Study Note

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Teachers' Understanding and Preparedness on Global Climate Change and Its Related Risks

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Abstract:

Teachers' awareness and preparedness on environmental issues, such as climate change, are vital for the development of an understanding on a larger scale, especially when young children are considered. This study examines secondary science teachers' understanding of climate change in the global context and their preparedness on its related risks. A questionnaire survey adopted from Evaluation of PBS Teachers Line's Global Climate Change Education Professional Development and SEERISK project by the South East Europe Transnational Cooperation Programme was administered to test teachers' knowledge of the science of climate change, including causes and effects, evidence for global climate change and factors that are needed to mitigate and adapt to climate change. The survey also examines sense of safety and preparedness to natural hazards, source of information and communication.

Findings indicated that teachers understand climate change. Yet, a very low 26.8% mean percentage score is observed for questions under consequences of human influence on climate change. Most teachers are not able to determine precisely whether they are fully prepared for natural disaster. Majority of them feel that they do not get enough information from official sources about the potential hazards and the ways to get prepared for them.

Keywords: Teacher's understanding and preparedness, Global climate change, Related Risks, Survey, Camarines Sur, Philippines

Introduction

Global attention on climate change in recent decades has been accelerated by natural disasters becoming frequent and devastating. In 2007, the United Nations Development Program (UNDP) recognized climate change to be one of the 21st century's key challenges to development the world over. In continuing response, numerous conferences leading to several protocols, campaigns, reports and researches have been initiated by United Nations and environmental organizations.

The Intergovernmental Panel on Climate Change (IPCC) together with a wide consensus among scientists and advocates report that climate change is happening and is being driven by unjustifiable practices of mankind which include; the burning of fossil fuels, deforestation, land use change, and industrial pollution. Hence, climate change is commonly defined as the anthropogenic alteration of global climate system through increased concentration of greenhouse gases in the atmosphere

leading to global warming. As a result, the earth is expected to warm by about 2-3^0 C by the end of 21st century (IPCC, 2007). This change will result in intense and frequent typhoons, loss of biodiversity and changes in agricultural production, which would lead to increase the level of poverty especially in the developing countries.

The Philippines, still a developing country, is highly at risk to climate change related disaster. Because of its location, geographical circumstance-located in the World's Ring of Fire, where earthquakes and volcanic eruptions are frequent, and being in the Inter-Tropical Convergence Zone, ITZC, or the area where the northern and southern hemisphere winds meet-, socio-economic and environmental conditions. In the United Nations World's Risk Report in 2014 the country is now ranked number 2. Every year in varying frequency and intensity, the country is devastated by typhoons, heavy monsoon rains, earthquakes, etc., destroying lives and properties. Thus, climate change seemed an easy concept for everyone to get well aware of. Yet only one in two Filipinos is aware of climate change, with knowledge level highest in Metro Manila, the capital, and lowest in Mindanao (Pulse Asia Inc., 2010). The same survey also shows that the knowledge of climate change in the Philippines is a function of urbanity and educational attainment. Secretary Lucille, vice chairperson of the Climate Change Commission noted that "majority of Filipinos have personally felt the effects of climate change, and yet most have done nothing to reduce it. Worse still, a portion of population do not know what climate change is. This lack of knowledge and confusion is mirrored in other sections of society, including some businesses, local public offices and journalists who report on the issue" This was proven by a recent survey commissioned by the World Bank revealing that from the 85% of the respondents have suffered from climate change, only 12% said they have extensive knowledge about climate change, 35% had partial but sufficient knowledge, 38% have only little understanding and 14% have almost no understanding of the issue. This little understanding offers a great challenge in the country's climate change preparedness and mitigation efforts.

Similar sentiment is echoed by the Asian Development Bank in 2013, saying that "the Philippines needs a strong national response to climate change, something that is lacking despite the fact that it is entirely vulnerable to its effects". The low level of awareness of Filipinos on climate change can be attributed to many problems pressing the country from poverty to political conflicts. Many Filipinos are concerned on how to secure enough and decent meal every day. In the process, many have completely disregarded the environmental impacts of their actions and methods on how to raise money.

