination capacity, with the use of certified superior seeds, but a few farmers in the selection of seeds do not pay much attention to healthy seeds with good germ capacity. The farmer's reasons are that he is still using local seeds that are potentially low-growth and can be infected with OPT because commercial superior variety seeds are expensive

The variable of planting and maintenance (X3) average score is 2.47, with a poor category. This indicates that the predominant farmers do not plant according to the cultivation guidelines, i.e., by moving the seed of rawit pepper on the ground at the right time and in the right way, it is in accordance with the procedure according to Rosdiana et al. (2001) that the planting of rawit pepper can be done at least 2 weeks after placing the plastic mulch (if the mulch uses mulch). Planting is best done in the afternoon so that the plants do not fade. Fertilization variable (X4) has an average score of 2.67, which is in a fairly good category. This indicates that the judgment of farmers regarding fertilization according to GAP procedures and standards is quite good; some farmers have knowledge and skills in determining the type, dose, and time of fertilization and the storage of fertilizers in safe and dry places. While the plant protection variable (X5) has an average score of 2.75 with a fairly good category, this means that the crop protection aspects carried out by peanut farmers are quite consistent with the procedures on the GAP.

OPT control by observing the PHT principle, which is to perform physical control, mechanical control, technical culture control, control with resistant varieties, and chemical control wisely. The harvest variable (X6) has an average score of 3.07, which is in a fairly good category. This means that the harvest variables carried out by farmers are quite consistent with the procedures in GAP. The harvest handling carried out by the farmers is in accordance with the GAP guidelines. Farmers can maintain the quality of the product in harvesting activities with good grinding techniques; generally, the time of harvest is 2.5 to 3 months after sowing. The next harvest can be done in 1-2 weeks, depending on the health and fertility of the plants. Harvesting is done on fruits whose flavors have reached between 80% and 90%; harvesting when young for green pepper products must be done at the time of consumption between 50% and 60% and done in the morning after the drizzle has dried with proper selection of time, i.e., once a week (Rosdiana et al., 2011). The post-harvest variable (X7) has an average score of 2.42 with a less-good category. That means six sub variables on post-harvest have not been properly implemented by farmers. For example, a special place

for collecting crops that is protected from direct sunlight is where farmers place their crops in open spaces or containers. Farmers don't have a special place for handling clean and protected post-harvest crops from direct sunlight. Farmers also do not have the packaging used to protect products from the storage of distribution garbage, so products are easily contaminated with chemicals or quickly rot.

The result of GAP variable analysis using likert scale analysis of fourteen subvariables found an average score of 2.70. Based on the likert scale table that refers to Sudjana (2001), the value belongs to the category quite well. Thus, the application of GAP by the farmers of rawit peppers in Tidore Eastern City, Tidore Island, is quite good according to the guidelines of GAP in accordance with the Regulation of the Minister of Agriculture Number 62 of 2010. The results of research on farmers' rates of application of the GAP to the cultivation of ravit peppers in this category are quite good. The results of this study are in line with the results of research carried out by Tanjung K et al., who found that the level of freedom of farmers through the application of GAP red chili rawit in Sukasari village, Rumpin district, is still low. The assessment results showed that not all respondents passed the GAP registration assessment of pepper because there were some unfulfilled obligatory checkpoint category assessments.

The findings based on the Likert scale above are in line with the research (Nahraeni et al., 2020) on the application of Good Agriculture Practices (GAP). Pamelo orange (Citrus Maxima (Burm.) Merr.) Said that farmers have begun to implement their criminal activities according to the guidelines, although not all components are applied optimally at > 50% (Nehraeni et al. 2020). The results of the research on the level of application of GAP, which is quite well influenced by the age of the respondents who are still productive and have work experience, are not in accordance with the study carried out (Kristiana & Sholeh, 2020) about the implementation of good agricultural practices by horticulture farmers and its development strategy in the Pamekasan district. The study stated that 100 percent of farmers who are engaged in agriculture are not in line with the GAP. (Kristiana & Sholeh, 2020; Agustina et al., 2017).

One factor influencing the implementation of GAP by farmers is their more than 5 years of work experience, which is in line with research (Kristiana & Sholeh, 2020) to find out the rate of adoption of good agricultural practices. Arabica coffee crops by the farmers in the district of South Tapanuli showed that the adoption rate of good agricultural practices is 32.40 percent. Various studies have been carried out in analyzing the extent of GAP application of various horticultural commodities, so it can be concluded that the majority of our farmers are not able to implement GAP properly, so it requires strategies to be implemented in order to increase the rate of GAP application among farmers in developing cultivation techniques and planting efforts.

3.2GAP Application Strategy SWOT Analysis Results

Results of the SWOT analysis of the internal and external environments of GAP implementation strategies. This analysis is based on the logic of maximizing strengths and opportunities while at the same time minimizing weaknesses and threats. The results of the analysis determine the strategies that can be taken to influence the application of GAP cultivation of pepper rawit on farmers in Tidore, Eastern City, and Tidore Island. The identification of internal and external factors is presented in Table 4.

