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Expanding the Right of Hot Pursuit: Challenges for Cooperative Maritime Law Enforcement Between the Philippines and Indonesia

Jacqueline Joyce F. Espenilla*

ABSTRACT

Piracy and armed robbery against ships is a rising problem in the tri-border area between Indonesia, Malaysia and the Philippines. As a result, these countries have begun formal discussions on the establishment of joint patrols, and are also exploring other possible avenues for trilateral maritime security cooperation. Indonesia and the Philippines recently took their partnership one step further by affirming previous bilateral enforcement agreements and expressing willingness to exercise an “expanded” right of hot pursuit within each other’s territorial borders. In a region where sensitivities concerning sovereignty and border issues run high, such an intrusive arrangement certainly warrants closer scrutiny. At the outset, this paper critically discusses the legality of an expanded right of hot pursuit and examines whether such an arrangement is permitted under international law. From a practical perspective, this paper further discusses three key pitfalls and challenges that must be addressed in implementation: (1) whether and to what extent force can be used in the exercise of the expanded right of hot pursuit, (2) whether there are any issues pertaining to the overlapping exercise of criminal jurisdiction, and (3) whether international human rights obligations apply in extraterritorial maritime law enforcement.

Keyword: Hot pursuit; maritime security cooperation; Philippines; Indonesia

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1. Introduction and Overview

On 9 September 2016, Rodrigo Duterte – President of the Philippines – and Joko Widodo – President of Indonesia – met in Jakarta, Indonesia, after the conclusion of the 2016 Association of Southeast Asian Nations (ASEAN) Summit in Vientiane, Laos. The two leaders discussed, among other issues, ways to ensure peace and security in the notorious waters located between their countries. The outcome of the discussion was interesting: the signing of a non-binding Joint Declaration expanding maritime security cooperation as a means to address piracy and lawlessness in and around the tri-border maritime area (TBA) surrounded by the Philippines, Indonesia and Malaysia (Gabacungan, 2016).

The 2016 Joint Declaration appears to have its foundations in a number of agreements between the two countries: the 1975 Revised Agreement on Border Crossing between the Republic of the Philippines and the Republic of Indonesia, the 1997 Agreement between the Government of the Republic of the Philippines and the Government of the Republic of Indonesia on Cooperative Activities in the Field of Defense and Security, the 2011 Memorandum of Understanding between the Philippine National Police (PNP) and the Indonesian National Police (INP) on Cooperation in Preventing and Combating Transnational Crime and Capacity Building, and the 2014 Memorandum of Understanding between the National Counter-Terrorism Agency of the Republic of Indonesia and the Anti-Terrorism Council of the Republic of the Philippines on Combating International Terrorism. Some of these agreements are binding and create enforceable legal obligations while others merely serve as guidelines and benchmarks for behavior. Taken all together, they paint a clear picture of how the Philippines and Indonesia intend to approach cross-border security problems. The non-binding 2016 Joint Declaration now takes its place within this existing framework by affirming the need for coordinated action in the TBA and by encouraging the mutual exercise of an expanded right of “hot pursuit”.

It should also be noted that the Foreign Ministers and Defense Chiefs of the Philippines, Malaysia and Indonesia signed a non-binding 2016 trilateral Joint Declaration that outlined immediate measures to address security in the maritime areas of “common concern”. The 2016 trilateral Joint Declaration recognized “the growing security challenges such as those arising from armed robbery against ships, kidnapping, transnational crimes, and terrorism in the region, particularly in reference to the maritime areas of common concern to the three countries”. In light of those developments and security challenges, it was also agreed that they would: (1) conduct a patrol among the three countries using existing mechanisms as a modality; (2) render immediate assistance for the safety of people and ships in distress within the maritime areas of common concern; (3) establish a national focal point among the three countries to facilitate timely sharing of information and intelligence as well as coordination in the event of emergency and security threats; and (4) establish a hotline of communication among the three countries to better facilitate coordination

during emergency situations and security threats. The 2016 trilateral Declaration resulted in the creation of the “Sulu Sea Patrol Initiative” (SSPI), which, once Standard Operating Procedures (SOPs) are mutually agreed upon, will be the governing framework for coordinated air and naval patrols, as well as for the exchange of military intelligence. Notably, the SSPI is modelled after the Malacca Strait Sea Patrol (MSSP), which focuses mainly on cooperation. Unlike the potential cooperative arrangement encouraged by the 2016 Joint Declaration, the three SSPI countries will merely carry out coordinated patrols in their respective territories without entering into each other’s waters or projecting their sovereign jurisdiction beyond their borders.