The Philippine government recognizes climate change as development issue. Hence, as a response: RA 9729-Climate Change Act of 2009 or the "Act Mainstreaming Climate Change into Government Policy Formulations and Creating the Climate Change Commission"; RA 10121-"Philippine Disaster Risk Reduction and Management Act of 2010" "An Act Strengthening the Philippine Disaster Risk Reduction and Management System, Providing for the National Disaster Risk Reduction and Management Plan, Appropriating Funds, Therefore and Other Purposes"; and Republic Act No. 10174 or the People's Survival Fund Act is otherwise known as "An Act Establishing the People's Survival Fund to provide long-term finance streams to enable the government to effectively address the problem of Climate Change, Amending for the purpose Republic Act. No. 9729, otherwise known as the Climate Change Act of 2009", have been enacted. All of these laws outline activities to be taken to mitigate and build resilience to the impacts of climate change.

These initiatives however, will not be complete if people will not be properly educated about climate change. Awareness on climate change through education is an important measure to persuade people to take an active role in climate change mitigation and adaptation measures, including disaster preparedness and management. In this way, people will understand the causes and consequences of climate change, prepares them to live with the impacts, of climate change and consequently will empower women, men, children and young people to adapt more sustainable lifestyles. Make the Link Be the Ways Project in 2009 noted that " a well-educated/informed children are often in a better position than their parents to both address climate adaptation/disaster risk reduction locally, as well as understand global issues. The bottom line is that-

Education is a key in climate change preparedness.

Additional initiatives have been undertaken by the DepEd to mainstream climate change education at all levels of basic education through the K-12 curriculum. The high correlation however, between teacher effectiveness and student learning outcomes must be considered in the implementation of this initiative. Since teachers are considered second population influence especially when students are in question, this also means that teachers should and must possess the necessary knowledge and competencies to teach climate change.

Whenever disaster strikes or in any emergency situations, young children and the elderly are always at high risk and greatly affected. In these times, schools usually become temporary refuge providing safety and shelter to those displaced by disasters. This means that schools must be ready even before any disaster occurs. School officials, teachers and school children must be trained on basic life-saving skills. Schools should therefore be treated as a zone of safety.

In 2008, the Department of Education as supported by UNICEF created the Disaster Risk Reduction Resource Manual under the Safer Schools Program. It was based on the Hyogo Framework of Action formulated during the World Conference on Disaster Reduction held in Kobe, Hyogo, Japan in January 2005. The manual is intended to provide school administrators, supervisors and school teachers the information needed to reduce risks and make schools safer. It promotes hazard/disaster awareness, manage impacts and reduce the risks of threats from natural and human made/induced disasters. The resource manual spells out the role of the Department's Central Office, Regional Offices, and Division offices down the school level. It illustrates the basic procedures that a school may employ before, during and after the occurrences of a disaster based on the adopted 4-phase strategy: Mitigation, Preparedness, Response and Rehabilitation. It focuses on awareness and preparedness on natural hazards and its related risks amplified by climate change.

This manual alone ensures that teachers are well aware of climate change and its related risks. However, does it really serve its purpose? While several researches have been undertaken to assess the level of awareness and understanding of climate change among Filipinos, including pre-service teachers, limited researches have been done to assess the level of understanding on climate change exclusively among teachers. The information on this subject will surely provide authorities on what initial steps to be taken before the final implementation of the program. This study is designed to fill this gap by assessing teachers understanding on global climate change and its related risks in the province of Cam. Sur.

Objectives of the Study

The study examines secondary science teachers' understanding on global climate change including its causes and effects; evidence for global climate change; and factors that are needed to mitigate and adapt to it. It also delves to examine teachers' sense of safety and preparedness to natural hazards, source of information and communication.

