

Sustainable Marine Space Managements: Malaysia Perspective

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SUMMARY

The management of good governance of marine space administration has been debated since at least the 2000s. An extensive literature and research report, it is hardly surprising that this marine space is under serious threat from a myriad of overlapping and conflicting interests, where the evidence of change is compelling and manifest. Therefore it is imperative to manage, administer and govern the coastal zone in a considerable, sustainable and structural manner as well as to protect and nurture the environment we live in. Failure to do so may have disastrous consequences for future generations. This includes polishing the management system, particularly the governance of marine space administrative to support marine rights. Marine space administration and management can help to improve our governance and information systems on coastal and marine areas. From the perspective of management, Malaysia has many institutions that manage and administering the marine environment. However, the developing of institutional framework is still uncertain with ambiguities, conflicts and overlapping on administration and management models due to the bill of act. This paper proposed method of the implanting marine space governance.

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1. INTRODUCTION

Marine administration has been defined as governing surrounding of the marine space. Governing the surrounding marine space tasks may include sustaining the natural environment, maintaining conservation and managing the resources. In Malaysia, governing such activities involves various departments at government stage as well as the stakeholder. Managing a marine space with approximately, 515,000 kilometres square area which covered by maritime realm and 4,576 km in length by coastline is a tedious task (Teo & Fauzi, 2006). Indeed, the maritime adjacent borders with Thailand, Brunei Darussalam, Singapore, Indonesia, Vietnam and the Philippines as show in Figure 1 mean proper standard of governing the marine space is needed. As part of the South East Asian Region and a founding member of the Association of South East Asian Nations (ASEAN) the relationships with these nations should be importance as they are one of the stakeholders in Malaysia marine spaces.

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Figure 1: Countries Maritime Adjacent Borders of Malaysia

The Malaysian coastline, which is about 4,800 km in length, is rich in coastal resources and has a plenty of natural bio diversity. The coastal areas of Malaysia which provision a major portion (70%) of the population, is the navel of socio-economic activities such as urbanisation, agriculture, fisheries, aquaculture, oil and gas exploitation, transportation and communication, tourism, recreation, and others. Indeed, there are numerous of the industries that are also located in coastal area to facilitate export and to stop the employment mere in this urban centre. The expansion of population and the industrialisation are the two core aspects that have contributed to the rapid growth of coastal cities, resulting in an escalation for the demand of coastal land development (Saw et al., 2002). However, the Malaysian marine spaces are not managed by single public institution but it was managed by several departments from the government, the stakeholder and an authorise individual who have interest on the marine spaces. As a result, it create complex, uncertain and conflict situations in determining the resolution of authority area of true governance.

Based on the above facts, the demand on good governance is one of the main factors that need to be addressed and soon developed by Malaysian marine spaces administrator. It needs to be planned, particularly by means of spatial planning on the level of local, regional and national. As good governance is a term, similar to sustainable development, that can mean many things depending on one's perspective or goals (Nichols et al., 2000).

In facts, management and governance are the foundation of life and society in order to achieve the human ability to seize the benefits of the natural environment and maintaining a quality resource to be sustained. Importantly, it is also about the decision-making and helm, and the distribution knowledge and influence in an organised entity (eg, jurisdiction, government departments and others) as an entity that pursued goals and objectives quoted from Paquet 1994 and 1997(Cockburn, 2005). In marine spaces, effective management is about covering accuracy, up-to-date, complete and helpful information about the resources that currently exist and the nature of the environment in which the resources exist, and also consumers contact for these resources (Ng'ang'a et al., 2004). Furthermore there are several

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values of marine space, such as sources of food from animals, plants and fishes, means of transportation, means of communication (subsea cables), areas for development (mineral extraction), areas for recreation, areas for dumping of waste and areas for scientific research. Figure 2 clearly shows the Malaysia Coastal and marine space that have multiplicity of uses, which often leads to conflict namely technical, legal and stakeholder management. In fact, to avoid conflict, in a multiple use resource there must be ruled, hence the importance of institutions and stakeholder frameworks in the administration of coastal and marine space.

