

Vietnamese Coastal Residents' Awareness and Attitude to Climate Change (A Case Study in Think Loc Community, Loc Ha District, Ha Tinh Province)

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Abstract

Climate change is a global environmental issue that many countries throughout the world have been thinking to address it. Vietnam, the focus of this research, is highly influenced by climate change impacts and natural hazards, especially in coastal zones. The objective of this study is to understand Vietnamese rural and coastal residents' awareness and attitude to climate change from a sample of 108 Vietnamese coastal participants. To obtain most representative results, mixed methods were used: a questionnaire, observations, and interviews. Preliminary results showed a low level of climate change knowledge, especially in school students and farmers. However, residents were very aware about the risks of climate change impacts to their livelihoods and community sustainability. They also predicted with a high level of accuracy a range of negative future climate change effects. Local residents agreed that a climate change education program is necessary for Think Loc community. It is expected that this study will develop an appropriate education program on climate change to enhance adaptive capacity of Vietnamese coastal communities to cope with climate change.

Keywords: Climate change, awareness, perception, attitude

1. Introduction

Climate change was recognized as a global environmental problem for the first time in last 1970s (Dimento & Doughman, 2007). The Intergovernmental Panel on Climate Change (IPCC) defined climate change as any change in climate over time which could be caused by natural variability or damage from human activities (IPCC TAR, 2001a cited in Levina & Tirpak, 2006). Recently, climate change has become such an urgent issue that many countries throughout the world have been paying a lot of attention to this problem. Climate change has affected almost all economies and societies as well as creating environmental problem worldwide. Over the recent decades, numerous regions have been suffering from dangerous disasters such as heavy storms and floods, severe heat and droughts, as well as adverse weather conditions, which cause loss and damage for both human life and property. Vietnam, the focus of this research, is highly influenced by adverse climate change impacts and natural hazards (Asian Development Bank, 2009). Moreover, 70% of the population in the Vietnamese coastal area is living with the threat of sea level rise (Oxfam, 2008). The prediction from the IPCC (2007) of a sea level rise of about 1m, means approximately 10% of population in Vietnam will be directly affected and may need to relocate or at the very least, adapt their lifestyles and economy (Nguyen, 2011).

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A variety of international and domestic sources illustrates that Vietnam is both very vulnerable and heavily exposed to the risks of increasing weather variability and climate change. Many studies point out that climate change was strongly believed to result in socio-economic impacts in Vietnam, particularly upsetting poverty reduction efforts (Bruun & Casse, 2013). In Central provinces, a research analysis of the impacts of floods on the economy, environment and society as well as community solutions to cope with floods was implemented by Tran, Marincioni, Shaw, Sarti, & An (2008) showed that during the rainy season, crops, infrastructure, ecosystems and inhabitants located around the lagoon suffer from severe floods and storms. Damage and loss of property, houses, and people cause a cycle of poverty in the study sites. The main findings were that annual floods have brought significant damage to agriculture and aquaculture. To illustrate this, floods destroy crops in the rice field, sweep away aquaculture, or ruin the fish and shrimp ponds. This causes a cycle of poverty in the communities with 24% of surveyed households being under the poverty line with an average per capita monthly income of \$11 US or less. In terms of social impacts, floods lead to a high rate of out-migration to cities to find work during the flood season. Most migrants are males and young, which causes more risks in response and recovery to floods for people living at home, especially the elderly and disabled. In addition, 93.3% of respondents in the communities stated that their children could not go to school due to annual floods (Tran et al., 2013).

In the proposed study site, Ha Tinh province, some studies have been conducted about climate change by Institute of Strategy and Policy on Natural Resource and Environment (ISPONRE). According to ISPONRE (2009), Ha Tinh province witnesses several severe annual natural disasters such as tropical storms, drought, heavy rain, intense dry season and hot westerly winds, and flash floods. The impacts of climate change in Ha Tinh has caused a lack of water resources for agricultural, industrial and household sectors; crop failure and agricultural and aquatic productivity reduction, ecosystem damage in forest and coastal areas which adversely affect the livelihoods of communities. Moreover, safety in industry, transportation, civil works such as hospitals and schools, energy demands and tourism continue to be severely affected by natural disasters in this area.

Another project from Ministry of Natural Resource and Environment (2008) [MONRE] was conducted in four coastal communities in Ha Tinh with the purpose to provide an assessment of livelihood adaptation and available response measures to mitigate the impacts of climate change related to natural hazards. The project strongly suggested that the key disasters in Ha Tinh are storms surges, storm waves, heavy rain, inundation, severe cold, flash floods, and westerly winds. These hazards adversely affected livelihood, food security, health, economy, society, and environment of local people in the study sites. In terms of livelihood, climate change might cause lack of fodder, lack of drinking water for cattle, for irrigation purposes and industries; reduced crop yield and quality of the crops; land degradation and damage to fish farming. Regarding to food security, severe consequences of climate change are loss of availability of food and loss of availability of nutritious food. Natural disasters also lead to health problems such as dependence on unsafe drinking water resources, insufficient water for hygiene purposes and stress due to loss of livelihood and income. Loss of income from agriculture and fisheries, unemployment and increased prices of food and fodder are economic impacts due to these hazards. Social impacts of climate change include migration, loss of human life, increased inequity among social groups, conflict, mental and physical stress and increased crime rate, and reduction in school attendance. Finally, environmental pollution and extinction of endangered species and loss of bio-diversity were considered as adverse environmental impacts (MONRE, 2008).