Methodology

The study used a survey research design and was carried out in the 15 secondary schools in the province of Camarines Sur, namely: Pili National High School, La Paz, Pili, Camarines Sur; Altamarino-Clasio High School, Curry, Pili, Camarines Sur; Victor Bagacina Memorial High School, Himaao, Pili, Camarines Sur; Binanuanan National High School, Binanauanan, Pili, Camarines Sur; Computer Science High School of Bicolandia, San Jose, Pili, Camarines Sur; Dna Basilia S. QUilon Memorial High School, Bagong Sirang, Pili, Camarines Sur; Rodriguez, National High School, Cadlan, Pili, Camarines Sur and Pamukid National High School, San Fernando, Camarines Sur; Hanawan High School, Hanawan, Ocampo, Camarines Sur; Ocampo National High School, Ocampo, Camarines Sur; Sta. Cruz National High School, Canaman, Camarines Sur; Agdangan High School, Agdangan, Baao, Camarines Sur; Baao National High School, Sta. Cruz, Baao, Camarines Sur; Justo V. Imperial Memorial High School, San Vicente, Baao, Camarines Sur and San Rapahael National High School, San Fernando, Camarines Sur.

A total of 50 secondary science teachers are the respondents of this study. All coming from public schools 19 are males and 31 are females. Age ranges

from 30-39 (42.8%), mostly married (80.95%) and 57.14% are living in their homes for 21 years or more.

The instruments used for data collection were adopted from the PBS Global Climate Change Education Professional Development and Climate Change Related Risks Awareness Questionnaire from SEERISK project by the South East Europe Transnational Cooperation Programme. It was administered during the Climate Change Awareness, Education and Training- Workshop on October 26-28, 2014 funded by the International and Research Exchanges Board of US Dept. of State.

Results and Discussion

The research focused on two domains: (A) Teachers' Understanding on Global Climate Change; and (B) Teachers' Preparedness on Climate Change Related Risks. The teachers' understanding on global climate change examined the key causes of global climate change; consequences of human influence on global climate change; evidence used to verify the occurrence of global climate change; mitigating climate change and addressing global climate change through adaptations.

The teachers' preparedness on climate change related risks also examined knowledge of teachers about the global climate change teachers' sense of safety; awareness and preparedness on climate change related risks and natural hazards; and volunteering status on related risks/ disaster prevention and relief action.

A. Teachers' Understanding on Global Climate Change

Increasing people's awareness on climate change through education is an important measure to persuade people in the community to play an active role in mitigating and adapting to climate change. Before integrating climate change knowledge into school curriculum, especially at basic education level, it is paramount to assess teachers' awareness and perception of climate change since this is likely to influence how teachers conduct knowledge transfer in the classroom, Pauker and Maina (2013).

1. Teachers response on the "Key Causes of Global Climate Change"

All teachers identified-increase in CO_2 levels due to emissions from fossil fuels-as one of the key causes of global climate change. The other correct answers, in bold, also got high percentage score: b-91.3%, d-73.9% and f-73.4%. Yet, a lot of teachers also selected the other choices as key causes of climate change indicating confusion and or lack of factual information on the subject matter.

Table 1a. Teachers' response on the "Key Causes of Global Climate Change"

Which of the following are the main causes of global climate change?	Correct Response (%)
a. Increase in CO_2 levels due to emissions from fossil fuels	100
b. Deforestation	91.3
c. Coral bleaching in marine ecosystem	60.9
d. Agricultural production of methane from animals and rice cultivation	73.9
e. Increase ocean acidification	47.8
f. Industrial practices producing nitrous oxides	73.4
g. Warmer weather earlier in spring and later in fall	60.9
Mean average	72.6

Despite the high percentage in answering correct answers of the teachers, only three out of 50 teachers got perfect responses. The high percentage of the wrong choices seems unclear whether teachers really know the causes of climate change. Similarly, Sağla, et.al. (2008) surveyed the causes of climate change and the result have revealed that many people hold misconceptions about the climate change science and are especially confused about the nature, reasons and results of it.

