



UNIVERSITI PUTRA MALAYSIA

***CLASSIFICATION OF FOREST CRIME RELATIONS FROM THE
EXPERIENCE AND PERCEPTION OF FOREST ENFORCERS
IN KELANTAN, MALAYSIA***

WAN NUR FARINIE BINTI WAN ZEE

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By

WAN NUR FARINIE BINTI WAN ZEE

**Thesis Submitted to School of Graduate Studies, Universiti Putra
Malaysia, in Fulfilment of the Requirements for the Degree of
Master of Science**

March 2020

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Master of Science

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Chair : Pakhriazad bin Hassan Zaki, PhD
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The non-compliance forest rules being one of the reasons of existing the forest offences in the states and it has being an issues to achieved sustainable forest management in Malaysia. There are several studies conducted on deforestation yet the study related to the forest illegal practices is not widely conducted. Therefore, this study focused on three objectives which are to analyze the trends in the occurrences of forest offences in the state of Kelantan from year 2007 to 2016, to clarify the factors associated with the forest offences in the state within enforcers experiences and to examine the issues and constraints of monitoring forest offences in the state within perception perceived by authority. This study was conducted in Kelantan, Peninsular Malaysia, with the target respondents is limited among the officers and staff in Kelantan State Forestry Department (KSFD), who both directly and indirectly involved with the forest enforcement activities. Sampling technique used is purposive sampling, involves identifying and selecting the focus groups that knowledgeable about or experienced with the matter. The data were analyzed by using descriptive analysis, and two further analyses which are Spearman's Correlation analysis and application of Multiple Discriminant Analysis (MDA). The results indicated the highest number of forest offence cases detected is by in year 2016 with total of 89 cases. There are three correlations that has been made to test the relationship between types of forest offences, factors associated with the forest offences and the issues and constraints of forest monitoring activities. The results indicates none of the variable pairings shows acceptable association strength although some are found to be significantly different between each other. Next, Multiple Discriminant Analysis (MDA) shows entire function derived shows very weak discrimination between variables fitted in the function as respective statistics is reaching to 1. Yet, there is

relationship between predictors with grouping variable from significant value of less than 0.05. The findings of the study provided meaningful information to related parties as guidelines or reference for work management and future research. Several recommendation about mitigation efforts to reduce the non-compliance forest rules in the state such as conducting awareness campaigns and organizing seminars with suitable contents. Since this study is limited to the state of Kelantan only, the results and findings could not be generalized to the other part of Malaysia, hence the follow up research, should be conducted elsewhere in Peninsular Malaysia to get more meaningful and comprehensive information.



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

**PENKELASAN HUBUNGAN JENYAH HUTAN DARIPADA PENGALAMAN
DAN PERSEPSI PENGUATKUASA HUTAN DI NEGERI KELANTAN,
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Ketidak-patuhan peraturan hutan merupakan salah satu sebab kewujudan kesalahan-kesalahan hutan di negeri-negeri dan kesalahan hutan telah menjadi isu di dalam pengurusan hutan berkekalan di Malaysia. Terdapat beberapa kajian mengenai penyahutan, namun kajian berkaitan amalan-amalan hutan yang tidak sah pula tidak dibuat secara meluas. Oleh itu, kajian ini berfokuskan kepada tiga objektif, iaitu untuk menganalisis arah aliran kejadian kesalahan hutan di negeri Kelantan dari tahun 2007 hingga 2016, untuk menjelaskan factor-faktor yang berkait dengan kesalahan hutan, dan untuk menilai isu-isu dan halangan di dalam pemantauan kesalahan hutan di dalam negeri. Kajian ini telah dibuat di negeri Kelantan, Semenanjung Malaysia dengan responden yang ditarget adalah terhad dalam kalangan pegawai dan staff di Jabatan Perhutanan Negeri Kelantan (JPNK), yang mana terlibat secara langsung dan tidak langsung dengan aktiviti-aktiviti pemantauan hutan. Teknik persampelan yang digunakan ialah persampelan purposif, yang melibatkan pengenalpastian dan pemilihan fokus kumpulan yang berpengetahuan dan berpengalaman dengan perkara tersebut. Data kemudian dianalisis dengan menggunakan analisis deskriptif, dan dua analisis yang lebih lanjut iaitu analisis korelasi Spearman dan analisis pelbagai diskriminasi (MDA). Keputusan kajian menunjukkan jumlah bilangan kes kesalahan hutan yang dikesan adalah pada tahun 2016 dengan jumlah kes 89. Terdapat tiga kolerasi yang telah dibuat untuk mengkaji hubungan di antara jenis kesalahan hutan, faktor-faktor yang berkaitan dengan kesalahan hutan, dan isu-isu serta halangan dalam aktiviti pemantauan hutan. Keputusan telah menunjukkan tiada pasangan pembolehubah yang menunjukkan kekuatan yang boleh diterima, walaupun ada di antara mereka yang di signifikasikan antara satu sama lain. Seterusnya analisis pelbagai diskriminasi menunjukkan keseluruhan diskriminasi pembolehubah didapati sangat lemah di Antara pembolehubah yang

