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CLIMATE CHANGE, AGRICULTURE, AND LOCAL WISDOM

PERUBAHAN IKLIM, PERTANIAN, DAN KEARIFAN LOKAL

Untoro Hariadi[1]

Faculty of Agriculture, Janabara University

email: untorohariadi67@gmail.com

ABSTRACT

This simple study attempts to see the link between climate change, agriculture, and local wisdom. With a descriptive-analytic method that relies on literature, this study wanted to show the need for fundamental changes to return to a "friendly" climate. The COVID-19 pandemic provides the experience that human life can fundamentally change, which it had a positive impact on the environment. Here is where local wisdom can play a role in ensuring agricultural work that follows the flows of nature so that it is not exploitative or takes and uses in moderation. New agriculture is the way out of the threat of climate change in a new way based on new awareness.

Keywords: Climate change, Agriculture, Pandemic, Local wisdom

INTISARI

Kajian sederhana ini mencoba melihat keterkaitan antara perubahan iklim, pertanian, dan kearifan lokal. Dengan metode deskriptif-analitik yang bertumpu pada literatur, penelitian ini ingin menunjukkan perlunya perubahan mendasar untuk kembali ke iklim yang "bersahabat". Pandemi COVID-19 memberikan pengalaman bahwa kehidupan manusia dapat berubah secara mendasar, yang berdampak positif bagi lingkungan. Di sinilah kearifan lokal dapat berperan dalam memastikan pekerjaan pertanian yang mengikuti arus alam sehingga tidak eksploitatif atau mengambil dan menggunakan secara moderat. Pertanian baru adalah jalan keluar dari ancaman perubahan iklim dengan cara baru berdasarkan kesadaran baru

Kata kunci : perubahan iklim, pertanian, pandemic, kearifan lokal

1. BACKGROUND

Climate change is understood as a change in the composition of the global atmosphere, especially temperature, over a long period. What caused the change? This change is caused by natural phenomena and anthropogenic activity that, in turn, triggers the concentration of greenhouse gases. Increased anthropogenic activity, namely activities that lead to the emission of greenhouse gases such as CO2, methane, and other substances, trapping some of the solar energy released by the Earth into space, causing the Earth's temperature to increase, which is also called the greenhouse effect [1]; Malhi et al., 2021).

[1] Alamat penulis untuk korespondensi: Untoro Hariadi. email: untorohariadi67@gmail.com

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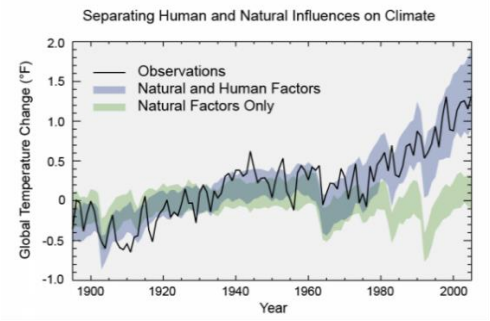

Separating Human and Natural Influences on Climate [3]

The development of human civilization, on the one hand, has improved the quality of life, achieved by increasing activities that have brought changes to the Earth. Human-centered activities, to a certain extent, place humans as if they were no longer exist as beings on planet Earth. Instead, it places Earth as if it is in its grasp. The need for food and all its derivatives made people take great action through a revolution in agriculture to overcome the race between population growth and the rate of ability to supply food.

For a long time, the mechanization of agriculture has had an impact on greenhouse gas emissions. Research shows that agricultural land activities account for about 60 percent of total nitrous oxide emissions, a gas that causes the greenhouse effect. The majority of carbon dioxide emissions in agriculture come from burning fuel to heat agricultural buildings and machinery, intensive tillage regimes, and many others [1]. What may not have predicted before is that the intensification of agriculture has had consequences that, in turn, affect agriculture, namely a decrease in production. As temperatures increase, crop yields are reduced through increased evapotranspiration, reduced soil moisture, creating the perfect conditions for weed and pest attack. At the same time, changing rainfall patterns also increases the likelihood of crop failure and decreases crop yields in rainfed areas [4].

