SECONDARY SCHOOL STUDENTS AND THEIR AWARENESS ON LANDSLIDE HAZARD IN PENANG ISLAND, MALAYSIA

Habibah Lateh, Vijaya Govindasamy

Abstract- Landslide is a growing global threat and has been destroying lives and property of humankind. In most cases, the damages inflicted could be mitigated if there is a proper knowledge and awareness among the students. Students are playing an important role in maintaining a safe environment and harmony as well as the hope of the nation. Moreover, they themselves become victims to the threat of landslides triggered by man's own actions in managing the environment. The purpose of this study was to identify the extent of students' awareness of landslides, as they are the future leaders who will lead this world and uphold positive environmental attitudes and practices of the environmentally responsible behaviors. Guided and close-ended questionnaires were distributed to 60 students in four selected schools in Penang Island. From the survey, the results showed awareness of landslide hazard among the students are moderate. This need to be addressed if the awareness of landslide hazard is to be detected at an earlier and beginning stage.

Keywords: awareness, knowledge, landslide, students, Penang Island.

I. INTRODUCTION

All over the world each year landslide disasters take a huge toll in deaths, property damage and economic loss. Disasters have always been part of the human experience [1]. Until recently, there were only isolated scholarly references that dealt with the impact of disaster on children by differentiating and characterizing natural disasters from human-made catastrophes and violence [1]. Vulnerability is emphasized as students come to realize that disasters are not produced by natural phenomena alone but also by human activities. [2] has mentioned that education is considered the potential instrument for achieving people’s participation in environmental management in general and disaster mitigation in particular. Students learn that, for many people of low educational and socioeconomic status, the scarcity of land forces them to live in high-risk zones, especially those exposed to river floods, as well as zones that have landslide hazards. The past several decades has seen an increase in landslide hazard awareness for individuals and societies. Controversies over issues such as landslide effect of the influence of environmental issues on today’s world. The rise in awareness has also coincided with an increase in environmental education since the 1970s [25], [26]. There is no special syllabus of landslides and other disasters in Malaysia, only learning in the classroom as casual.

Student’s perceptions of natural disasters are influence by their age, developmental abilities, and experiences. The incidents of landslide hazards are increasing in Penang Island. In this case, the students need to provide a better knowledge and awareness on the landslide hazard, which include the natural disasters. The secondary students have fundamental period for the formation of students' environmental attitudes. Environmental knowledge and attitudes learned during these years are hard to alter, since values need to be challenged at this stage before they become deeply entrenched without any serious consideration [3], [4], [5]. Environmental knowledge and attitudes learned during these stage are hard to alter, since values need to be challenged at this stage before they become deeply entrenched without any serious consideration [3], [4], [5]. So, knowledge and awareness of landslides should be applied from the earliest times to the students and the problem of landslides at least can be avoided or reduced.