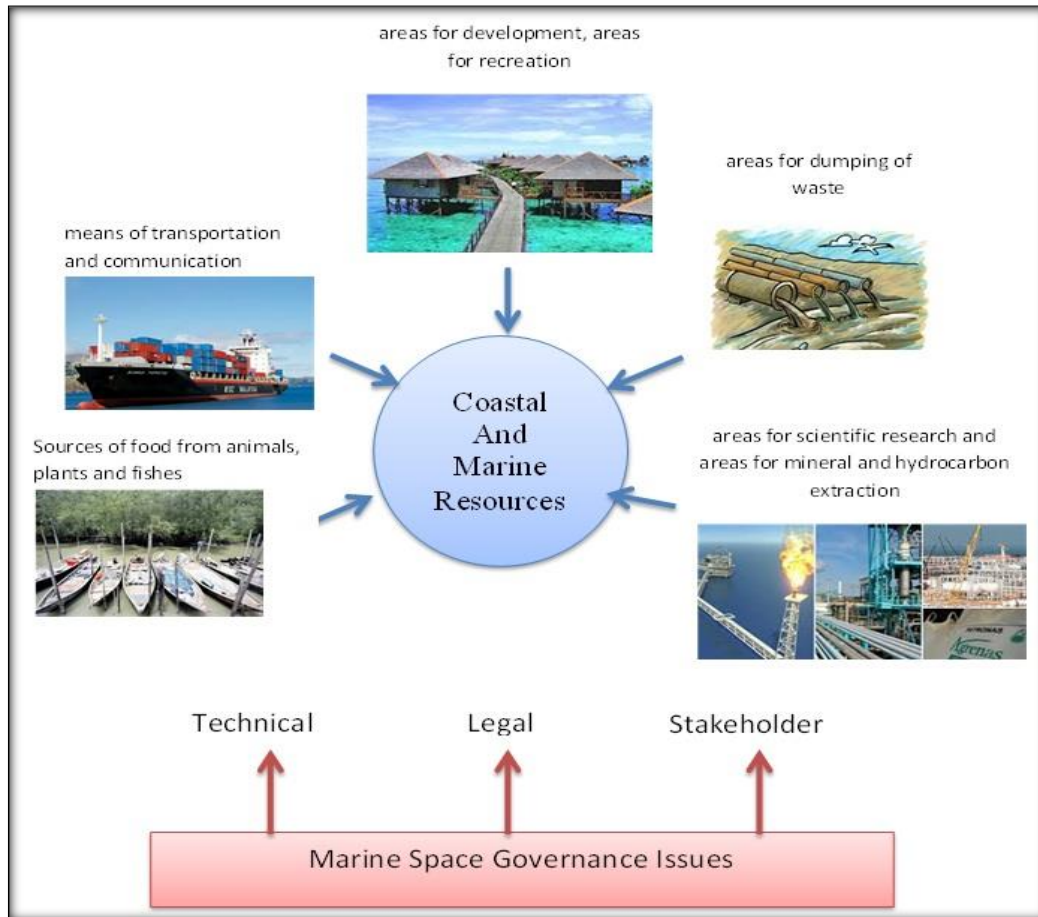


Figure 2: Competing Demand for Malaysia Coastal and Marine Resources with Marine Space Governance Issues

2. MARINE SPACE ADMINISTRATION IN MALAYSIA

Malaysia is a constitutional monarchy (Kerajaan Berperlembagaan) which uses the federal system of government (Fauzi & Teo, 2006). Its Constitution vests executive authority in the Yang Di Pertuan Agong or king, the nominal head of the nation. The Cabinet, headed by the prime minister, serves as the advisory body to the king. It is this body that actually governs the country. The prime minister has considerable power in choosing members of the Cabinet by advising the king on who should be chosen as members of parliament. The Cabinet is collectively responsible to the parliament.

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Legislative authority is vested in the bicameral parliament, composed of a House of Representatives and an appointed Senate. The appointed king also heads these two houses of parliament. Judicial authority is vested in the Supreme Court, the High Courts, and subordinate courts. The lord president of the Supreme Court heads the judicial branch of the government. The judiciary has the power to deliberate on civil and criminal matters, pronounce on the legality of any legislative or executive act, and to interpret federal and state constitutions (Caestino, 2001).

Marine managed areas, in the widest sense, are geographic areas designed to protect or manage resources within the marine environment. Any agency that has jurisdiction in the marine environment can create marine managed areas. A creating agency could be a federal, state, territorial, tribal, or local government and an independent agency, or a regional entity with resource authority, such as a port management council (Suzanne Bass et al., 2006). Malaysia marine space is being managed by national, state and local organizations with various departments and agencies. It is including government, private and educational organizations. Table 1 shown the Malaysia Marine Space institutional structure that includes 15 categories of marine space activities, 14 ministries and more than 30 department/units are responsible for the management of the marine space activities.

Table 1: The Malaysia Marine Space Institutional Structure

No	Category	Ministry	Department/Agencies	Division/Council
1	Port	Ministry of Transport	Johor Port Authority Bintulu Port Authority Klang Port Authority Kuantan Port Authority Kemaman Port Authority Penang Port Comission Maritime Institute of Malaysia	National Shipping Council
2	Shipping	Prime Minister's Department	Marine Department of Malaysia Maritime Institute of Malaysia	Malaysian National Shipper's Council
3	Light House	Ministry of International Trade and Industry	Marine Department of Malaysia	
4	Non Living Resources	Ministry of Science and Technology	Department of Standard Malaysia (STANDARD MALAYSIA) National Oceanographic Directorate (NOD) Malaysia Remote Sensing Agency (ARSM) Malaysia Meteorological Department	National Oil Spill Control Committee
		Prime Minister's Department Ministry of Transport	Economic Planning Unit Maritime Institute of Malaysia	National Petroleum Advisory Council
5	Living Resources/Fisheries	Ministry of Agriculture and Agro-Based Industry	Department of Fisheries Fisheries Development Authority of Malaysia (LKIM)	National Advisory Council for Marine Park and Marine Reserve

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		Prime Minister's Department Ministry of Transport	Maritime Institute of Malaysia	
6	Natural Resources	Ministry of Natural Resources and Environment Ministry of Transport	National Hydraulic Research Institute Research Institute of Malaysia (NAHRIM) Department of Survey and Mapping Malaysia Department of Director General of Lands and Mines Department of Irrigation and Drainage Minerals and Geoscience Department Maritime Institute of Malaysia	
7	Forestry/Wildlife	Prime Minister's Department	Department of Marine Park Malaysia Department of Environment Forestry Department Peninsular Malaysia Forest Research Institute Malaysia Department of Wildlife and National Park Department of Biosafety Maritime Institute of Malaysia	
8	Jurisdiction	Ministry of Defence	Royal Malaysia Navy Hydrographic National Center Maritime Institute of Malaysia	
		Prime Minister's Department Ministry of Transport		
9	Enforcement	Ministry of Home Affairs	Royal Malaysian Police	Marine Unit
		Prime Minister's Department	Maritime Enforcement and Coordinating Centre Malaysia Maritime Enforcement Agency	
10	Tourism	Ministry of Culture, Arts and Tourism	Malaysia Tourism Board	
11	Heritage and Antiquity	Prime Minister's Department Ministry of Transport	Maritime Institute of Malaysia	
12	Telecommunication	Ministry of Communication and Multimedia		
13	Dispute Settlement		Attorney General's Chamber	Advisory and International Division
		Ministry of Foreign Affairs	Economic Division Policy and Planning Division	Maritime Affairs Units
14	Educations	Ministry of Education		Universiti Teknologi Malaysia (UTM) Universiti Malaya(UM) Universiti Malaysia Terengganu(UMT) Universiti Putra Malaysia(UPM) Universiti Kebangsaan

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15	Trade and Service	Ministry of Finance	Internal Tax Division	Secretariat for Cabinet Committee on Trade and Service

Modify: After Abdul Hamid Saharudin (Saharuddin, 2001)

For these eras, the maritime areas have always been important to Malaysia and based on the maritime sector, economic activities have blossomed which has contributed significantly to Malaysia's economic growth (Saharuddin, 2001). However, many economic activities presence often conflict with the natural environments of coastal areas. The question is why and how this conflict in going on? According to table 1, the majority consent categories obtained that represents the marine activities involves more than one of the different agencies and ministries. For the example mixing of authorities between the state, federal and the private sector has resulted in uncoordinated port planning and development (Saharudin, 2001). This creates a Conflict jurisdiction and overlapping of functions between several federal ministries, state government and also private sector in such as fisheries, environment, state forestry and managing coastal zone are crucial to the sustainability of marine space administration.

