Decision Analysis of Farmers for Local Corn in Madura (Case Study of Local Corn Farmers in Sumenep Regency)

Heri Susanto[1(✉)], Teguh Soedarto[2], and Hamidah Hendrarini[2]

[1] Doctoral Agribusiness Program, University of Pembangunan Nasional Veteran Jawa Timur, Jl Raya Rungkut Madya, Surabaya 60294, East Java, Indonesia
20661030007@student.upnjatim.ac.id

[2] Department of Agribusiness, Faculty of Agriculture, University of Pembangunan Nasional Veteran Jawa Timur, Jl Raya Rungkut Madya, Surabaya 60294, East Java, Indonesia

Abstract. Madura has excellent potential for corn cultivation because it has land reserves based on agroecosystem potential. The problem is the trend of corn production in Madura in the last five years is fluctuating and tends to decrease; this is because in local corn farming in Madura, especially in Sumenep Regency, most farmers are still reluctant to change. Local types of corn to superior corn varieties, such as hybrid corn. Therefore, this study aimed to determine the factors that influence farmers' decisions to plant local maize in Sumenep Regency. This study uses independent and dependent variables. The independent variable is the farmer's socioeconomic status, the added value of local corn cultivation, the economic environment, and the farmer's motivation. The dependent variable is the farmer's decision to choose Madura local corn. The population in this study were local corn farmers in Sumenep Regency, with a total sample of 39 farmers. The analysis technique used is multiple linear regression analysis. Based on the regression test results, it is known that the variables of the farmer's socioeconomic status, the added value of local corn cultivation, the economic environment, and the farmer's motivation influence the farmer's decision to choose Madura local corn in Sumenep Regency.

Keywords: Farmer's decision · Madura local corn

1 Introduction

Corn is one of the local agricultural commodities, which is the main target of achieving food self-sufficiency. According to the Ministry of Agriculture (2020), Corn has a multipurpose function (4F), namely for food, feed, fuel, and industrial raw materials (fiber). Corn commodity is currently a strategic national commodity. Based on a report from the Ministry of Agriculture (Kementan), the largest corn-producing province in 2020, East Java, it produced 5.73 tons of Corn, or around 21.5% of the total national corn production. Corn harvested area in East Java was recorded at 1.19 million ha. Production in

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Table 1. Calculation of Hybrid and Local Corn Planting Yields

			Input		Output		
No	Type	Area (Ha)	Cost per Ha (Rp)	Total Production (kg)	Price (Rp)	Production Total Value (Rp)	Profit Farm Business (Rp)
1	Local Corn	1	6.930.000	2.200	3.500	7.700.000	770.000
2	Hybrid Corn	1	8.700.000	6.800	3.300	22.110.000	13.410.000

Source: Internal data from the Department of Agriculture and Plantation of Sumenep Regency, 2022

2020 has increased from 2019, which was only 6.34 million tons with a harvest area of 1.25 million ha.

East Java is the largest corn-producing province in Indonesia because East Java has a corn-planting area of 1,215,354 hectares of the total corn-planting area in Indonesia of 3,859,630 hectares. Of the area of corn planting in East Java, around 360,000 hectares are planted on the island of Madura. However, the problem is that the productivity of Madura corn farmers at this level is still low, with an average of 2.2 tons per hectare [1]. Madura has excellent potential for corn cultivation because it has land suitability based on agroecosystem potential. However, based on the table above, the problem is that the trend of corn production in Madura in the last five years has fluctuated and tended to decrease. Based on information from the Agricultural Extension Center, the problem in corn farming in Madura is the selection of local varieties. Until now, most farmers are still reluctant to change from local types of Corn to select types of Corn, such as hybrid Corn. The Center for Agricultural Extension has carried out various methods, both through the help of seeds and fertilizers. However, farmers still plant the local Madura variety in their farming.

