



RESEARCH PAPER

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Climate change awareness and mitigation practices of preservice teachers

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Abstract

A well-informed educator is influential to magnify the positive attitude and practices towards climate change and the easiest way of reaching out with students is through education. Hence, abatement of the ill effects of climate change is necessary in the present time. This study assessed the level of awareness of the preservice teachers on climate change, its impacts and their mitigation practices. The study is a descriptive research design with open and closed-ended survey instruments administered to 500 randomly chosen College of Teacher Education students of CSU Sanchez Mira. Findings reveal that the respondents have a low level of climate change awareness. The reported impacts of climate change in their own perspective are changes in rainfall patterns in the locality, excessive heat and lower incidence of strong typhoons during the past few years. Proper waste disposal, tree planting, inclusion of climate change topics in the school subjects and wider researches along adaptation practices are among the popular mitigation practices they identified. The study concludes that the impacts of climate change are not always negative. The change has led the people to adopt new technologies, crops and livestock that gave them even a higher income. New cropping patterns and production technologies must be studied to suit to the new weather condition.

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Introduction

Climate change is the most urgent environmental problem the world is facing in this decade. Scientists, environmentalists, researchers, teachers, farmers, and students talk about the threats due to this phenomenon which are without doubt affecting the quality of life. Some impacts are already becoming very evident, and the change cannot just be stopped in a year, in a decade or two. The devastating impacts are real and will put the future of human civilization at stake. Unchecked, climate change will pose unacceptable risks to security, economy, and the planet Earth. Hence, the challenge posed upon the authorities and the people now is how to mitigate and adapt to climate change.

The Philippines is a country that is most vulnerable to the effects of climate change. (AFP, 2008). It is one of the countries that suffer the most from extreme weather events, with a very high death toll and economic losses caused by the effects of climate change. Responding to climate change is about making choices in the face of risks. Any course of action carries with it potential risks and costs, but doing nothing may pose the greatest risk from climate change and its impacts.

To develop a positive attitude towards the environment, one should acquire sufficient knowledge on environmental issues. The implementation of sound and effective climate change practices requires the construction of new knowledge and understanding within the learners' existing beliefs, incomplete knowledge and beliefs. As existing knowledge serves as a foundation for the integration of new concepts, there is a need to assess prior knowledge at an early part of the educational process in order to assess misconceptions that may be barriers to deeper learning.

With this challenge, it is imperative to develop action plans that will assist people to cope with different scenarios of climate change that are prevalent in the country. However, developing such action plans will require information from the people since the ability to adapt and cope with climate change depends on

several factors such as technology, education, access to resources, management capabilities and not to forget the level of awareness of the people. Aside from creating awareness and ultimately an advocacy on environment stewardship, schools through research also tried to study and understand the perception, attitudes and conceptual knowledge of students as regards climate change. Magulod (2017) found out that there is a significant relationship between climate change awareness and environmental attitude of the respondents. Suggesting that the higher awareness the students on climate change, the higher environmental attitude they exhibit. Hence, by providing knowledge to students about climate change, the higher they demonstrate positive attitude towards environmental care is expected.

The study assessed the level of awareness on climate change of the College of Teacher Education students and their parents. Furthermore, it determined the impacts of climate change as observed by them and their parents affecting agriculture, fisheries, forestry and general environment. Finally, it identified the mitigation and adaptation practices employed by the respondents.

Materials and methods

Research Design

The research utilized the descriptive survey method. The questionnaire developed by the researcher contains indicators suited to the local condition of the survey site.

Respondents and Sampling Procedure

Five hundred students from the College of Teacher Education, randomly chosen from the 1,200 students, with their parents were included in the survey. They were chosen because their level of awareness and knowledge of climate change are necessary since they are future educators. Knowing their level of awareness will give feedback to the college if topics along climate change are to be strengthened in their curriculum.

Gathering Procedure and Ethical Consideration

The researcher personally administered the questionnaire to the randomly chosen student respondents.

After organizing the responses of the students, the sets of questionnaires which were identified to have new information were given special attention. The researcher reached out for the parents of these students and interviewed them to elicit their most truthful answers. In compliance with research ethics protocol, the researcher obtained clearance certificate from the University Review Ethics Committee. The researcher also obtained informed consent from the respondents prior to the gathering of the needed data for this study.

Data Analysis

The level of awareness of the students on climate change which was measured with a 3–point Likert scale was analyzed using frequency counts and weighted means. The observed impacts were analyzed whether the students were aware of it, considered by them to be highly beneficial, beneficial, high risk, medium risk or not applicable in the locality. These were presented in graphical form to become photogenic to the readers. The mitigation practices and results were written down as based on the responses of the parent-respondents.

