



# The Climate Change Awareness Among Senior High School Students in Sorsogon Province, Philippines

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## Article Information

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## Abstract:

The researchers of this study determined the climate change awareness of senior high school students in Sorsogon Province Division during 2022-2023. The subjects of this study were 412 officially enrolled Grade 11 and Grade 12 Academic and Technical Vocational Livelihood students of Juban National High School and J.P. Laurel High School. The researchers utilized descriptive survey design and used adapted research questionnaires. Moreover, the researchers applied weighted mean and ranking and also used other researchers' works in explaining the gathered data. Findings revealed that the senior high school students are neutral on climate change mitigation and agree on the effects of climate change. Additionally, internet, television, school, and radio are the major sources of

information of senior high school students relative to climate change. The researchers recommended that the senior high school students must continue in educating through the different available sources of information in order to improve their views on climate change which are useful in taking actions in connection with mitigation.

**Keywords:** *Climate Change, Senior High School Students, Awareness, Sources of information, Mitigation.*

## Introduction

Climate change is real. Human activities speed up the process. Widespread increases in the standard of living of people around the world have been accompanied by rising demands on natural resources, contributing to climate change. The earth's average global temperature rises and extreme weather events increase, changing ecosystems globally and endangering entire plant and animal species. The shifts in temperatures and weather patterns over a long period of time are referred to as climate change.

According to Riedy (2016) higher temperatures, altered rainfall patterns, shifts in the frequency and distribution of meteorological events including droughts, storms, floods, and heat waves, sea level rise, and resulting effects on human and ecological systems are only a few of the observed and projected changes in the climate.

According to Public Health Institute and Center for Climate Change and Health Climate (2016), 97% of climate scientists agreed that climate change is happening now and is being driven primarily by human activity. Moreover, people can do something to reduce its impact and



progression. In a worldwide context, the effects of climate change are continuously devastating, affecting plants, animals, and humans.

Meanwhile, in an online news report by Lukov (2022), France and other European countries have seen a wave of deadly wildfires, triggered by record temperatures and droughts across the continent. The series of wildfires in Europe are brought about by the effects of climate change.

Meanwhile, in the report of Jacobo (2021), experts said that if there is any doubt about climate change, look no further than the coldest regions of the planet for proof that the planet is warming at unprecedented rates. Added to the report, the Arctic is heating up twice as fast as the rest of the world. This is alarming, indeed. Widely considered by scientists as planet Earth's refrigerator due to its important role in regulating global temperatures, the mass melting of sea ice, permafrost, and ice caps in the Arctic is hard evidence of climate change.

Likewise, in the report of Carrington of the Guardian (2022), scientists have found that a major sea-level rise from the melting of the Greenland ice cap is now inevitable. Due to continuous carbon emissions, the melting of other ice caps, and the thermal expansion of the ocean, a multi-meter sea-level rise appears likely. Thus, billions of people live in coastal regions, making flooding due to rising sea levels one of the greatest long-term impacts of the climate crisis.

In another online news report of Al Jazeera (2022), Pakistan is greatly affected by flooding. Added to the report, the United Nations Secretary-General Antonio Guterres, who visited flood-ravaged Pakistan, said he had "never seen climate carnage" on such a scale, blaming wealthier nations for contributing to the devastation. In Pakistan flooding, more than 1000 people have died and more than a million people have been rendered homeless in flooding that has submerged nearly one-third part of the country and destroyed crops.

Similarly, the flooding in some places in Africa is devastating. In the report of Dewan (2022), human-induced climate change made the

extreme rainfall that triggered deadly floods in South Africa in April heavier and twice as likely to happen. In that flooding, 435 people's lives lost as well as destroyed the properties. Added to the report, the scientists analyzed weather data and computer simulations to compare today's climate, which is around 1.2 degrees Celsius warmer than temperatures before industrialization. Truly, climate change is a threat to us.

Meanwhile, in the Philippines, strong typhoons are one of the effects of human-induced climate change. In the report of Pope (2022), the Global Climate Risk Index 2020 ranks the Philippines as the second most vulnerable country in the world affected by climate change despite being one of the smallest contributors to CO2 emissions. Furthermore, more than 60 percent of the Filipino population residing in coastal areas will be affected by the one-meter sea rise brought about by climate change.