What is immediately apparent is a motion of aggravating interactions. Increased movement of agricultural production has driven climate change, and climate change, in turn, had an impact on production disruptions. Conditions that threaten the availability of food were anticipated by carrying out activities that intensify agricultural performance. Efforts have been made to overcome this deterioration by developing agriculture based on local wisdom, which is expected to be more environmentally friendly. Local wisdom can be said to be closely related to positive human behavior in adapting to the environment. It could also be said that local wisdom is all forms of knowledge, belief, understanding, insight, and customs or ethics that guide human behavior in life in an ecological community, which is obtained from active adaptation to the environment. [5]; [6]. Experience in rural Asia can be an example.

The study of Minah et al., (2019), shows that rural communities in Tambunan, Sabah, have local wisdom passed down from generation to generation to help them live their lives. In the study, they highlighted several practices, such as trees are not cut down as pleased to open new agricultural land, and animals cannot be treated roughly, crops must be taken good care of, burning of forest is done using the right techniques, using woods as barriers or digging holes to stop black soil from eroding to the bottom parts of farms, and using natural materials to make compost and organic

pesticides, in addition to planting plants with strong roots at the edge of banks. By utilizing local wisdom in managing and processing natural resources around it, it contributes to the survival of rural farming communities.

Of course, the question is whether this new approach able to support the needs of human life? Can humans change so that the destructive processes that result in climate change be handle significantly? The Global COVID-19 pandemic has provided important clues that a change has the potential to occur. As it is known, that a pandemic does not only disrupt public health but also seriously disrupt global supply chains. COVID-19 has influenced our behavior in one year, namely in working and business conditions in various parts of the world. These include increased social media use and decreased physical interaction and mobility. Many view this as a long-term effect on the environment and the way we manage our cities. Regardless of the disease itself, recovery plans may impact the environment and the physical and mental health of the population in the future [7]; [4]. What is crucial to see is that restricting human movement reduces air pollution and, to some extent, reduces greenhouse gas emissions.

Can this moment be the way to give birth to a new view, which is not entirely human-centered, and on the contrary, an environment-centered one. Circumstances have shown that a human-centered view forms the way for environmental damage that threatens human survival. Humans certainly have to fulfill their daily needs, but their fulfillment must not endanger their future. For this reason, new agriculture needed, namely a method of production based on local wisdom that, not only produces environmentally friendly work, but could also create new human behavior, aware fundamentally of its existence on planet earth.

2. LITERATURE REVIEW

Climate change has a wide impact and threatens the safety of human life and its sustainability. Problems such as floods in big cities, hurricanes, drought, and rising temperatures, are some of the events that have brought huge losses, both in material and life. Not only that, the main thing is that climate change is problematic for food security. One of the main concerns is the decline in yields of cereals such as wheat and rice, which are the main staple foods in South Asia. With warming temperatures likely to continue, wheat yields will decline by as much as 50% by 2050. It estimated that the highest decline, 60%, will occur in Bangladesh and India, followed by Pakistan at 27%. Rice yields will decrease by 40% in India, followed by Nepal by 32%, Bangladesh by 10%, and Bhutan by 4%. In addition, the yields of corn and sugar cane will also be affected by global warming [4]. Other studies have shown that climate change will affect food quality due to an increase in temperature and a decrease in the growing period of plants. As a result, to increase the total production of unhulled rice, it is necessary to expand the crop area. Otherwise, it will reduce food security [8].

Agricultural business can be said to bring double results. On the one hand, it can provide for the needs, but on the other hand, it has an impact that causes climate change, which can even be said to reduce the carrying capacity of the environment. Of course, efforts are needed to overcome it, considering that this situation results from human action. Pant's study [1]

shows that agriculture also emits greenhouse gases that will negatively affect agriculture. It would lead to a series of fixes and modifications that can overcome or even make things worse. Agriculture, although contributing to the increase of the greenhouse effect, still used as a safeguard for food security. Several studies, such as from [9], sought to cover up the vulnerability of the food system by increasing food production as a way to adapt to climate change. When trying to adapt to address climate problems, it turns out that it doesn't solve it, but it will revive the negative "cycle" waiting for its next turn. Therefore, the focus remains on food security which in terms of numbers continues to increase, considering that the human population also continues to increase sharply.

