

## REVITALIZING COMMUNITY PARTICIPANT: OVERCOMING CHALLENGES IN THE AFTERMATH OF AN OIL SPILL DISASTER PREPAREDNESS IN KAMPUNG TANAH MERAH BARU, TELUK BINTUNI, WEST PAPUA

Ronald Siregar<sup>1\*</sup>, Raldi Hendro Koestoer<sup>2\*\*</sup>, Fatma Lestari<sup>3\*\*\*</sup>

<sup>1,2,3</sup>Universitas Indonesia

\* [ronaldsrg@yahoo.com](mailto:ronaldsrg@yahoo.com) \*\* [ralkoest@yahoo.co.uk](mailto:ralkoest@yahoo.co.uk) \*\*\* [fatma@ui.ac.id](mailto:fatma@ui.ac.id)

### ABSTRACT

This research aims to investigate the community profile and challenges faced by Tanah Merah Baru Village in Teluk Bintuni, West Papua, following diesel fuel spill disasters associated with transportation activities near an LNG exploration company operation. The study employs a comprehensive research methodology, combining quantitative surveys, qualitative interviews, and focus group discussions with community representatives and a company's oil spill response team. Data was collected and analyzed by using descriptive statistics and factor analysis through IBM SPSS Statistics Version 27 software. The findings reveal that the community profile is influenced by social, economic, and environmental factors. Additionally, there is a low level of awareness and community participation in handling diesel fuel spills and implementing the Oil Spill Contingency Plan (OSCP). Notably, variations exist in the perceptions and attitudes towards diesel fuel spills among community members who have previous exposure to the company's operational environment. To enhance the community's profile and resilience, targeted efforts are required to provide information and training, thereby improving preparedness and response capabilities in handling diesel fuel spills effectively in Tanah Merah Baru Village, Teluk Bintuni, West Papua.

**Keywords:** *community participation, oil spill, disaster, SPSS, OSCP*

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### INTRODUCTION

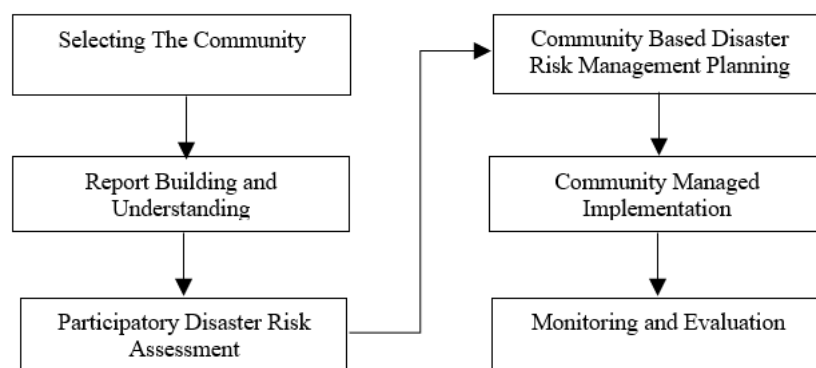
Most of the oil and gas natural resource exploration industry companies explore deep-sea waters and some land areas that have the potential for hydrocarbon natural resources and their derivatives such as oil and gas, for the distribution, and trade of oil and gas products, it is carried out using sea transportation using tankers (Saw, 2020). This has the effect of causing an increase in the potential for oil spills at sea (Torres et al., 2020).

Any oil-sourced sea pollution, in general, is most likely to cause serious environmental catastrophes that trigger economic and sociological problems resulting in health trouble in the region the very first victims of such disasters are the sea inhabitants (Türkistanlı et al., 2019a). This study points to local community participation as an important factor in fostering community resilience, specifically regarding alleviating the negative effects of oil spills. Another challenge related to oil spills is the perception and participation of communities in oil spill preparedness to increase community resilience, especially in communities living in coastal areas (Richard et al., 2021). Community participation can be loosely defined as the involvement of people in a community in a project to solve their own problems (Wilson, 2000). It should be given the opportunity where possible based on their perception (Davins et al., 2022).

Community participation in terminology is an activity to evoke feelings and participation in the activities of the organization, or the participation of subordinates in the activities of the

organization, community participation is the meeting point of their social identity, social representation, and power that help create identity, and establish a dialogue between various stakeholders (Campbell & Jovchelovitch, 1999). The successful oil spill response does not only involve stopping the release and cleaning up of the spill; it also involves engaging with local community members to ensure their voices are heard and their needs are met (Rondolo, 2020).

