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Zonal Versus Functional
Approach in the New Law
of the Sea

Master's thesis
30 credits

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Master's Programme in Maritime Law

Spring 2012

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Abstract

The international law of the sea has its roots in Roman law embedded in the ancient doctrines of *res communis* and *res nullius*. The law came from custom and practice and was transformed into customary law periodically confirmed and consolidated by fundamental doctrines such as *mare liberum* or freedom of the seas enunciated by *Hugo Grotius* in the 1500s and eventually by the doctrine of common heritage of mankind by Ambassador *Arvid Pardo* in relatively recent times. The law of the sea has thus evolved into convention law representing the codification of the customary law. This happened through four conventions adopted in 1958 by the United Nations generally referred to as the Geneva Conventions and culminated into the United Nations Convention on the Law of the Sea (UNCLOS) in 1982. UNCLOS entered into force in 1994 and it largely represents the current state of the law in this field.

It is notable that in this evolutionary process, originally the approach taken in the earlier conventions was the zonal approach. By contrast, the 1982 Convention has taken a shift in the trend described by academics as the functional approach to the law of the sea. This approach focuses on functions and activities carried out in the zone or protective measures typical of some functions rather than the mere existence of a zone.

This thesis attempts to compare and contrast the zonal versus the functional approach first, by presenting the salient features of each zone, and then by engaging in a detailed analytical discussion of four functions on a selective basis. These functions or activities are fishing and fisheries, navigation, marine scientific research and protection of the marine environment. The discussion primarily draws on relevant UNCLOS Parts and provisions but it also refers to commentaries of scholars as well as court decisions. The thesis concludes that the zonal and functional approaches are not entirely independent of each other. They are represented in an integrated fashion to define the regime of international law of the sea as it stands today. In this writer's opinion, the integrated adoption of the two approaches is desirable and should be maintained.

Acknowledgements

I am deeply indebted to my parents for encouraging me to undertake the Master of Laws (LL.M.) degree in Maritime Law at Lund University. Throughout my studies they extended their full support and always provided sound advice when I needed it especially when I missed my home and family. I am sure my academic achievement will make them proud.

I have made many friends here in Sweden and from many other countries among classmates and others who I met during my two-year stay in this country. I thank them all for their friendship and support.

Above all, I thank my teachers especially Professor Lars Goran Malmberg and Dr. Abhinayan Basu Bal of the Maritime Law Programme at Lund and also teachers from World Maritime University as well as the several distinguished Visiting Professors. I am indeed fortunate to have been their student.

Last but not least, I am immensely grateful to Professor Proshanto K. Mukherjee, the Director of the Maritime Law Programme and my thesis supervisor for his guidance and scholarly attention throughout my studies. He provided inspiration and encouragement which enabled me to face the academic challenges of the programme and strive towards success.

Abbreviations

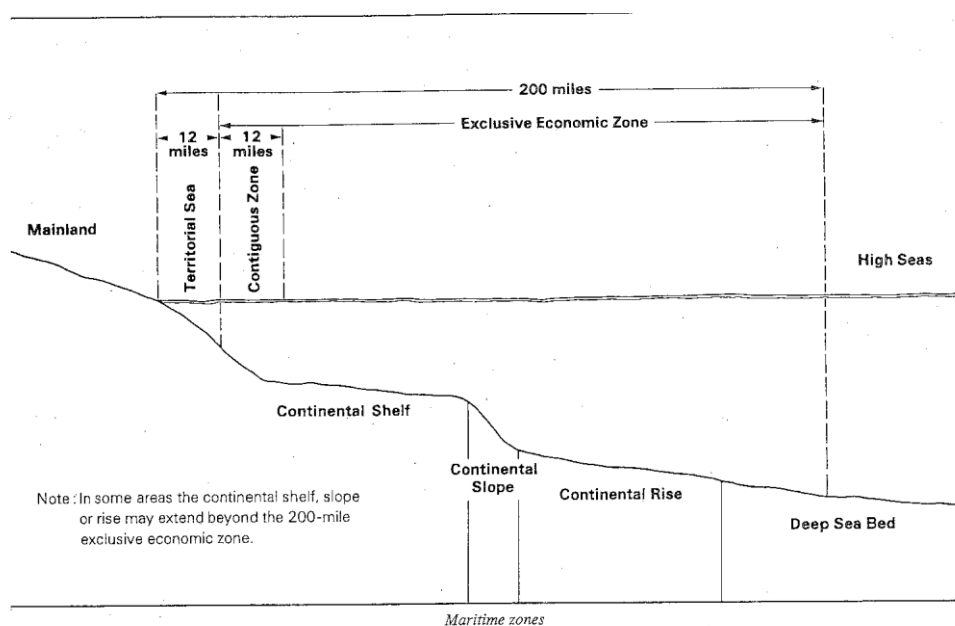
ASL	Archipelagic Sea Lane
ASLP	Archipelagic Sea Lanes Passage
AWPPA	Arctic Waters Pollution Prevention Act, 1970
CS	Continental Shelf
ECJ	European Court of Justice
EEZ	Exclusive Economic Zone
ICAO	International Civil Aviation Organization
MSR	Marine Scientific Research
MSY	Maximum Sustainable Yield
PSC	Port State Control
PSJ	Port State Jurisdiction
TAC	Total Allowable Catch
UNCLOS	United Nations Convention on the Law of the Sea, 1982
U.S.	United States

1 Introduction

1.1 Background

The law of the sea as a specialized branch of public international law has, in recent times, acquired a degree of sophistication that is unprecedented. Historically, the law of the sea has its roots in the Roman law and its antiquity has been recorded in numerous texts, treatises and scholarly writings. The traditional law of the sea is to be found in the customary international law that evolved over time. Only relatively recently, since the adoption of the four Geneva Conventions of 1958 has the customary international law of the sea been codified into treaty instruments. A remarkable characteristic of the international law of the sea is that the land and the sea traditionally had only one dividing line between them which was represented by the boundary where the two met. Through an evolutionary process, this dividing line came to be represented by the low water line. Subsequently a belt of water seaward of the low water line was defined as the territorial sea over which the coastal state exercised sovereignty subject only to a foreign ship's right of innocent passage through that belt of water. Thus, the sea comprised two bodies of water, namely, the territorial sea and the high seas, and the narrowness of the breadth of the territorial sea was exemplified by the customary international law under which it was only three nautical miles.

Before and since the advent of the United Nations Convention on the Law of the Sea, 1982 (UNCLOS), there has been a proliferation of maritime zones characterized not only by the diversity of their widths but also the uses and activities taking place within those zones.



©R.R. Churchill and A.V. Lowe, 1999; see *supra*, note 1 at p.30

Indeed, it is said that "[I]ncreasingly, ... the law of the sea is being developed along functional, rather than zonal lines"¹. In furtherance of this view, the celebrated authors Churchill and Lowe have made the following statement which supports this notion.

...whereas the 1958 United Nations Conference on the Law of the Sea concentrated mainly on producing a framework of rules governing States' rights and duties in the territorial sea, continental shelf and high seas, many of the more international agreements have been concerned not with particular zones but with particular uses of the seas, such as pollution, fishing (which was in fact also the subject of one of the conventions produced by 1958 conference) and navigation.²

The zonal approach to the law of the sea simply illustrates a diminution of jurisdiction and power of the coastal state in a seaward direction from the land. The extent of each zone is therefore of crucial importance in so far as the coastal state's authority at international law is concerned. The maritime zones prevailing under the current law of the sea start with the internal waters which lie landward of the dividing line between land and sea known as the baseline. Under UNCLOS, there are two kinds of baselines; the normal baseline which follows the sinuosity represented by the low water line and straight baselines which are only permissible where the coastline is deeply indented or is covered by a fringe of numerous islands³. Seaward of the baseline there are four maritime zones, namely, the 12 nautical mile territorial sea, a contiguous zone stretching for another 12 nautical miles and a further 188 nautical miles known as an exclusive economic zone (EEZ)⁴. Another zone which has its genesis in the Truman Proclamation of 1945 is the continental shelf, the outer limit of which can be delimited by application of Article 76 of UNCLOS. Beyond the continental shelf lie the high seas which, with few exceptions, are beyond the reach of any national jurisdiction.

The zonal concept in the law of the sea does not exist in isolation. Its significance lies in the various usages of each zone. In other words, the functions and activities of the zone take primacy over its extremity. The main purpose of this thesis is to examine the utilities of the functional approach by comparison with the zonal approach in the law of the sea as reflected in UNCLOS. As the thesis unfolds, it will become apparent that both approaches are intertwined and interrelated. In other words, the zonal and functional approaches work together in harmony. The comparative analysis in this thesis necessarily prompts an examination of the various functions and activities that are carried out in the maritime zones of the

¹R.R. Churchill and A.V. Lowe, *The Law of the Sea*, 3rd Ed., Manchester : Juris Publishing, Manchester University Press, 1984 at p.1

²*Ibid.*

³UNCLOS Articles 3 and 5

⁴UNCLOS, Article 57

coastal state pursuant to UNCLOS. The chosen functions for the purposes of this thesis are fishing, navigation, marine scientific research (MSR) and marine pollution. In this thesis, the rights and duties of coastal states in usages of the sea are brought into focus.

As mentioned above, under UNCLOS, there are six maritime zones, namely, internal waters, territorial seas, contiguous zone, EEZ, continental shelf (CS) and high seas. Of the six, the first five are zones appertaining to the coastal state whereas the high seas are *res communis*. The outer limit or breadth of each zone is measured from the baseline. The zonal approach is mainly concerned with what that breadth should be from the coastal state's perspective and how its coastal zones impinge on the rights of other states in the high seas. By contrast, the functional approach as it prevails currently under UNCLOS is concerned more with functions and activities in each zone. The functional approach deals with activities in each zone. It is apparent that since the first United Nations Conference on the Law of the Sea held in 1958 which produced four international conventions attempting to codify customary law, the law has taken a tangential turn away from simply zonal extents into a focus on functions. The international community interested in maritime matters is now concentrating more on functional issues. Besides the definition of rights and duties of states in the territorial seas, continental shelf and high seas, several international agreements are also concerned with uses of the seas. This is the essence of the functional approach as distinguished from the traditional zonal approach.⁵

The international law of the sea not only applies to States or international entities but to individuals. Hence, any activity of States or individuals that causes harm to the coastal state entitles it to apply municipal laws and proceedings against the perpetrator of the harm.⁶ In the past, around the 18th century when there were less vessels and fish was plentiful in the seas, *laissez-faire* prevailed over fishing and navigation. The high seas were open for any and everyone to exploit the seas with the object of deriving gain and benefit.⁷ Following the end of the Second World War, many newly independent states have come into existence which, along with the traditional maritime states emerging from a lengthy period of strife, began to perceive the benefits to be had from the bounties of the seas and the associated economic interests.

It was believed originally that the resources of the seas were inexhaustible until humankind came to realise that fisheries resources were vulnerable to depletion. It became apparent that the uses of the sea were not limited to navigation and fishing but that there are numerous other uses and functionalities to which the seas could be subjected. Oil, natural gas and minerals are key elements of national interest. However, uses and functionalities sometimes produce contradictory effects. For example, navigation has negative consequences in the form of ship-source pollution

⁵*Supra*, note 1

⁶*Ibid.*, at pp.1-2

⁷*Ibid.*, at p.2

which militate against the interests of coastal states.⁸ Ships are potential threats to the seas and to coastal states and their interests when they navigate negligently and cause oil or chemical pollution. If such ships carrying gas or chemicals pass near a coastal state or over fishing grounds they can cause potentially serious harm to the marine environment. If states over-exploit the natural resources even in the high seas or in adjacent areas, serious problems can occur. These were among the problems which instigated the development of the new law of the sea. The regime of *laissez-faire* was replaced by the principles of the zonal and functional approaches.⁹

It is apparent that where there are many interests, there are corresponding conflicts of interest. It is the task of the law to provide the rights of states to use the seas and also temper those rights. It is not easy to bring about a compromise of interests among states. There are many problems that have concerned the maritime constituency such as the problem of marine pollution which has been realized by all states. It increases the costs of shipping and sea transportation. Island states gain more benefits from the seas but at the same time, they have to face the risk of pollution if there is a grounding, foundering or collision involving a tanker. Disparate technological advancement and the geographical configuration of states also affect their sea use functions such as fishing abilities. A country like the United States has the technology to catch fish in huge quantities and can extend its fishing zone as wide as the law will allow while landlocked countries such as Bolivia, Nepal or Laos have limited ability to engage in fishing or explore the natural resources of the seas.¹⁰

1.2 Structure

Beyond this introductory Section, the first substantive Section of this thesis which is Section 2, examines the salient features of maritime zones as depicted in UNCLOS. The discussion begins with an examination of the concept of baselines which is the starting point of the zonal concept stretching landwards as well as seawards. Following that, the discussion proceeds with an examination of the internal waters, territorial seas, contiguous zone, EEZ and continental shelf regimes. Notably, of these regimes, all except the continental shelf are maritime zones in the proper geographical sense. The third Section addresses four selected sea use activities or functions and their legal implications. Fishing and fisheries is a major function of the EEZ although fisheries is also a part of the functions of the territorial sea and there are implications for what is referred to as the “straddling stocks” issue. The next function examined is navigation which extends to a detailed review of the doctrines of innocent passage, transit passage and archipelagic sea lane passage and their interrelationships. The regime of marine scientific research (MSR) as depicted in Part XIII of

⁸*Ibid.*

⁹*Ibid.*, at pp.2-3

¹⁰*Ibid.*, at p.3

UNCLOS is then addressed in light of the jurisdiction exercisable by the coastal state in the EEZ and continental shelf and the rights of all states in the high seas. The next function discussed in this Section is of a different kind compared with the others; it deals with protection and preservation of the marine environment as depicted in Part XII and touches on the correlation between UNCLOS and other technical/functional conventions such as MARPOL including their regulatory and penal implications. A summary of the thesis is provided in the concluding Section together with some comments and suggestions for possible future improvements of the regimes discussed in the thesis.

2 Salient Features of Maritime Zones under UNCLOS

2.1 Baselines

Whether or not maritime zones of a coastal state are considered in a historical perspective, any study concerned with maritime zones must necessarily start from an explanation and examination of the phenomenon of baselines. All except one of the maritime zones are measured seaward from the baseline. It is therefore necessary to carry out a preliminary examination of the concept of the baseline in general as well as within the context of UNCLOS. As indicated in the introduction, prior to 1945 there was essentially only the concept of the territorial sea of the coastal state beyond which there were the high seas which did not form a part of the maritime zones. The high seas were available to all states in equal measure in so far as their uses were concerned. The baseline has therefore been described as the "territorial sea baseline" because that is the line from which the outer limit of the territorial sea has always been measured. The rules relating to baselines have been treated as a part of the law associated with the territorial sea. As stated by Churchill and Lowe-

This was justifiable at the time when the territorial sea was the only zone of coastal state jurisdiction. But since the baseline is now used to measure not only the outer limit of the territorial sea but also the outer limit of the contiguous zone, the exclusive fishing zone and the EEZ, and in some circumstances the continental shelf, it no longer seems appropriate to consider baselines simply as part of the law relating to the territorial sea.¹¹

Under UNCLOS there are two types of baselines, namely, the normal baseline and the straight baseline. In Article 5, the normal baseline is defined as "the low water line along the coast as marked on large scale charts officially recognized by the coastal state". This is referred to as the sinuosity of the coastline as mentioned in the introductory Section. The concepts of high and low water are related to tidal phenomena which are governed by the position of the sun and the moon at any given time in relation to the earth. Two points are notable in this context: the gravitational force of the moon exerted on the earth is greater than that of the sun because the moon is closer to the earth, and also; the effect of gravitation is more pronounced on water than on land because water has a fluid characteristic. The revolution of the moon around the earth results in two high waters and two low waters per day occurring every six hours alternately. This configuration is mathematically represented by the sine curve; hence the

¹¹*Supra*, note 1 at pp. 31-32

description "sinuosity of the coastline". There are, of course, different levels of high and low water known as spring and neap tides. Spring tides occur when the sun and moon are on the same side of the earth and the combined gravitational force of both those heavenly bodies are exerted on the earth resulting in higher tide levels. Neap tides occur when these two bodies are on opposite sides of the earth and the combined gravitational force of the bodies is comparatively less.¹² Against the background of this natural and scientific observation, the legal application of the low water line being used as a line of demarcation between land and sea and the line from which the territorial sea is measured provides considerable geographical advantage to the coastal state.

It is recognized, however, that certain configurations of coastlines are not amenable to the use of the low water line as the baseline. In two situations it is practically impossible to identify the position of the low water line. One is where the coastline is deeply indented and is of a jagged nature, and the other is where there exists a fringe of numerous islands cluttering the coast line.¹³ In such situations, Article 7 of UNCLOS comes into play which provides for the use of straight baselines as opposed to the normal baselines. In paragraph 1 of this Article, it is stated that-

In localities where the coastline is deeply indented and cut into, or if there is a fringe of islands along the coast in its immediate vicinity, the method of straight baseline joining appropriate points may be employed in drawing the baseline from which the breadth of the territorial sea is measured.

