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SOCIAL AWARENESS OF CARBON EMISSIONS AMONG RURAL COMMUNITY IN TARAM VILLAGE KERDAU, PAHANG

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ABSTRACT

Global warming has become the center of the international environmental law and policy and has rapidly become one of the main environmental issues. Most scientists believe that the global warming issues are caused by the increased amount of carbon dioxides (Co_2) and other gases in the earth's atmosphere. Global warming has been made worse by economically developed countries or wealthier individuals but less affected by the negative impact of carbon emission by poor and developing countries. Nevertheless, these developing countries usually end up as victims of global warming due in the form of climate disaster. Therefore, the issue of global warming needs to be addressed from an early stage in order to safeguard life on our planet from the threat of future extinction. All stakeholders at local, state and international levels must take responsibility to overcome the global environmental problems. Therefore, this study aims to examine the rural community's sense of awareness of carbon emission at the local level. The study area is Taram Village which one of the rural community area within the Mukim of Kerdau, Pahang. The objectives of the study are to identify the level of awareness among the rural community about carbon dioxide emission and the impact of carbon dioxide emission on the rural community in Taram Village. The results showed that the rural community had a good social awareness about carbon dioxide emission and the carbon dioxide emission did not cause a significant impact on the rural community. Thus, all the stakeholders involved have to play an active role in maintaining a healthy environment to ensure the well-being of all the community members in Taram Village can be safeguarded.

Keywords: Global warming, Carbon emissions, Social awareness, Taram village kerdau, pahang

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1. INTRODUCTION

Global warming is a term that is widely used to describe a potentially dramatic rise in the average global surface temperature of the earth (Drake, 2014). Global warming has become the center of international environmental law and policy at least since the early 1990s, and in recent years has rapidly become one of the critical environmental issues that attract widespread media attention. The reason why it has become a global issue is because climate warming cannot be directly attributed to come from a specific location of emission but it is caused by harmful emissions from around of the world (Cullet, 2008).

It has been estimated that the temperature of the atmosphere has increased at the range of 1.5^0 C to 4^0 C which can caused alterations to our climate (Quoted from Houghton et al., 1996 by Drake, 2014). Therefore, according to Drake (2014), if such a change in temperature can lead to changes in the weather, the climate can undergo profound alterations such as rainfall distribution and others environmental disasters. Most of the scientists believe that the global warming issues are caused by the increased amounts of greenhouse gases such as carbon dioxides (Co_2) and other gases on Earth that trap the outgoing thermal radiation within the atmosphere. Consequently, the Earth becomes warm. However, the increase of carbon emission in the atmosphere has been caused the thermal radiation to increase and become trapped, ultimately leading to heat problems. As a result, the accumulation of the hot temperature can affect the weather and climate leading to the occurrence of environmental disasters such as floods, droughts and the spread of diseases, among others.

The increase of carbon dioxides emission began since humans discovered fire resulting in the burning of fuel that releases harmful gases to the atmosphere. The carbon dioxide emission has been produced by humans over the years from their daily activities. However, the industrial revolution have been responsible for vast energy consumption by burning fossil fuel that releases large amounts of carbon dioxide emission and heat. In addition, the increase in human technology had encouraged humans to alter the environment where they live. Consequently, the world faces severe environmental, social, and economic challenges of unprecedented complexity (Von Grebmer et al., 2016). Furthermore, the increase in human needs, especially in developed countries, have led to high energy consumption causing the carbon dioxide emission to increase over the years and contribute to the greenhouse gases that ultimately caused the accumulation of temperature in the atmosphere (Drake, 2014). As a result, there have been worldwide efforts to tackle the global warming issues currently.

Besides that, global warming had been caused by more economically and developed countries. The developed countries have contributed a disproportionate amount of harmful anthropogenic emissions over the past couple of centuries. According to Popescu & Luca (2017) the release of

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carbon dioxide emission to the atmosphere had been contributed by China 28%, the United States 16%, EU-28 10%, Russian Federation and India 6%, Japan 4% and others countries 30% (Quoted from United States Department of Energy, 2015). Nevertheless, the developed countries also have a higher capacity to mitigate global warming by shifting to less environmentally harmful technologies and a higher capacity to adapt to global warming. Similarly, wealthier individuals also contributed more to global warming and have more capacity to withstand the negative global impacts (Cullet, 2008). However, poor and developing countries, as well as the poor people in the world, have always been victims of global warming. According to UNDP (2007), 98% of the developing countries have been affected by climate disasters. Although the developing countries are less responsible for global warming, they are more vulnerable to global warming impacts. According to Von Grebmer et al. (2016) close to 800 million people live with hunger and 1.2 Billion people live in extreme poverty (Suresh & Johnson, 2015).