Results and discussion

Level of Awareness of Students on Climate Change

While everybody around the globe talks about the negative effects and the risks of climate change, majority of the respondents (69.2%) agreed that climate change has improved the weather condition in the locality. This is because according to most of them, they enjoyed summer days without so much heat during the last three summer vacations. There were likewise several instances when typhoons were

announced and classes were suspended, but the weather turned out to be fine. They in fact agreed that climate change is good for them. This finding differs from the 2013 Social Weather Station’s (SWS) report showing that eight out of 10 Filipinos have personally experienced the adverse effects of climate change (Flores, 2013). Moreover, to understand better why there were some students who did not agree with the positive statements, the researcher reviewed their responses and the result showed that they were mostly from the first and second year levels and from other places; hence, they were not aware of the local weather conditions during the past two-three years.

Majority of the respondents also considered climate change as just a natural fluctuation of the earth’s temperature, while more than half of them agreed that climate change is a result of using fertilizers and chemicals in the farms, and 46.8% accounted it to poor waste management. The popular claim of the people that climate change is due to deforestation and the many transportation facilities moving around is not being recognized by the respondents to be evident in Sanchez Mira.

When all the responses were analyzed for the total level of awareness of the respondents on climate change, with reversed scoring done for statements not against climate change, the result showed that there is a low level of awareness on climate change among the respondents. This implies that the students of Cagayan State University at Sanchez Mira have low awareness on what is considered by many as a serious problem.

Table 1. Level of awareness of students on climate change.

Indicators	Agree (High)	%	Uncertain (Average)	%	Disagree (Low)	%	Weighted Mean	Level of Awareness
1. Climate change is inevitable because of the way modern society works	125	25	78	15.6	297	59.4	2.25	Uncertain (Average)
2. Climate change will improve the weather *	346	69.2	42	8.4	112	22.4	1.55	Not Aware (Low)
3. Climate change is just a natural fluctuation in earth’s temperatures*	298	59.6	115	23	87	17.4	1.75	Uncertain (Average)
4. It is caused by activities of man	124	24.8	161	32.2	215	43	2.25	Uncertain (Average)

5. It is already too late to do anything about climate change	412	82.4	25	5	63	12.6	2.82	Aware (High)
6. Human activities have no significant impact on global temperatures *	215	43	43	8.6	242	48.4	2.54	Not Aware (Low)
7. Climate change is something that frightens me	157	31.4	78	15.6	265	53	2.31	Uncertain (Average)
8. It is the result of using fertilizers and chemicals in the farms.	285	57	140	28	75	15	2.57	Aware (High)
9. I am sure climate change is really happening	128	25.6	101	20.2	271	54.2	2.26	Uncertain (Average)
10. It is due to the many transportation facilities moving everyday.	103	20.6	99	19.8	298	59.6	2.21	Aware (High)
11. The effects of climate change are likely to be catastrophic	112	22.4	52	10.4	336	67.2	2.22	Uncertain (Average)
12. . Climate change is good for us.	228	45.6	87	17.4	185	37	2.28	Uncertain (Average)
13. It is caused by persistent deforestation	124	24.8	87	17.4	289	57.8	2.25	Aware (High)
14. It is due to poor land use and management	342	68.4	64	12.8	94	18.8	2.68	Aware (High)
15. Climate change is the result of poor waste management.	231	46.2	79	15.8	190	38	2.46	Aware (High)
Overall Awareness							2.29	Uncertain (Average)

- The scoring was reversed for positive statements.
- The items were patterned after the survey questionnaire on climate change from www.esds.ac.uk

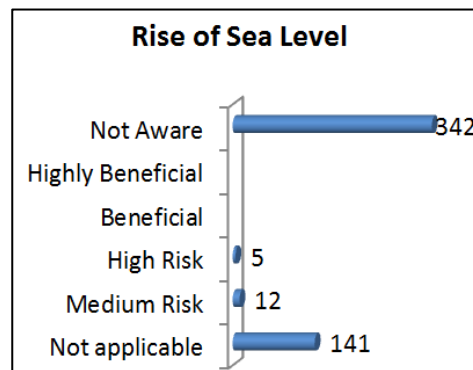
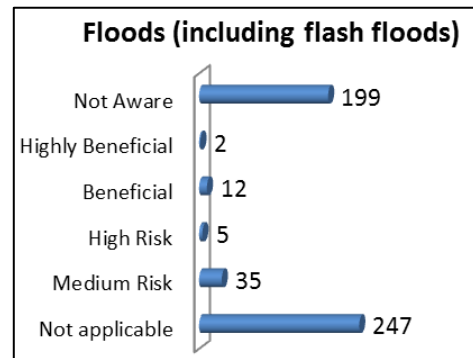
Perceptions on the Impacts/Effects of Climate Change

To determine the impacts of climate change, the respondents were asked to rate each impact as to whether these are “Not Applicable”, “Medium Risk”, “High Risk”, “Beneficial”, Highly Beneficial” or “Not Aware” of it.