In view of the foregoing, this paper now takes a deeper dive into the concept of an expanded right of hot pursuit through an examination of two aspects: (1) the legality of an expanded right of hot pursuit in international law and (2) the possible pitfalls, challenges and other considerations in the implementation of an expanded hot pursuit doctrine in the TBA. This analysis is timely given the impending possibility of the conclusion of a more binding arrangement that will likely take into account the two countries’ experiences in operationalizing the 2016 Joint Declaration.

1.1 The Abu Sayyaf Group hijacking-kidnapping incidents: piracy or armed robbery at sea? Does it matter?

The signing of the Joint Declaration was largely motivated by the recent criminal activities of the Abu Sayyaf Group (ASG), a violent Islamist militant group based in southern Philippines, in the TBA. In 2016 alone, the ASG claimed responsibility for at least nine known incidents of maritime hijacking and kidnapping, which all targeted Indonesian and Malaysian ships.

Table 1. ASG Piracy/Armed Robbery Incidents in the TBA (Espanilla, 2016)

Vessel/s	Incident Details	No. of Perpetrators	Treatment of Crew
Brahma 12 and Anand 12 (Indonesia)	*Attacked on March 26, 2016 while underway from Kalimantan, Indonesia to Batangas, Philippines *Boarded by armed perpetrators from a speedboat and a wooden-type motorized pump boat	17 alleged ASG members	All 10 Indonesian crew members were abducted but were released on May 1, 2016 following the purported payment of ransom money by Patria Maritime Lines, the sailors’ private employer
MV Massive 6 (Malaysian)	*Attacked on April 1, 2016 while underway from Manila, Philippines to Tawau in Sabah, Malaysia *Boarded by armed perpetrators from a	8 (alleged to be ASG members)	4 Malaysian crew members were abducted, leaving behind 5 other crewmen from Indonesia and Myanmar

Vessel/s	Incident Details	No. of Perpetrators	Treatment of Crew
	speedboat at approx. 27 nm southeast of Semporna in Sabah, Malaysia		
TB Henry (Indonesian)	*Attacked on April 15, 2016 while underway from Cebu, Philippines to Tarakan, Indonesia *Boarded by armed perpetrators from a speedboat at approx. 25 nm off Sitangkai Island in Tawi-Tawi, Philippines	Unknown (alleged to be ASG members)	Of 10 Indonesian crew members, 1 was injured while 4 others were abducted
Unnamed tugboat (Indonesian)	*Attacked on June 22, 2016 in the Sulu Sea, while underway from the Philippines to Indonesia *Boarded by armed perpetrators from a speedboat	Unknown (alleged to be ASG members)	Of 13 crew members, 7 were abducted
Unnamed fishing vessel (Malaysian)	*Attacked on July 10, 2016, *Boarded by armed perpetrators from a speedboat off the coast of Lahad Datu, Sabah, Malaysia	5 (alleged to be members of the ASG)	3 Indonesian fishermen were abducted
Unnamed tugboat and barge (Malaysian)	*Attacked on July 19, 2016 *Boarded by 5 armed perpetrators from a speedboat	Unknown (alleged to be ASG members)	5 Malaysian fishermen were abducted

International media have labelled these incidents as acts of piracy. However, it should be recalled that Article 101 of the United Nations Convention on the Law of the Sea (UNCLOS) defines piracy in a very narrow way, limiting it only to the following acts:

- (a) any illegal acts of violence or detention, or any act of depredation, committed for private ends by the crew or the passengers of a private ship or a private aircraft, and directed:
 - i) on the high seas, against another ship or aircraft, or against persons or property on board such ship or aircraft; or
 - ii) against a ship, aircraft, persons or property in a place outside the jurisdiction of any State;
- (b) any act of voluntary participation in the operation of a ship or of an aircraft with knowledge of facts making it a pirate ship or aircraft;
- (c) any act of inciting or of intentionally facilitating an act described in subpara-

graph (a) or (b).