The response to climate change can be said to be a response that is an effort to adapt. The basic idea is how in a changing climate situation, agricultural production can still maintain food security. Adaptation as a means of survival was a good thing. One form of applying the adaptation method is by bringing back local wisdom. Here, local wisdom can be said to play a role by providing knowledge that is following the environment. Many local pearls of wisdom are handed down and used to live without damaging the environment. Some even use local wisdom to overcome environmental problems, namely erosion on agricultural land [10]. Others, apart from using local wisdom, try to mobilize the community and try to solve the environmental problems they face today [11]; [12]. Of course, the challenge that will come soon: was utilizing this work would achieve the production capacity needs to ensure food availability? It appears that the presence of local wisdom is basically not intended to be a way for the use of different fundamental views but is still only positioned as a way of adapting to a changing environment.

The study of Minah et al., (2019) shows that local wisdom not only related to farming methods but also related to the way of life and human views on life (environment). Local wisdom is a belief inherited from generation to generation practiced in agricultural activities for prosperity and harmonious relationships between humans and other living things around them. In terms of agriculture, the view of local wisdom was able to complement agricultural science, especially to solve ecosystem problems that have changed due to agricultural performance that ignores the environment. Thus, local wisdom not only complements on more environmentally friendly farming methods but also allows us to revisit the concept of sufficiency and the concept of the relationship between humans and the environment.

3. STUDY METHOD

The research method used in this research is descriptive analytic. The data were obtained through literature studies using journal material on climate change and its impact on agriculture, the impact of agriculture on climate change, the influence of local wisdom in agriculture for environmental resilience. The analytical method used is a descriptive analysis by providing an overview of the relationship between climate change, agriculture, global pandemic events and local wisdom.

4. RESULTS AND DISCUSSION

Agriculture, in a broad sense, is all efforts to utilize biological resources to produce food

and all the necessities that support human life and was an important discovery that not only changes humans but also changes the face of the planet earth. Human life is no longer nomadic but instead permanent. Because of it, other discoveries exist, in managing other creatures, such as animals. If humans originally survived only by taking what was provided or available in nature, then with agriculture, humans began to produce food through agricultural activities. Intervention activities, ranging from hoeing, plowing, to engineering the land and biological resources conducted so that the need for food, which is increasing from time to time, could be satisfied. The whole process without being realized has changed the position of man, which was originally in the hand of nature, into a new state where it is as if nature is in man's hand.

What originally grew as a way of living together, or a way of life in nature, which fully adapts to the motion of the environment, has turned into a life in which nature arranged in such a way that it must fully follow the will of man. The fruit trade, for example, has been able to show that what was originally present following the seasons can now be present throughout the year, as if it no longer knows the seasons. Nature is like being forced to work endlessly. With chemical and biological discoveries, humans created conditions where crops can produce more and with a higher frequency. This situation makes us more confident and thinks that the path he is taking is the best way to build a new civilization that is completely different from the stone age civilization.

In some places, such as South Asia, agriculture is the backbone. It not only provides food but is also the main source of livelihood for millions of people in the region. With only 5% of the world's agricultural land, South Asian farmers feed more than 20% of the global population. South Asia is also one of the poorest regions in the world: about a third of the world's poor live in this region, with about 70% living in rural areas, and are mainly dependent on agriculture [4]. This dependence could also be suspected as one of the causes for the lack of human awareness of the impact of the intensification of the agricultural sector's performance, namely the occurrence of climate change, which has a major impact on agriculture.