2.1 Role and Responsibilities

Thought of environment changes in which civilization operates are increasingly determines that there is a need to restructure development practices, in order to ensure the continuity of these practices, or in other words, sustainable development, taking into account the need for harmony between the economic, social and environmental spheres (Cicin-Sain, 1993). Aligned with this idea, it becomes essential to examine the responsibilities and roles of different marine space stakeholders in order to ensure that their work in this field is taken into account. This then connects to the idea of marine space sustainable consumption, taken to be an intermediate dynamic feature in the marine space governance development paradigm. Michaelis (2003) and Mont and Plepys (2007) indicate sustainable consumption as the pattern of consumption resulting from the inter-relation of stakeholders interested in achieving sustainable development.

Hence, the discussions on sustainable development, it becomes increasingly clear that marine space stakeholders in different fields need to be working and assuming specific roles and responsibilities in this new context. Therefore this study tries to see the role of government, regulators and planning organisations and also role of national policy.

2.1.1 Role of Government, Regulators and Planning Organisations

Marine space administrations will be successful if supported by the appropriate law and regulation on marine management. The law and regulation is dependent on two components: local and international. The local law must be examined under marine cadastre contexts such as National Land Code 1965, Continental Shelf 1966, Territorial Sea Act 2012, State Land Rule and Baselines of Maritime Zones Act 2006. Whereas the international law is related to United Nations Convention on the Law of the Sea 1982 and Convention on the Territorial Sea and the Contiguous Zone 1958.

Management of coastal resources management are briefly said that water and land matters fall within the jurisdiction of the State Government, which entails, development planning and zoning powers amongst others (Mokhtar and Ghani Aziz, 2003). And yet the living resources are shared between the Federal and State government. The local authorities, both municipal and district councils, together with relevant government agencies (for example district land offices) act as a channel for both Federal and State government.

The resourcefulness on coastal zone management in Malaysia took place when the Federal Government responded to severe coastal erosion caused by a variety of natural and man-made processes. Malaysian government consequently launched the National Coastal Erosion Study in 1984-1985 and it has become a major national concern (Mokhtar and Ghani Aziz, 2003). This research was under the responsibility of the Environment and Natural Resources Division of the Economic Planning Unit (EPU) in the Office of the Prime Minister. The important results of this research were recommendations for implementing proper long-term planning to prevent coastal erosion and establishing in 1987 two important institutions related to coastal zone management is the Coastal Engineering Technical Centre (CETC) and the National Coastal Erosion Control Council (NCECC) which led to development of importance guidelines.

The Development guidelines encapsulated in the Federal Government's Outline Perspective Plans (which spans a period of at least 10 years) are then interpreted at State Government levels, and government agency levels, who take the directions formulated for sectors that they represent, and develop specific policy documents, programs and action plans. State government will be the actual local government of an area for all intents and purposes. They also have access and capability to raise funds, promulgate enactments and regulations, and develop development plans for areas within their boundary (Mokhtar & Ghani Aziz, 2003).

There is large volume of published studies describing Malaysia has a plethora of maritime and ocean laws. With respect to the concept of unity between land and water expressed by the Malay word 'tanahair' which literally means, 'land and water' depict the embodiment of the unity assumed simultaneously with the native land. In 1999, Juita Ramli (1999) described as early as 1276 during the reign of Sultan Muhammed Shah - the first sovereign of the Malacca Sultanate - it was found that the Malays has had already designed a set of laws of the sea applicable in sea areas within the jurisdiction of the Malacca Sultanate. These laws were referred to as the Malacca Code.

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Malacca Code is all about the laws designed were significantly related to the trading activities within the region, which thrived for centuries under the reign of the Malacca Sultanate (Ramli, 1999). It is also important to highlight that during this ancient time of living where daily lives were easily entertained, it is notable that such law and order governing matters both on land and at sea has had been well administered. Juita Ramli (1999), also pointed that the nature of victorious civilisation and it is regrettable that as beneficiaries we have failed in perpetuating or pursued to develop, in the least, the codified Malacca laws of the sea.

Today, Malaysia maritime laws consist of multiple meanings and purposes established in specific needs such as to solve any disputes or issues. However, Malaysia's marine legislation does not focus on laws related to the functions of marine space and its characteristic compared to the terrestrial. Ensure success in marine space governance, Malaysian marine laws have to be first examined to have a clear understanding of the Malaysian maritime regime scenario under the scope of marine spaces.

The governance of Malaysia's maritime territory is controlled by legally defined boundaries same as on land (Fauzi, 2006) . The United Nations Convention on the Law of the Sea (UNCLOS) establishes a jurisdictional regime under which Malaysia itself can claim, manage and utilise its maritime territories. In this regards, Malaysia ratified UNCLOS in October 1996, and in line with provisions of UNCLOS, is entitled to:

- (i) The Territorial Sea, which is the belt of sea measured 12 nautical miles (nm) seaward from the territorial sea baseline (Malaysia uses the straight base line approach). On 2 August 1969, an Ordinance under Article 150(2) of the Constitution known as the Emergency (Essential Powers) Ordinance, No.7, 1969 was promulgated. Under this Ordinance, the territorial waters of Malaysia (except in the Straits of Malacca, the Sulu Sea and the Celebes Sea) was declared as 12 nautical miles from the base line determined in accordance with UNCLOS.
- (ii) The Contiguous Zone, which is the belt of sea, contiguous to the territorial sea, measured 24 nm seaward from the Territorial Sea Baseline.
- (iii) The Exclusive Economic Zone, which is the area beyond and adjacent to the territorial sea, measured 200 nm seaward from the Territorial Sea Baseline.