Internal Factors / External Factors	Strengths (S)	weaknesses (W)
	1. The fertility of the soil is good. 2. Fertilization according to the engraving technique 3. The use of pesticides is in accordance with the technique of harvesting. 4. Harvest and post-harvest according to the harvest technique	1. Still weak mastery of production technology 2. Minimum land conservation measures 3. The packaging is not labeled, explaining the identity of the product. 4. Hygiene and health facilities are not available.
Opportunities (O) 1. Expansion of the development of horticultural land 2. Continuous requests for chili peppers 3. The government policy of Tidore City in the development of horticultural crops 4. Development of output processing technology	Strategies S-O 1. Ground fertility has good potential for expanding the development of horticultural crops. 2. The farmer's knowledge and skills sufficiently good about the chili cultivation techniques can increase production to meet market demand.	Strategies W-O 1. Improve the mastery of production technology by farmers so that production increases to meet market demand. 2. Increase knowledge of product labeling to have good sales value and skills in product processing technology.
Threats (T) 1. Opening up free trade 2. Climate Change 3. The price is fluctuating. 4. Government policies tend to change.	Strategies S-T 1. Improve the knowledge and skills of farmers on cultivation techniques in order to face free trade. 2. Improve farmers' knowledge and skills on cultivation techniques to cope with climate change.	Strategies W-T 1. Increase the mastery of technology in order to face free trade. 2. Increase farmers' knowledge of cultivation patterns to cope with climate change and fluctuating pepper prices.

Based on the SWOT analysis obtained, the total weight value (TNB) of internal and external factors, i.e., TNB strength is 4,208; TNB weakness is 3,239; TNB chance is 3,372; and TNB threat is 2,852. According to this kind of analysis, TNB strength is higher than TNB weakness (difference +0.969), and TNB probability is higher than threat TNB (difference +0.52). This is shown in Figure 1.

Based on the analysis of internal and external factors, the strategy to influence GAP implementation is in quarter position I. being in quarter I means a position that is quite favorable for farmers and can implement aggressive growth strategies in raw pepper

cultivation activities. Thus, to implement the GAP, farmers have greater strengths and opportunities than their weaknesses and threats. The highest FKK value (key success factor) on strength is the level of good soil fertility and the use of pesticides accordingly. Whereas on weakness, the highest value of FKK is still weak mastery of production technology and unavailable health and hygiene facilities. The results of the analysis are in Quadrant I, which shows that the strengths and opportunities positions are strategies to be implemented to influence the application of GAP cultivation of chili rawit on farmers. The right strategy is the S-O strategy, which, with good soil fertility and commitment and government policy in the development of horticultural crops as well as the good knowledge and skills of farmers about chili cultivation techniques, can increase the production of chili rawit in East Tidore district.

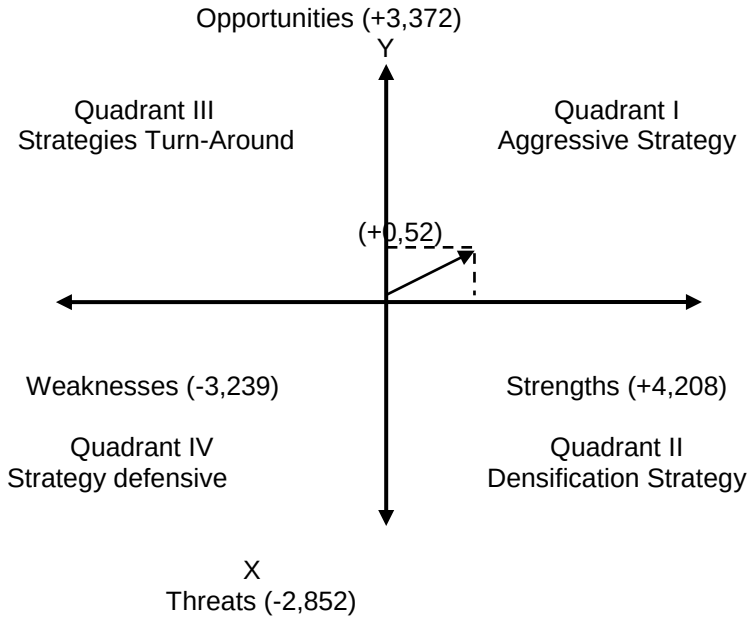

Figure 1. SWOT Diagram GAP Application Strategy

4. CONCLUSION

The study concludes that farmers in Tidore Eastern City, Tidore Islands, have a pretty excellent level of adherence to excellent Agriculture Practices (GAP) in the production of rawit pepper, with a rate of application of 2.70. Enhancing understanding of GAP applications, particularly in terms of technology utilization and the identification of superior varieties, is crucial for boosting production. The optimal approach involves implementing the S-O strategy by focusing on soil fertility planting. Additionally, there is potential for expanding the cultivation of raw pepper crops and enhancing farmers' knowledge and skills in utilizing technology for pepper cultivation techniques. These measures have the potential to significantly increase raw pepper production in the Eastern Tidore district.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

AUTHORS' CONTRIBUTIONS

Hasnartydesigned the study, performed the statistical analysis, wrote the protocol, andwrote the first draft of the manuscript. Suratman Sudjudand SuryatiTjokrodiningratmanaged the analyses ofthe study and managed the literature searches. All authors read and approved the final manuscript.

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