



Impact of Climate Change and Community Adaptation of Bajo Tribe

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Abstract

The purpose of this study is to determine the effects of climate change and the adaptation forms of the Bajo tribe that are felt in the coastal regions of Wawonii Indonesia. This research method is the type of data used in this study is the type of qualitative data and surveys, data collection techniques used in this study were interviews, discussion, questionnaire distribution, and field observations. The results showed that the impact of climate change in the Langara Laut village can be felt by increasing the cost of residential renewal activities by a percentage of 52.5% of respondents with 21 people, then shifting livelihoods to a percentage of 22.5% with respondents 9 lives, and the risk of activities at sea in the Bajo tribe community increased as a percentage 25.0% with respondents 10 people. As for the form of adaptation carried out by the Bajo Tribe community in Langara Laut by making stronger residential measures (Protective) a percentage of 52.5% with respondents 21 people, then diversifying livelihoods/diversification is part of a form of relocation action percentage of 22.5% with respondents 9 people, and the use of transportation (ships) and fishing gear that is more effective in other words a form of accommodation measures 25.0% with respondents 10 people.

Introduction

The issue of climate change is a global issue that is often discussed lately, however a deeper study is needed to identify and analyze climate change risks. Climate change is the change in the average of one or more weather elements in a particular region, while the term global scale climate change is climate change with reference to the whole earth region on the average variation in the climate conditions of a place or its statistically significant variability for a period of time Long Arnell et al (2004). It was also made clear that climate change might be due to internal natural processes or external forces, or human behavior that continuously changes the composition of the atmosphere and land use (Murdiyarso, 2003).

The main cause of climate change is greenhouse gas emissions which are a major contributor to extreme climate change (Luber & McGeehin, 2008; Lasmono & Avia, 2014). The increase in the average surface temperature of greenhouse gases such as carbon dioxide, methane and nitrogen-oxide is affected by global development and industrial activities that have helped accelerate the pace of climate change.

Coastal areas and small islands is one area that is potentially significantly affected. Climate change will work together to exacerbate problems that currently exist in coastal areas and small islands such as ecosystem degradation, pollution, erosion, availability of clean water, and biodiversity (Rogers & McCarty, 2000; Nicholls & Lowe, 2004).

The Intergovernmental Panel on Climate Change (IPCC) has stated that global warming can cause significant changes in the physical and biological systems, and the limitations of society in the region will result in the community groups suffering the great impact of climate change (Emanuel et al., 2008; Diposaptono et al., 2009).

Communities that are closely related to marine life are the Bajo people. Bajo people live and live on the coast, their communities are found in the Sulawesi region including the Southeast Sulawesi region. The Bajo tribe move around in groups to different locations according to their choice of fishing or other marine products. The sea is used as a source of life (panamamie ma di lao). They have the principle that "pinde kulitang kadare, bone pinde and kadare" which means moving Bajo people to land, as well as moving turtles to land or in other words take their lives (Artanto, 2017).

The most possible settlement for Bajo people to make it easier for them to go to sea to do work as a fisherman is in the coastal areas.

Methods

This research will be conducted in Langara Laut Village, West Wawonii District, Konawe Kepulauan Regency in January 2019. The material used in this study is interview guidelines as a guide in conducting the interview process and library materials related to the research location.

The type of data used in this study is qualitative and survey data types. The population in this study were all Bajo tribes who were domiciled in Langara Laut Village, Wawonii Barat District, Konawe Kepulauan Regency. The sampling method used was purposive sampling method. In this study sampling based on field research, the Bajo tribe people who depend on the coastal areas of the sea Wawonii with a period of 10-15 years or more than 15 years. Data collection techniques used in this study were interviews, discussions, questionnaires, and field observations. Analysis of the data used in this research is descriptive analysis.

Results and Discussion

Based on the results of the field research, there are indications that there are some impacts of climate change that are felt and experienced by the Bajo people in the Langara Laut Village. The climate change impacts referred to are presented in Table 1.

Table 1. Impacts of climate change felt and experienced

No.	Impact of Climate Change Amount	Respondent	Percentage (%)
1.	Increased housing renewal costs	21	52.5
2.	Livelihoods transition	9	22.5
3.	Risk activities in the sea community		
4.	Bajo people are increasing	10	25.00
	Total	40	100.00

Source: Primary Data, 2019

As has been presented in the table above the impact of climate change, resulting in an increase in housing renewal costs with 21 respondents affected with a percentage of 52.5% due to rising sea levels, making the community must take their own initiative to take action to renew the occupancy so that the impact due to sea level rise can be minimized by making houses more robust and strong enough to withstand the brunt of the waves which if at any time occur in the

coastal area, automatically also the cost must be incurred not a little to make the residential renewal.