Confusion occurs until precipitated the establishment of a rather irregular mix of national and international legislation in Malaysia are influence accorded by the development of world-wide laws of the sea since the advent of Western European dominance in ocean-related matters and international trading (Ramli, 1999).

2.1.2 Domestic Laws

There have been several studies in the literature reporting about Malaysia's government is modelled after the British system, somewhat modified because Malaysia's federal structure incorporates 13 states and 3 federal territories. Nine of those states have rulers or sultans and they elect a monarch, the supreme ruler, and every five years. The government is based on a parliamentary system, headed by an elected Prime Minister. The Parliament consists of a

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partially appointed senate and a house of representatives whose members are elected by universal adult suffrage.

The Federal Government has powers such as over external affairs, defence, internal security, civil and criminal law, federal citizenship and naturalization, finance, trade, commerce and industry, taxation, customs and excise duties, shipping, navigation and fisheries, communications and transport, federal works and power, education, medicine and health, social security and tourism. The States' powers include over land and its administration, Islamic law, Malay customs, permits and licenses for mines prospecting, agriculture, forests, local government, states works and water, and riverside fishing. It is essential to heed at this juncture that all of the pre-Federation of Malaysia laws were derived from British domestic laws. It has conclusively been shown from paragraph below.

Malaysia's earliest recorded 20th. Century national law - considered remotely relating to management of maritime matters - is the Waters Act, 1920 enacted to provide for the control of rivers and streams. It was not until 20 years later when the Federation of Malaya became an active rubber producer in the region that the Rubber Shipping and Packing Control Ordinance, 1949 was promulgated for the purposes of regulating shipping and packing of rubber for export. In the following years we may observe that domestic laws pertinent to shipping, navigation and port were duly promulgated and enforced. These included Carriage of Goods by Sea Act, 1950; Merchant Shipping Ordinance, 1952; Federation Light Dues Act, 1953; Penang Port Commission Act, 1955; Port Authorities Act, 1963 and so on. This trend was consistent with pre-Merdeka and pre-Federation of Malaysia days when the ruling British were active in pursuing interests in maritime trade arising from an abundance of agricultural produce in the Malay States. (Ramli, 1999)

2.1.3 International Laws

As highlighted by Aziz Meo Ngah & Nazery Khalid (2014) Malaysia is one of the world's major trading nations and its economic wellbeing depends largely on trade, 95% of which is carried though seaborne mean. Malaysia is subjected to international laws in marine matters and various treaties and resolutions have been sealed. The international consultation needs Malaysia to take the relationship with international institutions seriously in deciding to join the international maritime legislation to clarify the rights of marine territory of a country. Malaysia should understand and defend its rights and policies in accordance to the rules of international laws for recognition as a sovereignty of country's maritime. Until now, Malaysia has adopted the international laws in the implementation of all the functions and powers for marine administration and is related to the local legislation as showed in table 2. This information was summary from Country Report (Fauzi, 2006) and Juita Ramli (1999) writing.

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Table 2: Malaysia International Laws

Provision	Relate
Convention on the Law of the Sea, UNCLOS 1982	Maritime and Sovereignty
Collision Regulation (COLREG) Convention 1972	Safety
Safe Manning, Certification, Training & Watchkeeping (SCTW) Convention 1978	Safety
SCTW Convention 1995	Safety
International Maritime Satellite Organization, INMARSAT Convention 1976	Navigation
INMARSAT OA 1976	Navigation
Marine Pollution, MARPOL 73/78 (Annex I/II)	Environment
MARPOL 73/78 (Annex V)	Environment
Convention on the Civil Liability for Oil Pollution Damage, CLC Convention 1969	Environment
International Oil Pollution Compensation, FUND Convention 1971	Environment
Oil Pollution Preparedness, Response and Cooperation, OPRC Convention 1990	Environment
Conference on the Environment and Development, UNCED 1992	Environment
Convention on Facilitation of International Maritime Traffic 1965	Shipping and Transportation
Marine Pollution, MARPOL 73/78 (Annex I/II)	Environment
MARPOL 73/78 (Annex V)	Environment
Convention on the Civil Liability for Oil Pollution Damage, CLC Convention 1969	Environment
International Oil Pollution Compensation, FUND Convention 1971	Environment
Convention on the Control of the Transboundary Movement of Hazardous Wastes and their Disposal (Basel) 1989(1993).	Environment
Convention on the International Civil Aviation 1964	Airspace
Convention on Psychotropic Substances 1971	Safety

Source: (Fauzi, 2006; Ramli, 1999)

To ensure that the Malaysian Marine Space Governance is well managed, country report 2006 also highlights the instrument of Malaysia Governance as shown in table 3. Again it has a number of laws which apply the enforcement of the Malaysian Maritime Zone and seas which cover both the national and international levels and also agreements, circulars and any legal recourse to ensure that the Malaysian sovereignty is safe for the longest time. Thus, eleven among the provisions set forth under special laws are as follows:

- i. The Federal Constitution of 1957.
- ii. National Land Code [Act 56/65]
- iii. Emergency (Essential Powers) No. 7 [1969] (has unraveled and replaced)
- iv. Territorial Sea Bill 2012 (replacing the Emergency Ordinance 1969)
- v. Malaysian Maritime Enforcement Agency Act 2004 [Act 633]
- vi. Exclusive Economic Zone Act 1984 [Act 311]
- vii. Continental Shelf Act 1966 [Act 83]
- viii. Fisheries Act 1985 [Act 317]
- ix. The Mutual Assistance in Criminal Article 2002 [Act 621]
- x. The Official Secrets Act 1972 [Act 88]
- xi. Baselines of Maritime Zones Act 2006

