



## Geohazards Awareness And Education For The Society, Case Studies For University And High School Students In Bandung, Indonesia

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### ABSTRACT

*Since the great 2004 Aceh's tsunami and earthquake, geohazards awareness among communities in Indonesia has significantly increased. It is due to the fact that massive information is spread out through many kinds of media, though in some cases, stakeholders have limited understanding on disaster response. Students in secondary and tertiary education level generally have limited geohazards education opportunities and knowledge, which could imply a low level of awareness. This paper aims to elaborate the knowledge on geohazards of university and high school students as a basis to improve earth science education in the future.*

*The methodology of this study includes examination of curriculum, level of knowledge and awareness for geohazards. Pamphlets were distributed among students and presentation was performed in the classroom to measure understanding of the contents.*

*Result showed that geohazards subjects were generally out of curriculum in high school or basic level in the university, except for faculties or departments related to earth science. This might be due to limited knowledge of the curriculum development. For the awareness to disaster event, most of participants are unaware what to do when disaster happens. School visit or campus activities had increased the curiosity of student communities to learn more about geohazards awareness. These results suggest that dissemination of entry level of geology or earth science is deeply needed, since there is no such subject introduced in the secondary level school in Indonesia. While in the introductory level of university, the geohazard subjects is proposed to be integrated in the curriculum.*

**Keywords:** Geohazards, awareness, education, curriculum, students, Bandung

### I. INTRODUCTION

#### Background

Since the great 2004 Aceh's tsunami and earthquake, geohazards awareness among communities in Indonesia has significantly increased. This geological disaster had caused huge destruction and large victims in Southeast Asia. It was then followed by major earthquake around Bantul, Yogyakarta in 2006; tsunami in Pangandaran, West Java in 2006; mud-volcano eruption in Sidoarjo, East Java in 2006; major earthquake in Padang, West Sumatera in 2010 as well as 2010 volcanic eruption of Merapi around Central Java and Yogyakarta. These series of

disaster events had become sad stories in the humanitarian context. In the aftermath of each event, massive information is spread out through many kinds of media, not only in Indonesia but also in the world.

Stakeholders for disaster issues consist of government, private sectors and communities. In some cases, stakeholders have limited understanding on disaster response such as school community. Teachers and students in secondary and tertiary education level generally have limited geohazards education opportunities and knowledge, which could imply a low level of awareness for them (Muslim *et al.*, 2015). This might happen that earth science education needs

to be improved as part of effort in disaster mitigation activity. In this study, school community is defined as teachers/lecturers, students in all level and officers who spent most of their daily time in the school or campus premises.

### **Purpose of Study**

Based on the background above, there are needs of knowledge for disaster prevention or efforts to disaster risk reduction in school community (Shibayama *et al.*, 2012). This necessary knowledge is very important for school community to enhance the disaster resilient when the event is coming in the future. Therefore this paper aims to elaborate the knowledge on geohazards of university and high school students as a basis to improve earth science education in the future.

## **II. LITERATURE REVIEW**

Muslim *et al.* (2011) in their research of disaster prevention for school children in Indonesia mentioned that it is not uncommon to witness the victims of a disaster event involve many young people or youth communities in the school. It has become a public concern that students and school community are very vulnerable to disaster. They could be entrapped in a hopeless situation when an event of geohazard occurs around their vicinity. It is understandable since they are powerless in terms of knowledge to escape, communication tools as well as life-saving infrastructure or equipment within their premises.

Shibayama *et al.*, (2012) in their study about comparison of disaster awareness between students in Indonesia and Japan mentioned that there is a need for appropriate disaster education and training for stakeholders such as school communities, where there is positive correlation between willingness to respond or escape from a particular disaster and knowledge of the disaster event. Public should concern to save the population (all type of stakeholders, including

school children & their teachers) living in disaster prone areas by helping to create a more prepared and confidence for schools environment.

Mussachio *et al.* (2014) mentioned that based on detailed comparative study in 4 countries in Europe shows that compulsory school is greatly unprepared with regard to hazard education, and these results are in line with worldwide studies. Moreover, when hazards are addressed, this is not done at an early age, which results in a missed chance to intervene in the non-cognitive side of awareness, which decreases at later ages. It requires more knowledge on psychology when this communication is aimed toward young people such as students in their school community.