While there are many local and international reports given by media personalities about the negative effects of climate change, this study found out that almost 50% of them indicated that flood is not applicable in the locality, and 20% are not aware that flood is a problem in Sanchez Mira. This is because during the past two-three years, rainfall is distributed throughout the months but no flooding was recorded.

This negates the findings of Owolabi *et al.*, (2012) saying that floods will become more common due to changing rainfall patterns. The respondents were not aware about the rise in sea level; melting of ice and heat waves are not applicable. Very few considered spread of diseases as medium risk. Rated beneficial and highly beneficial are the changes in rainfall, change in weather patterns, and lowering of temperature.

From these data, it is revealed that the respondents considered the effects of climate change in Sanchez Mira as positive and beneficial.



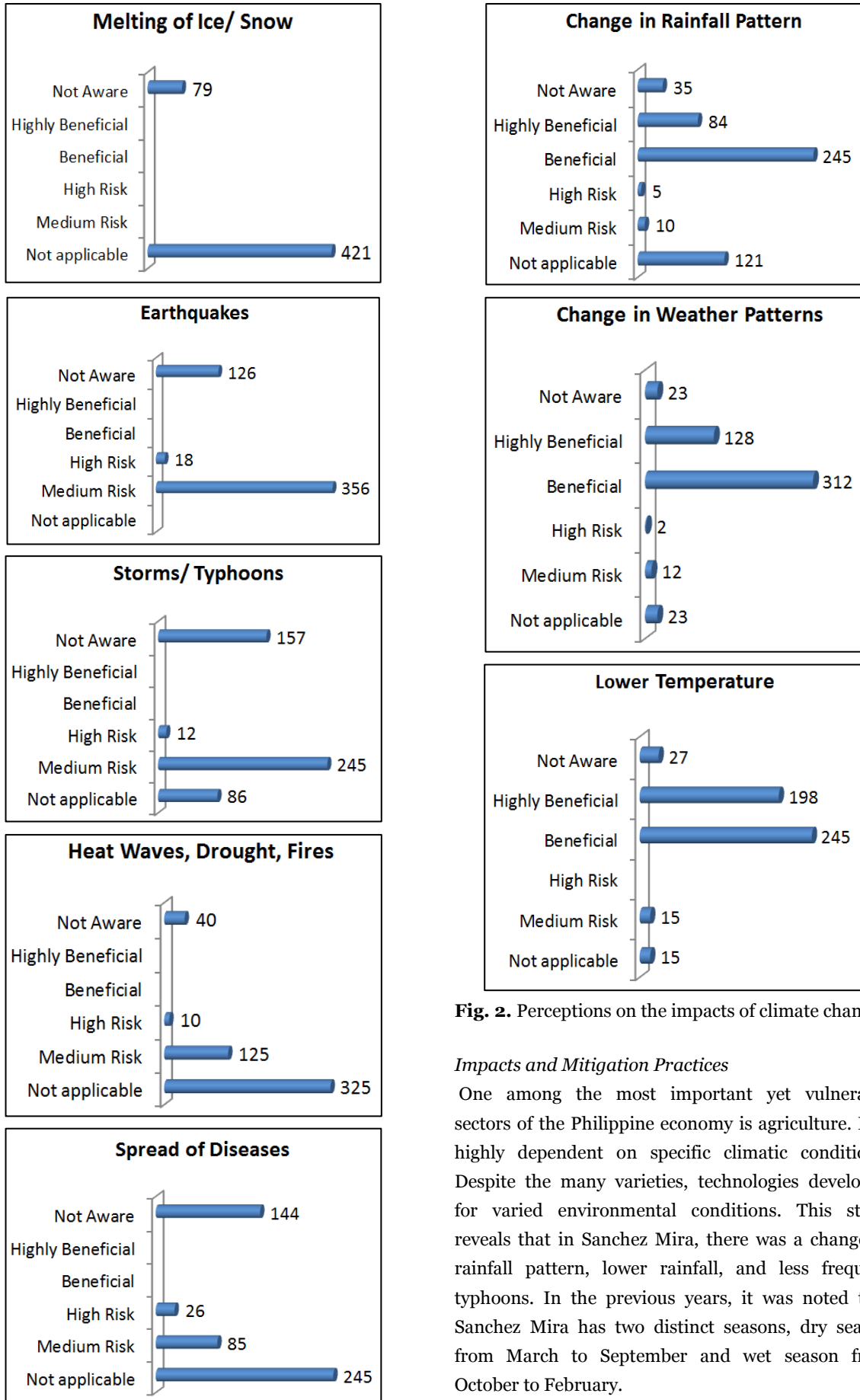


Fig. 2. Perceptions on the impacts of climate change.