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Table 3: Instruments of Malaysia Governance

Provision	Explanation
Environmental Quality Act, 1974 (ACT127)	An act relating to the prevention, abatement and control of pollution and enhancement of the environment. Act A593 of 1996 provides among others the control of trans boundary movement of schedule wastes and their disposal.
Environmental Quality (Amendment) 1985 Section 34A(1) empowers	empowers the Minister of Science, Technology and Environment to prescribe the development of Environmental Impact Assessments (EIAs) prior to granting approval to carry out certain activities, and grants control over the approval of projects based upon the results of the EIAs.
Mining Enactment FMS CAP 147	provides to the states the powers and rights to issue mineral prospecting, exploration licenses, mining leases, and other related matters.
Fisheries Act, 1985 (ACT 317)	An act relating to fisheries, including conservation, management and development of maritime and estuarine fishing and fisheries, in Malaysian fisheries waters, to turtles and riverine fishing.
Environmental Quality Act, 1974 Section 29 (1)	states that no person shall, unless licensed, discharge wastes into Malaysian waters in contravention of the acceptable conditions stated in Section 21. Section 31(1) states that where any pollutants are being or are likely to be emitted, discharged or deposited, the culprit must install and operate appropriate control equipment. Section 51(1) empowers the Ministry of Science, Technology and Environment to prescribe standards and criteria for the implementation of environmental policy, classification of the environment for protection purposes, prohibit discharge of pollutants into the environment, prohibit the use of equipment that could cause pollution, and, among others, regulate boating and swimming in waters to prevent pollution.
Fisheries Act 1985, Article 9 (1),	For any application that intend to attain the fishing vessel license or permit, any plan, specification or other information regarding the fishing area must be submitted to the Director General of Fisheries
Fisheries Act 1985 (Marine Parks Malaysia) Regulations 1997	Section 41(1) provides the powers for the Minister to establish any area or part of an area in Malaysian fisheries waters as a marine park or a marine reserve.
Fisheries (Prohibited Areas) Regulations 1994 Fisheries	Fisheries (Prohibited Areas) under section 61 of the Fisheries Act 1985, all forms of fishing and collecting are banned, however no permit is necessary to enter the prohibited area. The Department of Fisheries, Malaysia, controls this regulation.
Marine Parks Malaysia Order 1994	designated 38 islands as Marine Parks Malaysia. The boundaries of the park extend two nautical miles seaward from the outermost points of the islands measured at low water mark. Within these areas no person shall kill or capture any fish unless he holds a license issued under Section 11.
The Turtles (Prevention of Disturbance) Rules, 1962	The rules state that no vessel, other than a government vessel on official duty, shall enter within half a nautical mile of the low water mark of the above three islands, except with a permit granted by, or on behalf of, the Turtle's Board. Antiquities

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Antiquities Act 1976	Provision for the control and preservation of, and research into ancient and historical monuments, archaeological sites and remains, antiquities and historical objects and to regulate dealing in and export of antiquities and historical objects. According to this act, applicants who wish to search for artefacts or shipwrecks, a description on the proposed site, the type and the area of the search and other information must be produced.
Petroleum Act (Safety Measures) 1984	This act was formulated to control activities pertaining to safety aspects in petroleum industry. This act has legal provision to ensure safety of road and rail transportation, sea transportation, air transportation, pipeline transportation, storage and maintenance and use of equipment, building structure and fixation.

Source: (Fauzi, 2006)

3. MALAYSIA MARINE SPACE ISSUES

Malaysia's large sea area and its bounty of resources carry immense management responsibilities. These range from ensuring the integrity of its sovereignty over its maritime territories to the sustainable development of marine resources. The country's considerable, strategic stake in the oceans warrants serious, meticulous attention to the governance and administration of its oceanic and maritime affairs. Malaysia Marine Spaces are many and at times, competing, uses and these uses include such as Sources of food from animals, plants and fishes, means of transportation and communication, areas for development, areas for recreation, areas for dumping of waste, areas for scientific research and areas for mineral and hydrocarbon extraction (Teo & Fauzi, 2006). Figure 3 shows clearly that the Malaysia Coastal and marine space have multiplicity of uses, which often leads to conflict namely technical, legal and stakeholder management. In fact, to avoid conflict, in a multiple use resource there must be rules, hence the importance of institutions and stakeholder frameworks in the administration of coastal and marine space. It is also important to highlight the method of the implanting marine space governance.



Figure 3: Overview of Malaysia Marine Space Governance

As resources are scarce in relation to the demand for it, the scramble for the usage of resources at the coastal and marine space by man is ubiquitous and from antiquity. Accordingly, table 3 exhibits that major issues in administering the rights, restrictions and responsibilities in the marine space environment.

Table 2.4: The Major Issues in Administering the Rights, Restrictions and Responsibilities in the Marine Space Environment (Adapted from (Fauzi, 2006)

<i>Maritime Zone</i>	<i>Issues</i>
Coastal Zone	<ul style="list-style-type: none"> • When marine boundaries are not demarcated, there is no physical evidence of the boundary, resulting disagreement, confusion and conflicting versions of marine boundaries. • Line of low tide is difficult to determine. • Natural feature like the coastline change over time, so thus the marine boundaries.
Territorial Sea	<ul style="list-style-type: none"> • The determination of base points and baselines in accordance to UNCLOS 1982. • Enforcement agencies operating in the two maritime zones – the 12 nautical mile of territorial sea and the exclusive economic zone. Some enforcement agencies have found it difficult to operate in grey areas i.e. in areas where the territorial waters and EEZ meet at which the demarcation of the boundaries is distinguishable.