Peppoloni and Di Capua (2012) in their paper about geoeconomics emphasis the situation where lacking ability of geoscientists to use simple language for common people in communicating the disaster could imply to misunderstanding or even uninteresting information especially for young people. Eventhough the information is very important to save their life in facing the event of disaster.

All the above reviews are actually in-line with the effort of national program of disaster mitigation that should be performed by all stakeholders in Indonesia. Public concern on this issue should be supported by national and local government.

## **III. METHODOLOGY**

The methodology of this study includes examination of curriculum, level of knowledge and awareness for geohazards. These research activities were conducted in campus or schools involving students and teacher/lecturers. Brochures of disaster education as well as pamphlets were distributed among students and presentation was performed in the classroom to measure understanding of the contents. Brochures or pamphlets were prepared and printed in Osaka-Japan by several group of volunteers under coordination of Natural Environmental Institute from Osaka (Figure 1 & 2), which then brought to



Indonesia for this study. The posters are then posted in announcement board of each school, and the pamphlets are distributed to students and teachers in their classroom. Discussion session and short drama were performed in the classroom to measure understanding of the contents. The aim of discussion was to explore students & teachers' perceptions and knowledge of disaster education & response through a series of questions and answers (Shibayama *et al.*, 2006).

Due to the knowledge limitation of this topic, the authors thought that a survey research would be more appropriate as it would generate a basic understanding of the phenomenon as well as reaching a larger proportion of the population. Polit and Beck (2008) mentioned that the greatest advantage of survey research for disaster issue is its flexibility and broadness of scope. A mixed method of descriptive and exploratory research is carried out in this research.

#### IV. RESULT AND DISCUSSION

For the purpose of this study the term 'education' refers to any didactic formal education included in curriculum, where 'training' refers to practical hands on approach to disaster knowledge. Both of terms constitute activities such as lectures, desk top exercises, real-time exercises, etc. Many of participants had never attended specific disaster training or education outside their schools. Only a small amount of participants stated they had attended minor disaster specific courses in an extra-curricular activity such as "boy scout". Meanwhile, 'disaster specific courses' were considered as those that have been created specifically with the purpose of training common people in any aspects of disaster preparedness and response.

Result showed that geohazards subjects were generally out of curriculum in high school or basic level in the university, except for faculties or departments related to earth science. This might be due to limited knowledge of the curriculum development.

Muslim *et al.* (2011) mentioned that based on the discussions with school principal, teachers & students as well as local education section office, it is interesting to note that based on national curriculum, earth science is included in the subject of Geography instead of Geology course in all level of elementary to high school. Even in a region where previous geological disaster had occurred, local content of curriculum for disaster is not developed yet so far. Although most of participants stated they know about disaster events but many stated they have no ideas about kinds of natural disaster in their area or current vicinity. It is possible that the majority of participants answered since they have read newspaper or watch TV about the recent disaster events in Indonesia and elsewhere but unfortunately they don't have idea for their own area. It is worthy to note that pamphlets adopted from Japanese comic, created and produced in Japan along with the appearance of foreign researcher in the school or classroom seemed to increase psychologically the enthusiastic attention from students and teachers to the disaster topic in each school (See Figure 3 and 4).

While in the observation of early grade of university students, subjects related to disaster issues are rare to be found, except for some departments or faculties which specifically related to earth or natural sciences. This finding suggests that the distribution of disaster knowledge is still a long way to go further, even for the lecturers (see Figure 5 & 6). There is a huge necessity to campaign the public concern on disaster awareness and education to a wider audience.

#### V. CONCLUSION

Based on the analysis and discussion above, it can be concluded that dissemination of entry level for geology or earth science's subject is deeply needed, since there is no such subject introduced in the secondary level school in Indonesia. While in the introductory level of university, the geohazard subjects is proposed to be integrated in the curriculum.

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Figure 1. Preparation for brochures of disaster education and awareness by volunteers in Japan managed by NERI



Figure 2. Newspaper in Japan mentioning preparation of disaster pamphlets in Bahasa to be used in Indonesian schools.



**Figure 5.** Disaster awareness campaign in the campus of Faculty of Geology UNPAD



**Figure 3.** School community and classroom situation in disaster awareness campaign. Note that brochures are the tools for this activity.



**Figure 4.** Enthusiastic school community to attend workshop on disaster education in their premises.



**Figure 6.** Posters and brochures for disaster awareness campaign in the university level involving students and lecturer.