Many of the hijacking and kidnapping incidents described above do not fall within the strict contours of the crime as defined in the UNCLOS. The acts were mainly perpetrated in the territorial sea, the contiguous zones or the EEZs of Indonesia and Malaysia, and not, as the UNCLOS requires, in the high seas or in any place outside the jurisdiction of any State. How then are the ASG's hijacking-kidnapping incidents classified?

Under the International Maritime Organization's (IMO) Code of Practice for the Investigation of the Crimes of Piracy and Armed Robbery Against Ships, these incidents would be considered as "armed robbery against ships". "Armed robbery against ships" consists of the following acts:

- (a) any illegal act of violence or detention or any act of depredation, or threat thereof, other than an act of piracy, committed for private ends and directed against a ship or against persons or property on board such a ship, within a State's internal waters, archipelagic waters and territorial sea;
- (b) any act of inciting or of intentionally facilitating an act described above.

The distinction between piracy and armed robbery against ships has legal significance because it determines who would exercise primary criminal jurisdiction in case of interception and arrest. If the act is considered piracy under the strict UNCLOS definition, then any ship flying any flag may seize the pirate ship in the EEZ or on the high seas, arrest the persons and take the property on board (UNCLOS, Arts. 105, 58(2)). The courts of the seizing/arresting State are further authorized by the UNCLOS to decide upon the penalties to be imposed, as well as determine the action to be taken with regard to the ships or property, subject to the rights of third parties acting in good faith (*ibid.*). This "universal jurisdiction" over piracy in the EEZ/on the high seas is due to the nature of the perpetrators as *hostis humani generis* (enemies of mankind) – a designation that recognizes the far-reaching impact of their predation on the freedom of navigation and ultimately, on global trade and commerce. On the other hand, acts which are more consistent with the IMO's definition of armed robbery against ships fall within the exclusive enforcement jurisdiction of the coastal State. Thus, it is only that State that has the right to intercept and visit vessels, as well as arrest and prosecute individuals on board who are suspected of committing the said crime within its internal waters, archipelagic waters and territorial sea. This right is exclusive and cannot be exercised by any other State.

2. "Hot Pursuit" in the International Law of the Sea

The right of hot pursuit is generally defined in law of the sea parlance as "the right of the coastal State to continue, outside the territorial sea, the contiguous zone, or certain adjacent areas, the pursuit of a foreign vessel which – while within the

internal waters or the territorial sea, the contiguous zone, or certain adjacent areas of the pursuing State – has violated the laws and regulations of this State, provided, however, that the pursuit has commenced immediately after the offense and has not been interrupted” (Poulantzas, 2002:39). This definition implies that the right of hot pursuit is actually an extension of the criminal jurisdiction of the pursuing state. As such, its exercise is customarily recognized as an exception to the freedom of the high seas though it ends the moment that vessel being pursued enters into the territorial waters of another State.

2.1 Legal History and Evolution of the Right of Hot Pursuit

The right of hot pursuit was first codified in 1930, when it was introduced in Article 11 of Annex I to the Final Act of the Hague Codification Conference. Although the Final Act never achieved the status of an internationally legally binding instrument, the inclusion of Article 11 in Annex I validated the fact that the right of hot pursuit was a customarily recognized practice that even then enjoyed virtually unanimous acceptance within the League of Nations. Moreover, this early codification served as basis for the eventual inclusion of the right of hot pursuit in the binding 1958 Geneva Convention on the High Seas (CHS). Article 23 of the CHS provides:

Article 23

- 1) The hot pursuit of a foreign ship may be undertaken when the competent authorities of the coastal State have good reason to believe that the ship has violated the laws and regulations of that State. Such pursuit must be commenced when the foreign ship or one of its boats is within the internal waters or the territorial sea or the contiguous zone of the pursuing State, and may only be continued outside the territorial sea or the contiguous zone if the pursuit has not been interrupted. It is not necessary that, at the time when the foreign ship within the territorial sea or the contiguous zone receives the order to stop, the ship giving the order should likewise be within the territorial sea or the contiguous zone. If the foreign ship is within a contiguous zone, as defined in article 24 of the Convention on the Territorial Sea and the Contiguous Zone, the pursuit may only be undertaken if there has been a violation of the rights for the protection of which the zone was established.
- 2) The right of hot pursuit ceases as soon as the ship pursued enters the territorial sea of its own country or of a third State.
- 3) Hot pursuit is not deemed to have begun unless the pursuing ship has satisfied itself by such practicable means as may be available that the ship pursued or one of its boats or other craft working as a team and using the ship as a mother ship are within the limits of the territorial sea, or as the case may be within the contiguous zone. The pursuit may only be commenced after a visual or auditory signal to stop has been given at a distance which enables it to be seen or heard by the foreign

ship.

