

## Farmers Perception and Income in the Development of Organic Vegetables During Pandemic Covid 19

Natelda R. Timisela<sup>1\*</sup>, Febby J. Polnaya<sup>1</sup>, Stevianus Titaley<sup>2</sup>

<sup>1</sup>Faculty of Agriculture, Pattimura University, Jln. Ir. M. Putuhena, Kampus Poka, Ambon 97233, Maluku, Indonesia

<sup>2</sup>Faculty of Engineering, Pattimura University, Jln. Ir. M. Putuhena, Kampus Poka, Ambon 97233, Maluku, Indonesia

\*nateldatimisela@yahoo.com

### ABSTRACT

The study aims to analyze farmers' perceptions and income levels in developing organic vegetable farming during pandemic covid 19. The study was conducted in Mahu, Haria, and Saparua Villages on Saparua Island, Central Maluku Regency, in June-July 2020. The village's determination was carried out by purposive sampling because the three villages were the locations for developing organic vegetable farming on Saparua Island. The research sample was 35 organic vegetable farmers who were taken deliberately (purposive sampling) because they were the originators of organic farming in the three villages. The results showed that farmers' perceptions of the benefits of organic vegetable farming are greater than 80 percent. Farmers' perceptions of the ease of making organic fertilizers and vegetable pesticides are greater than 70 percent, and farmers' perceptions of the risk of vegetable farming are greater than 60 percent. The results of the factors affecting the income of farmers' organic vegetables can be seen as a calculated  $F_{\text{counts}}$  of 8.84, meaning that simultaneously all production variables, depreciation of equipment, organic fertilizer, vegetable pesticides, labor wages, land area and *DCovid-19* (the covid-19 dummy variable, for the unaffected locations, has a value of 0 and 1 for the affected locations) have a significant effect on income variables. The coefficient of determination is 61.9 percent meaning that 61.9 percent of the income level can be explained by production variables, depreciation of equipment, organic fertilizer, vegetable pesticides, labor wages, land area and *DCovid-19*. In comparison, other factors outside the model explain the remaining 38.1 percent income level.

### Keywords

Income; perception; farmers; vegetable; organic

### Introduction

Organic farming is now an alternative technology to overcome environmental problems. Environmental pollution such as land, water, and air will affect the degradation and loss of natural resources and land productivity, decreasing. The extensive distribution of chemicals based on the agricultural sector affects the quality and safety of food, health, and survival. The agricultural system that refers to natural factors using organic materials from nature and doing soil processing is part of organic farming [1]. Then Mayrowani [2] showed that organic agriculture as an answer to the green revolution is considered to cause a reduction in soil fertility and environmental damage due to the use of chemical fertilizers and pesticides, which cause more soil damage and reduce soil productivity.

Organic farming systems are regulated by the Decree of the Minister of Agriculture No. 64/Permentan/OT.140/5/2013 concerning a holistic production management system to improve agroecosystems, biodiversity, biological cycles, and soil biological activities. Implementing management practices that prioritize inputs from the residual waste of crop cultivation activities on agricultural land and considerations of adaptation to land conditions is emphasized in developing organic agriculture. The emphasis on requirements to provide agricultural products, exceptionally safe food for the health of producers and consumers while not damaging the environment is the primary goal of organic farming [2]. This time many people choose a healthy lifestyle by consuming organic vegetables. The Covid-19 pandemic encourages people to practice a healthier lifestyle to maintain their immune system against the coronavirus. This change in mindset has also influenced people's interest in finding healthy food sources, such as vegetables and fruit from organic farming, free of pesticides and good health.

The researcher showed that research on organic agriculture is mainly carried out, including perceptions and attitudes of farmers in the application of organic farming [3, 4, 5, 6, 7]. This is the sustainability of organic farming systems [8] and factors influencing the decision to choose organic agriculture or organic products [9, 10] and organic farming adoption systems [9]. The linkages of organic farming and perceptions need to be examined in depth to determine the readiness, maturity, and willingness of farmers to develop it for future generations. Perception is the process of

receiving, selecting, organizing, testing, and reacting to information obtained through the five senses [11, 12]. Also, perception is related to the ability in the brain to interpret stimuli induced by the senses. There are two parts associated with human perception, namely, positive perception and negative perception. Positive perceptions occur when someone considered to have positive and vice versa, negative perceptions if someone deemed to have negative things [11].

Perception formation occurs based on three main components, namely selection, interpretation, and rounding. Screening is the delivery of the senses to stimuli from outside the intensity. Once received, the data will be selected. Interpretation is organizing information that is meaningful to others. Rounding is related to the concluding report [11]. Farmers' perceptions are supported by farmers' backgrounds, innovations, and technologies made by farmers and their externalities. Farmers' experiences include education level, age, family members, length of farming, and income [13,14].