Hence, the global warming issue needs to be addressed at an early stage in order to safeguard lives on the planet from the threat of future extinction Kinney (2003). In addition, awareness about carbon dioxide emission should increase rapidly. The climate change needs to be understood and further studied, and all the social structure should be actively constructed to solve the related issues (Popescu & Luca, 2017). As a result, global warming is one of the most discussed issues due to the alarming increase in temperature as a result of the long enduring emission rates of the greenhouse gases. Therefore, global warming needs to be properly addressed at all levels from local, state and international level in order to safeguard the lives of the future generation. Thus, this study will focus on the awareness of carbon emission at the local level namely to investigate to what extent is the local rural community in Taram Village aware of the carbon dioxide emission where they live. Currently, this area is located nearby Sime Darby Company's palm oil plantation which Clean Development Mechanism (CDM) have been implemented by the company for reduce carbon dioxide emission.

2. STUDY AREA

The Taram Village is one of the rural community area within Mukim of Kerdau, Pahang. The Mukim of Kerdau is located at $3^0$34' 0" North and $102^0$24' 0" East. Most of the community in Taram Village are involved in agricultural activities and small businesses. The majority of race population in Taram Village of Kerdau is Malay people followed by Chinese, Indian and indigenous people. The village is located within the watershed area of Tekal Besar River and Tekal River Kecil that flow into Pahang River. Besides that, oil palm has been largely planted in this area, and the plantation is owned by the Sime Darby Company. In addition, a housing area is centrally built and lined which is influenced by the road development in Taram Village of Kerdau, Pahang.

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Figure 1: Study area (Source: Google Earth, 2018)

3. METHODS

The study had employed the interview, field observation and questionnaire survey methods to investigate the social awareness of the rural community (local level) in Taram Village about carbon emission. Anyone that the researcher came across during the study was selected as a respondent which 35 of respondents have been selected using simple random sampling to represent 50 houses in Taram Village. All the data that was collected was keyed in into IBM SPSS Statistic 23 for further analysis; both quantitative and qualitative methods were used in the analysis. Therefore, the descriptive statistical analysis such as frequency and percentage was used for demographic analysis to identify the gender, types of employment, education level and income levels of the respondents. The descriptive statistical analysis was also used to identify the level of knowledge and attitude towards nature preservation as well as the impact of carbon emission due to the increase of heat in the atmosphere. Besides that, the Taram Village was selected as study area due to the area is located nearby with palm oil plantation that owned by Sime Darby Company where the CDM had been implemented for reduce carbon emission to atmosphere.

4. RESULTS AND DISCUSSION

The results have been divided into three sections such as the demographic, general knowledge of respondents and the impact of carbon dioxide emission on the rural community.

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4.1 The demographics of the respondents

The analysis of the respondents' demography is focused on four aspects such as gender, the age of respondent, types of employment, education level and income level. Firstly, based on Figure 2, 65.7% of the respondents are males while 34.3% of the respondents are females.

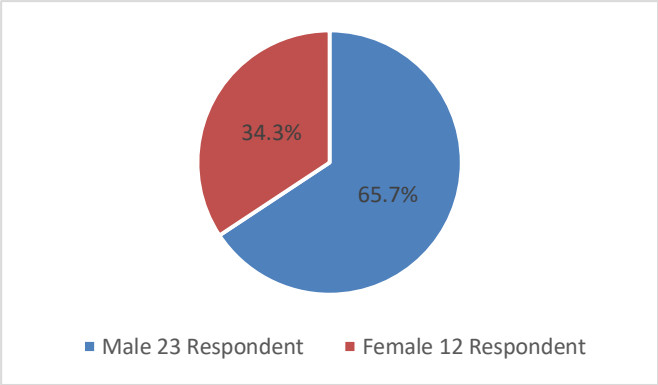

Figure 2: Percentage of respondents according to gender

Secondly, the distribution of the respondents' age illustrates that 34.3% of the respondents are at the age of 26-35 which is followed by 25.7% who are at the age between 46-55 and while20% of the respondents are in the age group of 36-45. Meanwhile, only 11.4% are above 56 years and 8.6% of respondents are below 25 years old, as shown in Figure 3.