dipasang di dalam fungsi tersebut dengan statistic masing-masing mencapai 1. Walau bagaimanapun, terdapat hubungan Antara peramal dengan pembolehubah berkumpulan daripada nilai signifikan kurang daripada 0.05. Hasil kajian ini memberikan maklumat yang bermakna kepada pihak-pihak yang berkaitan sebagai panduan atau rujukan untuk pengurusan kerja dan juga penyelidikan di masa hadapan. Beberapa cadangan mengenai usaha mitigasi untuk mengurangkan kes ingkaran peraturan hutan, seperti menjalankan kempen kesedaran dan menganjurkan seminar dengan kandungan yang sesuai. Oleh kerana kajian ini terhad kepada negeri Kelantan sahaja, hasil dan dapatan kajian ini tidak dapat digeneralisasikan bagi keseluruhan tempat di Malaysia. Maka, penyelidikan susulan perlu dijalankan di tempat lain di Semenanjung Malaysia untuk mendapatkan maklumat yang lebih bermakna dan komprehensif.



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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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TABLE OF CONTENTS

	Page
ABSTRACT	i
ABSTRAK	iii
ACKNOWLEDGEMENTS	v
APPROVAL	vi
DECLARATION	viii
LIST OF TABLES	xiii
LIST OF FIGURES	xv
LIST OF ABBREVIATIONS	xvi
CHAPTER	
1 INTRODUCTION	
1.1 General Background	1
1.2 Problem Statement	2
1.3 Objectives of the Study	3
1.4 Research Questions	3
1.5 Significance of the study	4
1.6 Scope and Limitation of the Study	4
1.7 The Definition of Terms Used in the Study	5
1.8 Structure of Thesis	6
2 LITERATURE REVIEW	
2.1 Forest and Forestry in Peninsular Malaysia	7
2.1.1 Introduction	7
2.1.2 Definitions of Forest	7
2.1.3 Definitions of Forest based on the Report of Expertise	9
2.2 State of Forest in Peninsular Malaysia (Law and Legislations)	11
2.2.1 Forestry and Forest Resource Industry Peninsular Malaysia	11
2.2.2 Forest Governance and State of Forest in Kelantan	12
2.3 Overview on Forest Offences (Law and Legislations)	13
2.3.1 Introduction	13
2.3.2 Previous Studies on Forest Offences and Enforcement	13

