Analyzing the Influential Factors of Farmer Exchange Rate Simultaneously and Partially in Candi District, Sidoarjo, Indonesia

Hamidah Hendrarini[1*], Esty Ratna Kusumastuti[1], Indra Tjahaja Amir[1], Rifan Jefri Sunarsono[2]

[1]Agribusiness Department, Agriculture Faculty, University of Pembangunan Nasional Veteran Jawa Timur, 60294, Indonesia

[2]Management Department, Economic and Business Faculty, Airlangga University, 60115, Indonesia

E-mail: hamidahrini1@gmail.com

Abstract

Farmer Exchange Rate (FER) is one of the significant factors in Indonesia needed to be studied remembering that this country has agriculture as the main foundation of the economy. This research analyzes some crucial factors such as productivity, land area, age, education, the number of family members, seed price, fertilizer cost, pesticide costs, selling price, food production, non-food expenditure and agricultural intensification which influence FER through simultaneous and partial way in Candi district, Sidoarjo, Indonesia. The existence of intervention from the government as a regulator and policy maker is needed to maintain the stability of farmer exchange rates. The government can make more efficient policies to support the economy in the agricultural sector. Improving agricultural infrastructure and providing outreach to the development of more advanced agricultural technology is one of the supports to improve and maintain the welfare of farmers. If the welfare of farmers in Indonesia is high, the Farmer Exchange Rate will increase and people in rural areas will also become prosperous.

Keywords: *Farmer exchange rate (FER), agriculture, farmer welfare, productivity*

1. Introduction

Agriculture is one of the crucial factors to build the food security. Through agriculture, the food source can be obtained. Agriculture is oftentimes considered as national priority by countries as those products are necessary for existing, whereas most manufacturing items are not as essential, hence demand for these items is often related to consumer sentiment [1]. In some countries, agriculture becomes vital sector for economic driving force like China, India, Brazil, United States, Russia and many more where Indonesia is one of them. The agricultural sector in Indonesia provides employment for around 44.3 percent of the population, although it only contributes around 17.3 percent of total gross domestic product [2]. The current era of globalization requires quality and expertise to produce goods and services in order to be able to compete in the market, but farmers in Indonesia have not yet reached a surplus level. The cause of the decline in farmer welfare is thought to be the limitations of modern technology and the education level of farmers [3]. East Java is a province in the eastern part of the Indonesian island of Java and its capital is located in Surabaya. The area of East Java reaches 47,803.49 km2, making the province of East Java known as one of the regions that contributes the most to national agricultural products [4].

The agricultural sector is one of the most dominant sectors contributing to the income of East Java Province. This is because the majority of the population in East Java works in the agricultural sector which consists of the food crops sub-sector, horticulture sub-sector, fisheries sub-sector, livestock sub-sector, and forestry sub-sector. East Java is known as the center of eastern Indonesia and has a fairly high economic significance, contributing 14.85 percent to GRDP. The agricultural sector in 2012 still made a sizeable contribution, namely 15.42 percent of the East Java province's GRDP [4]. In addition, the number of workers absorbed in the agricultural sector is also large, reaching 39.70 percent. To see the success of the development that has been carried out, in addition to data on economic growth, supporting data is also needed in the agricultural sector.

Although the agricultural development has had a positive impact on rural communities, it has not been able to solve some issues of poverty in rural areas. Although the number of the poor in rural areas has declined, the number of the poor in rural areas remain large. Agricultural production has significantly grown, but the farmers welfare has not significantly increased. This is due, among other things, to the relatively low prices received by farmers and those paid by consumers. This is related to the farmers low bargaining power. This condition indicated that the developed agribusiness system may not be able to fully prosper farmers. Some factors affect the farmers low bargaining power such as institutional equality in markets, product quality, infrastructure and so on. This condition shows that there are still some opportunities to improve the rural communities and farmers welfare and as a whole by improving and relaxing existing constraints [5].

To see the level of welfare of farmers (especially paddy rice) as a whole, it is necessary to look at it from the other side, namely the development of the amount of their spending/spending both for consumption needs and for production. In this case, farmers as producers and consumers are faced with choices in allocating their income,

namely: first, to meet basic needs (consumption) for the survival of farmers and their families; secondly, expenditures for agricultural production/cultivation which are their livelihood fields which include the operational costs of production and investment or formation of capital goods. This second element is only possible if the basic needs of farmers have been met, thus investment and the formation of capital goods are determining factors for the level of welfare of farmers [6].

The low increase in the exchange rate was partly due to the government's policy regarding floor prices or the HPP for grain/rice which was always low. Indeed, in this case the government is faced with a dilemma. If the government's purchase price is set higher, then it is feared that people who are classified as economically weak who are not farmers will suffer, because then they cannot afford to buy rice according to their portion. However, if the government purchase price is set low, it will be the farmer who suffers because the selling price of the grain or rice produced is low [7]. Therefore researchers are interested in conducting research on how much the Farmer's Terms of Trade (FER) for paddy rice, what factors affect the Farmer's Terms of Trade (FER) for paddy rice and how much household spending is out of the total income of paddy rice farming in Sidoarjo, Java East.

2. Literature Review

2.1. Farmer Exchange Rate (FER)

FER will be able to reduce farmers' incentives to increase agricultural productivity optimally in the long term. Such conditions can reduce the rate of increase in production relative to the rate of increase in domestic consumption, so that self-sufficiency in food, especially rice that has been achieved so far, can be threatened [4]. There was research with title Factors affected farmer exchange rates and their relationship to life expectancy in Central Sulawesi where this study aims to analyze the welfare of farmers in Central Sulawesi and the factors that influence it [8]. In addition, it also analyzes the relationship between farmer exchange rates and life expectancy as an indicator of farmer health in Central Sulawesi. This study uses time series data for the period 2003 to 2017. Descriptive analysis and multiple regression are used to answer the first objective, while the second objective uses a correlation test. The results of the descriptive analysis show that farmers in Central Sulawesi are not yet prosperous. Commodity production, commodity product prices, and fertilizer prices have a significant effect on farmer exchange rates. Land area, commodity production, and commodity product prices have a positive relationship, while fertilizer and pesticide prices have a negative relationship. The results also show that there is a tendency for a positive relationship between farmer exchange rates and life expectancy, with a correlation value of 0.528.

Trimono, et al., conducted research on "Forecasting Farmer Exchange Rate in Central Java Province Using Vector Integrated Moving Average". In Central Java Province, rice & secondary crops, horticulture, and fisheries are the largest agricultural sectors which are the main source of income for the majority of the population [9]. FER forecasting is very important to determine the level of welfare of farmers in the future. One method that can be used to predict the value of a variable that is influenced by the historical

value of several variables is the Vector Time Series. An empirical study was conducted using FER data from the rice & secondary crops, horticulture and fisheries sectors for the period January 2011-June 2017 in Central Java Province. The results obtained show that using the VIMA model (2.1) FER predictions are very accurate, with MAPE values of 1.91% (rice & crops sector), 2.44% (horticulture sector), and 2.18% (fisheries sector).