2. Teachers' response on the consequences of human influence on global climate change

The correct answers on the consequences of

human influence on global climate change, as shown, were almost not selected by the teacher-respondents. They got very low percentage to correct answers in four answers (a, b, e & f) except on human health is affected by global climate change due to an increase in serious infectious diseases (95.7%).

This data translates into only at least 4 teachers (8.7%) recognized the ocean tipping point concerns and migration of birds as major consequences of human influence on global climate change. Worst, only 2 teachers (4.3%), identified spreading disease as harbinger of climate change. No one got the correct responses in this question. Overall, this information revealed lack of global awareness among teachers on the impacts of climate change which are considered man-made or anthropogenic.

Table 2a. Teachers' response on the "Consequences of human influence on global climate change"

Consequences of human influence on global climate change	Correct response (%)
a.) The ocean tipping point is of concern because: ii. Arctic sea ice allows the ocean to take up more heat, without sea ice the ocean will heat up faster.	8.7
b.) The primary cause for changes in timing of bird migration is: iii. Warmer weather earlier in spring and later in fall	8.7
c.) Which of the following are ecosystem consequences of climate change: i. Spreading of disease, earlier spring arrival, plant and animal range shifts, coral reef bleaching.	30.4
d.) Human health is affected by global climate change in the following ways: iii. Increase in serious infectious diseases.	95.7
e.) Which of the following is considered a harbinger of climate change? ii. Spreading disease	4.3
f.) A climate change "fingerprint" is: i. A direct manifestation of a widespread and long-term trend toward warmer temperatures.	13.04
Mean average	26.8

3. Teachers' response on the evidence used to verify the occurrence of global climate change

The choices in bold are the correct answers. The table shows that majority of the choices, either right or wrong, was selected by the respondents. Their responses indicated that the respondents are not aware of the evidence of global climate change. Out of the 50 respondents, only 7 got the perfect answers.

Table 3a. Teachers' response on the "Evidence used to verify the occurrence of global climate change"

Which of the following are used as evidence of global climate change?	Correct response (%)
a. Decrease in sea levels	86.96
b. Global sea level rise	82.6
c. Increasing levels of carbon dioxide	100
d. Lower global surface air temperatures	86.96
e. Decrease in droughts and monsoon events	86.96
f. Warming of the oceans	78.3
g. Cooling of the oceans	95.65
h. Increase in Greenland and Arctic ice sheets	95.65
i. Decline of snow cover in both hemispheres	82.6
j. Decrease in ocean salinity near the equator	91.3
k. Movement of animals and plants to higher elevations	69.6
Mean average	86.96%

4.Teachers' response on mitigating climate change

The choices (c) Increased use of renewable heat and power sources (73.9%) and (e) More fuel-efficient vehicles (56.5%) are the options with high percentage correct response while choices (b) Fuel switching from coal to gas and (e) More fuel-efficient vehicles, both got a correct response of 26.1%, which is the lowest. The choices (b) Fuel switching from coal to gas and (e) More fuel-efficient vehicles are practical human activities which are not widely known to teachers. Teachers are unaware of these activities since (i) Underground cabling for utilities has the highest percentage, 95.7%, and is not a mitigation measure.

Table 4a. Teachers' response on "Mitigating Climate Change"

Items	Correct response (%)
a. Rainwater harvesting	86.96
b. Fuel switching from coal to gas	26.1
c. Increased use of renewable heat and power sources	73.9
d. Relocation of people along coastal areas	69.6
e. More fuel-efficient vehicles	56.5
f. Heat-health action plans	52.2
g. Crop relocation and erosion control	65.2
h. Carbon capture and storage	26.1
i. Underground cabling for utilities	95.7
j. Landfill CH4 recovery	60.9
Mean average	61.3

5.Teachers' response on addressing global climate change through adaptations

Most teachers incorrectly agreed that strengthening overhead transmission lines, underground cabling for utilities is an adaptation measure that would address global climate change (60.2%). The correct answer in this question though, Water storage and conservation techniques, water re-use; desalination, was selected by 52.2% of the respondents, half of them agreed that this can address global climate change. A high percentage even on the wrong answers suggests teachers' inability to identify measures that could address this environmental problem.