The most sensitive habitats that can be affected by oil spill contamination are coral surfaces, mangroves or mangrove forests, and salt marshes (Solo-Gabriele et al., 2021) The three ecological habitats provide coastal area protection and provide food and land for nurseries for many invertebrate and fish species, as well as coral ecosystems that are very sensitive to oil spill contamination and take a long time to repair (Solo-Gabriele et al., 2021). Oil layers floating on the surface of the water can be deposited directly on coral habitats when the intertidal zone experiences tides (Guzman et al., 2020) Mangroves are mangrove trees and shrubs typically found on coastal coastlines and estuaries in tropical and sub-tropical regions around the world (Richard et al., 2021). The disaster risk reduction process involves several stages that aim to minimize the impact of a catastrophic event. The stages may vary slightly depending on the source, but they generally include as shown on Figure 1.



**Fig. 1. The Stages in The Disaster Risk Reduction Process (Singh, 2013)**

This research provides a view on how to bridge crisis communication in socio-technology which involves community participation in oil spill response as part of high-tech activities since the OSCP excluded community participation from the implementation as the research gap. The research question is what the community's perception regarding oil spills, is as a social process and how engagement in a community that has not yet experienced a major oil spill but is at risk of one.

## **METHOD**

### **Research Area**

The research area is in Tanah Merah Baru Village, Teluk Bintuni, West Papua, which comprises tropical forests and pristine coastal areas. Tanah Merah Baru Village is a relatively small village with a population of 1,126 individuals, according to the 2022 data from the Central Bureau of Statistics (BPS, 2022). Specifically, the research is conducted in Kampung Tanah Merah Baru, Babo District. The village covers an area of approximately 200 hectares.

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Administratively, Tanah Merah Baru Village is bordered by Sebiar Village to the north, Saengga Village to the south, Onar Village to the west, and Wimbro Village to the east. The operational activities of one LNG company (PT.X) are situated to the east of Tanah Merah Baru Village.

### **Research Data Collection**

The study employs a comprehensive research methodology, combining quantitative surveys, qualitative interviews, and focus group discussions (Richard et al., 2021). This research was conducted with a case study and comprehensive field study by using a questionnaire to obtain primary data with 100 sample respondents, a review of several scientific articles and related references to obtain secondary data, and analysis to get an overview, and understanding of community participation in an oil spill. By utilizing a questionnaire consisting of three sections: community profile/perception, readiness, and community participation in response to fuel and hydrocarbon derivatives spill. The data processing method involves editing, tabulation, and coding, followed by descriptive presentation. Data collected will be analyzed using descriptive statistics and factor analysis performed by IBM SPSS (Statistical Package for Social Science) Statistics Version 27 software (Faradiba, 2020), using paired sample t-test to investigate the relationship between the significant correlation between community profile/perception with the readiness and participation variables. The result was presented with regression equations (Setiowati et al., 2022).

### **Previous Research Studies**

Several previous studies related to this research can be seen in Table 1, There are also theories from previous research that contradicted the notion that ordinary community members do not need to be involved in oil spill response activities since it is considered hazardous. Most of the previous studies explained the importance of community participation in disasters, emphasizing the importance of strong relationships and engagement between response teams and the local community in mitigating the impact of an oil spill (Nagea & Miller, 2023).

## **RESULTS AND DISCUSSION**

### **Socio-demographic Characteristics**

Concerning the socio-demographic characteristics of the respondents, participation was distributed with the age range above 18 years old divided into 4 age groups: 18-20 (34%), 21-25 (19%), 26-30 (29%), and above 30 years old (34%) They were primarily in Senior-High School (85%), Vocational High School (2%), and Juiniior-High School (13%). The distribution of gender among the respondents with male (74%) and female (26%). The occupational background of the respondents is a fisherman (43%), private sector worker (30%), government civil servants (29%), and unemployed (3%).

As many as 30% of respondents have worked on the LNG project at the company and 70% of respondents have stated that they never worked on a company project. The details of the respondents' socio-demographic characteristics and the research can be seen in Table 2 and Fig 1, respectively.

### Community Perception Overview

The data collected from 100 respondents were analyzed using descriptive statistics, including minimum, maximum, mean, and standard deviation (Fig.2). The objective of is to provide insights into the community's understanding and level of preparedness for potential oil spill incidents (Cope et al., 2020). The results indicate a mean score of 17.35 with a standard deviation of 3.112, suggesting a moderate level of preparedness among the surveyed population. These findings contribute to the existing body of knowledge on community response (Chun et al., 2020) and can be utilized to enhance oil spill preparedness strategies for community in remote areas.