Many farmers who cultivate Madura local Corn are not followed by maximum productivity [2], including in one of the Madura districts, the largest corn producer in Madura, the Sumenep Regency. Compared with the production of hybrid Corn, the difference in production and productivity of these local varieties is enormous. As calculated by the results of planting hybrid Corn and local in Sumenep Regency in the Table 1:

The results of brief observations conducted by the researchers showed that the farmers' decisions caused the decision to cultivate Madurese local corn in Sumenep Regency more. At the same time, hybrid maize farming was forced or encouraged by the government. Hybrid corn planting was carried out because the government provided the seeds. The choice of the local Madurese maize variety in maize farming is due to several reasons related to several aspects, including aspects of customs and habits and technical and economic aspects. The perception that rejects hybrid corn in farming and maintains local varieties is closely related to the socio-economic characteristics inherent in Madurese farmers. The reluctance of Madurese farmers to adopt new varieties of high-yielding maize is closely related to the consumption patterns of most Madurese people. Even though rice has become the staple food consumption pattern of the Madurese people,

corn is still an inseparable part of Madurese life. The study results indicated that the agricultural products they obtained were generally not for sale, but for self-consumption, either as a staple food or as a rice mixture.

This is by the Theory of Reasoned Action developed by Ajzen by adding individual beliefs and individual perceptions of behavior control, namely the belief that individuals can perform a behavior based on their ability. This theory is called the Theory of Planned Behavior. The core of the theory of planned behavior includes three things, namely, beliefs about possible outcomes and evaluation of these behaviors (behavioral beliefs), beliefs about expected norms and motivation to fulfill desired expectations (normative beliefs), and beliefs about a factor that can support or blocking behavior and awareness of the strength of these factors (control beliefs). In this study, the Theory of Reasoned is connected with farmers' beliefs in making decisions to plant Madura Local Corn, which is seen from the Socio-Economic aspects of Farmers; the Added Value of Local Corn Cultivation and the Economic Environment becomes a belief for farmers in making decisions to choose local corn cultivation.

The farmer's decision to plant local corn will impact the future of himself, his family, and the environment. In the decision-making process, farmers will be influenced by internal and external factors surrounding them. The factors of Socio-Economic Status of Farmers, Cultivation Added Value, Economic Environment, and Farmers' Motivation are the focus of this research in influencing farmers' decisions to choose local corn. Risk is a significant problem in local corn farming activities on Madura Island. Many farmers cannot produce maximum production potential (low farming productivity) because farmers decide to plant local corn, which yields higher productivity than hybrid corn. Coping mechanisms and social capital can overcome the risks farmers face. Farmers from a variety of different perspectives address these risks. This perspective makes farmers have risks in every decision-making [3].

Based on the explanation above, it is indicated that the farmer's decision to plant local maize is influenced by four variables, namely the farmer's socioeconomic status, the added value of local corn cultivation, the economic environment, and farmer motivation. The decision of Madura corn farmers to continue to plant local maize carries its own risks in achieving family food security. Therefore this study aims to determine the effect of the decision to choose local corn cultivation in the sumenep district.

2 Research Methods

This research was conducted in Sumenep Regency. The location selection was chosen purposively because Sumenep Regency is an area that has the potential for local corn production for Madura by 30%, and the selected districts are producers of local corn production. This type of research is quantitative research derived from qualitative data, quantified using a Likert scale. Sampling is a multistage sample, with the following stages:

1. Purposively identify districts with local corn potential in each district to be sampled.
2. Identify local corn production center villages in selected districts.
3. Determine the villages to be selected as samples for each sub-district purposively with directions from the Agricultural Extension Center.

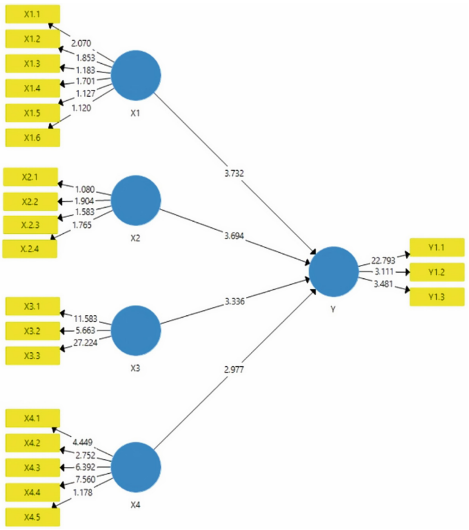

Fig. 1. Partial Least Square

4. Determine the research sample purposively in each village based on the corn productivity in each Sumenep Regency with the following calculations.

