



***ENVIRONMENTAL CONCERNS OF MALAYSIAN AND FOREIGN
RESIDENTS OF LANGKAWI TOWARDS THE DEGRADATION OF
MANGROVES IN KILIM KARST GEOFOREST PARK LANGKAWI***

FONG MAY YIN

FH 2019 113

**ENVIRONMENTAL CONCERNS OF MALAYSIAN AND FOREIGN
RESIDENTS OF LANGKAWI TOWARDS THE DEGRADATION OF
MANGROVES IN KILIM KARST GEOFOREST PARK LANGKAWI**



By

FONG MAY YIN

**A Project Report Submitted in Partial Fulfillment of the Requirements
for the Degree of Bachelor of Park and Recreation Science in the
Faculty of Forestry
Universiti Putra Malaysia**

2019

DEDICATION

I would like to dedicate my final year project to my family and friends. My mother, Yan Soo Guat and my brother, Fong Kit Fai who are always my main supporters.

I also dedicate this dissertation to my many friends and church members who are from Langkawi, as well as residents of Langkawi who have help me throughout the process.

Not to forget, this project is dedicated to all my lecturers and UPM staff for all their support, guidance and facilities.



ABSTRACT

Kilim Karst Geoforest Park Langkawi (KKGP) is one of the main tourism island, Langkawi's natural coastal protector as well as the perfect nursery for marine creatures. However, studies have found that the mangrove cover in KKGP Langkawi has degraded over the years. Conservation steps need to be taken and one of the ways is to increase the environmental concerns of the residents to encourage environmental responsibly behavior. The first objective of this study is to predict the relationship between environmental concerns, awareness of impact and willingness to take action in Langkawi residents. The second objective is to compare the environmental concerns, awareness of impact and willingness to take action between Malaysian and foreign Langkawi residents. Results shows that environmental concern was found to be relatable and have high correlation with awareness and willingness to take action. Moreover, results indicated that KKGP was well known among the residents and were visited by residents quite frequently. Therefore, both Malaysian and foreign residents were similarly concern and aware of the impact towards the degradation of mangrove. However, in terms of willingness to take action, Malaysian residents are more likely, compared to foreign residents due to global cultures and attitude differences. In general, all residents are environmentally concerned on the degradation of mangroves in KKGP Langkawi.

ABSTRAK

Kilim Karst Geoforest Park Langkawi (KKGPP) adalah salah satu pulau pelancongan utama, pelindung pantai semula jadi Langkawi serta nurseri penting untuk spesies marin. Walau bagaimanapun, kajian mendapati bahawa hutan bakau di KKGPP Langkawi semakin merosot. Langkah-langkah pemuliharaan perlu diambil dan salah satu cara adalah untuk meningkatkan keprihatinan terhadap alam sekitar penduduk untuk menggalakkan tingkahlaku yang bertanggungjawab terhadap alam sekitar. Objektif pertama kajian ini adalah untuk mengkaji hubungan antara keprihatinan terhadap alam sekitar, kesedaran kesan degradasi dan kesanggupan untuk mengambil tindakan penduduk Langkawi. Objektif kedua adalah untuk membandingkan keprihatinan terhadap alam sekitar, kesedaran kesan degradasi dan kesanggupan untuk mengambil tindakan di antara penduduk Langkawi yang berasal dari Malaysia dengan negara lain. Keputusan menunjukkan keprihatinan alam sekitar mempunyai korelasi yang tinggi dengan kesedaran kesan degradasi dan kesanggupan untuk mengambil tindakan. Selain itu, KKGPP terkenal di kalangan penduduk dan sering dikunjungi oleh penduduk. Dengan itu, penduduk yang berasal dari Malaysia dan luar negara menunjukkan keprihatinan dan menyedari kesan terhadap kemusnahan bakau. Walau bagaimanapun, dari segi kesanggupan untuk mengambil tindakan, penduduk Malaysia menunjukkan kerelaan yang lebih tinggi, berbanding dengan penduduk dari luar negara. Ini disebabkan budaya dan sikap yang berbeza antara penduduk asal and luar negara. Secara amnya, semua penduduk menunjukkan keprihatinan alam sekitar terhadap degradasi bakau hutan di KKGPP Langkawi.