The development of organic farming in the last three years on Saparua Island looks very unusual. The enthusiasm of farmers to cultivate environmentally friendly commodities is relatively high. Three villages are central to organic vegetable farming, namely Mahu, Haria, and Saparua villages. The growth of organic vegetables in these three villages is quite significant. This can be seen from the excellent performance of farmers in developing organic vegetables. Farmers' perception is that promoting organic farming actively guarantees nutrient continuity in the soil and does not poison the soil with chemicals. The study aims to analyze farmers' perceptions and income levels in developing organic vegetable farming based on the description above.

## Materials and Methods

The research was conducted in Mahu, Haria, and Saparua villages on Saparua Island, Central Maluku Regency, in June-July 2020. The village's determination by purposive sampling was based on the background of the three villages as the locations for developing organic vegetable farming on Saparua Island. The research sample was 35 organic farming farmers. They were taken intentionally (purposive sampling) because they were the drivers of organic farming in the three villages and became a sample village for other villages. Research data were analyzed qualitatively and quantitatively. Qualitative analysis is done for data on farmers' perceptions of organic agriculture, while quantitative data analysis is done for farmers' income from the sale of organic products. Analysis of the factors that influence the income of organic farmers is to use multiple regression models.

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + D_1 + e$$

$Y$  = farmer's income;  $X_1$  = the production of organic vegetables,  $X_2$  = price of organic fertilizer,  $X_3$  = price of vegetable pesticides,  $X_4$  = area of business land,  $X_5$  = labour costs,  $X_6$  = depreciation of equipment,  $D_1$  = dummy location ( $D_0$  = Non Covid-19;  $D_1$  = Covid-19),  $b_1$ - $b_6$  = regression coefficient,  $e$  = error term.

## Results and Discussion

### Characteristics of Organic Vegetable Farmers

Age is a condition in which a person categorized as able to work according to the level of age, namely, productive age and non-productive age. Organic vegetable farmers in Mahu, Haria, and Saparua villages are classified as productive age. Farmers can produce according to age levels. The average farmer age 41-51 years is higher than 40 percent. Young farmers have excellent physical and thinking abilities to carry out their farming activities. The productive age has a high level of productivity compared to the unproductive old age because of weak physical conditions and is not free to move [15, 16]. Theresia et al. [17] showed that someone of productive age is more eager to advance his business because of the high necessities of life than someone who is old. Young people become an essential benchmark that they will be keener to know many things and defter to adopt innovation even with minimal experience [18].

The education factor is related to one's ability and knowledge. The level of experience of a person increases the ability to adapt to various changes that will be even greater. Someone with a level of formal and informal education, has a broader mind insight and flexibility. Awareness about the importance of productivity will make people triggered to take productive actions. The education of organic vegetable farmers is elementary to the senior high

school level. The level of senior high school education is 51.43 percent. This means that organic vegetable farmers have the right level of education. The management of organic vegetable farming requires farmers' accuracy and patience in agriculture. This is because farmers must make their organic fertilizer and vegetable pesticides, and then farmers apply them to farmland.

The land area of farmers ranging from 0.25-1.5 ha. Farmland owned by farmers on average is less than 0.5 ha by 82.86 percent. Farmers have their land in developing organic vegetable farming. This is important because farmers do not work on or rent other people's land to cultivate organic vegetables, making it easier for them to work. Utilization of land is quite maximum because starting from land clearing, land management until planting. All is done privately and assisted by several people who are members of the business group. The farm area is quite extensive if it is to be cultivated sustainably, but there is limited labour for land clearing and processing. Therefore, farmers work on the land to grow organic vegetables effectively and efficiently according to land and farmers' ability.

Farmers of Mahu, Haria, and Saparua villages were previously farmers of nutmeg, clove, pulses, and vegetables. However, the development of organic vegetables has not been done at all. Over time, in 2015, farmers started farming organic vegetables. Information on the cultivation of organic vegetables is obtained from online media (social media and YouTube). This source of information then cultivates small scale organic vegetables on a  $9 \times 12$  m land area. The yields are quite encouraging, so that farmers are eager to expand the business area to date in 2020. Thus, the organic vegetable farming experience is still relatively new, ranging from 4-6 years by 62.86 percent. With this experience, the farmers continue developing themselves to process and increase income from organic vegetable farming.