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Exclusive Economic Zone	<ul style="list-style-type: none"> • The publication of a chart at a scale adequate for ascertaining the baselines for measuring the breadth of the territorial sea or listing geographical coordinates of these points. • The determination of the outer limits of the continental shelf based on Article 76, UNCLOS 1982, in which coastal states are allowed to claim outer limits of the continental shelf beyond 200 nautical miles, up to a maximum of 350 nautical miles or 2500 metre isobaths plus 100 nautical miles but must submit relevant scientific data to the Commission on the Limits of the Continental Shelf. • Redelimitation of internal waters, territorial sea, EEZ and continental shelf. • Updating the Peta Baru Malaysia 1979
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Conclusion from Country Report 2006 in generally, state that;

Since Malaysia has no explicit policies on management or utilisation of marine and coastal resources, the need for coordination between various agencies that manage the marine spaces in different sectors is non-obligatory. A lease issued without consultation with other relevant authorities, creates multiple use conflicts and ignorance of the rulings imposed by the other authorities. Moreover, the interstate and inter-district boundaries of marine governance have not been defined, which may lead to confusion to the territorial limits of administration between authorities and causing conflicting maritime claims. In addition, there is a lack of awareness of which ministry/agency issues rights and permits as well as the imposition of conditions and restrictions. As marine spaces are 3D, there are no clear rulings that allow for overlapping rights, for example having petroleum exploration leases overlapping fisheries. It is also important to highlight the integration of data from numerous marine related agencies into the Marine Spatial Data Infrastructure initiative and demarcation of boundaries in the marine spaces.

To design such systems to be useful for managing information on single activities or resource use (e.g., petroleum leases) occurring in marine spaces is uncomplicated. Studies have found that, in order to be of maximum benefit to the governance of marine spaces these information systems will have to be able to manage and visualize information on multiple marine resource interests that overlap in 3-dimensional space, and time and also these systems should also function in an environment of efficient and effective governance and legal frameworks, and optimal institutional arrangements that meet the often diverse needs of identified and engaged stakeholders (M. Sutherland & Nichols, 2006).

4. PROPOSED OF FUTURE IMPLEMENTATION OF MALAYSIA MARINE SPACE GOVERNANCE

Appropriate administration and management, exploitation, utilisation and conservation of marine resources, economic growth and social values can be improve and sustain (A. Rajabifard, et al., 2005, W. Mukupa, 2011), as showed in Figures 4 where coastal and marine activities need administration for marine industries, resources management, marine protected

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area and policing and conflict resolution). A marine policies, planning and management, institutional framework and legislation and conventions are part of marine administration, to enable sustainability. Furthermore these features will lead to sustainability of marine development, whereas it will balance between social, economic and environmental impacts (C Thia- Eng, 2003).

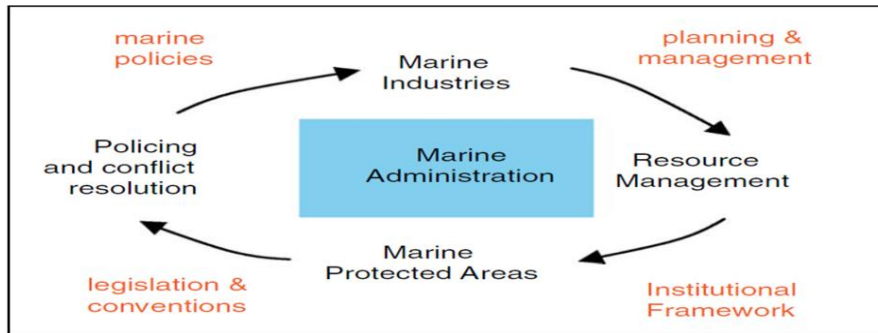


Figure 4: Features of Marine Administration (L. Strain et al., 2006)

4.1 The Marine Policies, Planning and Management

Maritime Institute of Malaysia (MIMA) (National legislation pertaining to maritime management, 1997) has publicized that there are at least 74 national laws at present pertaining to maritime management. This does not include about 35–40 subsidiary legislative items and by-laws which are enforceable with some of the major laws such as the Environmental Quality Act 1984 and Fisheries Act 1985. These laws provide the legal framework for about 15 different aspects ranging from ports, shipping, lighthouse, living resources, non-living resources, environment, telecommunications, trade and education. In the international arena, Malaysia has already ratified at least 21 UN Conventions and 13 IMO Conventions (6, pp. 57–58). Three Conventions are subject to ratification, 10 Conventions are under consideration for ratification and another 10 Conventions are recommended for ratification by Malaysia.

As policies are made by two levels of government, they can be either cross sectoral in natural or sectoral (Mohtar, 2003). Maritime Institute of Malaysia (MIMA) an agency directly involved in policy formulation and act. Their specialized in maritime matters and conflict to more educated in maritime transportation regulations, port rules and etc. Compatible with the MIMA visions to provide maritime-related advice and consultancy services to stakeholders through policy research, training, education and public awareness programmes. The Centre for Ocean Law and Policy (OLAP) is a research unit at MIMA that responsibility in ocean law and policy issues (see Box 1).

Box 1: The Centre for Ocean Law and Policy (OLAP)

The Centre for Ocean Law and Policy (OLAP), aspires to be Malaysia's national centre of excellence for research in ocean law and policy issues. OLAP aims to provide timely and relevant advice and policy options as well as to identify key areas of interest for Malaysia's multi-disciplinary realm of Ocean and maritime law that encompass the Law of the Sea (UNCLOS 1982)

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and other related international law, as well as maritime and admiralty law.

OLAP reinforces close working relationships with relevant stakeholders such as the Ministry of Transport, the Marine Department, the National Security Council, the Ministry of Foreign Affairs and the Attorney General's Chambers, as well as fostering links with other local and regional think tanks and international organisations such as the International Maritime Organisation (IMO), Division for Ocean Affairs and the Law of the Sea (DOALOS), International Labour Organisation (ILO) and similar entities.

OLAP undertakes the role of promoting awareness in ocean law and maritime legal aspects to appropriate stakeholders and the public, by conducting seminars, training workshops and conferences.

Source: <http://www.mima.gov.my/mima/research>

4.2 Data Management for the Marine Space

The development of a marine space management plan involves a multi-disciplinary approach. It should address issues such as the physical environment, resource inventory, environmental sensitivity, demand or land use projection, socio-economic setting and other factors which are of importance in arriving at the sustainable marine space administration. Abdul Hamid Saharudin (2001) highlight the importance of quality data and information in sea management is one of the most important components of process to develop management plans and policies.