2.3.3	Illegal Practices in Forestry Sector	14
2.3.4	Forest Offences and Classifications	15
2.3.5	An overview of Forest Offences in Malaysia	16
2.3.6	Scenario of Forest Offences in the State of Kelantan	17
2.4	Constitutional Provision, Policy and Legislations	19
2.4.1	Constitutional Provisions	19
2.4.2	Policy and Legislations	19
2.5	Forestry Laws	20
2.5.1	National Forestry Act 1984 (Amendment 1993)	20
2.6	Licensing (Harvesting License)	21
2.7	Theory Planned Behaviour	21
3	RESEARCH METHODOLOGY	
3.1	Introduction	23
3.2	Research Design	23
3.3	Coordination of the Study	24
3.4	Study Area	25
3.5	Sampling Technique	27
3.6	Data Collection	28
3.6.1	Questionnaire Development	29
3.6.2	Pre-testing of Questionnaire Form	32
3.6.3	Reliability and Validity of the Questionnaire Form	32
3.7	Data Analysis	35
3.7.1	Descriptive Analysis	35
3.7.2	Spearman's Correlation Analysis	35
3.7.3	General Overview on Application of Multiple Discriminant Analysis (MDA)	36
3.7.3.1	Data Analysis on Multiple Discriminant Analysis (MDA)	37
3.7.3.2	Elements in Multiple Discriminant Analysis (MDA)	38
4	RESULTS AND DISCUSSION	
4.1	Introduction	39
4.2	Descriptive Statistics	39
4.2.1	The Number in the Occurrences of Forest Offences in the State	39
4.2.2	Respondents Profile	40

4.2.3	Perceptions on Occurrences of Forest Offence in the State	41
4.2.4	Perception on Factors of Committing Forest Offence in the State	42
4.2.5	Perception on Limitation Issues on Monitoring Activities in the State	43
4.3	Association between Predictors	44
4.3.1	Relationship between respondent's backgrounds with perceptions	45
4.3.2	Association between Occurrences with Factors of Forest Crime	48
4.3.3	Association between Occurrences of Forest Crime with Monitoring Issues	52
4.4	Introduction to Multiple Discriminant Analysis (MDA)	54
4.4.1	Factors Combination on Forest Offence Occurrence	54
4.4.2	Homogeneity of Variances	55
4.4.3	Standardized Canonical Discriminant Function Coefficients	56
4.4.4	The Discriminated Functions of Multiple Discriminant Analysis (MDA)	57
4.5	Findings from Site Observation	58
5	CONCLUSION AND RECOMMENDATION	
5.1	Introduction	60
5.2	Conclusion	60
5.3	Recommendations	62
	REFERENCES	64
	APPENDICES	74
	BIODATA OF STUDENT	82
	LIST OF PUBLICATIONS	83

LIST OF TABLES

Table		Page
1	The Definition of Forest based on Expertise View	9
2	Classification of Forest Offences under National Forestry Act 1984 and National Forestry Act (Amendment) 1993	15
3	Number of Overall Forest Offences by Region from Year 2013-2015	18
4	The Questionnaire Sections and Particular Variables	31
5	The Reliability Coefficient of Cronbach's Alpha	34
6	The Reliability Analysis Result	34
7	The Types of Elements in Multiple Discriminant Analysis	38
8	Number of Forest Offence Cases detected in 10 years	39
9	The Respondents Profile	40
10	Awareness on Occurrences of Forest Offence	41
11	Perception of Factor of Committing Forest Offence	42
12	Perception on Limitation Issues on Monitoring Activities	43
13	Association between Perceptions with Respondent's Profile	45
14	Association between occurrences (B) with factors (C) of forest offence (Part 1)	48
14	Association between occurrences (B) with factors (C) of forest offence (Part 2)	49
15	Association between Forest Offences (B) with Monitoring Issues (D) (Part 1)	52
15	Association between Forest Offences (B) with Monitoring Issues (D) (Part 2)	53
16	Box's Test of Equality of Covariance Matrices	55
17	Standardized Canonical Discriminant Function Coefficients	56

18	The Functions Model of Multiple Discriminant Analysis (MDA)	57
19	The Fines Imposed under National Forestry Act 1984 and National Forestry Act (Amendment) 1993 – Attachment II	78