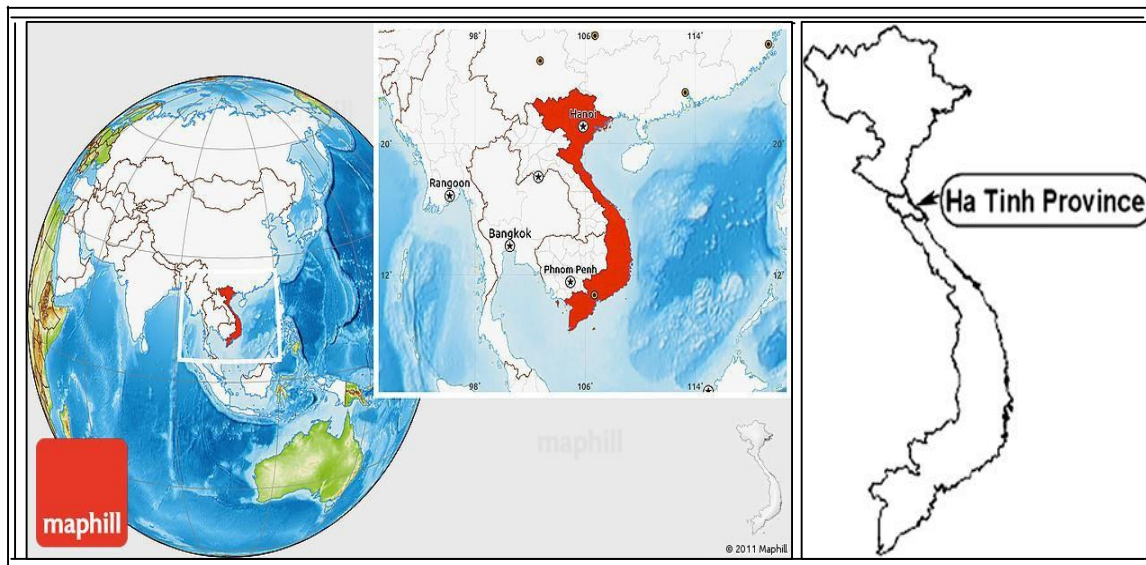
The particular study site of this research Think Loc community (pop.7000) is located on the eastern coast of Ha Tinh with little infrastructure. It is identified as one of the poorest community in Vietnam with a majority of the population works in the agricultural and aquaculture sectors. Their livelihood is totally depending on climatic conditions so that climate change is devastating to this region. It is also solely reliant on local produce, which is only sufficient to supply small local markets. Climate change is predicted to cause disruptions in social and economic terms; i.e., crop productivity decreases environmental pollution, unemployment increases, and forced migration and community erosion (Nguyen, 2011). Given these prediction, suitable mitigation strategies in the Think Loc community become an urgent and necessary requirement for both local government and residents. Therefore, this study was designed to respond to the perceived needs of the community.

Its main aim is to develop a fuller understanding of Think Loc community members' awareness and attitude to climate change, so as to help them to increase their adaptive capacity to cope with climate change and to enhance their understanding now and for future generations.

2. Study site selection

The basic topography of Ha Tinh is narrow and sloping, leaning from the West to the East. The average slope gradient is 1.2% which creates three types of natural topography; high mountain zones, low mountain zones and narrow coastal strip zones. (Action Aid, 2013). Ha Tinh is located in the monsoon and tropical area, which is divided into two main seasons: wet and dry. The hot season lasts six months, normally from April to September with average temperatures of 21°C to 29°C (Department of Planning & Investment Ha Tinh province, 2011) [DOPIHTP]

Figure 2: Location of Ha Tinh province



However, in recent years, from May to August, Ha Tinh province regularly had hot spells with average temperatures of 39-40°C. The number of hot and sunny days fluctuates from 100-200 days per year. In general, after a hot and sunny prolonged spell of 10-15 days, there is a big rain event. Average yearly rainfall in Ha Tinh is the highest in the Northern and central areas of Vietnam, with 2000mm, but some areas receive 5300mm. However, the rivers in Ha Tinh are very short and have a high slope so big rains often lead to floods in the upper rivers and cause wide inundation in the narrow coastal strip areas, while several rivers remain waterless despite the rain (DOPIHTP, 2011). Loc Ha district was established in 2007, located close to Ha Tinh city. Loc Ha district has many advantages because this district's topography includes rivers, sea, mountains, and deltas. It seems to have much potential to develop its economic capacity. The district's topography is divided into two main types: (1) lower areas along the banks of rivers including Ho Do commune, Mai Phu commune, Thach Chau commune etc. Productive activities are salt production, agriculture, and aquaculture. In general, the economy in these communes is better than other communes. (2) Higher areas such as Thinh Loc, Thach Bang, An Loc, Binh Loc commune etc. focus on agricultural and aquaculture activities (Loc Ha Government Report, 2010).

With a view to selecting a community for conducting the project, I visited several communities which are located on the coastal areas of Loc Ha district such as Thinh Loc, Thach Bang, An Loc, Thach Kim, and Binh Loc and so on. Since, Thinh Loc has witnessed the most serious impacts of annual climate change as identified from conducting in- depth interviews and field observations. As a result, Thinh Loc was selected to conduct my project which is comprised the following characteristics:

a. Thinh Loc is located in the coastal zone with 12km of coastline. The total area is 1,536 ha; including agricultural area of 476ha, forestry area of 564ha, building land area of 28ha, and other areas of 468ha (Thinh Loc Government Report, 2014) [TLGR].

b. The population of the commune was 1,484 households with 6,700 people. The population growth rate in 2009 was 0.82 %. The number of high-income households was 371, about 25%; the number of medium income households was 552, equal to 37.2%; the number of households close to poverty was 223, approximately 15%; and the number of poor households was 338 (22.8%) (TLGR, 2014)

c. The community had 2,500 people who are of working age, including 2,200 laborers who had long-term employment and the rest who did not have long-term employment. Poor economic and low incomes of households combined with serious weather events have been acting to exacerbate the poverty issue in this commune (TLGR, 2014).

d. Thinh Loc village is in a tropical monsoon area with an average daily temperature of about 23.40C. The annual rainfall level is from 1,680 to 1,700mm (Trinh, 2005).

e. In terms of education, the level of the Thinh Loc community members is not high, with more than one half of the population comprising school students who only obtained secondary school or lower (TLGR, 2014).

Despite living in a location that experiences severe weather conditions in central Vietnam, a poor economic capacity and a low level of education, Thinh Loc people in the past and currently have always cooperated, worked hard, and been steadfast in overcoming difficulties and obstacles brought on by both the weather and the war. During the war period, prior to 1954, although the French and American army dropped numerous bombs which decimated the village, local residents still chose to live in Thinh Loc. From 1954-1975, many young men from Thinh Loc went to southern Vietnam to take part in combat and save the motherland. Meanwhile, women, elderly people, and the remaining local residents worked extremely hard to increase agricultural production and provide farming products for soldiers. Today, with an unyielding attitude, Thinh Loc people work together and help each other to deal with natural disasters and climate change (Trinh, 2005).

3. Methodology

In order to examine Vietnamese coastal residents' awareness and attitude to climate change, a range of methods were employed; they comprised a survey, interviews, and field observations. The survey was considered as a key which to better understand participants' climate change knowledge. Before delivering the survey, a pilot study was conducted. Consequently, any problems of terminology were identified and converted to local languages. The sample size was 115 people who were selected through simple random sampling and convenience sampling methods from approximately 7000 local residents. The survey participants comprised 54 farmers, 20 local government staff, 11 secondary school teachers and 30 secondary school students⁴ who were selected through simple random and convenience sampling methods. Of 115 persons who received the survey, only 108 completed questionnaire fully. Seven uncompleted surveys were at random; therefore, they were not used to analyses results.

