

The 5th International Conference on Agriculture and Life Science 2021 (ICALS 2021)

“Accelerating Transformation in Industrial
Agriculture Through Sciences Implementation”

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Editors • Peng Zhang and Tri Agus Siswoyo



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Preface: The 5th International Conference on Agriculture and Life Science 2021 (ICALS 2021)

The history of ICALS began when the Faculty of Agriculture, University of Jember, Indonesia organized the international conference on Food Sovereignty and Sustainable Agriculture (FoSSA) in August 2017. The main theme of this conference was the building of food sovereignty through sustainable agriculture and its challenges toward climate change and the global economic community. Later on November 2018, the International Seminar and Workshop of Plant Industry (ISWPI) was held following the success of FoSSA the previous year. The discussion on ISWPI was focused on plant improvement through the molecular approach. In recent years, the 3rd International Conference on Agriculture and Life Sciences (ICALS 2019) was successfully held from July 31 to August 2 at 2019 as the continuation of FoSSA and ISWPI. Several speakers who are experts in the field of biotechnology, plant breeding, food science, socioeconomics of agriculture were invited to ICALS 2019 to share their knowledge on the sustainability of industrial agriculture and food sovereignty in the era of industrial revolution 4.0. The presented and selected papers from the ICALS 2019 participants have been published as an open-access proceeding in the E3S Web of Conferences (SCOPUS indexed). ICALS 2020 brought the speakers and participants a forum to discuss “Retouching Strategy for Exploring Potency of Industrial Crops for Health in Adapting to the New Normal Era”. The presented and selected papers from the ICALS 2020 participants have been published as an open-access proceeding in IOP Earth and Environmental Sciences (EES) (SCOPUS indexed).

The 5th International Conference on Agriculture and Life Sciences (ICALS 2021) is organized to continue the success story of the three previous conferences. The focus discussion in this conference is “**Accelerating Transformation in Industrial Agriculture Through Sciences Implementation**”. ICALS 2021 was held on November 3-4 2021. ICALS 2021 is remotely attended by 1262 participants from academicians, researchers, students, farmers, private businesses, governments from a total of 8 countries and 9 provinces in Indonesia. Among this number, 216 participants will disseminate their scientific results related to this conference topic. The topics were (1) agronomy and plant protection, (2) food science and smart education for plant based-diet, (3) biotechnology and biomolecule, (4) agriculture engineering and technology, (5) smart business for agriculture and healthy food, (6) smart social and political in industrial agriculture.

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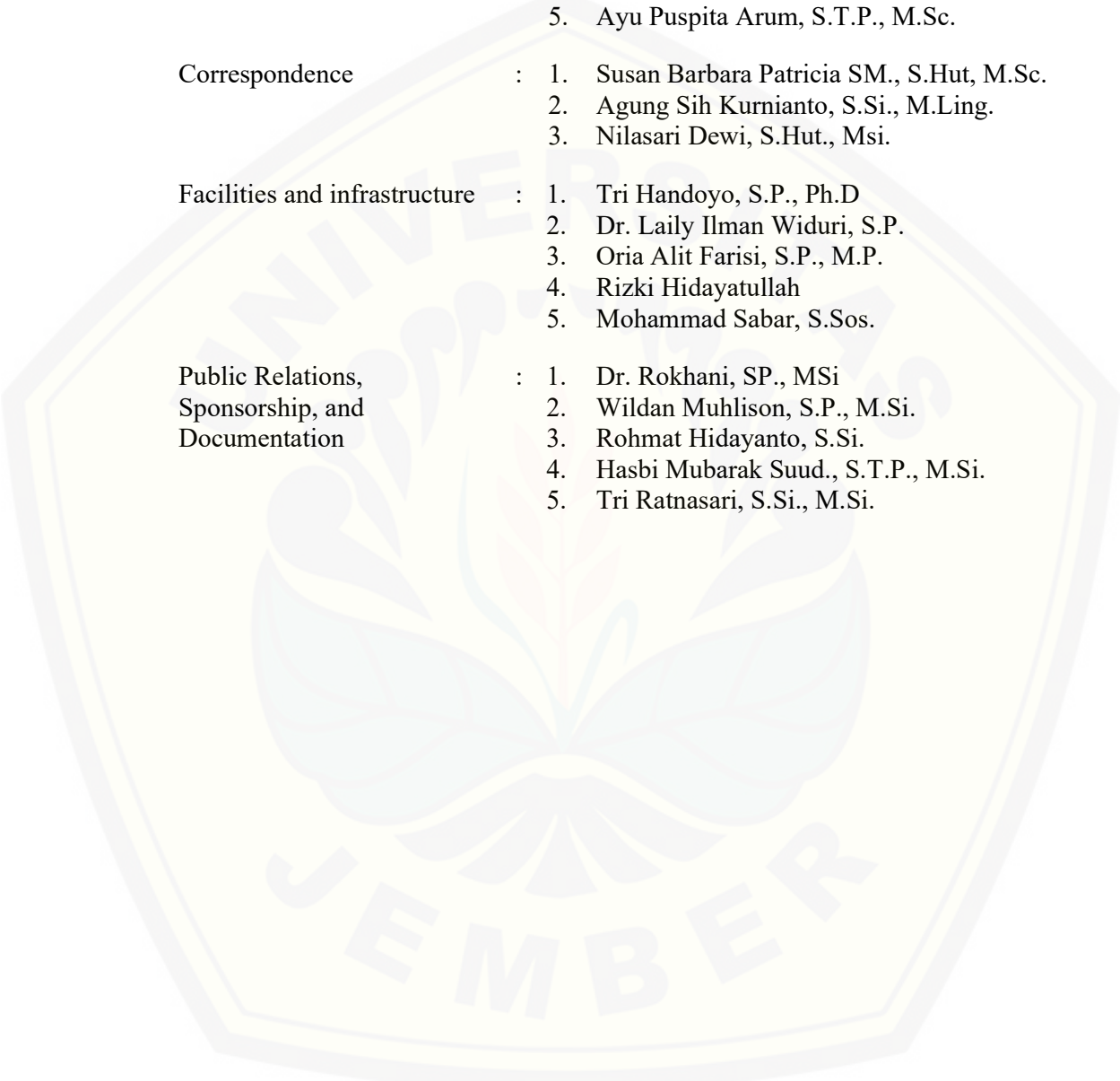
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Farmer response to the implementation of farmer card