II. LITERATURE REVIEW

A survey of literature on landslide awareness attitude yielded average promising results. Research on students’ landslide knowledge becomes vital if it is necessary to develop citizens who can take responsibility to protect and improve the environment. The Malaysian curriculum subjects in schools has no specific subject on risk mitigation and disaster preparedness, the social sciences (such history and geography) and the natural sciences enable each students to study and gain knowledge about the relation between social reality and nature. In this way, disaster prevention education is underpinned with principles and attitudes that will benefit the students. Thus, the curriculum activities are the way of learning rather than the application of what has been learned. In this sense, the education is considered as a set of formative processes that lead the students to study principles related to risk reduction coordinated with daily life. If the students are aware of the risks from natural hazards for the long-term procedures faced by the communities, they are more likely
to take steps to reduce potential losses. Now the environmental problems have an adverse effect upon quality of life. In our era of abundant and widespread information, one is tempted to believe that this kind of learning process may lead to similar preconceived ideas among different socio-cultural environments [6]. In the 1980s, questionnaires regarding students' preconceptions were basically used in the field of “experimental science” to elicit beliefs about science [7], [8] and to evaluate the effectiveness at science and math courses [9]. Although in the past a few environmental researchers employed specially composed questionnaires as a main device or as part of their measurement methodology [10], questionnaires of student’s preconceptions about the natural environment is a relatively new area of research [11], [12], [13]. Disaster tragedies as well as landslide hazards due to extensive development at high land areas and hill slopes given rise to the public concern in recent years. Recently, developments of high land areas and hill slopes have increased risks of landslides, which caused substantial loss of human life and damages to the properties and infrastructures. The most important lesson from experience is that prevention of disaster is better than trying to revenge the damage once it has occurred as stated in Agenda 21 of the United Nations Conference on Environment and Development 1992 [14]. Landslide hazard awareness is broadly defined. Among other things, awareness encompasses incorporating knowledge of contemporary issues affecting nature locally and beyond, discovering which actions can make a difference in your surroundings, and self-awareness concerning personal environmental philosophies. Awareness programs against environmental disasters problems are very less implemented in developing countries, such as Malaysia, since those countries are fortunate in being in the position to learn from the experience of developed countries and avoid their worst mistakes. As Penang State is a small state, it is not surprising, that developers have targeted land on hills and hill slopes for all sorts of development ranging from housing to transportation, industries and recreation. More than 50% of the Penang Island is made up of steep topography [15]. As such, hill land is abundantly available on the island. Penang is one of the most rapid industrialization, fast technological change, highest rate of urbanization and lead to greater demands for land. As such, it is anticipated that developers will cast their eyes on the remaining hill land on the island. Hence, the aim of this research is to identify the level of knowledge and awareness aspects among the students to prevent further landslide and environmental damages occur in the long-term plans and to collect information helpful in enhancing students' knowledge and awareness about the landslide hazards in Penang Island, Malaysia. To the best of the researcher's knowledge, such information is not available for any other states in this country. Development on the hill land areas contribute a hot issues in term of safety and environmental lately. Formal education is recognized as a significant factor in explaining landslide hazard and awareness attitudes. Landslide hazard knowledge and even wider abilities related to environmental sciences are acquired through the educational system. Moreover, people can interact or/and use the media to get landslide hazard knowledge. In general, promoting landslide hazard knowledge is considered as key issue to protect the environment. It has been shown that there is a positive relationship between environmental education and pro-environmental behaviors and attitudes. Students with higher level of knowledge may be more socially aware about the landslide hazard. [20] stated that individuals with higher levels of education may be more socially aware. The costs of environmental activism might be lower for better-educated people because they have more civic skills [20]. One of the main challenges of natural disaster discourses is to define environmental science and subsequently policies, programs, and practices for landslide hazard. People frequently use environmental education to describe what could also be designated as landslide hazard information. This includes information that can be acquired from the media, through advertisements, or even in internets. Science and geography education, in some instances, can also provide landslide hazard information without necessarily providing environmental education. [17] define environmental education as more than just mere transfer of information. It involves four issues: a working knowledge of environmental issues, a specific knowledge of approaches to address those issues, the competency to make appropriate decisions, and the possession of certain affective qualities and attitudes that make students care about and pay more attention to environmental conditions. Additionally, several previous studies have stressed the relevance of informal education [21], [22], [23]. Likewise, it is argued that students can extend their landslide hazard awareness about the landslide issues through the media (by watching television or reading newspapers), internet or by means of social interaction. In this sense, landslide hazard campaigns to aware students about the benefits of pro-environmental behaviors and the negative consequences of irresponsible behaviors seen to be particularly effective in achieving better attitudes and behaviors [24]. Thus, we can conclude that the landslide hazard can be widely recognized the importance of non-formal education channels in generating landslide awareness responsibility. Additionally, well-informed citizens who know about landslide problems might have stronger pro-environmental attitudes and behaviors, because they are better aware of the possible damage [18], [19]. It goes the same to the students to, who might have stronger landslide hazard attitudes and behaviors. In this context, a research about which is the main source from which students acquire landslide hazard awareness program can be informative. In this respect, one of the main issues consists of identifying the students’ knowledge and awareness in landslide hazard using data from SPSS Program for students, which is focused in geography and science achievement of grade in the examination of lower secondary assessment. Using specific information about landslide hazard knowledge achieved by students, the researcher implement a multilevel analysis that enables then to test the potential influence on multiple factors related to students’ attitudes and knowledge as well as activities that should be carried out by the government and as well as schools to promote landslide hazard awareness among the students. Many studies have shown that high-knowledge can increase the awareness of a person in a natural disaster such as landslides. It is claimed that the deeper the knowledge about environmental problems and the way to solve them, the higher is the probability that an
individual is involved in actions to protect the environment [16]. As an option, students should consider a proper knowledge with enough awareness on hill land development because they are the future developers and consultants who are going to develop the hill land areas. An awareness program among the students for a long term is needed to assist the local authority to avert or minimize the landslide hazards. Hence, the aim of this research is to identify the level of knowledge and awareness aspects among the students to prevent further landslide and environmental damages occur in the long-term plans and to collect information helpful in enhancing students’ knowledge and awareness about the landslide hazards in Penang Island, Malaysia. Development on the hill land areas contribute a hot issues in term of safety and environmental lately. As an option, students should consider a proper knowledge with enough awareness on hill land development. A landslide awareness program among the students for a long term is needed to assist the local authority to avert or minimize the landslide hazards. Hopefully this research will be very helpful to students, teachers, future researchers and all academicians to identify the most suitable ways or methods in developing the hill land areas in future without any damages to the environment and the human lives. This study can be particular merit to Malaysian education policy-makers in their pursuit to integrate knowledge and awareness among the students towards landslide hazard strategies.