The pre-test comprised 24 questions that were mainly closed. The questionnaire was designed by referring some survey questions to climate change awareness worldwide. Afterwards, the researcher prepared a questionnaire designed for this project. The questionnaire was designed to include five parts comprising of individual information, climate change knowledge, climate change attitude, climate change education requirement, and activities related to climate change.

Quantitative data analysis

The software package used for the quantitative data analysis was SPSS version 20.0. Descriptive statistics were employed to summarize the characteristics of participants, including age, gender, and occupation. Further, univariate analyses were conducted to examine participants' awareness of climate change knowledge, climate change attitudes and predictions, and their perceived need for an education program. To assess associations between participants' characteristics (such as age and occupation) and awareness of climate change, analyses of variance (ANOVA) and chi square independence tests were employed. A significant level of at least $p < 0.05$ was used for all statistical tests.

4. Finding

4.1 Profile of the Respondents

A total of 108 respondents were completed survey, of which 55.6% were females and 44.4% were males. The age of respondents was distributed as follows: 28% were age 11-14; 9% were age 21-30; 15% were age 31-40; 21% were age 41-50; 16% were age 51-60; and 11% were age 60 and over. Data on education indicated that 1%, 59%, 11%, and 29 % had no education, completed secondary school, high school, and bachelor or higher education respectively.

⁴In Vietnam there are three levels of schools: primary school (grade 1-5), secondary school (grade 6-9), and high school (grade 10-12).

Farmers, teachers, secondary school students, and local government staff members were main occupation of 43%, 10%, 28%, and 19% respondents, respectively. Table 4.1 demonstrates a distribution of respondents' gender, age, and education level by occupation:

Table 4.1 Distribution of respondents' gender, age, and education level by occupation (N=108)

| Respondent characteristics | Farmer | Teacher | Secondary school student | Local government staff member |
|----------------------------|--------|---------|--------------------------|-------------------------------|
| Gender (%) | | | | |
| Male | 38.3 | 27.3 | 46.7 | 65 |
| Female | 61.7 | 72.7 | 53.3 | 35 |
| Education (%) | | | | |
| No education | 2.2 | 0 | 0 | 0 |
| Primary school | 0 | 0 | 0 | 0 |
| Secondary school | 76.6 | 0 | 100 | 10 |
| High school | 10.6 | 0 | 0 | 30 |
| College/university | 10.6 | 100 | 0.0 | 60 |
| Age (%) | | | | |
| 11-14 | 0 | 0 | 100 | 0 |
| 15-20 | 0 | 0 | 0 | 0 |
| 21-30 | 8.5 | 0 | 0 | 30 |
| 31-40 | 10.6 | 81.8 | 0 | 10 |
| 41-50 | 25.5 | 18.2 | 0 | 45 |
| 51-60 | 31.9 | 0 | 0 | 10 |
| Over 60 | 23.5 | 0 | 0 | 5 |

4.2 Awareness of climate change

An understanding of climate change awareness of respondents is necessary in designing contents and knowledge for an intervention in order to enhance respondents' ability to mitigate and adapt with climate change. In order to identify climate change awareness of respondents in Thinh Loc community, the respondents were asked about their familiarity with five basic concepts related to climate change, their knowledge about climate change causes, their considering of climate change existence as well as their prediction on climate change impacts.

4.2.1 Familiarity with climate change concepts

The first original question delivered to respondents was "how are you familiar with the following terms?" The terms, which were used, included climate change, global warming, greenhouse gases, greenhouse effect, and carbon dioxide. The scales of variable were coded as follows: 1 = not at all, 2 = not too much, 3 = somewhat, 4 = very, 5 = extremely.

Figure 4.2.1a and 4.2.1b show familiarity of respondents with terms related to climate change. Overall, familiarity of respondents with climate change terms were under 3 (somewhat scale) except "climate change" term (3.5). Especially respondents only obtained their familiarity with "carbon dioxide" at scale 2 (not too much). Out of 108 respondents, about 30% respondents perceived that they were extremely familiar with the term of climate change and 24% were very familiar while 26% were somewhat familiar, 7% were not too much, and 13% were not at all.

The familiarity with climate change term of Thinh Loc community members was similar to Indian surveyed in 2013 with 59.5% (Suhatharahima, Gurugnanam, & Dharanirajan, 2013). Regarding "global warming" term, the familiarity of respondents was quite low as only 19% of respondents were extremely familiar with this term and 17.6% were very familiar while somewhat familiar accounted for 15%, not too much were 17.6%, and the highest proportion of people chose "not at all" (30.8%). Compared with the previous research in India, 72% of respondents in India were familiar with the term of global warming (Suhatharahima et al., 2013). The familiarity of respondents with the term of "greenhouse gases" was very low. It was indicated that 7.5%, 9.3%, 13%, 17.6%, and 52.8% of respondents were extremely familiar, very familiar, somewhat, not too much, and not at all, respectively. The trend was true with respondents' familiarity with the terms of "greenhouse effect" and "carbon dioxide".

Familiarity of respondents with “greenhouse effect” term were at extremely (13.9%), very (9.3%), somewhat (11.1%), not too much (18.5%), and not at all (47.2%). This compared to 29% of people in India who were familiar with the term of greenhouse effect (Suhatharahima et al., 2013). It was also found that only about 11% of respondents in Thinh Loc were very familiar with “carbon dioxide”, 12 % were very, 13 % were somewhat, 13% were not too much, and 60 were % not at all.