Based on the explanation above, using Slovin's formula, the number of samples is 39 respondents. Data analysis was performed using the PLS method. Kock carried out PLS analysis development by creating WarpPLS software. PLS was developed as an alternative to the Structural Equation MODEL, which has a weak theoretical basis but can also be used to confirm the theory, indicators of latent variables can be reflexive and formative. The Partial Least Square (PLS) technique was chosen because this tool is widely used for complex causal-predictive analysis and is an appropriate technique for use in predictive applications and theory development, as in this study.

3 Results and Discussion

3.1 Partial Least Square

Based on the test results using smart PLS, as shown in Fig. 1, it can be seen that there is no loading factor value below 0.50, so data drop is not required to remove indicators with a loading value below 0.50 to obtain a good model.

3.2 The Influence of Farmers' Socio-economic Status on Farmers' Decisions to Choose Madura Local Corn

Based on the results of the study shows that the Socio-Economic Status of Farmers influences the decision of farmers to choose Madura local corn, with a p-value = 0.036, which is smaller than the value $\alpha = 0.05$ (5%), with the most significant indicator that

influences the Socio-Economic Status of Farmers is business experience farming with a value of 0.856. This shows that the longer the experience of farming, the level of response to solving problems encountered in farming will be higher. Theoretically, the results of this study are in accordance with the opinion of [4], who explains that farming experience is one of the factors that can be categorized as supporting the success of a farming business. With the farming experience possessed by local Madurese corn farmers, it is hoped that they will overcome the problems they face in farming local corn farmers. Experience that a person has as a result of learning during his life can be described in the human brain. Someone will try to connect what is learned with their experience in the learning process. All human thinking, personality, and temperament are psychologically determined by the five senses, thoughts, and feelings, not the causes of action but are caused by past causes. The farmer's experience illustrates the farmer's ability to manage to farm based on effective and efficient planning in accordance with plant cultivation techniques. The competence of farmers shows the performance and responsibilities of farmers in carrying out farming in a better and more sustainable manner. Competent farmers have measurable characteristics and behaviors in acting and being responsible for their farming so that farmers are considered capable by other communities. Competent farmers are farmers who have technical skills and managerial skills in carrying out farming. The technical ability of a farmer can help increase the quantity and quality of farm production. In contrast, the managerial ability of a farmer helps manage to farm and make a profit. The success of farmers in farming is closely related to the agribusiness competence farmers possess in managing their farming business. Agribusiness competence is the ability of farmers to think, behave and act in planning farming businesses to gain farming benefits, build cooperation between agricultural sub-systems, manage post-harvest food to gain added value to agricultural products, and realize sustainable agricultural activities. Doing business will help farmers in making farming decisions. The more extended experience a farmer has, the farmer will have a high skill level. The farming experience possessed by farmers will also support success in farming.

This is in line with research by [5] which showed that the factors that significantly influence decision-making to do farming are experience, income, education, age, number of family members, and land area. Concluded that the factors that influence farmers' decisions in conducting farming in the study area are price, farmer income, age, education level, farming experience, number of dependents, land area, and level, cosmopolitan influences farmers' decisions.

3.3 Effect of Cultivation Added Value on Farmers' Decisions to Choose Madura Local Corn

Based on the results of the study showed that Cultivation Added Value influenced farmers' decisions to choose Madura local corn, with a p-value = 0.000, which was smaller than $\alpha = 0.05$ (5%) with the most significant indicator influencing Cultivation Added Value was the suitability of corn attributes with of 0.627, this shows that consideration of the suitability of corn attributes to make a commodity a primary food ingredient is closely related to consumers' willingness to accept the attributes contained in that commodity. Farmers generally like food with a sweet taste and a soft/soft/panel texture. In addition, it tastes sweeter when the ground does not produce too much powder, like corn from

outside Madura. At this time, hybrid varieties of corn have also been widely cultivated by farmers, but people prefer local varieties of corn to meet their consumption needs. The existence of hybrid corn varieties cannot shift the role of local varieties of corn. This is indicated by the level of demand for local corn, which is always more significant than the production level. According to [6], one factor influencing consumer decisions in consuming a product is the attributes attached to the product.

