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**SOCIUS:**

Jurnal Pendidikan dan Pembelajaran Ilmu Pengetahuan Sosial  
Volume 13, No 2, October 2024, pp. 88-96  
P-ISSN: 2089-9661 | E-ISSN: 2089-967X  
DOI: [10.20527/js.v13i2.18073](https://doi.org/10.20527/js.v13i2.18073)  
Open Access: <https://ppjp.ulm.ac.id/journal/index.php/JS/index>



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**RURAL COMMUNITY PERCEPTIONS OF CLIMATE CHANGE IMPACTS ON FARMERS' WELFARE**

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**ARTICLE INFO***Article history:*

Received 01 Januari 2020

Accepted 12 April 2020

Available online 30

Oktober 2020

*Kata Kunci:*

Persepsi; Perubahan  
Iklim; Kesejahteraan  
Petani

*Keywords:*

Perceptions; rural  
communities; climate  
change; farmers' welfare

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**ABSTRACT**

Climate change significantly challenges the agricultural sector, affecting crop yields and farmers' livelihoods. A decline in harvest yields leads to reduced income for farmers, impacting their overall well-being. This study aims to analyze rural farmers' perceptions of the impact of climate change on their welfare. The research employs a qualitative approach, using in-depth interviews as the primary data collection method. The findings reveal that climate change poses major challenges to agriculture, including changes in plant growth and development patterns. These challenges result in decreased productivity, lower selling prices, and reduced wages for farmers, ultimately leading to decreased welfare. These findings provide critical insights into the effects of climate change on farmers' lives. They can serve as a foundation for developing policies that support farmers' well-being amid global climate change.

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## INTRODUCTION

Indonesia, as an agricultural country, has an agricultural sector that is very important for the economy, especially for rural communities who depend on agricultural products for their livelihoods. Indonesia's geographical location in the tropics provides high natural potential in developing the agricultural sector, with weather conditions, soil, and other resources that support the growth of agricultural crops. However, although the agricultural sector has great potential, the challenges faced by farmers, especially those related to climate change, are increasing. Unpredictable climate change leads to uncertainty in planting patterns, plant development, and agricultural yields that have a direct impact on farmers' income and welfare.

According to Estiningtyas et al. (2012), climate change can cause crop and harvest failures, damage to agricultural land, and increased humidity that worsens attacks by plant-disturbing organisms. This is in line with research by Ruminta et al. (2018), which states that agriculture is very vulnerable to climate change, which significantly affects plant growth and yields. The impact of climate change on the agricultural sector can cause decreased productivity and production which has a direct impact on farmers' income. This decrease in yields can lead to decreased farmer welfare, especially for those who depend on the agricultural sector as their only source of income.

However, several studies, such as those conducted by Nuraisah & Budi Kusumo (2019), show that the magnitude of the impact of climate change on the agricultural sector is highly dependent on the level and rate of climate change itself, as well as the resources and agricultural production systems used. This study also shows that farmers who work on rented or other people's land tend to be more vulnerable to the negative impacts of climate change, because they do not have full control over the management of the land, so the results obtained are limited.

Given these conditions, this study aims to analyze the perceptions of rural farming communities regarding climate change and how it affects their welfare. This study will be conducted in Belun Village, Temayang District, Bojonegoro Regency, East Java, which is an area with the majority of its population dependent on the agricultural sector. This study is different from previous studies that focused more on analyzing the impact of climate change on agricultural output in general. This study will dig deeper into the socio-economic conditions of farming communities, the classification of farmer groups, and how their perceptions of climate change affect their welfare.

Based on this background, this study is formulated with several questions: (1) What are the socio-economic conditions of the farming community in Belun Village? (2) What are the types of farming groups in Belun Village? (3) What is the perception of rural communities regarding the impact of climate change on farmer welfare? The purpose of this study is to analyze the socio-economic conditions of the farming community in Belun Village, identify the types of farming groups that exist, and analyze their perceptions of the impact of climate change on farmer welfare in the village.