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Farmer Response to The Implementation of Farmer Card

Illia Seldon Magfiroh^{a)}, Ahmad Zainuddin, Rudi Wibowo, Intan Kartika Setyawati,
Rena Yunita Rahman

Agribusiness Study Program, Faculty of Agriculture, University of Jember, Tegal Boto, Jember - Indonesia

^{a)} Corresponding author: illia.faperta@unej.ac.id

Abstract. The Farmer Card policy is intended to support agricultural development, particularly in increasing rice production and productivity. According to the Ministry of Agriculture, the purpose of the Farmer Card is to protect fertilizer subsidies. If the need for fertilizer is fulfilled, it will impact rice farming production and efficiency, and food needs will be fulfilled. This study aims to determine farmers' response to a farmer card program in rice farming in the Jember Regency. The sample used was 20 farmers in each of Ambulu District, Wuluh District, and Balung District. Data analysis used a proportion test on several indicators to be asked, namely the cognitive, affective, and conative indicators of farmers. The results showed that less than 60 percent of rice farmers in Jember Regency had a high response to the existence of a farmer card. This shows that farmers do not know about the purpose of giving farmer cards, the benefits of farmer cards, and the use of farmer cards. Most of the rice farmers in Jember Regency have an inadequate response to the existence of this farmer card, which is around 56.67 percent. As much as 70.12 percent of the diversity of farmer response variables is influenced by the variety of age, land area, education level, membership status of farmer groups, and the role of extension workers, other variables outside the model influence the remaining 29.88 percent. Based on the estimation results, it was found that age had a positive but not significant effect. This shows that the farmer's age does not affect the farmer's response to the existence of a farmer card. In addition, the area of land and the dummy role of the extension agent also did not affect farmers' response to the existence of a farmer card.

INTRODUCTION

The agricultural sector is still the most important and main sector in the Indonesian economy, especially to meet food needs in Indonesia. Based on this, agricultural development should continue. Agricultural development aims to meet the food needs of the growing population through increased production and productivity of food commodities. One of the government policies to increase the production and productivity of agricultural commodities, especially rice plants, is carried out by providing subsidized fertilizers for farmers. Currently, the government is implementing the Farmer's Card program to improve the distribution system of subsidized fertilizers. According to [1], Farmer cards are cards owned by farmers that carry out all banking transactions, namely as deposits, transactions, loan distribution, and fertilizer subsidy cards, also known as cards for accessing integrated banking services. If appropriately implemented, the Farmer Card Program will contribute to the State of Indonesia in increasing the production and productivity of food crops, especially rice. Farmer cards are distributed to all farmers in Indonesia, including those in East Java. The distribution of farmer cards in East Java was carried out in 2019. One of the areas that have distributed farmer cards is Jember Regency. Farmers have used some of the farmer cards distributed in Jember Regency, but many farmers have not used the farmer cards. The district government of Jember stated that the number of farmers who had used the farmer card was still low (less than 20 percent). This is presumably due to a lack of socialization regarding the farmer card. In addition, the farmer card is also one of the requirements that farmers must own, especially food crop farmers (rice) in an electronic trading system (*e-commerce*) entitled "rego pantes". Farmers hope that the distribution of inputs, especially subsidized fertilizers, will be easier, cheaper, and more stable [2]. Based on this background, it is important to analyze the farmers' response to the implementation of farmer cards in Jember Regency.

The application of farmer cards by farmers is still relatively low. This can be caused by several factors, including farmers' education, which is still low, most of the farmers are old to apply the farmer card, and the low technological ability of farmers [2], [3]. Therefore, it is important to research the factors that influence farmers' responses to farmer cards. Research on farmer responses to farmer cards has been carried out in various regions in Indonesia. The results are relatively diverse, namely research [2] showing that, on average, farmers in Kendal have a moderate or hesitant response to farmer cards. Meanwhile, research [4] states that there are differences in perceptions between farmers of the farmer card program, where most farmers do not know the function of the farmer card. Research [5] states that there is no difference in farmers' perception of Pati towards the use of farmer cards and farmer cards mostly to obtain fertilizer subsidies. According to [2], the factors that influence farmers' response are the level of education, perception, and membership in farmer groups. Research related to farmer cards has been carried out by Sholihah (2018); Moko, Suwanto, and Utami (2018); Kurniawati and Kurniawan (2018); Permatasari, Witjaksono, and Harsoyo (2018); Isabella and Sunaryanto (2020); Chakim, Arifin, and Sanim (2019); Rusdiana and Maesya (2018); Ardhiansyah, Suwanto, and Utami (2018); Ashari and Hariani (2018); Lina and Rachmina (2020); Basuki (2017); Yuliana and Nadapdap (2020); Wahid, Gayatri, and Prayoga (2021). The novelty of this research is to analyze the response of rice farmers to the existence of farmer cards accompanied by factors that influence it. The difference of this study from previous research is that in determining the response, the researcher conducted a proportion analysis to see the magnitude of the farmer's response to the implementation of the farmer card. This study aimed to determine (1) the response of farmers and (2) the factors that influence it.