Table 1. Previous Research Studies

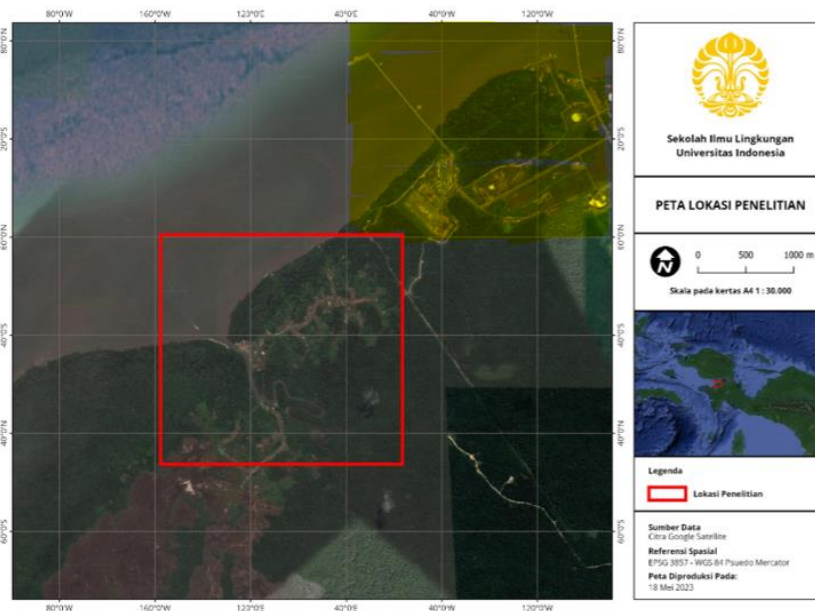
<b>Title</b>	<b>Research Year</b>	<b>Result</b>
Gender mainstreaming efforts in disaster management plans: Case study West Nusa Tenggara province, Indonesia.	(Septanaya & Fortuna, 2023)	The absence of participation in disaster management plans can be critical. Women's participation ensures their position as active agents rather than passive plan objects, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, which calls for increased participation and leadership of women in disaster risk reduction efforts. Participation is also a means to empower women, giving them a role in decision-making and enabling them to reduce their vulnerability to disasters.
Oil Spill Governance: Evidence from Bintan Island, Indonesia.	(Purnaweni et al., 2022)	The local government is indicated to be slow in responding to oil spills in Bintan Island. The emergency response policies are still focused on conventional methods, including the lack of preparedness among the community in oil spill disaster management.il Spill Governance: Evidence from Bintan Island, Indonesia

<p>The Importance of The Participatory Dimension in Urban Resilience Improvement Process.</p>	<p>(Lopezdeasiain, 2020)</p>	<p>Explaining the importance of community participation in sustainability, disaster resilience, and resilience to changes caused by environmental, economic, and social changes. In summary, community participation is crucial for achieving sustainability, building disaster resilience, and adapting to changes resulting from environmental, economic, and social transformations.</p>
<p>Analysis of Public Perception of Oil Spill Disaster Affecting Marine Environment: A Case Study in Cesme-Izmir.</p>	<p>(Türkistanlı et al., 2019b)</p>	<p>The study aims to examine the socio-economic consequences of oil spills, which can have far-reaching effects on affected communities. These impacts may include damage to coastal ecosystems, loss of livelihoods for fishermen and other coastal-dependent industries, health risks for communities exposed to contaminated water or air, and disruptions to local economies.</p>
<p>The Human Health Implication of Crude Oil Spills in The Niger Delta, Nigeria: An Interpretation of Published Studies</p>	<p>(Ordinoha, 2013)</p>	<p>The review of these studies shows that oil spills in the Niger delta have acute and long-term effects on human health. Material relief and immediate and long-term medical care are recommended, irrespective of the cause of the spill, to ensure that the potential health effects of the exposures to the spills are properly addressed.</p>

Table 2. Socio-demographic Characteristics of Respondents

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Demographic	Variable	N	Percentage (%)
Age	18-20	18	18
	21–25	19	19
	26–30	29	29
	>30	34	34
Education	Senior – High School	85	85
	Vocational – High School	2	2
	Junior-High School	13	13
Occupation	Fisherman	43	43
	Private Sector	30	30
	Civil Servant	3	3
	Unemployment	25	25
Gender	Male	74	74
	Female	26	26
Experience	Ever Worked in LNG Company	30	30
	Never Worked in LNG Company	70	70



**Fig. 2 The Research Location**

Data analysis stated the community perception regarding oil spill preparedness is categorized as good (80%) and not good (20%). Most of the community has a positive perception and a good level of preparedness toward potential oil spill incidents, while a smaller portion of the community has a less favorable perception and a lower level of preparedness. These findings highlighted the need for targeted intervention and awareness campaigns to enhance preparedness and address the concerns of minority groups (Ishak et al., 2020). This knowledge can guide the development of tailored initiatives such as education campaigns, training programs, and community.

