

## INCREASING DISASTER MITIGATION PREPAREDNESS THROUGH ECOLITERACY IN CULTURE BASED SOCIAL STUDIES LEARNING

*Meningkatkan Kesiapsiagaan Mitigasi Bencana Melalui Ekoliterasi Pembelajaran Kajian  
Sosial Berasaskan Budaya*

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### ABSTRACT

*High vulnerability to natural disasters requires preparedness in the process of mitigating natural disasters, related to environmental (ecological) crises has always been an issue that never ends for discussion because the ecological crisis is already at an alarming level. Community preparedness in dealing with natural disasters is a process to minimize the potential for natural disasters. Natural disasters can occur at any time and at any time, so preparedness is needed to minimize natural disasters, with natural disaster mitigation efforts. The purpose of this study is to identify preparedness in natural disaster mitigation through culture-based ecoliteracy for students in social studies learning. This research uses a descriptive study method with a qualitative approach, while the data collection techniques are through data triangulation, namely observation, interviews and documentation studies, as well as data analysis techniques with data collection, data reduction, data presentation, and data verification. The results of this study indicated the level of preparedness in disaster mitigation through ecoliteracy. About 65% of students in Garut Regency already show preparedness in dealing with natural disasters. The level of ecoliteracy of students related to preparedness in natural disaster mitigation has certainly increased and is driven by the creativity of students, one of which is in utilizing waste that can cause natural disasters literacy materials for learning.*

**Keywords:** *Disaster mitigation readiness, ecoliteracy, and social studies.*

### ABSTRAK

*Kelemahan yang tinggi terhadap bencana alam memerlukan kesiapsiagaan dalam proses mitigasi bencana alam, berkaitan krisis alam sekitar (ekologi) sentiasa menjadi isu yang tidak pernah berakhir untuk perbincangan kerana krisis ekologi sudah berada pada tahap yang membimbangkan. Kesiapsiagaan masyarakat dalam menghadapi bencana alam sebagai proses meminimumkan potensi bencana alam. Potensi bencana alam boleh berlaku pada bila masa dan pada bila-bila masa, maka kesiapsiagaan diperlukan untuk meminimumkan bencana alam, dengan usaha mitigasi bencana alam. Tujuan kajian ini adalah untuk mengenal pasti kesiapsiagaan dalam mitigasi bencana alam melalui ecoliterasi berasaskan budaya untuk pelajar dalam pembelajaran pengajian sosial. Kaedah kajian ini menggunakan kaedah kajian deskriptif dengan pendekatan kualitatif, manakala teknik pengumpulan data adalah melalui triangulasi data iaitu pemerhatian, temu bual dan kajian dokumentasi, serta teknik analisis data dengan pengumpulan data, reduksi data, persembahan data, dan pengesahan data. Hasil kajian ini menunjukkan bahawa tahap kesiapsiagaan dalam mitigasi bencana melalui ecoliterasi pelajar dari sekitar 65% pelajar di Kabupaten Garut sudah mempunyai kesiapsiagaan dalam menghadapi bencana alam. Sehingga tahap ecoliterasi pelajar berkaitan kesiapsiagaan dalam mitigasi bencana alam sudah pasti meningkat dan didorong oleh kreativiti pelajar, salah satunya dalam memanfaatkan bahan buangan yang boleh menyebabkan bencana alam menjadi barang literasi dalam pembelajaran.*

**Kata kunci:** *Kesediaan tebatan bencana, bkoliterasi, dan kajian sosial*

## INTRODUCTION

The phenomenon of the issue of the ecological crisis is always an endless discussion. Environmental problems are moral issues and not merely technical issues. That is, this morality crisis is rooted in a paradigm crisis (Keraf, 2002: XIII). In Indonesia itself, the environmental crisis is already at a serious level. Ecopedagogic is a combination of two terms. The first is ecology (ecology) which means the science that studies the reciprocal relationship between living things and their environment, and the second is pedagogic (pedagogy) which means the science of education. Ecopedagogy addresses three main areas. First, technical (functional) ecoliteracy to understand the basics of science, ecological and biological concepts, and the positive and negative impacts of humans. The second is cultural ecoliteracy to increase insight, awareness and understanding of various cultural perspectives in the relationship between humans and the environment. Third, critical ecoliteracy to involve students in ecological politics, technological progress and communication through critical and constructive dialogue (Ridwan, 2013).