Figure 4.2.1a: Mean rating of familiarity with the concepts related to climate change (N= 108)

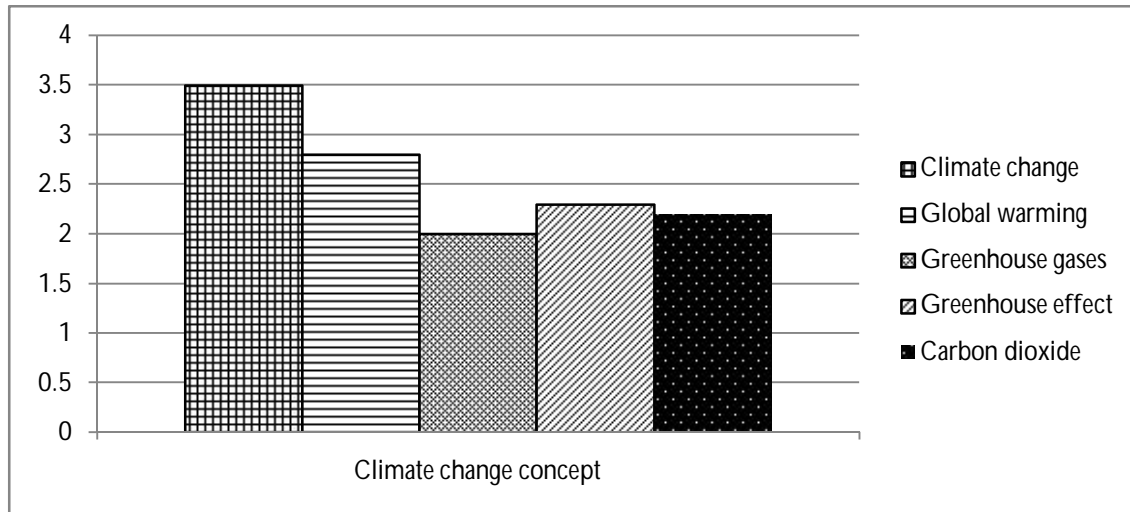
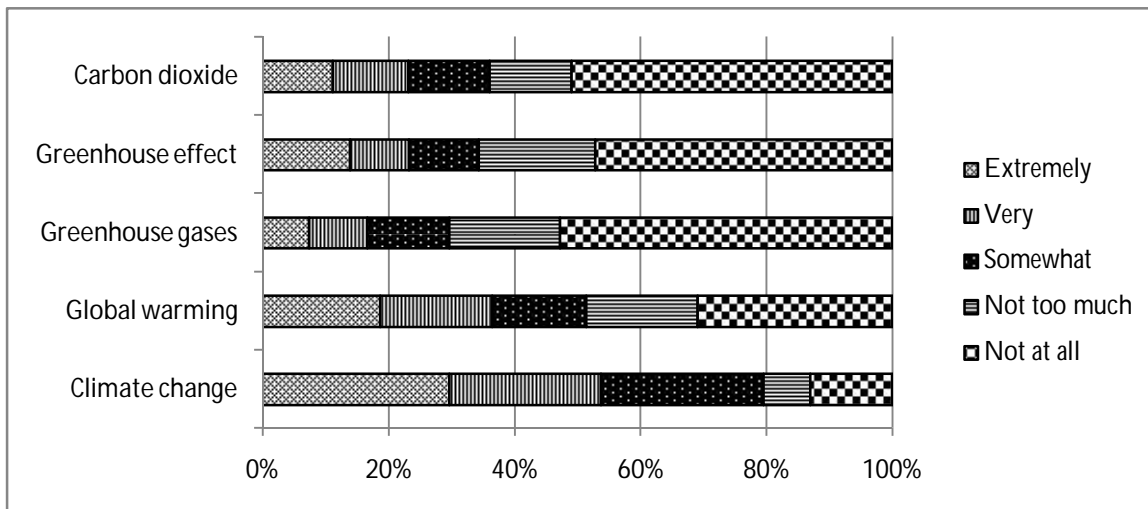


Figure 4.2.1b: Familiarity with the concepts related to climate change (N=108)



A one-way analysis of variance (ANOVA) was used to examine if occupation influences respondents' familiarity to the climate change terms. Significant associations were found between main occupation and respondents' familiarity with all five terms. Significant statistics were represented as follows:

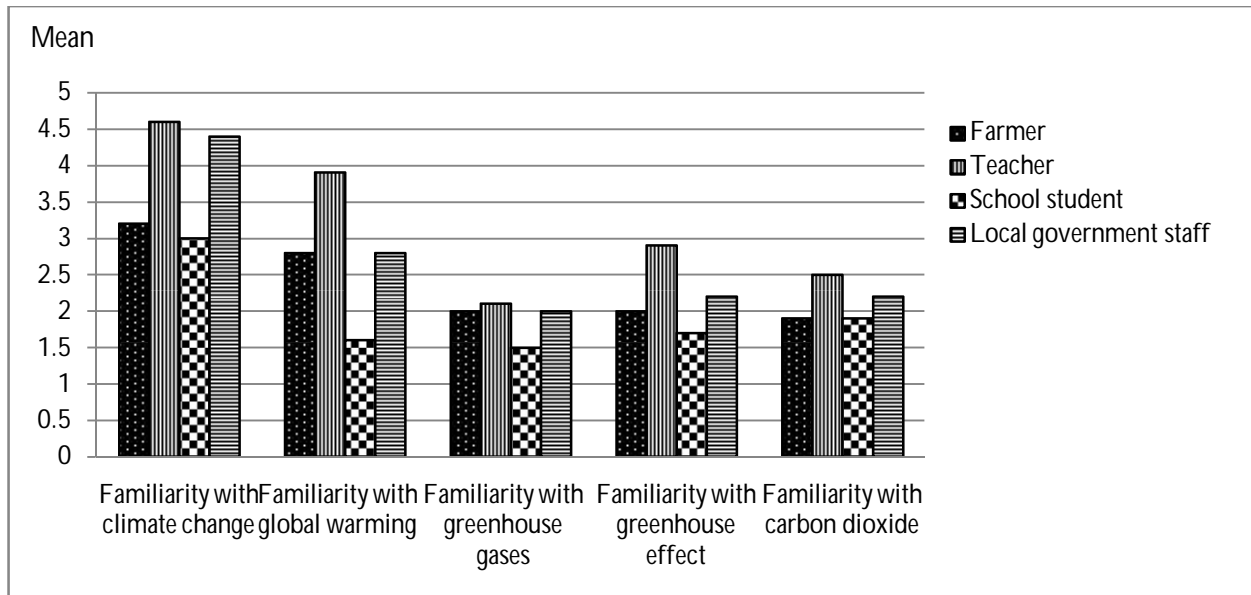
1. With climate change term: $F(3,104) = 9.270, p < 0.05, \eta^2 p^5 = 0.21$, showing a large size effect
2. With the global warming term: $F(3,103) = 14.617, p < 0.05, \eta^2 p = 0.3$, showings a large size effect
3. With the greenhouse gases term: $F(3,104) = 3.977, p < 0.05, \eta^2 p = 0.1$, showing a medium size effect
4. With the greenhouse effect term: $F(3,104) = 6.679, p < 0.05, \eta^2 p = 0.16$, showing a large size effect

⁵Partial Eta Squared ($\eta^2 p$) measures the proportion of the total variance in a dependent variable that is associated with the membership of different groups defined by an independent variable (Richardson, 2011). The values of .01, .06, and .14 to indicate small, medium, or large size effects for Eta squared (Richardson, 2011).