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The result suggesting a moderate level of preparedness among the surveyed population. These findings contribute to the existing body of knowledge on oil spill preparedness and can inform efforts to enhance community readiness and response strategies. Based on the data and data analysis conducted by the author, it can be concluded that there is a lack of knowledge and awareness among the community of Kampung Tanah Merah Baru regarding fuel oil spills. Most respondents are unaware or uncertain about the actions to be taken in the event of an oil spill, as well as the lack of information about training and oil spill response.

### Community Participation Overview

The objective of this section Descriptive statistical analysis provides an overview of the distribution of values for the variable, such as minimum, maximum, mean, and standard deviation as shown in Table. 3. This helps in understanding the basic characteristics of the "Participation" variable among the respondents. The primary objective of descriptive statistical analysis is to summarize and describe the data accurately. By doing so, it provides a foundation for further analysis, comparisons, and interpretation of the variable under investigation (Ishak et al., 2020).

Additionally, the analysis aims to provide a range of values (minimum and maximum) to indicate the boundaries within which the participation scores fall. This information helps to understand the overall distribution and range of participation among the respondents. The participants' average level of participation is 21.14, with a standard deviation of 1.853. This indicates a moderate level of participation overall, with relatively limited variability among the respondents.

### Descriptive Statistical Analysis

Table 3. Variables data Statistic Analysis

<b>.Statement (Variables)</b>	<b>N</b>	<b>Min.</b>	<b>Max.</b>	<b>Mean</b>	<b>Std. Deviation</b>
Profile	100	10	23	17,35	3,112
Preparedness	100	6	16	11,23	3,281
Participation	100	17	25	21,11	1,853
Valid (listwise)	N 100				

The minimum value of 10 indicates that there were respondents who rated their perception as 10 on the given questionnaire. On the other hand, the maximum value of 23 indicates that there were respondents who rated their perception as 23 on the given questionnaire. The average perception score of the community is 17.35, which means that the average of all perception scores given by the respondents is 17.35.

The standard deviation of the perception variable is 3.112. This indicates the amount of dispersion or variation in the perception scores given by the respondents, which is approximately 3.112. In other words, the standard deviation suggests that the perception scores of the community are not significantly different from the mean value, as the standard deviation is relatively small. This can be interpreted as most respondents having relatively similar perceptions regarding the topic addressed in the questionnaire.

The minimum value of 6 indicates that there were respondents who rated their readiness as 6 on the given questionnaire. On the other hand, the maximum value of 16 indicates that there were respondents who rated their readiness as 16 on the given questionnaire. The average readiness score is 11.23, which means that the average of all readiness scores given by the respondents is 11.23.

The standard deviation of readiness is 3.281, indicating the amount of dispersion or variation in the readiness scores given by the respondents, which is approximately 3.281. In other words, the standard deviation suggests that the readiness scores exhibit a relatively large variation, as the standard deviation is quite high. This can be interpreted as respondents having diverse perceptions and readiness to face a situation or event related to the topic addressed in the questionnaire. The minimum value of 17 indicates that there were respondents who rated their participation as 17 on the given questionnaire. On the other hand, the maximum value of 25 indicates that there were respondents who rated their participation as 25 on the given questionnaire. The average participation score is 21.14, which means that the average of all participation scores given by the respondents is 21.14.

The standard deviation of participation is 1.853, indicating the amount of dispersion or variation in the participation scores given by the respondents, which is approximately 1.853. In other words, the standard deviation suggests that the participation scores exhibit a relatively large variation, as the standard deviation is relatively high.

Table 4. Normality Test- One-Sample Kolmogorov-Smirnov Test

N		100	
<i>Normal Parameters<sup>a,b</sup></i>	<i>Mean</i>	,0000000	
	<i>Std. Deviation</i>	2,65255526	
<i>Most Extreme Differences</i>	<i>Absolute</i>	,053	
	<i>Positive</i>	,033	
	<i>Negative</i>	-,053	
<i>Test Statistic</i>		,053	
<i>Asymp. Sig. (2-tailed)<sup>c</sup></i>		,200 <sup>d</sup>	
<i>Monte Carlo Sig. (2-tailed)<sup>e</sup></i>	<i>Sig</i>	,690	
	<i>99% Confidence Interval</i>	<i>Lower Bound</i>	,678
		<i>Upper Bound</i>	,702

The normality test is conducted to assess whether the data follows a normal distribution or not. In this case, since the significance value (p-value) is greater than the chosen significance level of 0.05 (commonly used in hypothesis testing), it indicates that there is no significant departure from normality. Therefore, we can conclude that the data from the questionnaire is valid and can be assumed to be normally distributed (Table 4) & (Fig 3).