III. METHODOLOGY

The present study is attempt to examine the landslide awareness of form five secondary school students in relation to geography and science grades scored in Lower Secondary Assessment (PMR). Four secondary schools in the state of Penang (one of the 13 states in Malaysia) were selected based on the occurrences of landslides in the state. Two biggest districts, Northeast and Southwest of Penang Island were chosen for the survey, which are situate on landslide prone areas and outside the landslide prone areas. Two schools from each district were selected. Therefore, it would be very interesting to examine whether the four schools of students are aware about the landslide hazards. Guided close-ended questionnaires’ surveys were conducted and interviewed some respondents that are related to the problem of landslides in Penang Island. Figure 1 showed the selected areas in Penang for the survey in Penang Island.

Secondary schools consist of students from form five level aged between 17 to 18 years, this is because they are quite matured enough to answer the questions. The sample size of the study was 15 students randomly selected for each school from the total of 60 students. Researcher employed chi square statistic and frequency method to find out the significance difference between the level of awareness and knowledge of landslide hazard among the students in the selected areas. The questionnaire was divided into three parts, first part contains the student’s demographic, second part contains 15 questions with two choices ‘A’ and ‘B’ and the last part of the questionnaire contains 50 questions consisting with awareness of landslide hazard with the response format of a five points Likert scale ranging from strongly agree (5) to distrongly agree (1). Each question is given a choice of (1) most not agreed (2) not agreed (3) less agreed (4) agreed (5) most agreed to the questions asked. Specifically, 60 students completed the guided questionnaires. The responses of the students on answering the questionnaires were good indeed. Pilot study was conducted and the wording of questionnaire was amended accordingly.

IV. RESULTS

Chi square analysing statistic was used to compare the scores of students from different type of schools in Penang Island in both science and geography subjects. Table 1 showed the scores scored by the secondary students in PMR (Lower Secondary Assessment). This section will identify the students’ knowledge of landslides. 60 students from five selected from four secondary schools which already have basic knowledge about geography and science and will be moved into the realm of higher education. Of the total, students who achieve a grade A for geography is about 15% and science is 10%. Grade B for geography achievement is 30% while science is 42%. Students who achieved grade C in geography were 42% compared to 17% of science, the achievement of grade D for geography was 13.3%, and science is 32%. Table 1 shows the grade of geography and science achievement in PMR by students involved in this study which has the closes link with the landslide hazard awareness.