## **Farmers' Perception of Development of Organic Vegetable Farming**

Foods that contain high water content consumed fresh and processed are part of the primary and side menus known as vegetables. It is beneficial for health, high water content, alkaline, has high mineral, vitamin, and fibre food content [19]. There is a need for serious attention by all community members because the vegetables consumed must be quality and safety guaranteed and free of chemicals, pesticides, and chemical fertilizers. This condition is the desire of farmers to produce tasty vegetables and without using fertilizers and chemical pesticides. To increase demand and marketing opportunities for organic vegetables, it must meet these requirements. In the conditions of the Covid-19 pandemic, people must consume healthy foods to maintain the quality of their bodies to avoid the threat of dangerous viruses. Farmers need to improve biodiversity for organic food produced so that people continue to believe and continue to consume healthy food.

Cultivation of organic vegetables naturally contains advantages over non-organic, which is safe from chemical residues and is very important for health. This is what allows consumers to switch from consuming conventional vegetables to organic vegetables. Attention to producers and consumers' health and not damage the environment must be a priority in the cultivation of organic vegetables. Environmentally friendly agriculture in it is that organic vegetables need to be well developed for all human beings' lives and avoid negative impacts from the environment due to intensification technology with the mainstay of chemicals [20].

The understanding of farmers includes knowledge and stimulus from the environment from farmers' perception towards organic agriculture [3]. Also, farmers' opinions of organic farming are about the state of the individual concerned [21, 22]. As part of the cognitive component of humans to know psychological objects such as events, ideas, or specific situations coloured with personality values is part of perception.

## **Farmers' Perception of Utilization of Organic Vegetable Farming**

Perceived usefulness the degree to which an individual believes that using a particular system would enhance his or her job performance" [4, 23]. Ashari et al. [4] and Wahana [24] suggested that there were nine indicators studied related to the benefits of organic agriculture such as increased productivity, good soil fertility, low production costs, more natural tillage, controlled paddy work, price of rice sales, organic farming superior and cover-up shortcomings as well as profitable. The utilization of organic vegetable farming shows different perceptions according to available indicators.

Table 1 shows that all components of the benefit indicator are greater than 80 percent, which states the farmers' perception of the benefits of organic vegetable farming. This is important because organic vegetables have enormous benefits for the sustainability of an environmentally friendly farming system and avoid excessive use of chemicals. During the Covid-19 pandemic, it turned out that the demand for organic vegetables was relatively high at 80% because consumers felt the benefits of consuming organic vegetables. According to farmers, the benefits of farming organic vegetables during the Covid-19 pandemic are profitable. Farmers have good enough information to make decisions in developing organic vegetable farming. Wahana [24] research is relatively similar to the results in this study. The need for sufficient information about the benefits of organic farming that farmers must know. If farmers' knowledge is adequate, it influences the decision making for the utilization of organic agriculture.

**Table 1.** Farmers' perceptions of utilization of organic vegetable farming

| No. | Description                                           | Percentage of Perception |          |         |
|-----|-------------------------------------------------------|--------------------------|----------|---------|
|     |                                                       | Agree                    | Disagree | Neutral |
| 1   | Improvement of soil fertility                         | 85                       | 1        | 14      |
| 2   | Increased productivity                                | 87                       | 3        | 10      |
| 3   | Reduction of production costs                         | 86                       | 5        | 9       |
| 4   | Simplify tillage                                      | 83                       | 7        | 10      |
| 5   | Increased revenue                                     | 85                       | 10       | 5       |
| 6   | Control of work in the fields                         | 82                       | 13       | 5       |
| 7   | Increased selling prices of organic vegetables        | 88                       | 2        | 10      |
| 8   | Organic farming excels and covers up the shortcomings | 82                       | 8        | 10      |
| 9   | Profitable                                            | 84                       | 10       | 6       |

The benefits farmers look for will usually be different in decision making. Farmers decide whether or not to adopt organic farming depending on the benefits obtained [17]. There is 10 percent of farmers who do not agree to utilize organic vegetable farming, which is generally beneficial. This is because most farmers do not understand and understand organic farming for survival and health support. They prioritize conventional agriculture with the use of chemicals, so organic farming does not bring beneficial benefits.

### Farmers' Perception of the Ease of making organic fertilizers and plant-based pesticides

Perceived ease of use is "the degree to which the individual believes that using a particular system would be" free "for physical and mental effort" [4, 23]. Farmers' perceptions of making organic fertilizers and vegetable pesticides show that farmers experience the ease of making both materials for the sustainability of organic vegetable farming. This dramatically helps farmers to minimize the production costs of organic vegetable farming. Wahana [24], in the results of the study, stated that organic fertilizer must be made by farmers, so farmers are directly involved in the development of organic agriculture. As an ingredient for farmers, reduce inorganic materials, minimize costs, and utilize natural materials around the environment.