- 4) The right of hot pursuit may be exercised only by warships or military aircraft, or other ships or aircraft on government service specially authorized to that effect.
- 5) Where hot pursuit is effected by an aircraft:
 - a) The provisions of paragraphs 1 to 3 of this article shall apply *mutatis mutandis*;
 - b) The aircraft giving the order to stop must itself actively pursue the ship until a ship or aircraft of the coastal State, summoned by the aircraft, arrives to take over the pursuit, unless the aircraft is itself able to arrest the ship. It does not suffice to justify an arrest on the high seas that the ship was merely sighted by the aircraft as an offender or suspected offender, if it was not both ordered to stop and pursued by the aircraft itself or other aircraft or ships which continue the pursuit without interruption.
- 6) The release of a ship arrested within the jurisdiction of a State and escorted to a port of that State for the purposes of an enquiry before the competent authorities may not be claimed solely on the ground that the ship, in the course of its voyage, was escorted across a portion of the high seas, if the circumstances rendered this necessary.
- 7) Where a ship has been stopped or arrested on the high seas in circumstances which do not justify the exercise of the right of hot pursuit, it shall be compensated for any loss or damage that may have been thereby sustained.

When the current UNCLOS was adopted in 1982, its Article 111 substantially restated Article 23 of the CHS and formally established the following conditions for the legitimate exercise of the right:

- 1) The competent authorities of the coastal State must have good reason to believe that a foreign ship has violated the laws and regulations of that State.
- 2) The pursuit must be commenced when the foreign ship or one of its boats is within the internal waters, the archipelagic waters, the territorial sea or the contiguous zone of the pursuing State.
- 3) The pursuit can only be continued outside the territorial sea or the contiguous zone if the pursuit has not been interrupted.
- 4) The pursuit can only be commenced after a visual or auditory signal to stop has been given at a distance which enables it to be seen or heard by the foreign ship.
- 5) The pursuit can only be exercised by warships or military aircraft, or other ships or aircraft clearly marked and identifiable as being on government service and authorized to that effect.
- 6) The pursuit initially commenced by an aircraft can be transferred to pursuit by a ship providing that the foreign ship was ordered to stop and the pursuit has been carried out without interruption.

The International Tribunal for the Law of the Sea (ITLOS) ruled in one case that the above conditions are intended to be cumulative – each must be satisfied for the pursuit to be legitimate under the UNCLOS (M/V Saiga Case, para. 146).

2.2 Expanding the right of hot pursuit?

Both the CHS and the UNCLOS state that the right of hot pursuit ends the moment the pursued foreign vessel enters into the territorial sea of its own country or of a third State (UNCLOS, Art. 111(3)). Thus, the idea of continuing the hot pursuit into the territory of another state is extraordinary, especially as it tends to overlap with potentially sensitive issues relating to sovereign jurisdiction. This was clearly highlighted in UN Security Council (UNSC) Resolution 1816 and succeeding related Resolutions (UNSC Resolutions 1846(2008), 1851(2008) and 2007(2012)) relating to anti-piracy measures in Somalia. In its Resolution 1816, the UNSC authorized States cooperating with the Transitional Federal Government of Somalia (TFG) to: (1) enter the territorial waters of Somalia for the purpose of repressing acts of piracy and armed robbery at sea, in a manner consistent with such action permitted on the high seas with respect to piracy under relevant international law; and (2) use, within the territorial waters of Somalia, in a manner consistent with action permitted on the high seas with respect to piracy under relevant international law, all necessary means to repress acts of piracy and armed robbery. However, the UNSC was careful to underscore the extraordinary and sui generis nature of the authorized measures by clearly limiting their *ratione temporis* and *ratione loci* (Treves, 2009:399-414). Thus, cooperating States would only be allowed to make use of such authority for a period of six months (later extended for one year by UNSC Resolution 2077) and only with respect to the situation in Somalia. Resolution 1816 further states that it “shall not affect the rights or obligations or responsibilities of Member States under international law, including any rights or obligations under the Convention, with respect to any other situation, and underscores in particular that it shall not be considered as establishing customary international law... (para. 9).”