There are specified rules in Article 7 relating to straight baselines including certain limitations which are set out in that Article.¹⁴ Where, for example, the coastline is highly unstable due to tidal phenomena and because of the presence of a delta; there may be a regression of the seaward extent of the low water line after it has been established as the furthest line out towards the sea. In such cases, the straight baseline as established originally may remain effective until the coastal state itself decides to change it.¹⁵

It is not permissible to draw straight baselines that deviate too much from the general direction of the coastline. Furthermore, the sea areas lying landward of the baseline must be closely linked to the land. Only then will they be recognized at law as internal waters.¹⁶ Low tide elevations are natural land features surrounded by waters so that they are visible at low tide but are submerged when the tide is high. It is not permitted to draw straight baselines from or to a low tide elevation unless there is a permanent

¹² T.G. Jones, *Principles for Second Mates*, 3rd Ed., Glasgow: Brown, Son & Ferguson Publishers, 1952 at pp. 230-235

¹³The application of the straight baseline to the jagged coastline where there are deep indentations was first established by the judgement of the International Court of Justice in the *Anglo-Norwegian Fisheries Case* [1951] ICJ Rep. 116

¹⁴See paragraphs 2 to 6 of Article 7

¹⁵See Article 7, paragraph 2

¹⁶Article 7, paragraph 3

structure such as a lighthouse built on it that is always above sea level except where such an elevation has, without such structure, been recognized as such internationally.¹⁷ It is not allowed to have straight baselines that cut off the territorial sea of another state from the high seas or an EEZ. The baseline across the mouth of a river that flows directly into the sea is a straight line between points on the low water line of the banks of the river.¹⁸ The bay closing line is determined by application of the so called "semi-circular rule". Under this rule an indentation in the coastline qualifies as a bay if the waters in the indentation constitute an area at least as large as the area of a semi-circle generated by the diameter represented by a line drawn across the mouth of the indentation.¹⁹ The length of the bay closing line must not exceed 24 nautical miles.²⁰ The rules in Article 10 do not apply to so-called "historic bays".

Apart from low tide elevations and river mouths mentioned above, there are rules regarding the drawing of baselines in relation to islands,²¹ archipelagos and artificial islands²² and reefs²³.

2.2 Internal waters

The regime of internal waters is contained in Article 8 of UNCLOS and is defined in paragraph 1 as "waters on the landward side of the baseline of the territorial sea". In essence, the internal waters of a state are assimilated to its land territory and therefore the doctrine of full territorial sovereignty applies to internal waters in the same manner as it applies to the land territory itself. Article 2 provides that "the sovereignty of the coastal state extends beyond its land territory and internal waters" which implies that the same degree of sovereignty applies to internal waters as it does to the land territory.²⁴ There are virtually no impediments to the exercising of this sovereignty in terms of international law; and therefore, the law of the sea whether customary or convention law, has had little to do with the regime of internal waters.²⁵

The waters within a port area form part of the internal waters because the baseline exists as the outer extremity of the port. Therefore, in such waters the coastal state can exercise full sovereignty and generally speaking there is no inherent right of a foreign ship to enter a port. It is notable, however, that in the *Aramco* Arbitration of 1958 it was held that "[A]ccording to a great principle of public international law, the port of every state must be open to foreign vessels and can only be closed when the vital interests of the State

¹⁷See Article 13, paragraph 1 for definition of "low tide elevation" and Article 7, paragraph 4 for the rule

¹⁸Article 9

¹⁹Article 10, paragraph 2

²⁰Article 10, paragraphs 4 and 5

²¹Article 121

²²Article 11

²³Article 6

²⁴Article 2, paragraph 1

²⁵*Supra*, note 1 at pp.60-61

so require"²⁶ The predominant view, nevertheless, is that foreign vessels do not enjoy any unlimited rights. For example, it was held in the *Nicaragua case*²⁷ that the internal waters of the state are subjected to that state's exercise of sovereignty and that it is "by virtue of its sovereignty that the coastal State may regulate access to its ports".²⁸ The only exception is in customary international law under which a ship in distress has a right to enter a port if human life on board is in danger.²⁹

By virtue of its sovereignty, a state can exercise virtually unlimited jurisdiction in its internal waters. However, with respect to ships sailing within internal waters, the coastal state will usually only assert jurisdiction over matters pertaining solely to the ship if requested by the master or diplomatic authorities of the flag state of the ship. This is particularly the case with criminal offences if it concerns only the "internal economy" of the ship.³⁰ But the coastal state will almost invariably assert jurisdiction if the peace and good order of the port is affected by the incident or the offence committed on board.³¹

Another limitation on the exclusive jurisdiction of the coastal state in its internal waters is in respect of international water courses such as the river Rhine.³² In respect of such waterways which carry substantial amount of commercial traffic, the free navigational rights of foreign ships usually exist pursuant to bilateral or multilateral agreements among the riparian states.

2.3 Territorial seas

In general terms, the territorial sea is the seaward extension of the land territory of a coastal state. However, the regime of the territorial sea under UNCLOS as well as the customary international law is not one where the coastal state can exercise full sovereignty but is subject to the right of innocent passage of foreign ships. As such, the concept of the right of innocent passage is intimately associated with the territorial sea as a maritime zone. This is where the regime of the territorial sea is different from that of internal waters.

The concept of innocent passage consists of two elements, namely, "passage" and "innocence" in relation to such passage. With regard to passage, Article 18 provides as follows:

²⁶*Aramco v. Saudi Arabia* (1958) 27 *ILR* 117 61 at p.212

²⁷*Nicaragua Case* [1986] ICJ Rep.14

²⁸*Ibid.*, at p.111

²⁹See the cases of *Creole* (1853), Moore, *Int. Arb* 4375 63 and *Kate A. Hoff (The Rebecca)* (1929), IV *RIAA* 444 63

³⁰See D.R. Thomas, *Maritime Liens*; British Shipping Laws Vol. 14, London: Stevens & Sons, 1980 see also *supra*, note 1 at p.66

³¹*Supra*, note 1 at pp. 66-67

³²*Ibid.*, at pp. 64-65

1. Passage means navigation through the territorial sea for the purpose of:
 - (a) traversing that sea without entering internal waters or calling at a roadstead or port facility outside internal waters;
 - or
 - (b) proceeding to or from internal waters or a call at such roadstead or port facility.
2. Passage shall be continuous and expeditious. However, passage includes stopping and anchoring, but only in so far as the same are incidental to ordinary navigation or are rendered necessary by *force majeure* or distress or for the purpose of rendering assistance to persons, ships or aircraft in danger or distress.

The provision is not all that clear. In paragraph 1 reference is made to navigation through the territorial sea without entering internal waters or calling at a roadstead or port facility outside internal waters. Paragraph 2 requires passage to be "continuous and expeditious" but immediately exception is made for stopping and anchoring if that is incidental to ordinary navigation. A lack of clarity is apparent although exception for *force majeure* or distress is understandable and justifiable.

Article 19 elaborates on the meaning of "innocent passage" and contains a basic premise provided in paragraph 1 in that "[P]assage is innocent so long as it is not prejudicial to the peace, good order or security of the coastal state". In paragraph 2 twelve items are specifically mentioned as activities that are not considered to be innocent because they may be prejudicial to the peace, good order, or security of the coastal state. In other words, such activities or functions by a foreign ship passing through the territorial seas are prohibited. Article 19 thus points to an area of confluence between the zonal and functional approaches. There is no categorical prohibition on warships exercising the right of innocent passage through the territorial sea so long as the vessel does not engage in any exercise or practice with weapons or in launching, landing, taking on board any aircraft or military device.³³ Furthermore, under Article 20, submarines and others underwater vehicles must navigate on the surface and display their flags. Among other activities that are considered to be non-innocent for the purposes of Article 19 are included, threat or use of force against the sovereignty, territorial integrity or political independence of the coastal state"³⁴, any violation of the coastal state's customs, fiscal, immigration, or sanitary laws, any act of wilful and serious pollution, and fishing and research or survey.³⁵

³³Article 19, paragraph 2 (b) (e) and (f)

³⁴Article 19, paragraph 2 (a)

³⁵Paragraph 2 (g) (h) (i) (j)

Article 21 permits the coastal state to adopt legislation relating to innocent passage in respect of eight matters identified in paragraph 1 which are as follows:

- (a) the safety of navigation and the regulation of maritime traffic;
- (b) the protection of navigational aids and facilities and other facilities or installations;
- (c) the protection of cables and pipelines;
- (d) the conservation of the living resources of the sea;
- (e) the prevention of infringement of the fisheries laws and regulations of the coastal State;
- (f) the preservation of the environment of the coastal State and the prevention, reduction and control of pollution thereof;
- (g) marine scientific research and hydrographic surveys;
- (h) the prevention of infringement of the customs, fiscal, immigration or sanitary laws and regulations of the coastal State

Paragraph 2 provides that the coastal state's laws pertaining to these matters shall not apply to the design, construction, manning and equipment of foreign vessels beyond what may be required to give effect to international rules and standards. Article 24 imposes the duty on the coastal state not to hamper the innocent passage of foreign ships through laws that may have the practical effect of denying or impairing the rights of innocent passage of a foreign ship or exercise any form of discrimination against such ships.³⁶ Finally, Article 25 provides for protective measures in respect of the coastal state's rights in the territorial sea which includes temporary suspension of innocent passage in specified areas in the territorial sea.³⁷ Articles 27 and 28 provide for the non-application of the coastal state's criminal and civil jurisdictions.

It is apparent from the above discussion on various Articles of UNCLOS relating to the territorial sea that the coastal state has both legislative as well as enforcement jurisdiction. As stated by Churchill and Lowe-

State practice and doctrine on the question of the extent of a coastal State's rights to enact legislation -- its legislative, as opposed to its enforcement, jurisdiction -- varied according to whether the territorial sea was regarded as a mere 'bundle of servitudes' or as a belt of maritime territory under the plenary jurisdiction of the State. The aim in all cases, was to reconcile the right of innocent passage with the legitimate interests of the coastal States in the enforcement of their laws in the territorial sea.³⁸

³⁶Article 24, paragraph 1 (a) and (b)

³⁷Article 25, paragraph 3

³⁸*Supra*, note 1 at p. 92

The breadth of the territorial sea under UNCLOS is a maximum of 12 nautical miles.³⁹ The United Nations Conference held in 1958 at which the Convention on the Territorial Sea and the Contiguous Zone was adopted and the subsequent Conference held in 1960 failed to establish the breadth of the territorial sea which at the time was 3 nautical miles under the state practice of most states. Given the notion of sovereignty attached to the doctrine of the territorial sea, it was essential for a littoral state to be able to demonstrate effective control over the belt of waters which it purported to claim as its territorial sea. The so-called "cannon-shot rule" was utilised for this purpose. In most cases the reach of a cannon ball fired from a gun placed on the shore was 3 nautical miles which led to the practice of states claiming 3 nautical miles as the breadth of the territorial sea. The Scandinavian countries were an exception; they claimed 4 nautical miles as the breadth of the territorial sea under the cannon shot rule.⁴⁰

2.4 Contiguous Zone

There is only one article dealing with the contiguous zone in UNCLOS, namely, Article 33, but it says it all and introduces and expresses the concept in clear and concise terms. Paragraph 1 contains the definition which provides that the zone in question is one that is contiguous to the territorial sea; in other words, adjacent to or abutting it, but the regime is totally different. As per paragraph 1 of the Article, the contiguous zone deals with the coastal state's jurisdiction over four specified subject matters. These are customs, fiscal, immigration and sanitary laws. The elements of customs and immigration are self-explanatory. "Fiscal" refers to taxation of different varieties and "sanitary" deals with a multiplicity of health, hygiene and cleanliness issues. In the shipping jargon, "quarantine" is the essence of the sanitary aspect of the contiguous zone. It is under the quarantine regime that control is exercised over infectious diseases pursuant to Article 33.

Perhaps the most important feature of Article 33 and the contiguous zone concept is that the coastal state can only exercise enforcement jurisdiction under this regime. It is the only provision in UNCLOS which provides exclusively for enforcement jurisdiction which begs the question - enforcement in respect of what law. In other words, where is the legislative jurisdiction in respect of which enforcement jurisdiction is exercisable? The answer is to be found in the words of paragraph 1 of Article 33 which reads as follows:

1. In a zone contiguous to its territorial sea, described as the contiguous zone, the coastal state may exercise the control necessary to:

³⁹Article 3

⁴⁰David L. Larson *et al.*, *Major Issues in the Law of the Sea*, Durham, N.H.: University of New Hampshire, 1976 at p. 32

- (a) prevent infringement of its customs, fiscal, immigration or sanitary laws and regulations within its territory or territorial sea;
- (b) punish infringement of the above laws and regulations committed within its territory or territorial sea.

Attention must first be drawn to the word "control" in the opening phrase of the provision. This clearly indicates that its object is to provide for enforcement jurisdiction to the coastal state. Secondly, the word "prevent" carries the same connotation in sub-paragraph (a). Thirdly, the words "within its territory or territorial sea" points to the legislative jurisdiction of the coastal state in those zones, but not in the contiguous zone. In sub-paragraph (b), the word "punish" again refers to enforcement jurisdiction with respect to the contiguous zone whereas the words "territory or territorial sea" clarify that the legislative jurisdiction corresponding to the enforcement jurisdiction is with respect to those zones.

The reason for restricting the regime of the contiguous zone to enforcement jurisdiction only is explained by Churchill and Lowe in the following words:

If legislative jurisdiction were to exist in the contiguous zone so that ships could commit offences there, they would be able to achieve a greater degree of immunity from coastal State jurisdiction by fleeing into the territorial sea than fleeing to the high seas or economic zone, since in the latter case they could be seized after hot pursuit.⁴¹

The breadth of the contiguous zone is 12 nautical miles but it starts where the territorial sea ends so that its outer limit is at a maximum distance of 24 nautical miles from the baseline. Paragraph 2 of Article 33 provides as follows:

The contiguous zone may not extend beyond 24 nautical miles from the baselines from which the breadth of the territorial sea is measured.⁴²

An important aspect of the contiguous zone regime is its application to archaeological and historical objects found at sea. Article 303 of UNCLOS deals with this subject matter and through its paragraph 2 allows a coastal state to apply Article 33 in respect of removal of such objects from the seabed. The wording of that paragraph is somewhat curious. In reference to objects of an archaeological and historical nature it provides as follows:

In order to control traffic in such objects, the coastal State may, in applying article 33, presume that their removal from

⁴¹*Supra*, note 1 at p.137

⁴²Article 33, paragraph 2

the sea-bed in the zone referred to in that article without its approval would result in an infringement within its territory or territorial sea of the laws and regulations referred to in that article.⁴³

It is not clear from this writer's viewpoint, what is the significance of the "presumption" in the above provision that the coastal state may have. Surely the provision could have stated that the coastal state may in its legislation provide for a prohibition on removal of archaeological and historical objects, and in the event of any violation of such law, take enforcement action pursuant to Article 33. The problem, however, is that Article 33 identifies four specific areas in respect of which the enforcement jurisdiction may be applicable. It is not clear under which of those four areas would removal of archaeological and historical objects fall. Perhaps it is contemplated that unlawful removal of archaeological or historical objects from the contiguous zone would constitute a customs violation. It is submitted that further clarification of this issue is warranted.

Furthermore, it can be said that whereas the regime of the contiguous zone by reason of the geographical limit placed on it, is undoubtedly zonal in character, it also embraces the functional approach which is illustrated by the fact that specific areas of enforcement jurisdiction are identified and also because its application is extended to archaeological and historical objects through Article 303.

2.5 Exclusive Economic Zone

The EEZ is a relatively new concept and basically is a creation of UNCLOS. It is a specific legal regime under the Convention and is defined in Article 55 as follows:

The exclusive economic zone is an area beyond and adjacent to the territorial sea, subject to the specific legal regime established in this Part, under which the rights and jurisdiction of the coastal State and the rights and freedoms of other States are governed by the relevant provisions of this Convention.

The EEZ is often described as being 200 nautical miles wide which is an imprecise statement. It is actually 188 nautical miles in width starting at the outer limit of the territorial sea and ending at its own outer limit which is 200 nautical miles measured from the baselines. Article 55 provides that "[T]he the exclusive economic zone shall not extend beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured."

⁴³ Article 303, paragraph 2

The origins of the EEZ are somewhat obscure but it is well established that the regime has its roots in the Latin American concept of the patrimonial sea, which itself is consistent with a trend that started with the Truman Proclamation in 1945 of coastal states attempting to extend their jurisdiction and control over the sea increasingly further away from land. Such attempts included unilateral widening of territorial seas and creations of fishing zones.⁴⁴ The Latin American initiatives culminated into the declaration of *Santo Domingo* of June 1972⁴⁵ in which for the first time the term "patrimonial sea" was used. There were earlier Latin American proclamations proceeding towards the establishment of this concept which included the Montevideo Declaration on the Law of the Sea, 1970 and the Lima Declaration on the Law of the Sea 1970.⁴⁶ The conceptual background to the term "patrimonial" is connected to the connotation of the land territory being referred to by some states as the "fatherland".

The term EEZ and the concept itself is attributable to a proposal made by Kenya to the Asian-African Legal Consultative Committee in January 1971 and to the United Nations Sea Bed Committee in 1972 which attracted considerable support from several Asian and African countries. The concept of the EEZ in UNCLOS resulted from a combination of the Latin American approach and the Kenyan proposal. Undoubtedly, the developing countries at the Third Law of the Sea Conference found the new regime greatly favourable to their national interests for reasons discussed below. It is notable that Canada and Norway and developed coastal states with considerable offshore resources also embraced the new concept with enthusiasm.⁴⁷

It is important to note that the EEZ concept under UNCLOS is essentially a compromise that was reached at the conference between the extreme position taken by those states which wanted a widely extensive territorial sea through the patrimonial sea concept and a number of developed states which took a conservative view opposing any widening of coastal state jurisdiction and intrusion into the high seas.⁴⁸ In this context a number of observations are relevant and important.