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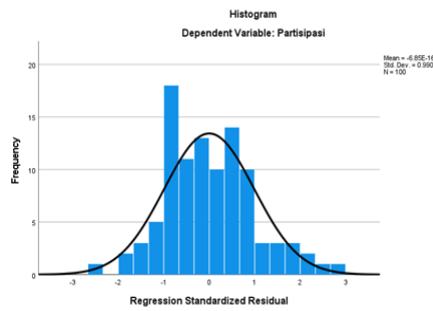


Fig.3. Histogram Curve for Validity and Normality Testing

The Reliability Test is conducted to measure the extent to which a measurement instrument or scale is consistently reliable in measuring a specific variable. In this study, the Cronbach's alpha coefficient is used. If Cronbach's alpha > r table, then the questionnaire is considered consistent, and if Cronbach's alpha ( $\alpha$ ) < r table, then the questionnaire is considered inconsistent. By analyzing the data using SPSS Statistics software version 27, the Cronbach's Alpha ( $\alpha$ ) value for the research variables is found to be 0.788 (Fig.5).

Table 5. Histogram Curve for Validity and Normality Testing

<b>Reliability Statistics</b>	
<i>Cronbach's Alpha</i>	<i>N of Items</i>
,788	14

In this research, with a total of 100 respondents, the critical value (rtable) for N 100 is 0.1946. Therefore, considering that the Cronbach's Alpha ( $\alpha$ ) value is 0.788 (Table 5), which is greater than the critical value (0.1946) or  $0.788 > 0.1946$ , it can be concluded that the relationship between the research variables is reliable.

Table 6. Variable Correlation Test Table

		<b>Profile / Perception</b>	<b>Preparedness</b>	<b>Participation</b>
Profile/ Perception	<i>Pearson Correlation</i>	1	,507**	,228*
	<i>Sig. (2-tailed)</i>		,001	,023
	<i>N</i>	100	100	100
Preparedness	<i>Pearson Correlation</i>	,507**	1	,207*
	<i>Sig. (2-tailed)</i>	,001		,039
	<i>N</i>	100	100	100
Participation	<i>Pearson Correlation</i>	,228*	,207*	1
	<i>Sig. (2-tailed)</i>	,023	,039	
	<i>N</i>	100	100	100

Table 6 shown the Pearson correlation coefficient between Profile and Preparedness is 0.507, and this correlation is significant at a significance level of 0.01 (2-tailed). This correlation indicates a moderate positive relationship between Profile and Preparedness.

The Pearson correlation coefficient between Profile and Participation is 0.228. This correlation is significant at a significance level of 0.05 (2-tailed). This indicates that there is a weak relationship between Profile and Participation, but the strength of this relationship is not as strong as that between Profile and Preparedness. However, it still suggests a significant positive correlation between the two variables.

The Pearson correlation coefficient between Preparedness and Participation is 0.207. This correlation is significant at a significance level of 0.05 (2-tailed). This means that there is a weak relationship between Preparedness and Participation. However, it also indicates a significant positive correlation between the two variables.

Based on the output data from SPSS Statistics version 27, the obtained Cronbach's Alpha value is 0.788 (Table 5), which is greater than 0.06. This indicates that the research variables are reliable. Therefore, the relationship between the research variables is valid and reliable.

Table 7. Respondents Univariate Analysis

Type	Category	Frequency (n)	Percentage (%)
Age	18-20	18	18
	21-25	19	19
	26-30	29	29
	>30	34	34
	Total	100	100
Education	Senior High School	85	85
	Vocational High School	2	2
	Junior High School	13	13
	Total	100	100
Occupation	Fisherman	43	43
	Private Sector	30	30
	Civil Servant	3	3
	Unemployment	24	24
	Total	100	100
Ever / Never Work in LNG Project (Company X)	Ever	30	30
	Never	70	70
	Total	100	100

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Based on Table 7, the information will later be related to the profile/perception of the community regarding the understanding of fuel oil spill disasters and preparedness. All the data is valid, and there are no missing data from the 100 research respondents.

Bivariate analysis (Table 8) is conducted to examine the relationships between each variable. The Pearson Chi-Square (p) value is used, with the criterion of  $p < 0.05$  to determine statistical significance. It can be shown that there is a relationship between the Profile/Perception of community understanding and occupation, previous work experience in the LNG Project of Company X, gender, preparedness, and participation because the Asym. Sig values are smaller than 0.05 or can be explained as the Pearson Chi-Square (p) values of these variables are smaller than 0.05 ( $p < 0.05$ ). This indicates statistical significance, and further multivariate analysis can be conducted.