Changes in terms of exchange rates have very important consequences for a country's overall economic performance. In this paper, terms of trade (1991-2003) for Pakistan's crop sector have been calculated to reveal how the sector has performed over time in terms of profitability [10]. Various indices are worked out to look at profitability from different angles using weights, giving the importance of all the contributing factors. The results reveal that the profitability of Pakistani farmers slightly increased during the study period but at the same time the purchasing power of the farmers as a whole decreased. Pakistani farmers are expected to lose out and consumers to gain if free agricultural trade (in certain commodities) is opened with neighboring India. It is suggested that farmer-friendly policies and cost-effective technologies should be transferred to farmers to make agriculture an attractive investment domestically and internationally competitive.

Farmer exchange rate is the ratio between the price index received by farmers (It) and the price index paid by farmers (Ib) in percentage. The price index received by farmers (It) is an indicator of the level of welfare of producing farmers in terms of income, while Ib is in terms of farmer needs both for consumption and production costs. Farmers' Exchange Rate (FER) conceptually is a measure of the ability to exchange agricultural products produced by farmers with goods/services needed for household consumption and the need to produce agricultural products [11]. In general, there are three kinds of understanding of FER, namely:

a. FER > 100, meaning that the farmer has a surplus. Agricultural commodity prices increased more than the increase in prices of consumption goods/services and production costs. Farmers' income increases more than their expenditure, thus the level of farmer welfare is better than the level of farmer welfare in the base year period.
b. FER = 100, meaning that farmers experience a break even. The increase/decrease in the price of agricultural commodities is equal to the percentage increase/decrease in the prices of consumer goods/services and production costs. The level of welfare of farmers has not changed.
c. FER < 100, meaning that farmers experience a deficit. The increase in the price of agricultural commodities was relatively smaller than the increase in the price of consumption goods/services and production costs. The level of welfare of farmers in one period has decreased compared to the level of welfare of farmers in the base year period.

Farmers' Exchange Rate as an indicator of price developments is useful, among others:

a. From the price index received by farmers (It) it can be seen the price fluctuations of goods produced by farmers. This index is also used as supporting data in calculating agricultural sector income.
b. From the price index paid by farmers (Ib), it can be seen fluctuations in the prices of goods consumed by farmers who are the largest part of the rural community, as well as

fluctuations in the prices of goods needed to produce agricultural products. The development of Ib can also describe the development of inflation in the countryside.

c. Farmers' exchange rate (FER) is used to measure the exchangeability (terms of trade) of products sold by farmers with products needed by farmers in production and household consumption. From this figure at least an overview can be obtained about the development of farmers' income levels from time to time which can be used as a basis for policies to improve the level of farmers' welfare.
d. Based on the household consumption sector in the price index paid by farmers (IB), it can be seen the fluctuations in the prices of goods consumed by farmers who are part of the community.

2.2 Concept of Farmer Exchange Rate (FER)

The concept of FER as an indicator of farmer welfare has been developed since the 1980s [12]. One element of farmer welfare is the purchasing power of farmers' income to meet household expenditure needs. The increase in people's welfare can be measured by an increase in the purchasing power of income to meet these expenditures. The higher the purchasing power of farmers' income to consumption needs, the higher the exchange rate of farmers and means that farmers are relatively more prosperous. Apart from being an indicator of welfare, according to the Central Bureau of Statistics, FER is also used for:

a. Measuring the ability to exchange (terms of trade) products sold by farmers with products needed by farmers in production and household consumption.
b. Obtain an overview of the development of farmers' income levels from time to time which can be used as a basis for policies to improve the level of farmers' welfare.
c. Shows the level of competitiveness of agricultural products compared to other products.

Furthermore Rachmat [12] shows that FER has characteristics that tend to decrease. This relates to the inherent characteristics of agricultural and non-agricultural commodities. There are three explanations for the decrease in FER, namely: (1) The income elasticity of agricultural products is inelastic, while non-agricultural products tend to be more elastic, (2) Technological changes at different rates benefit manufactured products, and (3) Differences in market structure, where the market structure of agricultural products tends to be competitive, while the market structure of manufactured products tends to be less competitive and leads to a monopoly/oligopoly market.

Farmer Exchange Rate is an indicator that serves to determine the level of welfare of farmers in certain areas. Farmers Exchange Rate is a comparison between the Index received by farmers (It) compared to the Index paid by farmers (Ib) expressed in percentage units (%) [11]. Therefore, the Farmer's Exchange Rate is formulated by:

$$FER = It/Ib \times 100\%$$

Note:

It = Index received by farmers
Ib = Index paid by farmers

FER is a measure of the purchasing power/exchangeability of farmers on the goods purchased by farmers. An increase in farmer exchange rates indicates an increase in the real ability of farmers and indicates an increase in farmer welfare, or vice versa [5]. Furthermore, Rachmat [12] states that the concept of calculating FER is a macro development of the NTS concept where farmers are in a position as producers and consumers. Conceptually, FER measures the exchange power of agricultural commodities produced by farmers against products purchased by farmers for consumption and production purposes. In addition to reflecting the purchasing power of the commodity cultivated, the farmer's exchange rate is also related to household economic behavior, because the household decision-making process to produce, spend and consume an item is part of household economic behavior. High farmer exchange rates will encourage farmers to be enthusiastic about farming. Farmers' Exchange Rate as an indicator of price developments is useful, among others:

a. From the price index received by farmers (It) it can be seen the price fluctuations of goods produced by farmers. This index is also used as supporting data in calculating agricultural sector income.
b. From the price index paid by farmers (Ib), it can be seen fluctuations in the prices of goods consumed by farmers who are the largest part of the rural community, as well as fluctuations in the prices of goods needed to produce agricultural products. The development of Ib can also describe the development of inflation in the countryside.
c. Farmers' exchange rate (FER) is used to measure the term of trade between the products sold by farmers and the products needed by farmers for production and household consumption. From this figure at least one can obtain an overview of the development of farmers' income levels from time to time which can be used as a basis for policies to improve the level of farmers' welfare.
d. Based on the household consumption sector in the price index paid by farmers (IB), it can be seen fluctuations in the prices of goods consumed by farmers who are members of the community.

According to Hedayana (1995), to calculate FER the income concept formula can be used as follows:

$$\boldsymbol{FER = \frac{\sum PxQx}{PyQy + PzQz}\ x\ 100\%}$$

Note:
FER : Farmers Exchange Rate
Px : Price of products produced by farmers
Qx : Number of products produced by farmers
Py : Prices of production inputs paid by farmers
Qy : The amount of production inputs paid by farmers
Pz : The commodity price paid by farmers for the necessities of life
Qz : The number of commodities paid by farmers for the necessities of life

From the formula above it can be concluded that:

$$\boldsymbol{FER = \frac{\sum PxQx}{PyQy + PzQz}\ x\ 100\%}$$

Note:
TR : Total Revenue
TC : Total Cost

2.3 Factors Affecting Farmers Exchange Rate (FER)

Farmers' Terms of Trade have characteristics that tend to decline. FER relates to the relative relationship in prices between agricultural and non-agricultural commodities. The phenomenon of decreasing agricultural exchange rates can be done through the concept of agricultural barter exchange rates for non-agricultural ones. There are three explanations regarding the decline in Farmer Exchange Rates, namely (1) the income elasticity of agricultural products is inelastic, (2) technological changes at different rates that benefit manufactured products and (3) differences in market structure where the market structure and agricultural products tend to be competitive, while the market structure for manufactured products tends to be less competitive and even leads to a monopoly market [12]. Factors that affect farmer exchange rates will indirectly have an impact on low productivity which results in low income levels so that low income will reduce farmer exchange rates. According to Fajri [14], the factors that affect farmer exchange rates are as follows:

a. Productivity

Productivity greatly affects fluctuations in farmer exchange rates because it is directly related to farming cultivation techniques, so that high productivity will increase farmer income so that farmer exchange rates also increase. According to Soekartawi [15], lowland rice production is a combination process and material conditions and input strength, resource factors or production services in the manufacture of one good or service. Production is a number of results in a certain location and time.

