

BUILD KNOWLEDGE ABOUT NATURAL RESOURCES AND HAZARD POTENTIAL THROUGH FIELD SOCIAL STUDIES LABORATORY PRODUCT

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Abstract— The Mount Kelud eruption in 2014 gave the impression that Blitar District was a safe area. This thinking results in the event of a disaster in the future the community becomes blunt in attitude. On this rational basis, this article aims to identify potential natural and disaster risks on the southern slopes of Mount Kelud in Gandusari District and presenting it in the material to open the public's insight into the surrounding environment since primary education. Design to achieve this goal uses surveys to identify, and develop 4D models to compile teacher books. The data presentation technique uses descriptive and analysis using a single tabulation to see potential patterns and disaster risk. The results obtained are on the southern slope of Mount Kelud has the potential in the form of plantation areas and mine C, while for disaster risks include volcanic eruptions and landslides. The material is presented in the material with the composition (1) Natural Resource of Gandusari District, (2) Disaster Risk in Gandusari District, (3) Environmental Based Disaster Risk Reduction Efforts.

Keywords— *Natural Resource, Disaster Risk Reduction; Teacher's Book*

I. INTRODUCTION

Gandusari Subdistrict is one of the areas directly affected by the Kelud eruption in 2014 [1]. Even though it has not suffered as much damage as other regions (Junun. 2014), this region still has the potential to be affected by the Kelud eruption in the future. As a result, the threat of disasters now tends to be ignored by the people around the Kelud area [2], they assume that by increasing spiritual values and religiosity, they will avoid future disasters [3]. That understanding is now embedded in the minds of the people around Kelud in Blitar Regency.

They are now lulled by the resources provided by Kelud in the form of fertile land and the potential for excavated raw materials in the form of sand and stone. In Gandusari Subdistrict the use of area for paddy fields and plantations is the most extensive [4] which covers 29.5 km² or 56% of the total area. The main commodities are bananas and mangosteen [5] and began to be developed for the cultivation of potatoes, onions in Tulungrejo and Krisik villages. For potential quarry C dispersed in Kali (river) Putih, Jari,

Semut, Soso, dan Icir [5] which become additional income for residents of Gandusari District for more than 23 years.

But the threat that it not be forgotten so alone. Need there is an understanding to the residents in the surrounding of the threat of disaster that will happen. Knowledge of the disaster is not enough of the experience of generations preceding even though it is a lesson that is important. Age is closely related to experience. Seniors are more time means more and a lot of experience in the face of the threat of disaster from the environmental point of staying so build perception of the disaster [6], [7], [8], [9], [10] through learning during a disaster. However, when the incidence of disaster is felt not affect significantly the life the generation of new it would build the perception that the disaster is the activity routine environment around the place of residence, or called by the domestication of disaster [11].

On the basis of the rationale that the article is attempting to do the identification of the potential of nature that exist in the District Gandusari as well as the risk of disaster and efforts disaster risk reduction in a book -based Lab Nature. Target book it is they who sit on the School Secondary First. So that the development of knowledge about the environment around can be initiated from the early beginning to recognize the environment around them. Environment around which serve as a knowledge base for learning will make the development of knowledge becomes more meaningful [12]. Knowledge which means it will be long lasting and know when to use [13].

II. METHOD

This research uses the 4D development design. This design was developed by Thiagarajan, et al [14] which consisted of four stages, namely: define (define), design (design), develop (development), and disseminate (spread). The initial stage is defining the needs of prospective users. Lab IPS in SMP and its products is still limited and not applicable [15], by because it is necessary there is an environmental nature which is packed into a means to learn and comes with a book guideline use. Subsequently conducted a survey of the potential resources of nature and the risks of disaster are there. The District of Gandusari Regency Blitar. The data obtained are to be developed in

stages next is design stage. Article is only limited to the stages of defining and designing the book. For more details, follow the development flow chart with 4D design.

Data collection techniques used to carry out inventory using surveys. Surveys were done is to collect the whole of data [16] are associated with potential resources of nature and risk of disaster either in the form of data of secondary or primary with the interview. Then the collected data is selected. The analysis uses the tabulation single to determine the potential source of the power of nature and patterns of disaster that is already happening.