Table 8. Bivariate Analysis

<i>Chi-Square Tests</i>		
		<i>Asymptotic Significance (2-sided)</i>
Profile/Perception	Age	0,065
	Education	0,493
	Occupation	0,008
	Ever/Never Work in LNG Project (Company X)	0,040
	Sex	0,004
Profil/Perception	Preparedness	0,000
Profil/Perception	Participation	0,000

It can be demonstrated that there is an association between the Profile/Perception of community understanding and occupation, previous work experience in the LNG Project of company X, gender, preparedness, and participation, Asym. Sig values are less than 0.05. This indicates that the Pearson Chi-Square (p) values for these variables are less than 0.05 ( $p < 0.05$ ), suggesting statistical significance. Consequently, further multivariate analysis can be conducted.

Table 9. Multivariate Analysis

		<b>B</b>	<b>S.E.</b>	<b>Wald</b>	<b>df</b>	<b>Sig.</b>	<b>Exp (B)</b>
Step 1 a	Ever/Never Work at LNG Project at	-0,335	0,100	11,284	1	0,001	0,715

	<b>B</b>	<b>S.E.</b>	<b>Wald</b>	<b>df</b>	<b>Sig.</b>	<b>Exp (B)</b>
Company X.						
Constant	6,871	1,862	12,622	1	0,000	963,945
Sex	-0,313	0,084	13,822	1	<,001	0,701
Constant	4,189	1,393	9,045	1	0,003	65,54

By using SPSS Statistics software version 27, it was found that there are two variables that influence the profile/perception of the community, namely whether they have worked on the LNG Project of company X and Gender. With a significance value (Sig.) < 0.05, it can be concluded that these variables significantly affect the profile/perception variable (Table 9).

Variable with the highest Exp (B) value, which is 0.715 with a significance value of 0.001, can be stated that individuals who have worked on the LNG Project of company X have the highest association with the profile/understanding of the community regarding spills of diesel fuel oil. In the analysis, the variable sex (Gender) has a coefficient of -0.313 with a significance value (Sig.) of less than 0.001. With an Exp (B) value of 0.701, this indicates that female members of the community have a likelihood or contribution of 0.701 in understanding spills of diesel fuel oil compared to male members, when other variables remain constant. Indeed, studies have shown that women tend to have higher risk perceptions compared to men. They may be more sensitive to the threats or consequences arising from spills of diesel fuel oil and are more likely to seek a deeper understanding of such issues. This difference in risk perception between genders can be attributed to various factors, including socialization, cultural influences, and individual differences (Septanaya & Fortuna, 2023).

### Result of Hypothesis Test

The hypothesis testing was conducted using a Partial Test (t-test), Simultaneous Influence Test (F-test), and Simultaneous Coefficient Test. This hypothesis testing was performed using SPSS Statistics software version 27.

**Table 10.** Partial Test (t-Test)

<i>Coefficients<sup>a</sup></i>							
<b>Model</b>		<i>Unstandardized Coefficients</i>		<i>Standardized Coefficients</i>		<b>t</b>	<b>Sig.</b>
		<b>B</b>	<i>Std. Error</i>	<i>Beta</i>			
1	(Constant)	7,678	3,098			2,478	0,015
	Preparedness	0,456	0,084	0,481		5,435	0,000
	Participation	0,215	0,149	0,128		1,449	0,151

The t-test results (Table 10) for preparedness based on the test conducted in SPSS version 27 are as follows: the calculated t-value is 5.435, and the tabulated t-value is 1.661 (the tabulated t-value is obtained from the t-table using the degrees of freedom, which is 100 - 2 =

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98). Since the calculated t-value (5.435) is greater than the tabulated t-value (1.661), we can conclude that there is a significant influence between preparedness and profile/perception.

The coefficient value of 0.481 indicates a positive and significant effect of preparedness on the community's profile/perception and understanding. This means that as the community's profile/perception and understanding of oil spills increase, their level of preparedness also increases.

The significance value (sig) of 0.000 being less than 0.05 indicates a significant relationship. Therefore, it can be concluded that the better the community's profile or understanding of diesel fuel spills, the higher their level of preparedness. In this case, X1 (preparedness) has a significant influence on Y (profile or perception). Since the significance value (sig) is  $0.000 < 0.05$ , or  $5.435$  (calculated t-value)  $> 1.661$  (tabulated t-value), there is a significant relationship between preparedness and the community's profile or perception.