## **RESEARCH METHODS**

The type of research used is a qualitative research method, where the qualitative method as a scientific method is often used by a group of researchers in the field of social sciences, including education. In this study, researchers create a complex picture, examine words, detailed reports from participant views and conduct studies on the situations experienced. This research was conducted in Belun Village, Temayang District, Bojonegoro Regency. The basis for determining the location is because this area is an area where most of the people work as farmers and much of its area is used as agricultural land.

Data collection was conducted using in-depth observation and interview methods. Observation was used to observe and ensure economic activities carried out by the community. While in-depth interviews were used to obtain primary data. So that the type of data in this study uses primary data based on interviews and observations of informants such as educated farmers, ordinary farmers and farm laborers. As well as secondary data obtained through literature studies, book or journal references, and other documents. The primary data collected will be grouped into one new variable consisting of various indicators. Indicators of climate change variables are rainfall, plant adaptation to the season and the number of rainy days. Indicators of farmer welfare variables are crop production, selling price levels, income or wages received. The sample taken to be participants during the interview was 3 people consisting of experienced or creative farmers, ordinary farmers and farm laborers. This study collected data based on observations of natural situations as without any manipulation. Observation here is used to observe directly with sources of information about the object of research, agricultural conditions, climate conditions, and farmer welfare.

## **RESEARCH RESULT AND DISCUSSION**

### **Socio-Conditions of Farming Communities in Belun Village**

As stated by one of the farmers of Belun village who is also a participant in the information acquisition, Mr. Bintoro, Belun Village is a village whose majority area is used for agriculture because its land is very large and its location is strategic, so that its people choose to work as farmers. He added that this village has the advantage of fertile and easy-to-plant land. With sufficient irrigation from both rice field irrigation and rivers that can help the growth and development of agricultural crops. In this study, the author argues that agriculture in the Belun area for the past few years has experienced a decline in the growth process and production results caused by several things. One of them is the occurrence of uncertain climate change. With the influence of climate on plant growth, farmers need to know the suitability of plants to the climate conditions in the area (Heksaputra et al., 2013;(Firmasyah & Mokhtar, 2011; Rejekiningrum, 2014)).

Based on information data obtained from 3 groups of farmers, namely the first farmer is a creative and experienced farmer. Which in essence says that climate change is a major factor in agriculture. Climate change poses serious challenges to many sectors including agriculture and the environment. Climate change that occurs makes plant growth less than optimal and the provision of fertilizers that are not in accordance with climate conditions will also affect. Many farmers are confused about what to do, seeing the climate that changes erratically so that what is obtained with what is attempted is very different and experiences losses. This is what then affects the welfare of farmers in rural areas.

### **Classification of Farmer Groups**

Farmers are people or communities who work or do work or earn a living and income from farming activities on agricultural land (Ardika & Budhiasa, 2017;Wibowo, 2010). Farmers themselves consist of several types, namely experienced or creative farmers, meaning they know the ins and outs of the planting process, fertilization to harvesting with a size that is in accordance with agricultural science. These farmers may be more open to new technologies and information that can help adapt agricultural practices to the ongoing climate change. And they will be more aware of the risks associated with climate change. Second, there are ordinary farmers, where in this context it can be said that this group may have limited access to information to make changes in their farming practices. And ordinary farmers tend to rely on traditional practices and local resources, making them more vulnerable to climate change that disrupts their farming. And the third, namely agricultural laborers where they work as farmers but not on their own land. And often depend on daily income from agricultural work. They have no control over agricultural practices or long-term decisions, making them vulnerable to economic changes caused by climate change. Because of their dependence on agricultural

work, agricultural laborers are directly affected by climate change on production or employment in the agricultural sector.

## **Public Perception of Climate Change on Farmers' Welfare**

### **a. Farmer's Income**

Income is a very important thing in determining the profit or loss obtained by comparing income with expenses or costs incurred on income (Agus Salim, 1999: 56). The income obtained by farmers is closely related to the capacity of climate change that is happening. Based on the results of interviews with three categories of farmers, namely experienced or creative farmers, ordinary farmers and farm laborers with an analysis of the questions "Does climate change affect your income or socio-economic life as a farmer? Do you feel more pressure in managing finances? " Information related to the problem was revealed by Mr. Bintoro, as a farmer who can be said to be experienced and creative.

