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The Relationship of Oil Pollution Sources, Consequences and Control towards Marine Life at Teluk Rubiah, Perak, Malaysia

Ismila Che Ishak, Muhammad Irfan Muhammad Lazim, Aminuddin Md Arof, Shaiful Bakri Ismail

Abstract: ***This research focuses to study on the oil pollution sources and consequences towards the marine life. The scope of the research was conducted at Teluk Rubiah, Perak, Malaysia. This research has analyzed the hierarchy of the sources, the consequences and the control of the oil spill towards the marine life. The element of sources were breakage of oil tanker (oil ships), oil pipe leakage and drilling activities. For the consequences covers on the damage to ecosystem, damage to society and damaging to marine biodiversity. Meanwhile, for the control of the oil spill covers the trained employees, the competent disaster management plan and the regular inspection of oil sites and methods of clean-up. A technique of questionnaire survey has remained pragmatic in this research and has established 117 sets of questionnaires from the embattled respondents situated at the Teluk Rubiah, Perak, Malaysia. The closed ended questions encompassed of the demographical contextual of the respondents, elements of sources, consequences and the control of the oil pollution. The descriptive and frequency analysis and multiple regression have been applied for the data analysis. The finding has designated that the element of control towards the oil spill are significantly correlated towards the marine life.***

Keywords: Marine Life, Marine Pollution, Oil Spill.

I. INTRODUCTION

Maritime oil pollution has turned into an interesting important issue. The issue of oil pollution sources and consequences towards the marine life and their impacts has gone up against much significantly. It is almost the same situation happens at the beaches of Teluk Rubiah, Perak, Malaysia which the oil spill has occurred and produce harm to the societies, economic, environment and social. The objectives of this research was to evaluate the main sources, to analyse the consequences and to regulate the control of the oil spill towards the marine life.

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***** Correspondence Author
Ismila Che Ishak*, Maritime Management Section, University Kuala Lumpur Malaysian Institute Marine Engineering Technology, Lumut, Malaysia
Muhammad Irfan Muhammad Lazim, Bachelor, Maritime Management, University Kuala Lumpur Malaysian Institute Marine Engineering Technology, Lumut, Malaysia
Aminuddin Md Arof, Maritime Management Section, Universiti Kuala Lumpur, Malaysian Institute of Marine Engineering Technology, Lumut, Malaysia
Shaiful Bakri Ismail, Marine Electrical Engineering Technology Department, University Kuala Lumpur Malaysian Institute Marine Engineering Technology, Lumut, Malaysia

II. LITERATURE REVIEW

A.Sources of Oil Pollution

The oil spill pollution has covered from several sources such as follows:

Breakage of Oil Tankers (Oil Ships)

A powered cracking of the oil tankers prompts to the oil spill into an expansive amounts (Burgherr, 2007).

Oil Pipeline Leakage

The oil pipeline spills due to a great of the oil contamination. The enormous pipelines laid the whole way across the world and smallest pipeline demonstrates grave threat to the water bodies. Even with a small leakage of the 5% pipeline spillages are capable to harm of half of the gross volume spilled. The pipelines are used to transfer of the hot oils and has an experience serious outside erosion of structure and development issues Larive (2008).

Drilling Activities

The drilling activities has created a prompt extreme to the oil contamination. The oil extractions has dumps the drilling banish into a water bodies. An inappropriate transfer of drilling waste has caused pollution.

B. Effects of The Oil Spill

The impact of the oil pollution is inexcusable, particularly on the amphibian and has widely varied the vegetation. The impressions of the oil spills and measurement of an unplanned discharges into the ocean in the previous decades has demonstrated that the marine oil slicks are erratic occasions that may cause noteworthy harm to the marine biological communities and natural life and the beachfront networks in huge (Al Fartoosi, 2013).

Damage to Ecosystem

The oil pollution is a remarkable hazard to the organic community, predominantly to the an amphibian environment. The environmental effect of the oil slicks on the seagoing mortals relies upon the area of the oil slicks and the affectability of the adjacent life forms to the oil contamination.