RESEARCH METHODS

Location and Time of Research

This research will be carried out in Jember Regency, especially the southern Jember area (Ambulu District, Wuluhan District, and Balung District). The location selection was carried out purposively considering that the southern Jember region is a rice center area in Jember Regency. In addition, in 2019, farmer cards were distributed by the government to farmers. This research will be conducted from June to October 2020.

Sampling Method

The sampling method of farmer respondents who received farmer cards in the southern Jember region (Ambulu District, Wuluhan District, and Balung District) was carried out using the quota sampling technique. Sampling was done by taking 20 samples of respondents randomly in each sample sub-district so that the total sample used in this study was 60 farmers. Consideration of sample selection using quota sampling technique is the population of farmers in Ambulu Subdistrict, Wuluhan District, and Balung District representing farmers who receive farmer cards whose numbers are not known with certainty. Almost every villager in the 3 (three) sub-districts works as a farmer and has difficulty in the field in meeting farmers who can be interviewed.

Data analysis method

Research on farmer responses to the existence of farmer cards was analyzed using a proportion test on several indicators to be asked, namely the cognitive, affective, and conative indicators of farmers. The list of questions used as indicators was assessed using an ordinal scale of 1-5. 1 for strongly disagree, 2 for disagree, 3 for undecided, 4 for agree, and 5 for strongly agree. The list of questions can be seen in the following table:

TABLE 1. List of questions on farmer response indicators

No	Indicator	Interval score
1	Understanding the purpose of the Farmer Card Program	1 / 2 / 3 / 4 / 5
2	Understanding the benefits of the farmer card	1 / 2 / 3 / 4 / 5
3	Understanding the requirements for getting a farmer card	1 / 2 / 3 / 4 / 5
4	Understanding how to get a farmer card	1 / 2 / 3 / 4 / 5
5	Understanding how to use a farmer card	1 / 2 / 3 / 4 / 5
6	An understanding of how to use a farmer card to transfer money	1 / 2 / 3 / 4 / 5

No	Indicator	Interval score
7	An understanding of how to use a farmer card to get government assistance (fertilizers, and other assistance)	1 / 2 / 3 / 4 / 5
8	An understanding of how to use a farmer card to apply for KUR (credit)	1 / 2 / 3 / 4 / 5
9	An understanding of how to use a farmer card to sell crops to BULOG	1 / 2 / 3 / 4 / 5

The analysis used to determine the magnitude of the farmer's response to implementing the farmer card has used proportion analysis. The proportion tests carried out are as follows:

a) Hypothesis testing

$$H_0 = p \leq 60\%$$

$$H_1 = p > 60\%$$

With the understanding:

H_0 : presumably less than or equal to 60% of farmers in Jember Regency have a high and very high response to the farmer card program

H_1 : allegedly, more than 60% of farmers in Jember Regency have a high and very high response to the farmer card program

b) The level of significance at = 0.05 (5%)

c) Test statistics

d) The test is carried out using the following formula:

$$Z \text{ count} = \frac{\frac{x}{n} - P_0}{\sqrt{\frac{P_0(1-P_0)}{n}}} \quad (1)$$

Description:

x : number of farmers who have a high response to farmer cards

n : total number of farmers used as sample

P_0 : population proportion = 60%

e) Test criteria

Zvalue \leq Ztable: H_0 accepted, H_1 rejected

Zvalue $>$ Z table: H_0 rejected, H_1 accepted

The second objective of this research regarding the factors that influence farmers' responses to the farmer card program in Jember Regency is carried out using Tobit analysis. The factors that are thought to influence are age, land area, education level, farmer group membership status, and the role of extension workers. Tobit analysis was analyzed with the following equation:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 D_1 + \beta_5 D_2 \quad (2)$$

Description :

Y = farmer response (percentage)

X_1 = farmer's age (years)

X_2 = land area (ha)

X_3 = farmer education level (years)

D_1 = Dummy Farmer group status ($D=1$ if you join farmer group, $D=0$ if you don't join farmer group)

D_2 = Dummy role of extension ($D = 1$ if active extension, $D = 0$ if the extension is not active)

β_0 = Intercept

β_i = Parameter to be estimated

sign and magnitude of the expected parameters: $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5 > 0$.