The process due to the impact caused by climate change is also currently also affecting the livelihoods of residents around where 9 respondents affected by the percentage of 22.5% who make the transition of livelihoods, communities that used to be able to rely on marine products, carry out sea activities and selling marine products but with the threat of nature that could occur at any time make the Langara Laut community must have other expertise besides doing sea activities and relying on sea products. Because the results obtained are not so much the same as previous lives due to climate change that continues to increase, coupled with human activities that contribute to aggravating the existing situation.

Rising risk of sea activity has also been felt by the community where there are as many as 10 people with a percentage of 25% who daily do sea activities say so, because the travel time and distance to sea that is long and far enough to take the risk of doing sea activities a threat. Sea level rise, the threat of storms that can occur at any time, and other extreme threats require people to be able to adapt to all the conditions that have occurred, felt, and have been experienced.

Form of Adaptation of Bajo People

Based on the results of the study, it is known that the Bajo people in the Langara Laut Kelurahan have made several efforts to adjust to the impacts of perceived climate change, as well as naturally during their domicile. The form of adaptation of Bajo people in Langara Laut Village, West Wawonii District, Konawe Kepulauan Regency is presented in Table 2.

Table 2. The adaptation forms of Bajo people in Langara Laut Village

No.	Form of Adaptation	Respondent	Percentage (%)
1	Making houses more robust	21	52
2	Diversification of livelihoods	9	22
3	The use of transportation and fishing tools that are more effective to support activities at sea		
Total		40	100.00

Source: Primary Data, 2019

As has been presented in the table above where the adaptation forms carried out by the Bajo Tribe community in Langara Laut Sub-District, in the form of a more robust housing development for the number of respondents who made the adaptation were 21 people with a percentage of 52.5%, then livelihood diversification measures 9 lives with a percentage of 22.5% and then the use of transportation and fishing gear more effective to support activities at sea with the number of respondents 10 people a percentage of 25%.

IPCC findings prove that climate change has impacted ecosystems and people in all parts of continents and oceans in the world. Climate change can pose great risks to human health, global food security, and economic development. Actions to reduce emissions are very important and urgent to take to avoid the danger of climate change. Adaptation is very important to do in order to face the risks of climate change. The degree of adaptation needed depends on the success of mitigation activities. Communities can adapt by preparing to face some of the risks of climate change.

The risk of climate change impacts will be related to the adaptation that must be done. An increase in sea level will have an impact on coastal communities and low-lying areas around the world with the emergence of the phenomenon of flooding, coastal erosion and soaking, and the loss of small islands. This will especially affect the island nation. Climate change is also causing shifts in geographical range and migration patterns of terrestrial and marine species. Ocean heating and acidification pose a great risk to marine ecosystems, especially ecosystems in polar regions and coral reef ecosystems (Directorate General of Climate Change Control Ministry of Environment and Forestry, 2016).

People who are in direct contact with the sea and coastal areas are the Bajo people. Bajo Tribe people who are scattered on the coast of Southeast Sulawesi also feel the impact that is happening right now due to the global climate change that is happening, it is also being faced and felt by the Bajo Tribe community in the Langara Laut village, Konawe Kepulauan Regency. The Bajo tribe community in Langara Laut hamlet area who inhabits the area has lived for a long time in the area, they carry out their daily activities and activities like land people in general.

The difference between the life of the landlord and the Bajo that we can always know from the way the Bajo live and carry out activities that are in direct contact with the sea. So that the sea for the Bajo people is very important, the sea is the easiest source of livelihood for the Bajo people to do because the Bajo people have been famous even throughout the world as the only "Sea nomadic tribe". However, the threat of global climate change as it is currently being felt makes the Bajo people are required to be able to adapt in their areas of residence and those related to their livelihoods which incidentally directly touches the sea area.

Bajo residents in Kelurahan Langara Laut used to be many who work as fishermen, and spend their daily activities to go to sea, there are actors who cultivate sea cucumbers, seaweed, lobsters and pearl oysters, with income that varies between individuals. The cost of daily living can still be met and sufficient for other costs. According to one respondent who has lived for a very long time in the study site with a length of stay of 57 years and once worked as a fisherman when he was 15 years old, according to his confession at that time the increase in the volume of seawater was not too felt, the use of "supporting" rowing boats was still widely owned or done by the Bajo people in their place of residence at that time.