Marine space data management is all about capturing information, analysing, storage and dissemination the data. Another essential point this paper will highlight two important agencies in data management for the marine space. Which are Department of Survey and Mapping Malaysia (JUPEM) that focusing on capturing information and analysing and Malaysia Centre of Geospatial Data Infrastructure (MaCGDI) focusing on data storage and dissemination data.

4.2.1 Department of Survey and Mapping Malaysia (JUPEM)

As main Malaysia institutional given the responsibilities in technically to tackle marine space administration issues. However, that effort must collaborate with academic institutional to bring out clearly the theory and methodology to apply and also be suitable to implementation and to be considering in marine environment and factor (see Box 2). Below are the functional of JUPEM:

- To advise the government in the field of cadastral survey and mapping along with the state and international boundaries.
- To provide complete and conclusive cadastral information for issuing land, strata and stratum titles.
- To manage efficiently the cadastral and mapping databases.
- To publish photographic, cadastral, thematic and utility maps for the purposes of planning, management of natural environment resources, preservation of environment, development, surveillance and security.

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To provide geodetic infrastructure for the purposes of cadastre survey, mapping, engineering and scientific research

Box 2:JUPEM Corporate Information's

Vision

Making JUPEM's an eminent organisation in providing outstanding survey and mapping services as well as geospatial data management towards fulfilling the nation's vision.

Mission

Providing a quality survey and mapping and services and geospatial data management via first-rate system, competent human resource and conducive working environment.

Motto

The catalyst for national development and citizen's prosperity.

Objective

To ensure the products and land survey and mapping services meets the quality acceptance and customer's needs.

- To ensure a well maintain, up-to-date cadastral and mapping database to meet needs of the national geospatial infrastructure.
- To make JUPEM as an excellent reference centre in the field cadastral survey and mapping.
- To survey determine, demarcate state and international boundaries.

Quality Policy

JUPEM is committed to provide Cadastral Survey, Mapping services and dissemination of high quality geographic information in accordance with established standards and also continuous improvement efforts to ensure customer satisfaction.

Source: <https://www.jupem.gov.my>

4.2.2 Malaysian Centre for Geospatial Data Infrastructure (McGDI)

Malaysia Geospatial Data Infrastructure (MyGDI) is an initiative by the government to develop a geospatial data infrastructure to enhance the awareness about data availability and improve access to geospatial information. This can be fulfilled by facilitating data sharing among participating agencies.

MyGDI as the National Spatial Data Infrastructure (NSDI) for Malaysia, is a national infrastructure comprises of policy, data, standard, geospatial information and technology, R&D and development of human capital established by MyGDI Circular Letter no. 1 of 2006 – Guidelines for the Implementation of Malaysia Geospatial Data Infrastructure (MyGDI) for the purpose of facilitating the sharing and dissemination of geospatial information amongst government agencies, private sector and the general publics. Through this infrastructure, smart partnerships among agencies is continuously being developed to produce and share geospatial information thus providing customer-focused, cost effective and timely delivery of geospatial data.

(MaCGDI) is a centre established by the government to manage and promote the development of geospatial data infrastructure for Malaysia (MyGDI). MaCGDI is also

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responsible for coordinating access and delivery of the geospatial information held by all government agencies.

MaCGDI was established in December 2002 to replace the NaLIS Secretariat under the Ministry of Land and Cooperative Development (MLCD). On the 27th March 2004, MaCGDI was subsumed under the Ministry of Natural Resources and Environment (NRE).

The main role of the centre is to continuously make available and accessible current and accurate geospatial data that promotes a sustainable living environment, economic growth and social progress for public. MaCGDI is organised with thirteen (13) sections and is set out to carry the following objectives:

- To provide mechanism/infrastructure in supporting the usage and sharing of current, accurate and reliable geospatial information among agencies by employing the latest geospatial technologies; and
- To avoid redundancy of duplicating efforts in collecting, processing, maintaining, providing and dissemination of required geospatial information.

The goal of MyGDI is to enable members of the geospatial communities in Malaysia to share and access geospatial data together seamlessly (see Box 3). Through its application MyGDI Explorer, MyGDI facilitates online access to geospatial information as an effort to avoid duplication of effort especially in the collection of geospatial data. It provides a base for geospatial data exploration, evaluation, and application for users and data providers within all levels of government, commercial, and non-profit sectors as well as the academia and the public.

MyGDI governs through its committees and MaCGDI as the coordinator. In the Malaysia contexts, SDI initiatives started from the national level and are expected to filter down to all the states and gradually to all local levels. Like other countries, apart from financial and skill resources which forbid comprehensive big-bang undertaking, are knowledge and agreement among agencies on fundamental datasets that are required to meet common needs. These issues are usually sorted out by the lead agency, in this case is MaCGDI.

Box 3: MyGDI Corporate Information's

Vision

The vision of MaCGDI is to continuously make available and accessible current and accurate geospatial data that promotes a sustainable living environment, economic growth and social progress for all Malaysians.

Mission

"The mission of MaCGDI is to facilitate, coordinate and manage geospatial data infrastructure through the development of policies, standards, data, ICT Technology, R&D and skilled human resources by providing customer-focused, cost effective and timely delivery of geospatial data."

Function

The functions of MaCGDI are :

- To act as an advisor to the Government of Malaysia in the formulation and implementation of policies concerning geospatial data;

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- To coordinate activities pertaining to the development of geospatial data and standard for geographic information/geomatics;
- To be a technical reference centre for advisory and consulting services with regard to the development and application of geospatial data;
- To develop and coordinate MyGDI Clearinghouse activities;
- To plan and conduct human resource development program in GIS and the related fields;
- To organise various activities in promoting the use of MyGDI throughout the country;
- To become a centre for research and development (R & D) for GIS and the related fields; and
- To represent the public sector in international forum, conferences and meetings involving geospatial data.