One of the characteristics of farming is the dependence on natural conditions and the environment. Therefore, to obtain maximum production, farmers must be able to combine the production factors of labor, fertilizers and seeds used. These three factors of production are interrelated with each other in influencing production to produce good and optimal productivity. Farming can be said to be productive if the farming has high productivity, this productivity can be achieved by combining the physical conception of farming with the capacity of the land used by measuring the results achieved in farming activities at a certain time unit. Apryanti [16] said that the increase in the amount of production marketed by producers (farmers) at constant demand conditions led to a tendency for production prices to decline. Thus the increase in productivity causes production prices to fall which in the next stage can reduce the exchange rate received by farmers.

b. Land area

Land area has a very large positive influence on farmer exchange rates, this is because a larger land area will increase production potential which will increase farming revenues and increase farmer exchange rates so that farmer welfare also increases. Land is the main production factor in farming activities, including rice farming. The area of land tenure will determine the income of farming households and in turn will determine their level of welfare. Agricultural land as an important asset owned by farmers greatly determines business opportunities for them. This asset is very influential on the amount of income they get from managing the land. Narrow land, of course, the results obtained are inadequate, the income they earn is also low. The area of agriculture will be affected by the scale of the business, and the size of this business will affect the efficiency of efforts to increase agricultural business [15].

c. Age

The older the age of the farmer, the more experienced the farmer is, so that he closes himself to technological developments in agriculture, and is closer to non-productive age, in contrast to young farmers who tend to be open to technological innovation in agriculture so that with a productive age, farmers will be effective in managing farming and increasing production to increase farmer exchange rates.

d. Education

Education taken by farmers, makes farmers have expertise in managing their farming, but sometimes the formal education that is taken by farmers is not a guarantee of the progress of their farming.

e. Number of family members

The more members of the farmer's family the more the farmer's household will be responsible, but sometimes it also makes the farmer more productive because family members also participate in his farming business.

f. Seed price

Seed prices affect farmers' exchange rates because higher seed prices will increase farmers' expenditure on seed costs, so that if farmers' expenditure increases, it will have an impact on decreasing farmers' exchange rates.

g. Fertilizer costs

Fertilizer costs incurred by farmers are influenced by the price of fertilizer subsidies set by the government. Increasingly expensive fertilizer prices will increase farmer household expenses and reduce farmer exchange rates so that farmer welfare will also decrease.

h. Pesticide costs

The higher the cost of pesticides will increase the expenditure of farmers, so that the increasing expenditure will have an impact on decreasing the exchange rate of farmers.

i. Selling Price

The selling price will determine the income of farmers, with a high selling price it will certainly increase the exchange rate of farmers, and vice versa, with a low selling price it will reduce the exchange rate of farmers. Basically, the government has long adopted a price guarantee policy for agricultural products, especially rice, in order to ensure the welfare of producer farmers. The basic price policy is one of the government policies implemented to protect farmers from the risk of loss during harvest. The alternative that can be done to increase the price of agricultural commodities at the farmer level as a producer is to open up opportunities to increase the added value of farmer production.

Price is the amount of money charged for a product or service or the amount of value exchanged by consumers for the benefits of having or using the product or service [17]. The effect of price changes on farmers' exchange rates can be direct and indirect. The direct effect of price changes on farmer exchange rates is a direct response to farmer values due to changes in a price, while indirect impacts occur due to the influence of prices, both agricultural commodity prices and manufactured product prices [12].

j. Food production

Farmers' food expenditure is a cost that must be incurred by farmers for the survival of farmers, food expenditure is inversely proportional to the farmer's exchange rate, if food expenditure is high, the farmer's exchange rate will decrease. In conditions of limited income, the community prioritizes the need for food consumption, in line with increasing income, the percentage of income spent on food decreases. Thus, the amount of income (projected by total expenditure) spent on food for a household can be used as an indicator of the level of welfare of that household. The higher the share of food expenditure, the less the welfare of the household concerned. Conversely, the smaller the share of food expenditure, the more prosperous the household [18].

k. Non-food expenditure

Non-food expenditures such as various goods and services such as health care, clothing, education, recreation and the like are necessities of life that must be fulfilled after food expenditure. However, as farm income increases, the non-food needs of farmer households will also increase because the desire for humans also increases, so that high non-food expenditure will reduce farmer exchange rates. Community welfare is determined, among other things, by the level of poverty which is influenced by the level of income and usage patterns, which are related to the level of income of food and non-food consumption patterns [4]. Low-income people will allocate most of their income to meet food needs compared to non-food items, the higher non-food expenditure indicates an improvement in the welfare of the population.

l. Agricultural intensification

Farmers' dependency on chemicals on the demand side causes the price of agricultural inputs to increase which implicitly causes the index of farmer-producer pay to increase. The free market in the production input trading system, which has the opposite structure

to the product market, even causes the increase in input prices to be much faster than the increase in output prices [19].

According to Soekartawi [15] that the price factor has a large effect on the exchange rate of receipts and exchange rates of income. The exchange rate of acceptance is influenced by the level of technology application, the level of pest/disease attack, the season/weather, and the price (both input prices and product prices). The subsistence exchange rate is influenced by the level of agricultural business income and the level of expenditure for food consumption.

2.4. Welfare of Farmers

An important element used as an indicator of farmer welfare is the amount of income and its balance with expenditure. In this regard, one of the measurement tools that is often used is the farmer exchange rate (FER). The FER calculation is obtained from a comparison of the price index received by farmers against the price index paid by farmers. The farmer's exchange rate describes the exchange rate/purchasing power of farmers for the products purchased/paid for by farmers which includes consumption and production inputs purchased. The higher the farmer's exchange rate, the better the farmer's purchasing power for consumption products and production inputs, and means that they are relatively more prosperous.

The essence of the concept of welfare is the fulfillment of every aspect of human life, both moral and material. Social welfare is a condition of fulfilling the material, spiritual and social needs of citizens so that they can live properly and be able to develop themselves, so that they can carry out their social functions.

Aspects that can show indicators of farmer welfare, namely:

a. Revenue structure development

The income structure shows that the main source of income for farming families comes from the agricultural sector.

b. Development of spending on food

The development of the share of spending on food can be used as an indicator of farmer welfare. The larger share of expenditure on food indicates that farm household income is still concentrated to meet basic (subsistence) needs. On the other hand, the larger share of expenditure in the secondary (non-food) sector indicates that there has been a shift in the position of farmers from subsistence to commercial. Improvements in farmer welfare can be measured by increasing purchasing power or income to meet the expenditure needs of farmer households. The farmer's exchange rate is the ratio of the index received by the farmer to the index paid by the farmer. Farmer Terms of Trade above 100 means that the index received by farmers is higher than what farmers pay, so that it can be said that farmers are more prosperous than if the FER is below 100.