The t-value for the variable X2 (Participation) is 1.449, and it is lower than the tabulated t-value of 1.661. This indicates that the influence of participation is not significant. Therefore, it can be concluded that good preparedness is not significantly influenced by participation alone, suggesting that participation does not have a significant relationship with the profile variable. From the analysis and calculations using SPSS Statistics software version 27, the regression equation was obtained:

$$Y = 7,678 + 0,481X1 + 0,128 X2$$

- Y : Community Profile / Perception
- X1 : Community Preparedness
- X2 : Community Participation

The Simultaneous Test (F-test) aims to test the overall effect of the X variables on Y, and the results of the analysis using SPSS Statistics software version 27 indicate that the F-value is 18.235. Adjusted R-square is the F-table value looked up from the row 100 - (3-1) and column (3-1) = 2 (total number of variables - number of dependent variables). The F-table value for row 98 and column 2 is 3.089. This means that  $18.235$  (calculated F-value)  $> 3.089$  (tabulated F-value), indicating that the simultaneous effect is significant. If the significance value (sig) is greater than 0.05 or the calculated F-value is less than the tabulated F-value, it means that there is no simultaneous effect of the X variables on Y. In other words, participation and preparedness have a significant combined effect on Y, specifically on the profile/perception of the community.

Table 11. Simultaneous Variables (F – Test) Result

Model	Sum of Squares	df	Mean Square	F	Sig
Regression	261,969	2	130,984	18,283	0,000b
Residual	696,781	97	7,183		
Total	958,750	99			

The value of the F table for row 98 (Total respondents – 2) is 3.089. This means that 18.235 (F calculated) > 3.089 (F table), indicating that the simultaneous influence is significant. If the significance value (sig) is greater than 0.05 or the F calculated is less than the F table, it means that there is no simultaneous effect of variable X on Y. In other words, participation and preparedness have a significant joint effect on profile/perception (Y).

By this means that preparedness and participation have an impact on the profile/perception of the community, but the profile and preparedness have a less significant effect on participation.

The findings support the alignment with the research hypothesis, there is a significant influence between preparedness and the profile/perception, therefore the previous hypothesis accepted and the implementation of OSCP by involving community participation, will make it more reliable and optimal, participation may not be statistically significant in the regression model regarding OSCP.

### **Research Limitation**

Limitations of research conducted by researchers include: (a) The research is only conducted on one company, (b) the research does not investigate all factors that have a higher influence based on the literature study, the research is not intended to change the Standard Operating Procedure (SOP) or the OSCP of the company.

### **CONCLUSION**

Recent studies offered some insight regarding community participation in disaster and the importance of their roles at stage of before, during, and after the disaster such as oil spill. One critical gap in the literature is associated with the evaluating on how the community participation can be a synergy framework that strengthens and support each other between community and the oil gas company which can be bridged with a number of notes described in the following sections as a techno-social integration in interaction.

There is a strong and positive relationship between the readiness of the community in Kampung Tanah Merah Baru, Teluk Bintuni, West Papua, regarding fuel oil spill preparedness, and their participation in handling fuel oil spills as a form of environmental concern. There is a positive relationship between public perception profiles and oil spill preparedness.

The research findings reveal that there is a reality of knowledge transfer regarding fuel oil spill from community members who have worked on the company, LNG project to other community members. This knowledge is obtained through HSE induction and training prior to their work on the company. The future challenge is to involve community participation in oil spill response actions by providing information, training, and socialization of crisis communication processes between companies and the community. The community of Tanah Merah Baru Village, predominantly comprised of indigenous people, follows local policies that value the environment, which have been taught from one generation to another, even starting from childhood. The findings indicate a strong and positive relationship, highlighting the importance of knowledge transfer regarding fuel oil spill disasters and response plans to the community. This can contribute to making the Oil Spill Contingency Plan (OSCP) more reliable, serving as a reference for the company to enhance the community's profile and

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understanding of fuel oil spills, should improve the delivery of information and training regarding fuel oil spills to the community to enhance the knowledge capacity of the people in Kampung Tanah Merah Baru, Teluk Bintuni, West Papua.