Attributes that are a priority in consuming local Madurese corn are taste, texture, size, and price. The first attribute the community considers in consuming local varieties of corn is a sweet taste compared to the taste of hybrid corn. The second attribute the community considers is the texture of the local Madura corn after being cooked, which has a punel taste and is not hard. The community's consideration of making a commodity the leading food ingredient is closely related to the willingness of consumers to accept the attributes contained in the commodity. People generally like food with a sweet taste and a soft/soft/punel texture. This condition also occurs in the Madurese people's choice of local varieties of corn. So that efforts to diversify food to realize household food security for the Madurese community will be successful if the corn commodity introduced has almost the same characteristics as the local corn commodity, which the community has commonly consumed.

These results are by Max Weber's theory of rationality action when associated with the research concept related to rational reasons for farmers deciding to plant local maize because farmers consider planting local maize to be profitable from an economic and technical standpoint, from the attributes possessed by local maize, and can provide sufficient resilience. Family food, so most farmers in Madura decide to grow local corn.

3.4 The Influence of the Economic Environment on Farmers' Decisions to Choose Local Madurese Corn

Based on the results of the study shows that the Economic Environment influences the farmers' decisions to choose Madura local corn, with a p-value = 0.040, which is smaller than the value $\alpha = 0.05$ (5%), with the most significant indicator that influences the Economic Environment is Market Guarantee with a value of 0.790. This shows that the Economic Environment will influence farmers in the decision-making process. The economic environment includes farm credit, input providers, and market guarantees. Farmers who consider planting local maize to be advantageous from an economic and technical perspective, in harmony with the environmental conditions of farmers and the needs of farmers, easy to understand and apply, easy to try and observe, and support from economic and environmental conditions will decide to plant local maize. Economic environment, namely economic forces that can directly or indirectly encourage or inhibit farmers in making organic rice cultivation decisions (theory). Indicators of the economic environment in the form of production facilities, market guarantees, price guarantees, and credit availability for farmers measure it. Of the three indicators, market guarantees are the most significant indicator affecting the economic environment.

This research, by the Theory of Reasoned, which is connected with the confidence of farmers to make decisions to plant Madura Local Corn from the Economic Environment, becomes a belief for farmers to achieve food security. Desire to behave shows how much individual effort in this study farmers want to commit to behavior with a higher

commitment to the tendency for that behavior to be carried out. In the theory of planned behavior, [7] suggests that individual beliefs determine the perception of control about the availability of resources in this study in the form of market availability and price guarantees in realizing this behavior to achieve family food security.

3.5 The Influence of Farmer Motivation on Farmers' Decisions to Choose Local Madurese Corn

Based on the results of the study, it was shown that farmer motivation influenced the farmer's decision to choose Madura local corn, with a p-value = 0.000, which was smaller than $\alpha = 0.05$ (5%) with the most significant indicator influencing farmer motivation was the need for appreciation with a value of 0.769. This shows that farmers have high determination and continue to cultivate local Madurese maize even though there are various choices of hybrid maize with higher production values than local maize. Of course, farmers have encouragement in cultivating this local Madurese corn.

The relationship between the social environment and farmers' motivation in cultivating local Madura maize has a positive (+) direction, which means that the relationship between the two variables is unidirectional. The unidirectional relationship can be intended when the social environment variable is higher and the farmer's motivation in cultivating local Madura maize is also higher. This means that more support from the social environment is in line with the increased motivation of farmers to cultivate local Madura maize. Social interaction with various social environments will increase respondents' motivation to cultivate local Madura maize.

4 Conclusion

This study shows that the factors of economic status, the added value of cultivation, economic environment, and farmer motivation have a significant effect on farmers' decisions to plant Madura local maize in Sumenep Regency.

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