

# excavator

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## The Effectiveness Of The Use of Floating Excavators in Increasing Students Knowledge of Tidal Flooding For Farmers in The Coastal Areas of Java

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### Abstract

Indonesia is a country with a very high level of vulnerability to disasters. Disasters that have often occurred in Indonesia have caused significant loss of life and material. Students as agents of change need to have good knowledge of disaster preparedness in order to provide positive changes to the community regarding disaster preparedness. The purpose of this study was to analyze the level of knowledge of PGRI Semarang University students regarding disaster preparedness through the effective use of floating excavators. The method used in this research is descriptive analytic. The sample in this study were PGRI University students who met the inclusion criteria set by the researcher. Sampling using purposive sampling technique. Data analysis was carried out using univariate analysis which was carried out on the characteristics of the respondents, namely age and gender and categorical variables, namely knowledge using percentage and proportion sizes. The results showed that as many as 207 (65.1%) respondents had an increased and good level of knowledge regarding disaster preparedness through the effective use of floating excavators. The conclusions obtained from the results of this study are that the students of PGRI Semarang University already have a good level of knowledge which may be caused by disaster preparedness training through the effective use of floating excavators. Therefore, the floating excavator is one of the tools that can be used in disaster management that students can learn.

*Keywords: preparedness, flood, students, floating excavator, farmers, coastal*

### Introduction

Indonesia is one of the countries with a very high level of disaster vulnerability (BBC, 2011). In 2020 alone, the National Disaster Management Agency has recorded 1,792 disaster events that occurred in Indonesia from early January to July (National Disaster Management Agency, 2020). In Indonesia, floods, landslides, cyclones, forest fires, earthquakes and tsunamis are types of disasters that often occur (National Disaster Management Agency, 2019). In DKI Jakarta itself, the type of disaster that often occurs is flooding, which has occurred 75 times in the last 5 years (National Disaster Management Agency, 2020). BNPB also stated that the most flooding occurred in East Jakarta when compared to other Jakarta areas, with 8 sub-districts affected (Ladjar, 2020). Disasters are major events that come suddenly, can cause disruption of community functioning, can take lives and property, and can damage the environment in which the affected community cannot survive solely by relying on its own resources (International Federation of Red Cross and Red Cross). Crescent (IFRC), 2020b), while disaster preparedness is an effort aimed at preparing oneself for disasters and reducing the negative impacts of IFRC, 2020a). However, it turns out that there are still many populations who do not feel that their disaster preparedness is adequate: Nurses in the United States state that they are not ready and confident if they have to face disasters because they have not received adequate training (Labrague et al., 2018); Students in China stated that they needed disaster preparedness training (Tan et al., 2017); and nursing students in Korea

are stated to have not been able to deal with disasters and require special training related to it (Kim, 2015).

In Indonesia itself, it is known that in Purwokerto, nursing students have a relatively low level of disaster preparedness (Rizqillah, 2019). Based on the results of the studies above, it can be seen that knowledge can affect a person's level of preparedness. Knowledge is the result of "knowing" that occurs after someone senses a certain object (Notoatmodjo, 2010). Knowledge is the basis of attitudes, behavior, or actions taken by a person. To perform an appropriate action, then a person needs the right knowledge first. If a person has adequate knowledge of disaster preparedness, then if a disaster strikes, he will be able to take appropriate rescue actions. Someone who is undergoing the process of studying in higher education is called a student (Hartaji, 2012). Another task of students apart from studying is as an agent of change or reformer, where they are expected to bring positive changes for themselves, their families, and society (Akin, Calik and Engin-Demir, 2017).

As agents of change, students can be an example for the community on how to act appropriately when facing a disaster. For this reason, students need to have adequate knowledge about disaster preparedness. As one of the private universities in Central Java, PGRI Semarang University, which has received a Tokoreka Matching Fund grant regarding floating excavators, needs to evaluate the program of activities. The urgency of doing this research at UPGRI is an evaluation of the training that has been given by students for three months regarding flood evacuation for farmers on the coast of Java. If the level of knowledge has been measured, the results of this study will be the basis for further interventions regarding disaster preparedness. This study aims to determine the level of student knowledge about disaster preparedness. The research results obtained are expected to be the basic data for PGRI Semarang University to conduct disaster preparedness training for all students.

## **Research methods**

This study uses a quantitative descriptive method using online surveys to identify and measure the level of knowledge students have about disaster preparedness after participating in floating excavator training. The research was conducted in September 2022. The student population at the time of the research was 1500 students from the Management and Mechanical Engineering Study Program. By using the Slovin formula, a total of 318 samples were obtained. Students from two study programs at PGRI University Semarang were involved as respondents, namely management and mechanical engineering students. The research data was obtained using the Google Form application as an online questionnaire. The questionnaire to measure knowledge was developed from the disaster preparedness manual written by BNPB (BNPB, 2017) and consists of 20 questions. The number of samples obtained as many as 318 respondents which is the result of calculations from the Slovin formula with a population of 1500 students. Some of the inclusion criteria from this sample are being registered as an active student at Binawan University, not currently on leave, and understanding how to fill out a Google Form. The questionnaires were then distributed to the 318 respondents where there was not a single respondent who did not return the questionnaire. After the data has been collected for two weeks, the data is then processed to obtain the frequency and percentage of the measured variables. Before the respondents filled out the questionnaire, the researcher explained in advance about the research objectives on the research explanation sheet on the first page of the online questionnaire. The researcher also explained that there would be no negative impact on the respondents if they decided to be involved or not to be involved in this research. The results of this study will not affect academic grades at all. Researchers use the principles of anonymity and confidentiality in the entire research process, however respondents have the right to resign or stop being respondents.