5. With the carbon dioxide term: $F(3, 104) = 3.708, p < 0.05, \eta^2p = 0.1$, showing a medium size effect.

Figure 4.2.1c displays means of familiarity with 5 terms related to climate change knowledge among farmers, teachers, school students, and local government officers. In general, local government officers obtained the highest familiarity with almost all five terms, followed by teachers. Farmers ranked at the third position and secondary school students acquired the lowest familiarity with all five terms.

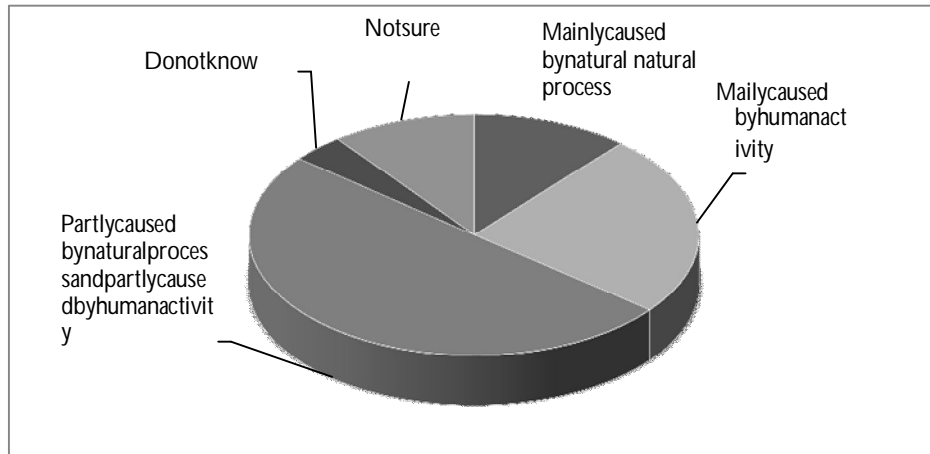
Figure 4.2.1c: Mean rating of familiarity with 5 terms related to climate change knowledge by occupation (N= 108)



4.2.2 Understanding of climate change causes

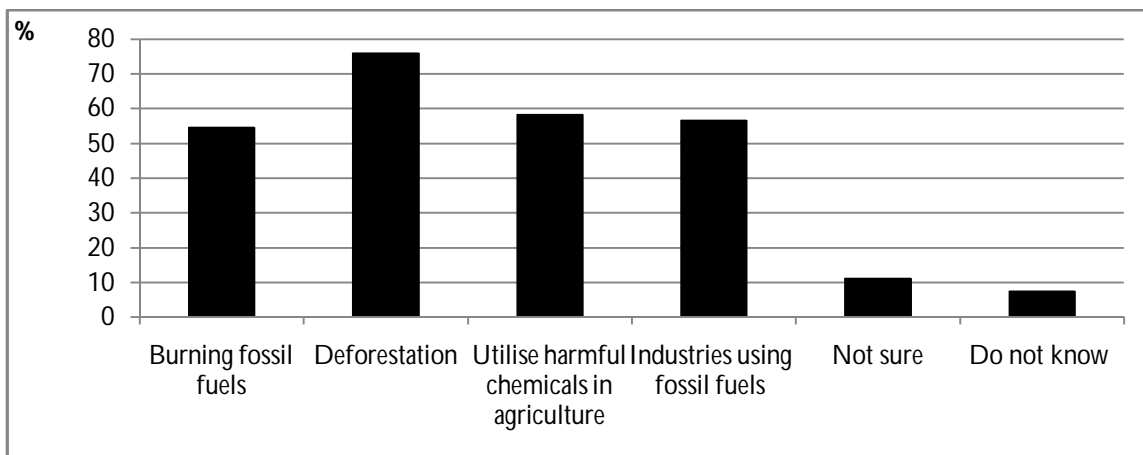
The proportion of people who attributed climate change mainly caused by human activity was 24% while 11% of respondents said climate change was mainly or entirely due to natural causes. The largest proportion of respondents (over 50%) thought climate change is a mixture of natural and human cause. Nearly 4% of population samples did not know the causes of climate change while over 10% respondents were not sure about climate change causes (Figure 4.2.2a). Compared with the survey in the UK (2015), awareness of human activity as a driver of climate change in Tinh Loc community was low as this figure in UK was 40% (Roz, 2015).

Figure 4.2.2a: Perception of respondents on climate change causes (N=108)



Particular on human causes, it was found from Figure 4.2.2b that the largest percentage of people who thought deforestation activity such as cutting down and burning forest contributes to climate change (75.9%). The following factors were utilizing harmful chemicals in agriculture (58.3%), industries using fossil fuels for manufactories (56.5%), and burning fossil fuels such as coal oil, gas, and petrol at 54.6%. Moreover, the number of respondents who did not sure and did not know the reasons was moderate high, 11.1% and 7.4%, respectively.

Figure 4.2.2b Perception of respondents about human activity causes climate change (N=108)



4.3 Awareness of climate change’s existence and prediction of climate change impacts

Perception of the statement “Do you think that climate change is happening?” also was one of important indicators to examine Thinh Loc community members’ awareness on climate change. A large proportion of people (75%) thought climate change was happening while only 2.8 % of those did not agree with this statement. However, the percentage of respondents did not sure, whether or not the existence of climate change was significant (22.2%). In a 2011 CSIRO survey of Australian attitudes to climate change, a similar result was indicated when roughly three quarters of Australian respondents believed climate change was happening (Leviston & Walker, 2011).

Regarding perception of climate change impact, a majority of respondents were aware of negative impacts of climate change in the near future. In their opinions, if nothing to be done to address climate change, the issue of climate change will be “very serious” over the world, in Vietnam, and Thinh Loc community at approximately 92%, 80%, and 79% respectively.

Respondents also believed that there will be “a great deal” harmfulness of climate change on their family members, and their future generation at over 65% and nearly 80%, respectively (see Figure 4.3a & Figure 4.3b).