Table 5a. Teachers' response on "Addressing global climate change through adaptations"

Choose the most critical adaptations needed to address global climate change:	Correct response (%)
a. Water storage and conservation techniques, water re-use; desalination	52.2
b. Creation of wetlands as buffers against sea level rise; dune reinforcement	56.6
c. Diversification of tourism attractions; shifting ski slopes to higher altitudes	40.0
d. Strengthening overhead transmission lines; underground cabling for utilities	60.2
Mean average	52.2

6. Summary

Table 6a-Summary of Teachers Responses-revealed a mean average score of only 59.9%. In an ordinary evaluation this would mean-Passed. However, knowing that the respondents are science teachers and claimed to have been teaching the topic and experienced first-hand the devastating impacts of climate change and natural disasters, the score is quite unimpressive. A 26.8% correct response on the-consequences of human influence on global climate change-indicated poor

Table 6a. Summary of Teachers Responses

Items	Correct response (%)
Key Causes of Global Climate Change	72.6
Consequences of human influence on global climate change	26.8
Evidence used to verify the occurrence of global climate change	86.96
Mitigating Climate Change	61.3
Addressing global climate change through adaptations	52.2
Mean average	59.972

acknowledgement of one's own contribution to the problem. Better yet, they simply do not know.

B. Teachers Preparedness on Climate Change Related Risks

1. Knowledge of teachers about the global climate change

All respondents answered "YES" to the question, "Have you ever heard about global climate change? The respondents are science teachers teaching climate change but the highest percentage of source of information is the broadcast media while school/ education comes 2nd. (Table 1b). Antilla (2008), Gavin (2009), Lyytimäki & Tapio (2009) studies concluded that the mass media affects public comprehension of climate change. However, the role of teachers in the transfer of knowledge to the students is immense, thus a special interest should be given to the teachers. Sanders & Rivers, (1996) and Westerlund (2002) studies indicated that there is a direct and positive relationship between teachers' effectiveness and students' learning outcomes.

The lowest rate of source of climate change is from authority information despite of the advocacy's and government programs initiated.

Table 1b. Sources of Information about global climate change

Source of Information	Percentage
Broadcast Media	100
Internet	86.95
Newspaper, etc.	82.60
Friends, Colleagues	78.26
School, Education	91.30
Authority Information	60.86

The influence of global climate change on everyday life is very strong (Figure 1). The respondents are aware that it has a great effect on them. Despite the low percentage of teacher's responses on the key causes of global change (Table 2a), majority of the teachers recognized that it has a strong influence in their lives.