The development of ecopedagogic learning (environmental education), emphasizes more on Green Behavior on aspects of memorizing and recalling the names of natural resources, tree names, types of pollution, natural disasters, types of organic and inorganic foods. Environmental learning that refers to the 2013 Curriculum Standards emphasizes more on knowledge and not on attitudes and skills. The school environment with all its problems, the life of the community in the school environment, the social experiences of students and their relationship with the community are the scope of Green Behavior (Supriatna, 2013).

Problem of the accumulation of plastic waste is one of the wastes that is difficult to decipher because it takes tens to hundreds of years for plastic waste to decompose. The National Oceanic and Atmospheric Administration (NOAA) (in detik.com, 2020) revealed that it takes 10-20 years to decompose a plastic bag. Therefore, in this case, it is necessary to reduce the consumption of plastic-packaged food and drinks in order to reduce plastic waste pollution. The habit of indiscriminate consumption of snacks and plastic packaging followed by the habit of littering has resulted in the packaging of food and beverage product packaging waste being a fairly large pollutant element in the school environment. Based on the opinion of Tamam (2016: 1), it shows that product packaging is only considered as a wrapper and protector of food and beverages, so that after being consumed the contents are then thrown away and most of them become pollutants for the environment. Meanwhile, the education unit is a very effective means of developing competence in caring for the environment. This is in accordance with Pandikar's statement (2020: 76) which states that the main ability that students must develop is concern for the surrounding environment, one of which is ecological intelligence, the important role of implementing ecoliteracy, especially in disaster mitigation efforts as a context in maintaining environment.

The problem of vulnerability to natural disasters, or disaster vulnerability, will certainly have a high level of danger to the survival of living things. Every country has vulnerability to natural disasters and Indonesia is a maritime country that has wide waters consisting of a group of islands, so that many areas are directly adjacent to the waters or commonly referred to as coastal areas. Indonesia is also included in the world's tropical climate area which can be affected by the effects of global warming (*global warming*), which causes sea level rise as a result of melting ice at the earth's poles.

The conception of natural disaster mitigation in the context of ecopedagogy and history as part of the flow of human life is studied in the study of social science. Social science according to Mulyana (2014) is science that studies humans in all aspects of their lives, their characteristics, behavior behavior, both individually and collectively, in a small or large scope, as well as interactions in their environment. In social science there are material objects of social science, namely in the form of objects of behavior between humans that affect nature (determinists) and nature that affects humans (possibilists). One of the social science disciplines that studies natural disasters is Geography. Geography studies humans and environmental conditions. Hurri (2014) states that the purpose of social science is to provide the ability to remember and observe phenomena experienced both in social life and in phenomena that occur in the environment.

The context of ecoliteracy is one of the efforts in information literacy about the environment.