Figure 4.3a: Perceptions of harmfulness of climate change for the world, Vietnam, and Think Loc village if nothing is done to reduce this problem (N=108)

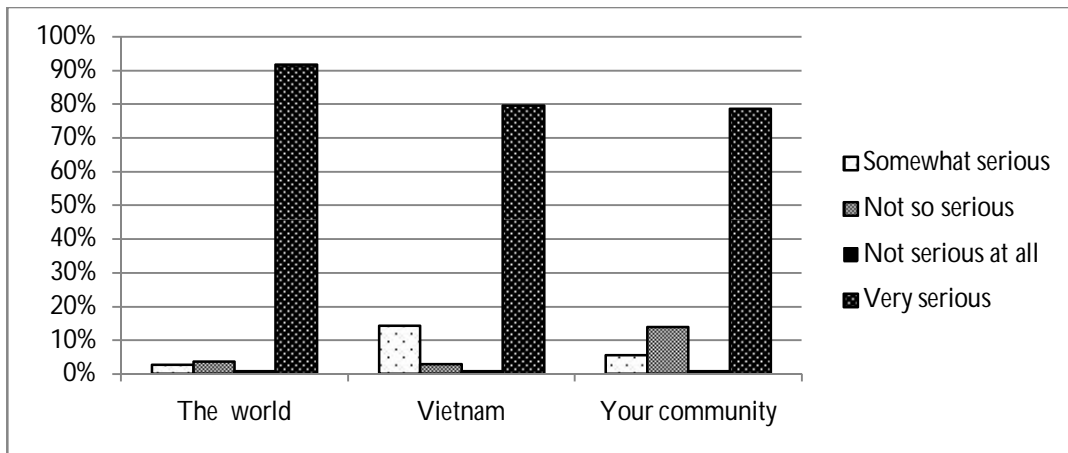
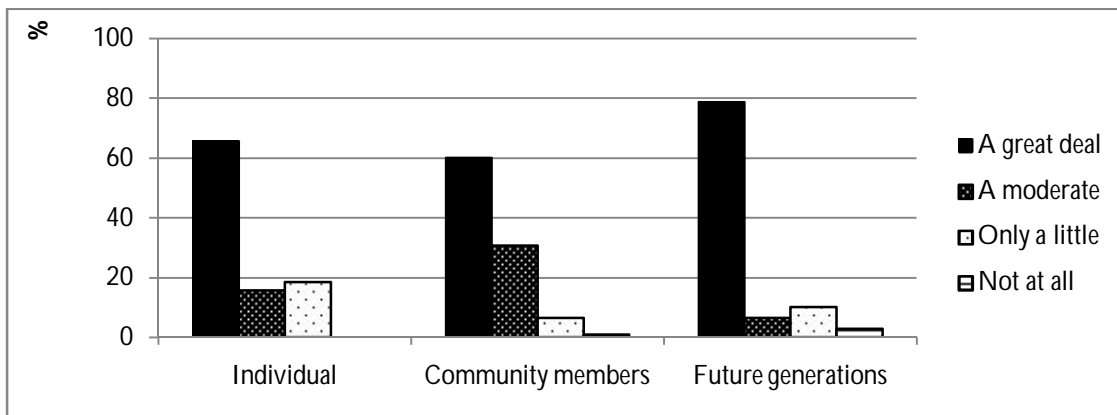
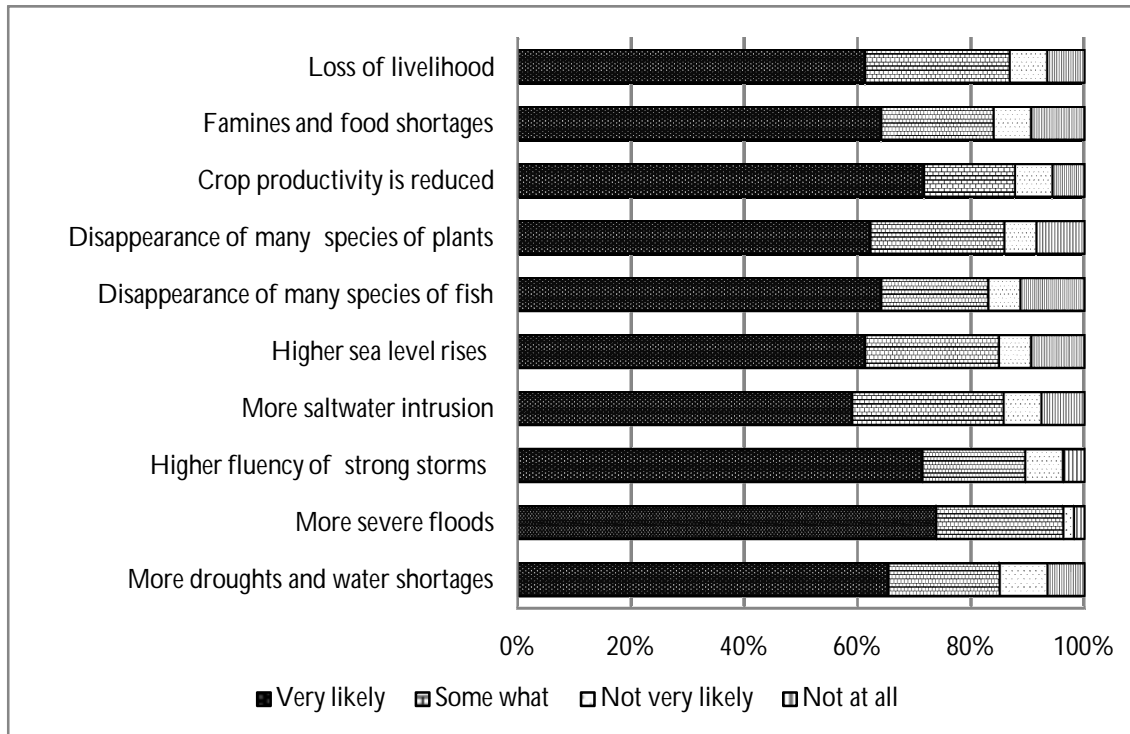


Figure 4.3b: Perception of harmfulness of climate change for individual and his family, community members, and future generations (N=108)