First, the EEZ is a zone that does not constitute an inherent right under international law. It must be declared or claimed through some procedure such as enactment of national legislation.⁴⁹ In the view of this writer, while there is no compulsion under UNCLOS for a state to claim an EEZ, it is equally true that a state cannot have an EEZ unless it makes an express claim. Second, prior to the start of the Third U.N. Law of the Sea Conference, the EEZ was not a part of customary international law.

⁴⁴*Supra*, note 1 at p. 160

⁴⁵*UN Leg. Ser B/16 p.599; ND I*, p. 247

⁴⁶*UN Leg. Ser B/16 pp. 586 and 587; ND I*, pp. 235 and 237

⁴⁷*Supra*, note 1 at p.30

⁴⁸*Ibid.*, at p. 153

⁴⁹For a somewhat contradictory view see *supra*, note 1 at p. 161 where the authors state that "[U]nder the convention there is no obligation on a state to claim an EEZ". Following that statement, the authors refer to several states which have expressly made such claims.

However, during the several years of negotiations at the Conference leading up to the adoption of the Convention in 1982, by reason of the fact that many states already started to claim EEZs through enactments of national legislation or otherwise, it is quite appropriate to say that the EEZ regime is now a part of customary international law; and therefore, in this writer's opinion, the rights associated with this zone may be invoked regardless of whether or not the state concerned has made any express claim to the zone through legislation or otherwise. Third, the EEZ is neither an extension of the territorial sea nor a part of the high seas even though three of the six freedoms of the high seas apply within the EEZ, namely, the freedoms of navigation, over flight and laying of submarine cables and pipelines are applicable in that zone⁵⁰ Thus the EEZ is aptly described as a regime *sui generis*. Fourth, there are two fundamental attributes of the EEZ regime; namely, the notion of sovereign rights and jurisdiction applicable in that zone.

In Article 56 it is provided that in the exclusive economic zone the coastal state has -

sovereign rights for the purposes of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superjacent to the sea-bed and of the sea-bed and its subsoil, and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds;⁵¹

A number of points of observation are noteworthy in the above context. First, what the coastal state has is "sovereign rights" which is cast at a lower threshold level than sovereignty which the coastal state fully enjoys in internal waters, and to a limited extent, that is, subject to a foreign ship's right of innocent passage, in the territorial sea. The distinction is crucial particularly because the concept of "sovereign rights" in the present context is a creation of UNCLOS which should not be construed literally or in the ordinary sense. This leads to the second point of observation; that is, that the sovereign rights pertain only to exploration, exploitation, conservation and management of natural resources. In other words, it does not extend to resources that are human-made. The resources, however, include living as well as non-living ones so that fisheries and mineral resources are both included under the coastal state's sovereign rights. Third, the object is to enhance the economic position of the coastal state which is reflected in the term "EEZ" and extends to economic exploitation and exploration activities relating to such things as production of energy from the sea including tidal energy as well as energy derived from currents and wind.⁵² Fourth, the EEZ regime has both a vertical as well as a horizontal or lateral dimension. The

⁵⁰See Article 51, paragraph 1 which cross-refers to Article 87

⁵¹Article 56, paragraph 1 (a)

⁵²Proshanto K. Mukherjee, *Maritime Zone and Boundaries*, Malmo: WMU Publications, 2000 at pp.9-14

water column or superjacent waters is part of the regime; and so is the seabed and subsoil underlying it.

With regard to sovereign rights over natural resources there is an overlap with the continental shelf regime which is elaborated below.

The second element of the EEZ regime is reflected in Article 56 which provides that in the exclusive economic zone, the coastal state has -

jurisdiction as provided for in the relevant provisions of this Convention with regard to:

- (i) the establishment and use of artificial islands, installations and structures;
- (ii) marine scientific research;
- (iii) the protection and preservation of the marine environment;⁵³

The two most important matters over which the coastal state has jurisdiction in the EEZ are marine scientific research (MSR) and the protection and preservation of the marine environment; in other words, prevention of marine pollution from all sources. In the context of this thesis, MSR is singled out as one of the functions, among others, to illustrate the functional approach taken by UNCLOS. The subject of "protection and preservation of the marine environment" is covered comprehensively by Part XII of the Convention. The subject of artificial islands, installations and structures pertains to the regimes of the continental shelf and the high seas in addition to the EEZ. With regard to the EEZ, the coastal state enjoys exclusive rights and jurisdiction in relation to these subject matters including jurisdiction with regard to its customs, fiscal, health, safety and immigration laws.⁵⁴

2.6 Continental Shelf

The genesis of the continental shelf doctrine lies in the Truman Proclamation of 1945 in which Harry Truman, then President of the United States, declared on behalf of his country that-

... the natural resources of the subsoil and seabed of the continental shelf beneath the high seas but contiguous to the coasts of the United States as appertaining to the United States, subject to its jurisdiction and control.⁵⁵

In scientific terms, maritime features are identified as either continental or oceanic. The continental shelf is a continental feature and is described as the

⁵³Paragraph 1 (b)

⁵⁴Article 60, paragraphs 1 and 2

⁵⁵ND I, p. 106. See also Ann Hollick, "US Oceans Policy: the Truman Proclamation", (1976-77), 17 *VJIL* pp. 23-25

natural prolongation of the continental land mass. To be more precise, in geological terms, the continental shelf consists of three associated components, namely, the shelf, the slope and the rise. Collectively, the three components are referred to as the continental margin. The basic description is contained in the first part of Article 26 paragraph 1 in the following words,

The continental shelf of a coastal State comprises the seabed and subsoil of the submarine areas that extend beyond its territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin.

The specific components of the continental shelf system are set out in paragraph 3 in the following words:

The continental margin comprises the submerged prolongation of the land mass of the coastal State, and consists of the seabed and subsoil of the shelf, the slope and the rise.⁵⁶

It is important to note the last sentence in paragraph 3 which expressly states that the continental margin "does not include the deep ocean floor with its oceanic ridges or the subsoil thereof". The essence of this preclusion is that seaward of the continental shelf, the features are oceanic as distinguished from continental, and where the two meet is where the hydrocarbon resources are to be found in abundance.⁵⁷

In the law of the sea, the geological and the juridical dimensions of the continental shelf must be reconciled and clearly understood. The first point of observation is that the geological dimension essentially consists of a natural phenomenon whereas the juridical dimension partly comprises a legal fiction in that the extent or limit of the continental shelf under the Convention is fixed arbitrarily. The combination of the geological and juridical concepts is what defines the regime of the continental shelf under the international law of the sea.⁵⁸

Following the Truman Proclamation, the first attempt at defining and establishing a continental shelf regime was made in the 1958 Convention on the Continental Shelf. In that Convention, the outer limit of the continental shelf was stated to extend to a line depicting the 200 metre isobath⁵⁹ to the limit of exploitability. It did not take long for the international maritime

⁵⁶See diagram at p. 7 above

⁵⁷See Robert W. Smith and George Taft, "Legal Aspects of the Continental Shelf" in Peter J. Cook and Chris M. Carleton, *Continental Shelf Limits: The Scientific and Legal Interface*, U.S.A.: Oxford University Press, 2000 at p. 19 and "History of the Ocean" visited on <http://marinebio.org/oceans/history/> visited on 4 April 2012

⁵⁸ *Supra*, note 52 at p.11

⁵⁹The word "isobath" means a line of equal bathymetry which means sounding or water depth. In *A Manual on Technical Aspects of the United Nations Convention on the Law of the sea 1982*, Special Publication No.51, Monaco: IHO Publishing, 1993 at p. 18 "isobaths" is defined as "a line representing the horizontal contour of the sea-bed at a given depth".

community to realize the lack of scientific precision in the definition of the outer limit. The 200-metre isobath criterion would obviously be unsuitable for states where the natural prolongation of the continental shelf was extensive, which was the reason for introducing the "limit of exploitability" criterion. However, the latter criterion was recognized to be dependent on the level of technological advancement available to a particular coastal state.⁶⁰ At the Third UN Conference on the Law of the Sea, the Canadian and Irish delegations expressed the view that the application of the exploitability criterion could lead to the Canadian outer limit reaching into the Irish continental shelf and *vice versa*. Thus, in UNCLOS, a radically new outer limit regime was designed to equitably meet the needs of both narrow as well as wide margin states.⁶¹

Paragraph 1 of Article 76 provides for a juridical limit of 200 nautical miles from the baseline for narrow margin states. In other words, where the geological continental margin is less than 200 nautical miles from the baseline, the coastal state is entitled to a 200 nautical mile outer limit anyway. Thus we find an artificial outer limit created by legal fiction regardless of the actual geological extent of the continental margin. With regard to wide margin states, the articulation of the juridical outer limit is considerably complex as reflected in paragraph 4, which provides as follows:

(a) For the purposes of this Convention, the coastal State shall establish the outer edge of the continental margin wherever the margin extends beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured, by either:

(i) a line delineated in accordance with paragraph 7 by reference to the outermost fixed points at each of which the thickness of sedimentary rocks is at least 1 per cent of the shortest distance from such point to the foot of the continental slope; or

(ii) a line delineated in accordance with paragraph 7 by reference to fixed points not more than 60 nautical miles from the foot of the continental slope.⁶²

The above provision referred to as the "Irish formula" provides for an option which the coastal state can invoke. As explained by Churchill & Lowe-

The limit is either a line connecting points not more than sixty miles apart at each of which points the thickness of sedimentary rocks is at least one percent of the shortest distance from such point to the foot of continental slope, or a

⁶⁰*Supra*, note 40 at pp. 58-61

⁶¹*Supra*, note 1 at pp.148-150 in particular see footnote 11 at p.148

⁶²Paragraph 7 provides that the delineation of the outer limit shall be by straight lines not exceeding sixty nautical miles in length connecting fixed points identified by geographical co-ordinates

line connecting points not more than sixty miles apart, which points are no more than sixty miles from the foot of the slope.⁶³

Limitations are placed on both the above-noted options by paragraph 5, which read as follow:

The fixed points comprising the line of the outer limits of the continental shelf on the seabed, drawn in accordance with paragraph 4 (a)(i) and (ii), either shall not exceed 350 nautical miles from the baselines from which the breadth of the territorial sea is measured or shall not exceed 100 nautical miles from the 2,500 metre isobath, which is a line connecting the depth of 2,500 metres.

This limitation means that regardless of which option is chosen, the maximum outer limit must be either within a distance of 350 nautical miles from the baseline or within 100 nautical miles from the 2500-metre isobath. It is, however, misleading to consider these limitations as absolute. There are indeed exceptions to the limitations provided in paragraph 6 which, however, are not as clearly drafted as might be expected. The following is the wording of paragraph 6:

Notwithstanding the provisions of paragraph 5, on submarine ridges, the outer limit of the continental shelf shall not exceed 350 nautical miles from the baselines from which the breadth of the territorial sea is measured. This paragraph does not apply to submarine elevations that are natural components of the continental margin, such as its plateaux, rises, caps, banks and spurs.

From the above text, it would seem that in respect of submarine ridges, the 2,500-metre isobath plus 100 nautical miles option is not available; the maximum is 350 nautical miles. But the second sentence in the paragraph would appear to state that the maximum limit of 350 nautical miles does not apply to submarine elevations which are natural components. Examples of such submarine elevations cited in that paragraph are plateaux, rises, caps, banks and spurs.

It has long been alleged that the Irish formula lacks certainty in that there is considerable scope for changes occurring to the configuration of the seabed; that there is lack of adequate bathymetric information, that it is not easy to locate the positions of the 2,500-meter isobath, that the sedimentary rock thickness is not accurately discernible so as to fix the outer limit under

⁶³*Supra*, note 1 at pp. 148-149

Article 76 with any degree of precision.⁶⁴ It is notable that subparagraph (b) of paragraph 4 provides that-

In the absence of evidence to the contrary, the foot of the continental slope shall be determined as the point of maximum change in the gradient at its base.

In addition to the above examples of lack of certainty, it is also alleged that it is virtually impossible to determine the location of the foot of the slope. As mentioned above, the foot of the slope is where most of the off-shore hydrocarbon resources are to be found. It is therefore important for wide margin states to be able to identify as precisely as possible, the location and extent of the foot of the slope. Despite the above noted uncertainties, recent scientific revelations indicate that the Article 76 formula is not as uncertain as many may think. Indeed, at least in so far as the location of the foot of the slope is concerned, it can be determined with a fair degree of precision.⁶⁵

The continental shelf is both similar to and also different from the EEZ. Indeed there is a conspicuous overlap between the two zones. Whereas the EEZ consists of both, the sea-bed and subsoil as well as the superjacent waters, the continental shelf has only one component; that is the sea-bed and subsoil. Thus, up to a distance of 200 nautical miles from the baseline there is an overlap between the EEZ and continental shelf regimes in respect of the sea-bed and subsoil. Perhaps the most important attribute that both regimes share is that the coastal state is entitled to exercise sovereign rights over exploration and exploitation of natural resources in both the EEZ as well as the continental shelf; and in both instances the rights are exclusive so that if the coastal state does not exercise its right, no other state may undertake such activities without the express consent of the coastal state.⁶⁶

One difference between the two regimes is that whereas the EEZ needs to be claimed as mentioned earlier, the continental shelf is an inherent right of the coastal state. Thus, its rights "do not depend on occupation, effective or notional, or on any express proclamation".⁶⁷ It is notable that the natural resources of the continental shelf consist of mineral and other non-living resources of the sea-bed and subsoil and also living organisms of the sedentary species.⁶⁸ In this paragraph, "sedentary species" is defined as "organisms which, at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or the subsoil". While there is an overlap between the EEZ and the continental shelf regimes in relation to the resources of the sea-bed and

⁶⁴*Ibid.*, at p.149; see also P.A.Verlaan, "New seafloor mapping technology and article 76 of the United Nations Convention on the Law of the Sea", (1997), 21 *Marine Policy* pp. 425-434

⁶⁵See Vaughan Stagpoole, *et al*, "Foot of the Continental Slope in Article 76", Institute of Geological & Nuclear Sciences, Lower Hutt: New Zealand, at p.4 www.gmat.unsw.edu.au/ablos/.../PAPER2-1.PDF, visited on 28 March 2012

⁶⁶Article 77, paragraph 1 and 2

⁶⁷Article 77, paragraph 3

⁶⁸Article 77, paragraph 4

subsoil it should be noted that Article 56 paragraph 3 provides that those rights must be exercised in accordance with Part VI of the Convention which is the Part that deals with the continental shelf.

Beyond 200 nautical miles from the baseline, a wide margin state enjoys the rights pertaining to the extended continental shelf as provided in Articles 76, 77, 80 and 81.⁶⁹ In the extended continental shelf, the rights mentioned in Article 77 apply equally to the shelf within 200 nautical miles as well as beyond that limit up to the outer limit of the extended shelf as determined under Article 76. An important point to be noted in respect of the extended continental shelf is that the coastal state must make payments or contributions in kind in respect of the exploitation of non-living resources⁷⁰, except that a developing state which is a net importer of a mineral resources produced from its continental shelf is not required to make such payments or contributions.⁷¹

⁶⁹Articles 80 and 81 relate to artificial islands, installations and structures and drilling on the continental shelf which is an exclusive right

⁷⁰Article 82, paragraph 1

⁷¹Article 82, paragraph 3

3 Selected Functions in Maritime Zones and their Legal Implications

As indicated above, the functional approach has increasingly gained more importance than the zonal approach to the international law of the sea as reflected in UNCLOS. In this part of the thesis, four selected functions in the maritime zones of a coastal state are discussed in contextual detail.