2.5. Relevance of Farmers' Exchange Rate (FER) as a Measuring Tool for Farmers' Welfare

Elizabeth and Darwis [6] state that the success of agricultural development that has been achieved cannot be denied, it has also been followed by structural changes in the national economic sector, in which the role of the agricultural sector has decreased,

shifted by the role of the industrial sector, where it is also implied that there is a heavy burden from the agricultural sector. agriculture. This is mainly related to the widening gap between the agricultural sector and non-agricultural sectors, as well as the decline in the agricultural exchange rate due to a decrease in the agricultural commodity exchange rate. There are practically no unique markers of welfare for farming households [4], so FER is the only choice for observers of agricultural development in assessing the level of farmer welfare. Thus, FER is an indicator of the relative level of farmer welfare. The higher the FER, the relatively more prosperous the level of farmer's life.

One of the important indicators used to determine the level of welfare of farmers is the exchange rate of agricultural products. The higher the exchange rate of agricultural products, the higher the farmer's welfare. Conversely, the lower the exchange rate of agricultural products, the lower the welfare of farmers [19]. FER relates to the ability and purchasing power of farmers in financing their household life. NTKP relates to the strength and power of exchange or purchasing power of an agricultural commodity against other commodities/production that is exchanged.

3. RESEARCH METHOD

Candi District, Sidoarjo Regency was choosen as the research location where it was determined deliberately based on the consideration that Candi District, Sidoarjo Regency influences the exchange rate of farmers. The time for data collection is carried out for around 3 months from June to August 2022. The object of this research is rice commodity farmer households. The population in this study were farmers in the three villages that contributed the highest rice production in Candi District with a total population of 195 rice farmers.

In this study, the number of samples determined to be examined was 40 samples in accordance with the amount to be determined by the author as follows:

Table 1. Number of Samples

No	Candi District	Number of Farmers
1	Narrow	10
2	Moderate	15
3	Wide	15
Total		**40**

The 40 sample respondents in this study were divided into several categories based on land area. The formula used to calculate the categorization of land area is as follows:

Narrow = X < (Mean – 1 Standard Deviation)
Moderate = (Mean – 1 Standard Deviation) ≤ (Mean + 1 Standard Deviation)
Large = ≥ (Mean + 1 Standard Deviation)

Table 2. Criteria for Farmers Based on Land Area

Criteria	Wide (Ha)	Frequency	Percentage (%)
Narrow	< 0,21	16	7,8
Moderate	0,21 ≤ 1,27	150	73.2
Wide	≥ 1,27	39	19.0
Total		**205**	**100,0**

Based on the data in the table above, it is known that the majority of farmers have land area in the medium category, namely as many as 150 people (73.2%), then as many as 39 people (19.0%) have large land and the remaining 16 people (7.8 %) have a narrow land area.

4. RESULTS

4.1. Farmers Exchange Rates

Most of the farmers in Candi District, Sidoarjo Regency, for the most part, even 80 percent, are still in the subsistence category where these farmers don't really think about how to get high profits, but the important thing is that the land can produce enough to eat with their families. Because the people of Candi District, Sidoarjo Regency, are a society that is very thick with its culture, where there are still many people who believe in traditions that have been passed down from generation to generation. From the results of the study it can be seen that the expenditure of farmer households from the total income of paddy rice farming is described in the following table.

Table 3. Average Income and Expenditure of Respondent Farmer Households in Candi District

No	Item	IDR/Year
1	Rice Farming Income	22,964,663
2	Household Expenses	35,796,313

From Table 3 it is shown that the rice farming income is 22,964,663 per year and the household expenditure of rice farmers in the study area is 35,796,313 per year and. These mean that rice farmer household expenditure takes a large portion of the income from the total rice farming income per month, which is the difference between expenditure and household income. It can be stated that farm household expenditure is greater than the total rice farming income received. UMR is the minimum wage set by the government based on the decent living needs components. It ca be stated that the UMR becomes a benchmark whether a person's life is said to be decent or not. The UMR increase affects the production or consumption price in household needs.

The type of commodity studied is rice, production inputs paid by farmers include seeds, fertilizers, pesticides, labor costs, and other production factors including equipment depreciation costs. While the commodities purchased by farmers to fulfill their daily needs include food and non-food consumption. The price used to calculate farmer exchange rates is the price in 2021. Using the calculation concept (FER), the following is the calculation of farmer exchange rates from sample farmers in the study area.

Table 4. The results of the calculation of Respondent Farmer Exchange Rates in Candi District

No	FER	Total	Percentage (%)
1	< 100	36	90
2	>100	4	10
Average	**63,19**	**40**	**100**

The farmer's exchange rate is the ratio of the index received by the farmer to the index paid by the farmer. The FER value is obtained by dividing the total income of rice farming farmers by the total expenditure of farmers, namely farming expenditure and household expenditure (food and non-food). The farmer exchange rate above 100 means that the index received by farmers is higher than the index paid by farmers, so that it can be said that farmers are more prosperous. And Farmers Exchange Rate below 100 means the index received by farmers is lower than the index paid by farmers, so it can be said that farmers are not prosperous.

It can be seen that the lowland rice farmers who have a FER of more than 100 are 4 of the total sample (table 4). The highest sample is in sample 12 with a total price index received of Rp. 85,690,400 and the paid index is Rp. 50,574,200. Based on the prices of the two indices, it can be calculated that the Farmer's Exchange Rate is 169.44, meaning that the farmer's household is prosperous (can meet the needs of farmers in rice farming and for household needs).

On average, the sample farmer exchange rate in the study area was 63.19 or less than 100. Thus it can be concluded that the welfare level of the sample farmers in Candi District, Sidoarjo Regency in 2021 is classified as low (less prosperous). This means that the income obtained from lowland rice farming is less able to finance lowland rice farming, meet the needs of the farmer's household (family) and farmers can also save a portion of this income.FER di Jawa Timur pada 2020, tercatat sebesar 101,80 atau mengalami penurunan 2,08 persen dibandingkan dengan FER Agustus sebesar 103,72. Hal ini disebabkan turunnya FER pada subsektor tanaman pangan sebesar 0,44 persen, subsektor hortikultura sebesar 0,48 persen, subsektor peternakan sebesar 0,72 persen dan subsektor perikanan sebesar 0,44 persen. Sedangkan FER subsektor tanaman perkebunan rakyat naik sebesar 0,48 persen indeks harga yang diterima petani (It) Provinsi Jawa Timur mengalami kenaikan sebesar 0,23 persen.

4.2. Factors Affecting Farmers Exchange Rates Analysis

The used data type is primary data where the independent variables are number of family dependents, education, farming costs, selling price, farming experience, land area, age, food expenditure, non-food expenditure, income and productivity. From these independent variables, it will be monitored how much the factors influence the Farmer's Exchange Rate / FER (the dependent variable) then the regression results are obtained as follows:

1. Classical Assumption Test

a. Normality test

This test was conducted to find out whether the data used in a regression model, the dependent variable, the independent variable or both have a normal distribution or not. A good regression model is the data distribution is normal or close to normal. This test was conducted to find out whether the data to be analyzed is normally distributed or not, as one of the requirements for data processing using the parametric method. If the data used is not normally distributed, then the method used is nonparametric statistics.