Although the case of Somalia is unique in that the expanded right of hot pursuit was authorized by the Security Council under its Chapter VII powers in the UN Charter, nothing in customary or conventional law prevents States, on their own, from entering into bilateral agreements or arrangements allowing hot pursuit to continue into their respective territories for maritime enforcement purposes. They can even consent to foreign or joint patrols in their waters (Petrig, 2015:854). With respect to piracy, in particular, the UNCLOS itself encourages States to cooperate “to the fullest extent” in its repression (UNCLOS, Art. 100), a directive broad enough to encompass an expanded right of hot pursuit embodied in a bilateral agreement.

Such bilateral agreements/arrangements have in fact been done before: In 2007, Australia and France entered into a cooperative agreement relating to the enforcement of fisheries laws in the maritime areas adjacent to the French Southern and Antarctic Territories, Heard Island and the McDonald Islands. This agreement gave reciprocal

authority to continue a properly initiated hot pursuit in the territory of the other Party provided that it comply with stipulated legal and procedural requirements (Australia-France Agreement, Arts. 4-7). In 2011, Nigeria and Benin launched “Operation Prosperity”, which allowed the two countries to conduct joint patrols along the coast of Benin (Kamal-Deen, 2015:102). Under the arrangement, Benin had operational command over the patrols while Nigeria exercised tactical command (ibid.).

Based on the foregoing, the cooperative arrangement implied by the 2016 Joint Declaration appears to be legally acceptable.

3. Pitfalls, Challenges and Considerations: A Legal and Practical Perspective

Although the 2016 Joint Declaration’s possible expansion of the right of hot pursuit appears to not be incompatible with customary international law and with the UNCLOS, a number of potentially complex legal issues must nonetheless be considered, particularly in the event that the pursuit is successful and an intercept actually happens.

3.1 Use of force

Hours before President Duterte met with President Widodo, he addressed the Filipino community and verbalized his intention to enter into an expanded hot pursuit arrangement with Indonesia. He touched on the issue of “use of force” and expressed his preference for a more hardline Indonesian approach to the ASG problem (i.e. “blowing up” intercepted ASG vessels) (Gutierrez, 2016). While the 2016 Joint Declaration does not expressly reflect this rather draconian sentiment, it is nonetheless silent on whether and when force can be used, its limits as well as its modalities.

The UNCLOS alludes to the “use of force” concept in a very limited way. In fact, the phrase only appears in three provisions: Article 19 (2)(a), Article 39 (1)(b), and Article 301. None of these provisions have any significant bearing on the issue at hand. Fortunately, international case law sheds much needed light on the use of force in maritime enforcement actions. In the 1935 *I’m Alone* Case between Canada and the United States, the commissioners referred to the “necessary and reasonable force for the purpose of effecting the objects of boarding, searching, seizing and bringing into port the suspected vessel”. In relation to this, the commissioners differentiated the “incidental sinking” from the “intentional sinking” of a vessel: the former is justifiable if done as a result of the exercise of necessary and reasonable force while the latter is prohibited by international law. In that particular case, it was found that the pursuing vessel – the United States’ USCGC *Dexter* – intentionally

sank the *I'm Alone*, a Canadian ship used as an illegal rum runner during the American Prohibition. The United States was thus found liable for the excessive use of force and fined.

In the 1962 Red Crusader Case between the United Kingdom and Denmark, the Commission of Enquiry found that the arrest of the British trawler Red Crusader while it was illegally fishing within a mutually-agreed prohibited area near the Faroe Islands was attended with an excessive degree of force (Red Crusader Case, p. 537). As evidence, the Commission points out that Danish law enforcement officials opened fire on the Red Crusader without issuing proper warnings thereby creating danger to human life on board the ship (Red Crusader Case, p. 538). It was convinced that under the circumstances, the Danish officials could have used other less violent means to stop the fleeing vessel (*ibid.*).