Table 1

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Figure 1
Overall it can be concluded that the achievement of grade A is the lowest compared to the grade B, C and D for both the subjects. Geography and science are closely associated with landslides in which geography is the study of the location and space variations in physical and human phenomena in the Earth consisting of soil, plants and animals, is also a human environment, history and information science. While scientific knowledge is a collection process or the information, review things carefully, sorting and measuring, experimenting with to explain why things happen such as natural disasters such as landslides. So clearly here, the two subjects are closely linked with the problem of landslides. From the chi square test, data analysis showed that 86.7% of the students are concerned about the development of hill land because it is an ongoing process since time immemorial, while 75% of students disagreed build flats in hilly areas to accommodate population growth and economic problems in the state. This means that the student is aware of the effects that arise if the development of hill land carried out continuously. 80% of students agreed that land law is needed to control the development of high ground because it has reached an alarming level and 86.7% of students agree that a home buyer must take cognizance of the environment of their homes before buying a house in the hills, while 88.3% of the students distressed if their home is close to the hills.

This shows that students have a high awareness of the dangers of landslides for understanding the adverse effects of high land for the purpose of exploration and development of housing accommodation danger on the hill. 90% of students seriously in the problems of landslides that occurred in this country and do not regard it as a problem of developed countries and 85% of students do not support logging and improved housing even if it damages the hill. This explains that students are aware of the danger of landslides is a global problem and be firm against the destruction of forest ecology that can lead to various environmental problems. 88.3% of students agreed to intensify reforestation activities on the hill to prevent landslides and same total percentage of students also stated that every student should be concerned about endangered species of flora and fauna on the hill, while 68.3% of students did not agree that the problem of landslides is a common phenomenon occurring in anywhere. This reflects that the students realize the importance of vegetation in reducing soil erosion and hill treasures rich species that are valuable to humans and other living things and understand that disasters can happen at any time if people fail in their natural work. 93.3% of students agreed to have a sense of caring and responsibility among societies on hill development to prevent landslides and 91.7% of them agreed to establish an anti-development attitudes among students of hills that could lead to natural disasters such as landslides, floods lightning, soil erosion and so on, while 93.3% of students agreed to create a self understanding of the needs of hills. This means that students are aware of the dangers of landslides are very high as they are more concerned over the development of hill land that lead to landslides and criticized the attitude of some people who do not take care about the safety of the environment and the students want to maintain the high ground from further degraded as a result of activities people who do not hesitate to explore the hill. 76.7% of students agreed that they should be skilled in solving problems of landslides and 90% of students consider the pace of economic growth and high ground cover can enhance the quality of life, while 71.7% of students agreed that the government is not only responsible for the landslide problem, but also other walks of life involved in the problem. This reflects the students' awareness of the dangers of landslides is high, as they seek a competency in solving problems of landslides and see that a safe environment can ensure a comfortable and harmonious living and each of the community should be responsible for the landslide in the state. 81.7% of students agreed that the developer highlands are occupied profit solely from the safety of the occupants approximately the hill and 86.7% of them agreed that students should participate in environmental activities in addressing the problem of landslides. This shows the students aware of the greed of developers in exploring the highlands, causing environmental hazards and the importance of environmental activities to students at schools in addressing the problem of landslides in the state. 86.7% of students agreed to investigate the causes of the problem itself landslides and 93.3% agreed that the drama or documentary about the development of high ground can help to understand the facts about the landslide problem, while 88.3% of students agreed that outdoor education can increase knowledge about the problem of landslides. This means that students are aware of the importance of environmental research and the role of outdoor education in landslide hazard among students. 78.3% of students agreed that the issue of landslides should be made compulsory in biological subjects at school and 55% of them agreed that the issue of appropriate applied in the subjects in school, while 91.7% of students agreed the issue is best applied to landslides in certain subjects in school. Students are high awareness of the dangers of landslides due to the support of so many issues are embedded in a landslide in the school syllabus. 51.7% of them did not agree highland development issues must be applied at the university level only, while 75% of the students agreed high land development issues as a basic subject in primary and secondary school curriculum. This means that students realize the importance of this issue is applied in the teaching and learning in schools and their seriousness of the disaster knowledge among students in primary, secondary and higher education. 93.3% of them agreed on self-awareness can prevent all natural disasters in the universe and 91.7% of the students said that with the increasing technological advances and the population will increase natural disasters on earth, while 58.3% of students disagreed material advancement of conscious self-awareness. This shows that students have a high
awareness of the dangers of landslides since the majority admitted that negligence and greed of human nature as well as managing the human and technological development is not balanced as the primary cause of environmental destruction. As conclusion, it can be said that overall student awareness of the dangers of landslides is high and there are a few of the them who are still far behind in realizing the importance of this disaster issues embedded in the school syllabus.