Table 5. Data Normality Test Results (One Sample Kolmogorov - Smirnov Test)

		Unstandardized Residual
N		40
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	12.27621056
Most Extreme Differences	Absolute	.151
	Positive	.151
	Negative	-.078
Test Statistic		.151
Asymp. Sig. (2-tailed)		.022[c]

From the results of the Kolmogorov-Smirnov test calculations, it shows that with the hypothesis that has been set above, therefore the Asymp. Sig (2-tailed), namely 0.22 > 0.05, which means that the data is normally distributed. In addition, the Kolmogorov-Smirnov test is also known to be better than the Chi-Square test when the assumptions are met.

b. Multicollinearity Test

The results of the multicollinearity test showing the tolerance values and VIF values are shown in Table 6.

Table 6. Value of Tolerance and VIF

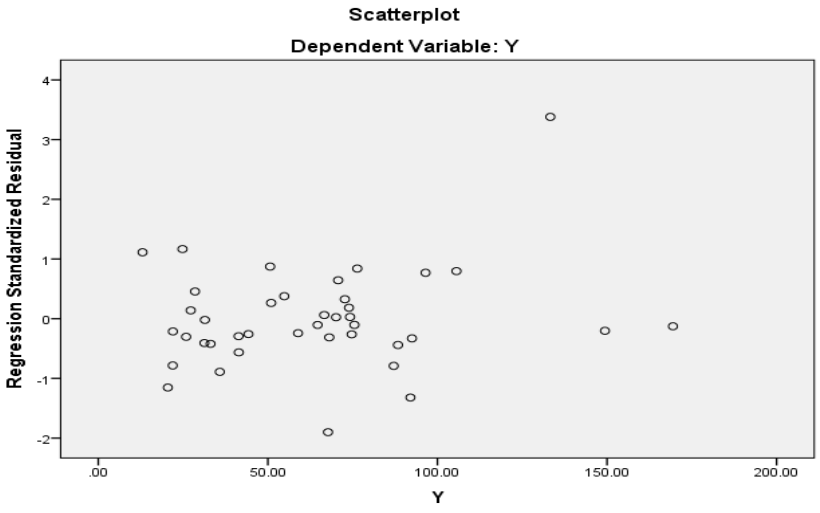
Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Luas lahan	.104	9.623
	Umur	.501	1.997
	Pendidikan	.549	1.822
	Jumlah Tanggungan Keluarga	.782	1.278
	Pengalaman usahatani	.406	2.465
	Biaya Usahatani	.328	3.052
	Harga Jual	.312	3.205
	Pengeluaran Pangan	.253	3.960
	Pengeluaran Non Pangan	.564	1.774
	Pendapatan	.124	8.049
	Produktivitas	.071	9.124

The multicollinearity test can be seen from the Tolerance value and the VIF (Variance Inflation Factor) value. If the Tolerance value is > 0.1 and the VIF value is < 10, it indicates that there is no multicollinearity. From the results of the calculation of the multicollinearity assumption test above based on the test criteria it can be seen that the variables of land area, age, education, number of family dependents, farming experience, farming costs, selling price, food expenditure, non-food expenditure, income and productivity each have a Tolerance value > 0.1 and the VIF value < 10. So it can be concluded that there are no symptoms of multicollinearity in this equation.

c. Heteroscedasticity Test

Analysis The heteroscedasticity test can be carried out using the scatterplots graphical method. From the graph it can be concluded that there are no symptoms of heteroscedasticity. This is because the display on scatterplots shows that the plots are spread out and do not form certain patterns randomly above or below zero. The results of the heteroscedasticity test are shown in the following figure.

Figure1. Scatterplots For Heteroscedasticity Testing



Based on the results of the classical assumption test that has been carried out, it can be concluded that the processed data is normally distributed and there are no symptoms of multicollinearity and heteroscedasticity.

Table 7. Results of Analysis of Factors Affecting Farmers Exchange Rates

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-25.252	54.926		-.460	.649
	X1	-3.948	6.252	-.074	-.632	.533
	X2	-.045	.246	-.010	-.181	.857
	X3	-.258	.647	-.020	-.399	.693
	X4	-1.200	1.121	-.046	-1.070	.294
	X5	.020	.137	.009	.148	.883
	X6	1.978E-6	.000	.430	6.545	.000
	X7	-.002	.006	-.026	-.385	.703
	X8	-1.275E-6	.000	-.497	-6.641	.000
	X9	-9.659E-7	.000	-.274	-5.461	.000
	X10	2.447E-6	.000	1.254	11.741	.000
	X11	.007	.003	.348	2.460	.020

Based on Table 7, the regression equation is obtained as follows:

Y = -25.252 – 3.948 X1 – 0.45 X2 – 258 X3 – 1.200 X4 + 0.20 X5 + 1.978 X6 – 0.002 X7 – 1.275 X8 – 9.659 X9 + 2.447 X10 + 0.007 X11

Note:

Table 8. Description of Item on Table 7

Item	Description	Item	Description
Y	FER (%)	X6	Farming Costs (IDR)
β1- β9	Regression Coefficient	X7	Selling Price (IDR / Kg)
X1	Land Area (Ha)	X8	Food Expenditure (IDR)
X2	Farmer Age (Year)	X9	Non-Food Expenditure (IDR)
X3	Education (Year)	X10	Income (IDR)
X4	Number of Family Dependents (People)	X11	Productivity (Kg/Ha)
X5	Farming Experience (Year)		

2. Coefficient of Determination (R2)

The coefficient of determination (R2) essentially measures how far the exchange rate of farmers explains the variation in the dependent variable. The coefficient of determination is a test used to examine the effect of the independent variables on the dependent variable together. The magnitude of the coefficient of determination from 0 to 1. The closer to zero the magnitude of the coefficient of determination of a regression equation, the smaller the influence of the independent variables. Conversely, the closer to one, the greater the influence of all independent variables on the dependent variable.

Table 9. Determination Coefficient Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.980[a]	.960	.945	8.31986	1.867

From the model, the coefficient of determination (R2) is 0.960. This shows that 96% of the variation in farmer exchange rate variables can be explained by variables of land area, age, education, number of family dependents, farming experience, farming costs, selling prices, food expenditures, non-food expenditures, income and productivity while the remaining 4 % is explained by other variables not included in the model. The results of research in the field in Candi District, Sidoarjo Regency, farmers all answered that for an average land area of 0.2 - 2.00 hectares, the average age of farmers was 46 - 71 years, the average farmer's education was Senior High School (SMA). For 12 years, the average number of family members is 1-2 people, the average farming costs are 18,968,101 per year for two planting seasons, the average selling price is IDR 4,414, the average household expenses are IDR 35,796,313 per year, the average farmer income per year is IDR 18,090,413 and the average productivity is 10,850 kg / ha. Factors that affect farmers' exchange rates are influenced both internally and externally.

3. Simultaneous Test (Test F)

The F test is a simultaneous (simultaneous) test of the significance of the effect of changes in the independent variables on the dependent variable. This means that the variable parameters of land area, age, education, number of family dependents, farming experience, farming costs, selling price, food expenditure, non-food expenditure, income and productivity are simultaneously tested whether they have significance or not. The results of the F test can be seen in Table 9 below.