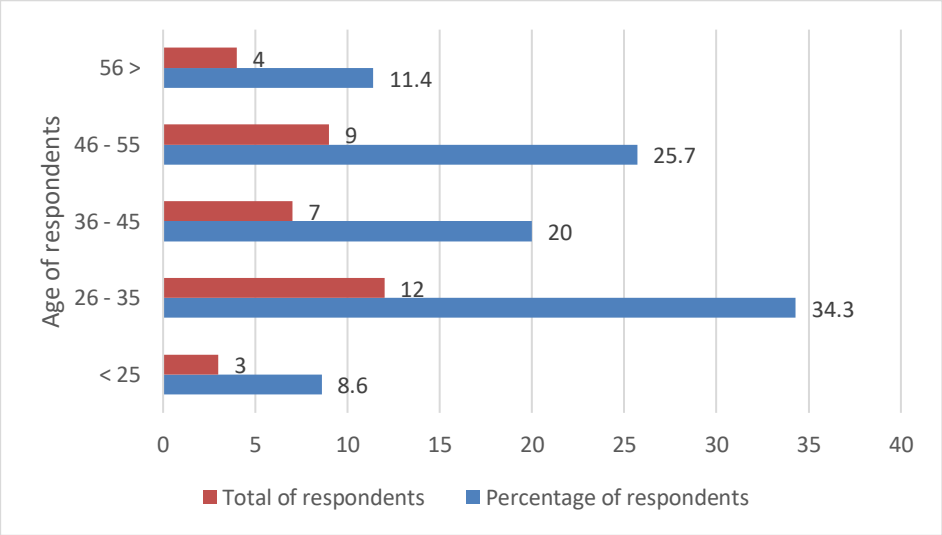

Figure 3: The age of respondents by total and percentage of respondents

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Thirdly, the distribution of the respondents' education levels indicates that the majority (51.4%) of the respondents have an SPM qualification followed by 25.7% who attain SRP/PMR, 11.4% with only UPSR. 5.7% of the respondents are Diploma holders while 2.9% have a Bachelor's degree and 2.9% of the respondents have other types of education level as shown in Figure 4.

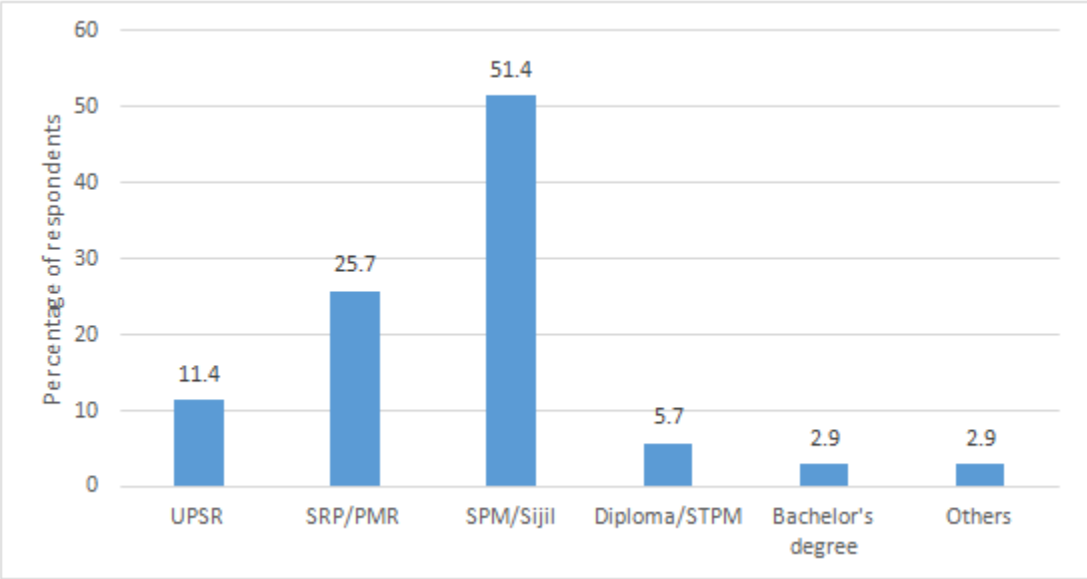

Figure 4: The percentage of respondents by level of education

Figure 4 illustrates the distribution of the type of employment that the respondents have. 31.4% of the respondents are not working while 22.9% of respondents are involved in the private sector, 17.1% work as government employees, followed by freelancers and pensioners who form 14.3% each as shown in Figure 5.