RESULTS AND DISCUSSION

Farmer's Response to the Farmer Card Program in Rice Farming in Jember Regency

The response is a behavior to receive a certain message. A person's response to a message can vary, that is, some have a low response rate, and some have a high response. According to Guire [17], the response is an attitude that is a reaction to an action against him. The response is an attitude, and an attitude consists of affective (feeling), cognitive (knowledge), and conative (behavior or participation). The response of farmers to the existence of a farmer card program in rice farming in Jember Regency is seen based on cognitive, conative, and affective aspects. The farmers' responses to the existence of a farmer card are as follows:

TABLE 2. Farmer's Response to the Farmer Card Program in Rice Farming in Jember Regency

No	Indicator	Interval score	Average score	Response rate (%)
1	Understanding the purpose of the Farmer Card Program	1-5	1,67	66,67
2	Understanding the benefits of the farmer card	1-5	1,63	68,33
3	Understanding the requirements for getting a farmer card	1-5	3,02	80
4	Understanding how to get a farmer card	1-5	2,85	70
5	Understanding how to use a farmer card	1-5	1,42	45
6	An understanding of how to use a farmer card to transfer money	1-5	1,18	36,67
7	An understanding of how to use a farmer card to get government assistance (fertilizers, and other assistance)	1-5	1,35	71,67
8	An understanding of how to use a farmer card to apply for KUR (credit)	1-5	1,33	46,67
9	An understanding of how to use a farmer card to sell crops to BULOG	1-5	1,03	41,67
Amount			15,48	526,68
Average			1,72	58,52

Based on the study results, it is known that farmers do not know about the purpose of giving farmer cards, the benefits of farmer cards, and the use of farmer cards. This is because most farmers are only made by their farmer groups and there has been no explanation of the benefits and objectives of making farmer cards in Jember Regency massively. The role of farmer groups, fertilizer stall is needed to socialize the usefulness of the farmer card to farmers in Jember Regency so that the use of farmer cards is maximized. This is in accordance with research [2], [4]–[6], [14] which states that farmer cards need to be socialized through farmer groups.

The response of farmers to the existence of farmer cards is quite diverse. In conducting interviews, researchers divided farmers' responses to this farmer card program into five categories, namely very low, low, medium, high, and very high responses. The distribution of farmers' responses to the existence of farmer cards can be explained in Table 2.

TABLE 3. Distribution of farmers' responses to the existence of farmer cards in Jember Regency

No	Category (percentage score)	Number of people	Percentage (%)
1	Very Low (0 – 20%)	5	8,33
2	Low (21 – 40%)	34	56,67
3	Enough (41 – 40%)	18	30,00
4	High (60 – 80%)	3	5,00
5	Very High (81 – 100%)	0	0,00
Amount		60	100,00

Table 2 shows that most rice farmers in Jember Regency have a low response to the existence of this farmer card, which is around 56.67 percent. These results are in line with research [2], [5], [7] which shows that the response of farmers to the existence of farmer cards is low. While getting a farmer card, farmers have not used the farmer card as they should buy subsidized fertilizers or obtain farm credit. So far, the purchase of fertilizer is still based on the ability of farmers to buy at kiosks or shops selling fertilizers. About 18 farmers or 30 percent, show a moderate or hesitant response to the farmer card program. This is because the program has not been effective in overcoming the scarcity of fertilizer in Jember Regency. Farmers are still unsure whether the use of the farmer card is effective in obtaining assistance from the government in the form of input assistance or farm credit. The farmers who responded with a high

response were only about 5 percent. After seeing the news on radio and television, some of these farmers believed in the government's policy regarding the farmer card program. They believe that the farmer card will be profitable for farmers in the future, especially in obtaining input assistance and farming credit, which so far have not been right on target.

The response level of farmers to the existence of the farmer card is calculated by calculating the proportion analysis with the following results:

$$Z = -8,73$$

Test Criteria:

Z Value \leq Z Table : H₀ Accepted, H₁ Rejected

Z Value $>$ Z Table : H₀ Accepted, H₁ Rejected

Conclusion :

Z value = -3,968

Z table = 1,645

Z count \leq Z table : H₀ accepted, H_a rejected

The results of the calculation of the proportion value were obtained by a Z value of -8.73. This value is smaller than the z table value, which is 1.645. Based on this, it was concluded that H₀ is accepted it means that less than 60 percent of rice farmers in Jember have a high response to the presence of peasant cards. This shows that more rice farmers in Jember Regency gave a low response to the existence of the farmer card. The reason is that many farmers are not aware of the benefits of the farmer card, and most farmers are still unsure about the success of the farmer card program.

Factors Affecting the Response of Rice Farmers to the existence of a Farmer Card in Jember Regency

After analyzing the farmer's response to the existence of a farmer card, an analysis was carried out on the factors that influence the response of rice farmers to the existence of a farmer card in the Jember Regency. The factors that are thought to influence are age, land area, education level, farmer group membership status, and the role of extension workers. The results of the Tobit regression analysis can be seen in the following table:

TABLE 4. Factors Affecting the Response of Rice Farmers to the existence of Farmer Cards in Jember Regency

Variable	Coefficient	Std Error	Z Statistic	Prob.
Constant	-0,3412	0,040	-6,227	0,0001
Farmer's age (years)	0,0290	0,011	1,021	0,3070
Land area (Ha)	0,0027	0,001	0,742	0,4577
Education (years)	0,2533	0,063	3,245	0,0012
Dummy of Farmer Group Status	0,0188	0,026	3,471	0,0005
Dummy of the role of the extensionist	-0,9662	0,310	0,821	0,5325
LR Test	74,967 (p value = 0,000)			
Pseudo-R square	0,7012			

The results of the tobit regression analysis showed a Pseudo R-square value of 0.9012. This means that 70.12 percent of the diversity of farmer response variables is influenced by the diversity of age, land area, education level, farmer group membership status, and the role of extension workers. Meanwhile, 29.88 percent is influenced by other variables outside the model. Based on the estimation results, it was found that age had a positive but not significant effect. This shows that the farmer's age does not affect the farmer's response to the existence of a farmer card. In addition, the area of land and the dummy role of the extension agent also did not affect farmers' response to the existence of a farmer card.