“I see firsthand how unstable weather patterns affect my farming output. For example, irregular rainy seasons or prolonged droughts have reduced yields and threatened my family’s economic sustainability as farmers. In managing my finances I feel greater pressure. I have to consider additional spending on more adaptive farming techniques or more efficient irrigation systems to address the challenges of climate change. And try to continue learning the latest practices in sustainable farming to increase my family’s economic resilience.”

This is similar to the information provided by ordinary farmers, Mr. Muharto as an ordinary farmer gave his answer related to climate change and income as follows.

“I feel more pressure in managing finances because I have to deal with additional costs to cope with these weather changes. For example, the cost of more adaptive farming techniques or more efficient irrigation systems to keep crops growing and producing in unpredictable weather conditions. This requires us to be more creative in managing our budget and investing wisely to keep our farming business going.”

Different from farm laborers. Where their income is obtained from the work done, not to mention sharing the results with the land owner. In the information provided by Mr. Supriyanto as a farm laborer related to the question, the following answer was obtained.

“Extreme weather changes also often lead to instability in my employment, especially when bad weather disrupts farming processes and reduces demand for farm work. This puts even more stress on managing day-to-day finances, as inconsistent income makes financial planning difficult. I often feel the need to seek additional work outside of farming to cope with this uncertainty.”

From this information, it is concluded that extreme weather or climate changes affect the growth patterns and development of agricultural crops. In addition, the changes that occur will have an impact on the final results of agriculture. The harvest will decrease and threaten the

economic sustainability of farming families. Moreover, with the existence of farm laborers where the income generated is inconsistent. Thus, if a family's economy is unstable, the family's welfare will also decline.

#### **b. Crop Production**

The yield is related to agricultural productivity, but the two are not the same. The higher the yield, the higher the productivity and profitability of a farm, so that it will improve the welfare of farmer families. Based on the conclusion of the interview results with 3 groups of farmers, namely experienced or creative farmers Mr. Bintoro, ordinary farmers Mr. Muharto and farm laborers Mr. Supriyanto with an analysis of the questions "How do you see changes in weather and climate patterns in recent years? What do you think is the most significant change? How does this change affect your harvest?" the same core information was obtained regarding crop production.

In recent years, the most significant changes have been in the problem of rainfall patterns. The rainy season has become more irregular. This change significantly affects crop yields. In long periods of drought, crop productivity is reduced, resulting in decreased yields. On the other hand, in years with excessive rainfall, there is a risk of crop loss due to flooding or water that damages the soil and plants. Thus, if the harvest decreases, then the income of farmers also decreases. And of course the economy of a family and its welfare level will also be less stable. Therefore, to overcome this change, the three groups of farmers, namely Mr. Bintoro, Mr. Muharto and Mr. Supriyanto as farmers are trying to adapt agricultural practices, the use of more modern technology to control irrigation, the selection of plant varieties that are more resistant to climate change, they said.

#### **c. Production Results Selling Price Level**

The selling price of the production is determined by the party that is the distributor of agricultural products. The determination of the selling price also depends on climate conditions. Based on information from interviews with 3 types of farmers with an analysis of the question "In your opinion, what are the main factors that affect the selling price of agricultural products in this area? Do you use a special strategy to maintain or increase the selling price of your agricultural products?" The answers obtained from each participant, namely Mr. Bintoro, as an experienced or creative farmer as follows.

"In my opinion, the main factors that influence the selling price of agricultural products in this region include several things. One of them is the availability of supply and demand in local and regional markets. Weather and seasonal factors also greatly influence the supply of agricultural products. In addition, macroeconomic factors such

as exchange rates, government policies related to imports and exports, and global market factors also play an important role in determining selling prices.

"If it's a matter of strategy, yes... The strategies I use to maintain or increase the selling price of my agricultural products include implementing more modern agricultural techniques, diversifying products, and building networks or partnerships with local buyers or traders who might help me in marketing products at better prices."

Meanwhile, based on the interview answers from Mr. Muharto as an ordinary farmer participant, the following information was obtained.