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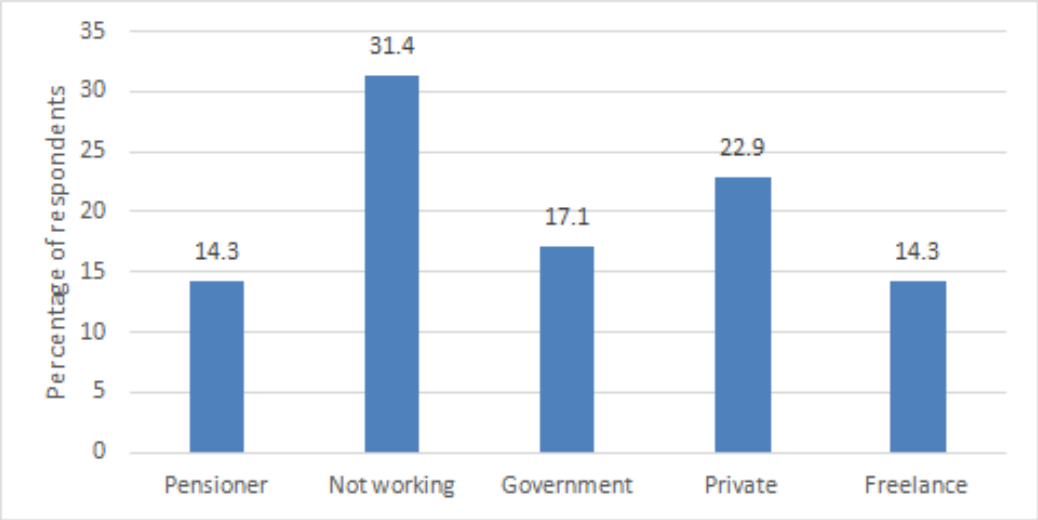

Figure 5: The percentage of respondent by types of employment

4.2 The awareness of rural community on carbon dioxide emission

To identify the level of awareness of the rural community, a few aspects were viewed such as the level of knowledge and the attitudes towards nature preservation. Based on the statistical descriptive analysis, the level of knowledge is determined through the general knowledge about the consequences carbon dioxide emission to the atmosphere, economic and health. Therefore, Table 1 illustrates that two-thirds (62.9%) of the rural community in Kerdau, Pahang lack knowledge about the atmospheric gases while 51.4% of the respondents are not aware of the link between carbon dioxide and plants. Meanwhile, 42.9% of the rural community has better knowledge regarding the impact of carbon dioxide emission and deforestation activities on the atmosphere. In other words, the respondents know that carbon emission causes air pollution. 60% of the respondents know that the deforestation activity has an impact on carbon dioxide in the atmosphere, while 77.1% of the respondents know that plants play an important role in controlling Earth's temperature (Table 1).

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Table 1: The general knowledge about carbon dioxide emission to the atmosphere

Questions	Percent (%)		
	Yes	No	Not sure
Do you know in the air contains various gases	22.9	62.9	14.3
Do you know the function of carbon dioxide gas to plants	22.9	51.4	25.7
Do you know that the emission of carbon dioxide into the air causes air polluted	42.9	34.3	22.9
Does the deforestation activity affects carbon dioxide gas	60.0	11.4	28.6
Do you know that plants play an important role in controlling the temperature of the earth	77.1	2.9	20.0

In terms of the knowledge of carbon emission impacts to the economic, many of the respondents seem to have limited knowledge about the pollution caused by the emission of carbon dioxide. Only 42.9% of the respondents showed knowledge are aware of this, while the 37.1% do not have such knowledge and 20% of respondents are not sure about it (Table 2). Meanwhile, with regards to the knowledge of the respondents about carbon dioxide emission's impact upon human health, 51.4% of the respondents have some knowledge, on the matter, but 22.9% of the respondents do not such knowledge. Meanwhile, the remaining 25.7% are unsure. Therefore, although the respondents know that the increase of heat caused by carbon dioxide emission in the atmosphere can affect human health, most of the respondents have no knowledge regarding the types of disease outbreaks that it can cause. 42.9% of the respondents have no knowledge, and 20% of the respondents are not sure. Meanwhile, only 37.1% of the respondents are aware of the type of disease outbreaks that can result from the emission (Table 3).