The education variable has a positive influence on the response to the existence of a farmer card. The higher the education of rice farmers, the higher the farmers' response to the existence of farmer cards. These results are in line with research [2], [6]. This means that farmers who have relatively high education, namely farmers with S1 education, state that they know the benefits of having a farmer card and support the existence of a farmer card. Different statements were conveyed by farmers who had an average education of elementary to high school, on average, did not know the benefits of having a farmer card, and expressed doubts about the farmer card program.

In addition to education variables, the dummy status of farmer groups also affects the response to the existence of farmer cards. In the results of the Tobit regression, the dummy of participation in farmer groups is positive, which means that farmers who participate and are active in farmer groups will have a high response to the existence of farmer cards. This is proven based on conditions in the field, showing that farmers who actively participate in farmer groups are more aware of the benefits and uses of farmer cards. These results are in accordance with research [2], [5], [11]. In addition, farmers who participate in farmer groups on average give moderate and high responses to the existence of farmer cards. This shows that farmer groups are the right institutions to educate farmers regarding farmer cards to find out the benefits and uses of the farmer cards.

CONCLUSION

The farmers' response to the existence of a farmer card is quite diverse, most of the rice farmers in Jember Regency have a low response to the existence of this farmer card, which is around 56.67 percent. While getting a farmer card, farmers have not used the farmer card as they should buy subsidized fertilizers or obtain farm credit. So far, the purchase of fertilizer is still based on the ability of farmers to buy at kiosks or shops selling fertilizers. About 18 farmers or 30 percent, show a moderate or hesitant response to the farmer card program. This is because the program has not been effective in overcoming the scarcity of fertilizer in Jember Regency. Farmers are still unsure whether using the farmer card is effective in obtaining assistance from the government in the form of input assistance or farm credit. The factors that influence farmers' response to the existence of a farmer card are the education variable and the dummy status of the farmer group. It is necessary to socialize the use and benefits of farmer cards to farmers in Jember Regency. Socialization can be done through farmer groups or extension workers to know the use and benefits of having a farmer card for rice farming.

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Intan Kartika Setyawati, Ahmad Zainuddin, Rudi Wibowo, et al.



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Consumer Attitudes Towards Food Attributes Due to the Dynamics of Supply Shock Covid 19

Intan Kartika Setyawati^{a)}, Ahmad Zainuddin, Rudi Wibowo, Illia Seldon Magfiroh, Rena Yunita Rahman, Luh Putu Suciati, Evita Soliha Hani, Julian Adam Ridjal, Indah Ibanah

Agribusiness Study Program, Faculty of Agriculture, University of Jember - Indonesia

^{a)}Corresponding author: intan.faperta@unej.ac.id

Abstract. Regional lockdown policies and work-from-home patterns have led to changes in consumer behavior and household food purchases. This study aims to determine consumer attitudes towards food attributes due to the dynamics of supply shock due to Covid 19. This study was conducted in Jember Regency using a sample of 100 respondents spread across urban and rural areas. This study uses Fishbein analysis to determine consumer attitudes towards food attributes due to the Covid 19 pandemic. The results of the analysis show that consumption patterns change during the pandemic. These changes include the number of purchases, changes in the place of purchase, and the frequency of purchases. The price attribute has a high level of importance but has low performance. The food price attribute needs attention from the government so that people can access food. The attribute of ease of access has a high level of importance and high trust from consumers. The stock attribute has a high level of importance but has sufficient trust from the public. In addition, quality or brand attributes have a low level of importance but have a relatively high level of trust from the public.

INTRODUCTION

Food needs are one of the basic human needs that are strategic. By following under the law on food in Law Number 18 of 2012, food is the most important human need. Its fulfillment is part of human rights guaranteed in the 1945 Constitution of the Republic of Indonesia. The virtue of food is related to the concept of food security. This consists of three dimensions: food availability, accessibility, or affordability of the community to food, characterized by food price stability and food sufficiency related to consumption patterns. The fulfillment of these three dimensions is related to food security in an area [1], [2].

Domestic food prices strongly influence the fulfillment of community food needs related to production, distribution, and consumption. Even the Central Statistics Agency recorded that the increase in food prices to the inflation rate in 2018 was 0.68 percent or the highest. Then followed by an increase in prices for processed food, beverages, cigarettes, and tobacco which contributed 0.67 percent to inflation. This fluctuation in food prices is inseparable from the biological conditions in the agricultural environment and economic conditions, time lags in decision making related to the use of inputs to selling output, market conditions, natural disasters, disease pandemics, and the impact of policies [3]–[6].

At the beginning of 2020, all countries in the world experienced a disease pandemic. The disease pandemic is known as the coronavirus, and its disease is called covid-19. Indonesia also experiences this pandemic. The COVID-19 or coronavirus pandemic in the community has disrupted the Indonesian economy. The economic impact of this virus initially only eroded the external side of the Indonesian economy through an increase in the number of imported commodities from China. However, with the rapid spread of the virus, economic stability has also been affected. From a macro perspective, the impact can be seen from the sharp weakening of the rupiah exchange rate and the stock market, accompanied by a deep correction in the Composite Stock Price Index (JCI). Economic growth is also expected to slow drastically, eroded by the spread of the impact of the virus to various sectors of the economy [7]–[10].

