

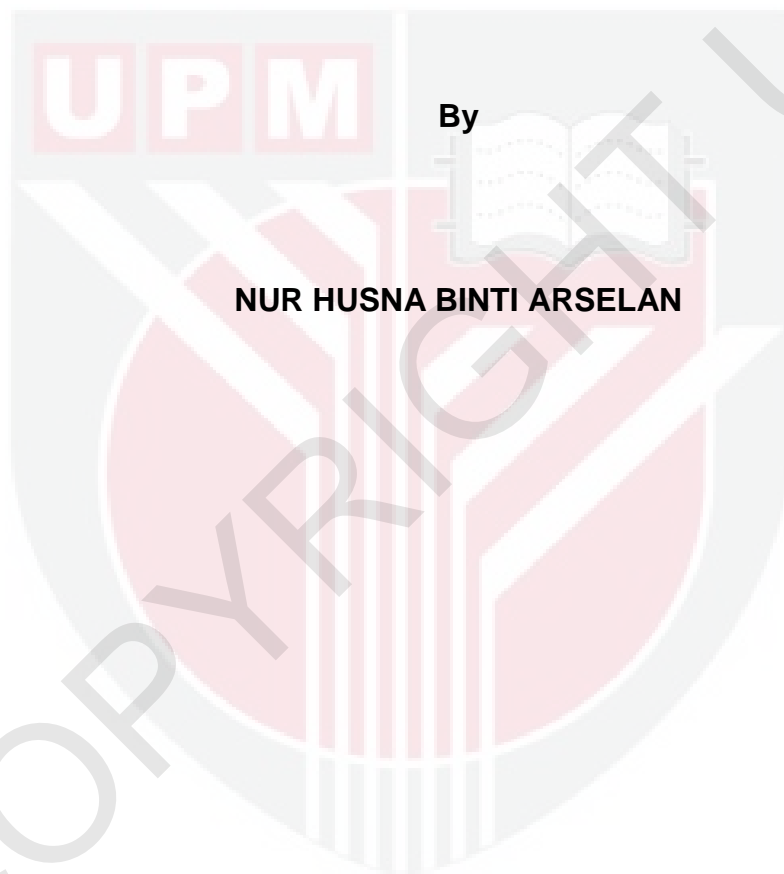


***ASSESSMENT OF SELECTED MANGROVE SEDIMENT PROPERTIES AT
KAMPUNG KUANTAN***

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FH 2019 24

**ASSESSMENT OF SELECTED MANGROVE SEDIMENT PROPERTIES AT
KAMPUNG KUANTAN**



**A Project Report Submitted in Partial Fulfillment of the Requirements
for the Degree of Bachelor of Forestry Science in the**

Faculty of Forestry

Universiti Putra Malaysia

2019

DEDICATION

This humble work is dedicated to

My beloved family,

Arselan, Zuhriah, Asma', Hanis, Ihsan, Ilham, Zeehan

My supervisor,

Assoc. Prof. Dr. Seca Gandaseca

My soul sisters,

Who stayed in H 205, 2017/2018

My dearest friends,

Always be with me through ups and downs

Thank you for everything. May Allah Bless All of us.

ABSTRACT

Mangrove is a unique ecosystem that dominates the line of coast of subtropical and tropical coastlines around the world. It is always referred as carbon sinks as it has capable of storing carbon from the atmosphere and has higher carbon content compared to other forest types. Besides, it also provides habitat for many animals. However, without realizing the importance of this ecosystem, this area had been largely cleared for fisheries, agriculture and development, where it caused this ecosystem to be threatened. Limited amount of data on mangrove ecosystem, especially belowground, has made people unrealised about the potential of the mangroves as carbon storage. Therefore, this study was conducted to provide information and compare the selected mangrove properties at Kampung Kuantan between different plots at two different depths. Data obtained were analysed using the Statistical Analysis System (SAS) version 9.4. Based on the results, the pH in the plot can be classified as moderately acidic. The type of sediment was sandy clay. The results showed there was a significant difference of the total organic carbon between Plot 1 and 5. The total organic carbon was higher at depth 15-30 cm. As a conclusion, sediment properties are important because they may influence the productivity of the mangrove ecosystem. Lastly, as a recommendation, this area of study should be conserved from any activities that would affect the sediment properties.