Table 2: The general knowledge of carbon dioxide emission towards economics

Questions	Percent (%)		
	Yes	No	Not sure
Did you know the increase in global temperature can affect the growth of crops?	42.9	37.1	20.0
Do you know the increase in global temperatures affect the total yield of crops particularly for crops that depend on cooler climate conditions such as tomatoes, flowers, apples, lime, etc.?	37.1	42.9	20.0

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Table 3: The general knowledge of the effect of carbon dioxide emission on human health

Questions	Percent (%)		
	Yes	No	Not sure
Did you know that the increase in global temperatures affects human health?	51.4	22.9	25.7
Did you know that stroke, lung disease, lung cancer, asthma, malaria and cholera outbreaks occurred due to the increase in global temperature?	31.4	40.0	28.6

Findings for the question regarding the attitudes towards nature preservation show that 82.9% of the respondents feel that preserving the environment is important and they keep trees arround their surroundings while 71.4% of the respondents like to cultivated plants. In addition, 91.45% of the respondents also worry if they see trees being cut down. The study also shows that 60% of the respondents do not practice recycling and 57.1% of the respondents burn dried leaves (Table 4). However, based on the field observation this situation is due to the fact that the Taram Village is a rural area which is located far from the urban area. Therefore, it encourages most of the rural community to observe old practices to deal their rubbish and to clear by burning trunks and leaves.

Table 4: The attitudes towards nature preservation by respondents

Questions	Percent (%)	
	Yes	No
Do you practice recycling?	40.0	60.0
Do you keep the trees around you?	82.9	17.1
Do you like to cultivate?	71.4	28.6
Do you worry about seeing the trees being cut down?	91.4	8.6
Do you burn dry wood leaves?	57.1	42.9

As a result, the study shows that the majority of the respondents are aware of the link between carbon dioxide emission and the environment around them. In other words, they are aware that the heat increases in the atmosphere could have impact on social, economy and health as well as the atmosphere itself. However, the awareness that the rural community has about carbon dioxide emission have influenced recent problems or the problems they presently face. According to a study by Ye Li at al. (2011), it was found that people's beliefs and concerns about global warming depend on whether the local temperature on the day of study seemed warmer or

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colder than usual. Besides that, based on field observation it showed that although the rural community takes part in maintaining a good environment particularly by retaining trees and replanting, big companies such as Sime Darby also plays an important factor to contribute towards a good environment. Due to the fact that wealthy individuals or rich businessmen can contribute to a large number of greenhouse gases in the atmosphere, they are also highly capable of mitigating global warming (Cullet, 2008). Therefore, the attitudes towards nature preservation should involve all the stakeholders to ensure that the atmosphere is always preserved.

4.3 The impact of carbon dioxide emission

The study shows 77.1% of respondents feel the rise of temperature in the atmosphere in Taram Village, Kerdau while only 14.3% of respondent feel there the temperature remains the same and 8.6% of respondents are not sure regarding the current state of the local temperature (Figure 6). Although the rise of temperature in Taram Village occurs according to most of the respondents, but study find that the rise of temperature in the atmosphere does not have a significant impact on the community's well-being particularly on the level of vision disturbance; 82.9% of the respondents feel that their vision level are not interrupted, and only 17.1% of the respondents feel that their level of vision had been interrupted. In addition, the study also finds that there hardly any dust on the plants' trunks and leaves (Table 5) and according to most of the respondents, they have a good quality of life in the environment where they live. This shows that the condition of the atmosphere in Taram Village does not have a significant impact on their quality of life (Interview, 2017).