**Table 2.** Farmers' perceptions of the ease of making organic fertilizers and vegetable pesticides

| No. | Description                                                                              | Percentage of Perception |          |         |
|-----|------------------------------------------------------------------------------------------|--------------------------|----------|---------|
|     |                                                                                          | Agree                    | Disagree | Neutral |
| 1   | The ease of learning to make organic fertilizers and vegetable pesticides                | 71                       | 8        | 21      |
| 2   | Clarity on how to make organic fertilizers and vegetable pesticides                      | 78                       | 6        | 16      |
| 3   | Flexible to make organic fertilizers and vegetable pesticides                            | 72                       | 5        | 23      |
| 4   | Skilled in the practice of making organic fertilizers and vegetable pesticides           | 76                       | 10       | 14      |
| 5   | In general, it is easier to practice making organic fertilizers and vegetable pesticides | 70                       | 12       | 18      |

There are five indicators of farmers' perceptions of the ease of making organic fertilizers and vegetable pesticides applied in the three villages, namely the ease of learning to produce organic fertilizers and vegetable pesticides, clarity on how to make organic fertilizers and vegetable pesticides, flexible to make organic fertilizers and vegetable pesticides, skilled in manufacturing practices Organic fertilizers and vegetable pesticides, in general, are more easily practised making organic fertilizers and vegetable pesticides. Farmers' perceptions according to quality of organic fertilizer are better than inorganic fertilizer; organic fertilization costs are cheaper than inorganic[6]. A good quality fertilizer will increase production, and if lower fertilization costs follow it, the expenditure will be smaller so that income will increase.

Overall, farmers can make organic fertilizers and vegetable pesticides because these two ingredients are environmentally friendly and do not contain chemicals that are harmful to health. Farmers continue to improve their performance in making their organic fertilizer and vegetable pesticides for the sustainability of organic vegetable farming. Wahana [24] and Basri [25] research results showed that farmers are very interested in applying solid organic fertilizer (*bokashi*). Hermawati et al. [26] showed that organic fertilizer has the ease of trying.

### Farmers' Perceptions of the Risk of Organic Vegetable Farming

Perceived risk is "the one's perception of the uncertainty and the adverse consequences of the desired outcome" [4, 27]. Farmers' perceptions of the risk of organic vegetable farming presented according to seven indicators. Which are likely to reduce the income of organic vegetable farmers, feel uncomfortable if there is a failure, production risk, marketing risk, riskier than conventional, will fail to meet customer satisfaction/expectations, not safe because it has not many people do.

The risk is the probability of an event that can harm when something happens in a certain period. Risks in agriculture significantly influence farmers' production and investment decisions; it must have well-conceptualized risk management [28]. Uncertainties in the agricultural sector consist of five primary sources of risk: market or price risk, production risk, legal or social risk, technological risk, and risk due to human activity. These five risks can have short-term or long-term effects on farming. Farming activities carried out by farmers can lead to production risks due to climate changes, pest and disease attacks, and low-quality seeds [29].

Farmers faced with uncertain risks in farming. Risks faced by farmers can be influenced by external factors such as weather and climate. In contrast, internal factors are present in farmers, such as land area, age, farming experience, and education. Farmers cannot control the weather and climate factors because they occur automatically, so the planting season is not according to the time requirement. In addition, farmers are faced with non-natural disasters such as the Covid-19 pandemic, causing farmers not to be free to produce continuously. This is what causes production risk and income risk because production continuity is disrupted due to covid-19.

**Table 3.** Farmers' perceptions of the risk of organic vegetable farming

| No. | Description                                              | Percentage of Perception |          |         |
|-----|----------------------------------------------------------|--------------------------|----------|---------|
|     |                                                          | Agree                    | Disagree | Neutral |
| 1   | Likely to reduce the income of organic vegetable farmers | 65                       | 25       | 10      |
| 2   | Feel uncomfortable if a failure occurs                   | 62                       | 20       | 18      |
| 3   | Production risk                                          | 64                       | 19       | 17      |
| 4   | Marketing risk                                           | 68                       | 10       | 22      |
| 5   | More risky than conventional                             | 69                       | 8        | 23      |
| 6.  | Will fail to meet customer satisfaction / expectations   | 63                       | 12       | 25      |
| 7.  | Not safe because not many people do                      | 65                       | 14       | 21      |

Table 3 shows that farmers' perceptions of the risk of vegetable farming are based on seven indicators with a value of more than 60 percent. This means that farmers will accept the risk of organic vegetable farming in any form of risk. The advantages of organic cultivation systems include chemical fertilizers and pesticides are not used because it pollutes the environment, there is no toxic content in the product, the taste of organic plants is sweeter than inorganic plants, the products of organic plants are expensive. The disadvantages are: 1) more labour is needed, pest and

disease control because it is done manually, and natural pesticides are made independently; and 2) physical plants are less attractive because of their smaller size and hollow leaves [30].