Impacts and Mitigation Practices

One among the most important yet vulnerable sectors of the Philippine economy is agriculture. It is highly dependent on specific climatic conditions. Despite the many varieties, technologies developed for varied environmental conditions. This study reveals that in Sanchez Mira, there was a change in rainfall pattern, lower rainfall, and less frequent typhoons. In the previous years, it was noted that Sanchez Mira has two distinct seasons, dry season from March to September and wet season from October to February.

In the last two to three years, however, it was observed that the usual summer days in which almost no rain can be experienced for an average period of one to two months, turned into rainy days. This resulted to lower rice production because they are flooded just before the harvest period.

On the other hand, the growing period of rice which is scheduled on the rainy days was not as expected because the plants did not reach their maximum yield potential. As Yeo (2013) mentioned, climate change impacts are expected to affect harvests. Since the farmers did not get a good harvest from their rice production, they invested into fruit and vegetable growing, and this resulted to increased production and better quality of fruits and vegetables. Other rice farmers went into poultry and livestock production while the season did not allow them to plant rice. This likewise resulted to higher poultry and livestock production which gave them a higher income than from rice. This implies that the farmers took the risk in investing into new ventures just to cope with the changes in climatic conditions which would not happen if the weather did not change. As regards fisheries, the change in climatic condition in the locality has led the fisher folks to use floating fish cages and aquafloat feedstuffs for their milkfish and tilapia cultures, rather than the usual fish ponds on the ground. This new investment according to the respondents resulted to a better income in milkfish and tilapia production.

In terms of forestry, particularly on orchard production, it was reported by the farmers that they

had better stand of fruit trees like bananas, rambutan, oranges, mangoes, santol, and many other fruit bearing trees. This conforms to the study conducted by the Social Weather Station during the first quarter of 2013 where it was revealed that most Filipinos mentioned “planting trees” as the primordial way of mitigating climate change (Social Weather Station, 2013). The change in climatic condition in the locality has changed the landscape of orchard production from small bananas to big bananas. It appeared that the very suitable climatic condition for fruit production in the Southern Philippines like Davao, Cagayan de Oro and Bukidnon, was transferred to the North Luzon particularly to Sanchez Mira, Cagayan and its neighbors. Since fewer typhoons hit the area, more farmers went into fruit tree planting which resulted to better soil cover hence lesser soil erosion.

The overall environment is also affected by climate change (Climate Change Commission). Since there was a change in rainfall pattern and less frequent typhoons in the locality, the respondents want it will never change anymore; hence, they practice zero waste management and do not burn their trashes, and they are back to organic farming. All these events and observations that are happening in the area negate the many reports about climate change. The experiences of people are indications that climate change may not be always negative. The effects or the threats could lead to better opportunities if only the people were smart enough to cope with the challenges of nature.

Table 2. Sectors affected by climate change, mitigation practices, and results.

Sectors Affected	Observed Climate Changes	Mitigation Practices Done	Results
1. Agriculture	<ul style="list-style-type: none"> • Changes in rainfall pattern • Lower rainfall • Less frequent strong typhoons 	<ul style="list-style-type: none"> ➢ Change in cropping pattern ➢ Change rice to fruits and vegetables ➢ Change rice to poultry and livestock 	<ul style="list-style-type: none"> ➢ Decreased rice production ➢ Increased poultry and livestock production ➢ Increased fruit and vegetable production
2. Fisheries		<ul style="list-style-type: none"> ➢ Used floating fish cages ➢ Used aqua-float feeds 	<ul style="list-style-type: none"> ➢ Increased milk fish and tilapia production
3. Forestry		<ul style="list-style-type: none"> ➢ Tree planting ➢ Stopped <i>Kaingin</i> system 	<ul style="list-style-type: none"> ➢ Better forest stand ➢ Decreased soil erosion
4. General Environment		<ul style="list-style-type: none"> ➢ Zero waste management ➢ No burning of trashes ➢ Stop using CFCs ➢ Back to organic farming 	<ul style="list-style-type: none"> ➢ Better health ➢ Lower incidence of illnesses/Diseases

Conclusion and recommendation

Based on the foregoing findings, this study concludes that the impacts of climate change are not always negative. The changes in the climate have led the people in Sanchez Mira to embrace new technologies, crops and livestock. This gave them even a higher income as this made them divert to other productive practices instead of focusing on the ill effects of climate change that are reportedly happening in other places. Having set the conclusions on this study, it is hereby recommended that topics on climate change should be included in the curriculum. Furthermore, it is recommended that a part of the University Extension Program must focus on climate change.

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