Tabel 10. F Test Result

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	46,919.386	11	4,265.399	61.621	.000[b]
	Residual	1,938.163	28	69.220		
	Total	48,857.549	39			

Simultaneously the influence of the variable land area, age, education, number of family dependents, farming experience, farming costs, selling price, food expenditure, non-food expenditure, income and productivity is real at the 95% level. This can be seen from the results of the analysis, obtained F – count = 61.621 > F – table = 2.08 with a significance value (0.000 <0.05). This shows that H0 is rejected and H1 is accepted, which means that the independent variables are land area, age, education, number of family dependents, farming experience, farming costs, selling price, food expenditure, non-food expenditure, income and productivity have a significant effect on farmer exchange rates . Each - each variable has an influence on farmer exchange rates. Internal factors such as land area, age, education, number of family dependents and farming experience will affect the way of thinking, level of productivity and decision making. As for external factors such as farming costs, selling prices, food expenditures, non-food expenditures, income and productivity this influences the understanding of increased production so that in carrying out rice farming it is in accordance with existing conditions and policies.

4. Partial Test (Test - t)

From the results of the regression analysis it can be seen partially that each independent variable is land area, age, education, number of family dependents, farming experience, farming costs, selling price, food expenditure, non-food expenditure, income and productivity are the factors that influence exchange rate of rice farmers. This can be explained in more detail on each variable as follows:

a. Effect of land area on the exchange rate of rice farming farmers (X1)
Based on the t test, it was obtained that the t-count value was 0.632 <0.680 with a significance (0.533 <0.05) then H0 was accepted and H1 was rejected, so that the variable land area had no significant effect on the exchange rate of rice farmers. These results are not like research conducted by Fajri [14] which concluded that land area has a positive effect on farmer exchange rates because larger land areas will increase production potential which will increase rice farming revenue and increase farmer exchange rates so that farmer welfare paddy also increased. The area of the harvested land is the area of the harvested area, which means that the wider the harvested area, the more production there will be which will increase the income of farmers so that the welfare of farmers will increase. This research is also in line with the theory of Fajri [14] that land area is one of the main factors in increasing rice production which in turn can also increase the welfare of rice farmers.

b. Effect of age on the exchange rate of rice farming farmers (X2)
Based on the t test, the t-count value is -0.181 <0.680 with significance (0.857 > 0.05) then H0 is accepted and H1 is rejected, so that the farmer's age variable has no significant effect on the exchange rate of rice farmers. Farmer's age partially has no effect and is not significant (significant) on Farmer Exchange Rates. The hypothesis stated that the age of the farmer is suspected to have no significant and significant effect

is unacceptable. This is because the increasing age of farmers will increase the mindset of farmers in managing their farming.

c. Effect of education on the exchange rate of rice farming farmers (X3)
Based on the t test, the t-count value is -0.399 <0.680 with significance (0.693 > 0.05) then H0 is accepted and H1 is rejected, so that the farmer education variable has no significant effect on the exchange rate of rice farmers. Partially farmer education has no effect and is not significant (significant) on Farmer Exchange Rates. From the hypothesis stated that education is suspected of having a significant value unacceptable, this is because even though the farmer's education is high but without technology or other factors that support the development of his farming business, the farmer cannot realize the knowledge he gets due to certain limitations.

d. The effect of the number of family dependents on the exchange rate of rice farming farmers (X4)
Based on the t test, the t-count value is -1.070 <0.680 with significance (0.294 > 0.05) then H0 is accepted and H1 is rejected, so that the variable number of dependents of the farming family has no significant effect on the exchange rate of rice farmers. The number of dependents of the farmer's family partially has no effect and is not significant (significant) on the Farmer's Exchange Rate. This means that the addition of family members (soul) is an additional expense for rice farmers. With regard to the hypothesis stated that the number of family dependents is thought to have a negative and significant impact it is unacceptable, because in addition to increasing household expenditure, on the other hand it also provides assistance in the form of labor in the family.

e. Effect of farming experience on the exchange rate of rice farming farmers (X5)
Based on the t test, the t-count value is 0.148 <0.680 with significance (0.883 > 0.05) then H0 is accepted and H1 is rejected, so that the variable number of dependents of the farming family has no significant effect on the exchange rate of rice farmers. Partially, farmer's farming experience has no effect and is not significant (significant) on Farmers' Terms of Trade. Because the more experience the farmers have, the better they will be in cultivating or running their farming business in their own way without the need for more roles from the farmer groups. So, people who have been in a job for a long time will become more skilled and tend to produce better results than people who are new.

e. Effect of farming costs on the exchange rate of rice farming farmers (X6)
Based on the t test, the t-count value is 6.545 > 0.680 with significance (0.000 <0.05) then H0 is rejected and H1 is accepted, so that the farming cost variable has a significant effect on the exchange rate of rice farmers. This means that the cost of farming partially and significantly (real) effect on the Farmer's Exchange Rate, this indicates that the increase in farming costs makes farmers incur greater costs so that it has an impact on reducing the Farmer's Exchange Rate. With the alleged hypothesis stated that farming costs have a positive and significant effect, it can be fulfilled.

f. The effect of the selling price on the exchange rate of rice farming farmers (X7)
Based on the t test, the t-count value is -0.385 <0.680 with significance (0.703 > 0.05) then H0 is accepted and H1 is rejected, so that the selling price variable has a significant effect on the exchange rate of rice farmers. This means that the selling price has a partial and significant (real) effect on the Farmer's Exchange Rate. This shows that the increase in farming costs makes farmers incur greater costs so that it has an impact on a decrease in the Farmer's Exchange Rate. This shows that the higher the selling price of rice, the higher the income of farmers so that the Farmer's Exchange Rate obtained is also higher. With the hypothesis stated that the selling price of rice has a positive and significant effect, it can be fulfilled.

g. Effect of food expenditure on the exchange rate of rice farming farmers (X8)
Based on the t test, it was obtained that the t-count value was -6.641 <0.680 with significance (0.000 > 0.05) then H0 was rejected and H1 was accepted, so that the food expenditure variable had a significant effect on the exchange rate of rice farmers. This shows that the increase in food expenditure makes farmers incur greater costs so that it has an impact on a decrease in the Farmer's Exchange Rate. With the alleged hypothesis stated that food expenditure has a positive and significant effect, it can be fulfilled. There is an influence on expenditure because the higher the level of expenditure issued by farmers, the income received by farmers will decrease. The results of this study are also in accordance with research conducted by Riyadh & Ilham [20]. regarding several factors that determine farmer exchange rates where the results of the study show that consumption expenditure negatively affects farmer exchange rates.

h. Effect of non-food expenditure on the exchange rate of rice farming farmers (X9)
Based on the t test, the t-count value is -5.461 <0.680 with significance (0.000 > 0.05) then H0 is rejected and H1 is accepted, so that the non-food expenditure variable has a significant effect on the exchange rate of rice farmers. If the farmer's non-food expenditure is greater than the increase in the price of agricultural production and has an impact on his purchasing power, this will indicate that the farmer's ability is getting better or there is an increase in his income. Improving the welfare of farmers and the performance of the agricultural sector requires financing that can not only help farmers to cultivate their agriculture, but can also help them in terms of repayment.

i. Effect of income on the exchange rate of rice farming farmers (X10)
Based on the t test, it was obtained that the t-count value was 11.740 > 0.680 with significance (0.000 <0.05) then H0 was rejected and H1 was accepted, so that the income variable had a significant effect on the exchange rate of rice farmers. If the farmer's income is greater than the increase in the price of agricultural production and has an impact on his purchasing power, this will indicate that the farmer's ability is getting better or there is an increase in his income. Improving the welfare of farmers and the performance of the agricultural sector requires financing that can not only help farmers to cultivate their agriculture, but can also help them in terms of repayment.

j. The effect of productivity on the exchange rate of rice farming farmers (X11)
Based on the t test, it was obtained that the t-count value was 2.460 > 0.680 with a significance (0.02 <0.05) then H0 was rejected and H1 was accepted, so that the productivity variable had a significant effect on rice farmers' exchange rates. Comparison of rice productivity between land area scales shows a very significant difference. The difference between productivity is due to the relatively different amount of input used in rice farming. The productivity of the land of narrow farmer groups is greater than that of broad farmers. This is probably due to narrow farmers being more intensive in managing spacing, using production facilities and using their workforce.