Based on the opinion of Putrawan (2014) there are still errors in interpreting the term ecology with the environment because the term ecology is often equated with the environment. Ecological intelligence is also based on knowledge, awareness, and skills to live in harmony with nature. Knowledge possessed by a person becomes the initial capital for the formation of awareness and awareness which is manifested in the form of skills to improve ecological problems so as to enable caring behavior towards the environment (Supriatna, 2016). Concerning the environment, it is associated with the behavior or actions taken by a person towards the environment itself, whether consciously or not. A person's awareness to perform certain behaviors that make changes to the environment does not just happen. Awareness of behavior has a relationship between the level of knowledge and attitudes. However, a person's knowledge of the environment indirectly affects his attitudes and behavior (Yulianti et al., 2014). There is still a tendency of low concern for the environment caused by influences that come from within a person such as knowledge (knowledge), awareness or attitude (awareness or attitude) and ends with action (action). An attitude of environmental concern is an attitude that needs to be accustomed from an early age. Getting used to caring for the environment will help preserve the environment. Caring for the environment is an attitude and action that always tries to prevent damage to the surrounding natural environment, and develops efforts to repair the natural damage that occurs. Environmental care can also be interpreted as a conscious effort to prevent, improve and preserve the natural environment. Human attitudes can be educated or changed through educational institutions, and can also be influenced by the environment and their parents (Desfandi, et.al : 2021).

Thus departing from this, it is necessary to have appropriate mitigation or preparedness in the face of disasters in reducing the impacts caused by natural disasters with environmental care behavior as part of natural disaster mitigation that can be instilled in students as school residents from an early age by respecting and loving nature which is manifested through maintaining harmony with nature, responsible behavior towards the surrounding environment such as not littering, as well as ecological behavior such as avoiding fishing using inappropriate water and tools, and replacing them with environmentally friendly ways. This is in accordance with the objectives of social studies education which is to become good citizens and to become a society that has social intelligence or social intelligence which is part of the human mind to be able to filter every social life between one human and another. The higher the individualistic nature of each person, the less disturbed they will be in the process of socializing with each other. Schools are institutions or agencies that provide teaching or education to every student, especially in social science education that provides teaching on social intelligence, where social intelligence can occur when we adapt to each other in a situation.

## **METHODOLOGY**

The approach employed in this research is a qualitative approach, with descriptive qualitative study method which is a method to understand the meaning and explore something that will be examined. Qualitative research does not generalise but puts more emphasis on information so that it reaches the level of meaning (Sugiyono, 2019). In this descriptive study, the researcher uses this method in order to clearly describe improving disaster mitigation preparedness through ecoliteracy in culture based social studies learning. The location of this research is in Garut district, West Java province, Indonesia. Data collection techniques in this study are observation, interviews and documentation studies. Data and information collection techniques were further enhanced by conducting search techniques on data sources that can be accounted for the validity of the data where the data is taken from various sources such as books, journals and articles which are then reviewed on various books and journal articles that have been selected. The journals and articles that have been selected are the results of previous studies of the same type of descriptive qualitative and are interconnected with the title that the author uses, so that the results of this study can be useful for obtaining a theoretical basis on the problems to be researched and studied by the author. Then the data analysis technique to identify the validity of the data can be done by means of data reduction, data presentation and data verification.

## Results

Based on the results of the research carried out especially among students related to improving disaster mitigation preparedness through ecoliteracy in culture based social studies learning. This can increase ecological intelligence as an individual's ability to adapt to the ecology where the individual is in a cultural context. Based on Supriatna's opinion (2016) ecological intelligence is based on knowledge, awareness, and life skills in order to be in harmony with nature. Individuals who have ecological intelligence will understand every behavior and action that not only has an impact on themselves and others, but also has an impact on the natural environment where they live, which must be maintained so that they have the carrying capacity for the lives of themselves and others.

Based on the conception of empirical experience, it shows that the pressure on ecosystems mainly comes from the human desire to change the function of the area and cause natural damage. This shows that human desires which also come from their ecological intelligence are related to their concern for the environment. The environmental care behavior of elementary school students towards the ecological intelligence that students get when taught by educators in utilizing and conserving natural resources is based on data obtained with data collection techniques using observation, interviews, and documentation studies.