LIST OF FIGURES

Figure		Page
1	The Theory Planned Behaviour	21
2	The General Flow of Work Coordination	25
3	The state of Kelantan	27



LIST OF ABBREVIATIONS

FAO	Food and Agriculture Organization
UN. FAO	United Nations Food and Agriculture Organization
FDPM	Forest Department Peninsular Malaysia
CDM	The Clean Development Mechanism
UNFCCC	United Nations Framework Convention on Climate Change
IUFRO	International Union of Forest Research Organizations
UN-CCD	United Nations Conventions to Combat Desertification
SFM	Sustainable Forest Management
PRF	Permanent Reserve Forest
KSFD	Kelantan State Forestry Department
NFC	The National Forestry Council
NLC	The National Land Council
IBM SPSS	Statistical Package for Social Science
IV	Independent Variable
DV	Dependent Variable
DOSM	Department of Statistics Malaysia
MDA	Multiple Discriminate Analysis
MANOVA	Multivariate Analysis of Variance

CHAPTER 1

INTRODUCTION

1.1 General Background

In year 2015, the total forest cover is about 30.6% out of the world's land surface, which is just over 4 billion ha (FAO, 2017). The forests in global are increasingly deteriorated due to the land-use change, forest fragmentation, forest degradation, changing management objectives and deforestation. Forests are defined as a home to the most world's species but due to tremendous deforestation in the last century, it declines the world's forest cover areas (Rahman et al., 2016).

The loss of forest covers being one of important global issues because its effects on biodiversity and climate change, and based on the observation in afforested area in between year 2005 and 2010, there is 26.44% decrease in forest cover and 37.56% decrease in water bodies (Rahman et al., 2016). According to the data recorded by United Nation Food and Agriculture Organization, deforestation was in the highest state in the year 1990s, when each year the world lost on millions hectares of the forest (average 16 million ha per year). The total area of global forest become progressively worse and has declined by 3% since year 1990 but the planted forest areas having increased in all regions of the world and it shows that almost 7% of global forest land (Birdsey & Pan, 2015).

Asia is the most crowded area with a significant number of worldwide biodiversity hotspots and gifted with a few mega-diverse nations. This situation is including to Malaysia which is rich with social and nature legacy. Malaysia is the one of country in the Southeast Asia that has tropical rainforest. Malaysia occupying parts of the Peninsular Malaysia and the island of Borneo, and they are separated by the South China Sea into two similarly sized regions (Hoh et al., 2015). It is known for its beaches, rainforests and the variation of citizens such as Malay, Chinese, Indian, and also have various cultures. Neighboring countries of Malaysia that share land borders are Thailand, Indonesia and Brunei Darussalam. Other than that, Peninsular Malaysia located north of Singapore and east Malaysia shares maritime borders with Brunei and Indonesia and also a maritime border with the Philippines and Vietnam. The capital for Malaysia is Kuala Lumpur and the federal government is seat in Putrajaya. Malaysia consists of thirteen states and three federal territories with a total landmass of 330,803 square kilometers (127,724 sq. mi). Land surface of Malaysia was almost entirely covered with forest and today Malaysia's land surface area still cover about 59.5% of the total land area (FDPM, 2017).

1.2 Problem Statement

The non-compliance of forest rules are classified as a forest offence. Forest offences are not only giving disadvantages towards the economy of the State, but it also being one of the factors affecting the implementation of Sustainable Forest Management (SFM) in Malaysia, especially in the State of Kelantan. Illegal and uncontrolled harvesting activities, for example, may cause irreparable damage to the forest which subsequently influences its long-term productivity and sustainability.