ACKNOWLEDGEMENT

First and foremost, I would like to thank God Almighty for His blessing and guidance upon me by giving me the strength, knowledge, ability and opportunity to complete this research study.

Next, I have to thank my research supervisor, Associate Prof. Dr. Manohar a/l Mariapan, for his guidance, supervision and support. I would like to thank you for your support and understanding.

I would also like to thank all my family and friends, for your unconditional love and encouragement throughout the process. Not only that, I would like to thank my friend who share the same supervisor with me, Al-Kautsar Hidayanto Bin Abdul Rahim who always share his knowledge with me.

Lastly, I would like to show my gratitude to all Langkawi resident who helped me with the study and special thanks to Mr Aidi Abdullah, Miss Wendy Chin and Mr Muhammad Yasin Bin Jakfar for accepting my interview.

APPROVAL SHEETS

I certify that this research project report entitled '**Environmental Concerns of Malaysian and Foreign Residents of Langkawi Towards the Degradation of Mangroves in Kilim Karst Geoforest Park Langkawi**' by Fong May Yin has been examined and approved as a partial fulfillment of the requirements for the degree of Bachelor of Park And Recreation Science in the Faculty of Forestry, Universiti Putra Malaysia

Assoc. Prof. Dr. Manohar a/l Mariapan
Faculty of Forestry
Universiti Putra Malaysia
(Supervisor)

Prof. Dr. Mohamed Zakaria Bin Hussin
Dean
Faculty of Forestry
Universiti Putra Malaysia

Date: Jun, 2019

TABLE OF CONTENT

	Page
DEDICATION	ii
ABSTRACT	iii
ABSTRAK	iv
ACKNOWLEDGEMENTS	v
APPROVAL SHEETS	vi
LIST OF TABLES	ix
LIST OF FIGURES	xi
LIST OF ABBREVIATIONS	xii
CHAPTER	
1	INTRODUCTION
1.1	Background of Study 1
1.2	Background of Langkawi 1
1.3	Problem Statement 3
1.4	Objective 5
2	LITERATURE REVIEW
2.1	Mangrove forest 6
2.1.1	Natural habitat 7
2.1.2	Coastal Protection 7
2.1.3	Resources of Timber, Fuel and Medicine 8
2.1.4	Nurseries and Breeding Ground for Marine Species 9
2.2	Mangrove in Kilim Karst Geoforest Park (KKGP) 10
2.3	Environmental Concerns 11
3	METHODOLOGY
3.1	Location of Study 13
3.2	Source of Data 15
3.3	Sampling Technique 15
3.4	Sample Size 16
3.5	Questionnaire Design 18
3.6	Data Analysis 22
3.6.1	Section 1A 22
3.6.2	Section 2A and B 22
3.6.3	Section C 24
4	RESULTS AND DISCUSSION
4.1	Socio Demographic Background 25
4.1.1	Nationality 25
4.1.2	Gender 26
4.1.3	Age 26
4.1.4	Marital status 27
4.1.5	Ethnic 27
4.1.6	Occupation 28
4.1.7	Education level 28