## REFERENCES

- Chun, J., Oh, J. H., & Kim, C. K. (2020). Oil spill response policies to bridge the perception gap between the government and the public: A social big data analysis. *Journal of Marine Science and Engineering*, 8(5). <https://doi.org/10.3390/JMSE8050335>
- Cope, M. R., Slack, T., Jackson, J. E., & Parks, V. (2020). Community sentiment following the Deepwater Horizon oil spill disaster: A test of time, systemic community, and corrosive community models. *Journal of Rural Studies*, 74, 124–132. <https://doi.org/10.1016/j.jrurstud.2019.12.019>
- Davins, D. A., Respati, B., Yapsenang, D., & Mustagfirin. (2022). The Analysis of Level Community Perception and Participation in Corporate Social Responsibility Program “Mangrove Planting at Abrasion Areas” in Kampung Klayas. *Indonesian Journal of Social Responsibility Review (IJSRR)*, 1(1), 33–43. <https://doi.org/10.55381/ijssr.v1i1.12>
- Faradiba. (2020). Penggunaan Aplikasi Spss Untuk Analisis Statistika Program. *SEJ (School Education Journal)*, 10(1), 65–73.
- Ishak, I. C., Ishak, N. A. L., Ali, N. M., Ishaisa, A. S. N., & Ishak, I. C. (2020). A Study on Preparedness and Response of Oil Spill. *Journal of Physics: Conference Series*, 1529(3). <https://doi.org/10.1088/1742-6596/1529/3/032088>
- Lopezdeasiain, M. (2020). *The Importance of the Participatory Dimension in Urban Resilience Improvement Processes*. 1–25.
- Nagea, J., & Miller, R. K. (2023). A comparative case study of multistakeholder responses following oil spills in Pointe d’Esny, Mauritius, and Huntington Beach, California. *Ecology and Society*, 28(1). <https://doi.org/10.5751/ES-13737-280124>
- Ordinoha, S. B. (2013). *The human health implications of crude oil spills in the Niger delta , Nigeria : An interpretation of*. 54(1), 10–16. <https://doi.org/10.4103/0300-1652.108887>
- Purnaweni, H., Saputra, J., Roziqin, A., Kismartini, K., Djumiarti, T., & Seitz, T. (2022). *Oil Spill Governance : Evidence from Bintan Island , Indonesia*. 1–18.
- Richard, B., Sivo, S. A., Orłowski, M., Ford, R. C., Murphy, J., Boote, D. N., & Witta, E. L. (2021). Qualitative Research via Focus Groups: Will Going Online Affect the Diversity of Your Findings? *Cornell Hospitality Quarterly*, 62(1), 32–45. <https://doi.org/10.1177/1938965520967769>
- Rondolo, R. (2020). *Community Engagement Strategies for Marine Oil Spill Planning and Response*. August.
- Saw, C. L. (2020). *Advancement in Emerging Technologies and Engineering*.
- Septanaya, I. D. M. F., & Fortuna, S. (2023). Gender mainstreaming efforts in disaster management plans: Case study West Nusa Tenggara province, Indonesia. *International Journal of Disaster Risk Reduction*, 87(January), 103576. <https://doi.org/10.1016/j.ijdr.2023.103576>
- Setiowati, R., Mizuno, K., Hasibuan, H. S., & Koestoer, R. H. (2022). Urban green spaces for support healthiness in Jakarta during the COVID-19 pandemic: A quantitative study.

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*Environmental Engineering Research*, 28(2), 210598–0.  
<https://doi.org/10.4491/eer.2021.598>

Singh, R. (2013). *Community Based Disaster Preparedness Course Book*. 1–50.

Torres, D. H. A., da Costa Dias, F., Bahiana, B. R., Haddad, A. N., Chinelli, C. K., & Soares, C. A. P. (2020). Oil Spill Simulation and Analysis of Its Behavior Under the Effect of Weathering and Chemical Dispersant: a Case Study of the Bacia de Campos—Brazil. *Water, Air, and Soil Pollution*, 231(10). <https://doi.org/10.1007/s11270-020-04857-8>

Türkistanlı, T. T., Kuleyin, B., Çetinkaya, V., & Akdaş, O. (2019a). DENİÇevresiniEtkileyen PetKirliliğiAfetlerinin Toplumsal AlgisiniAnalizi: ÇeşmİzmirÖrneği. *Dokuz Eylöl Üniversitesi Denizcilik Fakültesi Dergisi*, December. <https://doi.org/10.18613/deudfd.659805>

Türkistanlı, T. T., Kuleyin, B., Çetinkaya, V., & Akdaş, O. (2019b). DENİÇevresiniEtkileyen PetKirliliğiAfetlerinin Toplumsal AlgisiniAnalizi: ÇeşmİzmirÖrneği. *Dokuz Eylöl Üniversitesi Denizcilik Fakültesi Dergisi*, December. <https://doi.org/10.18613/deudfd.659805>

Wilson, H. C. (2000). Stop propagating disaster myths. *Disaster Prevention and Management: An International Journal*, 9(1), 242–257. <https://doi.org/10.1108/dpm.2000.07309aaa.001>