

## AWARENESS OF CLIMATE CHANGE AMONG GLOBE TRAINERS

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### Abstract

*This study explores the awareness of the trainers regarding climate change of the Global Learning and Observations to Benefit the Environment (GLOBE) program. The GLOBE program is a worldwide hands-on, primary and secondary school-based science and education program. The GLOBE's vision is to promote and support students, teachers and scientists to collaborate on inquiry-based investigations of the environment and the dynamics of the Earth system working in close partnership with NASA, NOAA and NSF Earth System Science Projects (ESSP's). GLOBE hosted a Lower Mekong Initiative Train-the-Trainer workshop at Mae Fah Luang University in Chiang Rai, Thailand from 23-28 January 2012. The week-long workshop qualified 63 GLOBE trainers from seven countries including Cambodia, Laos, Malaysia, Nepal, Philippines, Vietnam, and Thailand. About 52 trainers volunteered to take part in this the survey for the study. Each participant was given a self-administered, pre-tested questionnaire to solve on the spot. This paper will discuss the various traits of trainers' attitudes, awareness of climate change issues and challenges over the years, implication of environmental awareness to impart knowledge as well as inculcate values that would nurture sustainable behaviours.*

**Keywords:** Awareness; Climate change; GLOBE; Asian Teachers; SEAMEO

### Introduction

Global warming has altered the earth's climate. It poses one of the greatest threats to society and a challenge to young people of the world and Asian countries as well. Since the young of today will inherit and manage our world tomorrow, it is vital for educators to instil in them awareness and understanding of climate change and other global issues. In addition, it is also necessary to equip them with the relevant knowledge and skills for them to collaborate across cultures in seeking solutions to these vital issues. One program that purposes to raise awareness of global climate change is the Global Learning and Observations to Benefit the Environment (GLOBE). The GLOBE program is a worldwide hands-on, primary and secondary school-based science and education program. The GLOBE's vision is to promote and support students, teachers and scientists to collaborate on inquiry-based investigations of the environment and the Earth system working in close partnership with NASA, NOAA and NSF Earth System Science Projects (ESSP's) to study and research about the dynamics of Earth's environment

(GLOBE, 2012). GLOBE hosted a Lower Mekong Initiative Train-the-Trainer workshop at Mae Fah Luang University in Chiang Rai, Thailand. The GLOBE train-the-trainers workshop was held from 23-28 January 2012. Some of the activities are shown from Picture 1 to Picture 4 in Appendix A. The week-long workshop qualified 63 GLOBE trainers from seven countries including Cambodia, Laos, Malaysia, Nepal, Philippines, Vietnam, and Thailand. This paper explores the awareness of respondents towards climate change issues and challenges over the years, of the GLOBE trainers through surveys.

Among environmental disasters, related to the environment, hurricanes, floods, droughts are caused by the effects of uncertain and unpredictable climate change (Khor, 2008). Secondly, climate change and global warming effects threaten human safety and health. The increasing temperature of the Earth is the source of a major threat to human life because of these frequent natural disasters. Global climate change clearly is visible and Asia is experiencing its negative effects. Report of the Intergovernmental Panel on Climate Change (IPCC) predicts that this will worsen in the future (IGES White Paper, 2008).

Human greed associated to the need to meet the necessities of life becomes the main cause of global climate change (Goudie & Viles, 2009). Among the activities that contribute to global climate change is development: deforestation, industry, manufacturing and transportation. Increased release of greenhouse gases into the atmosphere as the result of a rapid build-up in the manufacturing, logging, agriculture, transportation and other industries in the world contribute to global climate change and directly increase the temperature of the earth. Records of scientific monitoring show that not only is the earth getting warmer, but human activity causes the changes. Scientists now definitely and firmly believe that 98% of the global warming we are experiencing can be attributed to carbon dioxide emissions from fossil fuels combustion over the past centuries (Royer, Berner, & Park, 2007).

### **Research Question**

Previous surveys in several studies on climate change found that causes, consequences and cures to climate change are more likely explored. However, rarely are the perspectives of the respondents investigated. With this in mind, this study sought to explore the answers to the following research questions:

1. How well are the trainers aware of climate change?
2. What is the preference of sources of information of climate change available to trainers?
3. How do the trainers react to the reality of climate change?