The use of sailboats around the 70s is still often found, and mangrove forests are still maintained so that the surrounding community is still young to fish around the mangrove forest area in other words the coastal environment ecosystem is still awake, and the use of fishing gear is still very safe to use so it is not a threat for marine life. At present the life of the Bajo tribe in Langara Laut Village is very different from the life of 70 years ago, seeing the current situation as a result of the impact of global climate change that happened enough to have an impact on the life of the Bajo Tribe community in Langara Laut, although the situation is still acceptable but still requires a fairly good level of adaptation to the impact of current changes to support the next life.

Impacts of Climate Change

The Bajo people in Langara Laut Village have felt and experienced the effects of global climate change today. The impact of climate change that is currently happening based on perspectives in their area is in the form of increased housing renewal costs, changes in livelihoods, and increased risk of marine activities in the community. This is inseparable from the events in the form of the impact of global climate change that has occurred long enough, so it can be observed during the last 10 years.

Changes in weather patterns that continue to change in monthly rainfall, monthly rainy days, monthly temperatures, and monthly humidity of the city of Kendari City in the period 2008-

2017, which was monitored by BMKG Kendari Maritime Meteorological Station as presented in graph 1 and 2

As an area that is quite close to Konawe Kepulauan Regency, the BMKG (Meteorology Climatology and Geophysics Council) Kendari Maritime Meteorological Station in the process of collecting data by the Kendari Maritime measurement tool can be stated that the data available for the Kendari City area is the same as the data available for the Konawe Kepulauan Regency, with the same consideration- the same is facing the same sea area, so it can be used as a material or a reference for valid data collection for further research related to rainfall, rainy days, temperature and humidity.

The current changing climate patterns in the Southeast Sulawesi region have an impact on the climate of Konawe Kepulauan Regency so that the impact of climate change that is happening today has an impact on the less well-being of individuals in the Langara Laut Kelurahan Wawonii Barat Konawe Kepulauan District. The climate that continues to change every year has an impact on small parts of the Bajo Langara Sea tribe, the impact of climate change where people used to feel safe with the supporting poles above the sea, but now the community has to spend some money to renew shelter by stockpiling and using materials coral reefs surrounded by wires with a view to strengthening the foundation of occupancy. But for those who have not been able to renew it, some people still rely on buffer wood as the Bajo house which is right above the sea first, with the risk of any increase in seawater when accompanied by tidal waves can cause water to enter the residents' houses. So that residents themselves must have the initiative to survive with all the existing risks or take action to renew housing.

The impact of climate change that occurred in Langara Laut Kelurahan does not only harm the community in terms of residential renewal but also in the livelihood sector. Residents around also feel the impact, because the Bajo people's livelihoods are quite famous for good marine activities, but with the current situation that is no longer the same as the previous life helped push the Bajo tribe community to be able to adjust the current situation by more demanding the community have a job not only as a fisherman but can look for work outside the activities as a sailor, and also remember the risk of sea activity will continue to increase if it is not matched by the more effective form of ships and other supporting tools. The influence of climate change cannot be underestimated at this time because the impacts that it causes are also quite significant for socio-economic life. Considering that the impacts of climate change are quite detrimental and very risky for the sea and coastal areas, mitigation actions are needed that are supported by good adaptation activities.

Adaptation of the Bajo Tribe Society

The daily activities of Bajo people who come in direct contact with the sea make the sea for the Bajo people very important, therefore the impact of climate change that is happening right now makes the Bajo people in Langara Laut have to take the initiative to take action to adapt to the creation of more robust dwellings (Protective), such as the making of dwellings by hoarding the foundation of the house using rocks and wires wrapped around it, with the hope that the houses built can become stronger.

Then by livelihood diversification of livelihoods in order to minimize the risk of going to sea when circumstances are not possible. And there are also some residents who started to make changes to their livelihoods by moving on land (relocation), although as we know that in fact there is a term that surfaces that Bajo people are not land people, meaning that even if Bajo people have jobs as land people will not have been able to abandon the habits of ancestors as a sailor, therefore the use of transportation and more effective tools was chosen by the Bajo people in Langara Laut to continue to support marine activities (accommodation).

Conclusion

Social capital in Tanah Towa is found in this study. It can be seen from the trust and reciprocity that occurs in the community and based on the overall results obtained by the trust of the village community is quite good, cooperation such as farmer groups and farmer groups combined and mutual relations with the community do not only occur with close relatives but also on all societies depending on the degree of closeness between individuals.

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