Likewise, in the report of Valmonte (2022), the 2021 World Risk Poll by the Lloyd Register Foundation showed that Filipinos are most worried about the serious harm brought by severe weather due to climate change. The poll also revealed that the majority or 69.5% of Filipinos believed that climate change is a "very serious threat" to the country. Moreover, the Philippines experiences an average of 20 typhoons per year.

Based on the experience of the researchers, during the class discussions in science subjects especially on values integration, there are senior high school students in the selected schools who are not aware about the climate change. Therefore, as a whole, there is a need to determine their awareness of climate change. The worldwide effects of climate change must be an eye-opener to all of us. We only have one planet Earth to live on and we must think about our present and future generations. Thus, we must have the awareness to take action to mitigate the effects of global climate change. Thus, the researchers of this study determined the climate change awareness of senior high school students in selected schools in the Sorsogon Province Division during 2022-2023.

Specifically, it determined the students' views about climate change mitigation, levels of agreement on the effects of climate change, and sources of information about climate change.

## Literature Review

According to Fankhauser (2017), a certain amount of climate change is now unavoidable and already observable. While emphasizing the importance of cutting greenhouse gas emissions, the international response to climate change now puts equal emphasis on adaptation and mitigation. Moreover, effective adaptation requires knowledge, planning, coordination, and foresight.

According to Ratinen (2021), humanity is living in a climate emergency where climate change should be significantly mitigated and greater efforts should be made to adapt to it. Furthermore, findings revealed that the students had a relatively high level of constructive hope and that general climate change knowledge predicted students' constructive hope well. Thus, students can do something to mitigate the effects of climate change.

Meanwhile, Dewi and Khoirunisa (2018) said that knowledge of climate change is essential. Understanding the causes, consequences, and also solutions is one of the main keys to know how far the students care about climate change issues. Moreover, it was revealed that 96% of the students believed that global warming is happening and 35% of the students understand that global warming is caused mostly by human activities. Hence, it only shows that students have an awareness of climate change. Furthermore, it is important to increase the knowledge of the students about climate change because it serves as the first step to mitigating the causes and effects of climate change.

Moreover, Littrell, et al. (2020) conducted an informal science education program relative to climate change. They found out that the students have greater confidence in their understanding of the causes and consequences of climate change. Additionally, students have a stronger sense of both collective and personal

responsibility to take action to address climate change challenges in their communities. On the other hand, educational programs can boost the awareness of the students to determine the causes and mitigate the effects of global warming.

Meanwhile, Tabago (2016) said that climate change is one of the greatest challenges ever to confront humanity, and its effect is already being seen and may consequently intensify if nothing is done. Moreover, it was revealed that students are strongly agree that they are worried about the effects of global warming and disagreed that global warming is not alarming. Thus, it only shows that students have information on the effects of climate change brought by global warming.

However, in the paper of Palomar and Ingcol (2020) it was revealed that there are students who demonstrated specific misconceptions about the concepts of the effects of rainfall, cyclone, and drought while having no understanding of the concepts of temperature, extreme meteorological condition, and greenhouse gases. But there is a strong significant relationship that exists between students' conceptual understanding of the causes and effects of the concepts of cyclones, extreme meteorological conditions and greenhouse gas. Meaning, the causes and effects of climate change must be learned by the students.

Meantime, Agboola and Emmanuel (2016) said that the sources of information of the students relative to climate change are personal experience, public sources and education. These sources greatly affected their awareness on climate change. Monroe, Plate, Oxarart, Bowers, and Chaves (2019) said that increased interest in climate change education and the growing recognition of the challenges addressing the issue can create an opportunity to conduct a systematic review to understand what research can contribute to our ideas about effective climate change education. Kukkonen, Kärkkäinen, and Kinwomen, (2012) said that the sources of information for students about climate change are television, newspapers, the internet, lectures, magazines, and friends.

The mentioned related literature discussed the ideas of students on the causes and effects of climate change as well as the sources of information. However, there is a need to determine the climate change awareness of senior high school students in selected schools in the Sorsogon Province Division. Like other places in the world and within the Philippines, Sorsogon Province also experienced the effects of climate change.

## Materials and Methods

### Scope and Delimitation

The subjects of this study were 412 officially enrolled Grade 11 and Grade 12 Academic and Technical Vocational Livelihood students of Juban National High School and J.P. Laurel High School during the school year 2022-2023 in the municipalities of Juban and Bulan, respectively, in the province of Sorsogon. Excluded in this study are the other Grade 11 and Grade 12 Academics and Technical Vocational Livelihood students from the other schools across the mentioned province.