The pressure on the needs of human life which increasingly has an impact on the exploitation of the capacity of natural resources so that environmental problems also arise, but there are still humans who have ecological intelligence in the form of behavior or local wisdom in their management. Coastal ecosystems and natural resources and ecological intelligence are formed from traditions, attitudes, and behaviors with ecological insight into the life order of local communities. Local values that apply to coastal communities are quite effective in managing natural resources and efforts to preserve their ecosystems (Utina, 2012). This behavior or local wisdom is maintained and used by certain ethnic communities because it becomes a culture and has religious and sacred values, regardless of the ecological value contained in every traditional and cultural behavior and knowledge related to literacy and information about the environment.

The potential vulnerability to natural disasters in each region has its own potential for natural disasters, one of which is in Garut Regency which has a fairly high level of vulnerability to natural disasters. Based on data from the Central Bureau of Statistics for the Regency of Garut Dalam (Santoso, et al: 144), which states some areas that are vulnerable to natural disasters are as follows:

**Table 1**

*Number of natural disasters by type of disaster in Garut Regency in 2020*

Subdistrict	Flood <i>flood</i>	Fire <i>burning</i>	Landslide <i>erosion</i>	Hurricane <i>Hurricane</i>	Etc <i>Others</i>
(1)	(2)	(3)	(4)	(5)	(6)
Cisewu		2	2	3	
Search		3		1	
Talegong		1	3		
Bungbulang		4	2	1	
Mekarmukti		4			
Pamihan		1	3	2	Earthquake 1 Time
Pakenjeng		4	1	2	
Cikelet		4			
Pameungpeuk		2		1	Earthquake 1 Time
Cibalong		5		1	Earthquake 1 Time

Cisompet		5	4		Earthquake 1 Time
Peundeuy		1	4		
Singapore		2	1	1	
Cihurip			1	1	Earthquake 1 Time
Cikajang		1			Earthquake 1 Time
Banjarwangi			7	1	Earthquake 1 Time
Cilawu	1	1	6		Earthquake 1 Time
Bayongbong		5	2		
Ciledug		2			
Cisurupan		3	1		
official	2	3		3	
Samarang		9			
Pasirwangi		5			
South Tarogong	5	12			Earthquake 1 Time
Tarogong Kaler		7			
Garut City	1	6		2	
Karangpawitan		3	1	2	Earthquake 1 Time
Wanaraja		1			
Sucinaraja		2			
Panickan	0	0	0	0	
Sukawening	0	0	0	0	
Karang Tengah		1			
Banyuresmi		1		2	
catfish	1	8	2	1	
leuwigoong		5			
Cibatu		2			Earthquake 1 Time
Friendship		1			
Cubiuk		1		2	
Kadungora		7		1	
Blur Limbangan		2			
Selaawi		2			
Malangbong	1	3	2		
Amount	11	131	42	27	11 Districts

Source: Garut Regency Central Bureau of Statistics, 2020.

Based on the table, it can be identified that the vulnerability to the occurrence of disasters is emphasized by the presence of residential areas in hilly areas which results in the potential for landslides being increasingly felt. Mulyana, et al (2020, pg 12) suggests that Garut Regency has 42 sub-districts where there is a risk of vulnerability to natural disasters, and that is why disaster mitigation is needed, especially in increasing ecoliteracy, especially for students to work on disaster mitigation efforts based on ecopedagogy and implementing eco-pedagogy traditional cultural values that become local wisdom in natural disaster mitigation. Thus, non-structural mitigation is needed, including reducing the possibility or consequences of risk through modification of human or natural behavioral processes, without the need for the use of the designed structure. In this technique there are

regulatory steps, educational programs, and public awareness, non-structural physical modification, behavior modification, and environmental control, one of which is the delivery of ecoliteracy-based information literacy.