This deficiency makes it a risk in organic vegetable farming. Therefore, it appears that organic vegetable farming is more at risk than conventional by 69 percent. The organic cultivation system is an ecological, economic, and cultured sustainable agriculture models [31]. The dependence on artificial inputs and the manipulation of natural resources to maximize profits in conventional farming systems has begun to lead to the instability of production systems.

The risk of marketing organic vegetables by 68 percent means the price of organic vegetables is relatively high. The product's appearance is less attractive and beneficial to health because it is produced free of chemicals. Organic vegetable production without chemicals is like urea, potassium chloride, triple superphosphate, pesticides, herbicides, insecticides, fungicides, and other chemicals. Cultivation uses compost and manure [32]. If consumers do not look at organic vegetables, producers will lose confidence in cultivating organic vegetables.

### **Production cost, Reception, Income, and Benefit-Cost Ratio of Organic Vegetables**

Production activities require production costs. Production costs are all expenses incurred to meet the production of goods and services [33]. Production costs consist of fixed costs and variable costs. Fixed costs mean an increase in production in the company's activities, but the costs are constant [34]. Variable costs are in line with the number of activities; if the production increases, the costs will increase, and if the volume of production decreases, the costs will be reduced [35].

The total cost of producing organic vegetables is Rp. 10.240,000 consists of variable costs include the cost of organic fertilizer, the cost of vegetable pesticides, and labour costs. In contrast, the fixed costs include the depreciation of equipment. All production costs allocated for the maintenance of production inputs used during the production process and the results received by farmers are revenue. Receipts in the form of money are gross proceeds because no costs have been incurred during the production process [36]. The production produced by farmers sold at an appropriate selling price, and revenue [37]. Several factors affect revenue, such as farm size, type, and price of the commodity and the amount of production. These factors are directly proportional; if one factor moves up or down, revenue will also impact the same way.

The amount of revenues of organic vegetable farmers is Rp. 35,450,000. Types of organic vegetables produced include kale, mustard greens, Sakata, long beans, beans, and cucumbers. The amount of revenue is calculated based on the yield and sales of all types of vegetables produced by farmers per planting season.

Determining income as part of evaluating farming activities in one year aims to improve farm management and illustrate the situation both now and in the future. The purpose of a farmer in running a farm is to establish a combination of farm branches that can later provide maximum income. Income is enabled to meet the needs and satisfaction of farmers for the sustainability of business activities. The total net income of organic vegetable farmers is Rp. 25,210,000 is greater than zero. If the farmer issues all the sacrifices to produce, the farmer will receive an income of that value.

Benefit/Cost Ratio (BCR) as a criterion for measuring the feasibility of the production process [38]. BCR shows the net benefits obtained from every one rupiah that sacrificed in business activities. BCR value of 2.46 means that if one rupiah sacrificed to do organic vegetable farming, farmers would benefit from 2.46 rupiah. This result is relatively the same with [39] that organic vegetable farming in Aerlow and Waai villages is profitable if one rupiah sacrificed for organic vegetable farming activities. Farmers will get additional net benefits or a net income of 126 rupiahs. Farmers in the three villages received great benefits in managing organic vegetable farming because of the value of  $BCR > 1$ . This indicates that the development of organic vegetable farming is up-and-coming to be carried out sustainably and can break the production chain of inorganic vegetable farming. In addition, Covid-19 is not an obstacle for farmers to increase organic vegetable production to meet consumer needs for healthy and environmentally friendly vegetables.

To support farmers' yield of the production and marketing of organic vegetables in Saparua Island, marketed to Ambon City. The results of the Timisela et al. [40] study shows that demand for organic vegetables in Ambon City is quite significant because the price of organic vegetables influences it, the price of non-organic vegetables, consumer

income, the number of family members, the intensity of needs and tastes of consumers. Every day there is consumer demand for organic vegetables, but the availability of organic vegetables does not support it on a sustainable basis. Therefore, if organic vegetables are supplied from other regions, consumer demand for organic vegetables will continue.

The consumers of organic vegetables in Dian Pertiwi Supermarket in Ambon City always consider product attributes when buying organic vegetables such as price, packaging, available continuously and on time, clean and fresh, quality and label[41]. This is important to trigger organic vegetable farmers in the three villages on Saparua Island to make updates to increase the production and marketing of organic vegetables through a more extensive network.