### **Methodology**

This study explores the awareness, access to information and reaction of the trainers to climate change of the GLOBE workshop. Of the 63 participants, 70% came from Thailand. The researcher took it upon herself to poll the trainer audience on the three research questions at the end of the program. The poll consisted of four parts. Part A asked questions related to pre-awareness of climate change with questions about the future and projections into it. Part B was purely affective questions: How did the trainers feel about climate change. Part C asked for answers of how do the trainers access climate change information and what are their plans for action as a reaction to the week -long program. Part D asked for their opinion for the causes of climate change.

A set of 52 trainers volunteered to participate in the poll. Each trainer was given a self-administered, pre-tested questionnaire to solve on the spot at the end of the last day of the

workshop. The survey instrument used in this study was derived and modified from the questionnaire devised by Hogan (2008) (see Appendix A). A pre-test questionnaire was not administered because we were interested in a quantitative assessment of the perspectives of the trainers after the workshop. The data that was obtained from the questionnaires were analyzed by using Statistical Package for Social Science version 17.0. The purpose and all the terms in the study were explained to the trainers and confidentiality was maintained.

## Findings and Discussion

### Thoughts about Climate Change

Part A of the survey explored the trainers' thoughts about climate change, awareness and future effects. Most of the trainers (98%) had heard about climate change before they were involved in the GLOBE workshop. Three quarters of the trainers indicated that less rain (77%) and rise of sea water level (70%) are the possible future effects of climate change in their country. About half of the trainers claimed that more storms (52%) would be the effects of climate change. These responses are not a surprise since most of the participants were Thai and from the mountainous region of the country. Surprisingly, a very small number focused on the human and economic aspects: loss of utilities and business. These often contribute greatly to the loss of life during disasters. Figure 1 provides the percentage of responses for each item.

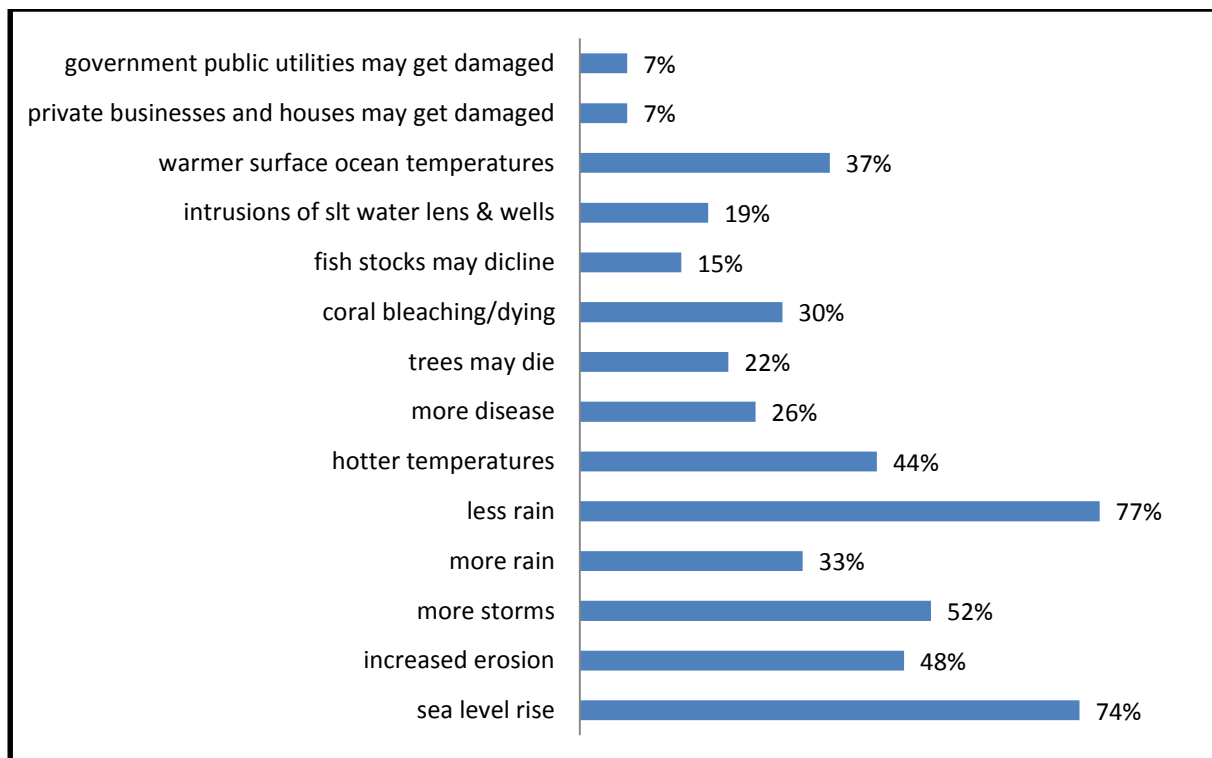


Figure 1. The percentage of response of possible future effects of climate change.