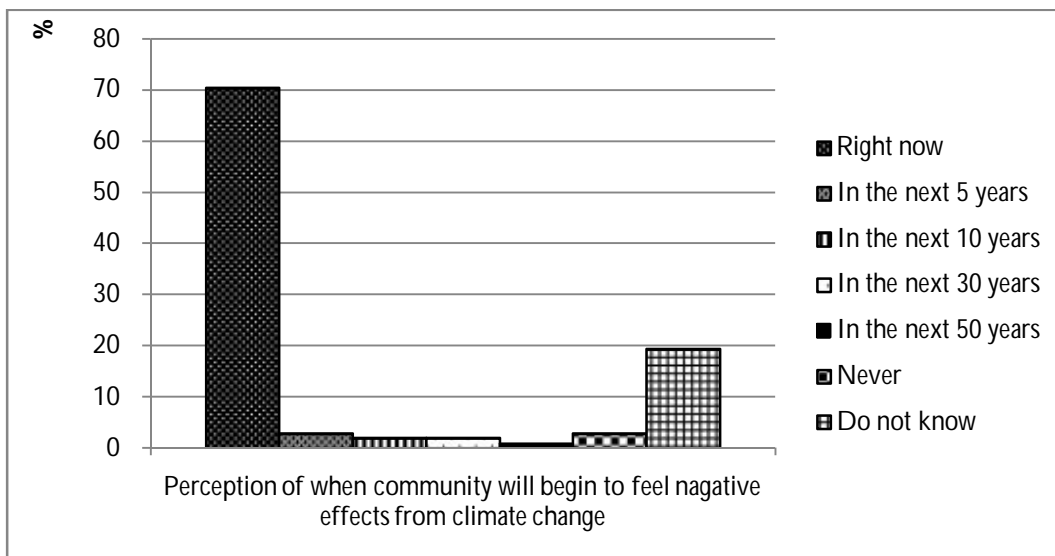
Furthermore, Think Loc community participants also forecasted severe impact levels of climate change within Think Loc community in the next 20 years. Figure 4.3c shows that more than 70% of respondents forecasted that the level of crop productivity's reduction, higher frequency of strong storms, and more severe floods will be "very likely" in the next 20 years. Other phenomena such as famines and food shortages; disappearance of many species of plants and fishes; more droughts and water shortages; higher sea level rise; and loss of livelihood will be happened "very likely" in the next 20 years with a prediction of over 60% of respondents.

Figure 4.3c Prediction of phenomena likely to be observed in the next 20 years in Thinh Loc (N=108)



Regarding the time of when the local community is likely to feel negative impacts from climate change, around 70% of the sample thought that Thinh Loc village is being affected "right now". The number of respondents who did not know when their community would begin to feel negative effects from climate change accounted for approximately 20%. Those who believed that their village would be "never" affected by climate change were just less than 3% (see Figure 4.3d).

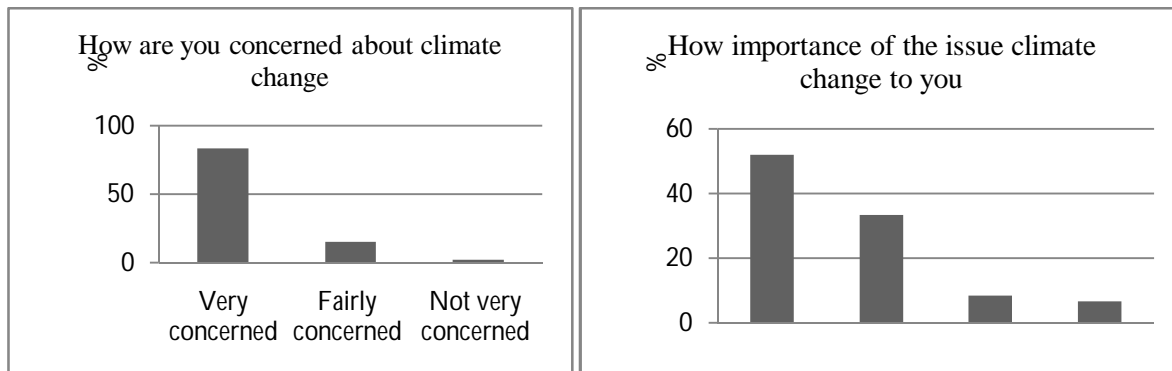
Figure 4.3d Perception of when Thinh Loc community will begin to feel negative impacts from climate change (N=108)



4.4 Attitude to climate change

Understanding of residents' attitude to climate change plays a crucial role in designing adaptive strategies. Results represented that people in Think Loc community members were very concerned about the issue of climate change. It is evident (see Figure 4.4a) that a majority of respondents was very concerned over climate change (83.3%) and a huge proportion of people who believed that the issue of climate change were "extremely" (51.9%) and "very important" (33.3%) to their personal lives.

Figure 4.4a Attitude to climate change (N= 108)

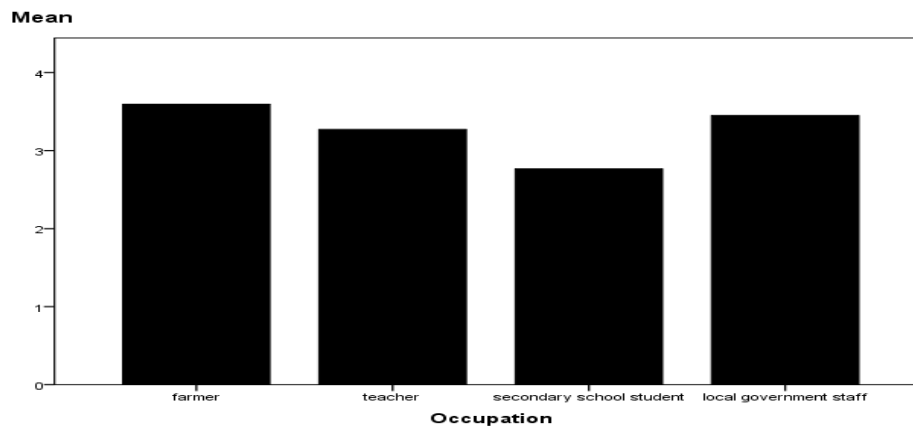


Concern over the issue of climate change in Think Loc community even was significantly higher than general population in Asian countries such as India (76%), the Philippines (72%) and Vietnam in general (69%) (Bruce, Richard, & Jill, 2015). In order to examine if main job affected perception of importance of climate change to local residents, a chi square independence analysis was employed. Results showed that the importance of climate change to farmers, local government staff, and teachers was higher than that of high school students (see Table 4.4 and Figure 4.4b). A significant association was detected as $\chi^2 = 19.189$, $df = 9$, $p < 0.05$, and the value of Cramer's $V^6 = 0.24$ showed a large size effect of occupation upon importance of climate change to participants climate change to participants.