4.2	Knowledge of Kilim Karst Geoforest Park (KKG P)	30
4.2.1	Knowledge of Langkawi Residents about Existents of KKG P	31
4.2.2	Knowledge of Langkawi Residents about KKG P as a Reserve Forest	31
4.2.3	Frequency of Visitation of Langkawi residents to KKG P	32
4.3	Awareness of Impact, Environmental Concern and Willingness to Take Action among Langkawi Residents towards Kilim Karst Geoforest Park (KKG P)	34
4.3.1	Environmental Concern of Langkawi Residents towards KKG P	34
4.3.2	Awareness of Impact of Langkawi Residents towards KKG P	35
4.3.3	Willingness to Take Action among Langkawi Residents towards KKG P	35
4.4	Reliability Statistics of Environmental Concern, Awareness of Impact and Willingness to Take Action among Langkawi Residents towards Kilim Karst Geoforest Park (KKG P)	36
4.5	Relationship between Environmental Concerns, Awareness of Impact And Willingness to Take Action among Langkawi Residents towards Kilim Karst Geoforest Park (KKG P)	38
4.6	Comparison of Environmental Concerns, Awareness of Impact and Willingness to Take Action between Malaysian and Foreign Langkawi Residents towards Kilim Karst Geoforest Park (KKG P)	39
5	CONCLUSION AND RECOMMENDATION	
5.1	Conclusion	42
5.2	Recommendation for Future Research	43
5.3	Implication and Recommendation	44
	REFERENCES	47
	APPENDICES	50
	Appendix A: Questionnaire Design	51
	Letter to apply for permission to conduct research at KKG P	56

LIST OF TABLES

Table		Page
3.1	Population of each district in Langkawi Island	14
4.1	Nationality of Langkawi resident respondents	25
4.2	Age of Langkawi resident respondents	26
4.3	Marital Status of Langkawi resident respondents	27
4.4	Ethnic of Langkawi resident respondents	27
4.5	Occupation of Langkawi resident respondents	28
4.6	Education level of Langkawi resident respondents	29
4.7	Nationality and age group of Langkawi resident respondents	29
4.8	Nationality and education level of Langkawi resident respondent	30
4.9	Knowledge of Langkawi residents about existents of Kilim Karst Geoforest Park	31
4.10	Knowledge of Langkawi residents about Kilim Karst Geoforest Park as a reserve forest	31
4.11	Frequency of visitation of Langkawi residents to Kilim Karst Geoforest Park	32
4.12	Knowledge of Langkawi residents about existence of Kilim Karst Geoforest Park (KKGP) and knowledge of KKGP as reserve forest	33
4.13	Knowledge of Langkawi residents about existence of Kilim Karst Geoforest Park and as a reserve according to nationality	33
4.14	Environmental concern of Langkawi residents towards Kilim Karst Geoforest Park	34
4.15	Awareness of impact of Langkawi residents towards Kilim Karst Geoforest Park	35
4.16	Willingness to take action among Langkawi residents towards Kilim Karst Geoforest Park	36
4.17	Cronbach's Alpha of environmental concern, awareness of impact and willingness to take action among Langkawi residents towards Kilim Karst Geoforest Park	37

4.18	ANOVA of linear regression model of environmental concerns, awareness of impact and willingness to take action among Langkawi residents towards Kilim Karst Geoforest Park	38
4.19	Comparison of environmental concerns, awareness of impact and willingness to take action between Malaysian and foreign Langkawi residents towards Kilim Karst Geoforest Park	40



LIST OF FIGURES

Figure		Page
1.1	The location plan of Kilim Karst Geoforest Park Langkawi	2
2.1	Schematic representation of the theory of planned behavior	12
3.1	Location of study (Kuah) in Langkawi	14
3.2	Example of section 1A questions to measure knowledge of Langkawi residents towards the mangrove in Kilim Karst Geoforest Park	18
3.3	Example of section 2A statements to measure awareness about the impact of Langkawi residents towards the degradation of mangrove in Kilim Karst Geoforest Park Langkawi	19
3.4	Example of section B statements to measure concern and willingness of Langkawi residents to take action for the degradation of mangrove in Kilim Karst Geoforest Park Langkawi	20
3.5	Example of section C questions for demographic of respondents	21

LIST OF ABBREVIATIONS

ABARE	Australian Bureau of Agricultural and Resource Economics
IUCN	International Union for Conservation of Nature
KKGP	Kilim Karst Geoforest Park
LADA	Langkawi Development Authority
PCA	Principal Component Analysis
PhD	Doctor of Philosophy
SPOT	Systeme Probatoire d'Observation de la Tarre
SPSS	Statistical Package for Social Science
STPM	Malaysia Higher School Certificate
UNESCO	United Nations Educational, Scientific and Cultural Organization
WWF	World Wide Fund for Nature