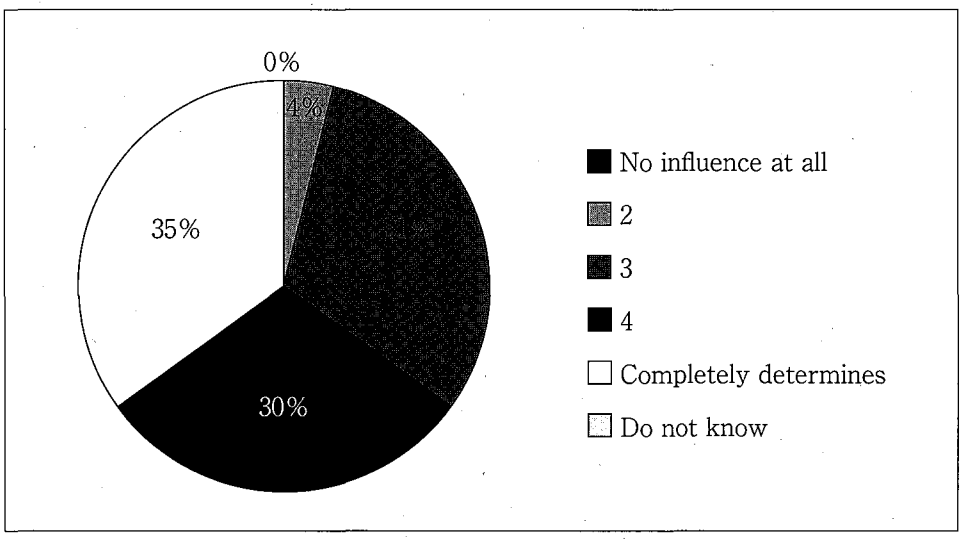

Figure 1b. Evaluation of the Influences of global climate change

Table 2b. Responses to the question "According to your personal experience has the weather changed in the past 20-30 years/ since your childhood?" (%)

No change has happened	0
2	0
3	26.08
4	39.13
Weather has completely changed	34.78
Do not know	0

Majority of the respondents answered that the weather has completely changed in the past 20-30 years. The respondents ages from 30-39 and they said that the change in the weather is very noticeable. Specifically, one teacher said that "Before, we seldom use electric fans at home". Also, they mentioned about the strength and typhoons. As what they experienced before, typhoons in the Philippines happened from October to December contrary to unpredictable coming of typhoon nowadays and becoming stronger every year.

2.Teachers' sense of safety, awareness and preparedness on climate change related risks and natural hazards

The respondents feel that natural hazards are very influential on their safety. None of them answered that natural hazards have no influence at all. This can be traced that Philippines is prone to hazards. Among the hazards being experienced, typhoon (60.86%) is the hazard that influences mostly the sense of safety. This is followed by floods (47.82%) and flash flood (34.78%) (Table 2a).

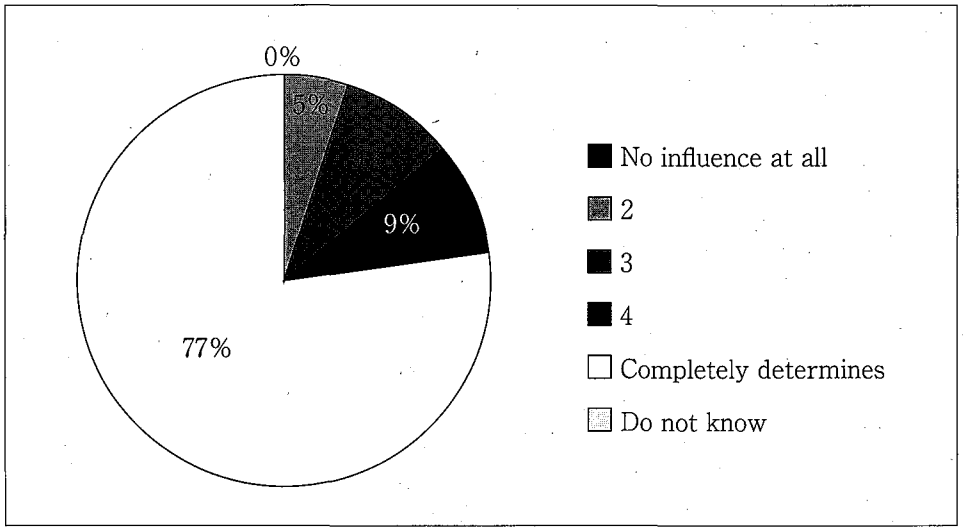

Figure 2. Evaluation of the Influence of natural hazards on sense of safety

When respondents were asked about whether they experienced typhoon or not, all of them answered, Yes. They counted numerous strong typhoons and other hazards that affect their lives. As identified by the Philippine Atmospheric Geophysical and Astronomical Services Administration that Bicol Region, in particular Camarines Sur is a typhoon and a flood-prone area.

Table 3b. Natural hazards which can influence sense of safety

Hazard	Percentage
Typhoons	60.86
Floods	47.82
Flash flood	34.78

Respondents' life and properties were endangered by typhoon (77.77%) and floods (58.82%). These natural hazards damaged their homes, caused economic damages and took lives.