3.1 Fisheries and Fishing

The sea is the physical environment which provides the different kinds of resources, both living and non-living for the global community at large. Fish and other living resources of the sea provide food for human consumption which is the main reason why fisheries resources have gained notable significance in the development of the modern law of the sea. Fisheries was the subject matter of one of the Geneva Conventions of 1958.⁷² In the past, prior to the adoption of UNCLOS, fishing and fisheries came under the regime of the high seas. However, in UNCLOS, with the establishment of multiple maritime zones, in particular the EEZ, fishing rights fell under several zones. This goes to show that the functional approach is a better measure than the zonal approach to the establishment of legal principles for governing rights and responsibilities pertaining to fisheries and fishing as an activity.⁷³

Freedom of the seas was firmly established as a legal doctrine by the end of the 18th century. Freedom had the connotation that the seas were open to all states; and it was, at least in the context of the living resources of the oceans, an equally firm belief among the world community at large that they were inexhaustible. There was no international regulation or restriction to control or limit any state to exploit the bounties of the seas. So long as states carried out activities outside the territorial seas of a coastal state, they had the freedom to use the seas. No state was able to assert any rights or control over fishing activities on the high seas. One significant example was the dispute between the United States (U.S.) and Great Britain relating to British fishermen catching and killing seals for obtaining seal fur in the Behring Sea which was considered a cruel activity by the U.S. The arbitral tribunal in rendering the award held that the British activity occurred far beyond the territorial seas of the U.S. and under international law it was a freedom which the British fishermen were entitled to enjoy on the high

⁷²United Nations Convention on Fishing and Conservation of the Living Resources of the High Seas, 1958

⁷³M. Dahmani, *The Fisheries Regime of the Exclusive Economic Zone*, Volume 11, Dordrecht/ Boston/ Lancaster: Martinus Nijhoff Publishers, 1987 at p.1

seas.⁷⁴ This decision confirmed the regime of freedom of the high seas by virtue of which no state could control any activity of another state in the high seas or restrict the amount of fish catches.⁷⁵

The fishing rights of coastal states are now entrenched in Article 56 of UNCLOS. This Article gives to coastal states the right to exploit living resources in the superjacent waters as well as the sea-bed of the EEZ. However, the rights of the coastal state in the EEZ depend on the proclamation or declaration of an EEZ or an exclusive fisheries zone by the coastal state. Article 56 enables coastal states to assert their rights in the EEZ. Therefore, the area over which fishing rights can be asserted is based on the claim of the coastal state which can extend to any distance beyond the outer limit of the territorial sea up to 188 nautical miles from that limit.⁷⁶

The provisions relating to fishing and fisheries are contained in Part V of UNCLOS which deals with the regime of the EEZ. There is nothing in UNCLOS pertaining to the tasks and duties of states pertaining to fishing or any prohibition of harmful activities but the convention provides for planning and management structures to be put into place by coastal states for the efficient and effective management and conservation of their living resources. The provisions have been articulated for the benefit and economic interests of both coastal states as well as the international community at large. The principal responsibility of coastal states is to manage and conserve the living resources in their superjacent waters and the sea-bed and to control and limit overexploitation activities carried out by local as well as foreign fishermen.⁷⁷

Besides the general framework provided by the Convention for coastal states to regulate their own conservation and preservation restrictions, there are provisions under which States can adapt to particular circumstances taking account of their national interests and in respect of their population, economic interests, food consumption, and financial and geographical situations. The maximum sustainable yield (MSY) is another regime that the Convention provides for states to appreciate the objective of conservation and preservation. The term MSY is defined as “a constant amount of catch produced by a fish-stock at a given effort of fishing.”⁷⁸ Conceptually it is the measure adopted by the state to determine the level at which over-exploitation is deemed to occur. The factors that need to be considered in arriving at the MSY include the biological parameters of fish stock, as well as social, economic and political needs and implications of each state. In

⁷⁴*U.S.A. v. Great Britain* (Behring Sea Arbitration Award) 1893, reported in Moore's Digest of International Arbitration at pp. 836-920

⁷⁵*Supra*, note 73 at pp.1-2

⁷⁶*Ibid.*, at pp.34-35

⁷⁷*Ibid.*, at pp.42-43

⁷⁸*Ibid.*, at p. 43. See also footnote 39 at p. 124 of that text where reference is made to John P. Harville, "Multidisciplinary Aspects of Optimum sustainable Yield" in Proceedings of a Symposium on Optimum Sustainable Yield as a Concept in Fisheries Management, Honolulu, Hawaii, September 9, 1974, American Fisheries Society, Special Publication No. 9, Washington D.C., 1975, pp. 51-64.

other words, it can be said that the regime of MSY combines both environmental and economic factors. Therefore, the state does not only have a task to manage MSY of the fish stocks but also needs to be concerned with the economic and environmental interests of the state too. For example, if the state is under a food shortage or there is widespread unemployment, the state must increase the amount of fish stocks to a level above the normal biological MSY level.⁷⁹

As mentioned above, UNCLOS does not provide for specific measures to be undertaken by coastal states in respect of conservation and preservation of living resources. However, Article 61 provides the legal framework for the management by coastal states of their living resources in their EEZ and for measures to be adopted for maintaining their quantities. Under the first paragraph, the task of the coastal state is to limit the amount of fish catches or catches of other living resources in the EEZ. The coastal state also has to provide measures to conserve and manage the number of living resources to ensure that the amount of living resources will not be subjected to over-exploitation. Besides, coastal states have to maintain the levels of living resource populations to ensure that they will not decrease rapidly. The convention provision requires coastal states to create measures to ensure that the population of living resources will be at an adequate level for harvesting over the long term. Notably, the term "maximum sustainable yield" is used in paragraph 3 of Article 61 in this context. However, the measures adopted by states necessarily depend on factors such as levels of consumption, economic condition, the available technology and the state of trade in fishing in each state. Of course, different fishing communities have different needs. Thus it must be ensured by a coastal state that any measures used by it to maintain or increase one or another species will not threaten other species in the seas. Thus, it is important for coastal states to make all data relating to scientific information and catch and fishing statistics and fishing stocks available to both national and international organizations.⁸⁰

Article 62 provides the scope for the utilization of living resources by the coastal state in the EEZ. This Article requires coastal states to promote the utilization of living resources to maximize the accrual of benefits for itself and also serve the interests of other states. Previously, all states concentrated their efforts on fishing on the high seas since there was no concept of an EEZ. Since UNCLOS brought in the regime of the EEZ, there is now in place a legal framework for coastal states to determine their capacity to harvest the living resources in their respective EEZs. Furthermore, under Article 62 it is now open to other states through agreement to harvest the remainder of the living resources which the coastal state has no ability to exploit. However, in every case where the coastal state offers access rights to other states to harvest the surplus of the allowable catch, the coastal state must take account of the rights of land-locked and geographically disadvantaged states. The coastal state must also consider the rights of developing states in the region or sub-region and recognise the need to

⁷⁹ *Supra*, note 73 at pp.43-44

⁸⁰ UNCLOS Article 61.

minimise the economic dislocation in those states whose nationals have traditionally enjoyed fishing rights in that coastal state's EEZ.

The Article also requires nationals of other states fishing in the EEZ to comply with the relevant conservation requirements of the coastal states. All coastal state requirements must provide for terms in their national law relating to, *inter alia*, fishermen and fishing vessel licenses, quotas of species and quantities of catch allowance, determine fishing seasons and types, sizes and numbers of fishing gears and vessels, regulate ages and sizes of living resources that may be caught, require fishing vessels to report all fishing data and bring any catches to the port. Coastal states are also required to provide for the training of fishing personnel and place observers or trainees in the fishing vessels. All in all, the fishing laws and regulations must be given due publicity by the coastal state.⁸¹ The text of paragraph 4 of Article 62 reads as follows:

Nationals of other States fishing in the exclusive economic zone shall comply with the conservation measures and with the other terms and conditions established in the laws and regulations of the coastal State. These laws and regulations shall be consistent with this Convention and may relate, *inter alia*, to the following:

- (a) licensing of fishermen, fishing vessels and equipment, including payment of fees and other forms of remuneration, which, in the case of developing coastal States, may consist of adequate compensation in the field of financing, equipment and technology relating to the fishing industry;
- (b) determining the species which may be caught, and fixing quotas of catch, whether in relation to particular stocks or groups of stocks or catch per vessel over a period of time or to the catch by nationals of any State during a specified period;
- (c) regulating seasons and areas of fishing, the types, sizes and amount of gear, and the types, sizes and number of fishing vessels that may be used;
- (d) fixing the age and size of fish and other species that may be caught;
- (e) specifying information required of fishing vessels, including catch and effort statistics and vessel position reports;
- (f) requiring, under the authorization and control of the coastal State, the conduct of specified fisheries research programmes and regulating the

⁸¹UNCLOS Article 62

- conduct of such research, including the sampling of catches, disposition of samples and reporting of associated scientific data;
- (g) the placing of observers or trainees on board such vessels by the coastal State;
- (h) the landing of all or any part of the catch by such vessels in the ports of the coastal State;
- (i) terms and conditions relating to joint ventures or other cooperative arrangements;
- (j) requirements for the training of personnel and the transfer of fisheries technology, including enhancement of the coastal State's capability of undertaking fisheries research;
- (k) enforcement procedures.

Article 63 deals with stocks existing within the EEZs of two or more coastal states or associated stocks in the same zones. The Article requires the relevant states to coordinate among themselves directly or through agreements reached within regional or sub-regional organizations, the object being to adopt conservation measures and develop such stocks. Similar actions are required to be taken in respect of the same stocks or stocks of associated species which are present in areas beyond and adjacent to the respective EEZs.⁸²

In essence, Article 63 provides the regime for coastal states to adopt conservation measures relating to stocks. The first paragraph requires the states, whose stocks are in their EEZ to agree to propose conservation measures but there is no legal or scientific framework prescribed for the determination of such measures. It is left to states to design their own schemes Paragraph 2 deals with situations where there are stocks both in the EEZ as well as in the high seas. Thus the management regime applicable to these stocks consists of two separate components; one for stocks within the EEZ and the other for stocks existing in the high seas. The content of paragraph 2 of Article 63 resembles Article 118 of the Convention which provides that “[S]tates shall cooperate with each other in the conservation and management of living resources in the areas of the high seas”. Article 63 provides that “the coastal State and the States fishing for such stocks in the adjacent area shall seek, either directly or through appropriate sub-regional or regional organizations, to agree upon the measures necessary for the conservation of these stocks in the adjacent area”.⁸³

As mentioned above, the EEZ regime is one that must be expressly declared by a coastal state through legislation or otherwise. Thus, it is logical that the rights which the coastal state is entitled to enjoy pertaining to fisheries and other living resources carry with it certain responsibilities. In the main these include conservation measures which should extend to all varieties of species.

⁸²UNCLOS Article 63

⁸³*Supra*, note 73 at pp.113-115

In this context, the first species is the highly migratory ones addressed in Article 64. States whose nationals fish in waters infested with such species are required to cooperate either directly with one another or through appropriate international organizations. The object of such cooperation is to ensure conservation and to promote optimum utilization of the species in the waters of the region within and beyond the limits of the EEZ. If there is no existing organization, coastal states of the region should strive to establish one and endeavour to participate in it.

Highly migratory species continuously change their habitat. A list of such species is found in Annex 1 of UNCLOS. The list includes tuna, sword-fish, dolphins and oceanic sharks. All these sea-animals constantly change their habitat. Paragraph 2 of Article 64 provides for its application to other provisions of Part V with regard to highly migratory species. Thus, such species found in the EEZ should be treated as other living resources under Part V. The coastal state has the right to determine the total allowable catch (TAC) and can allow other states to catch the surplus if it does not itself have the capability to harvest all of those resources.⁸⁴

Pursuant to Article 65, states must cooperate towards the conservation of marine mammals. The ones of most concern among marine mammals are the cetaceans such as whales, dolphins and porpoises. Article 65 provides for duties of the coastal state and international organizations to co-operate “to prohibit, limit or regulate the exploitation of marine mammals.” Marine mammals need strict regulation because they cannot reproduce themselves in the same manner as other marine living resources. Given the past over-exploitation of these species, the Convention establishes through this provision a framework for the coastal state and international organizations to conserve and maintain the numbers of marine mammals and prohibit or limit their exploitation in stricter terms than what is prescribed in this Article. Harvesting, especially within the EEZ, is of particular concern. Marine mammals get special protection not only within the EEZ but also on the high seas. Article 120 of the Convention states that “[A]rticle 65 also applies to the conservation and management of marine mammals in the high seas”. Hence, coastal states and international organizations are required to conserve and create measures for the preservation of marine mammals both within the EEZ and the high seas.⁸⁵

Anadromous stocks are dealt with in Article 66. They are a species which swim up from the seas into tidal waters or upstream freshwater areas such as rivers and canals to spawn, but their habitat is in the seas. Such fish as salmon and sea animals such as turtles belong to this species. Hence, according to Article 66, states in whose waters anadromous stocks spawn

⁸⁴*Ibid.*, at p.105-106

⁸⁵*Ibid.*, at p.111

"shall have the primary interest in and responsibility for such stocks"⁸⁶. It means that the state of origin has the responsibility for the conservation, management and allocation of the spawns. The legal framework under which states must fulfil their conservation responsibilities is provided in paragraph 2 of Article 66. Pursuant to this provision, the state must adopt regulatory measures for the conservation of fish and of fishing in all waters from the landward side of the baselines up to the outer limits of the EEZ and regulate the number of total allowable catches (TAC) originating in their rivers.

Even if the anadromous species are in the EEZ of one coastal state and the fish then migrate to spawn in the waters of another state which is not the state of origin, the states must cooperate to conserve them. It is important to note that fishing of anadromous species is only allowed in the EEZ of a coastal state in the first instance. However, under paragraph 3(a), there is provision for fishing beyond the EEZ where fishing only in the EEZ of the coastal state may result in economic dislocation for another state. In such case, the interested states must engage in consultations with the coastal state to arrive at agreements whereby the conservation needs and requirements of the latter are given due regard. Thus, anadromous species are the responsibility of all concerned states, but the state of origin, namely, the state where the anadromous fish migrate to spawn, must cooperate with other states to minimise the economic dislocation in those states taking into consideration their normal catch quantities and operational modes. It is apparent that subparagraphs (a) and (b) of paragraph 3 complement each other.

The next species of living resources is the catadromous species. The life cycle of this species is opposite to that of the anadromous. Their habitat is in fresh water but during the spawning period they move to open seas. Eels are typical members of the catadromous species. The coastal states whose waters are the natural habitat of catadromous species are responsible for their management and conservation. The state must ensure that they are able to ingress and egress. The concept of fishing this kind of species is totally different from the anadromous stocks because their life starts within the waters of the coastal state's territory but they spawn in the high seas. Therefore, fishing this species in the high seas is prohibited and there is no exception.⁸⁷ Another point of observation is that regardless of whether the coastal state has the capability to fish catadromous species, there is no provision suggesting or compelling that state to open its fishing quota to other states unlike the case of regulation of anadromous species. One commentator points out that "the coastal state is left with a wide discretion to prescribe and enforce any conservation and management measures it may consider appropriate and to allow or deny access of other states to these species even where it does not have the capacity to harvest the entire allowable catch".⁸⁸ Paragraph 2 of Article 67 restricts the harvesting of

⁸⁶UNCLOS Article 66, paragraph 1

⁸⁷Article 67, paragraph 2. See also *supra*, note 73 at p. 103

⁸⁸*Ibid.*, at p. 104

catadromous species to waters landward of the outer limits of the EEZ. However, if the fish migrate to spawn in the EEZ of another state, the relevant states must cooperate to maintain the species.⁸⁹

"Sedentary species" is a species defined in Article 77, paragraph 4 as "organisms which, at the harvestable stage, either are immobile on or under the sea-bed or are unable to move except in constant physical contact with the sea-bed or the subsoil." According to this definition, this is a species of organisms that is not of the same type as other species which fall under the EEZ regime. Indeed Article 68 of the Convention expressly excludes the application of Part V to sedentary species. Because sedentary species are so excluded, only the coastal state has the exclusive right to harvest this species;⁹⁰ and if the coastal state has no ability to harvest, it has the exclusive right to determine whether or not to give rights to other states in the absence of any provision compelling the coastal state to allow other states to catch the surplus.

It seems anomalous that the coastal state has no complementary or corresponding obligation to adopt measures to conserve, maintain or restore the species because the species are excluded from the application of Part V which requires coastal states to conserve the living resources within their maritime zones. Notably, Part VI which contains the continental shelf regime and deals with sedentary species in Article 77 does not obligate the coastal state to conserve sedentary species.⁹¹

3.2 Navigation

Since ancient times up until the present modern age, the sea and its uses have gained increasing importance in everyday life. The significance of the seas in various respects continues to grow as trade and commerce flourishes across the globe and related seaborne activities and occupations face new challenges in a changing economic, social and technological world not to mention the detrimental effects of marine pollution and other menaces such as piracy and unlawful acts at sea. The functional approach of UNCLOS reflects the international maritime community's multifarious interests tied to the seas and its bounties. As mentioned earlier, one of the primary concerns of the new law of the sea is to provide for "rights and obligations of States regarding the use, management, and control of ocean space..."⁹² In this context it has been pointed out by the eminent Judge Thomas A. Mensah citing the words of Louis B. Sohn acclaimed as one of the fathers of the modern international law of the sea, that-

⁸⁹*Supra*, note 73 at pp.103-104; see also UNCLOS Article 67

⁹⁰UNCLOS Article 77, paragraph 1

⁹¹*Supra*, note 73 at pp.104-105

⁹²Thomas A. Mensah, Preface to Donald R. Rothwell and Sam Bateman (eds.) *Navigational Rights and Freedoms and the New Law of the Sea*, The Hague/ London/ Boston : Martinus Nijhoff Publishers, 2000 at p.vii

[T]wo principles have governed the law of the sea since early times when sailors and fishermen first ventured into the sea: the right of the coastal state to control a narrow strip along the coast, and the freedoms of navigation and fishing in the high seas beyond that coastal area.⁹³

Fishing, as one of two sea uses or functions alluded to above, has already been discussed in contextual detail. The other function is navigation with which this section of the thesis is concerned. It is submitted that navigation is and always has been the most important and significant of sea uses. Shipping is the primary means of global transportation and seaborne trade is considered to be the lifeblood of every nation to which marine navigation is intimately connected. All coastal states have an interest in navigation not only for trade and commerce reasons but also the associated concerns over maritime safety and security and the protection of their coastlines and coastal and hinterland interests as matters of priority ranking high on their national policy agendas. No doubt, states consider themselves duty bound to protect their citizens and residents from attacks emanating from the sea and to provide security measures along their coasts and seaways. Navigational safety and security is as much a matter of concern as the corresponding concept of freedom of navigation embedded in the international law of the sea since Grotius and his doctrine of *mare liberum* which became firmly established as the cornerstone of that law.

Yet in terms of the codification of the customary law of the sea first through the Geneva Conventions of 1958 and subsequently through UNCLOS, it is alleged that shipping has not been accorded the attention and status it deserves although public law rules pertaining to navigational rights and responsibilities have been addressed. The illustrious Professor Edgar Gold has stated that-

... The new law of the sea has in the past decade addressed itself to all areas of ocean use except the one that since before the dawn of history, has been preeminent - the use of the ocean as a means to transport people and their goods from place to place on this planet, so much more of which is water than is land. Marine transport has been discussed in an almost abstract manner, as if it did not fit or belong within the public domain but needed to be confined to the more "private" region of international commerce, which was considered to be outside the scope of the law of the sea.⁹⁴

In referring to the artificial bifurcation between public and private maritime law in respect of navigation and shipping and in support of Professor Gold's comment, another distinguished author has stated that it-

⁹³*Ibid.*

⁹⁴Edgar Gold, *Maritime Transport : The Evolution of International Marine Policy and Shipping Law*, Toronto: Lexington Books, 1981, Introduction at p. xix

is not entirely the product of narrow private law perceptions of maritime law, nor necessarily, of the inherent biases of the commercial world. It is evidently as much a product of perceived superiority of public power.⁹⁵

Against the above background, it is recognized that navigation is inherently a part of shipping and is probably the most important sea use dating from ancient times long before the eras of power-driven vessels and even sailing ships. It is well documented that ancient maritime civilizations such as those of the Egyptians, Phoenicians and Greeks, oars were the main means of ship propulsion even in distant voyages. In the following text the role of navigation as a major function in the various maritime zones of a coastal state as depicted in UNCLOS is discussed.