Table 4.4: Distribution between occupation and the importance of climate change issue to respondents (N= 108)

| Occupation | | Extremely important | Very important | Somewhat important | Not important | Total |
|--------------------------|---------------------|---------------------|----------------|--------------------|---------------|-------|
| Farmer | N | 11 | 8 | 0 | 1 | 20 |
| | % Within Occupation | 55 | 40 | 0 | 5 | 100 |
| | % within total | 19.6 | 22.2 | 0 | 14.3 | 18.5 |
| Teacher | N | 31 | 13 | 3 | 0 | 47 |
| | % Within occupation | 66.0 | 27.7 | 6.3 | 0 | 100 |
| | % within total | 55.4 | 36.1 | 33.3 | 0 | 43.5 |
| Secondary School student | N | 6 | 3 | 1 | 1 | 11 |
| | % Within occupation | 54.5 | 27.3 | 9.1 | 9.1 | 100 |
| | % Within total | 10.7 | 8.3 | 11.1 | 14.3 | 10 |
| Local Government staff | N | 8 | 12 | 5 | 5 | 30 |
| | % Within occupation | 26.6 | 40 | 16.7 | 16.7 | 100 |
| | % total within | 14.3 | 33.3 | 55.6 | 71.4 | 27.8 |
| Total | N | 56 | 36 | 9 | 7 | 108 |
| | % Within Occupation | 51.9 | 33.3 | 8.3 | 6.5 | 100 |
| | % within total | 100 | 100 | 100 | 100 | 100 |

⁶Cramer's V is frequently used to find out the strength of association between two variables for tables larger than 2 by 2. Cramer's V ranges between 0 and 1, with 0 representing no association and 1 a perfect association. (Miller, Acton, Fullerton, & Maltby, 2002)

Figure 4.4b Mean rating of importance of climate change to respondents (N=108)

Coding of scales was conducted as follows:

- 1= Not important
- 2= somewhat important
- 3= Very important
- 4=extremely important

4.5 Climate change communication and a requirement for a climate change education

Examination of communicational tools which local residents used to obtain climate change information is extremely essential to help suggesting the best effective methods to enhance community's ability to deal with climate change. Table 4.5a displays where respondents often acquired information on climatic problems and climate change. It was demonstrated that approximately 100% of respondents obtained climate change information from television. Radio stood at the second position with 69.4%. Nearly 60% of population samples acquired climate change information from newspapers and the internet. Local government staff and book also were common instruments to transfer climate change information to residents with 47.2%, 43.5%, respectively. More than 30% of survey recipients believed that they obtained climate change information from teachers. Climate change information provided from family members, friends, relatives, and neighbors was selected by lower percentages of respondents, just fewer than 30%.

Table: 4.5a Prevalence of communication methods reported by community members (N=108)

| Communication method | % |
|--------------------------------|------|
| Television | 96.3 |
| Radio | 69.4 |
| Newspapers | 58.3 |
| Books | 43.5 |
| Internet | 58.3 |
| Local government staff members | 47.2 |
| Neighbors | 23.1 |
| Relatives | 21.3 |
| Friends | 22.2 |
| Teachers | 32.4 |
| Family members | 27.8 |
| Community education programs | 40.7 |
| Others | 3.7 |

Particular on community education programs, 40.7% of respondents achieved climate change information from this method. However, climate change was only one topic in the comprehensive programs delivering to community members. Therefore, most respondents expressed their desire to participate in a climate change education program.

Table 5.2b showed that there was a high demand for a community education project about climate change since 102 out of 108 respondents desired that a climate change education program should be conducted in Thinh Loc. Importantly, 97% of population samples expressed their willingness to attend a proposed climate change education if any program was implemented in their local area.

Table 4.5b Responses to question about a climate change education program (N=108)

| Questions | Yes | | No | |
|--|-----|------|----|-----|
| | N | % | N | % |
| Question 1: Do you think that a future climate change education program should be conducted in your community? | 102 | 94.4 | 6 | 5.6 |
| Question 2: If a climate change education Programs conducted in your community will you attend? | 105 | 97.2 | 3 | 2.8 |

One local resident emphasized the necessity of a climate change education program in Thinh Loc village that “I have been a teacher for 30 years and now I am a high school principal. I strongly understand the issue of climate change in our area but we almost do not have any educational activity to deal with this problem. If you conduct a climate change education program in Thinh Loc, I will encourage our teachers and students attend this program (smile). We greatly lack climate change knowledge to design an external curriculum for students. It will be great if our staff can attend your project and then we will be able to establish a group of facilitator to transfer your climate change project to our students and other organizations” (Interview- 10/2014).

5. Conclusion

Before proceeding to summarize the primary findings, it is a priority to find out the limitations of the first phase of study. Identifying climate change awareness of Thinh Loc community residents was affected by several factors such as education levels, a difficult topic, and poor living conditions. Firstly, a majority of obtained samples indicated low education levels (69 out of 108 samples only completed under secondary school or secondary school, parallel to grade 9/12 for those residents under 45, and grade 7/10 for ages of above 45). Therefore, the literacy ability of many respondents was limited, especially in old females. The researcher spent several hours supervising respondents’ answers. Secondly, climate change has become an urgent topic in recent years, but it is a complex and abstract concept and not easy to understand. Consequently, information provided by respondents was not always consistent. Thirdly, due to it being harvest time, data collection from 47 famers (of 108 samples) was done mostly at nights. This caused a significant challenge because the electricity system in Thinh Loc village is extremely poor. As a result, in some cases, respondents listened to questions from researchers and then verbalized their decision about preferred categories.

Despite these limitations, the study was able to answer the research questions. It is clear that low-level awareness of the concepts related to climate change knowledge was demonstrated. Excluding the climate change item, other terms such as global warming, carbon dioxide, greenhouse gases, and greenhouse effect were not familiar to local residents. Regarding the cause of climate change, a low proportion of participants believed climate change was caused by human activity and a significant percentage of respondents did not know the reasons of climate change. In terms of reason the given as caused by human activities, more respondents believed that forestation, which is witnessed more directly and easily than other activities, causes climate change.

On the other hand, almost all participants demonstrated a highly concerned level on the issue of climate change as well as the importance of climate. Furthermore, local residents were strongly aware of the seriousness of climate change to the world, Vietnam, Thinh Loc, and further generations. Almost all respondents felt that climate change is happening and predicted severe impacts of climate change to their community and personal lives.

Further, more severe floods, storms, and crop productivity’s reduction are likely to be strongly negative impacts from climate change in their village compared to other phenomena in the next 20 years. Residents also followed and updated climate change information through a variety of communicational methods, of which television became the most important tool to transfer climate change information for many Thinh Loc community residents.

Importantly, there was a high requirement for conducting climate change education in the Thinh Loc community. A majority of respondents expressed their willingness to participate if any climate change education program were conducted in the village. Therefore, a climate change education program is a strong recommendation to conduct in the community in order to enhance adaptive capacity to cope with climate change.

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