## Factors Affecting Farmer's Organic Vegetable Income

The results of multiple linear regression tests for production factors ( $X_1$ ), equipment depreciation ( $X_2$ ), organic fertilizer costs ( $X_3$ ), vegetable pesticide costs ( $X_4$ ), labour wages ( $X_5$ ), land area ( $X_6$ ), and  $DCovid-19$  (the covid-19 dummy variable, for the unaffected locations, has a value of 0 and 1 for the affected locations) obtained the value of the  $R^2$  coefficient 61.9. This shows that the independent variable can explain 61.9 percent of the income variable. In comparison, the remaining 38.1 percent is explained by other variables not included in the model. Simultaneous test results at the 0.05 trust level were seen  $F_{counts} (8.84) > F_{tables} (2.44)$ . This means that all factors examined have a significant effect to farmer's income. The results of the analysis of factors affecting the farmers' organic vegetable income showed in Table 4.

The Partial test results show that production, equipment depreciation, organic fertilizer costs, vegetable pesticide costs, and land area significantly affect income with  $t_{value} > t_{table}$ . The regression coefficient for production and land area is positive. This means that if production and land areas increase, the income will increase. Organic vegetable production increases; the revenue of organic vegetable farmers will increase. If land increases, production will increase, causing farmers to increase income. The land is very influential on the sustainability of organic vegetable farming in the three villages. When farmers start organic vegetable cultivation, the area allocated for farming activities is relatively narrow because of fear of failure. However, over time, farmers see that organic vegetable farming is very promising because consumers are finally very enthusiastic about buying organic vegetables. Thus, farmers began to expand farming land to cultivate organic vegetables on a large scale. Covid-19 is a dummy variable that explains the impact of Covid-19 on the income level of organic vegetable farmers. The value of the variable coefficient is 1,352, meaning that if there is an increase in cases of Covid-19 in other locations, the income level of organic vegetable farmers will increase by Rp. 1,352. Based on the t-test criteria, this variable is significant, and this means that Covid-19 affects farmers' activities to produce organic vegetables continuously to increase farmers' income. Consumers will continue to consume organic vegetables because they are useful for their health.

**Table 4.** Analysis of factors that affect the income of organic vegetable farmers

| Variabel    | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig.  |
|-------------|-----------------------------|------------|---------------------------|--------|-------|
|             | B                           | Std. Error | Beta                      |        |       |
| (Constant)  | 3716271,182                 | 674274,337 |                           | 5.512  | 0.000 |
| $X_1$       | 4729.635                    | 830.137    | 0.653                     | 5.697  | 0.002 |
| $X_2$       | -1.175                      | 0.348      | -0.385                    | -3.375 | 0.002 |
| $X_3$       | -0.140                      | 0.380      | -0.044                    | -3.369 | 0.024 |
| $X_4$       | -2.530                      | 1.225      | -0.332                    | -2.165 | 0.047 |
| $X_5$       | -4.785                      | 5.733      | -0.138                    | -0.835 | 0.410 |
| $X_6$       | 3.732                       | 6.038      | 0.246                     | 2.979  | 0.036 |
| $DCovid-19$ | 1.352                       | 0.462      | 0.405                     | 3,264  | 0.027 |

$X_1$ : production;  $X_2$ : equipment depreciation;  $X_3$ : organic fertilizer costs;  $X_4$ : vegetable pesticide costs;  $X_5$ : labour wages;  $X_6$ : land area;  $DCovid-19$ ;  $R^2$  coefficient = 0.619;  $F_{counts} = 8.939$

Unlike the depreciation of equipment, the cost of organic fertilizer and the cost of vegetable pesticides is negative. This means that if the depreciation of equipment, the cost of organic fertilizer, and the cost of vegetable pesticides increase, the income will decrease. The wage factor does not have a significant effect on income with the  $t_{value} < t_{table}$ . The regression coefficient is negative, meaning that if labour wages increase, income decreases. If there is an increase in the price of production inputs, in this case, the costs of organic fertilizers, vegetable pesticides, and labour

costs will reduce farmers' income. This is because farmers have to spend significant production costs to finance their farming, which causes them to decrease revenue.

The farmers need to support the availability of organic and environmentally friendly food to improve public health and a better life. The connection between perception and income is that if the farmer decides to increase organic vegetables' production, the farmers' income will be better, considering the relatively high prices of organic vegetables. Even though organic vegetables' price is high, consumers still buy organic vegetables because they prefer to live healthily even if the price of organic vegetable increases.

## Conclusions

Farmers' perceptions of the development of organic vegetable farming include benefits (9 indicators), ease (5 indicators), and risk of farming (7 indicators). Farmers' perception of the benefits of organic vegetable farming is higher than 80 percent. Farmers' perceptions of the ease of making organic fertilizers and vegetable pesticides are greater than 70 percent and farmers' perceptions of the risk of vegetable farming are greater than 60 percent. The results of BCR analysis of 2.46 show that economically, organic vegetable farming is profitable. Farmers can develop themselves to cultivate organic vegetable farming sustainably because it is very profitable. The analysis of the factors affecting the income of farmers' organic vegetables can be seen as a calculated  $F_{\text{counts}}$  of 8.84, meaning that simultaneously all production variables, depreciation of equipment, organic fertilizer, vegetable pesticides, labour wages, and land area have a significant effect on income variables. The coefficient of determination is 61.9 percent meaning that 61.9 percent of the income level can be explained by production variables, depreciation of equipment, organic fertilizer, vegetable pesticides, labour wages, and land area. In comparison, other factors outside the model explain the remaining 38.1 percent income level.