The Indonesian government's policies to prevent the spread of the COVID-19 virus pandemic include regional quarantine (districts/districts/villages/small towns). One of the regencies in East Java that has also implemented a regional quarantine policy is Jember Regency. Quarantine policy limits people's activities for social and economic aspects. In particular, the economic aspect's impact on food consumption is felt because quarantine requirements are restrictions on interaction with other parties. Interaction restrictions change household consumers' behavior patterns and attitudes, especially those related to the staple food consumed. In addition, food-related attributes are a concern for consumers in deciding and determining food purchasing attitudes.

Martin Fishbein and Ajzen developed attitude theory. The model discusses many attributes of a person's attitude towards an object, such as a product. This model is also known as the multi-attribute attitude model. Usually, a consumer in buying a product or service, first the consumer will look for information about the product or service and then will form a belief in himself based on these attributes [11]. Related food attributes to be studied are price, stock, quality/brand, and ease of obtaining necessities. Based on the description above, researchers are trying to examine consumer attitudes towards the attributes of food purchases amid the Covid-19 condition. Research related to consumer attitudes has been conducted by Amam et al. (2019)[11], Hasibuan (2020)[12], and Adrianto (2018) [13]. Compared to previous research, the novelty of this research is related to consumer attitudes in determining food attributes amid during the Covid 19 pandemic.

RESEARCH METHODS

Research Time and Location

This research was carried out for 4 (four) months from September to December 2020. Jember Regency was chosen as the research location purposively. Jember is a district affected by Covid 19, an education city with a high population movement outside the region and one of the districts with the largest population in East Java. The research locations were deliberately set in several sub-districts in Jember Regency, with location characteristics (urban and rural areas). The sub-districts categorized as urban sub-districts are Kaliwates and Sumbersari sub-districts. In contrast, the sub-districts other than the two sub-districts are categorized as sub-districts in rural or suburban areas, namely Balung and Kalisat sub-districts.

Types of Research Data

The research data collected came from primary and secondary sources. Primary data were obtained through interviews with consumer households in Jember Regency. Secondary data were obtained from the Central Statistics Agency of Indonesia, BPS East Java, BPS Kab. Jember (the year 2020), several kinds of literature, scientific journals, the internet, and other sources related to the research topic.

Research Sample and Sampling Method

Respondents used in this study amounted to 100 people with sampling using the Cluster Sampling Technique. In this case, the sample area consists of four sub-districts representing rural and urban clusters and considering the profession or character of family income, namely fixed income and variable income (e.g., civil servants, farmers, private sector, small businesses). Determination of respondents was carried out by accident, namely, respondents who were met by the researcher based on the characteristics of the established research such as variations in professions, aged more than 17 years, played a role in the decision-making process in providing family food, in one family only one person was taken as a respondent, and food purchases that are asked to respondents are conditions during a pandemic. Research data collection uses structured questionnaires and combined online using the google forms format. Other important data needed is obtained as needed

Data Analysis Method

Attitude models that are generally used in measuring attitudes are Fishbein's Multi-attribute and scoring method [14]. This analysis determines consumer attitudes towards food attributes due to the dynamics of supply shock due to Covid 19. . Evaluation of consumer attitudes is carried out by comparing conditions before and after covid-19. This Fishbein attitude model focuses on predicting the attitude formed by a person towards certain objects. The formulation of the Fishbein model is as follows [15]:

$$A_o = \sum_{i=1}^n b_i \cdot e_i \quad (1)$$

Information:

A_o = consumer's overall attitude towards food;

b_i = The level of consumer confidence in the i -th attribute;

e_i = Evaluation of the importance of the i attribute;

n = number of prominent attributes

There are two important measurement targets in evaluating product attributes, namely (1) identifying conspicuous evaluation criteria and (2) estimating the *relative salience* of each product attribute [15]. The striking evaluation criteria can be identified by determining the attribute that ranks the highest. *Salience* can be interpreted as interest, namely, consumers are asked to assess the importance of various evaluation criteria. Meanwhile, consumer confidence in the attributes of a product is reflected by consumer knowledge of a product [16].

Measurement of the level of evaluation and level of confidence is carried out using a *Likert* scale, the highest intensity is given five [17]. The e_i component that describes the evaluation of attributes is measured on a *Likert* scale that ranges from "very unimportant" to "very important". The following is an example of measuring the level of evaluation and confidence in the price attribute:

TABLE 1. Attributes of Consumer Attitude Assessment to Changes in Supply Shock due to the Covid 19 Pandemic

No.	Attribute	Evaluation level score (e_i)	Confidence level score (b_i)
1.	Food prices (rice, oil, sugar, eggs)	1= very unimportant 2= not important 3= quite important 4= important 5= very important	1= very expensive 2= expensive 3= moderate according to standard 4= cheap 5= very cheap
2.	availability/ food stocks (rice, oil, sugar, eggs)	1= very unimportant 2= not important 3= quite important 4= important 5= very important	1= very limited stock 2= limited stock 3= enough stock 4=lots of stock 5= stock is abundant
3.	Quality/brand of groceries	1= very unimportant 2= not important 3= quite important 4= important 5= very important	1= Rare branded product 2= Branded products are difficult to market 3= Rare branded products 4=s Many branded products 5= Branded products are abundant
4.	Ease of obtaining/ access to food (rice, oil, sugar, eggs)	1= very unimportant 2= not important 3= quite important 4= important 5= very important	1= very difficult to access 2= difficult to access 3= quite easy 4= easy access 5= very easy access

An example of measuring the evaluation level (e_i) is:

"Food prices (rice, sugar, oil, eggs, etc.)"