Once the oil slick has happened, it has a magnificence affected the ecosystem of the earth (Hannah, 2011).

Damage to Society

Society effect clearly influences by the number of inhabitants of an individuals in the network. The oil spill pollution has turned out to be the exceedingly badly to a shoreline and effected an individual who lives close to the shoreline.

Damaged to Marine Biodiversity

Marine biodiversity gets extraordinary influenced by the oil contamination. The oil slicks have made a potential mischief to the marine flying creatures. The feathers covered with the slick water which hampers with the water repulsing stuff of their fluff. This may build their odds of suffocating in water as their lightness may extensively diminish (Troisi, Barton , Bexton, 2016).

C.Control the Oil Spills

It is a fundamental control to prevent the oil pollution. A water transport has known as a vital significance related to the oil slicks (Vanem, Endresen, Skjong, 2008). The control of the oil contamination could covers as follows:

Trained Employee

Drilling activities should just be conducted by the talented and skilled employees as to keep an undesirable oil contamination (Smith, 2001).

Efficient Disaster Management Plan

The government should manage the oil contamination issue genuinely. The nearby ecological offices should venture and design activity towards the recuperation of polluted water bodies. The effective coordination of the reclamation procedure and join things like coral and estate recreation, shoreline upgrades and transport confinements crosswise over water bodies.

Regular Inspection and Methods of Clean-Up

A regular inspection on the oil spill equipment assist to combat the oil spill pollution effectively.

III. METHODOLOGY

A. Survey Method

A closed ended questionnaires survey method has been conducted to the scope of the research at Teluk Rubiah, Perak, Malaysia.

B. The Conceptual Theoretical Framework

The proposed conceptual theoretical framework covers the elements of an independent and dependent variables as shown in Figure 1.

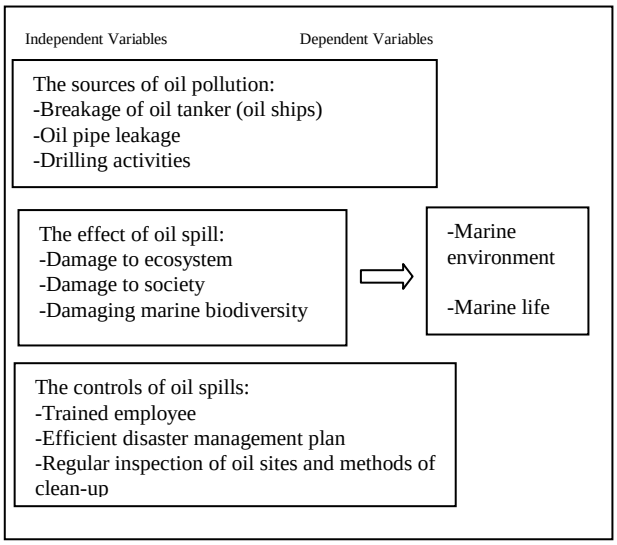

Fig. 1 The Conceptual Theoretical Framework

C. Population and Sample

The entire amount of 117 respondents have contributed in the questionnaire review from a total of 237 from the sample and the number of population. The response rate was at 49.36%.

Table. 1 List of Population, Sample and Respondents

Group	Population	Sample	Respondents
Citizens	100	100	25
Tourist	60	60	15
Marine Department	28	28	28
MMEA	40	40	40
DOE	9	9	9
Total	237	237	117

MMEA- Malaysian Maritime Enforcement Agency, DOE-Department of Environment

IV. DATA ANALYSIS

The data was analysed based from 117 respondents' feedback by applying reliability analysis and multiple regression investigation from Statistical Package for Social Science (SPSS) version 25.

A. The Respondents Background

Table II shows the respondents background from 117 respondents.