## Acknowledgement

Thank you to BRIN/RISTEK for providing community service funds (PkM) in 2020.

## References

- [1] Bahar, Y.H. (2007). The success and performance of horticultural agribusiness. <http://hortikultura.go.id>.
- [2] Mayrowani, H. (2012). The Development of Organic Agriculture in Indonesia. *Forum Penelitian Agro Ekonomi*, 30(2), 91-108.
- [3] Ummu, S. S., Saleh, M., Ali, S., & Arsyad, M. (2018). Farmer's perception to the agriculture of organic and non-organic peppers: A case study in Swatani Village, Rilau Ale Sub-district, Bulukumba District, South Sulawesi Province. *JSEP*, 14(2), 121-132.
- [4] Ashari, Sharifuddin, J., Mohammed, Z., & Terano, R. (n.d.). (2015). Farmers' Perceptions of Organic Farming Technology and Intention to Adopt It. *Proceedings of the National Seminar on Agricultural Protection and Empowerment in the Context of Achieving National Food Independence and Improving Farmers' Welfare*, 25, 35-44.
- [5] Nuraini, C., Dwidjono, H. D., Masyhuri, & Jamhari. (2016). Institutional model in organic rice agribusiness in Tasikmalaya Regency. *J. Agraris*, 2(1), 9-16.
- [6] Tedjaningsih, T., Suyudi, & Nuryaman, H. (2017). Farmers' perception of the use of organic fertilizers in mendong farming. *Mimbar Agribisnis: Jurnal Pemikiran Masyarakat Ilmiah Berwawasan Agribisnis*, 3(1), 64-72.
- [7] Kusumo, R.A.B., Charina, A., Sadeli, A. H., & Mukti, G. W. (2017). Perceptions of farmers on organic vegetable cultivation technology in West Bandung Regency. *PASPALUM*, 5(2), 19-27.
- [8] Widiarta, A., Adiwibowo, S., & Widodo. (2011). Analysis of Sustainability Organic Farming Practise on Farmer. *Sodality: Jurnal Transdisiplin Sosiologi, Komunikasi, dan Ekologi Manusia*, 5(1), 71-89.