4.4 Level of Welfare of Farmers Against Farmers Exchange Rates

As one of the developing countries, Indonesia is always trying to improve the standard of living of its people by carrying out development in all fields [21]. Food crop farmers as frontline workers working to realize food security need to get special attention in terms of welfare and standard of living. One of the indicators used by the government to describe the welfare of farmers is the farmer exchange rate (FER). The level of welfare of red chili farmers in the study area was measured using the modified BPS method by looking at their income and expenses. The welfare of the farmers is seen from the exchange rate of the farmers, there are three kinds of understanding of FER according to BPS (2020), namely:

1. FER > 100, meaning that farmers experience a surplus. The price of production rose more than the increase in the price of consumption. Farmers' income has increased more than their expenditure, thus the level of farmer welfare is better than the previous level of farmer welfare.
2. FER = 100, meaning that farmers experience a break even. The increase/decrease in production prices is the same as the percentage increase/decrease in the price of consumer goods. The welfare level of farmers has not changed.
3. FER < 100 means that the FER in a certain period decreases compared to the FER in the base year, in other words, farmers experience a deficit. The increase in production prices was relatively smaller than the increase in the price of consumption goods. Farmers' income fell and was smaller than their expenses.

The following is a tabulation/classification of the amount of FER in the study area.

Table 11. The results of the calculation of Respondent Farmer Exchange Rates in Candi District

No	FER	Total	Percentage (%)
1	< 100	36	90
2	>100	4	10
Average	**63,19**	**40**	**100**

Based on table 11, it can be seen that 4 farmers have a FER greater than 100, which means that 4 farmers in the study area experience a surplus. The price of production rose more than the increase in the price of consumption. Farmers' income increases more than their expenditure, thus the level of welfare of farmers is better than the previous level of welfare of farmers. Meanwhile, there are 36 farmers who have a smaller FER of 100, which means that the FER in a certain period decreases compared to the FER in the base year, in other words, the farmers experience a deficit. The increase in production prices was relatively smaller compared to the increase in the price of consumer goods. Farmers' income fell and was smaller than their expenses.

The farmer's exchange rate describes the exchange rate/purchasing power of farmers for the products purchased/paid for by farmers which includes consumption and production inputs purchased. The higher the farmer's exchange rate, the better the farmer's purchasing power for consumption products and production inputs, and means that they are relatively more prosperous [22]. High labor costs can cause the farmer's exchange rate to be low because the total expenditure is high so that farmers are not prosperous if their income from rice production with the farmer's land area is low. So far, the weak bargaining position of farmers has caused farmers to receive selling prices, which are solely determined by traders. The similarity of rice prices offered by village-level traders resulted in farmers having no choice in seeking alternatives for higher selling prices [23]. The higher the selling price received by farmers, the greater the income of farmers if the production is constant. On the other hand, the lower the selling price received by the farmer, the lower the farmer's income will be and the lower the farmer's exchange rate and the less prosperous the farmer will be.

The increase in rice production is not significant and has nothing to do with the pandemic. This is because farmers do not reduce the use of production inputs such as seeds and fertilizers even though there is an increase in the price of TSP and organic fertilizers in the study area. It can be seen that the decisions of farmers who remain consistent in using stable inputs produce production that is not much different so that the production during the lowland rice pandemic did not experience too much difference compared to the lowland rice production before the pandemic. The decline in grain prices that occurred in the study area was caused by several reasons, namely: the quality of grain during the pandemic had decreased which was marked by too high a water content (the water content exceeded the 25% standard set by state logistics company, in Indonesia called with BULOG), the stock or supply of rice was too high so it was not can be absorbed by BULOG, and natural phenomena such as strong winds that uproot rice so that the price drops greatly. Most farmers have to sell their crops to middlemen so that the grain quality does not decrease. This resulted in the farmers' bargaining position (bargain position) being low and forced to accept the price offered by the middlemen.

As for the management of the impact of rice farmer exchange rates on welfare that can be done to increase the exchange rate of rice farming farmers in Candi District, Sidoarjo Regency by looking at the circumstances that occur. Taking advantage of high market demand or always needed, high public consumption so that production can still be increased with the level of farming maintenance, facilities and infrastructure that are adequate and easy to get to increase experience. Participate in farmer groups so that

qualified agricultural extension workers can help farmers so that the knowledge used for farmer cultivation develops, supports the development of technology and information in rural areas. Utilizing markets that need rice to increase production by increasing farming maintenance.

Other management of the impact of rice farmer exchange rates on welfare can be done to increase the exchange rate of rice farming farmers in Candi District, Sidoarjo Regency by looking at the impact that occurs on farming, namely the support of quality agricultural extension workers so that they know the mastery of technology and irrigation water is difficult. Taking advantage of increased production, the demand for rice consumption is high and the market needs rice so that it can consider production and capital prices and can determine production prices by utilizing information and communication technology in rural areas.

Utilizing existing farming experience and knowledge so that they can overcome pest and disease problems, climate deviations. Utilizing participating in farmer groups and increasing maintenance so that it can overcome fertilizer prices and land conversion to non-agriculture. Take advantage of production developments in other areas so that they can find information to get production facilities easily. Increase capital to increase the purchase of production facilities and increase the area of land. Increase mastery of technology to deal with pests and diseases, climate deviations and increase production prices by looking at production developments in other regions. The welfare of farmers in East Java has decreased, one of which is due to the transfer of functions of productive agricultural land which was built into plantation areas, industry and infrastructure development such as toll roads and so on. If paddy fields decrease, farmers cannot work, agricultural production will also decrease which will have an impact on the welfare of farmers who will decrease. The decline in Farmer Exchange Rates was caused by many things, such as inflation which caused the prices of commodity goods or supporting goods for farmer production to become expensive, farmer production decreased because farmers had difficulty finding paddy fields that could be used for the rice planting process, besides that there was inefficient government policies, where the government's performance in the agricultural sector is more focused on increasing agricultural output rather than processes and the level of farmer welfare so that it has not been able to solve the problems that occur in the agricultural sector. Government policies related to lowering the Basic Price of Grain (HDG) or the Government Purchase Price (HPP) are considered to have not been able to resolve the problems in the agricultural sector. In fact, the policy of giving prices that are too low actually makes the farmers poorer. The relatively low price of grain is sometimes used by collectors or interested parties to buy grain from farmers and with the aim of getting as much profit as possible.