CHAPTER 1

INTRODUCTION

1.1 Background of Study

The conservation, protection and management of indigenous, ecological and sacred sites have received global attention because of the significant they hold for sustainable necessities, recreation and scientific research (Mensah, Bi, Nyamekye & Amisah, 2014). As the population of human increases, the significant of conservation has become critical. Biological researches on biodiversity, habitats and sustainability had been done to provide variable information for the recovery of the environments. Effects and solutions has been projected to save our environment. Despite these advances, technology alone cannot solve environmental problems because human behavioral also plays a huge role in conservation (Newhouse, 2010). This leads to the matter where the concerns of people towards the environment is also significant in the contribution of environmental conservation.

1.2 Background of Langkawi

Langkawi is an archipelago, made up 104 islands during the low tide and 99 during the high tide (LADA, 2019). It is part of the state of Kedah, located at the northern part of Peninsular Malaysia and shares the Andaman Sea with Thailand (Ahmad, Ayob & Majid, 2013). Out of 104 islands, there are only three

main islands that are inhabited, Langkawi (mainland), Dayang Bunting and Tuba Island. The mainland of Langkawi Island is an area of 47,848.36 hectares (478.4836km²) which have six subdivision of district that consist of Kuah, Ayer Hangat, Bohor, Kedawang, Padang Matsirat and Ulu Melaka (Langkawi District Council, 1991). According to the Department of Statistics Malaysia (2014), the population in Langkawi is approximately 92,893. The majority ethnic group are Malays followed by Chinese, Indians and many more. Langkawi had been certified as a Geopark by UNESCO on the 1st June 2007. The Langkawi Geopark consist of its three main conservation areas which are, Kilim Karst Geoforest Park, Dayang Bunting Marble Geoforest Park and Machincang Cambrian Geoforest Park (LADA, 2019). These park made Langkawi a popular tourist destination in Malaysia. The location plan of Kilim Karst Geoforest Park Langkawi is shown in Figure 1.