Table 4b. Natural Hazards which can cause serious consequences

Hazard	People who have ever endangered by natural hazards in their life	Consequences
Typhoons	77.77	Demolished or seriously damaged homes Caused other economic damages
Floods	58.82	Caused other economic damages Took lives
Droughts	56.25	Caused other economic damages
Extreme Thunderstorm	50	Demolished or seriously damaged homes Caused other economic damages
Sudden Unexpected Flooding	35.29	Caused Injuries Demolished or seriously damaged homes Caused other economic damages

None of the respondents answered that they are fully prepared for natural hazards. They feel that they are on the mid-way in terms of preparedness (Table 2c). Interestingly, teachers are not fully prepared for the natural hazards though they've experienced it many times in their lives. One teacher responded that their experience in typhoons and other disasters vary that is why they cannot fully say that they are fully prepared for it.

Table 5b. Evaluation of the feeling of preparedness for natural hazards

Preparedness Level	%
I am not prepared at all	4.34
2	21.73
3	52.17
4	21.73
I feel fully prepared	0
Do not know	0

The measures/ precautions they take to protect from natural disasters are through caretaking around the house and by means education (100%) in Table 6b. The measure (Through caretaking around the house) is done during the occurrence of typhoon while the measures: Avoidance of waste dumping in public land, Avoidance of unsafe storing of hazardous materials and careful selection of the construction site of your residential building are the measures that can be done to prevent greater damage of natural hazards.

Respondents said that education is important also to understand how strong the typhoon would be or the typhoon signals and other information on the news, e.g. location and time and coordinates.

Table 6b. Measures/ Precautions taken to protect from natural disasters

Measures/ Precautions	%
Through caretaking around the house	100
Education for self-protection	100
Avoidance of waste dumping in public land	95.23
Avoidance of unsafe storing of hazardous materials	95
Careful selection of the construction site of your residential building	90.47

All respondents follow the official weather forecasts and warnings regularly to prepare for the consequences (100%) and prepare a strong "survival" tools (including candle, match, electric torch, batteries, warm blanket, etc.) during the disaster (95.65%) (Table 2e). In the interview conducted, respondents said that they experienced disaster mostly at night and electrical supply is cut off that is why they prioritized to prepare for "survival tools" over stock of foods and drinking water and paying attention to vulnerable members of the family.

Furthermore, they said that it doesn't mean that paying attention to vulnerable members of the family is less important rather they prefer to stay together in the house than leaving other family members in other place which the authorities may deem stronger and better than their houses. They better stay together and look into the welfare of each other during disaster.

Table 7b. Preparedness for the consequences of a disaster event

Measures/ Preparedness	%
Following the official weather forecasts and warnings regularly	100
Medication and First Aid kit at home	82.6
Stocks of foods and drinking water	91.3
Strong "survival" tools (including candle, match, electric torch, batteries, warm blanket, etc.)	95.65
Paying special attention to the vulnerable members of the family	91.3

Local media (100%) and broadcast media (95.45%) have a great influence in communicating the potential dangers and civil protection (Table 2f). Sources of information that are fast , accessible and of wide coverage e.g. Electronic messages (85.71%), National newspapers (80.90%) and Social networking services (80%) has the highest percentage as compared to newspapers and leaflets.

Teachers regard local media and broadcast media as the 1st and 2nd source of information over

school even if they are part of the system since they themselves are unsure of the information for disaster dissemination. One teacher said that local media and broadcast media have greater access to people who are specialized on these fields like meteorologists. Although teachers access to students is great but their information is also coming from local media and broadcast media. They are the secondary source of information which is different from getting the information from the primary source.

The coverage of the media is wide and its dissemination is fast as compared to schools. However, one teacher said that their role as Science teacher will not be empowered by media since they can always explain at the language understandable by the students the dangers that happened in the locality.