The welfare of farmers is very dependent on how successful the productivity of rice plants is. Productivity indicators consist of production yields and land area, if one of these indicators decreases, it will also have a decreasing impact on agricultural productivity. The condition of the area of agricultural land that is getting narrower every year is a major problem for farmers in developing their agricultural products. This is due to the conversion of productive agricultural land which is changed by interested people to make apartments, hotels, malls and other infrastructure. If there are no strict

regulations in order to protect agricultural land in Indonesia, it can cause agricultural production to decline. Conditions like this can actually worsen the economy in Indonesia, especially in rural areas where the majority of people work as farmers. If agricultural productivity decreases, it indicates that the welfare of farmers in Indonesia is low.

5. CONCLUSION

Based on the results of research on the Analysis of Factors Influencing Farmer Exchange Rates (FER) for Rice in Candi District, Sidoarjo Regency, there are several suggestions to lead to a better direction. The existence of intervention from the government as a regulator and policy maker is needed to maintain the stability of farmer exchange rates. The government can make more efficient policies to support the economy in the agricultural sector. Improving agricultural infrastructure and providing outreach to the development of more advanced agricultural technology is one of the supports to improve and maintain the welfare of farmers. If the welfare of farmers in Indonesia is high, the Farmer Exchange Rate will increase and people in rural areas will also become prosperous. Government policies in setting subsidies on factors supporting agricultural production needs to be evaluated, so that the provision of subsidies is more equitable and in accordance with farmer groups who need assistance. Government control over the availability of productive land for agriculture is further emphasized, so that farmers do not experience difficulties in producing agricultural products.

REFERENCE

[1] J. Beckman and A. M. Countryman. “The Importance of Agriculture in the Economy: Impacts from COVID-19”, American Journal of Agricultural Economics, vol. 103, no. 5, **(2021)** pp. 1595-1611.

[2] Central Bureau of Statistics, “East Java Farmer Exchange Rate Statistics”, Central Bureau of Statistics, Jakarta, **(2018)**.

[3] Central Bureau of Statistics, “East Java Farmer Exchange Rate Statistics”, Central Bureau of Statistics, Jakarta, **(2020)**.

[4] P. Simatupang and M. Maulana, “Kaji Ulang Konsep dan Perkembangan Nilai Tukar Petani Tahun 2003-2006”, Jurnal Ekonomi dan Pembangunan, LIPI, **(2018)**.

[5] N. Rusono, A. Sunari, A. Candradijaya, I. Martino and Tejaningsih “Analisis Nilai Tukar Petani (NTP) Sebagai Bahan Penyusunan RPJMN Tahun 2015-2019”, Direktorat Pangan dan Pertanian, Badan Perencanaan Pembangunan Nasional, Jakarta, **(2013)**.

[6] R. Elizabeth and V. Darwis, “The Role of Farmers' Exchange Rates and Commodity Exchange Rates in Efforts to Increase the Welfare of Soybean Farmers (Case Study: East Java Province), Center for Socioeconomic Analysis and Agricultural Policy Bogor Research and Development Agency Ministry of Agriculture, **(2000).**

[7] Supriyati, “Analisis Nilai Tukar Pendapatan Rumah tangga Petani”, ICASEP Working Paper No. 71, Pusat Penelitian Sosial Ekonomi Pertanian, Bogor, **(2004)**.

[8] E. Chritoporus, I. W. D. Armayadi, Muhardi and E. K. S. Surentu, "Factors affected farmer exchange rate and their relationship to life expectancy in Central Sulawesi", EurAsian Journal of BioSciences, vol 14, no 3, pp. 6245-6248, **(2020)**.

[9] T. Trimono, A. Sonhaji and U. Mukhaiyar, "Forecasting Farmer Exchange Rate in Central Java Province Using Vector Integrated Moving Average", Media Statistika, vol. 13, no. 2, pp. 182-193, **(2020)**.

[10] A. A. Khan, and Q. M. Ahmed, "Agricultural Terms of Trade in Pakistan: Issues of Profitability and Standard of Living of The Farmers", Conference Paper No. 60. Social Policy and Development Center, Islamabad, Pakistan, **(2005)**.

[11] Central Bureau of Statistics, "East Java Farmer Exchange Rate Statistics", Central Bureau of Statistics, Jakarta, **(2016)**.

[12] M. Rachmat, "Nilai Tukar Petani: Konsep, Pengukuran dan Relevansinya sebagai Indikator Kesejahteraan Petani", Forum Penelitian Agro Ekonomi, vol. 31, no. 2, pp. 111-122, **(2013)**.

[13] R. Hendayana, "AnalisisFaktor-Faktor yang Mempengaruhi Nilai Tukar Petani", Pusat Penelitian Sosial Ekonomi Pertanian. Badan Penelitian dan Pengembangan Pertanian, Bogor, **(1995)**.

[14] Fajri, "Analisis Faktor- faktor yang Mempengaruhi Nilai Tukar Petani Sebagai Indikator Kesejahteraan Petani Padi di Kabupaten Sragen", Agrista, vol. 4, no. 2, pp. 85-94, **(2016)**.

[15] Soekartawi, "Prinsip Dasar Manajemen Pemasaran Hasil-Hasil Pertanian, Rajawali, Jakarta, **(2002)**.

[16] S. Apriani and Y. F. Baliwati, "Faktor-faktor yang Berpengaruh Terhadap Konsumsi Pangan Sumber Karbohidrat di Pedesaan dan Perkotaan", Jurnal Gizi dan Pangan, vol. 6 no. 3, Institut Pertanian Bogor, Bogor, **(2011)**.

[17] P. Kotler and N. Amstrong, "Principles Of Marketing (13rd ed.)", Upper Sadle River: Person Prentice Hall, New Jersey, **(2011)**.

[18] T. B. Purwantini and M. Ariani, "Pola Pengeluaran dan Konsumsi Pangan pada Rumah Tangga Petani Padi", Seminar Nasional Dinamika Pembangunan Pertanian dan Pedesaan: Tantangan dan Peluang bagi Peningkatan Kesejahteraan Petani. Bogor: Pusat Analisis Sosial Ekonomi dan Kebijakan Pertanian, Departemen Pertanian, **(2008)**.

[19] L. Soetrisno, "Paradigma Baru Pembangunan Pertanian Sebuah Tinjauan Sosiologis", Kanisius, Yogyakarta, **(2002**).

[20] M. I. Riyadh, "Analisis Nilai Tukar Petani Komoditas Tanaman Pangan Di Sumatera Utara", Fakultas Pertanian, UISU, Medan, **(2015)**.

[21] Nurhayani, "Analisis Peranan Sub Sektor Tanaman Pangan dalam Pembangunan Ekonomi Wilayah Kabupaten Batang Hari Periode 2005-2012", Jurnal Paradigma Ekonomika, vol. 10, no.1, **(2015)**.

[22] Bappenas, "Analisis Nilai Tukar Petani (NTP) Sebagai Bahan Penyusunan RPJMN Tahun 2015-2019" Direktorat Pangan dan Pertanian, **(2013)**.

[23] S. K. Indraningsih, "Analisis Nilai Tukar Komoditas Cabai Merah (Kasus di Kabupaten Brebes, Jawa Tengah)", Badan Pusat Penelitian dan Pengembangan Pertanian: Bogor, **(2004)**.