3.2.1 Navigation and Passage

In ordinary shipping parlance, the word "voyage" and "passage" are often used interchangeably although it is more accurate to say that passage is a part of a voyage and navigation is something that is conducted throughout a voyage. Thus passage is an integral part of navigation. However, in legal terms the word "passage" has some specific connotations under UNCLOS in which the navigation regime consists of three kinds of passages; namely, innocent passage, transit passage and archipelagic sea-lane passage. The application or non application of the various concepts of passage pertaining to each maritime zone will be discussed in the following text. As well, the notion of freedom of navigation will be addressed contextually.

3.2.2 Internal Waters

Within the internal waters of a coastal state, ships of other states have no inherent freedom of navigation, or generally, any right of innocent passage. The coastal state has the right to apply institute a navigation regime as a regime within its land territory where navigational rights of a foreign ship are entirely subject to the sovereignty of the coastal state. Whatever rights such a ship may enjoy in the internal waters are a matter of discretion pursuant to the domestic law of the coastal state. UNCLOS does not provide for any rights of innocent passage to navigate within internal waters except in one case. If straight baselines are drawn by the coastal state in such a manner as to enclose areas which had not been a part of internal waters prior to UNCLOS, foreign ships may enjoy a right of innocent passage in those waters.⁹⁶

⁹⁵Proshanto K. Mukherjee, *Maritime Legislation*, Malmo: WMU Publications, 2002, at p. 2

⁹⁶Hasjim Djalal, "The Law of the Sea Convention and Navigational Freedoms" in Rothwell and Bateman (eds.) *Navigational Rights and Freedoms and the New Law of the Sea*, *supra*, note 92 at p.1

3.2.3 Territorial sea

As mentioned earlier, in the territorial seas, a coastal state enjoys sovereignty but that sovereignty is not 100 percent as in the internal waters, but is subjected to the right of innocent passage of a foreign ship. The notion of innocent passage has its roots in customary international law subsequently codified through conventions and referred to in international case law.⁹⁷ Innocent passage pertains primarily to territorial seas of all states including those of an archipelagic state but also applies in archipelagic waters.⁹⁸ The terms "passage" and "innocent passage" are defined in detail in Articles 18 and 19 of UNCLOS. These have been discussed in the previous Section of this thesis. However, at this juncture it would be useful to reproduce the text of Article 19 because the navigation rights of foreign ships in the territorial seas of a coastal state can be limited if its passage is not considered to be innocent.

1. Passage is innocent so long as it is not prejudicial to the peace, good order or security of the coastal State. Such passage shall take place in conformity with this Convention and with other rules of international law.

2. Passage of a foreign ship shall be considered to be prejudicial to the peace, good order or security of the coastal State if in the territorial sea it engages in any of the following activities:

(a) any threat or use of force against the sovereignty, territorial integrity or political independence of the coastal State, or in any other manner in violation of the principles of international law embodied in the Charter of the United Nations;

(b) any exercise or practice with weapons of any kind;

(c) any act aimed at collecting information to the prejudice of the defence or security of the coastal State;

(d) any act of propaganda aimed at affecting the defence or security of the coastal State;

(e) the launching, landing or taking on board of any aircraft;

(f) the launching, landing or taking on board of any military device;

(g) the loading or unloading of any commodity, currency or person contrary to the customs, fiscal,

⁹⁷See Donald R. Rothwell, "Innocent Passage in the Territorial Sea: The UNCLOS Regime and Asia Pacific State Practice" in Rothwell and Bateman, (Eds) *Navigational Rights and Freedoms in the New Law of the Sea*, supra, note 92 pp. 74-93, particularly at p.74

⁹⁸Article 52, paragraph 1 provides, *inter alia*, that "...ships of all states enjoy the right of innocent passage through archipelagic waters". Navigation in archipelagic waters is dealt with in detail later in this Section.

immigration or sanitary laws and regulations of the coastal State;
(h) any act of wilful and serious pollution contrary to this Convention;
(i) any fishing activities;
(j) the carrying out of research or survey activities;
(k) any act aimed at interfering with any systems of communication or any other facilities or installations of the coastal State;
(l) any other activity not having a direct bearing on passage.

It is notable that two functions that are normal and otherwise lawful in other maritime zones are considered to be non-innocent under Article 19. These are fishing activities and research or survey activities. The remaining items in Article 19 paragraph 2 would appear to be inherently non-innocent as they would under any circumstances be prejudicial to the peace, good order or security of the coastal state. Most of these activities have political or security implications or would constitute an illegal activity pursuant to which the enforcement jurisdiction of the coastal state may apply under Article 33 or the coastal state may suffer damage from an act of wilful or serious pollution. It is evident from the above that a foreign ship's right of innocent passage in the territorial seas is subject to strict controlling factors set out in Article 19, the non compliance of which will render passage non-innocent within the meaning of the convention. In addition to the above, it is to be observed, as discussed in detail in the previous Section of this thesis, that the coastal state is entitled to adopt laws in respect of a number of specific matters, three of which are virtually identical to their corresponding items in Article 19.⁹⁹

Apart from the anomalously repetitive nature of these items, there is no express statement to the effect that a violation of the coastal state's laws referred to in Article 21 by a foreign vessel will constitute non-innocent passage. While there is no clear indication in the Convention, if there is a violation the coastal state may be entitled to halt navigation or it may be that the foreign vessel will simply be subjected to its prescriptive jurisdiction.¹⁰⁰

Articles 24 and 25 appear to balance the navigation rights of foreign vessels within territorial seas of a coastal and the coastal state's rights in its own territorial seas. As mentioned earlier, the coastal State is prohibited from hampering the innocent passage of a foreign ship through its territorial

⁹⁹See Article 19 (2) (g), (h), (i), (n) and (j) and Article 21(1) (d), (e), (f), (g) and (h)

¹⁰⁰Donald R. Rothwell in Rothwell & Bateman, *supra*, note 92 at p.76 citing in footnote 9 at that page Tommy T.B. Koh, "The Territorial Sea, Contiguous Zone, Straits and Archipelagoes under the 1982 Convention on the Law of the Sea" (1987) 29 *Malaya Law Review* 163 at 168; and Francis Nganthca, *The Right of Innocent Passage and the Evolution of the International Law of the Sea* (1990), at p. 175.

sea¹⁰¹ but is entitled to take steps necessary to prevent passage that is not innocent.¹⁰²

Whether warships or other military craft can conduct passage through a coastal state's territorial sea that is actually innocent has been a matter of debate for a long time. There appears to be no outright prohibition on such vessels passing through territorial seas in general. Whether passage is non-innocent is thus basically a question of fact dictated by relevant provisions of Article 19. Unless certain specific activities that are mentioned in that Article are conducted, passage of warships is not prohibited and is, therefore, *prima facie*, not illegal under UNCLOS. In essence, so long as warships navigate without causing any danger to the security of the coastal state, they can be considered to be carrying out innocent passage within the meaning of UNCLOS and are entitled to the rights connected to such passage in the territorial sea. It is arguable, however, that the mere presence of a warship in the territorial sea constitutes apprehension of endangerment to the coastal state by reason of the ship's proximity to the coastline and coastal interests of the state concerned. It is notable in this context that subparagraphs (a) to (f) of paragraph 2 of Article 19 provide for specific acts that would render passage not being innocent, and all these can potentially be carried out by warships. In the case of submarines and other underwater vehicles, during passage through the territorial seas, these vessels are required by Article 20 to navigate on the surface and display their flags. Only if they comply will they be entitled to the rights of innocent passage.¹⁰³

Under Article 25, paragraph 3 of UNCLOS, a coastal state may declare specified exclusion zones or otherwise suspend the right of innocent passage of foreign ships if it deems it necessary for the protection of its security. This may include prohibition of weapons exercises.¹⁰⁴

3.2.4 Archipelagic waters

Archipelagic waters is a new and special maritime zone which pertains only to archipelagic states such as The Philippines and Indonesia. The term "archipelagic waters" is a creation of UNCLOS. During the negotiations at the Third U.N. Conference on the Law of the Sea, two alternative approaches were discussed. One view was to design a special navigational regime for archipelagic waters. This view, mainly espoused by the archipelagic states, was to treat the waters in an archipelagic system as a part of the regime of internal waters so that no right of innocent passage for foreign ships would exist as in the territorial seas. The other viewpoint was that archipelagic waters should be treated as a part of the EEZ. The rights of

¹⁰¹UNCLOS Article 24 paragraph 1

¹⁰²UNCLOS Article 25 paragraph 1

¹⁰³See Donald R. Rothwell, *supra*, note 97 at p.77

¹⁰⁴UNCLOS Article 25(3); see also Rothwell, *ibid.*, at pp. 92-93

the archipelagic state in those waters would be limited to rights to explore and exploit the natural resources while the rights of navigation in those waters would be open to all states as in the high seas. Following extensive negotiations at the Conference, a compromise was reached pursuant to which a new maritime zone was created - the regime of archipelagic waters. The attributes of this regime can be summarized as follows:

1. there is no right of any passage in the internal waters within archipelagic waters;
2. there is a right of innocent passage in archipelagic waters as a whole (outside the internal waters) and in the territorial seas encompassing or surrounding the archipelagic waters ; and
3. there is a new and more “liberal” right of archipelagic sea lanes passage (ASLP) through specifically designated archipelagic sea lanes (ASL) in archipelagic waters.¹⁰⁵

As mentioned earlier, a foreign ship enjoys the right of innocent passage through the territorial seas as well as the archipelagic waters of an archipelagic state. However, if the territorial seas of an archipelagic state are adjacent to archipelagic sea lanes or the EEZ, the right of innocent passage may be temporarily suspended and the right of archipelagic sea lane passage may apply instead as indicated below:

The archipelagic state may, without discrimination in form or in fact among foreign ships, suspend temporarily in specified areas of its archipelagic waters the innocent passage of foreign ships if such suspension is essential for the protection of its security.¹⁰⁶

Article 53, which is a comprehensive Article dealing with the concept of archipelagic sea lane passage, provides for the designation of archipelagic sea lanes for the continuous and expeditious passage of foreign ships and the right of foreign ships to conduct such passage.¹⁰⁷

The archipelagic sea lane is a special sea lane which was designed for the navigation of vessels and aircraft passing through archipelagic waters in archipelagic states. The term of ‘sea lanes’ and ‘air routes’ appear in Article 53 of the Convention. Archipelagic states are able to designate these special lanes for the benefit of navigation of vessels and aircrafts. Indeed, the provision suggests that archipelagic states do so but there is no compulsion. The decision of the archipelagic state in this respect depends largely on the existing measure of security it has and whether in the interest of enhancement of security, archipelagic sea lanes are needed. According to the provision in question, “[A]n archipelagic State may designate sea lanes and air routes thereabove”. The word ‘thereabove’ limits the areas of air

¹⁰⁵Djalal, *supra*, note 100 at p.2

¹⁰⁶See Article 52, paragraph 2

¹⁰⁷Article 53, paragraphs 1 and 2

routes to those passing only over sea lanes and not the whole of the archipelagic waters, territorial seas and the archipelago itself. This special type of passage is known as "archipelagic sea lane passage" or ASLP. It is for aircraft and vessels to navigate through sea lanes and air routes continuously, expeditiously and unobstructed.¹⁰⁸ In this regime, activities such as fishing, marine scientific research are not considered to be continuous, expeditious and unobstructed passage through archipelagic sea lanes. The right of aircraft in terms of navigation under UNCLOS is distinguished from passage right provided for under the instruments of the International Civil Aviation Organization (ICAO). The purpose of UNCLOS is to designate rights for non-civil aircraft while ICAO is the organization whose aim is to designate routes for civil aircraft.¹⁰⁹

The right of archipelagic sea lane passage of a foreign ship applies for purposes of navigation and communication.¹¹⁰ Since navigation in archipelagic sea lanes is under the regime of archipelagic sea lanes passage, it is important to clearly understand the purport of the term "archipelagic sea lanes passage". The definition of archipelagic sea lanes passage is provided in Article 53 of UNCLOS as follows:

"Archipelagic sea lanes passage" means the exercise in accordance with this Convention of the rights of navigation and overflight in the normal mode solely for the purpose of continuous, expeditious and unobstructed transit between one part of the high seas or an exclusive economic zone and another part of the high seas or an exclusive economic zone.

According to the above definition, vessels and aircraft enjoy the right of navigation but they must navigate continuously, expeditiously and unobstructed. For the sake of clarity and better understanding of the purpose of archipelagic sea lanes passage, first it must be noted that there is a difference between the right of archipelagic sea lanes passage and the right of transit passage in "straits used for international navigation". As stated by one commentator, "ASLP navigation and over flight are regarded as the 'right' of navigation while in transit passage they are defined as the 'freedom' of navigation".¹¹¹ The quoted words emphasize the distinction between "right" and "freedom" of navigation. Aircraft and vessels may have rights in respect of navigation and overflight but may not have the freedom to enjoy the right.¹¹²

To facilitate easier understanding, it can be said that vessels and aircraft have the "freedom" of navigation and overflight so long as the act of navigation or overflight does not affect the security of the state. But if the navigation or overflight is limited to a "right", vessels and aircraft must

¹⁰⁸UNCLOS Article 53, paragraph 3

¹⁰⁹Djalal, *supra*, note 96 at pp. 4-5

¹¹⁰See *ibid.*, at p.1

¹¹¹*Ibid.*, at pp.5-6

¹¹²*Ibid.*, at p.6

follow certain rules despite having freedom. Another significance of the word is that the navigation must take place in a normal mode. This implies that the purpose of the navigation must be passage through the ASL and its aim must be for normal transportation such as merchant, passenger service or just passage from one part of the high seas or EEZ to another part of the high seas or EEZ. The most important distinctive character is that passage must be continuous, expeditious and unobstructed. No such legal concept exists in the regime of transit passage through straits used for international navigation.¹¹³

The term “all normal passage routes” can be found in paragraph 4 of Article 53 of the Convention. This paragraph explains the purpose of the ASLP which expressly provides that archipelagic sea lanes must include all normal passage routes used “for international navigation or overflight through or over archipelagic waters and, within such routes”. However, there is no clear definition of “all normal passage routes” in UNCLOS. There is nothing to imply that the use of ASLP on all normal passage routes arises as of right. Also, it is impossible to designate all normal passage routes as ASLP. Furthermore, the term “all normal passage routes” cannot be defined because all normal passage routes are different. Much depends on locations and routes in each state. Given the confusion surrounding the term “normal passage route”, one commentator provides the following opinion:

If “all normal passage routes” used by “all” countries in the world would be regarded as routes used for international navigation that could be designated as ASLP, then the whole archipelagic waters could be regarded as falling under the regime of ASLP.¹¹⁴

Sea lanes are routes for vessels and aircraft to navigate or overfly. If compared with land transportation, a sea-lane is the same as a road. An archipelagic sea lane is “a series of continuous axis lines from the entry points of passage routes to the exit points.”¹¹⁵ While navigating, vessels and aircraft are not allowed to deviate from the axis lines more than 25 nautical miles of each side during the passage. Thus the maximum width of a sea lane is 50 nautical miles. Besides, the navigation of vessels and aircraft is not permitted to navigate closer to the coast than 10 percent of the distance between the nearest points on islands bordering a sea lane. The maximum width of sea lanes was established following compromises and negotiations among the states.

The regime of archipelagic sea lanes (ASL) is the same as that of sea lanes. As opined by Djalal, “the ASL is not a corridor and the establishment of ASLs does not affect the status and the sovereignty of the archipelagic State over the ASLs and their airspace, seabed and subsoil and the resources

¹¹³*Ibid.*, at pp. 5-6

¹¹⁴*Ibid.*, at p.6

¹¹⁵UNCLOS Article 53 (5)

contained therein”.¹¹⁶ The rights to explore and exploit the resources of the coastal state still exist on the routes where there are sea lanes or ASL. In Article 53 there is no provision regarding the adjustment of sea lanes if the coastal state would like to have military practice or temporary exploitation over sea lanes. There is also no prohibition on any coastal state activities so long as the activity does not affect the rights of navigation of vessels and aircraft.¹¹⁷

Paragraph 12 of Article 53 provides as follows:

If an archipelagic State does not designate sea lanes or air routes, the right of archipelagic sea lanes passage may be exercised through the routes normally used for international navigation.

According to this provision, archipelagic states have the right to decide whether or not to designate ASLs. If the state decides not to designate ASLs it does not mean that foreign vessels or aircraft do not have the right to navigate over the zone of archipelagic waters but they are able to navigate over the “routes normally used for international navigation”. Besides, they also enjoy the ASLP rights during their navigation or overflight.

The application of this paragraph does not extend to, nor does the provision explain the “routes normally used for international navigation” regarding how many states or ships must be considered to make a route qualify as one used for international navigation. It may simply be implied from the navigation practices of states.¹¹⁸

When navigating in archipelagic waters, there are two rights that vessels and aircraft can exercise. If a vessel or aircraft navigates in an archipelagic sea lane, the right of ASLP is applied during navigation whereas the right of innocent passage will be exercised if navigation is outside the sea-lane.