Table. 2 The Respondents Background

Background Respondent	Questions	Frequency	Percent
Gender	**Male**	**70**	**60**
	Female	47	40
Marital Status	**Married**	**84**	**72**
	Single	33	28
Age	18-25 years	20	17
	26-35years	22	19
	36-45years	35	30

	46 years above	**40**	**34**
Education	SPM	29	25
	STPM	**35**	**30**
	Diploma	25	21
	Degree	15	13
	Master	9	8
	PhD	4	3
Race	**Melayu**	**46**	**39**
	Chinese	29	25
	Indian	25	21
	Others	17	15

B. The Reliability Test and The Cronbach's Alpha

22 items of the questionnaires were analysed and it showed that the *Cronbach's Alpha* was at 0.737. The Cronbach's Coefficient Alpha exhibited an internal uniformity reliability of the research questions which the reliability coefficient is valued nearer to 1.0. as shown in Table III and Table IV.

Table. 3 Reliability Test Analysis

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Cronbach's Alpha if Item Deleted
22 items	69.10-73.30	6.322-12.056	0.707-0.788

Table. 4 The Cronbach's Alpha Value

Cronbach's Alpha	N of Items
0.737	22

Table. 5 The Cronbach's Alpha Interpretation

Cronbach's alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

C. The Correlation Analysis

The correlation analysis is used to acquire the degree and course and affords an projected association among the two variables (Puth, M. T., Neuhäuser, M., & Ruxton, G. D., 2014). As from the range of correlation coefficient (r) from Table 4 indicated the value of r= 0.80 is considered high and it is acceptable to mention the positive and strong relationship between the variables. Cortina, J. M. (1993), stated that the nearer the correlation is to 1.0, the tougher the relationship between the two variables. In this case, means that high scores on one are linked with high scores on the other elements and that low scores on one are associated with low scores on the other elements. If the higher score on the sources, consequences and control shall contribute a higher towards the marine life. The Pearson coefficient requires both variables to be restrained on an interval or ratio scale, and controls based on actual values. A adjacent affiliation with +1 has a strong connection while the correlation with 0 or -1 has a correlation between variables but with a coefficient of the correlation coefficient.

Table. 6 Correlation between Sources and Marine Life

		Sources	Marine Life
Fatigue	Pearson Correlation	1	**.732****
	Sig. (2-tailed)		.000
	N	117	117
Rate of Accidents	Pearson Correlation	**.732****	1
	Sig. (2-tailed)	.000	
	N	117	117

**Correlation is significant at the 0.01 level (2-tailed)

Table VI shows the correlation analysis data between sources and the marine life which is absolutely interrelated and can be demonstrated by the high value of 0.732. This positive relationship means that the relationship between sources and marine life is strongly associated. This association value is the second highest.

Table. 7 Correlation between Effects and Marine Life

		Effect	Marine Life
Communication	Pearson Correlation	1	**.683****
	Sig. (2-Tailed)		.000
	N	117	117
Rate of Accidents	Pearson Correlation	**.683****	1
	Sig. (2-Tailed)	.000	
	N	117	117

**Correlation Is Significant At The 0.01 Level (2-Tailed)

Table VII designates that effect and marine life are also strongly associated at 0.683. The association value is less than the association between effect and marine life rate. This association value is the third highest.

Table. 8 Correlation between Control and Marine Life

		Control	Marine Life
Lack of Knowledge	Pearson Correlation	1	**.772****
	Sig. (2-tailed)		.000
	N	117	117
Rate of Accidents	Pearson Correlation	**.772****	1
	Sig. (2-tailed)	.000	
	N	117	117

**Correlation is significant at the 0.01 level (2-tailed)

The association between control and the marine life shows a positive association as shown in Table VIII.

This is demonstrated by the highest correlation value of 0.772 as compared to the correlation of the other two elements of source and effect. The control of the oil spills is seriously crucial in the marine life.

The correlation between element of control is tougher because the association value is at 0.8 and shows the strongest relationship.

C. The Multi Regression Analysis

The Multiple Regression is used as an extension of simple linear regression to predict the estimation of a variable dependent on the estimation of at least two different variables.

