



Marine BioValley

Universiti Malaysia Sabah

Saleem Mustafa

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Marine BioValley
Universiti Malaysia Sabah



PERPUSTAKAAN UMS



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FOREWORD

Malaysia is endowed with abundant marine resources along its vast coastline. With the implementation of the Exclusive Economic Zone our marine area has exceeded the land area. Malaysia is certainly well positioned to benefit from initiatives aimed at making wise use of this impressive marine heritage through a knowledge-based approach and using technology that is consistent with the principle of ecologically sustainable development.

This document clearly defines the concept of UMS Marine BioValley, identifies its three important components: 1) Education, research and development, 2) Marine ecotourism and 3) Public awareness. Besides, it lays down a blueprint for commercialization of research and harnessing socio-economic benefits from ecologically sustainable activities.

The author has discussed the importance of academia-industry partnership in achieving the aims of UMS Marine BioValley and made a sincere effort for promoting marine biodiversity conservation using public awareness tools.

I highly value the new concept, innovative ideas and action plans contained in this book and hope that it will soon be able to see the light of the day.

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The Marine World – What is at Stake?

The sea is one of our planet's most valuable natural resources. It provides food (fish and shellfish), medicinal ingredients, minerals, salt, sand, gravel and oil. It is used for transportation and recreation. It regulates world's climate and helps in removing carbon dioxide from the atmosphere while generating oxygen.

Although the sea covers two-thirds (71%) of the surface of Earth, it is vulnerable to human actions such as overfishing and pollution. A better understanding of the sea by revolutionary developments in science and technology in recent decades makes it abundantly clear that old notions about the oceans so vast that any amount of pollutants dumped into them will be diluted and that their fishery resources are limitless and no amount of fishing pressure can deplete them were utterly wrong. In fact, fishery resources are dwindling (more than 70% of the world's commercially targeted fish species have been overfished to unsustainable levels), pollutants are everywhere, fuel reserves are fast depleting and ability of oceans to provide many other services severely undermined. These are time-sensitive issues that need urgent attention. A wise decision on applying ways and means of arresting or reversing the trend of degradation requires knowledge of the marine ecosystem.

Life exists throughout the sea. It houses the single largest (>90%) repository of organisms on the planet. Members from virtually all phyla are found in the sea. This tremendous diversity of life is critical to human existence. The ocean life supports all life forms on earth. Life in the sea is interdependent. Marine species are the links that constitute the complex web of life. The more biologically diverse the ocean is the better the chances of survival for all species of this marine web. Unfortunately, marine biodiversity is reducing, and the rate at which this is happening has alarmed the scientists.

A lot of efforts are being made to explain the benefits of marine biodiversity and the consequences of its decline. The human beings will seriously suffer from shortages of food and many other products if species number and abundance continue to decline at the present rate. Human beings are responsible for threatening the species with extinction. Our marine conservation efforts are heavily outnumbered by the impacts on the sea. Something serious should be done to save the marine fauna and flora. Our actions should be based on scientific facts and this requires that we must study the marine ecosystem to understand and preserve the world we live in.

Seafood is the protein-rich product of marine biodiversity. We cannot get the much sought-after groupers, shrimps, lobsters and other animals without protecting the environment where they live, feed, breed and grow, and the connections that they have with other species.

Many plants and animals of our oceans produce chemical complexes which they require for their defense, but these turn out to be of medicinal value to humans. Researchers have shown that the marine bioactive compounds are effective against pathogens and diseases such as tumors and cancers. They are also useful as ingredients of cosmetic formulations. With marine biodiversity decreasing significantly, we cannot hope to have sustained supplies of such organisms from the sea.

Marine biodiversity also generates income from tourism when people from around the world come to Malaysia, especially Sabah, to see the rich life beneath the waves. Not far from Sabah is Sipadan island, the world renowned marine biodiversity hotspot of Malaysia. There are marine animals which are resident while others are transient. We have to keep our ecosystem in good condition for resident populations to continue to persist and thrive, and the transient ones to freely move across our country's marine territory.

Growth of human population and interest in seafood have multiplied pressure on marine living resources. The overharvesting leaves behind a population which is too small to replenish the loss by reproduction and recruitment. Mechanized fishing operations such as those conducted using large trawlers equipped with efficient catching devices have particularly more damaging effect on marine populations. Destructive fishing methods such as poisoning and bombing produce devastating results. They kill the target animals and inflict a collateral damage that indiscriminately destroys the organisms and damages the habitat at the affected spot.

Marine habitats are degraded or destroyed by coastal developments and pollution. Mangroves and seagrasses provide feeding, breeding and nursery grounds to many economically important food fish and shellfish. Their loss disrupts all these life processes and consequently, the catch of species using the habitat declines. Pollutants have direct as well as indirect affect on marine life.

All the oceans of the world are connected to form a vast expanse of saltwater that is essentially one incredibly powerful entity which we call as

- The Sea. The result of species depletion or deletion and pollution are not restricted to a particular area but produce widespread effects. International efforts are therefore required to save the sea – the last frontier for exploitation on our watery planet.

Malaysia is one of those countries that have signed the landmark Convention on Biological Diversity, an international commitment to preserving the biological diversity. It is binding on all of us to protect biodiversity. This involves protecting fish stocks from reckless fishing, controlling pollution, rehabilitating degraded habitats, and conserving wild genotypes by regulating alien species and genetically modified organisms so they do not pose threat to natural populations.

Public education is vitally important in protecting our marine world from abuse. We are in an enviable position as far as marine heritage is concerned. Nature has bestowed on us a mesmerizing underwater beauty in the form of coral reefs and biodiverse marine communities, and it is for us to protect it for the benefit of present and future generations. Educating younger generations in schools, colleges and universities on the significance of this natural wealth can make a difference to marine life. We should spare no efforts in disseminating knowledge and appreciation of marine biodiversity to those in whose hands lies the future of this planet.

The need of the hour is to use scientific knowledge to save our marine heritage and to gain from it. The UMS Marine BioValley espouses this very concept. It is not just an empty song for the blue ocean. It is about taking timely action.

Borneo Marine Research Institute of Universiti Malaysia Sabah (UMS) has articulated this concept and is seeking cooperation from public and private sectors, and in fact, the larger society to propagate it.



Exploring the Diversity of Marine Life



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