ABSTRAK

Paya Bakau adalah sebuah ekosistem unik, yang menguasai persisiran pantai subtropika dan tropika di seluruh dunia. Ia sentiasa dirujuk sebagai tempat penyimpanan karbon kerana ia mampu menyimpan karbon dari atmosfera dan mempunyai kandungan karbon yang lebih tinggi berbanding dengan jenis hutan yang lain. Selain itu, ia juga menyediakan habitat untuk banyak haiwan. Walau bagaimanapun, tanpa sempat menyedari betapa pentingnya ekosistem ini, kawasan ini telah dibersihkan secara besar-besaran untuk perikanan, pertanian dan pembangunan, di mana menyebabkan ekosistem ini terancam. Jumlah data yang sedikit tentang ekosistem paya bakau, terutamanya di bawah tanah, telah menjadikan orang ramai tidak dapat melihat potensi bakau sebagai simpanan karbon. Oleh itu, kajian ini dijalankan untuk memberi maklumat dan membandingkan sifat tanah bakau terpilih di Kampung Kuantan di antara plot berlainan pada dua kedalaman yang berbeza. Data diperolehi dianalisis dengan menggunakan Sistem Analisis Statistik (SAS) versi 9.4. Berdasarkan hasilnya, pH dalam plot boleh dikelaskan sebagai sederhana berasid. Jenis sedimen adalah tanah liat berpasir. Keputusan menunjukkan terdapat perbezaan yang signifikan dari jumlah karbon organik antara plot 1 dan 5. Jumlah karbon organik lebih tinggi pada kedalaman 15-30 cm. Sebagai kesimpulan, sifat sedimen adalah penting kerana ia boleh mempengaruhi produktiviti ekosistem bakau. Akhir sekali, sebagai cadangan, bidang pengajian ini harus dipelihara daripada sebarang aktiviti yang akan mempengaruhi sifat-sifat sedimen.

ACKNOWLEDGEMENTS

Prime facie, I am grateful to the God for the good health and wellbeing that were necessary to complete this book. I owe my deepest gratitude to my supervisor, Assoc. Prof. Dr. Seca Gandaseca. His insight and mentorship were paramount to the success of my project.

Every result described in this book was accomplished with the help and support of fellow friends. My sincere thanks also goes to the student master in faculty of forestry, Lurna Nyangon, Albert Empawi and PhD student, Ahmad Mustapha bin Mohd Pazi for rendering assistance in the collection of sample and during my laboratory work.

Finally, I must express my very profound gratitude to my parents and family for providing me with unfailing support and continuous encouragement throughout my years of study and through the process of researching and writing this thesis. This accomplishment would not have been possible without them.

Thank you.

APPROVAL SHEET

I certify that this research project report entitled “Assessment of Selected Mangrove Sediment Properties at Kampung Kuantan” by Nur Husna Binti Arselan has been examined and approved as a partial fulfillment of the requirements for the Degree of Bachelor of Forestry Science in the Faculty of Forestry, Universiti Putra Malaysia.

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LIST OF ABBREVIATIONS

CO₂ - Carbon Dioxide

GPS - Global Positioning System

TOC -Total Organic Carbon

OM - Organic Matter

SAS - Statistical Analysis System

MC – Moisture Content



CHAPTER 1

INTRODUCTION

1.1 Background

Mangrove forests are one of the world's most threatened tropical ecosystems but it still dominates the coastal intertidal zone of tropical and subtropical regions of the world. Mangrove forests have a unique ecosystem and the only woody halophytes that live in saline, tidal areas (Alongi, 2012).

Donato *et al.*, (2011) found that mangroves are so efficient at storing carbon dioxide out of the atmosphere. However when they are destroyed, they release as much as 10 percent of all emissions worldwide attributable to deforestation. It also can effectively store both the aerial and underground biomass and hence mangrove soils register relatively high concentrations of carbon. Baretto *et al.*, (2016) agreed that environmental conditions, mainly weather, hydroperiod and composition of the parent material influence the alteration processes of carbon and the organic matter in mangrove soils. The debris from the dead plant and animals contribute to the quality and quantity of organic material incorporated into the soil. The tides and river cause the organic carbon to enter the mangrove ecosystem. Organic matter that is not transported by the tide and remains within the system is incorporated into the soil by means of other organisms, biological degradation, or chemical modification. (Kristensen *et al.*, 2008).

Fertility and healthiness of mangrove environment is reflected by the physical and chemical properties of the soil. The rate of carbon production and respiration are different depend on the mangroves size and age. Carbon is accumulated in mangroves by direct inputs of mangrove carbon to the soil pool and by increasing rates of mass sediment accumulation. Carbon produced by mangroves does have other flow pathways, such as consumption by living organisms, especially microbes. Carbon consumed is remineralized and either emitted back to the atmosphere as CO₂ or exported by dissolved inorganic carbon.

1.2 Problem Statement

Mangrove forest plays an important role to sustain the ecosystem, ecology, provide societal goods and services to local communities. It can be beneficially used as buffer zone to protect shoreline, nutrient cycling, and carbon sequestration. Mangrove wood is resistant to rot and insects, making it extremely valuable. Many coastal and indigenous communities rely on this wood for construction material as well as for fuel.

However, due to some of human activities to coastal development, expansion of pond construction and logging excess has led to declination of forest cover. Moreover, the issues of global warming always related to the declination of forest cover. There are few published data and study on the potential of mangrove forests as belowground carbon storage in Kuala Selangor.

Forest performance is highly related to the soil properties, and it is necessary to find out the characteristics of soil in a mangrove ecosystem in order to understand how these selected soil chemical properties affect the mangrove's soil carbon sequestration. Therefore, this study aims at providing an overview of sediment properties at different depths at Kuala Selangor Mangrove Forest. Thus, hopefully the information from this study will be useful to the parties concerned in provide proper management plans for the mangrove forest

1.3 Objectives

The objectives of this study were:

1. To provide information about selected mangrove properties at Kampung Kuantan.
2. To compare selected sediment properties between different plots and depths.

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