

## THE APPLICATION OF KNOWLEDGE MANAGEMENT FOR SMALL AND MEDIUM-SIZED ENTERPRISES IN DISASTER CONDITION

### [Penerapan Manajemen Pengetahuan dalam Kondisi Bencana bagi Usaha Kecil dan Menengah]

Pricyilia Chintya Dewi Buntuang<sup>1)\*</sup>, Harnida Wahyuni Adda<sup>2)</sup>, and Andi Gauri<sup>3)</sup>

<sup>1)</sup> Management Study Program, Faculty of Economics and Business, Tadulako University

<sup>2)</sup> Management Study Program, Faculty of Economics and Business, Tadulako University

<sup>3)</sup> Students of Management Study Program, Faculty of Economics and Business, Tadulako University

Diterima 27-5-2022 / Disetujui 9-8-2022

#### ABSTRACT

*This study describes the knowledge management applied by small and medium-sized enterprises (SMEs) in both natural and non-natural disaster conditions. SMEs need innovation and creativity to maintain business continuity so the application of knowledge management is important as limited resources greatly affect it. Therefore SMEs need to innovate and show their creativity to get out of the slump caused by the disaster. This study used a quantitative approach by conducting statistical tests and comparative tests. This study involved 200 SMEs affected by natural and non-natural disasters as the population, while the sample size was based on the Slovin formula and was determined randomly (simple random sampling). The results of the study showed that there were differences in the knowledge management applied by SMEs during natural and non-natural disaster conditions.*

**Keywords:** SMEs, Knowledge Management, Disaster, Innovation

#### ABSTRAK

Penelitian ini melihat manajemen pengetahuan yang diterapkan oleh Small and medium-sized enterprises (SMEs) dalam kondisi bencana alam dan non alam. SMEs sangat membutuhkan inovasi dan kreativitas untuk menjaga kelangsungan usaha, untuk itu penerapan manajemen pengetahuan menjadi penting. Mengapa demikian, karena keterbatasan sumberdaya sangat mempengaruhinya. Olehnya itu SMEs perlu melakukan inovasi dan menunjukkan kreativitasnya untuk keluar dari keterpurukan akibat bencana. Penelitian ini didesain menggunakan pendekatan kuantitatif dengan melakukan pengujian statistik dan uji komparasi. Penelitian ini menetapkan 200 SMEs yang terdampak bencana alam dan non alam sebagai populasi, sementara sampel penelitian ini tarik menggunakan rumus slovin dan ditentukan secara acak (sampel acak sederhana). Hasil penelitian menyimpulkan terdapat perbedaan manajemen pengetahuan SMEs saat kondisi bencana alam dan bencana non alam.

**Kata Kunci:** SMEs, Manajemen Pengetahuan, Bencana, Inovasi

#### INTRODUCTION

The financial indicator of Small and medium-sized enterprises (SMEs) have changed during a crisis (Balios, Daskalakis, Eriotis, & Vasiliou, 2016; Duarte, Gama, & Gulamhussen, 2018; Lisboa, 2017), while the existence of SMEs is important in the economy (Auzzir, Haigh, & Amaratunga, 2018; Eggers, 2020). The crisis in this study cover natural and non-natural disasters. Disasters cause an economic crisis. Natural

disasters can cause physical damage affecting business operations, especially SMEs. Then, non-natural disasters such as the COVID-19 pandemic also cause the same condition which stops business operations due to various government policies to prevent the spread of COVID-19 (Lutfi, Buntuang, Kornelius, Erdiyansyah, & Hasanuddin, 2020). The COVID-19 crisis has damaged the economy (Eggers, 2020) as many SMEs do not take immediate action (Thorgren & Williams, 2020).

\*Korespondensi Penulis:  
 E-mail: pricyliabuntuang@gmail.com

The economic downturn can be managed by applying knowledge management. Knowledge management is expected to provide SMEs with a role in solving problems through skills and innovation, especially when natural and non-natural disasters occur. One of the reasons for the downturn was the SMEs' lack of capability and innovation. Crises or disasters provide opportunities for large companies to expand and innovate, but not all businesses can do so (Mendoza, Lau, & Castillejos, 2018). Therefore, businesses need to implement knowledge management. Knowledge management can be the basis for disaster preparedness (Kusumastuti, Arviansyah, Nurmala, & Wibowo, 2021), especially in disaster-prone areas such as Palu City. SMEs in disaster-prone areas have a higher vulnerability compared to other areas (Auzzir et al., 2018).