V. DISCUSSION

In this study, it was found that though many students understand and aware of the landslide hazard, but there are some students who are still far behind in terms of safety and landslide hazard threats in the world. The study also found that there are still a number of students from the selected schools with low level of landslide knowledge and awareness. The present study highlighted that in total there is influence of education systems on level of students' landslide knowledge and awareness. It was found that the system of education has impact on landslide knowledge and awareness of students in both Penang Island or overall in Malaysia. This study provides further evidence to support the necessity of key interventions in the design of school curriculum in order to make landslides issues such as disaster matter more effective. Since majority of the students of the two districts are more likely understand and aware of landslide issues, while they seem to ignore some other features of the hill development and they feel the government should adopt a landslide issues as well as other environmental issues as an environmental education in school curriculum subjects as civic and moral practice in the secondary school level or even primary schools too. The questionnaire of the present study can be used both as a mapping tool in order to assess students’ awareness and knowledge for landslide issues and as a platform for enhancing students’ knowledge and awareness on these problems in the school curriculum and environmental education. Landslide hazard as a threat to human strict, the education ministry and other government agencies should play an important role in students’ awareness about the importance of protecting the environment because of human actions on nature itself is fabulous. Things will become normal and safe if trained and taught the importance of protecting the environment from the grassroots. Teachers can play a role in enhancing knowledge and awareness of landslide hazards to students. Ministries of education and government intervention itself can only successfully implement this. Students should exposed to landslide hazard. Visiting the landslide areas in or outside the state in the contexts of co-curricular activities in schools may be encourage the students in developing their knowledge and awareness on landslide hazard. In this sense, students can take photographs of landslide for viewing public or competition held. By doing this the students would be able to understand more closer about the landslide issues and be more alert on developing the hill lands in future. Generally, landslide knowledge in schools is one of the most effective strategies for increasing students’ awareness of landslide. Determining what students know about the landslide, how they feel about it, and what actions they take that may help the students be more conscious on the landslide issues. This will create a strong national environmental movement that will conserve the environment by solving landslide problems in future.

VI. CONCLUSION

Each student has a curiosity and the wish to conduct a study on landslide disaster or other natural disaster on the island. As a students themselves need to understand the environmental problem deeply. With this, the learning methods that can enhance students’ interest towards the subject taught. As a teacher can give a boost or encourage and provide facilities and supportive disaster knowledge for their students so that they love to create healthy environment and responsible for any environmental damages occurred which terribly caused by human himself. Ministry of Education and the state government needs to mandate education of landslide disasters and modify the existing educational system into a more efficient education system and at the same time maintaining a natural passion for the students forever without disturbing the environment. Parents also need to encourage their children to love the nature without creating any damages to the environment. There is no better way without having a deep knowledge and awareness of landslide disasters. With sufficient knowledge and awareness of the problem of natural disasters such as landslides can be prevented or reduced in some way.

ACKNOWLEDGMENT

We would like to thank the Education Department of Penang and the students for the moral support.

REFERENCES