Efforts to implement ecoliteracy are related to natural disaster mitigation caused by the low understanding of students about environmental intelligence and the important role of ecopedagogy. The following are principles that can be applied in waste reprocessing as a way of mitigating natural disasters. These principles are known as 4M (Nugroho, 2013), namely:

- i. Reduce  
Reducing the use of consumables that can cause waste. Because the more things are wasted, the more trash.
- ii. Reuse  
Trying to find items that can be reused, and avoiding the use of single-use items in order to maximize the life of an item.
- iii. Recycle  
In addition to looking for items that can be reused, you can also look for items that can be recycled. So that these items can be used instead of being wasted.
- iv. Replace  
This method can be done by observing the surroundings, and replacing disposable items.

**Figure 1**  
*Mat from used coffee*



**Figure 2**  
*Map Indonesia from closed bottle*



Based on the Figure 1 and 2, it can be identified as related to efforts to minimize the occurrence of natural disasters with the disaster mitigation process, one of which is through increasing the ecoliteracy of students related to environmental conservation and information literacy processes that are environmental in nature and interrelated with cultural contexts. It can reduce the risk of natural disasters, one of which is by applying ecological intelligence and social intelligence in utilizing goods that can cause natural disasters by being used as a source of ecoliteracy for students. Application of environmental awareness and preparedness in natural disaster mitigation is part of literacy skills, 21st century competencies, and higher-order thinking skills with the hope that students will be ready to compete in a competitive global society packaged through learning (Tanjung & Supriatna : 2021). Local wisdom is the result of human cultural processes that are in accordance with the surrounding natural environment, obtained over a long period of time and passed down from generation to generation to foster ecoliteracy, while the core competencies of core ecoliteracy are knowledge, skills, attitudes, and human relations with nature, developed by the Center of Ecoliteracy in the United States. Based on these core competencies, growing ecoliteracy can be done through habituation (Yonanda, et. al: 2022).

Based on the research data , the research results with the title of the proposed minirist are improving disaster mitigation preparedness through ecoliteracy in culture based social studies learning. The data is identified through the following table:

**Table 2**

*Results of observations and interviews*

No.	Question Form	Answer (Yes)	Answer (No)
1.	Is social intelligence in schools developed by students?	✓	
2.	Is it only intellectual intelligence that is applied in schools or is social intelligence also applied?	✓	
3.	What is the role of social studies educators in providing guidance on social intelligence in schools or not?	✓	
4.	Is there an increase in terms of social intelligence in students at school?	✓	
5.	Do teachers and students have the same role in the development of social intelligence?	✓	

*Source: Research Results at Schools in Garut Regency, 2022*

Based on the table, it can be seen from the results of the submission of these questions that social intelligence is developed by students in the school environment because of the equal role between educators and students in the process of developing social intelligence. Intellectual intelligence plays a role in helping a student in educational institutions and in the community to be able to use his thinking power, and the role of social intelligence is to be able to communicate well between one individual and another (Dahlana & Mulyana :2021). Through increasing preparedness in disaster mitigation through ecoliteracy, it will form a healthy life style that supports sustainable life. Strengthening students' social skills, which can be instilled in social studies learning that has an orientation towards increasing social behavior is in accordance with the order of life (Alifah, & Mulyana : 2022).

Thus, students begin to realize the importance of maintaining environmental sustainability. Because clean environment will give comfort on every creature's life and reduce the risk of vulnerability to natural disasters. This can be a source of literacy related to the environment and preparedness in tackling natural disasters with efforts to prevent them and carrying out environmentally friendly disaster mitigation as part of ecological intelligence.

## **CONCLUSION**

Based on the results of this research that has been carried out on students about improving disaster mitigation preparedness through ecoliteracy in culture based social studies learning, disaster risk reduction is one of the most important parts in the concept of disaster management, understanding disaster requires integrated management of various elements at both schools and the social environment. One of the efforts that can be done is to increase preparedness in mitigating natural disasters through culture-based ecoliteracy in social studies learning. This way, students can understand vulnerabilities and threats in their living environment, and begin to understand ecological intelligence and the importance of preparedness in disaster mitigation starting through the learning process in schools so that students can implement them in the form of environmental care behavior.

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