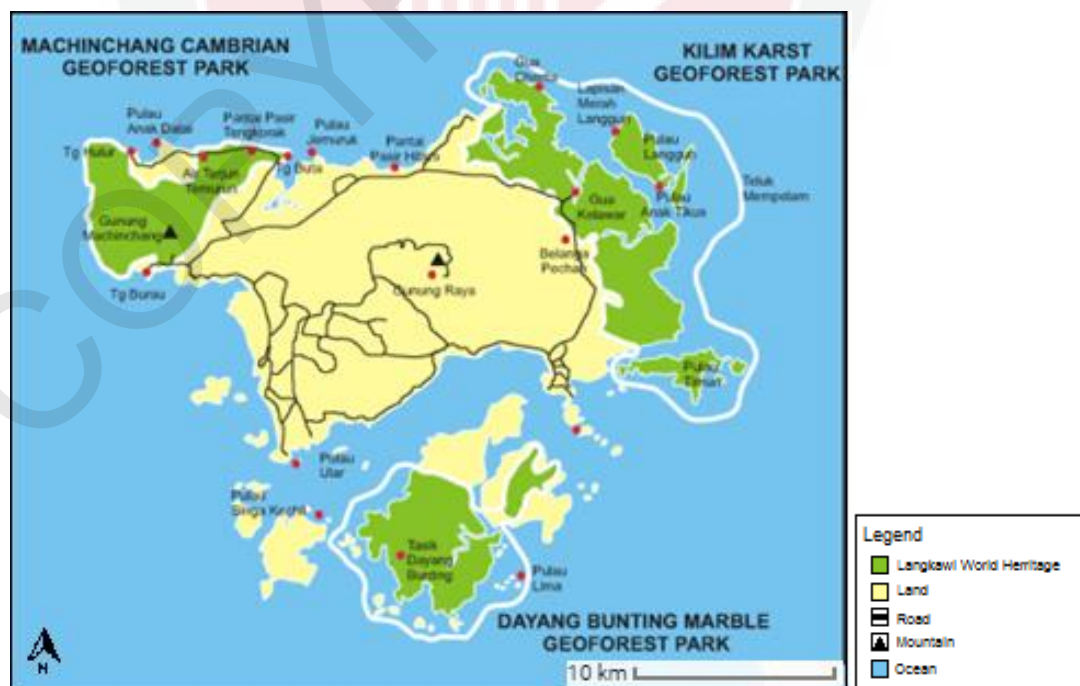


Figure 1.1: The location plan of Kilim Karst Geoforest Park Langkawi

Source: LADA, 2019

1.3 Problem Statement

Kilim Karst Geoforest Park Langkawi is one of the main tourism island, Langkawi's natural coastal protector as well as the perfect nursery for marine creatures. However, studies have found that the mangrove cover in Kilim Karst Geoforest Park Langkawi has degraded over the years (Shahbudin, Zuhairi & Kamaruzzaman, 2011) and this may led to the insufficient of seafood source to the people in Langkawi, extinction of mangrove species, eventually affecting the biodiversity and economy of Malaysia.

According to the study of World Wide Fund for Nature (2018), commercial fish stocks, including tuna, mackerel and bonito, has decreased by almost 75%. Reuters (2015) also found the ocean fish population has decreased half since 1970 and one of the main threat is the damage of the corals and mangroves. This is because when the mangroves degrade, the species could not survive due to the loss of habitat and nurseries. Polidoro et al. (2010) stated that at least 40% of the animal species which are restricted to mangrove habitat that has previously been assessed under IUCN Categories and Criteria are at elevated risk of extinction due to extensive habitat loss because of the loss of mangrove area. At the same time, mangrove act as a breeding ground and it replenish some of the ocean's fish stock (Blum & Herr, 2017). Therefore, the area of breeding ground are lesser when mangrove degrade, thus lesser young and this causes the decrease in population of marine species which lead to insufficient of seafood source. From this, it shows that the mangrove in

Kilim may be in high risk of losing its marine species and decrease in seafood source.

Loss of mangrove cover in Langkawi is getting crucial and it is affecting the ocean marine species population. The decreasing of marine species with the current demand will increase the market price of seafood and slowly people might not be able to afford any seafood such as fish or prawns as their daily source of protein. According to Godfrey (2013), an economist at the Australian Bureau of Agricultural and Resource Economics (ABARE) found that because of the lack of new supply of fish products, the price of fish will increase by 48%, far ahead of any other food category, including meat, up to 14% by 2050 and cereals, 13%. Not only that, when marine population decreases, lack of catch will also affect the incomes of fisherman, the fishery industry and eventually the country and world economy. Therefore, conserving the mangrove is essential and increasing environmental concern and participations of the residents are one of the basic ways. In essence, this study helps to find out what contributes to the environmental concern about the loss mangrove in Kilim Karst Geoforest Park Langkawi.

According to Dunlap, Gallup Jr., and Gallup (1993), the environmental concern of residents within 24 nations are obvious. However, some studies find global cultures boundaries in environmental concerns (Hunter, 2000). For an example, Szagun and Pavlov (1995) findings states that German adolescents

are angrier about environmental problems as compared to Russian adolescents. Therefore, the interest of this study to find the environmental concern of Malaysian and foreign Langkawi resident may or may not differ due to differences in global cultures. Information gathered may help the authority, Langkawi Development Authority (LADA) and other organization into planning better strategy for involving the residents into saving the of mangrove cover in Kilim Karst Geoforest Park Langkawi.

1.4 Objective

- a) To predict the relationship between environmental concerns, awareness of impact and willingness to take action among Langkawi residents.
- b) To compare the environmental concerns, awareness of impact and willingness to take action between Malaysian and foreign Langkawi residents.