Table 8b. Sources of information about the potential dangers and civil protection

Type of Media	%
Leaflets	52.63
Local newspapers	50
National newspapers	80.95
Loudspeaker (fixed or mobile e.g. from a car)	60
Forums/ presentations at schools and work places	90
Commercial broadcast media (TV/ radio)	95.45
Local broadcast media	100
Electronic messages (Internet, Mobile, SMS etc.) directly from individual	85.71
Social networking services	80

When teacher-respondents were evaluated on the sense of awareness of for related risks/natural hazards, 57.14% of them answered that they get enough information from official sources about the potential natural hazards and about the ways to get prepared them. 95.65% of them feel the need of getting more information about the potential natural hazards and about the ways to get prepared for them.

"Disaster drills are common in the schools but not in the place of residence."- This is what the teacher said when asked whether they've participated disaster drill in their residence. Among the 50 respondents, 43.47% of them knew about the disaster drill in their place and all of them participated and found it very useful (Table 2g).

Table 9b. Disaster simulation

	Yes	No	Do not know
Has there ever been a Disaster event simulation exercise in your settlement according to your knowledge?	43.47%	47.82%	8.69%
If yes, did you take part in it?	100%		
If yes, did you find it useful?	100%		

3. Volunteering status on related risks/ disaster prevention and relief action.

All respondents find it important to take an active part in the disaster prevention or relief action. 52.17% actively joined while 47.83% did not join any disaster prevention or relief action. The 86.95% of the respondents are not members of any civil protection organization. However, 90.90% are ready to participate in relief action in time of a real disaster situation.

Conclusion

The low score of teachers' in the human influence on global climate change suggests further realization to level up from the concept understanding of the subject. Teachers' must put themselves "in" rather than just an observant. Despite the misfortune of the country and the eventual 2nd highest ranking in natural disasters, teachers' aren't completely aware of one's participation of being an "agent" and/or a "victim"

of climate change. In addition, teachers' must learn climate change in a more global context rather than just local.

Teachers are "aware" of global climate change. This awareness though does not equate full understanding of the subject. The top most source of information is the broadcast media while the authority information is the lowest. Teachers regard the school/ education as secondary source of information despite of the initiatives undertaken on integrating climate change in the curriculum. The advocacy of the authority on climate change adaptation seems does not provide remarkable impact. Natural hazards are very influential in the safety of the respondents. Typhoons are regarded as the most influential since all of them have experienced it. Its consequences include damaged in their homes and economic status and to some extent it took lives.

Despite the regularity of typhoons and the immense presence and occasional occurrences of natural hazards, respondents answered that their preparedness is very poor. They clamor for more information to be prepared for natural hazards. Still, local media/ broadcast plays the top means of communicating/ spreading information during the disaster. Majority of teachers showed a very high volunteering attitude even though not a part of any civil protection organizations. Some has attended drills on natural hazards in their place although a limited number only has been done. Consequently, respondents who took part found the simulations very useful.

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Note:

This paper has been presented and awarded in the following conferences:

1. International Conference on Interdisciplinary Research Innovations (ICIRI) 2015
   BarCIE International Center, La Consolacion University Philippines
   Malolos, Bulacan, Philippines
   February 9-11, 2015

   Best Presenter Award

2. Philippines Network of Educators on Environment (PNEE)
   8th International Conference and Scientific Meeting
   Nature's Village Resort, Talisay City, Negros Occidental
   February 17-19, 2015

3. 3rd National Multidisciplinary Research Conference
   University of Northern Philippines
   Vigan City, Ilocos Sur
   April 27-29, 2015

4. International Conference on Nature Studies and Innovations for the Environment (IConSIE) 2015
   PSSN's 15th Annual Scientific Meeting
   Hotel Stotsenberg, Clark Free Zone Pampanga
   May 26-30, 2015

5. International Educators' Conference 2015
   Saint Paul University, Tuguegarao City, Cagayan
   August 20-22, 2015

6. International Conference on Science & Technology (S&T) Education and 64th Annual Convention of PhilAAST
   Henry Sy, Sr. Hall, De La Salle University
   Taft Avenue, Manila

   Best Poster Award