COMPARATIVE STUDY OF CARBON STOCKS BETWEEN PROTECTED AND UNPROTECTED MANGROVE AREA AT INANAM-LIKAS RIVER BASIN, KOTA KINABALU, SABAH.

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TABLE OF CONTENTS

		Page
ACKNOWLEDGEMENTS		iii
TABLE OF CONTENTS		iv
LIST OF TABLES		vi
LIST OF FIGURES		vii
LIST OF ABBREVIATIONS		viii
ABSTRACT		ix
ABSTRAK		x
CHAPTER 1 INTRODUCTION		
1.1	Study Background	1
1.2	Problem Statement	2
1.3	Significance of study	4
	1.3.1 Academician	4
	1.3.2 Society	4
	1.3.3 Management	4
1.4	Objectives of Study	5
CHAPTER 2 LITERATURE REVIEW		
2.1	Description of Protected and Unprotected Mangrove Area	6
2.2	Mangroves Ecosystem Benefits and its Impact of Destruction	8
2.3	Carbon cycle and Carbon Production of Mangrove	9
2.4	Role of Mangrove Ecosystem towards trapping Carbon Dioxide	10
2.5	Carbon Sequestration and Storage in Risilence to Mangrove	11
2.6	Mangrove Aboveground and Belowground Biomass and Carbon Pools	12
2.7	Mechanism Facilitating Carbon Accumulation	13
2.8	Kyoto Protocol Regarding Carbon in Forest	14
CHAPTER 3 METHODOLOGY		
3.1	Materials	15
	3.1.1 Raw materials	15
	3.1.2 Chemicals	15
	3.1.3 Apparatus	15
3.2	Methods	16
	3.2.1 Station Plot Setup	16
	3.2.2 Sampling and Data Collections	19
	3.2.3 Preservation and Homogenization	19
	3.2.4 Soil Samples Analysis	22
3.3	Data Analysis	23
	3.3.1 Carbon pools of aboveground biomass	23
	3.3.2 Carbon pools of belowground biomass	24
	3.3.3 Total ecosystem carbon stocks	24

FLOW CHART STUDY 25

CHAPTER 4 RESULTS AND DISCUSSION

4.1 Aboveground and belowground carbon pools of protected area and unprotected areas 26

4.3 Biomass and carbon stocks comparison of both protected areas and unprotected areas 32

4.4 Ecosystem carbon stocks comparison of protected areas and unprotected areas with other study 35

4.5 Correlation between DBH and carbon stocks, and between soil depth and soil carbon stocks 37

4.7 Significant different between both protected areas and unprotected areas and carbon stocks 41

CHAPTER 5 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion 43

5.2 Recommendations 44

CITED REFERENCES 46

APPENDICES 50

CURRICULUM VITAE 59

ABSTRACT

COMPARATIVE STUDY OF CARBON STOCKS BETWEEN PROTECTED AND UNPROTECTED MANGROVE AREA AT INANAM-LIKAS RIVER BASIN, KOTA KINABALU, SABAH

Mangroves ecosystem plays important role in trapping carbon dioxide in the form of biomass as if it is not stored and released into the air, it may cause greenhouse gases effect that may lead to global warming, this is cause by anthropogenic activities, pollution, land use and land – cover. This study is significant for future researcher in same field to monitor carbon stocks of these study areas, awareness campaign to community on the importance of protecting mangroves for environment and to management in aiding them to implement rules and regulation in protecting mangroves ecosystems. This study was conducted at Inanam-Likas River Basin, specifically pointed at two different places and environment comprises protected areas at KK Wetlands and unprotected areas at Kg. Bangka – Bangka which aimed at comparing carbon stocks of protected and unprotected mangrove ecosystems. Carbon stocks pools that are compared between the study sites comprise aboveground carbon stocks including live tree, while belowground carbon stocks including roots and soils. The result of this study shows that there is ecosystem carbon stocks difference between protected and unprotected mangroves with statistical analysis value which is KW $\chi 2$: 0.275, $p < 0.05$. As the χ^2 value below $p< 0.05$ indicating carbon stocks value obtained showed protected areas have higher ecosystem carbon stocks value compared to unprotected area with 546.8 Mg C ha^{-1} and 439.4 Mg C ha^{-1} respectively. The difference in ecosystem carbon stocks value indicates protected areas is well managed and conserved as there is rules and regulation implemented to protect mangrove ecosystem compared to unprotected areas, where the community there use the mangrove vigorously without noticing the effect to the community and environment especially in the future.

CHAPTER 1

INTRODUCTION

1.1 Background of Study

Mangroves in Malaysia cover an area of approximately 586 036 hectares in which more than half is found in Sabah (FRIM, 2009). While Sabah comprises about 341 024 ha of mangrove forests which are 92.7% of them are forest reserve and the other 7.3% outside the reserve (Latiff and Faridah Hanum, 2014). Mangrove ecosystem is important habitat nursery habitat for fish and crustacean, it also important for sediment trapping, nutrient recycling and protection of shorelines from erosion (Debajit *et al.,* 2010).

Stringer *et al.* (2015) states mangrove containing carbon pools particularly in soils and stored more carbon per area three times more compared to typical upland tropical forests. Mangroves' ability to trap and store atmospheric carbon for extended periods show it is valuable ecosystem to for inclusion in climate change adaptation and mitigation strategies (Bhomia *et al.,* 2016).