### **A.1 Data source**

#### **1. Primary data**

Primary data is data taken directly from the subject/research source through interviews and field analysis.

## 2. Secondary Data

Secondary data is additional data that is related to the research focus. This secondary data is not directly obtained from the subject but from other parties. This additional data can be obtained from various reading sources that are relevant to the research title, such as reading books, archives, literature reviews, newspapers, available documents, and other related documents.

## 3. Data collection technique

### a. Observation

Observation or observation is the author made direct observations of the object of research. The observation method is a method of collecting data by observing and measuring an object under study in various situations and conditions during the study.

### b. Interview

Interviews are a way to obtain information by asking directly the interviewees. The interview method is a data collection technique by asking a series of questions relevant to the research directly to the informant. In this study, the authors conducted interviews with informants related to the subject matter of the research object.

After the data is collected and processed, data on the age, gender, and level of knowledge of the respondents regarding disaster preparedness are obtained as follows.

Table 1. Characteristics of Respondents

Age	
mean	21.03
median	19.00
Std Deviation	5.018
Minimum	14
maximum	56

Table 2. Gender Characteristics

Gender	Frequency (N)	Percentage (%)
Woman	250	78.61
Man	68	21.38
Total	318	100

Based on table 2, it can be seen that most of the respondents are female as much as 78.61%.

Table 3. Knowledge Level of Respondents

Knowledge level	Frequency (N)	Percentage (%)
Well	207	65.1
Enough	103	32.4
Not enough	8	2.5
Total	318	100

Based on the data in table 3, it is known that the majority of respondents have a good level of knowledge regarding disaster preparedness (65.1%). Based on the results of the research data, table 3 proves that more than half of the respondents have a good level of knowledge about disaster preparedness (65.1%). The results of this study are in line with research

conducted by Fadilah et al (2020) and Grimes et al (2020) which also stated that students who participated as respondents in the study had low knowledge. However, several other studies have had different results, where students' knowledge of disaster preparedness is categorized as high (Fadhil, 2019; Kurniawati and Suwito, 2019). Knowledge of a person can be influenced by several factors, including age and education (Suwaryo and Yuwono, 2017). Age is often associated with experience. The higher the age, the more experience gained, including experience in the field of disaster. It is hoped that the more mature a person is, the more experience they will get related to training, education or even direct disaster experience. Because the average age of students in this study had been given floating excavator-based disaster training, the researchers assumed that they had received special education or training on disaster preparedness, both on campus and in the community. Students are students in higher education whose educational status is considered higher than some other community groups. The formal education system at PGRI Semarang University that prioritizes disaster preparedness education can encourage students to understand the importance of mitigation and disaster preparedness efforts. This resulted in high knowledge of disaster preparedness from PGRI Semarang University students. This is in accordance with research conducted by Johnson where knowledge has a significant effect on increasing the ability to cope with disasters (Johnson et al., 2014; Emami, 2015; Simandalahi, Apriyeni and Pardede, 2019). Through the literature review process, gender also affects the level of knowledge. Women have a higher interest in personal and family safety than men, so women's knowledge about this tends to be high (McCright, 2010). This is possible because women, especially those who are married, have an instinct to protect their families from dangerous threats, including disasters. As a result, women find out more about things that can help support the safety and welfare of their families. Moreover, women have a significant role in disaster mitigation and preparedness efforts (Hemachandra, Amaratunga and Haigh, 2018; Story et al., 2020). Regarding female students, whose status is mostly unmarried, it becomes an opportunity to instill disaster preparedness knowledge from an early age. The things that can affect the knowledge of disaster preparedness further emphasize the importance of integrating disaster preparedness education in the formal education curriculum. Not all universities and institutions in Indonesia provide disaster preparedness education to their students, even though disaster preparedness education can improve the competence of graduates in responding to disasters, ensuring health and safety as helpers in disasters, and increasing motivation to provide assistance when disasters occur (Achora and Kamanyire, 2016). This needs to be pursued because knowledge has a positive relationship to disaster preparedness attitudes, where the higher the knowledge possessed, the more prepared to face disasters (Mashdariyah, 2018). ensure health and safety as a helper in disasters, and increase motivation to provide assistance when disasters occur (Achora and Kamanyire, 2016). This needs to be pursued because knowledge has a positive relationship to disaster preparedness attitudes, where the higher the knowledge possessed, the more prepared to face disasters (Mashdariyah, 2018). ensure health and safety as a helper in disasters, and increase motivation to provide assistance when disasters occur (Achora and Kamanyire, 2016). This needs to be pursued because knowledge has a positive relationship to disaster preparedness attitudes, where the higher the knowledge possessed, the more prepared to face disasters (Mashdariyah, 2018).

### **Conclusions and recommendations**

The results of this study revealed that the level of knowledge of students regarding disaster preparedness was quite good, this was an illustration that disaster preparedness efforts at PGRI Semarang University in developing knowledge of disaster anticipation with floating excavators for farmers on the coast of Java were quite good. Age and gender can also be things that affect the level of this knowledge. In disaster management, Disaster Risk Reduction (DRR) efforts have been prioritized compared to other efforts related to disaster response and

recovery. Improving disaster preparedness is one of the DRR efforts that should have been carried out from an early age. For this reason, disaster preparedness education needs to be more encouraged, especially in areas of Indonesia with a high level of disaster vulnerability, including the Coastal Zone. Furthermore, it is hoped that PGRI Semarang University can formulate a method of disaster preparedness education that can be given to all students from all study programs.

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