REFERENCES

- Abeyasinghe, P.D. (2010). Antibacterial activity of some medicinal mangroves against antibiotic resistant pathogenic bacteria. *Indian Journal of Pharmaceutical Sciences*, 72(2): 167.
- Ahmad, A., Ayob, N.M., & Majid, A.A. (2013). *Regional Carrying Capacity (RCC) Issues Langkawi Islands, Kedah*. In Proceeding of International Conference on Tourism Development, Building the Future of Tourism, 58-72.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2): 179-211.
- Australian Institute of Marine Science. (2019). *Mangroves uses*. Retrieved November 23, 2018 from <https://www.aims.gov.au/docs/projectnet/mangroves-uses.html>
- Behzad, R., Jaynhaye, R.G., & Saptarshi, P.G. (2014). The role of local people in environmental conservation of the Shir-Ahmad wildlife refuge. Sabzevar-Iran. *International Journal of Environmental Sciences*, 4(5): 968-971.
- Blum, J., & Herr, D. (2017). *Mangroves: nurseries for the world's seafood supply*. Retrieved October 29, 2018 from <https://www.iucn.org/news/forests/201708/mangroves-nurseries-world%E2%80%99s-seafood-supply>
- Chong, V.C., Ng, Y.P., Hairi, B.J., Ooi, A.L., Chew, L.L., Amirah, M., & Affendi, B.N. (2005). Update of the Fishes of Mangrove and Coastal Waters of Northeastern Langkawi. *Malaysian Journal of Science*, 24: 167-184.
- Crossman, A. (2018). *Understanding Purposive Sampling: An Overview of the Method and Its Applications*. Retrieve November 12, 2018 from <https://www.thoughtco.com/purposive-sampling-3026727>
- Department of Statistics Malaysia. (2014). *Preliminary Count Report 2010*. Retrieved November 23, 2018 from https://www.dosm.gov.my/v1/index.php?r=column/cthemedByCat&cat=117&bul_id=cUxSKzBHRktuRGJqajFQK2RiRHpKUT09&menu_id=L0pheU43NWJwRWVVSZkiWdzQ4TihUUT09
- Dunlap, R.E., Gallup Jr, G.H., & Gallup, A.M. (1993). International public opinion toward the environment. *Impact Assessment*, 11(2): 113-143.
- EcoLogic Development Fund. (2016). *What Is a Mangrove?*. Retrieved November 23, 2018 from <http://www.ecologic.org/actions-issues/about-the-region/what-is-a-mangrove/>
- Fransson, N., & Garling, T. (1999). Environmental concern: Conceptual definitions, measurement methods, and research findings. *Journal of Environmental Psychology*, 19(4): 369-382.

Gafoor, K.A. (2012). *Considerations in the Measurement of Awareness*. Retrieved October 31, 2018 from <https://files.eric.ed.gov/fulltext/ED545374.pdf>

Godfrey, M. (2013). *Seafood prices to rise 70 percent by 2050*. Retrieved October 30, 2018 from <https://www.seafoodsource.com/news/supply-trade/seafood-prices-to-rise-70-percent-by-2050>

Hays, J. (2012). *Mangroves and the plants and animals that live there*. Retrieved October 31, 2018 from <http://factsanddetails.com/world/cat53/sub335/item2182.html>

Hunter, L.M. (2000). A comparison of the environmental attitudes, concern, and behaviors of native-born and foreign-born US residents. *Population and Environment*, 21(6): 565-580.

Langkawi Development Authority. (2019) *Langkawi UNESCO Global Geopark*. Retrieved January 2, 2019 from <https://www.lada.gov.my/mengenai-kami/produk/langkawi-unesco-global-geopark>

Langkawi Development Authority. (2019). *UNESCO Endorsed Geoforest Park*. Retrieved January 11, 2019 from <https://naturallylangkawi.my/about-langkawi/>

Langkawi District Council Malaysia. (1991). *Keluasan Daerah Langkawi 1990*. Retrieved on 31 October 2018

Matthew, N.K., Ahmad, S., Sridar, R., & Herman, M.A. (2013). Demand model of international visitors to the Kilim Karst Geoforest Park, Langkawi: application of ITCM model. *Journal of Applied Economics and Business*, 1(4): 51-66.