The impacts of forest offences can be divided in to two; namely as direct and indirect impact. Direct impacts are related to the loss of state revenue in term of land premium, royalty collection and other related charges. Forest offences have serious economy implications with millions of ringgit worth of timber revenue being lost each year. Forest offences also can be the reason behind the losses of other assets of the state and they are also one of the factors that contribute to the failure of forests to remain intact. The logging sector is the main source of state revenue generated from Permanent Forest Reserve in Kelantan. Besides that, timbers also produced from government land, alienated land and also from area for plantations purposes and infrastructure development. The highest income is from the collection of the land premium paid by timber contractors and loggers for the production of forest products from Permanent Forest Reserve and government land.

Meanwhile, the indirect impacts are involving to the widespread environmental damages and biodiversity losses. Forest offences will be affect the environmental and biodiversity in term of loss of forest area, and undermine the functions of environmental services such as water regulation, source of oxygen, formation and stabilization of soil, the loss of wildlife, and the damages of environment can exacerbate catastrophic flooding. All of these situations make the natural functions of forests have changed.

Kelantan face the issue where forest offences create serious obstacles towards attaining sustainable forest management in Kelantan. This kind of condition should be improved with suitable ways or methods so that the statistics of forest offences in the state of Kelantan would be minimize. Forest offences cases occurring unrestrained and blatant with disregard the law such as in the permanent reserve forest and it is must be controlled and the illegal forest activities should be control for future undertaking to maintain the sustainable of forest in Kelantan. However, the study related to this topic does not widely understand and there are very little studies have been done related to the forest offences especially regarding to the forest offences and factors associates to their occurrences. This study will

highlights the trends in the occurrence of forest offences in the state and clarify the factors contributed to the occurrences of forest offences and to examine the issues and constraints of monitoring forest offences in the state. The results from study are considered important to the Kelantan State Forestry Department for future strategies in term of implementing forest law effectively. As we know that forest offences are difficult to eliminate but it could be minimized as far as possible. The factors associate to the occurrence of forest offences need for meaningful understanding and deliberate investigation. Therefore, the suitable solution could be apply and to enhance the efficiency of enforcement unit. The objectives from this study also will give advantage to Kelantan State Forestry Department in term of applicability the findings to enhance the efficiency of enforcement unit. Forest law enforcement is a critical aspect of forest management because it regulates the relationship between many parties, particularly timber companies, with the forest resource.

1.3 Objectives of the study

The general objective for this study is to analyze the trends in the occurrences of forest offences in the state of Kelantan from year 2007 to 2016. The specific objectives are:

- 1.3.1 To clarify the factors associated with the forest offences in the state within enforcers experiences;
- 1.3.2 To examine the issues and constraints of monitoring forest offences in the state within perception perceived by authority.

1.4 Research Questions

- i. How are the trends in the occurrences of forest offences in the state of Kelantan in 10 years, from year 2007 to 2016?
- ii. What are the factors that associated with the forest offences in the state based on the enforcer's experiences?
- iii. What are the issues and constraints related to the monitoring forest offences in the state within perception perceived by the authority?

1.5 Significance of the study

The need to study the essential facets of the non-compliance forest rules in the State of Kelantan is highly required to have a better understanding of the existing problem regarding to the forest offences in the State of Kelantan. This study is an exploratory study. It can be defined as a research conducted for an issue or problem that has not been clearly studied (Shields & Rangarajan, 2013). This kind of study are involves forest policies and legislation, which are not widely conducted among the researchers. This study would contribute useful information to the Kelantan State Forestry Department (KSFDD), forestry authorities, environmentalists, publics in general, various academic backgrounds and from every level of society to understand the characteristics and actual condition of the non-compliance forest rules in the state and all the matter related to the forest offences. The output and all information of the study also can be used by forest authorities to minimize the occurrences of the non-compliance forest rules as well as forest offences in the state.

This study was highlighted the forestry issues that addressed by forestry personnel and staffs based on their work experiences and their perceptions, especially those who are work under forest monitoring unit. Based on the list of forest offences, we can summarize the types of forest offences that frequently happened in the state in the duration of time from year 2007 to 2016. Simultaneously, perceptions regarding to the factor of committing forest offences and the issues on forest monitoring can be revealed.