The largest known economic impact of climate change is on agriculture because of the size and sensitivity of the sector [13]. It is just one example of what many people think the impacts of climate change are. Climate change seen as a major problem to our food security. With temperatures continuing to rise many predict it will result in a decrease in our crop production and potentially jeopardize our food security. To overcome this, scientists are trying to create new agricultural models, which can adapt to the environment. Now, it seems that the problem has not been resolved, meaning that in the future, humans still have not found a way to improve agricultural performance without destroying the environment, so that their food needs fulfilled. Meanwhile, in reality, the performance of the agricultural sector not followed by the work of a fair distribution of products, so that some places experience an advantage and in others experience a deficiency. Rasul, (2021), taking data from FAO, IFAD, UNICEF, WFP, and WHO, said that before the COVID-19 pandemic, 649 million people in South Asia

experienced moderate or severe food insecurity, and 271 million were very food insecure. Likewise, 36% of children were stunted, and 16% were acutely malnourished. This situation is likely to get worse due to the effects of the pandemic.

The idea above when faced with the fact that a more intense effort is needed to increase agricultural production capacity, will immediately emerge as a very large negative effect on the environment, which has serious implications for public health. Unsustainable agriculture practices also increase health risks [14]. Chemical overuse of agriculture, unsustainable use of water and energy, contributes to high emissions, pollution and water scarcity, air pollution and energy problems, as well as issues related to the disruption of biodiversity, and risks to human health. In areas with a high level of dependence on the agricultural sector, and the need to increase agricultural production capacity, of course, will have a big impact. Pingali (2012) explains that agriculture in developing countries face a series of increasing challenges, such as meeting the needs for food diversity resulting from rapidly increasing incomes; provide enough food for a rapidly growing urban population, and preparing for the projected negative consequences of climate change. Despite absorbing new challenges, food policymakers continue to grapple with hunger and poverty in low-income countries, especially in sub-Saharan Africa and underdeveloped areas in developing countries.

It seems clear that humanity faced with a dilemma. Research shows how climate change affects agriculture, but at the same time, agriculture also plays a role, not only changing the climate but also bringing about changes such as land through some land management [16]. These relationships that have a negative impact, of course, need to find a way out. It is good to note at this point that local wisdom is crucial. What meant here is a view of life, which includes the teaching of environmentally friendly farming methods. This view of life contains two things at once. First, a wisdom that can help prevent negative impacts or worsening environmental conditions. With this way of working, it is hoped that agriculture can reduce its negative impact on the environment, or even not making any negative impact. Second, wisdom seeks to reduce the impact of climate change so that agriculture developed is more resilient so that it can still produce to meet the needs of life. Of course, this local wisdom design needs to be improved, not only on a small scale but also elevated to global wisdom. This is made possible through the development of global knowledge networks so that inter-local experiences can be further developed and exchanged.

Of course, climate change can only be overcome by fundamental changes in human life, where agriculture can help become the starting point. Changes in the way agriculture works are one of the changes from a broader change, namely the development of a new farm. What is meant by this new agriculture here is a way of working of agriculture which is based on the view that man and its life are in the hand of Earth, and not the other way around. This means all kinds of old destructive interventions must be replaced by a working method that completely follows the clockwise motion of the Earth. However, this will certainly lead to problems such as "what if the food production decreases, so that food security is disrupted?" Of course, this problem

needs to be approached with a new perspective that follows the rhythm of nature. The answer is not only an effort to find a more massive way of production, but it is necessary to think about a new concept of human consumption, so that consumption patterns that only rely on a few commodities, such as rice, can be expanded with other commodities available in nature. If this is acceptable, then the challenge ahead will be to find new food sources that were never thought of or discovered before, which do not require us to "transform" the Earth to get them. With this new agriculture, we are slowly reducing the production of greenhouse gases and, in time, meeting a climate that is friendly to us.

5. CONCLUSION

Climate change had a major impact, which threatens the survival of humankind, especially its ability to maintain food security. Addressing climate change requires the ability to fundamentally change the perspective, which will form the basis of new agriculture. Local wisdom gives way to that direction. On the one hand, changing agriculture to be more environmentally friendly, and on the other hand helping to adapt to existing changes, so that production capacity can be maintained. But above all, the new agriculture must be based on awareness of the human position, or in this case, agriculture, that its position was in the environment so that all steps must be in line with environment rhythm. Only then can we achieve sustainable food security, and at the same time the opportunity to see a "friendly" climate.

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