Very unimportant --- : --- : --- : --- : --- *Very important*
1 2 3 4 5

The b_i component describes how strongly the component believes that the price of food ingredients (rice, sugar, oil, eggs, etc.)" has the given attribute. Trust is measured on a *Likert* Scale, the implementation results of attributes that range from "Strongly disagree" to "Strongly agree".

Examples of confidence level measurements (b_i) are:

"Food prices ((rice, sugar, oil, eggs, etc.)"

Very expensive --- : --- : --- : --- : --- *Very cheap*
1 2 3 4 5

The attributes used for the e_i component must be the same as those used to calculate the b_i component. To estimate consumer attitudes towards each type of food, each confidence score must first be multiplied by the appropriate evaluation score. The final result shows consumer attitudes towards food during the supply shock of the Covid 19 pandemic, such as liking or disliking, important or unimportant. The assessment will be better when compared to conditions if the situation is normal, so that consumers can give an objective assessment.

RESULT AND DISCUSSION

Level of Importance of Food Attributes

Fishbein multi-attribute analysis is used to find out consumer attitudes towards food attributes due to the dynamics of supply due to Covid 19. In this study, four attributes were used that were taken into consideration by consumers in consuming food during this pandemic, namely: (1) price; (2) stock; (3) quality or brand; (4) ease of obtaining. Fishbein's analysis is seen based on two sides, namely the interests and trust in attributes. The level of attribute importance is used to see the extent to which an attribute is considered important by consumers. This level of importance can be used as a reference for sellers to determine strategies for basic food products to improve their performance. The higher the level of importance of the attribute, the more important the attribute is to consumers.

This level of importance will later determine the attributes that will be prioritized based on the mapping carried out. Each attribute is mapped using the average value and based on the average value obtained, then categorized based on the level of importance of each attribute. Determination of the importance level interval by reducing the highest value of the Likert scale used (5) with the lowest value (1) divided by the number of values of the Likert scale used (5) or can be calculated by the formula $(5-1)/5 = 0.8$. The interval value of the attribute importance level can be categorized as follows:

TABLE 2. Category of Interest Level Aribut

Category	Range of importance scale
Very unimportant	$1.0 \leq x < 1.8$
Not important	$1.8 < x \leq 2.6$
Quite important	$2.6 < x \leq 3.4$
Important	$3.4 < x \leq 4.2$
Very important	$4.2 < x \leq 5.0$

The value of the importance level of the attributes used to determine consumer preferences in purchasing basic food products is described in Table 9 below. The evaluation results were carried out on 100 respondents or consumers spread across rural and urban areas. In the categorization, several attributes are classified as very important, important, and unimportant. This shows that several attributes are very important in determining the purchase of a food product or basic necessities.

Table 3 shows that two attributes have intervals in the very important category: the price attribute and the ease of obtaining or accessing food. The price attribute has an average score of 4.58, that is, the value is in the range of 4.2 – 5.00. This shows that in purchasing a food product, consumers are always concerned with the price aspect. Price determines the number of goods that consumers will purchase, the cheaper an item, the more the number of goods to

be purchased, and vice versa. Especially during this pandemic, declining public income has caused consumers to be more selective in buying food products at relatively lower prices.

TABLE 3. Evaluation Score of Importance of Attribute Purchase of Staple Food Commodities

Attribute	Attribute importance evaluation score					Total Value	The average value of e_i	Category
	1	2	3	4	5			
Price	3	1	7	13	76	458	4.58	Very important
Stock	3	5	15	35	42	408	4.08	Important
Quality/Brand	21	33	29	10	7	249	2.49	Not important
Ease of getting groceries	2	0	10	29	59	443	4.43	Very important

The attribute of convenience or access to food is also considered an important attribute with a value range of 4.43. This value indicates that the ease of access in buying is a consideration in making purchases of staple foods. During this pandemic, consumers tend to choose to buy food commodities that tend to be easily accessible and close to the consumer's domicile location. The ease of obtaining or accessing products is a very important consideration in purchasing food products. This is consistent with research [5] showed that access to food is important in food purchases.

While the food stock attribute is one of the attributes considered important by consumers, food stock has an average value of 4.08, which is in the range of 3.4-4.2, classified as an important attribute. Stock is one of the attributes that are of concern to consumers. During this pandemic, food is the main commodity needed by household consumers, so that if there is a delay in the distribution of food, it will increase prices. Therefore, the stock or supply of food products is one of the concerns of consumers to buy food products. This is because more people do stock at home, so they don't buy too often. This result is in line with Hutauruk's (2020) [9] research which shows that food stocks are a determinant in food repurchase.

Meanwhile, quality or brand attributes are considered unimportant by staple food or basic food consumers. The value of the brand quality attribute is 2.49. This shows that people in Jember Regency are not too interested in branded or quality food products, but consumers pay attention to low prices and availability if they need them. Therefore, this quality attribute is considered unimportant by consumers. The quality or branded products tend to have relatively high prices, so consumers assume that in consuming food products, it is not quality that determines because it is related to people's incomes which tend to decline during this pandemic. These results are in line with research by Ariani and Purwantini (2006) [5] and Hutauruk (2020) [9] which state that consumers are more focused on the number of purchases rather than on certain brands.