The last question of part A dealt with thoughts about statements about climate change. All of the trainers agreed that climate change is happening. Approximately two thirds (77%) of the trainers indicated that climate change is affecting the people in their country and they also believed that every individual can do something to adapt to climate change (78%). As for living for today being more important than worrying about the effects of climate change in 50 years' time, the opinions were split even. However, 74% agreed that climate change will reduce

the quality of life of their children and grandchildren in the future whereas others were unsure (4%) and disagree (22%).

### Your Feelings about Climate Change

The second component of the questionnaire (part B) explored trainers' feelings about climate change. 40% of the trainers hoped to do some things to adapt to climate change. Some felt fearful (22%), sad (22%), confused (19%), powerless (11%) and about 1% felt disbelief and angry.

### How people learn about climate change?

Composed of nine items, part C asked trainers about their source of information and actions that would be effective in adapting to climate change. The most common source of information about climate change was from computer/Internet (70.3%), followed by overseas TV channel (62.9), newsletter (40.7%), meetings (37.0%), and posters (33.3%). NGO's, local newspapers radio (overseas, government and commercial), DVD, and development committees were cited with less than 30%. This gives some insight as to what medium to use in climate change awareness advertising for populations. Figure 2 presents the various sources of information about climate change.

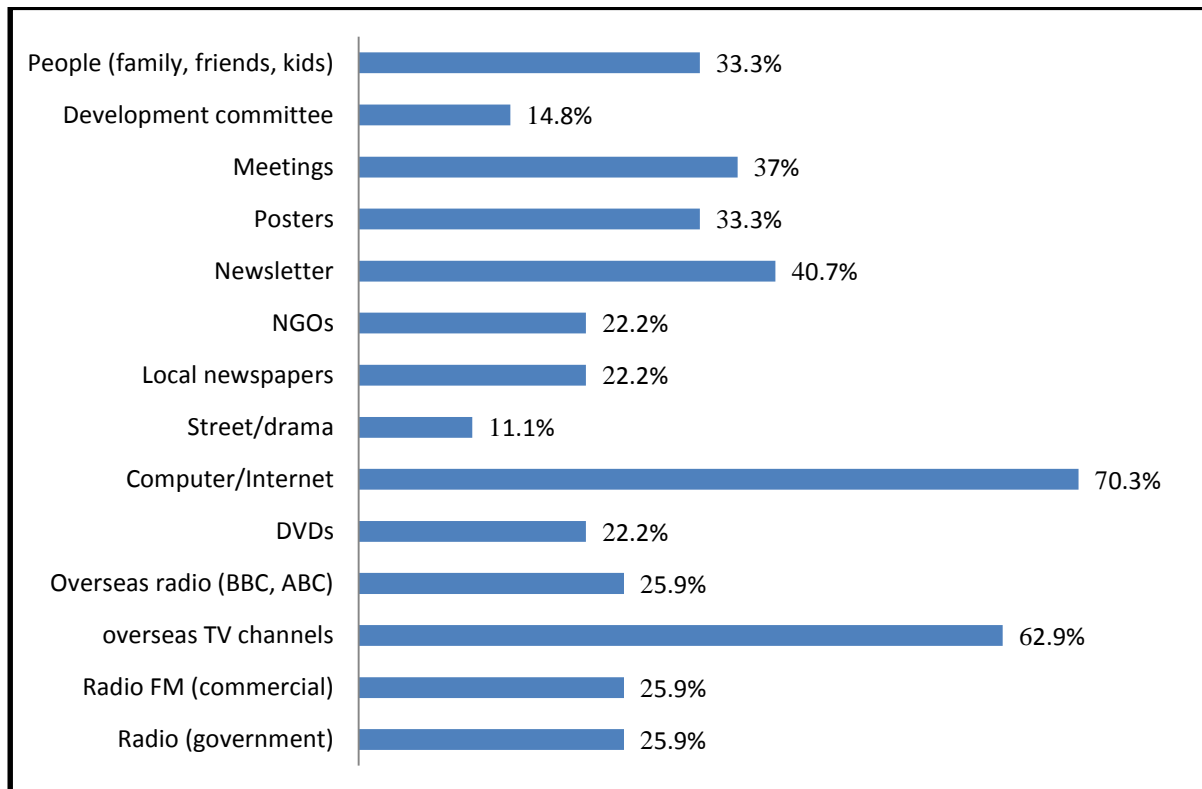


Figure 2. Sources of information.