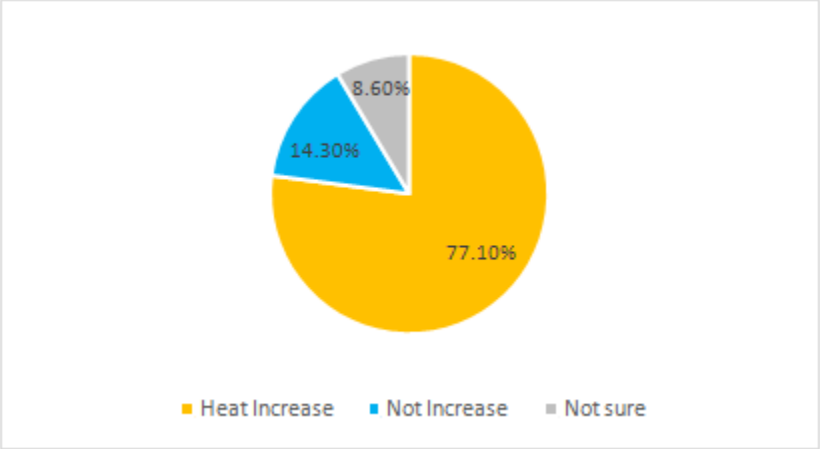

Figure 6: The rise of temperature in the atmosphere by respondents

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Table 5: The dust disturbance on the community

Questions	Percent	
	Yes (%)	No (%)
Is your vision level affected?	17.1	82.9
Is there any dust on the plants?	17.1	82.9

According to Mccright et al. (2000), in the past decades, global climate change has been widely accepted as a social problem due to the increased awareness of public concerns towards environmental problems. Nevertheless, there is a need to reinforce the public's concern on the environmental problem, which will provide environmental activists, scientists and policy-makers with new momentum in their efforts to promote environmental protection. Therefore, based on Figure 7, it is shown that the rural community is concerned with social problems. As a result, 34.4% agree, and 14.3% of respondents strongly agree that the rise of temperature has disturbed their outdoor activities while the 20% of the respondents do not agree and 20% strongly disagree. However, 11.4% are not sure.

Meanwhile, when asked whether the rise of temperature in the atmosphere disturbs their work, 37.1% of the respondent disagrees while only 5.7% of the respondents strongly agree and 11.4% of the respondents agree that the rise of heat in the atmosphere has caused negative impacts on their work. As far as school activities are concerned, it is found that 31.4% of the respondents do not agree that the rise in atmospheric temperature has cause disturbances while 11.4% of the respondents strongly agree and 11.4% also agree that school activities have been disturb. When asked whether the rise of temperature have a significant impact on the recreational activity, 37.1% do not agree, and 20% of the respondents strongly disagree while 5.7% of respondents strongly agree and 22.9% of the respondents agree that the rise in temperature has caused a negative impact and only 14.3% of the respondents are not sure.

The study also finds that the rise of temperature does not have a significant impact on the health of the community. 37.1% do not agree, and 20% of the respondents strongly disagree that the present temperature has caused a decrease of the health of the community while 5.7% and 14.3% of the respondents strongly agree and agree respectively that the rise of temperature has been caused negative impacts.

Besides that, on issue of the spread of disease, it is shown that 31.4% of the respondents are not sure whether the rise of temperature in the atmosphere can cause the spread of disease yet 28.6% disagree and 17.1% strongly disagree that the rise of temperature has a significant impact on the

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spread of disease. Only 8.6% strongly agree, and 14.3% of the respondents agree that the increase in temperature had cause disease outbreaks. Meanwhile, on the question whether the increase in natural disaster is caused by temperature shows that 25.7% of the respondents are not sure while 22.9% of the respondents strongly disagree and 22.9% disagree that the rise in temperature could cause the increase in natural disaster and 14.3% of the respondents strongly agree and 14.3% agree that the temperature has caused the increase in natural disaster.

Lastly, 28.6% of the respondents disagree, and 20% strongly disagree that the rise in temperature can give a negative impact on clean water supply while 22.9% of the respondents are not sure. Meanwhile, 11.4% of respondents disagree, and 17.1% strongly agree that the rise of temperature has caused a negative impact on the availability of clean water supply. Therefore, the results displayed in Figure 6 finds that the rise of temperature in Kerdau, Pahang does not have a significant impact on the community's well-being. Most of the respondents feel that the quality of life where they live is still in good condition. Furthermore, the study also finds that 91.4% of the respondents do not want to relocate to another place and only 8.6% of the respondents want to move out if they have an opportunity (Table 6).