III. FINDING AND DISCUSSION

Gandusari District is an area directly adjacent to Mount Kelud (Figure 1). Before the 2014 eruption event this district was included in a disputed area with Kediri Regency to fight for the Mount Kelud Administration [1]. There are 14 administrative levels at the village level in this sub-district and traversed by the main rivers (*Kali*) of the Mount Kelud cold lava flow include; (1) *Kali Lekso*, (2) *Kali Jari*, (3) *Kali White*, and (4) *Kali Semut*.

The climatic conditions have quite high rainfall so they are able to support the agricultural sector or providers of drinking water. This water comes from the upstream of the rivers on Mount Kelud or springs that come out in the rock slits [5]. This agricultural sector absorbs employment by 63% of the total population in Gandusari District (PODES. 2016). Products from this sector include: (1) food crops (rice, corn, cassava and sweet potatoes), (2) horticulture crops (vegetables and fruit), and (3) annual crops (coffee, tea, sugar cane, and clove).

The river that has upstream in Mount Kelud also carries economic value material that can be utilized by the community such as sand and stone. The measurable mine volume reaches 3,100,000 m³ (Figure 2). The community mines traditionally in the Gandusari Village Semut River. The mining products are utilized by Blitar and Kediri districts for infrastructure development needs.

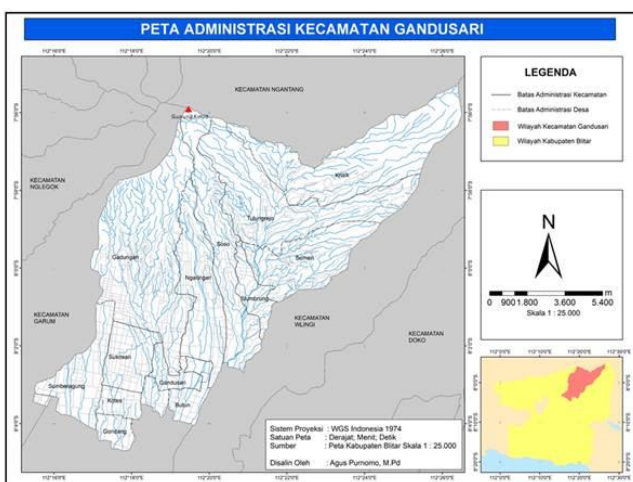


Fig. 1. Administrative Region of Gandusari District

The resource wealth described above is the result of Mount Kelud which has potential disasters. Mount Kelud is located between two regency areas in East Java, namely

Kediri and Blitar districts. As an active volcano, Mount Kelud provides fertility for the area around Kelud. So it is not surprising that in the distribution of 7 km there are already a lot of residential villages [17].

History of eruptions in January 2014, status of Mount Kelud has increased status. Mount Kelud is stated to show turmoil that all communities must watch out for it. On February 13, 2014 at 9:30 a.m. Mount Kelud was declared Siaga I status and residents within a 5 km radius had carried out massive evacuation. Shortly thereafter at 11:20 a.m. Kelud erupted [18]. The eruption did not last long, many people returned to their homes on February 18, 2014 [18]. Mount Kelud eruption did not cause casualties in the area of the Refuge Command Post. But it leaves a secondary danger: volcanic ash fall and volcanic lava eruptions. This volcanic ash fall erupted in Ngantang District and Pujon (Figure 3).



Fig. 2. Potential of mining C (Sand and Stone) in the Semut River, Gandusari District



Fig. 3. Impact of Mount Kelud eruption on Ngantang and Pujon Districts Malang Regency

Education is the main key in increasing individual readiness in the face of disasters. The higher the education level the income tends to be higher as well [19]. The level of education will influence the level of individual knowledge

and shape their understanding of assessments of disaster risk and how to act [20].

Education about disaster should not only be done in formal education. In school knowledge about disaster can be given in a classroom learning. While in society, education can be taught in various forms [21]. In these communities there is a transfer of knowledge about aspects of vulnerability, disaster risk assessment, and providing alternatives to problems that can be disseminated in family, friends and neighbors.

Educated individuals have more readiness because they are able to access information about disasters from various sources [22]. So with these evidences, it can be concluded that education greatly influences the individual's response to disasters.

Educational data shows the average level of education of residents in Gandusari Subdistrict between junior high school and senior high school. The relationship between education level and age is very close. Many residents over the age of 40 only receive elementary-junior high school education. They claimed that they felt that they had enough education at that level because in their area there were no facilities to continue higher education. In addition, the surrounding community also still considers that religion is more important than formal education. The following are data from cross-tabulations between Respondents Education and Age Levels.