1. Submarines and underwater vehicles exercising the right of innocent passage must navigate on the surface; when they are able to navigate underwater in “normal mode” they can navigate through ASLs by enjoying the right of ASLP;
2. With regard to the right of innocent passage there is no right of aircraft to overfly but they can fly over sea lanes by asserting the right of ASLP;
3. The archipelagic state has power to designate certain activities as falling outside the scope of ASLP; it can require other states to comply and can limit the ASLP rights of their ships;
4. In the case of warships navigating through zones where the right of innocent passage exists, there are no precise rules

¹¹⁶*Supra*, note 96 at p.7

¹¹⁷*Ibid.*

¹¹⁸*Ibid.*, at p.8

to force it to give prior notification. It is left to each state to adopt necessary measures. In respect of warships exercising the right of ASLP, some states may require prior notification because there is no prohibition to the contrary. While warships are entitled to the right of innocent passage over territorial seas, navigation must be innocent in that they must not operate as warships.¹¹⁹

3.2.5 Straits and Transit Passage

Straits are sea lanes designed for international navigation. States have the right of transit passage to navigate through straits. According to Article 38, paragraph 2, “transit passage” means “the exercise ... of the freedom of navigation and overflight solely for the purpose of continuous and expeditious transit of the strait between one part of the high seas or an exclusive economic zone and another part of the high seas or an exclusive economic zone.” The definition continues with the proviso that “... the requirement of continuous and expeditious transit does not preclude passage through the strait for the purpose of entering, leaving or returning from a State bordering the strait, subject to the conditions of entry to that State”. Incidentally, there is no definition in the Convention of a “strait”. But Article 37 provides that straits exist “between one part of the high seas or an exclusive economic zone and another part of the high seas or an exclusive economic zone”. It is notable that the distinguished authors Churchill and Lowe refer to the ordinary meaning of straits as “a narrow natural passage or arm of water connecting two large bodies of water”.¹²⁰

The right of transit passage is a right that is exclusively associated with straits under UNCLOS. As mentioned above, the purpose of straits is to facilitate international navigation but for reasons of security, and the economic and other interests of coastal states, there are certain limitations on the right of transit passage of ships and aircraft. If a strait is formed by an island of a State bordering the strait and its mainland; if there is seaward of the island, a route through the high seas or the EEZ of similar convenience with respect to navigational and hydrographical characteristics, then the right of transit passage does not apply.¹²¹ Hence, there are three categories of straits in which the right of transit passage does not apply. These are-

1. Straits which have a route between the high seas and the EEZ such as the Florida Strait between U.S.A. and Cuba
2. Straits which connect islands or the mainland to the EEZ or high seas; for example the Straits of Messina between Italy and Sicily

¹¹⁹Rothwell, *supra*, note 97 at p.77

¹²⁰*Supra*, note 1 at p. 102

¹²¹Article 38 paragraph 1

3. Straits which connect an area of the high seas or an EEZ with the territorial seas of another state such as the Strait of Tiran.¹²²

The rights and duties of ships and aircraft during transit passage were designed in Part III of the Convention. Duties of vessels exercising the right of transit passage include proceeding without delay, refraining from carrying out any actions which threaten the sovereignty of the coastal state, and refrain from any activities which are not a part of the normal passage in transit.¹²³

At the Third Law of the Sea Conference, discussions on the issue of straits extended to use of certain terminology including the terms “international straits” and “straits used for international navigation”. Incidentally, the term “international strait” appeared as if the regime of straits was designed for the “international community” and not for coastal states. It seemed as if coastal states lacked a sense of belonging; it was therefore considered that the term “straits used for international navigation” was better. The term “straits used for international navigation” aims to consider the functional attribute of a strait rather than sovereignty of the coastal state over the strait. For this reason, vessels and aircrafts are able to enjoy the right of navigation through straits for international navigation, and not only through the territorial seas but also the EEZ and the high seas.

There is some doubt as to whether vessels and aircraft are able to assert the right to navigate through straits used for international navigation in archipelagic waters. The answer is that it is not necessary to navigate in archipelagic waters to assert the right to navigate through straits used for international navigation, and the reason is that in archipelagic waters vessels and aircraft can freely navigate under the regime of ASL.¹²⁴

3.2.6 EEZ

The right of navigation in the EEZ is referred to in Article 58 (1) of UNCLOS where it is provided that all states whether they are coastal, land-locked or geographically disadvantaged, enjoy the freedom of navigation and overflight as stated in Article 87. Navigation beyond the EEZ or on the high seas is open to all vessels and aircraft. They can enjoy freedom of navigation without impediment so long as there is compliance with Article 58. Incidentally, whereas the coastal state has sovereign rights over natural resources and can exercise jurisdiction in respect of certain matters, foreign ships are entitled to three of the six freedoms of the high seas set out in Article 87. Freedom of navigation and overflight are among the three that can be asserted in the EEZ.¹²⁵

¹²²See *supra*, note 1 at p. 105

¹²³UNCLOS Article 39 paragraph 1

¹²⁴See Djalal, *supra*, note 96 at pp. 2-3

¹²⁵See Articles 58 and 87. See also Djalal, *ibid.*, at p. 4

3.3 Marine Scientific Research

3.3.1 Preliminary Observations

Marine scientific research (MSR) is one of the most important functions or activities that are carried out in the maritime zones of a coastal state. Prior to the advent of UNCLOS there was no international legal regime governing MSR mainly because no need for it was perceived. MSR is a relatively recent phenomenon in terms of maritime activities or sea use compared with fishing or navigation. One commentator has observed that -

Our knowledge of oceanic phenomena has increased abundantly since man first ventured out to the sea in search of new horizons. Early mariners accomplished great feats in the navigation and exploration of unknown waters with no other means than their keen sense of observation of the nature and behaviour of the winds and waves. In a broad sense, the origins of oceanic research are lost in antiquity. It is clearly evident, however, that the urge to acquire increased knowledge about the oceans' characteristics was a direct function of the navigational needs of bygone eras.¹²⁶

In contrast to MSR, hydrographic surveys or hydrography, which is considered to belong to the same genre as MSR or oceanic research, has been a regular maritime activity for a long time because hydrographic data goes into the making of nautical charts which in turn is essential for safe and efficient navigation.¹²⁷ Hydrography is basically a practical branch of oceanic inquiry consisting of two parameters, namely, knowledge of water depth or sounding, otherwise known as bathymetry, and the exact geographical position of that depth. It is closely related to marine geodesy which deals with the shape of the earth. Marine science, on the other hand consists of the disciplines of oceanography and marine geosciences. Oceanography comprises three branches, namely, physical, chemical and biological and the geosciences consist of marine geology, geomorphology and geophysics.¹²⁸

All states have traditionally been free to conduct MSR on the high seas.¹²⁹ While that legal position has not changed, the location of the high seas has. It is now beyond the outer limit of the EEZ which is 200 nautical miles seaward of the territorial sea baselines. Aside from the creation of the EEZ

¹²⁶Proshanto K. Mukherjee, "The Consent Regime of Oceanic Research in the New Law of the Sea", *Marine Policy*, Vol.5, No.2, April 1981, Guildford: IPC Science and Technology Press, at p. 98

¹²⁷*Ibid.*, at pp.105-106

¹²⁸*Ibid.*, at pp. 99-100

¹²⁹Alfred H.A. Soons, *Marine Scientific Research and the Law of the Sea*, Deventer/Netherlands–Antwerp–Boston–London–Frankfurt: Kluwer Law and Taxation Publishers, 1982, at pp.53-54

by UNCLOS, where coastal states have the sovereign right to explore and exploit natural resources, the same right is vested in the coastal state in respect of the continental shelf. In other words, states other than the coastal state, cannot have unrestricted freedom to conduct MSR anywhere they wish except on the high seas. The need for the establishment of a legal regime to govern the conduct of MSR thus became apparent and such a regime was established through Part XIII of UNCLOS.

As noted earlier, in the EEZ the coastal state has jurisdiction with respect to MSR.¹³⁰ The EEZ comprises the superjacent waters together with the seabed and subsoil below it. Thus, by extension the jurisdiction of the coastal state applies to the continental shelf underlying the superjacent waters. It is important to note that whereas rights of exploration and exploitation of the natural resources are exclusive to the coastal state, MSR is the necessary precursor to the exercise of those rights. It is therefore natural that the coastal state has jurisdiction over MSR. It is through MSR that technology has developed for coastal states to utilize the full benefits of the exploration and exploitation rights granted to coastal states especially in relation to fishing and other living resources as well as non-living resources such as minerals and oil and gas reserves.¹³¹ MSR has also proven to be an essential instrument for protection and preservation of the marine environment over which the coastal state also enjoys jurisdiction.¹³² Through MSR it can be determined what happens to a pollutant after it spills into the sea and how it can be removed to clean up the seas. One commentator has stated that broadly speaking, MSR involves “the physical, chemical, and biological processes of transport, accumulation, dispersion and degradation of pollutant substances and energy”.¹³³

MSR, in practical or in scientific terms, is essentially of two kinds. Where research is carried out simply for the purpose of obtaining scientific knowledge or information without any consideration of its potential use, it is called pure research or research that is basic or fundamental. Pure research reveals information on the developing and changing characteristics of planet earth. Studies of seabed configurations, ocean currents and their circulation and seasonal changes in wind and wave directions enable scientists to predict natural disasters relating to the oceans and to determine ways to prepare for phenomena such weather predictions and climate change.¹³⁴

Where research is carried out with the object of putting the knowledge obtained to some gainful use, it is referred to as applied research. It is important to note that whether and to what extent research findings can be used for gainful purposes depends on several factors such as technological and economic viability and the need and demand for the resources associated with such research. Unsurprisingly, applied research is

¹³⁰ Article 56 (1)(b)(ii)

¹³¹ *Supra*, note 129 at p.55

¹³² Article 56(1)(b)(iii)

¹³³ *Supra*, note 129 at p. 14

¹³⁴ *Supra*, note 1 at p.400

sometimes referred to as resource-oriented or exploratory research. As pointed out by Churchill & Lowe - "Adequate and effective scientific research is a basic precondition for the rational exploitation of the sea's resources".¹³⁵ With regard to fisheries, MSR helps to determine fish stocks and how overfishing can be controlled bearing in mind the food consumption needs of the population. Geoscientific research leads to identifying locations of oilfields, minerals and natural gas reserves and decisions regarding establishment of offshore installations and platforms. MSR also contributes to safe navigation. Another salient feature of MSR is information relating to preservation of the marine environment. Scientists first need to discover the substances that are harmful for the seas and their resources, and second, to find ways to eliminate or mitigate marine pollution.¹³⁶

Arguably, all research is in, the first instance, directed to obtaining knowledge and is therefore pure research in character. Where the use of that knowledge is potentially gainful, the application of that knowledge then becomes the dominant purpose and can be described as applied research. It would appear, therefore, that there is no real distinction between pure and applied research that can be easily discerned.¹³⁷

3.3.2 MSR in the Territorial Sea, EEZ and the Continental Shelf : The Consent Regime

The centre of gravity of Part XIII of UNCLOS is contained in Articles 245 and 246 in which is manifested the so-called "consent regime" of MSR. It is therefore necessary to examine these two Articles analytically to gain an adequate insight into this functionality of the modern law of the sea. First, one must look at Article 245 which restates the coastal state's sovereignty in the territorial sea in light of which it is provided that the right to regulate, authorize and conduct MSR in that zone is vested exclusively in the coastal state. All MSR in the territorial sea is subject to the express consent of the coastal state. Notably, there is no prohibition on other states conducting MSR in the coastal state's territorial but express consent must be obtained, and the coastal state may set conditions with which there must be compliance. The expression of the consent regime starts at this maritime zone.

Article 246 deals with MSR in the coastal state's EEZ and continental shelf. The wordings of paragraphs 1 and 2 are virtually identical to the wording in Article 245 but are expressed in respect of the EEZ and continental shelf. Paragraph 3 looks at the consent regime from the opposite side of the consent line. It provides that, in normal circumstances, the coastal state must

¹³⁵ *Ibid.*

¹³⁶ *Ibid.*

¹³⁷ *Supra*, note 126 at pp.99-100

not withhold consent where the intended research fulfils two requirements. First, the research to be carried out must be exclusively for "peaceful purposes" and second, it must be for "the benefit of all mankind". These elements need to be discussed analytically.

First, what are "normal circumstances" is unclear at best. One view is that it is a matter of discretion of the coastal state as to what is or is not normal in a given set of circumstances.¹³⁸ This is an issue which is tied to paragraph 5 which provides for the discretion of the coastal state to withhold consent in certain specified circumstances. These are, if the project in question -

- (a) is of direct significance for the exploration and exploitation of natural resources, whether living or non-living;
- (b) involves drilling into the continental shelf, the use of explosives or the introduction of harmful substances into the marine environment;
- (c) involves the construction, operation or use of artificial islands, installations and structures referred to in articles 60 and 80;
- (d) contains information communicated pursuant to article 248 regarding the nature and objectives of the project which is inaccurate or if the researching State or competent international organization has outstanding obligations to the coastal State from a prior research project.¹³⁹

Notably, paragraph 4 provides that there may be normal circumstances between the coastal state and the relevant research even if there is no diplomatic relationship between them. Another important point is the provision in paragraph 6 which deals with research on the extended continental shelf of a wide margin state. Ordinarily, consent cannot be withheld for research in that part of the shelf except in respect of certain areas designated for exploration and exploitation and reasonable notice of such designation is given.

With respect to the second requirement in paragraph 3, what research is exclusively for peaceful purposes and what is for the benefit of mankind are also uncertain elements. Both these elements are prone to subjective interpretation. In this regard, Yusuf has commented that-

If the criterion for ascertaining pure research is the language of article 246 (3), that is, that the activity seeks to contribute to man's knowledge of the maritime environment for the

¹³⁸Abdulqawi A Yusuf, "Toward a new legal framework for marine research : coastal-state consent and international coordination", *Virginia Journal of International Law*, Vol 19, 1979 at p.418

¹³⁹See Article 246 (5) (a),(b),(c) and (d)

benefit of all, then such an ascertainment inevitably becomes highly subjective and imprecise.¹⁴⁰

Some are of the opinion that the parameter of "benefit to mankind" is tied to whether the research in question is pure or applied. In UNCLOS there is no provision indicating any differences between pure and applied research unlike the Continental Shelf Convention of 1958¹⁴¹. According to Churchill and Lowe, "applied research is that which is of 'direct significance' for the exploration and exploitation of natural resources". The purpose of applied research is thus exploration of the natural resources of the coastal state.¹⁴² If the aim is that all benefits go directly to the coastal state, it is "applied research". But if the purpose of the research is to benefit all mankind it is "pure research". The aim of pure research is to gain knowledge of the seas. In the view of Churchill and Lowe, "pure research is research which is carried out 'exclusively for peaceful purposes' and in order to increase scientific knowledge of the marine environment for the benefit of all mankind".¹⁴³

3.3.3 MSR in Internal Waters, Contiguous Zone, Straits and Archipelagic Sea Lanes

In as much as coastal states enjoy sovereignty in the territorial sea, it is subject to the right of innocent passage of foreign ships. As per Article 19, however, a foreign ship engaged in MSR is not considered to be carrying out innocent passage. By contrast, the sovereignty of the coastal state in its internal waters is absolute and not subject to any right of innocent passage. Therefore, in the internal waters there is absolutely no right of a foreign ship to carry out MSR. The prerogative of the coastal state in that zone is without any hindrance whatsoever as regards MSR.¹⁴⁴

There is no express provision in UNCLOS relating to MSR in the contiguous zone. In effect, there is no need for any separate MSR provision for the contiguous zone since that zone is subsumed within the EEZ in zonal terms and is therefore subject to that regime and to that of the continental shelf to the extent of its relevance, except as provided otherwise in Article 33 discussed earlier.

With respect to MSR in straits, Article 40 provides that foreign ships engaged in transit passage through a strait are not entitled to carry out any MSR or hydrographic survey without obtaining prior authorization from the state(s) bordering the strait. Similarly, foreign ships in passage through

¹⁴⁰Yusuf, *supra*, note 138 at p.419

¹⁴¹See Article 5 (1) and (8) on the Convention on the Continental Shelf, 1958. See also *supra*, note 1 at p. 402

¹⁴²*Supra*, note 1 at p.405

¹⁴³*Ibid.*, at pp. 405-406

¹⁴⁴Soons, *supra*, note 129 at pp. 45-47

archipelagic sea lanes have no right to carry out MSR or survey activities without prior authorization of the archipelagic states.¹⁴⁵

As stated earlier, the conduct of MSR on the high seas is a right vested in all states.¹⁴⁶ In the 1958 Geneva Convention on the High Seas no restriction on freedom of MSR was expressly mentioned. By contrast, in Article 87 of UNCLOS it is provided that-

The high seas are open to all States, whether coastal or land-locked. Freedom of the high seas is exercised under the conditions laid down by this Convention and by other rules of international law. It comprises, *inter alia*, both for coastal and land-locked States:

...
(f) freedom of scientific research, subject to Parts VI and XIII.¹⁴⁷

This Article gives to all states and international organizations the right to conduct MSR on the high seas. Furthermore, under Article 257, they have the right to carry out MSR in the water column above the continental shelf beyond the EEZ which is considered to be a part of the high seas.

The use of MSR exclusively for peaceful purposes and for the benefit of mankind as a whole set out in respect of the EEZ and the continental shelf discussed above, are repeated in Article 143 with regard to MSR in the Area. Article 143 provides that “Marine scientific research in the Area shall be carried out exclusively for peaceful purposes and for the benefit of mankind as a whole in accordance with Part XIII”. If the aim of scientific research in the Area deviates from these two requirements, the research activity may be in potential conflict with Article 256 which, gives to all states the right to conduct MSR in the Area but only in conformity with Part XIII.