The acquired information from the study will be a catalyst to the community to be more aware regarding to the forest matter and the environment. They should be exposing to the issues on forestry crimes, forest offences and the non-compliance forest rules in the state of Kelantan, so that the community will be more responsible towards the biodiversity and the environment. At the same time, we can create the more socioeconomics' opportunity to the local community, as long as they can use forest produce in a good way and wisely according to the rules and legislations that has been made.

1.6 Scope and Limitation of the Study

With the aim to achieve the objectives of the study, the scope and limitation of this study only focusing on the non-compliance forest rules in the state of Kelantan. The scope of data collection is focusing on the following aspects:

- a) Respondents Limitation: The target respondents for this study is limited among the personnel and enforcement staffs in Kelantan State Forestry Department (KSFD), who both directly and indirectly involved with the forest enforcement activities with the total number is 164. In term of criteria of experience, the respondents should been to experience a work in a forest monitoring unit for five years above (Brofeldt et al., 2018). The sampling for this study was done according to respondent's willingness and availability along data collection phase.
- b) Sampling Technique: The sampling technique used is purposive sampling whereby involves identifying and selecting the focus groups that were knowledgeable about or experienced with the matter.
- c) The duration of sampling: The study has limited time, resources and workforce, because not all the respondents were available with the data collection schedule.

1.7 The Definition of Terms Used in the Study

The definition of terms representative of independent and dependent variables as the guide for the whole process of the study as below:

1.7.1 Forest Law Enforcement

In the definition, the forest law enforcement can be define as an action taken by Forestry Department in legally qualified to determine the non-compliance of forest rules in any particular areas. By the law enforcement, the illegal activities in the forestry sector can be reducing to a minimum.

1.7.2 The Non-compliance of Forest Rules

Forest offences are any forest related activities that against the law and regulations in the forestry. All the forest offences are classified under the non-compliance forest rules.

1.8 Structure of Thesis

The structure of the thesis consisted of five chapters. As a standard organization of the thesis, it is opening with an introduction section in chapter one, followed by literature review in chapter two. All the research methodology is elaborated in chapter three; the data collection, method has been used, and study site are clarified in chapter three. Then the results and study findings are detailed in chapter four and the last chapter, which is chapter five narrated about a summary of the whole thesis, conclusion, and recommendations for the study.



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Wan Nur Farinie binti Wan Zee was born in Pasir Mas, Kelantan, Malaysia on 5th March 1990. Early education began in 1997 at Sekolah Kebangsaan Mekasar, Pasir Mas, Kelantan. She continued her secondary education in 2003 at Maahad Muhammadi Perempuan Pasir Pekan and Sekolah Menengah Kebangsaan Sultan Ibrahim Dua, Pasir Mas, Kelantan until 2008. She pursued her study and obtained a Diploma in Forestry from Universiti Putra Malaysia, Bintulu Campus (UPMKB) in 2012. Later, she pursued her study in Bachelor's Degree Level and obtained the Bachelor of Forestry Science (B. For. Sc.) and honored with Second Class Upper Honours from Universiti Putra Malaysia (UPM), Serdang Campus in 2016. Her passionate in seeking knowledge, she once again pursued her study in Bachelor Master's Degree by September 2016. She conducted a research on the forest enforcement, in the State of Kelantan in Faculty of Forestry and Environment, at the Universiti Putra Malaysia (UPM). During the Bachelor Master's Degree, she was financially supported by Graduate Research Fellowship (GRF), for the two years, provided by the university. For the time being, Wan Nur Farinie working with the Department of Statistics Malaysia (DOSM) in the State of Kelantan, and holds a post of Personnel MySTEP. She also holds a post as an Assistant Manager for her family business in WZ Timber Trading Sdn. Bhd.