- [9] Kallas,Z., Serra,T.,& Gill,J.M.(2009). Farmers Objectives as Determinant Factors of Organic Farming Adoption. Paper prepared for presentation at the 113<sup>th</sup> EAAE Seminar "A Resilient European Food Industry and Food Chain In A Challenging World", Chania, Crete, Greece, date as in: September 3-6, 2009.
- [10] Prager, K., &Posthumus,H.(2010).Adopting sustainable soil management, the role of socio-economic factors. Proceedings of the 16<sup>th</sup> Annual International Sustainable Development Research Conference, Hong Kong, 30 May – 1 June, 2010, Hong Kong, Track "Sustainable Agriculture".
- [11] Sobur,A. (2009). *General psychology*. Bandung: Pustaka Setia.
- [12] Toha,M. (1983). *Organizational behavior*. Jakarta: CV Rajawali Press.
- [13] Azmi, M. R., Hasyim, H., &Fauzia, L.(2013). Effect of socio-economic characteristics on farmers' attitudes in the application of rice system of rice intensification (SRI) (Case Study: Pematang Setrak Village, Teluk Mengkudu District, Serdang Bedagai Regency). *Journal of Agriculture and Agribusiness Socioeconomics*,2(8), 1-15.
- [14] Sulistyowati, L., Natawidjaja, R. S., &Saidah, Z.(2013).Socio-economic factors affecting the decision involved in mango farming system with informal traders. *Sosiohumaniora*,15(3), 285-293.
- [15] Tanto, D., Dewi, S. M., &Budio, S. P. (2012). Factors affecting worker productivity in lightweight steel roof workings in green hills housing Malang. *Jurnal Rekayasa Sipil*, 6(1), 69-82.
- [16] Aprilyanti, S.(2018). Effects of age and working period on work productivity (Case study: PT. OASIS Water International Palembang Branch). *Jurnal Sistemdan Manajemen Industri*, 1(2), 68-72.
- [17] Theresia, V., Fariyanti, A., &Tinaprilla, N.(2016).Analysis of farmer perception to utilize local and foreign shallot seed at Cirebon District,West Java. *Jurnal Penyuluhan*,12(1) 74-88.
- [18] Soekartawi.(2002).*Basic principles of agricultural economics*. Jakarta:Raja Grafindo Persada.
- [19] Supriati, Y., Yulia, Y., &Nurlaela, I.(2008). *Vegetable garden*. Jakarta:Penebar Swadaya. 91p.
- [20] Pracaya.(2002).*Growing organic vegetables*. Jakarta: PT. Penebar Swadaya.
- [21] Davidoff. (1981). *Introduction to psychology*. International Book Company, International Student Edition. Tokyo: McGraw-Hill.
- [22] Walgito, B.(2001).*Social psychology: An introduction*. Yogyakarta [ID]: Ar-Ruzz Media.
- [23] Davis,F.D.(1989).Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*,13(3),319-339.
- [24] Wahana, S.(2018).Organic Agriculture in the Farmers Perception of Bantaragung Village as Protectors of the TNGC Forest Area. *LOGIKA*22(3), 51-57.
- [25] Basri, H.(2016).Farmers Perception Analysis toward Bokashi Use on Rice Cultivation. *AGRISEP*,15(2), 135-142.
- [26] Hermawati, U., Ihsaniyati, H., &Utami, B. W.(2016).Farmer'sperception towardscharacteristics of the liquid organic fertilizer ethanol's waste in Mojolaban subdistrict.*AGRISTA*,4(3), 1-12.
- [27] Fu, J.R., Farn, C.K., &Chao, W.P.(2006).Acceptance of electronic tax filing: A study of taxpayer intention. *Information andManagement*,43(1),109-126.
- [28] Badariah, N., Surjasa, D., &Trinugraha, Y.(2012). Supply chain risk management analysis based on the failure mode effects analysis (FMEA) method. *Jurnal Teknik Industri*,2(2), 110-118.
- [29] Crane,L., Gene,G., Steve,I., Doug,J., &Rod,S.(2013).*Understanding agricultural risks: production, marketing, financial, legal, and human*. Second Edition. Extension Risk Management Education and Risk Management Agency with funding by United States Department of Agriculture.
- [30] Pracaya.(2007).*Pests and plant diseases*. Jakarta:Penebar Swadaya. 427 p.

- [31] Trisnawati, W., Made, R. Y., &Nyoman, A.(2006). Adaptation of three varieties of sweet potato (*Ipomoea batatas* L.) performance of chemical composition and panelist reference. Institute for Agricultural Technology Assessment, Bali.
- [32] Rifai, A., Muwardi, D., &Rangkuti, J. R. F. N.(2008). Consumer behavior of organic vegetables in Pekanbaru City. Riau. *Jurnal Industri dan Perkotaan*,12(22), 1786-1792.
- [33] Wanda,F. F. A.(2015).Analysis of Income of siam orange farming (Case study in Padang Pengrapat Village, Tanah Grogot District, Paseri Regency). *eJournal Ilmu Administrasi Bisnis*,3(3), 600-611.
- [34] Hansen, D. R. dan M. M. Mowen. (2002). Cost Management: Accounting and Control (3r ed.). Ohio: South-Western College Publishing.
- [35] Sutrisno.(2001).*Financial management: Theory, concepts and applications*. First edition. Second printing. Yogyakarta: Ekonisia.
- [36] Husni, Hidayah, A.K., &Maskan, A. F.(2014). Financial analysis of chili(*Capsium frutescens* L.) farming in Purwajaya Village, Loa Janan District. *Jurnal AGRIFOR*,13(1), 49-52.
- [37] Ambarsari, W., Ismadi, V. D. Y. B.,& Setiadi, A.(2014). Analysis of income and profitability of rice farming (*Oryza sativa*, L.) in Indramayu Regency. *Agri Wiralodra*,6(2), 19-27.
- [38] Soekartawi.(2006).*Farm analysis*. Jakarta: UI Press.
- [39] Timisela, N. R., Leatemala, E. D., &Polnaya, F.(2018). Organic vegetable supply chain in Ambon city. *Proceedings of the National Seminar on Research and Development Results to the Community of Surabaya State University*,1(1), 637-645.
- [40] Timisela, N. R., Leatemala, E. D., &Polnaya, F. J.(2017). The demand of organic vegetables at frismart modern market in Ambon city. *Jorunal of Economics and Sustainable Development*,8(18), 132-139.
- [41] Timisela,N.R., Raja,M.S., Lawalata,M., &Titaley,S.(2020).Effect of product attributes on consumer satisfaction of organic vegetables at dian pertiwi supermarket, Ambon City. *International Journalof Innovation, Creativity and Change*,12(9),109-122.