3.3.4 MSR Conducted by Foreign States or International Organizations

Pursuant to Article 247, MSR may be conducted in the EEZ or continental shelf of a coastal state by foreign states or international organizations if within four months of notification of the project, no objection is expressed by that state. The notification requirements are contained in Article 248 under which, *inter alia*, a full description of the project must be provided six months prior to the intended start date of the project. The details of the description are as follows:

¹⁴⁵Article 54 provides, *inter alia*, that Article 40 applies *mutatis mutandis* to archipelagic sea lane passage. See also *supra*, note 1 at pp. 404-405)

¹⁴⁶Soons, *supra*, note 129 at pp.53-54

¹⁴⁷See Article 87(1)(f)

- (a) the nature and objectives of the project;
- (b) the method and means to be used, including name, tonnage, type and class of vessels and a description of scientific equipment;
- (c) the precise geographical areas in which the project is to be conducted;
- (d) the expected date of first appearance and final departure of the research vessels, or deployment of the equipment and its removal, as appropriate;
- (e) the name of the sponsoring institution, its director, and the person in charge of the project; and
- (f) the extent to which it is considered that the coastal State should be able to participate or to be represented in the project.

Article 249 provides for further duties. States and international organizations must comply with certain conditions. The coastal state is entitled to participate or be represented in the marine scientific project,¹⁴⁸ upon completion of the research, the results and conclusions must be provided to the coastal state¹⁴⁹; if the coastal state requests for assessment or interpretation of the research, such request must be complied with¹⁵⁰ and the research results must be made available for both national and international access.¹⁵¹

Where MSR is conducted by an international organization of which the coastal state is a member and there is no reply within four months from the submission of information required under Article 248, consent is implied and the project can begin within six months of submission of the information requested by the coastal state unless within the four months of receipt of the communication, the entity intending to carry out research is informed that the coastal state has withheld its consent.¹⁵² If there is failure to comply with the obligations mentioned in Article 249, then in accordance with Article 253, MSR activities can be suspended by the coastal state or it may require a cessation of the research activities.

3.4 Protection and Preservation of the Marine Environment

In May 1969 an ice breaking tanker known as the *m.t. Manhattan* made a passage through the Northwest Passage which Canada claimed as a part of its internal waters. The *Manhattan* was an U.S. flag vessel belonging to Esso Tankers. The American government did not recognize Canada's claim with regard to the Northwest Passage and considered it as an international

¹⁴⁸Paragraph 1(a)

¹⁴⁹Paragraph 1 (b) to (c)

¹⁵⁰Paragraph 1(d)

¹⁵¹Paragraph 1(e)

¹⁵²Article 252 (1)

strait through with all ships were entitled to conduct unimpeded passage. Diplomatic notes of protest went back and forth between the Canadian and U.S. governments with Canada taking the position that any foreign ship would have to seek clearance from the Canadian government before entering the Passage. The dispute eventually led to the enactment in 1970 of the Arctic Waters Pollution Prevention Act by Canada's Parliament. Subsequently the Canadian delegation at the Third UN Conference on the Law of the Sea succeeded in having Article 234 titled "Ice Covered Areas" into the Convention". Canada justified its unilateral action of enacting the Arctic Waters Pollution Prevention Act, 1970 (AWPPA) as a functional approach to the protection and preservation of the Arctic environment in response to allegations by the United States and other countries that Canada's object behind the enactment of the legislation was assertion of sovereignty over the Arctic.

In this thesis, so far the functional approach as distinguished from the zonal approach has been illustrated through positive functions characterized by activities leading to some form of gain for the coastal state in concrete terms. By contrast, the function discussed in the present section, as the name implies, is an activity relating to protecting the marine environment and preserving it from further deterioration. The provisions relating to these subject matters are contained in Part XII of UNCLOS. It is submitted that the international law of marine pollution falls into four categories, namely, the public international law, the regulatory law, the penal or criminal law and the private law dealing with liability and compensation for pollution damage. Part XII of UNCLOS mainly deals with the first component but provides a legal framework for the regulatory and penal law components as well, although the details of the regulatory and penal regimes are to be found in convention law generated by the IMO and UNEP¹⁵³ through such conventions as MARPOL, the London Convention on Dumping of Wastes and the Basel Convention on the Trans-Boundary Movement of Hazardous Wastes. It is to be recognized at the outset of this discussion that pollution of the seas can be caused by land-based sources, ship-source or from and through the atmosphere. Also ship-source pollution can be operational, deliberate or accidental.¹⁵⁴

Against the above background, the object of this section of the thesis is to deal with the functionality of the subject matter in the context of Part XII of UNCLOS mainly from the perspective of the public international law and the framework provisions of the regulatory and penal law. Part XII consists of eleven Sections comprising a total of 45 Articles of which the salient features will be presented for discussion on a selective basic.

¹⁵³United Nations Environment Programme

¹⁵⁴Proshanto K. Mukherjee, "The Penal Law of Ship-Source Pollution" in Tafsir Malick Ndiaye and Rudiger Wolfrum (Eds.) *Law of the Sea, Environmental Law and Settlement of Disputes Liber Amicorum Judge Thomas A. Mensah*, Leiden/ Boston: Martinus Nijhoff Publishers, June 2007, Max Planck Institute for Comparative Public Law and International Law, at pp. 465-468

Section 1 consists of Articles 192 to 196. The fundamental principles are contained in Articles 192 and 193 pursuant to which all states are obliged to protect and preserve the marine environment and have the right to explore their natural resources in line with their environmental policies and their obligations towards protecting and preserving the marine environment. Article 194 contains detailed provisions relating to measures to be adopted by states in respect of prevention, reduction and control of marine pollution emanating from any source. They must use the best practicable means available bearing in mind their capability to discharge their environmental obligations. In this connection states must try to harmonize their national policies and also try to ensure that no pollution damage is caused to other states and their environment. They must also refrain from carrying out any act that may cause pollution to spread beyond their jurisdictional zones where they are entitled to exercise their sovereign rights. Paragraph 3 goes into details of measures to be taken. In the words of one commentator-

These measures must be designed to minimize, *inter alia*, ship-source pollution and extend to preventing accidents, dealing with emergencies, ensuring maritime safety and regulating international and unintentional discharges¹⁵⁵

Under Article 195 states have a duty to prevent, reduce and control pollution that may result from direct or indirect transfer of any damage or hazard between sea areas or transform one form of pollution to another. This Article provides the basic principle for the subsequent creation of the Basel Convention on the Trans-Boundary Movement of Hazardous Wastes of 1989. Article 196 deals with the transportation of harmful alien or new species and obliges states to take preventive and mitigative measures against such movement of harmful alien species. This provision is recognized as the basis for the subsequent adoption of the Ballast Water Convention.¹⁵⁶

Articles 197 and 198 in Section 2 requires states to cooperate on a regional or global basis to develop rules and standards for protecting and preserving the marine environment. Article 198 requires them to notify other states of the possibility of imminent danger resulting from pollution damage of which they are aware. Under Article 199, states are required to develop contingency plans for responding to pollution incidents and to cooperate as much as possible to eliminate the effects of pollution. Articles 200 and 201 which are the two last Articles in Sections 2, require states to cooperate in promoting studies, and to undertake research and exchanges of information leading to the establishment of appropriate scientific criteria for rules and standards and also practices and procedures for the prevention, reduction and control of marine pollution. The provisions in Sections 3 and 4 deal, respectively, with technical assistance to developing countries and monitoring and environmental assessment requirements.

¹⁵⁵Jingjing Xu, "The Public Law Framework of Ship Source Oil Pollution" (2007) 13 JIML 416 at p. 417

¹⁵⁶International Convention for the Control and Management of Ship's Ballast Water and Sediments, 2004

Section 5 deals with legislative action and rule-making with respect to pollution from land-based sources¹⁵⁷, sea-bed activity under national jurisdiction¹⁵⁸ and activities in the Area¹⁵⁹. Article 210 deals with pollution from dumping of wastes and serves as the framework provision for the 1972 London Convention on Dumping of Wastes at Sea.

The most important Article in Section 5 is Article 211 which is very comprehensive and deals with ship-source pollution. Its seven paragraphs provide the fundamental basis or blueprint for MARPOL. Paragraph 1 requires states to establish through the IMO, rules and standards to prevent, reduce and control ship-source pollution and also to design routing systems with the view to preventing casualties. In paragraph 3, the coastal state's rights to regulate pollution emanating from foreign ships traversing its waters is addressed. The coastal state's law in this regard must be given due publicity and must be communicated to IMO. Foreign ships exercising their right of innocent passage through the territorial sea must provide information as required by coastal states engaged in cooperative arrangements to harmonize their policies. Under paragraphs 4 and 5, coastal states in exercising sovereignty within the territorial sea have legislative jurisdiction for preventing, reducing and controlling pollution from foreign ships; and in the same manner, they are entitled to exercise legislative and enforcement jurisdiction in respect of foreign ships navigating in the EEZ pertaining to prevention, reduction and control of marine pollution.

Paragraph 6 establishes the concept of the "special area" which is dealt with in detail in MARPOL. In subparagraph (a) of this paragraph, it is provided that the coastal state may adopt special legislation in respect of certain clearly defined areas within the EEZ. The legislation would entail special mandatory measures necessary to prevent ship-source pollution within the coastal state's EEZ. The details of the legislation must be communicated to the IMO and the IMO must make a determination on whether the conditions in those "special areas" warrant special mandatory measures. In any event the coastal state's legislation as referred to above can only apply to foreign ships after 15 months following the coastal state's submission of the communication to IMO. It is to be noted, however, that the additional legislation must not require foreign vessels to comply with any domestic requirements related to design, construction, manning or equipment standards that are different from international requirements. As commented by one author "[T]his provision makes perfect sense as it is aimed at avoiding a 'patchwork quilt' international regime. "As pointed out by the same author, "[H]owever, states sometimes fail to comply with this preclusive provision, intentionally or otherwise. The unilateral requirement by some states for tankers navigating in their coastal waters to be double-hulled is a prime example."¹⁶⁰

¹⁵⁷Article 207

¹⁵⁸Article 208

¹⁵⁹Article 209

¹⁶⁰See *supra*, note 155 at pp.417-418

The last Article in Section 5, that is Article 212, bears the title "Pollution from and through the Atmosphere". This Article provides the basis for the subsequent adoption of Annex VI of MARPOL which is described as "Air Pollution". It is submitted that the term "Air Pollution" in MARPOL is imprecise and potentially misleading. This is because MARPOL is not, or should not, be concerned with pollution of the air (or with the atmosphere for that matter), but with pollution of the seas caused by ships given its mandate under the IMO Convention (previously IMCO Convention)¹⁶¹ Furthermore, the pollutant that enters the oceans emanates from the exhaust of the ship but does not enter the sea directly from the ship. The exhaust emissions consisting of nitrogen oxide and sulphur oxide rise upwards through to the lower levels of the atmosphere from where they return to the sea as acid rain. The component of exhaust emissions containing CO₂, which is a greenhouse gas and an ozone depleting substance which contributes to global warming.¹⁶²

Section 6 of Part XII deals with enforcement by flag states, port states and coastal states covering pollution from land-based sources, sea-bed activities, activities in the Area and pollution by dumping.¹⁶³ It is apparent that enforcement is a function carried out in the various maritime zones, in respect of various pollution sources and carried out by flag, port and coastal states.

It is important to note that under paragraph 2 of Article 217 flag states must prevent their ships from sailing if they are not in compliance with the international rules and standards which, under paragraph 1, they are bound to observe. The prohibition on sailing includes the requirement to comply with the design, construction and equipment standards together with compliance regarding safe manning. Under paragraph 3, flag states are to ensure that an effective certification system is implemented in accordance with international rules and standards. Vessels must be inspected periodically to ensure that they are in compliance with the standards stated in the respective certificates. Under paragraph 4, flag states are obliged to investigate violations committed by their ships and to take legal actions against them through the courts without regard to the location of the violation or the place of detection of pollution. Investigation of violations and commencement of proceedings are addressed in paragraphs 5, 6 and 7. Flag states are required to start proceedings promptly once sufficient evidence is obtained and is considered to be adequate in respect of prosecution of the alleged violation. Flag states can request other states to assist if their cooperation is expected to be useful to clarify the

¹⁶¹Convention on the International Maritime Organization, 1948. See Proshanto K. Mukherjee and Jingjing Xu, "The Legal framework of Exhaust Emission from Ships: A Selective Examination from a Law and Economics Perspective" in Neil Bellefontaine & Olof Linden (Eds) *Impacts of Climate change in the Maritime Industry*, Malmo: WMU Publications, 2009 69 at pp.76-79

¹⁶²See *ibid.*, Mukherjee and Xu, at pp. 71-72 where it is stated at p.72 that CO₂ and NO_x are both ozone depleting substances.

¹⁶³See Articles 213-218 and 220

circumstances surrounding the case. Under paragraph 8, flag states are required to impose penal sanctions that are heavy enough so that violations are discouraged regardless of location.

Port state enforcement provisions are contained in Article 218. This Article has many significant attributes. It is the only provision in UNCLOS that deals with port state jurisdiction (PSJ), and extending from it, the concept of port state control (PSC) which is the regulatory mechanism through which PSJ is asserted and exercised. It is also important because in UNCLOS, PSC is addressed only in respect of ship-source pollution but not in respect of any of the other PSC issues such as maritime safety or seafarer welfare and qualifications.

A fundamental principle of the exercise of PSJ through PSC is that a ship must be voluntarily within the port or an offshore installation of the state in question. This is something that is often not observed by PSC officials by ignorance or by oversight. If a ship is not in a port or offshore installation voluntarily; such as for example, by reason of *force majeure*, then PSJ cannot be exercised. However, in the interest of maritime safety and environmental protection, the authorities of that state would be obliged to detain a ship that is technically deficient and poses a safety or environmental threat, until the deficiency is rectified. Thus, the only exception to the requirement for detention is that in an appropriate situation a vessel may be allowed to proceed to the nearest ship repair facility where the deficiency can be dealt with in a satisfactory manner.¹⁶⁴ A peculiarity of port state enforcement jurisdiction is that so long as a vessel is voluntarily within a port or offshore terminal of the state, proceedings can be commenced by that state following an investigation, even if a discharge is committed by the ship beyond the EEZ in the high seas, if it is a violation of any applicable international rule or standard.¹⁶⁵ However, if a violation has occurred in the maritime zone of another state, no proceedings are to be commenced unless requested by that state, or where there is a likelihood of pollution damage being caused to the waters of the state intending to institute the proceedings.¹⁶⁶ Under paragraph 3, a port state may, at the request of another state including the flag state of a polluting ship, investigate a discharge violation referred to in paragraph 1 of this Article if that state believes that pollution damage was caused to waters within any of its maritime zones.

Article 219 deals with unseaworthiness of vessels and what enforcement mechanisms are available to address the issue. If because of a violation of applicable international rules and standards, a vessel is rendered unseaworthy, and the marine environment is at risk of suffering damage, the vessel may be detained if it is in a port or offshore terminal of the state. In this Article the expression used is "administrative measures to prevent the vessels from sailing". It must be noted in this context that, in several

¹⁶⁴See Article 219 discussed below

¹⁶⁵Article 218, paragraph 1

¹⁶⁶Article 218, paragraph 2

jurisdictions, a ship may only be detained pursuant to a court order. In such cases it is a judicial and not simply an administrative measure. This provision stands in contrast with the provision in Article 218 which provides for enforcement jurisdiction of a port state only if a foreign vessel is voluntarily in a port or offshore terminal of that state. As stated above, detention as an administrative or judicial sanction may be exercised even if the ship is not voluntarily in the state's port or offshore terminal if that is necessary for ensuring maritime safety or environmental protection. Under Article 219, a ship may be allowed to proceed to the nearest repair yard, and after the vessel is fixed by removal of the cause of the violation, it can continue on its intended voyage.

Article 220 has the title "Enforcement by Coastal States" but in paragraph 1 it provides for enforcement jurisdiction only when a vessel is voluntarily within a port or offshore terminal of that state after committing a violation of applicable international rules and standards within its territorial sea or EEZ. The wording used in the provision is "may... institute proceedings". This implies that enforcement must be through court intervention. With respect to the territorial sea, where there are "clear grounds" for belief that a violation has occurred, a physical inspection of the vessel may be carried out.¹⁶⁷

With respect to the EEZ, in the event of "clear grounds", the ship's flag state must provide certain information requested by the coastal state, *inter alia*, the identity of the ship, its port of registry, and last and next port of call.¹⁶⁸ However, where there are "clear grounds" in respect of the territorial sea or EEZ that a violation causing "substantial discharge" has been committed and there is threat of significant pollution, a physical inspection may be carried out by the coastal state authorities. But such inspection is only permitted if there is refusal by the vessel to give the information requested; or where it has been provided, it is inconsistent with the facts as evident or if inspection is otherwise justified by the circumstances.¹⁶⁹

If in the territorial sea or EEZ there is "clear objective evidence" as opposed to "clear grounds" and the violation causes "major damage or threat to major damage" (as distinguished from "substantial discharge") to the coastline or coastal interests of the coastal state, it may commence proceedings and also detain the vessel.¹⁷⁰ Under paragraph 7, if a bond or other appropriate financial security is posted, the vessel may be allowed to proceed on its intended voyage. Paragraph 8 as the final paragraph in this Article provides that the coastal state enforcement provisions contained in paragraphs 3 to 7 also apply in respect of the domestic legislation referred to in paragraph 6 of Article 211 dealing with ship-source pollution applicable to all states.

