

INFLUENCE OF CAGE CULTURE ON WAVE ATTENUATION AT
THE FRONT MANGROVES

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**INFLUENCE OF CAGE CULTURE ON WAVE ATTENUATION AT THE FRONT
MANGROVES**

By

Mohd Zulfadli bin Jalalludin

**Research Report submitted in partial fulfillment of
The requirements for the degree of
Bachelor of Science (Marine Science)**

**Department of Marine Science
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UNIVERSITI MALAYSIA TERENGGANU
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**DEPARTMENT OF MARINE SCIENCE
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**DECLARATION AND VERIFICATION REPORT
RESEARCH PROJECT I AND II**

It is hereby declared and verified that this research report entitled:

Influence of Cage Culture on Wave Attenuation at the Front Mangroves by **MOHD ZULFADLI BIN JALALLUDIN** Matric No **UK 14647** have been examined and all errors identified have been corrected. This report is submitted to the Department of Marine Science as partial fulfillment towards obtaining the Degree of Bachelor of Science (Marine Science), Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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LIST OF ABBREVIATIONS

SYMBOL	DEFINITION
H_{in}	wave height in front of cage culture
H_{out}	wave height after passing the cage culture
ρ	specific density of water
g	gravity acceleration
H	wave height

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ABSTRACT

Mangroves are trees and shrubs that grow in saline coastal habitats in the tropics and subtropics, mainly between latitudes 25° N and 25° S. The saline conditions tolerated by various species range from brackish water, through pure seawater (30 to 40 ppt), to water of over twice the salinity of ocean seawater, where the salt has become concentrated by evaporation. Mangrove also help to protect coastlines against erosive wave action and strong coastal winds, retain concentrate and recycle nutrients and remove toxicants, provide resources for coastal communities, and important breeding ground for many fishes, crabs, prawns and other marine animals, essential for sustaining a viable fishing industry. Cage culture is one of the shore morphology that available at mangroves. Cage culture is an aquaculture production system where fish are held in floating net pens. Cages are widely used in commercial aquaculture overseas and individual cage units come in all shapes and sizes and can be tailored to suit individual farmer's needs. The study to know their influence to the wave that goes to the mangrove is important in order to identify the factors that threaten this habitat. From the result, cage culture is not reduce the wave that passed through it but increase the wave height and wave energy and affected the mangrove behind them. It is because the floating cage is giving a reflectant and makes the wave bigger and stronger. Cage culture make a new wave when they are going upward and downward when wave passed through them and make the passed wave higher in height and energy. More study and research are needed in order to solve this problem. Cage culture is giving much benefit in economy sector but in the same time the precious habitat is in danger.

ABSTRAK

Paya bakau ialah tumbuhan yang hidup di kawasan air payau dan masin yang terdapat di kawasan tropik dan subtropik pada latitud di antara 25° N dan 25° S. Keadaan kawasan air masin ini boleh di terima oleh pelbagai spesis daripada tahap air payau hingga air laut yang asli (30-40 ppt). Paya bakau membantu melindungi garis pantai daripada ombak yang menyebabkan hakisan dan angin pantai yang kuat, menyimpan dan mengitar semula nutrisi dan menghapuskan toksik, merupakan sumber ekonomi kepada masyarakat sekitarnya dan merupakan kawasan untuk pembiakan ikan, ketam, udang dan haiwan laut lain. Sangkar ikan adalah salah satu morfologi pantai yang terdapat di habitat paya bakau. Kaedah yang di gunakan dalam proses ini ialah penternakan ikan di dalam sangkar yang di letakkan jaring yang terapung agar ikan tidak terlepas. Kaedah ini banyak di gunakan dalam industri perikanan komersial dan unit sangkar serta saiz di tentukan mengikut kemampuan pengusaha. Kajian untuk mengetahui pengaruh ombak yang melalui sangkar adalah penting untuk mengenalpasti factor-faktor yang mengancam habitat ini. Daripada data yang telah di analisis, sangkar ikan tidak mengurangkan ombak yang melaluinya malahan menambah lagi ketinggian dan tenaga ombak tersebut serta akan memberi kesan kepada paya bakau di belakang sangkar tersebut. Ini kerana sangkar ikan yang terapung ini akan memberi kesan refleksi terhadap ombak tersebut sehingga menyebabkan ombak tersebut semakin besar dan kuat. Ombak baru akan tercipta apabila sangkar ikan bergerak mengikut alunan ombak yang melaluinya dan menyebabkan ketinggian dan tenaga ombak itu semakin besar. Sangkar ikan memberikan banyak manfaat dari segi ekonomi tetapi pada masa yang sama mengancam habitat yang berharga ini.