LIST OF PUBLICATIONS

i. Proceedings

Wan Nur Farinie, W.Z., Pakhriazad, H.Z., Mohd Hasmadi, I., Nur Syuhada, N., Nur Afifah, M.A., Md Damiri, M.S. and Nor Azmi, B. The Temiar Community in Kelantan, Peninsular Malaysia: Their Socioeconomic and Culture Values. Proceedings of Joint Regional Meeting of IUFRO RG3.03.00 and RG3.06.00 in Asia. Matsuyama and Kochi, Ehime University & Kochi University, Japan: 24th – 28th July 2017. ISBN 978-4-9906725-1-5.

Md Damiri, M.S., Pakhriazad, H.Z., Mohd Hasmadi, I., Paiman, B., Wan Nur Farinie, W.Z., Nur Syuhada, N., Nor Azmi, B., Nur Afifah, M.A. Managing of Malaysian Tropical Rainforest: Issues and Challenges. Proceedings of Joint Regional Meeting of IUFRO RG3.03.00 and RG3.06.00 in Asia. Matsuyama and Kochi, Ehime University & Kochi University, Japan: 24th – 28th July 2017. ISBN 978-4-9906725-1-5.

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Mohamad Amran, N.A., Hassan Zaki, P., Ismail, M.H., Wan Zee, W.N.F., Syuhada Nawi, N., Md. Sairi, Md.D. and Baharom, N.A. Factor of Illegal Logging through Villagers Perspectives: A Case Study in Permanent Reserve Forest Ulu Sat, Kelantan, Peninsular Malaysia. Proceedings of Joint Regional Meeting of IUFRO RG3.03.00 and RG3.06.00 in Asia. Matsuyama and Kochi, Ehime University & Kochi University, Japan: 24th – 28th July 2017. ISBN 978-4-9906725-1-5.

ii. Conferences

Wan Nur Farinie Wan Zee, Pakhriazad Hassan Zaki, Nur Syuhada Nawi, Nur Afifah Mohamad Amran, and Mohd Hasmadi Ismail. Monitoring of Forest Offences in the State of Kelantan, Peninsular Malaysia: Issues and Constraints. Attended NTrop5 (5th International Conference on Natural Resources in the Tropics) as a poster presenter at Sibul & Kapit on 27th November to 1st December 2017. Kingwood Hotel, Sibul, Sarawak and Hotel Meligai, Kapit, Sarawak.

Md Damiri Md Sairi, Pakhriazad Hassan Zaki, Wan Nur Farinie Wan Zee, Nur Syuhada Nawi, Nur Afifah Mohamad Amran, Nor Azmi Baharom, and

Mohd Hasmadi Ismail. Forest Legislation and Challenge in Sustainable Forest Management Practice in Malaysia. Attended NTrop5 (5th International Conference on Natural Resources in the Tropics) as a poster presenter at Sibul & Kapit on 27th November to 1st December 2017. Kingwood Hotel, Sibul, Sarawak and Hotel Meligai, Kapit, Sarawak.

Nur Syuhada Nawi Pakhriazad Hassan Zaki, Wan Nur Farinie Wan Zee, Nur Afifah Mohamad Amran, and Mohd Hasmadi Ismail. An Overview of Forest Plantation in Peninsular Malaysia: Issues and Constraints. Attended NTrop5 (5th International Conference on Natural Resources in the Tropics) as a poster presenter at Sibul & Kapit on 27th November to 1st December 2017. Kingwood Hotel, Sibul, Sarawak and Hotel Meligai, Kapit, Sarawak.

iii. Publications

The manuscript entitled as "Monitoring of Forest Offences in the State of Kelantan, Peninsular Malaysia: Issues and Constraints." has been submitted in to the Journal of Tropical Resources and Sustainable Science for possible publication.

The manuscript entitled as "Classification of Forest Offence: Experiences and Perceptions of Forest Enforcers in the State of Kelantan, Malaysia." has been submitted in to the Indonesian Journal of Forestry Research (IJFR) for consider publication.



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