¹⁶⁷Paragraph 2

¹⁶⁸Paragraph 3

¹⁶⁹Paragraph 5

¹⁷⁰Paragraph 6

Article 221 deals with pollution arising from maritime casualties. Paragraph 1 is the substantive provision dealing with the rights of states to take and enforce measures beyond the territorial sea which must be in proportion to the actual and threatened damage from pollution or threat of pollution. The object is to "protect their coastline or related interests, including fishing..." following a maritime casualty which may lead to "major harmful consequences". Apart from the above, the significance of this Article lies in the definition of "maritime casualty" provided in paragraph 2 under which the term means-

a collision of vessels stranding or other incident of navigation, or other occurrence on board a vessel or external to it resulting in material damage or imminent threat of material damage to a vessel or cargo.

It is notable that until the adoption of the Casualty Investigations Code¹⁷¹ by the IMO, this UNCLOS provision has been the only source for defining and understanding in legal terms, the notion of a maritime casualty.

Article 222, which is the last Article in Section 6 of Part XIII deals with the enforcement aspect of pollution from and through the atmosphere. It must be observed that the Article is not restricted to ship-source atmospheric pollution but also extends to such pollution emanating from aircraft. It cross-refers to paragraph 1 of Article 212 which is the substantive provision dealing with pollution from and through the atmosphere discussed above. This thesis is obviously only concerned with the ship-source pollution aspect of this issue and not with pollution caused by aircraft.

Section 7 of Part XIII provides for "Safeguards" relating to the enforcement jurisdiction of flag, port and coastal states conferred by various provisions of UNCLOS. The Section consists of eleven Articles from Articles 223 to 233. The state in which legal proceedings are to take place must facilitate the appearance and giving of testimony of witnesses and admissibility of evidence. Official representative of states attending the proceedings are entitled to rights given under national or international laws and they must observe their duties associated with those rights.¹⁷² Enforcement can only be exercised by government officials or warships and military aircraft properly identified as such.¹⁷³ In exercising enforcement power, states must not impede navigational safety or create hazard or expose the marine environment to any risks.¹⁷⁴

Article 226 is in respect of investigation of foreign vessels and is particularly important. In exercising their rights under Articles 216, 218 and 220, foreign vessels must not be unduly delayed and inspections in the first instance must be limited to examination of certificates and documents only.

¹⁷¹Code of International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident

¹⁷²Article 223

¹⁷³Article 224

¹⁷⁴Article 225

Further examinations may only be conducted if there are clear grounds for believing that the physical condition of the ship is inconsistent with the information contained in the documents or the information is inadequate for confirming or verifying the violation in question; or there are no valid documents on board. No discrimination with respect to foreign ships is permitted.¹⁷⁵ Article 228 deals with suspension and restrictions on proceedings if instituted. If it is evident that the flag state is taking proceedings in respect of a violation committed beyond the territorial sea, the coastal state must suspend its own proceedings unless it is a case of major damage to the coastal state.¹⁷⁶ The limitation of actions against foreign ships is three years from the date of a violation¹⁷⁷ and there must be no prejudice to the flag state's right to take any action or impose penalties under its own laws.

Article 230 is possibly the most important "Safeguards" provision in this Section. It provides as follows:

1. Monetary penalties only may be imposed with respect to violations of national laws and regulations or applicable international rules and standards for the prevention, reduction and control of pollution of the marine environment, committed by foreign vessels beyond the territorial sea.
2. Monetary penalties only may be imposed with respect to violations of national laws and regulations or applicable international rules and standards for the prevention, reduction and control of pollution of the marine environment, committed by foreign vessels in the territorial sea, except in the case of a wilful and serious act of pollution in the territorial sea.
3. In the conduct of proceedings in respect of such violations committed by a foreign vessel which may result in the imposition of penalties, recognized rights of the accused shall be observed.

The importance of this Article lies in the fact that it is frequently ignored by legislators and enforcers of the law of ship-source marine pollution as well as the judiciary, both at the domestic as well as the regional levels. The European Union Directive on Ship-Source Pollution¹⁷⁸ and the decision of the European Court of Justice (ECJ)¹⁷⁹ are prime examples of this

¹⁷⁵Article 227

¹⁷⁶Paragraph 1

¹⁷⁷Paragraph 2

¹⁷⁸Directive 2005/35/EC of the European Parliament and of the Council of 7 September 2005 on ship-source pollution and on the introduction of penalties for infringements, [2005] O.J. (L255), 11 supplemented by Council Framework Decision 2005/667/JHA of 12 July 2005, [2005] O.J. (L255), 164 of 4 November 2005, now defunct. and replaced by a draft directive dated 11 March 2008 to amend the original directive 2005/35

¹⁷⁹Case C-308/06 - *The Queen on the application of: International Association of Independent Tanker Owners (Intertanko), International Association of Dry Cargo*

proposition. Whether the non-compliance with Article 230 arises out of sheer ignorance or deliberate misinterpretation continues to be a matter for debate.¹⁸⁰ Article 231 requires prompt notification to be given to the flag state of the violating vessel and any other affected states when the coastal state takes enforcement measures against the foreign vessels. Article 232 provides for unlawful or unreasonably excessive measures taken by the enforcing state resulting in loss or damage. In such cases the courts of the enforcement state must provide for legal recourse.

Article 234 has been mentioned earlier; it is the singular Article in Section 8 of Part XII dealing with "Ice covered areas" under which coastal states are given the rights to legislative and enforcement jurisdiction relating to ship-source pollution in ice covered areas of the EEZ. Section 9 also has only one Article that is Article 235 which provides for the application of the doctrine of state responsibility in the context of protection and preservation of the marine environment. This is an important subject matter in its own right on which much has been written by eminent scholars¹⁸¹ The Article provides for liabilities for marine pollution damage and payment of compensation which may be effected through private law mechanisms. Article 236 in Section 10 provides for sovereign immunity accorded to state entities and their ships if used for non-commercial purposes. Article 237, the only Article in Section 11, preserves the application of special international instruments relating to the protection and preservation of the marine environment.

Shipowners (Intertanko), Greek Shipping Co-operation Committee, Lloyd's Register, International Salvage Union v. Secretary of State for Transport (3 June 2008)

¹⁸⁰For a comprehensive discussion of this issue, see Proshanto K. Mukherjee, "The Penal Law of Ship-Source Pollution", *supra*, note 152 at pp. 489 - 495. See also Colin de la Rue, "Pollution from Ships: EU Directive on Criminal Sanctions for Ship-Source Pollution" in D. Rhidian Thomas (Ed.) *Liability Regimes in Contemporary Maritime Law*, London: Informa, 2007, at pp.19-36

¹⁸¹See Brian D. Smith, *State Responsibility and the Marine Environment*, Oxford: Clarendon Press, 1988 at pp.5-21. See also Patricia W. Birnie and Alan E. Boyle, *International Law and the Environment*, Oxford: Clarendon Press, 1992 at pp. 139-148

4 Conclusion

In this thesis an attempt has been made to address the proposition that through UNCLOS, the modern international law of the sea has taken on a change in direction from the purely zonal approach to a predominantly functional approach. It is submitted that the statement regarding a so-called pure zonal approach was true until the pre-1958 era. The four Geneva Conventions of 1958 codified the zonal concepts which had evolved over a considerable period of time. The zones included inland waters, territorial seas and the contiguous zone in terms of coastal state rights and jurisdiction. The continental shelf being an extension of the continental landmass was only a zone in light of the fact that a seaward extremity was contemplated for a legal regime to be established. However, the exploitability criterion in the 1958 Continental Shelf Convention left the extent of the outer limit uncertain. The high seas under the 1958 Convention bearing that name was a zone, but it did not pertain to the coastal state but rather was a zone in which all states could enjoy certain rights and freedoms.

In UNCLOS, which was adopted in 1982, the zones mentioned above were reconfirmed, or modified to reach certainty and completeness such as in the case of the continental shelf regime. The outer limit of the continental shelf was established through the availability of options which the coastal state could claim according to what it perceived to be most advantageous, and the regime of the EEZ was created. Up to that point in time, coastal state rights, and by comparison, the rights of other states including those that are landlocked or geographically disadvantaged, were based entirely on geographical limits. In other words, the zonal approach to rights and responsibilities in the international law of the sea rested on maritime zones and their demarcations. During the course of negotiations at the Third UN Conference on the Law of the Sea, the functional approach developed. It was realized by the international community that what goes on in the zones is at least as important as the zones themselves. While it is recognized that there are numerous functions of these zones identified by their uses or the activities carried on in them, in this thesis four functions have been singled out for detailed discussion in the third Section.

Before entering into a detailed examination of the functions to illustrate the functional approach taken by UNCLOS, in Section 2, the various maritime zones themselves are reviewed with particular reference to their legal characteristics and their extremities as contained in UNCLOS. The discussion starts with the analysis of baselines in general and the two notions of normal and straight baselines in particular. The importance of the baseline concept is apparent in the fact that all the other zones, with a small exception in the case of the continental shelf, are measured from it. It should be noted in this context that there is really no inward limit for internal waters. All waters landward of the baseline are a part of the regime regardless of where they are geographically located within the confines of

the coastal state. In Section 2, all the other maritime zones, namely, the territorial sea, contiguous zone, EEZ and continental shelf are explained by reference to their peculiar legal characteristics and their outer limits.

As mentioned in the thesis, the functional approach does not exist in isolation but is subsumed within the zonal concept. Thus, the functions are an integral part of the zones. The conclusion that emanates out of this observation is that the functional approach is not independent of the zonal approach; that the functions are associated with and are an integral part of the zonal concept. When fishing is considered as a function, it is connected to the rights of the coastal state in the EEZ. When exploration and exploitation of oil, gas or mineral resources are considered, they must be considered in the context of the rights of the coastal state in the continental shelf and the *res communis* rights of all states in the Area. When discussing navigation as a function, one must consider the rights of innocent passage in the territorial sea, transit passage in straits and ASL passage in archipelagic sea lanes. It is thus apparent that the zonal and functional approaches are not independent of each other; nor do they run in parallel, but rather are integrated phenomena in the context of the contemporary international law of the sea.

It is notable that the terms "zonal approach" and "functional approach" are not to be found in any relevant conventions. These expressions are creations of scholars and academics who have found it expedient to explain the legal regimes and make distinctions and comparisons. As the law of the sea has evolved since the middle of the twentieth century, sea usages have increased considerably. This is largely attributable to scientific discoveries and technological advancements. With seaward zonal expansion, the high seas have shrunk which has prompted increasing focus on the functional approach to the law of the sea.

It is submitted in conclusion that no need is envisaged for changing the direction which the functional approach has taken so long as there is a rational and logical connection with the maritime zones as established and configured under UNCLOS. What is perhaps needed, from the perspective of legislators, enforcement officials, bureaucrats, and judiciaries is a clear understanding of the zones and their functions so that the international community as a whole can derive full benefit and enjoy all the advantages that UNCLOS has to offer. Perhaps what is needed is more scholarly literature on this subject produced not only from an academic or philosophical standpoint, but also taking account of user needs. This would include the various industries which stand to benefit and the needs of ordinary members of the world maritime community such as fishermen and seafarers as well as professionals such as scientists and engineers.

It is hoped that this thesis will, to at least some extent, fulfil that objective especially in terms of a realization that the zonal and functional approaches are not to be characterized as one versus the other, but rather as an integrated whole adopted for the ultimate benefit of all concerned.

Bibliography

Books and Monographs

Bateman, Sam and Rothwell, Donald R., *Navigation Rights and Freedoms and the New Law of the Sea*, Dordrecht/ Boston/ London: Martinus Nijhoff Publishers, 2000

Birnie, Patricia W., and Alan E. Boyle, *International Law and the Environment*, Oxford: Clarendon Press, 1992

Churchill, R.R. and Lowe, A.V., *The Law of the Sea*, 3rd edition, Juris Publishing, Manchester: Manchester University Press, 1892

Dahmani, M., *The Fisheries Regime of the Exclusive Economic Zone*, Dordrecht/ Boston/ London: Martinus Nijhoff Publishers, 1987

Gold, Edgar, *Maritime Transport : The Evolution of International Marine Policy and Shipping Law*, Toronto: Lexington Books, 1981

Jones T.G., *Principles for Second Mates*, 3rd Ed., Glasgow: Brown, Son & Ferguson Publisher, 1952

Kwiatkowska, Barbara, *The 200 Mile Exclusive Economic Zone in the New Law of the Sea*, Dordrecht/ Boston/ London: Martinus Nijhoff Publishers, 1989

Larson, David L., *et al.*, *Major Issues in the Law of the Sea*, Durham, N.H.: University of New Hampshire, 1976

Mukherjee, Proshanto K., *Maritime Legislation*, Malmo: WMU Publications, 2002,

Mukherjee, Proshanto K., *Maritime Zones and Boudaries*, Malmo: WMU Publications, 2000

Smith, Brian D., *State Responsibility and the Marine Environment*, Oxford: Clarendon Press, 1988

Soons, Alfred H.A., *Marine Scientific Research and the Law of the Sea*, Deventer/Netherlands–Antwerp–Boston–London–Frankfurt: Kluwer Law and Taxation Publishers, 1982

Thomas, D.R., *Maritime Liens*; British Shipping Laws Vol. 14, London: Stevens & Sons, 1980

Articles

Harville, John P., "Multidisciplinary Aspects of Optimum sustainable Yield" in Proceedings of a Symposium on Optimum Sustainable Yield as a Concept in Fisheries Management", Honolulu, Hawaii, September 9, 1974, American Fisheries Society, Special Publication No. 9, Washington D.C., 1975

Hollick, Ann, "US Oceans Policy: the Truman Proclamation", (1976-77), 17 *VJIL*

Mukherjee, Proshanto K., "The Consent Regime of Oceanic Research in the New Law of the Sea", *Marine Policy*, Vol.5, No.2, April 1981, Guildford: IPC Science and Technology Press

Mukherjee Proshanto K., "The Penal Law of Ship-Source Pollution" in Tafsir Malick Ndiaye and Rudiger Wolfrum (Eds.) *Law of the Sea, Environmental Law and Settlement of Disputes Liber Amicorum Judge Thomas A. Mensah*, Leiden/ Boston: Martinus Nijhoff Publishers, June 2007, Max Planck Institute for Comparative Public Law and International Law

Mukherjee, Proshanto K., and Xu, Jingjing, "The Legal framework of Exhaust Emissions from Ships: A Selective Examination from a Law and Economics Perspective" in Neil Bellefontaine & Olof Linden (Eds) *Impacts of Climate change in the Maritime Industry*, Malmo: WMU Publications, 2009

Smith Robert W. and Taft George, "Legal Aspects of the Continental Shelf" in Cook Peter J. and Carleton Chris M., *Continental Shelf Limits: The Scientific and Legal Interface*, U.S.A.: Oxford University Press, 2000

Verlaan, P.A., "New seafloor mapping technology and article 76 of the United Nations Convention on the Law of the Sea", (1997), 21 *Marine Policy*

Xu, Jingjing, "The Public Law Framework of Ship Source Oil Pollution" (2007) 13 *JIML* 416

Yusuf, Abdulqawi A., "Towards a new legal framework for marine research : coastal-state consent and international coordination", *Virginia Journal of International Law*, Vol 19, 1979

Conventions

Convention on the Continental Shelf, 1958

Convention on the International Maritime Organization, 1948.

Convention on the Territorial Sea and the Contiguous Zone

International Convention for the Control and Management of Ship's Ballast Water and Sediments, 2004

International Convention for the Prevention of Pollution from Ships, 1973 as modified by its Protocol 1978 (MARPOL 73/78)

United Nations Convention on Fishing and Conservation of the Living Resources of the High Seas, 1958

United Nations Convention on the Law of the Sea, 1982

Legislation and Documents

Arctic Waters Pollution Prevention Act, 1970 (Canada)

Council Framework Decision 2005/667/JHA of 12 July 2005, [2005] O.J. (L255), 164 of 4 November 2005, now defunct. and replaced by a draft directive dated 11 March 2008 to amend the original directive 2005/35

Declaration of *Santo Domingo*, *UN Leg. Ser B/16 p.599; ND I*

Directive 2005/35/EC of the European Parliament and of the Council of 7 September 2005 on ship-source pollution and on the introduction of penalties for infringements, [2005] O.J. (L255), 11 supplemented by Montevideo Declaration, *UN Leg. Ser B/16 pp. 586 and 587; ND I*

Online Sources

"History of the Ocean" <http://marinebio.org/oceans/history/>

Stagpoole Vaughan, *et al*, "Foot of the Continental Slope in Article 76", Institute of Geological & Nuclear Sciences, Lower Hutt: New Zealand, at p.4 [www.gmat.unsw.edu. au/ablos/.../PAPER2-1.PDF](http://www.gmat.unsw.edu.au/ablos/.../PAPER2-1.PDF)

Table of Cases

Anglo-Norwegian Fisheries Case, [1951] ICJ Rep. 116

Aramco v. Saudi Arabia (1958), 27 ILR 117

Case C-308/06 *The Queen on the application of: International Association of Independent Tanker Owners (Intertanko), International Association of Dry Cargo Shipowners (Intertanko), Greek Shipping Co-operation Committee, Lloyd's Register, International Salvage Union v. Secretary of State for Transport* (3 June 2008))

Creole (1853), Moore, *Int. Arb* 4375 63

Kate A. Hoff (The Rebecca) (1929), IV RIAA 444 63)

Nicaragua Case, [1986] ICJ Rep.14

U.S.A. v. Great Britain (Behring Sea Arbitration Award) 1893, reported in Moore's Digest of International Arbitration