Years after the *I'm Alone* and *Red Crusader* arbitration cases, the ITLOS revisited the use of force issue in maritime enforcement actions in the 1999 *M/V Saiga* Case. In considering the legality of the force used by Guinea in the arrest of the *M/V Saiga*, a ship flying the flag of St. Vincent and the Grenadines, the ITLOS took into account the circumstances of the arrest in the context of the applicable rules of international law (*M/V Saiga* Case, para. 155). It considered in particular that: (1) the *M/V Saiga* was an unarmed tanker, (2) The *M/V Saiga* could only travel at a maximum speed of 10 knots as it was sailing fully-loaded and sitting low in the water, (3) the Guinea officers approached it with a fast-sailing patrol boat, (4) the Guinea officers approached without issuing any of the signals or warnings required by international law and practice, (5) Guinea officers opened fire on the *M/V Saiga* before boarding, and (6) Having boarded the ship without resistance, and although there is no evidence of the use or threat of force from the crew, the Guinea officers fired indiscriminately while on the deck and used gunfire to stop the engine of the ship. As a result, two *M/V Saiga* crew members sustained injuries and considerable damage was inflicted on the ship and its equipment (*M/V Saiga* Case, para. 158). The ITLOS thus found that Guinea used an excessive degree of force and stated that: "Although the Convention does not contain express provisions on the use of force in the arrest of ships, international law, which is applicable by virtue of Article 293 of the Convention, requires that use of force must be avoided as far as possible and, where force is unavoidable, it must not go beyond what is reasonable and necessary in the circumstances. Considerations of humanity must apply in the law of the sea, as they do in other areas of international law" (*M/V Saiga* Case, para. 155).

In the *Guyana v. Suriname* arbitration, a boundary delimitation arbitration case, the arbitral tribunal acknowledged in its 2007 award that "in international law, force may be used in law enforcement activities provided that such force is unavoidable, reasonable and necessary." (*Guyana v. Suriname*, para. 445). It ruled that Suriname violated the UNCLOS, the UN Charter, and customary international law when its navy vessels approached and threatened a Canadian oil rig/drill ship conducting seismic testing/exploratory drilling under a concession granted by Guyana

in the disputed maritime area. The arbitral tribunal found that the incident was “akin to a threat of military action” that threatened international peace and security since the circumstances under which Suriname’s actions were done did not warrant the use of force. It further found that Suriname’s actions jeopardized the possibility of reaching a final delimitation agreement between the two countries.

The four preceding cases capture some of the customary law principles for the use of force in maritime enforcement actions, which can be summarized as follows:

- 1) The use of force in maritime enforcement must be avoided as much as possible;
- 2) If such use of force cannot be avoided, its use must be necessary and reasonable under the circumstances;
- 3) The use of force can only be done after taking a number of “appropriate actions” (e.g. give internationally-recognized signals and warnings to stop)
- 4) Considerations of humanity apply in maritime enforcement actions.

Beyond the principles established by international jurisprudence, commentators have also clarified that in order to ensure the safety and security of the persons subject to the attack, the use of force in enforcement actions must be a last resort rather than a first option (Tuerk, 2015:486). Force should not even be used unless in self-defense and even then, warnings should first be issued before force is used (*ibid.*; Petrig, 2013:34). One commentator even goes so far as to say that self-defense is the sole avenue for legitimizing forcible action by states against non-state actors in the territory of other States (Lubell, 2010:74). He further notes that in any case, the force used must be commensurate with the pursuer’s perception of the level of threat being posed by the pursued.

The 2016 Joint Declaration does not acknowledge or reference any of the established international legal principles regarding the use of force, nor does it contain any guidelines or rules pertaining to the use of force in possible cross-border maritime enforcement actions. More importantly, it does not address the issue of liability or state responsibility in case an inordinate degree of force is used in the course of the hot pursuit from one country’s territory to the other’s. The Philippines and Indonesia should thus address this ambiguity in a subsequent document containing mutually agreed Standard Operating Procedures (SOP) or Implementing Rules should they wish to move forward with the conclusion of a binding and more concrete expanded hot pursuit arrangement.

3.2 *Criminal Jurisdiction*

One commentator asserts that “the natural goal of every law enforcement operation is to bring the alleged offenders to justice” (Petrig, 2014:32). For this to happen in a transnational counter-piracy operation, both the policing, prosecution, and enforce-

ment aspects must be perfectly synced across all actors in all involved countries. This may prove challenging given that “as compared to a purely domestic prosecution situation, where the path from policing to criminal prosecution is paved with a comprehensive set of rules articulating the two elements and the interaction between the competent authorities, policing and prosecution in the counter-piracy context are two relatively different spheres” (*ibid.*) Although the commentator made these statements in relation to the admittedly more complex UN Security Council-backed multi-state counter-piracy operations in Somalia, they remain equally true and applicable to the possible expanded hot pursuit operations heralded by the 2016 Joint Declaration.