Table. 9 The Dependent Variables

Model	Standardized Coefficient			
	B	Beta	T (value)	Sig.
Adjusted R Square			.739	
F	70.244		**8.984**	.000
Constant	1.012			
The sources of oil spill	5.956	-.309	14.907	.000
The effect of oil spill	5.772	-.266	14.124	.000
The control of oil spill	5.333	-.167	12.666	.097

The multiple regression result designates that the total disparity in the dependent is explained by the independent variable. The model is statistically substantial as the F value is significant at $p<0.001$ and has a value of 8.984. The results indicated a positive significantly related with the response of the oil spill.

V. CONCLUSION AND RECOMMENDATION

A. Conclusion

The research objectives have positively achieved on the sources, effects and control of the oil spill towards the marine life. The sources, effects and control of the oil spill are important in the preparedness dimension engaged by the connected respondents and government authorities towards the oil spill contingency plan. In addition, the prompt and effective decision making determine the response towards the control and prevention of marine life. The significant relationship of the elements have been evaluated by using the theoretical framework. It is found that these objectives have a solid relationship between independent variables and dependent variables. The marine life from the oil spill pollution can be minimize by control and prevent towards oil spills based on trained employees, competent disaster management plan and have the consistent inspection of oil sites and methods of clean-up.

B. Recommendation

An awareness campaign among the response teams, staff and public is needed to inculcate the knowledge and know how once the oil spill has occurred. In addition, the effective SOPs from the Occupational Safety and Health should be emphasized regularly on the safety of working environment with the proper regulations and legislation. A true and correct information to outsiders about the oil spill is important. It could assist societies with a better knowledge about the oil spill incidents. Finally, the punishments and penalties towards the oil spill incidents essential to be revised efficiently.

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AUTHORS PROFILES

Ismila Che Ishak: was born in Alor Setar, Kedah on 29.10.1072. She has obtained her higher education studies in Diploma in Business Studies (DBS) from ITM Arau, Perlis on 1993. She continued her degree in Bachelor of Business Administration (BBA) from Universiti Utara Malaysia (UUM) on 1997.

She also completed her masters in Masters in Business Administration (MBA) on 2004 from Universiti Sains Malaysia (USM). Currently, she is undergoing her P.h.D study in Maritime Management at UniKL MIMET as a part time student basis. She has published several papers in conference proceedings, technical notes, and scopus indexed journals by using name as Ismila Che Ishak. At UniKL she's also supervising final year students for Final Year Projects (FYP) in research. She is an active Chartered Member in International Logistic and Transportation (CMILT) since 2013. She is happily married with husband name Zamrady Ariffin, has five kids and enjoying her teaching and learning at UNIKL MIMET until present.

Muhammad Irfan Mohamad Lazim full name was born in Tanah Merah, Kelantan on 22 March 1995. He has graduated in Diploma from Universiti Kuala Lumpur Malaysian Institute of Marine Engineering Technology (UniKL MIMET) in 2015 and Bachelor of Maritime Operation in Universiti Kuala Lumpur Malaysian Institute of Marine Engineering Technology (UniKL MIMET) in 2019.

Aminuddin Md Arof is an Associate Professor at Universiti Kuala Lumpur, Malaysian Institute of Marine Engineering Technology. Before joining UniKL in 2007, he served the Royal Malaysian Navy and as a lecturer with Universiti Teknologi Malaysia. He hold a PhD in Transport and Logistics from the Universiti Teknologi Mara, Malaysia and a Master of Arts in Maritime Policy from University of Wollongong, Australia. His research interests include short sea shipping (SSS), liner shipping, cabotage regime, navigational rights and freight logistic.

Shaiful Bakri Ismail graduated with B.Eng (Hons) in Electrical and Electronic Engineering from Universiti Teknologi Malaysia (UTM), Malaysia in 2007. He obtained his Master Science (M.Sc.) in Mathematics from Universiti Kebangsaan Malaysia (UKM), Malaysia in 2010. After graduation in 2007, he worked as Teaching Assistant for PERMATA UKM and Process Engineer at Nippon Semiconductor Sdn Bhd (NEC) at Klang, Selangor. His specialize area are in Mathematical Application (Optimization) and Programming. Mr.Shaiful Bakri is an established teacher and researcher in Marine and Electrical Department at UniKL MIMET and already teaching various courses in mathematics and programming including MATLAB and C++