Source: <http://macgdi.mygeoportal.gov.my>

Based on the theories, principles and an overview of the literature, we has proposes a framework for future implementation of Malaysia Marine Space Governance such as illustrated in Figure 5. According to identify the marine space data management on utilisations of marine space administration, there are four elements of data management, which are capturing information, analysing, storage and dissemination the data. This is consistent with the purpose of sustainable management of marine space where sustainable development involves a continuous process in deciding where certain questions are asked and where the 'right' and the decision were made (Cicin-Sain, 1993).

Table 3: **Proposed Malaysia Marine Space Governance CUSTODIAN**
Prime Minister's Office

IMPLEMENTERS
Department Of Director General Of Lands And Mines (FEDERAL)
TECHNICAL SUPPORT & GEOSPATIAL DATA CENTRE
Department of Survey and Mapping Malaysia (JUPEM)
POLICIES SUPPORT
Maritime Institute of Malaysia (MIMA)
SPATIAL DATABASE INFRASTRUCTURE COORDINATOR
Malaysia Centre of Geospatial Data Infrastructure (MaCGDI)
USERS OF MARINE SPACE SERVICES
International and Domestic Import and Export Community
National Security
Oil & Gas Sector
Ports
Freight Forwarders
Supply Chain Managers
Logistics Services Providers
Maritime Support Service Providers
FACILITATORS
Ministry Of Transport
Ministry of International Trade and Industry
Ministry of Finance
Royal Custom and Excise Department
Ministry of Science and Technology
Ministry of Agriculture and Agro-Based Industry

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Ministry of Natural Resources and Environment
Ministry of Defence
Ministry of Home Affairs
Ministry of Culture, Arts and Tourism
Ministry of Communication and Multimedia
Ministry of Foreign Affairs
Marine Department
Financial Institutions and Insurers
Legal and Arbitration and Technology Service Providers
Ship Registers
Classification Societies

SUPPLIERS of MARINE SPACE SERVICES

Ship Building and Ship Repairing Yards
Shipbrokers
Ship Management Companies
Ship Owners
Main Engine and Propulsion Manufacturers
Land Transport Service Providers
Warehouse Operators
Aviation Companies

SOURCES of HUMAN CAPITAL

Maritime Academies and Technical Colleges
Universities and Polytechnics Offering Courses in Marine Navigation, Engineering Oceanography, Supply Chain Management and Logistics

Modify: After Aziz Meo Ngah & Nazery Khalid (2014)

Table 5 illustrates the Framework of Malaysia Marine Space Governance. They are eight key categories in the framework including detail parties involved namely:

- The **Custodian** of the marine space sector. Prime Ministers Department should be the lead agency to promote the development and oversee the growth of the sector, given its clout that can enable it to gather other agencies and parties involved in the maritime sector to work together (Aziz Meo Ngah & Nazery Khalid, 2014).
- The **Implementers**. These are parties that involved directly in marine space governance. All the activities should be under there are recommendations.
- The **Technical Support & Geospatial Data Centre** . Department of Survey and Mapping Malaysia (JUPEM) should lead agency in term of record activity above and under, maintaining and updating the marine space data. Again, Department of Survey and Mapping Malaysia (JUPEM) playing the role of data storage and dissemination. They would sit between the administration/management activities and the data, allowing any user access to appropriate data to support their needs.
- The **Policies Support**. Maritime Institute of Malaysia (MIMA) an agency directly involved in policy formulation and act. Their specialized in maritime matters and conflict to more educated in maritime transportation regulations, port rules and etc.
- The **Spatial Database Infrastructure Coordinator**. Malaysia Centre of Geospatial Data Infrastructure (MaCGDI) for the purpose of facilitating and responsible for coordinating the sharing and dissemination of geospatial information amongst government agencies, private sector and the general publics. Through this infrastructure, smart partnerships among

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agencies is continuously being developed to produce and share geospatial information thus providing customer-focused, cost effective and timely delivery of geospatial data.

- **The Users of Marine Space Services.** These are parties that use services in the marine space sectors such as shipping, port operations and shipyard services. Identifying them is an important step in managing the demand side of the maritime sector (Aziz Meo Ngah & Nazery Khalid, 2014).
- **The Facilitators** include government agencies involved in the marine space sector and support services providers in areas such as finance, ICT, legal, tax, consultancy, classification and registry (Aziz Meo Ngah & Nazery Khalid, 2014).
- **The Providers of Marine Space Services.** These are parties offering marine space services required by users (Aziz Meo Ngah & Nazery Khalid, 2014).
- **The Sources of Human Capital,** include maritime academies, universities, polytechnic and technical colleges providing marine space-related courses and programs (Aziz Meo Ngah & Nazery Khalid, 2014).

This framework show inter-related with and provides support to one another. According to Aziz Meo Ngah & Nazery Khalid, (2014) the custodian of the marine space, the regulatory authorities, industry players and users of marine space services are part of an ecosystem of marine space sector that features stakeholders working in harmony towards attaining common objective in a facilitating and pro-business and pro-investment environment towards sustainable. In such sustainable framework proposed, there is effective management of demand and supply sides of the marine space sector, supported by talented, skilled the human capital that matches the marine space governance needs and its rapid development and dynamic operating environment

5. CONCLUSION

This research highlights the need of marine space governance seriously consider the issues that involved in role and responsibilities. By the introduction of the data management into the stakeholder management and organizational performance, the researchers propose to explain how role, responsibilities and data management in marine space administration can lead to successful sustainable marine space governance.

Role, responsibilities and data management, in the broad sense of the process by which stakeholder work together to accomplish a common mission is hence essential when stakeholder need to work together closely. Stakeholder must commonly agree on how they will manage the marine space administration functions of marine space tenure, marine space value, marine space-use and marine space development, and, equally important, on how they will make this information available to the wider society in order to encourage creativity, efficiency and productive development among citizens and businesses in a sustainable manner. Therefore, role, responsibilities and data management is functions an approach that must be embedded in the marine space governance. A future study investigating marine space stakeholder role, responsibilities and data management would be very interesting.

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