The last four questions of part C addressed potential actions the participants would consider after the workshop. Most of the trainers identified actions that can alleviate climate change such as plant and preserve mangroves/tress/bushes along coast (63%) as well as working cooperatively (33%) among each other. Not surprising since the coastal devastation of tsunamis has received extensive media coverage and so has the mangrove planting solution. The trainers (44%) affirmed that attending meetings about climate change with the authorities could lead to adapting strategies to deal with climate change. Moreover, about 37% indicated that the government would be the first place they sought for advice if there was a need for

funding. Encouragingly, 66% of the trainers were willing to share their skills in finding ways and local wisdom in adapting to climate change voluntarily.

### ***Causes of climate change***

The final section of the survey was designed to examine the trainers' knowledge about factors that cause climate change. In all, 83% of the trainers indicated that burning fossil fuels e.g. coal, oil, gas, petrol contributed most significantly to climate change. Only 33% felt that deforestation i.e. cutting down large forests contributed significantly to climate change.

## **Conclusion**

These results are qualitative because the need to conduct the study arose out of questions that were formulated during the early workshop. To return to the original three questions of this study, the following insights for future training programs can be formulated

How well are the trainers aware of climate change? As a whole, trainers were very aware of climate change. Disturbing was the observation that deforestation was not perceived as a major contributor.

What is the preference of sources of information of climate change available to trainers? Without question it is the Internet and TV. Radio, posters and meetings play an important role, more so though in academic settings.

How do the trainers react to the reality of climate change? Trainers reacted favourably with the desire to contribute something to counteract climate change in their environment.

The findings from the survey data collected from GLOBE trainers shows the majority of the trainers being aware that climate change is happening and burning fossil fuels is responsible for it. The information about climate change is available through computer/Internet. Generally, trainers from different countries with different cultures are aware that climate change is happening and are willing to engage in pro-environmental behaviours. In order to create the awareness we need to provide a public education program that can provide information, share knowledge about the causes, adaptation and prevention of climate change. To this end, the GLOBE workshop is one of the potential approaches to promote knowledge and behaviours towards the environment thereby inculcating strong environmental stewardship.

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## Appendix A.

The survey used for the study.

### A. THOUGHTS ABOUT CLIMATE CHANGE

1. Before this interview, had you heard about climate change?  
[a] yes [b] no [c] don't know
2. What have you ALREADY heard about the possible FUTURE effects of climate change in your country? (Mark all that apply)\*  
[a] sea level rise [b] increased erosion [c] intrusion of salt into water lens, wells  
[d] more storms [e] more rain [f] less rain [g] hotter temperatures [h] more disease  
[j] trees may die [k] warmer surface ocean temperatures [l] coral bleaching/dying  
[m] fish stocks may decline [n] private businesses and houses may get damaged  
[o] government public utilities may get damaged e.g. buildings, roads, causeways, ports, airports  
[p] private businesses and houses may get damaged [q] don't know  
[r] other, specify \_\_\_\_\_
3. What are your thoughts about the following statements about CLIMATE CHANGE?  
[a] Climate CHANGE *is* happening Agree Disagree Unsure  
[b] CLIMATE CHANGE *is affecting* the people of your island/city already Agree Disagree Unsure  
[c] Every *individual can do something* to ADAPT to climate change Agree Disagree Unsure  
[d] Living for *today* is more important than worrying about the effects of Climate Change in 50 years' time Agree Disagree Unsure  
[e] CLIMATE CHANGE will reduce the quality of life of my children & grandchildren in the *future* Agree Disagree Unsure

### B. YOUR FEELINGS ABOUT CLIMATE CHANGE

4. How do you feel about climate change? (Mark all that apply)\*  
[a] fearful/afraid [b] disbelief [c] confused [d] angry [e] powerless e.g. I can't do anything  
[f] hopeful i.e. we can do some things to adapt [g] sad i.e. we might lose our culture & lands  
[h] don't know [i] other, specify \_\_\_\_\_