The disaster vulnerability in Palu City requires all SMEs to have knowledge management as an important part of disaster preparedness. SMEs' disaster preparedness can help them survive in disaster conditions, both natural and non-natural disasters. Disasters have been an unpredictable external threat so far. External threats to SMEs greatly affect the market (Eggers, 2020). Many studies concerning disasters have been carried out, but those focusing on SMEs' knowledge management in dealing with disasters are still limited. The impact of disasters becomes an interesting topic of study. A study by Durst & Runar Edvardsson (2012) recommends the development of knowledge management in SMEs. Thus, knowledge management is important, especially in disaster-prone areas. Handzic (2006) also explains that knowledge management is necessary and so does the implementation. Knowledge management is vital for small and medium enterprises and it has to be controlled by existing resources (Desouza & Awazu, 2006) because the knowledge of small and medium enterprises is weaker than that of large enterprises (Edvardsson, 2006). Hossain et al. (2022) state that all researchers in various parts of the world are interested in studying the impact of the pandemic, especially those that

describe the condition of SMEs. Meanwhile, concerning natural disasters, the condition of SMEs also needs to be investigated more deeply as infrastructure damage greatly affects SMEs' operations.

Based on the description above, this study aims to analyze the role of knowledge management owned by SMEs in natural and non-natural disaster conditions in Palu City and examine the extent to which knowledge management plays a role in maintaining SMEs in natural and non-natural disaster conditions. This study analyzes knowledge management based on the theory developed by Mills & Smith (2011) and Gold, Malhotra, & Segars (2001) with four processes, namely knowledge acquisition, knowledge conversion, knowledge application, and knowledge protection.

## METHODS

This study used a quantitative approach by conducting statistical tests and comparative tests. A comparative test was conducted to see the difference in knowledge management owned by SMEs during natural and non-natural disaster conditions. This study involved 200 SMEs affected by natural and non-natural disasters as the population, while the sample size was based on the Slovin formula with an error rate of 5 percent so that the number of samples was 133 SMEs determined randomly (simple random sampling).

Data collection covered observation, questionnaires, and documentation techniques. The observation was to observe conditions in the field related to knowledge management applied by SMEs during natural and non-natural disaster conditions. The questionnaire was to collect data through the distribution of questions based on the dimensions of the knowledge management variable, while the documentation technique was evidenced in the form of photos and supporting data in the form of documents. Data were analyzed using statistical testing with the help of SPSS with a focus on the comparative test (t-test) to compare the role of knowledge management applied by SMEs

in natural and non-natural disaster conditions. The hypothesis of this study used the Sig. value (2-tailed), with the following conditions:

1. If the Sig. value (2-tailed) is  $< 0.05$ , then there is a significant difference between knowledge management applied by SMEs in natural and non-natural disaster conditions.
2. If the Sig. value (2-tailed) is  $> 0.05$ , then there is no significant difference between knowledge management applied by SMEs

in natural and non-natural disaster conditions.

## RESULTS AND DISCUSSION

This study presents statistical test results, data normality tests, and t-tests.

### Data Normality Test Results

Before testing the hypothesis, the normality test of the data was first carried out. The normality test used the Kolmogorov Smirnov with the help of SPSS.

**Table 1.** One-Sample Kolmogorov-Smirnov Test

		KM_Natural 1_Disaster	KM_Non_Natural _Disaster
N		133	133
Normal Parameters <sup>a</sup>	Mean	38.8872	37.5263
	Std. Deviation	6.59046	6.48726
Most Extreme Differences	Absolute	.095	.095
	Positive	.095	.095
	Negative	-.088	-.081
Kolmogorov-Smirnov Z		1.091	1.095
Asymp. Sig. (2-tailed)		.185	.182

a. Test distribution is Normal.

The test results showed that the Sig. value (2-tailed) was higher than alpha 0.05. If the Sig. value (2-tailed) is higher than 0.05, then the data distribution is declared to meet the assumption of normality, and if it is lower than 0.05, it is interpreted as abnormal.

### Hypothesis Test Results

The hypothesis test used the T-Test. The test results are presented in Table 2.

**Table 2.** Paired Samples Test

		Paired Differences			t	df	Sig. (2- tailed)
		Mean	Std. Deviation	Std. Error Mean			
Pair 1	KM_Natural_Disaster - KM_Non_Natural _Disaster	1.36090	4.09793	.35534	3.830	132	.000

Source: SPSS Output.

The results of the T-Test showed the Sig. value (2-tailed) of  $0.000 < 0.05$ . Based on this result, it can be concluded that there is a significant difference between knowledge management applied by SMEs in natural and non-natural disaster conditions. It indicates that the hypothesis in this study is accepted.