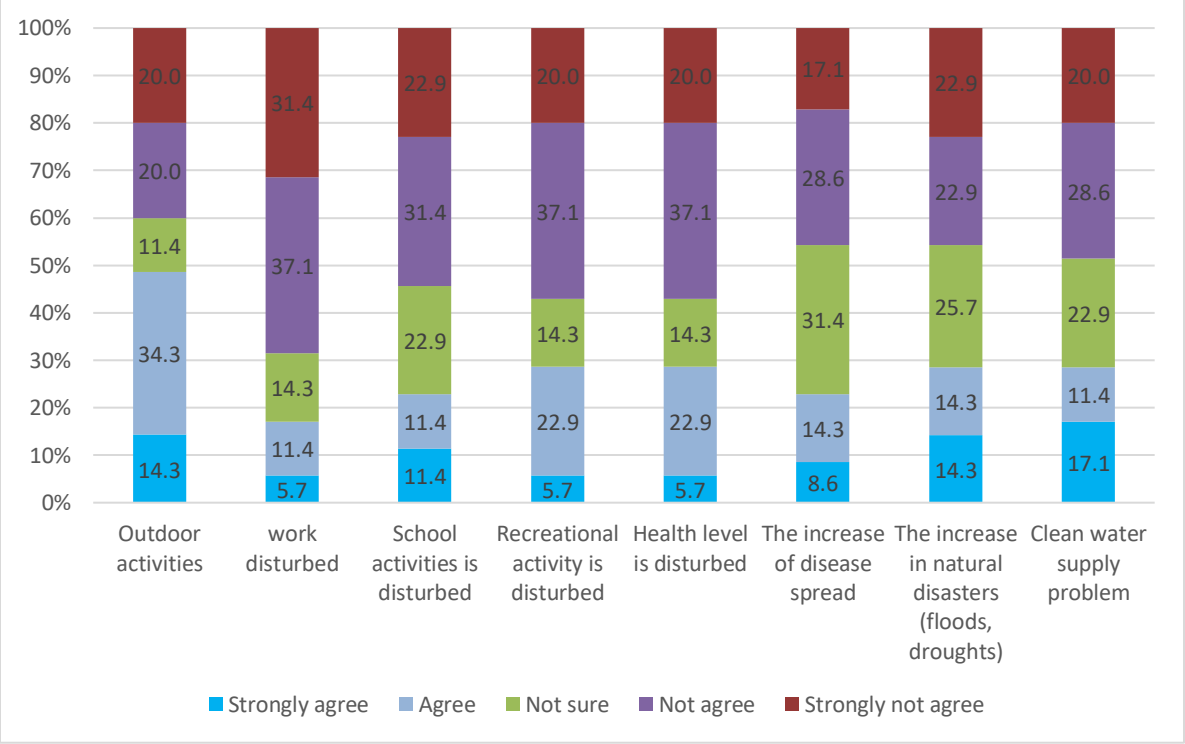

Figure 7: The negative impacts of temperature towards the community's well-being.

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Table 6: The percentage of respondents who wants move out given the choice

Question	Percent (%)	
	Yes	No
If you are given a choice, do you want to move to another place?	8.6%	91.4%

5. CONCLUSION

The study found that the rural community in Taram Village, Kerdau has a good awareness towards carbon dioxide emission. Based on the results, it showed that the rural community had some common knowledge that carbon dioxide emission has an impact on the economy, health and atmosphere, particularly on the types of greenhouse effects and the types of disease. The study concludes that the rural community in Taram Village had a good awareness because a majority of them were aware that the increase in the atmospheric heat would bring a negative impact on the quality of life to their community, particularly on the social, economic and health aspects. In addition, the attitudes towards nature preservation also show that most of the rural community take part in keeping a healthy environment. However, the study also found that although the rural community takes part in maintaining a healthy environment, the replacement of forest land to agriculture particularly the creation of palm oil plantation on a large scale was beyond the power and control of the rural community in Taram Village.

Therefore, all stakeholders who are involved in palm oil agriculture should take the responsibility to ensure the negative impacts of carbon dioxide emission do not affect the quality of life of the rural community who are particularly vulnerable to environmental problems. Based on the findings, the results also showed that the impact of carbon dioxide emission in Taram Village was not significant to the rural community's well-being although most of the respondents felt the rise of temperature occurred. Most of the respondents also stated that the quality of air in Taram Village was still in good condition. In addition, based on the results of the study, the impact of carbon dioxide emission on their social life showed that most of the respondents felt that Taram Village still has a good air quality. Most of the respondents did not want to move to another place even if there they were given a choice to make a decision to move out. Therefore, the study concludes that the rural community in Taram Village, Kerdau had good social awareness about carbon dioxide emission.

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