### C. HOW PEOPLE LEARN ABOUT CLIMATE CHANGE

5. Do you make use of any of the following media at home/workplace/school? (Mark all that apply)\*  
[a] radio [b] newspaper [c] TV [d] DVD [e] computer/internet [f] none
6. Through which media have you heard about CLIMATE CHANGE?  
[a] radio (Gov) [b] radio FM (commercial) [c] overseas radio (BBC/ABC) [d] overseas TV channels [e] DVDs [f] computer/internet [g] local newspapers [h] church/mosque/temple [i] NGOs [j] meetings [k] street theatre/drama [l] posters [m] newsletter [n] land/ island development committee [o] people (family, friends, kids) [p] none  
[q] other, specify \_\_\_\_\_
7. By which of the following methods would you like to receive information about Climate Change and adaptation methods? (Mark all that apply)\*  
[a] radio (Gov) [b] radio FM (commercial) [c] overseas radio (BBC/ABC) [d] TV [e] DVDs [f] computer/internet [g] local newspapers [h] church/mosque/temple [i] NGOs [j] meetings [k] street theatre/drama [l] posters [m] newsletter  
[n] other, specify \_\_\_\_\_
8. Have you recently attended a consultation, workshop or school lessons on Climate Change or biodiversity (fisheries/agriculture/water linked to climate change)?

- [a] yes [b] no [c] don't know (Go to Q 12)
9. If "yes" who organised the events? \_\_\_\_\_
10. What did YOU learn about ways to adapt to climate change? (Mark all that apply)\*  
 [a] must plant mangroves/trees/bushes along coast [b] must look after mangroves/trees/bushes [c] must avoid damaging the reefs when fishing (using crowbar for octopus/eels) [d] how to build sea walls with concrete and sand bags [e] importance of maintaining sea walls [f] importance of sea walls having sloping sides/wide bases [g] must not mine aggregate (reef, shells, sand) [h] should not build on the shoreline (first sand dune closest to beach) [i] everyone needs to cooperate in adapting to CLIMATE CHANGE [j] nothing [k] other, specify \_\_\_\_\_  
 [l] N/A
11. What did you do as a result of the workshop to adapt to CLIMATE CHANGE? (Mark all that apply)\*  
 [a] held/attended meetings with Island Council/government departments about CLIMATE CHANGE adaptation strategies  
 [b] held/attended meetings to enable villagers to identify projects to adapt to CLIMATE CHANGE  
 [c] held/attended meetings with police/rangers/constables on how to enforce the Environment Act i.e. enforce environmentally friendly fishing/farming/building strategies  
 [d] held/attended training courses to teach new skills to villagers  
 [e] built new buildings away from shoreline (first sand dune closest to beach)  
 [f] gave talks in schools about CLIMATE CHANGE adaptation strategies  
 [g] had informal talks with friends/others [h] nothing  
 [i] other \_\_\_\_\_ [j] N/A
12. If funding is NOT available and you needed help (physical and skills) to adapt your environment that are too difficult to do or solve alone, how would you go about it? (Mark all that apply)\*  
 [a] seek help from own family [21.2] form a cooperative/group with different families  
 [b] seek help from the church/mosque/temple [21.4] discuss & plan within the village  
 [c] go to government/island/city council/island/land development committee for advice  
 [d] don't know  
 [e] other \_\_\_\_\_
13. If you learnt new information/skills about adaptation to CLIMATE CHANGE, would you be prepared to share with others outside your family? (Mark all that apply)\*  
 [a] for nothing ie to enable everyone to adapt together [b] for money [c] in exchange for goods/services [d] no [e] not sure

#### **D. CAUSES OF CLIMATE CHANGE**

14. What do you think are the causes of climate change? (Mark all that apply)\*  
 [a] burning fossil fuels e.g. coal, oil, gas, petrol  
 [b] deforestation i.e. cutting down large forests and burning off  
 [c] don't know [d] other, specify \_\_\_\_\_



Picture 1: The trainers examine the type of soil and classify it according to the manual given



Picture 2: The trainers learn how to use and to read the barometer



Picture 3: The trainers were trained on how to use the GPS to get the location



Picture 4: The trainers learn how to use the apparatus to measure the quality of the water