Level of Trust in Food Attributes

The level of trust is what is believed from the relationship of an object with its relevant characteristics. To measure the level of confidence used by using a five-point scale (-2, -1, 0, 1, 2) which indicates a scale of very distrust to believe strongly. The interval value of the evaluation of the level of confidence can be categorized as follows:

Table 4. Interval Value Evaluation of the Confidence Level of Food Attributes

Category	Range of importance scale
Really can't believe it	$-2.0 < x \leq -1.2$
Do not believe	$-1.2 < x \leq -0.4$
Doubtful	$-0.4 < x \leq 0.4$
Believe	$0.4 < x \leq 1.2$
Strongly believes	$1.2 < x \leq 2.0$

The evaluation results of food attributes are carried out using the Fishbein multi-attribute method using four indicators. The results of the measurement of confidence level in the attributes are presented in the following table 5. Based on the four food indicators in Table 5, it is known that food attributes have poor performance or are not trusted by consumers. Food prices are considered expensive by consumers. In particular, the prices of necessities such as rice, sugar, oil, and eggs are the community's most consumed commodities, even though people do not reduce their food consumption during a pandemic. The prices of necessities are considered expensive by the

community, where during this pandemic period, people's incomes tend to fall, but the prices of necessities have not decreased. This causes the purchasing power of consumers to decline so that the real prices of these food commodities tend to be expensive even though, nominally, the prices are relatively fixed. The stock attribute is considered to have a pretty good performance. The availability of food during this pandemic can be said to be sufficient without food shortages. People consider food stocks to be sufficient for supplies during this pandemic.

TABLE 5. Evaluation Score of Consumer Confidence in Food Attributes

Attribute	Attribute confidence level evaluation score					Total Value	The average value of b_i	Category
	-2	-1	0	1	2			
Price	20	35	45	0	0	-75	-0.75	Expensive
Stock	4	11	49	36	0	17	0.17	Enough Stock
Quality/Brand	0	0	11	85	4	93	0.93	Many Branded Products
Ease of getting groceries	0	1	18	65	16	96	0.96	Easy Access

The quality or brand attributes have a good performance where quality or branded food products are quite large. People who wish to buy branded products can consume them easily. In addition, the attribute of ease of obtaining is also considered as an attribute that has good performance where access to food products is said to be easy by consumers. This shows that even though in a pandemic condition and limiting consumer access outside the home, buying food products can be done online or through shops or mobile vendors that are easily accessible by consumers. The results of this study are in accordance with research by Ariani and Purwanti (2006) [5], Adrianto (2018) [13], Dewi and Yusalina (2011) [14], which showed that brand and access are attributes that are considered to have good performance in determining food consumer behavior.

Total Consumer Performance Assessment of Food Attributes

The consumer preference model for food attributes is a continuation of the application of Fishbein's multi-attribute model. This model will explain which attributes have a very high level of importance but have low performance and vice versa. This attribute performance appraisal analysis is obtained by multiplying the confidence value by the average attribute importance value. The results of the calculation of preferences for sugarcane seed attributes can be seen in Table 6 below:

TABLE 6. Results of Total Consumer Performance Analysis on Food Product Attributes

Attribute	Interest evaluation	Confidence level evaluation	Total score ($e_i \times b_i$)
	score e_i	score b_i	
Price	4.58	-0.75	-3.435
Stock	4.08	0.17	0.6936
Quality/Brand	2.49	0.93	2.3157
Ease of getting groceries	4.43	0.96	4.2528

The results of the analysis of the total performance of food product attributes in Table 12 show that the price attribute has a high level of importance but has low performance. This result is in accordance with Adrianto's research (2018) [13] which shows that price is an important attribute but low performance. The food price attribute needs attention from the government to consume food evenly and be affordable. This is prioritized in this pandemic condition where people's incomes are declining, but food prices remain the same, and some have increased. The attribute of ease of access has a high level of importance and high trust from consumers. This result is in line with Hutaaruk's research (2020) [9] which states that access is an important and good attribute. This shows that the ease of access attribute has performed well so that during this pandemic, consumers can easily obtain or access food. The stock attribute has a high level of importance but has sufficient trust from the public. This shows that the food stock is considered sufficient by the community or consumers, but it is still necessary to increase the stock, so that food prices tend to be cheaper if the stock is added. In addition, quality or brand attributes have a low level of importance but have a relatively high level of trust from the public. This result is in accordance with Ariani's research (2006) [5] which shows that the quality or brand of food is a priority but the performance is good. This proves that although the

quality or brand is considered not very important by consumers, the availability of quality food products is very much. Therefore, consumers belonging to the upper middle income can easily consume quality food products.

CONCLUSION

The price attribute has a high level of importance but has low performance, so the food price attribute needs attention from the government to consume food evenly and be affordable. This is prioritized in this pandemic condition where people's incomes are declining, but food prices tend to stay the same, and some have increased. The attribute of ease of access has a high level of importance and high trust from consumers. This shows that the ease of access attribute has performed well so that during this pandemic, consumers can easily obtain or access food. The stock attribute has a high level of importance but has sufficient trust from the public. This shows that the food stock is considered sufficient by the community or consumers, but it is still necessary to increase the stock so that food prices tend to be cheaper if the stock is added. In addition, quality or brand attributes have a low level of importance but have a relatively high level of trust from the public. This proves that although the quality or brand is considered not very important by consumers, the availability of quality food products is very much. Therefore, consumers belonging to the upper middle income can easily consume quality food products.

The central governments need to make policies related to policy on price stability for staple foods such as rice, sugar, cooking oil, and eggs. The policy can be carried out by setting the highest retail price for these basic food commodities so that people during the COVID-19 pandemic can still consume in fixed quantities as before the COVID-19 pandemic.

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