### Research Methodology

This study employed a quantitative approach since the questions given were answered by numerical data. Specifically, the researchers utilized a descriptive survey design. The subjects of the study were selected senior high school students in Juban National High School and J.P. Laurel High School for the S.Y. 2022-2023. The researchers of this study used the research questionnaires from the works of Akrofi, Antwi, and Gumbo (2019) and Lopez and Malay (2019) which are available publicly.

Overall, the research questionnaires are divided into 3 parts. Part 1 dealt with the students' views about climate change mitigation while part 2 dealt with the students' levels of agreement on the effects of climate change. Moreover, on the first 2 parts of the research questionnaires, the students had 5 options in answering, namely: 1-Strongly Disagree, 2-Disagree, 3-Neutral 4-Agree, and 5-Strongly Agree. Part 3, it dealt with the students' sources of information about

climate change wherein the students are allowed to have multiple answers. Additionally, the researchers properly cited the sources of the research questionnaires. Moreover, to interpret the data results on students' views on climate change mitigation and levels of agreement on the effects of climate change, levels of agreement on the effects of climate change, the researchers applied weighted mean and the Likert scale below:

4.50-5.00-Strongly Agree

3.50-4.49-Agree

2.50-3.49-Neutral

1.50-2.49-Disagree

1.00-1.49-Strongly Disagree

Furthermore, the researchers applied ranking on data relative to the students' sources of information about climate change. The researchers also added relevant related literature and studies in explaining the gathered data.

### Sampling

The researchers of this study chose the Senior High School students—Grades 11 and 12, both Academics and Technical Vocational Livelihood students. Out of the officially enrolled Senior High School students of Juban National High School and J.P. Laurel High School during 2022-2023, the researchers applied Slovin's formula in determining the number of samples Slovin's formula is used to calculate the sample size ( $n$ ) given the population size ( $N$ ) and a margin of error ( $e$ ). It is computed as  $n = N / (1 + Ne^2)$ .

Whereas:

$n$  = no. of samples

$N$  = total population

$e$  = error margin / margin of error

Furthermore, the researchers employed convenient sampling. Convenient sampling is a type of non-probability sampling that involves selecting participants for a study from those who are readily available and willing to participate.

## Data Collection

The researchers of this study used Google Forms in distributing the research questionnaires. The Google Forms is a survey administration software included as part of the free, web-based Google Docs Editors suite offered by Google. The researchers sent the link of the research questionnaires to be answered by the senior high school students or the respondents. Moreover, the researchers also printed the research questionnaires for the senior high school students who cannot access the research questionnaires online.

## Results and Discussion

This section discusses the results and discussion along with students' views about climate change mitigation, students' levels of agreement on the effects of climate change, and the students' sources of information about climate change.

### Students' Views on Climate Change Mitigation

Table 1 summarizes the views of senior high school students about climate change mitigation. Given the data results, they had an overall weighted mean of 3.13 and were interpreted as neutral. Remarkably, they agree that people can do a bit in order to reduce the effects of climate change (4.04). Moreover, they agree that climate change is inevitable due to the way modern society works (3.65) and neutral that the government is not doing enough to address climate change (3.32).

The data provided by the senior high school students imply that human activities contribute to climate change and the government and the people must work together on climate change mitigation. According to Evseeva, Evseeva, and Dudarenko (2021), human activities contribute to climate change. Examples of many human activities that contribute to climate change include landfills, automobiles, deforestation, production, and livestock. As said by Trenberth (2018), humans are the main agents of climate change and at considerable expense to society and the environment, directly affects storms,

droughts, and heavy rainfall. Thus, people and the government must do things in combating climate change.

**Table 1. Views About Climate Change Mitigation**

Statements	Weighted Mean	Interpretation
We can all do our bit to reduce the effects of climate change.	4.04	Agree
Using renewable energy reduces climate change.	3.15	Neutral
The government is not doing enough to tackle climate change.	3.32	Neutral
Climate change is inevitable because of the way modern society works.	3.65	Agree
Nothing I do on a daily basis contributes to the problem of climate change.	2.80	Neutral
Nothing I do on a daily basis makes any difference to reducing climate change.	2.90	Neutral
It is already too late to do anything about climate change.	2.05	Disagree
Overall Weighted Mean	3.13	Neutral

Fawzy, Osman, Doran, and Rooney (2020) found out that humans can do something in mitigating climate change, primarily by reducing the emission of carbon dioxide. Furthermore, the government must promote and implement the most effective emission-reduction of greenhouse gases strategies (Wynes & Nicholas, 2017). Therefore, senior high school students must be aware on climate change mitigation, the fact that awareness is useful in doing the action. Rahman, Tasmin, Uddin, Islam, and Sujauddin (2014) stated that the creation of climate change awareness among students is essential to mitigation and adaptation plans.