TABLE I. CROSS TABULATION BETWEEN EDUCATION LEVEL AND AGE OF RESPONDENTS

Age group	Level of education				Total
	Elementary school	Junior high school	High school	PT	
20-24	0	3	4	1	8
25-29	2	0	11	4	17
30-34	1	1	11	2	15
35-39	1	4	7	0	12
40-44	0	1	0	0	1
45-49	3	3	0	0	6
> 50	5	0	0	0	5
Total	12	12	33	7	64

The level of education is very closely related to the ability to find information. Those who have higher education will be better able to access information from various sources, including by previous generations about disaster experiences. The older generation had experienced a disaster worse than this and did not evacuate. This fact will add to the understanding that the older generation still prioritizes mythology or knowledge about nature to respond to disasters.

If seen from the existing pattern, those who are younger have more readiness to prepare themselves to face the threat of disaster. This ability is seen from their response. The ability to respond to disasters is a form of their perception of disasters. The following page presents a cross-tabulation analysis between the level of education and response when a disaster occurs.

During the 2014 Kelud eruption disaster, the source of information was well coordinated on one door, the Blitar District Regional Disaster Management Agency. But this single source of information is interpreted differently by the

community. They assume that there is no serious threat from the disaster. So they also don't prepare themselves seriously.

TABLE II. CROSS TABULATION BETWEEN EDUCATION LEVELS AND RESPONSES TO DISASTERS

Response during a disaster	Level of education				Total
	Elementary school	Junior high school	Senior high school	Higher education	
Nothing to do	8	4		1	12
See and follow the situation	4	8	12	2	27
Search for information from various sources			21	4	25
					64

The experience of disasters in the last 5 years from the 2015 Village Potential data shows that the region had experienced a tornado and landslide disaster in 2013. The experience of the disaster will shape existing knowledge. In this case the experience of the disastrous volcanic eruption they got last in 1990. Those born after the disaster did not have the knowledge to deal with the disaster. Because of this his knowledge was awakened from the perception of the previous generation of disasters.

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Fig. 4. Draft outline of the teacher's book supporting the Natural Lab Social Studies Education Program

Natural Laboratory of Social Studies Department in Blitar Regency is one of the facilities that can be used to conduct learning to the community, especially the younger generation about the potential of nature and the surrounding disaster. The results of the identification of the facts above will be used as material for developing teacher books. The developed teacher book is oriented towards contextual learning. The structure of the book containing material taken

from the surrounding area and equipped with problem-based worksheets will hone high-level thinking skills (HOTs) (Figure 4).

Contextual learning is a concept of learning that helps teachers associate material taught with real-world situations of students and encourages students to make connections between the knowledge they have and their application in their lives as family members and society [23]. This approach helps students to construct their own knowledge with the help of educators. So contextual learning is very closely related to constructivism learning.

Research in education has been dominated by constructivism views. According to this view, students do not passively absorb information, but meaningful learning involves the active creation and modification of knowledge structures [24]. When students learn they use existing knowledge from everyday life experiences, beliefs, interests, and goals to interpret new information, and this can cause their ideas to be modified or revised. In this way, learning the results of the conceptual schemes of each individual progressively (reconstructed) and become new experiences and ideas [25].

The results of the readability test in the teacher's book indicate that the material designed has described the environmental conditions around the students. This will support contextual learning so that it produces meaningful learning. However, it should be noted that to build an understanding of attitudes and actions during a disaster, it cannot be done only through one aspect of learning. There needs to be a thorough understanding of all aspects such as government, family and community environment [26].

IV. CONCLUSION

The northern part of Blitar Regency is the southern slope of Kelud which has many natural potentials and also the risk of disaster. There needs to be contextual learning that brings these 2 things so that students understand the potential and risks of the surrounding environment. The teacher's book is one of the products from the Natural Laboratory of the Faculty of Social Sciences which is compiled based on a survey of potential facts and risks, with the structure of the material and worksheet description is one of the means to realize the learning outcomes of understanding the potential and risks of the surrounding environment. But this book is still a draft and is only taught at 7th grade at junior high school. There needs to be more general development so that this book can not only be used by students in the northern region of Blitar Regency.

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