## DISCUSSION

This study aims to analyze the differences in knowledge management applied by SMEs in natural and non-natural disaster conditions. Natural disasters are a very scary condition for business actors due to their impact on business operations. The natural disaster that occurred in Palu City affected almost all business actors as the disaster such as the earthquake, tsunami, and liquefaction in 2018 caused physical and infrastructure damage and trauma.

A large number of victims of natural disasters makes it difficult for business actors to rise up as they or SMEs are also affected. This COVID-19 pandemic also caused the same conditions. The COVID-19 pandemic has an impact worldwide and causes deaths (Hossain, Akhter, & Sultana, 2022). Business actors are affected by various government policies that disrupt SMEs' operations, starting from the supply chain, limited capital, limited government assistance, and even leading to bankruptcy (Cowling, Brown, & Rocha, 2020; Lu, Wu, Peng, & Lu, 2020). Thorgren & Williams (2020) conclude that when a disaster occurs, SMEs are more likely to take action by delaying investment, reducing labor costs and operational costs, and re-discussing contracts and terms that existed before the disaster occurred.

Conditions caused by natural and non-natural disasters urgently require SMEs' knowledge management to help SMEs survive as knowledge can help manage SMEs through capabilities and innovation. The slightly different characteristics of natural and non-natural disasters make the handling of SMEs also different as evidenced by the results of this study.

The results of this study indicate that there is a significant difference between knowledge management applied by SMEs in natural and non-natural disaster conditions. In natural disaster conditions, SMEs have a different way of managing their businesses, where due to full of fear, SMEs are a little late to take action but slowly can rise and return to normal. This is different from the knowledge management owned by SMEs during the COVID-19 pandemic, where it is very difficult for SMEs due to various government policies that prohibit SMEs' operations and cause losses with a fixed cost and limited and even no income. Besides, the pandemic also affects the human resources of SMEs. COVID-19 causes layoffs because many SMEs do not even get income (Lutfi et al., 2020).

During natural disasters, SMEs have excellent knowledge protection. They carefully protect their knowledge which means that knowledge management is only carried out internally without having to be informed to competitors as the knowledge has been fully implemented. However, knowledge acquisition is still low as SMEs have not applied the knowledge gained from external parties. This is in contrast to the non-natural condition during the COVID-19 pandemic, where the knowledge acquisition dimension has been applied very well by SMEs. This means that SMEs acquire knowledge internally and externally and implement the knowledge gained through capabilities and innovation to survive the pandemic. However, during the pandemic, knowledge protection received a poor response. This means that during a pandemic, SMEs do not protect their knowledge, we all know that the whole world is experiencing the same impact and applying the same pattern to survive and recover from the pandemic.

The difference in knowledge management owned by SMEs is due to the different characteristics of natural and non-natural disasters. During natural disasters, it is very difficult to digitize business operations due to infrastructure damage that

causes the internet network to malfunction, while during the COVID-19 pandemic, SMEs can digitize businesses, however, the serious impact caused by COVID-19 has affected not only SMEs, but the community's economy resulting in a decrease in the consumptive behavior of the community.

The serious impact of the COVID-19 pandemic is not only on socio-economic and political conditions but also on the entire community (Jaziri & Miralam, 2021). The COVID-19 pandemic has caused a crisis that is different from other crises, not only in the economic crisis but also in unexpected conditions (Rapaccini, Saccani, Kowalkowski, Paiola, & Adrodegari, 2020). This has made SMEs worse off, especially SMEs in Palu City, that many SMEs are closed due to a lack of capital and difficult access to capital during the pandemic. Meanwhile, during natural disasters, SMEs' operations were also disrupted but not in all business aspects. The results of this study are expected to provide benefits for business actors in developing their businesses in both natural and non-natural disaster conditions as the knowledge management possessed by SMEs is important as part of SMEs' preparedness in unwanted disasters.

### CONCLUSION

Natural and non-natural disasters cause uncertainty for SMEs as the knowledge owned by SMEs in dealing with disasters is still low. Therefore, SMEs need to apply knowledge management as a preparedness effort in an unwanted disaster. Based on the results of this study, it can be concluded that there is a significant difference between knowledge management applied by SMEs in natural and non-natural disaster conditions. These differences are caused by the different characteristics of disasters. For example, during a natural disaster, the impact is infrastructure damage, while the COVID-19 pandemic has an impact on economic activities and activities of all people in the world so the knowledge management applied by SMEs is also different as evidenced by this study.

The limitation of this research is its less broad scope. Considering natural disasters and non-natural disasters, especially in Central Sulawesi areas including Palu City, Donggala District, and Sigi District, future research must consider broader research on knowledge management and small and medium enterprises. This research is expected to contribute to business actors in implementing knowledge management for their human resources as a mitigation measure in dealing with uncertain future conditions.

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