Mensah, P., Bi, A., Nyamekye, S., & Amisah, S. (2014). Environmental Conservation and Preservation of Cultural Heritage. *Worldviews: Global Religions, Culture, and Ecology*, 18(1): 30-53.

Nabila, G.F., Faridah-Hanum, I., Kudus, K.A., & Nazre, M. (2011). Assessment of Floristic Composition of Kilim Geoforest Park, Langkawi, Malaysia. *Journal of Agricultural Science*, 4(3): 23.

Nagelkerken, I.S.J.M., Blaber, S.J.M., Bouillon, S., Green, P., Haywood, M., Kirton, L.G., Meynecke, J.O., Pawlik, J., Penrose, H.M., Sasekumar, A., & Somerfield, P.J (2008). The habitat function of mangroves for terrestrial and marine fauna: a review. *Aquatic Botany*, 89(2): 155-185.

Newhouse, N. (2010). Implications of attitude and behavior research for environmental conservation. *The Journal of Environmental Education*, 22(1): 26-32.

Polidoro, B.A., Carpenter, K.E., Collins, L., Duke, N.C., Ellison, A.M., Ellison, J.C., Farnsworth, E.J., Fernando, E.S., Kathiresan, K., Koedam, N.E., Miyagi, T., Moore, G.E., Nam, V.N., Ong, J.E., Primavera, J.H., Salmo, S.G., Sanciangco, J.C., Sukardjo, S., Wang, Y., Yong, J.W.H., & Livingstone, S.R. (2010). The loss of species: mangrove extinction risk and geographic areas of global concern. *PLoS one*, 5(4).

Reuters. (2015). *Ocean fish numbers on "brink of collapse"*. New Straits Times. Retrieved from <https://www.nst.com.my/news/2015/09/ocean-fish-numbers-brink-collapse-wwf>

Ritchie, E.J. (2017). *Good Intentions: Why Environmental Awareness Doesn't Lead to Green Behavior*. Retrieved November 5, 2018 from <https://www.forbes.com/sites/uhenergy/2017/06/30/good-intentions-why-environmental-awareness-doesnt-lead-to-green-behavior/#1a10ffa357d9>

Shahbudin, S., Zuhairi, A., & Kamaruzzaman, B.Y. (2011). Impact of coastal development on mangrove cover in Kilim river, Langkawi Island, Malaysia. *Journal of Forestry Research*, 23(2): 185-190.

Stanford Children's Health. (2019). Cognitive Development. Retrieved January 13, 2019 from <https://www.stanfordchildrens.org/en/topic/default?id=cognitive-development-90-P01594>

Szgun, G., & Pavlov, V.I. (1995). Environmental concern: A comparative study of German and Russian adolescents. *Youth & Society* 27: 93-112.

Trochim, M.K. (2006). *Descriptive Statistics*. Retrieved November 23, 2018 from <https://www.socialresearchmethods.net/kb/statdesc.htm>

Tusinski, A., & Verhagen, H.J. (2014). The use of mangroves in coastal protection. *Coastal Engineering Proceedings*, 1(34): 45.

UTMSPACE. (2018). About Langkawi and Visa. Retrieved October 29, 2018 from <https://seminar.utmspace.edu.my/icwr2018/visa.html>

Wolf, B. (2012). *Ecosystem of the mangroves*. Wisconsin: University of Wisconsin-Stevens Point.

World Wide Fund for Nature. (2018). *Mangrove Importance*. Retrieved November 2, 2018 from http://wwf.panda.org/our_work/oceans/coasts/mangroves/mangrove_importance/

Yamane, T. (1967). *Statistics: An Introductory Analysis* (2nd ed.). New York: Harper and Row.

Zakaria, M., & Rajpar, M.N. (2015). Assessing the fauna diversity of Marudu Bay mangrove forest, Sabah, Malaysia, for future conservation. *Diversity*, 7(2): 137-148.