"In my experience, as an ordinary farmer, the main factors that affect the selling price of our agricultural products are the season, oversupply in the local market, and the presence of middlemen or brokers who influence the price. In addition, competition between farmers in the area also plays an important role in determining the selling price. To increase the selling price of agricultural products, we often try to sell our products directly to consumers or local markets, avoid middlemen, or collaborate with farmer groups to get better prices from potential buyers."

Likewise, based on the interview answers from Mr. Supriyanto as a farm laborer participant, the following information was obtained.

"As a farm worker, I see that the main factors that affect the selling price of agricultural products are the policies and decisions of buyers or middlemen in the market. We usually do not have direct control over the selling price of agricultural products. To increase the selling price of agricultural products, we sometimes try to provide advice to the farmers we work with on agricultural techniques or practices that can improve the quality or productivity of their agricultural products, in the hope of positively influencing the selling price."

From some of the information, it is concluded that the level of production selling price when viewed from the uncertain weather changes is not only influenced by supply and demand in the local market, but also by weather and seasons. On average, the complaint from farmers is that seasonal changes are the main factor. If the selling price is low, it will automatically affect the income obtained and the welfare of farmers. Therefore, they try to share knowledge and experience with other farmers about agricultural practices that can improve the quality or productivity of agricultural products.

#### **d. Wages Received**

Wages are an acquisition either in the form of money or workers' rights that are received and stated as compensation from people who provide work with predetermined standards. The production results obtained will affect the wages received by both farmers and farm laborers. Based on evidence from the results of interviews with farmers with an analysis of the question "In your opinion, are the wages received so far in accordance with the costs incurred from the planting process to harvesting?" The following is information on the answers put forward by

experienced or creative farmers, namely Mr. Bintoro and ordinary farmers, namely Mr. Muharto, who have the same core saying that,

“The wages received as farmers do not fully reflect the costs incurred from the planting process to harvesting. The agricultural process involves significant costs for seeds, fertilizers, pesticides, water, labor, and other costs required to produce quality crops. However, fluctuations in agricultural product prices in the market are often not commensurate with the costs incurred. This makes us, farmers, sometimes face significant financial challenges, especially if the harvest does not meet expectations or if the selling price in the market is not profitable. We hope that there will be a fairer mechanism or system for determining selling prices that accommodate the costs we incur in the agricultural process.”

This is different from the information obtained from Mr. Supriyanto, a farm laborer who stated that,

“As a farm laborer, I usually receive a daily wage or according to the harvest that I help plant and harvest. However, often the wages I receive are not always enough to cover my daily living expenses. Sometimes, especially when the harvest is not good or when the weather affects production, the wages I receive are inadequate. I hope that there will be more attention to the welfare of us, farm laborers, in setting wages or better protection for our economic conditions, especially when weather conditions or harvests are not favorable.”

Based on the information obtained, it is concluded that the wages received by farmers depend on the profit or loss of an agricultural product. This can be seen from the amount of costs incurred from the planting process to harvesting with the costs obtained from sales. Between the two things are sometimes not comparable. There are times when the harvest is not good or when the weather affects production, so that the wages received are inadequate.

## **CONCLUSION**

Farmers' welfare is closely related to climate change. Climate change can affect both cropping patterns and the growth and development of agricultural crops. In addition, the changes that occur will have an impact on the final results of agriculture. The harvest will decrease and threaten the economic sustainability of farming families. Thus, if the harvest decreases, then the income of farmers will also decrease. And of course the economy of a family and its level of welfare will also be less stable. Likewise, it is related to the level of selling price of production when viewed from the uncertain weather changes, in addition to being influenced by supply and demand in the local market, it is also influenced by weather and seasons. If the selling price is low, it will automatically affect the income obtained and the welfare of farmers.



Contributions in this study can be done in several ways, including to overcome this uncertainty, it is important to continue to conduct in-depth research and monitoring of climate change and build responsive and flexible adaptation strategies to emphasize the importance of awareness and readiness to face unexpected extreme changes. Trying to provide understanding or knowledge to farmers about agricultural techniques or practices that can improve the quality or productivity of agricultural products. And implementing strategies to maintain or increase the selling price of my agricultural products including the application of more modern agricultural techniques, product diversification, and building networks or partnerships. In addition, there is a fairer mechanism or system for determining the selling price.

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