## Students' Levels of Agreement on the Effects of Climate Change

Table 2 summarizes the students' levels of agreement on the effects of climate change. Given the data results, they had an overall weighted mean of 3.75 and were interpreted as agree. Notably, they agree that the climate change lead to droughts and heat waves (4.12), climate change induces the risk of illness and death from extreme heat and poor air quality (4.10), and climate change can result in low crop yields and leads to food insecurity (4.07).

The data provided by senior high school students imply that they are convinced by the effects or consequences of climate change. According to Hersher (2023), extreme weather is becoming increasingly often due to climate change and the unprecedented heat waves and droughts caused by climate change. Meanwhile, Rocque, et al. (2021) found out that climate change has an impact on health. The consequences of climate change on health are respiratory, cardiovascular, or neurological diseases, other infectious diseases, and even death.

Furthermore, according to Kumar, et al. (2020), climate change has effects on agriculture, and so does food security. Climate change affects the water cycle, the soil, the resurgence of pests, and other factors that affect the crops production. Thus, food productions are very vulnerable to climate change. Therefore, senior high school students are informed about the different effects of climate change. According to Lopez and Malay (2019), high school students' sides regarding climate change issues and concerns are a good sign that they are more likely to demonstrate a readiness to take action to address this global issue.

## The Students' Sources of Information About Climate Change

Table 3 summarizes the students' sources of information about climate change. Remarkably, the major sources of information were the internet (96%), television (83%), school (73%), and radio (50%). The data imply that the senior

high school students had different sources of information about climate change.

**Table 2. Agreement on the Effects of Climate Change**

Statements	Weighted Mean	Interpretation
Climate change causes droughts and heat waves.	4.12	Agree
Climate change causes low crop yields and leads to food insecurity.	4.07	Agree
Climate change affects water supply and water quality.	4.03	Agree
Climate change causes a rise in sea levels and ocean acidity.	3.88	Agree
Climate change causes biodiversity loss.	4.02	Agree
Climate change causes flooding.	4.00	Agree
Climate change increases the risk of illness and death from extreme heat and poor air quality.	4.10	Agree
Climate change affects renewable energy sources.	3.86	Agree
Climate change leads to job insecurity.	3.44	Neutral
Climate change cause conflicts and wars.	2.90	Neutral
Climate change cause gender and income inequalities.	2.84	Neutral
Overall Weighted Mean	3.75	Agree

Moreover, the data also imply that the media and schools have a big role in the senior high school students' knowledge and awareness of the causes and effects of climate change which are essential in doing actions combating climate change.

According to Rosenthal (2022), sources of information about climate change are traditional and social media. Moreover, education at school relative to climate change is a great tool for students in understanding and mitigate this worldwide problem (Feinstein & Mach, 2020). Therefore, in this present time, senior high school students have many available sources of information about climate change.

**Table 3. Sources of Information About Climate Change**

Sources of information	Percentage	Rank
Internet	96%	1
Television	83%	2
School	73%	3
Radio	50%	4
Movies	38%	5
Books	36%	6.5
Relatives	36%	6.5
Newspapers	31%	8.5
Peers	31%	8.5
Flyers/Brochures	16%	10
Magazines	10%	11

## Conclusion

Given the data results, the researchers concluded that the senior high school students are neutral on climate change mitigation. Furthermore, they agree on the climate change and have multiple sources of information relative to climate change. Meanwhile, the researchers recommended that the senior high school students must continue in educating in order to improve their views on the different ways of mitigating the effects of climate change through the help of teachers. Moreover, senior high school students must demonstrate a readiness to take action in combating the effects of climate change and must utilize the different available sources of information to further understand the climate change. Lastly, further research must be done using other variables.

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## Conflict of Interests

The researchers are hereby declaring that they do not have any personal conflict of interest that may arise from the application and submission of the research paper.

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