Based on past ASG piracy/armed robbery at sea incidents, on the broadly drawn language of the 2016 Joint Declaration, and on statements made by Philippine government officials, an enforcement scenario like this could happen: A Philippine-registered speedboat intercepts and attacks an Indonesian tugboat that has just left its home port in Kalimantan. Armed ASG members then board the tugboat, kidnap its crew and attempt to take them back to their hideaway somewhere in Sulu, Philippines. Indonesian Coast Guard vessels immediately pursue the ASG speedboat which, despite having heard warning shots, refuses to stop. The pursuit continues unbroken all the way into the Philippine territorial sea where finally, the Indonesian Coast Guard manages to intercept the ASG speedboat and apprehend its crew with the assistance of Philippine Coast Guard vessels who were earlier notified of the pursuit.

In the above hypothetical scenario, one question immediately comes to mind: Who will exercise primary criminal jurisdiction? This question in turn generates even more questions: Whose criminal laws will apply? Where will the suspects be detained pending prosecution/judgment? Who will investigate and handle evidence? Where will the trial happen? Will the suspects need to be formally extradited or transferred to Indonesia? Who will enforce the sentences? As the 2016 Joint Declaration is broadly drawn and vaguely references past cooperative arrangements, these questions will need to be clarified by the Philippine and Indonesian governments in an SOP or via Implementing Rules. Failure to address ambiguities relating to criminal jurisdiction will likely lead to ineffective or even failed prosecutions. In relation to this, the Somali piracy prosecution experience serves as a cautionary tale and demonstrates the dangers of jurisdictional ambiguity: Whenever a suspected Somali pirate is apprehended by a country acting under UNSC authorization, several prosecution options are potentially available: (1) They can be prosecuted under the laws of the flag State that apprehended them and taken to that country for trial; (2) The flag State can turn over the suspected pirates to another State in the region willing to assume the prosecution; and (3) The suspected pirates can be returned to Somalia for domestic prosecution. Due to practical difficulties and legal ambiguities concerning the correct course of action, suspects are more often than not simply disarmed and released by the apprehending ship without being subjected to any formal criminal proceeding.

It should also be remembered that the Philippines and Indonesia are parties to the 2004 Mutual Legal Assistance Treaty (MLAT). Under the MLAT, State parties

are required to “render to one another the widest possible of mutual legal assistance in criminal matters, namely investigations, prosecutions and resulting proceedings” (MLAT, Art. 1.1). “Mutual legal assistance” can take any of the following forms: (a) taking of evidence or obtaining voluntary statements from persons; (b) making arrangements for persons to give evidence or to assist in criminal matters; (c) effecting service of judicial documents; (d) executing searches and seizures; (e) examining objects and sites; (f) providing original or certified copies of relevant documents, records and items of evidence; (g) identifying or tracing property derived from the commission of an offence and instrumentalities of crime; (h) the restraining of dealings in property or the freezing of property derived from the commission of an offence that may be recovered, forfeited or confiscated; (i) the recovery, forfeiture or confiscation of property derived from the commission of an offence; (j) locating and identifying witnesses and suspects; and (k) the provision of such other assistance as may be agreed and which is consistent with the objects of this Treaty and the laws of the Requested Party (MLAT, Art. 1.2). Notably, MLAT only pertains to assistance that can be done by the Requested State within its own territory and in accordance with its own laws. It does not apply to requests to cede jurisdiction to another State, as in the case of requests for extradition, the transfer of criminal proceedings, and the enforcement of criminal judgments imposed by the Requesting Party beyond what is allowed by the laws of the Requested Party (MLAT, Art. 2.1). Moreover, the MLAT explicitly provides that States are not entitled to exercise jurisdiction or perform functions that are reserved exclusively for the authorities of another State as required by that State’s domestic laws (MLAT, Art. 2.2). Both countries should thus consider what role, if any, that the MLAT might play in terms of facilitating prosecutions effected as a result of the operationalization of the 2016 Joint Declaration.

Finally, it should also be pointed out that under the 2005 Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation (SUA Convention), the Philippines as a State party is obliged to establish its jurisdiction over any of the covered offenses (e.g. seizure of ships by force, acts of violence against persons on board ships, etc.) when, among others, they are committed by its nationals or by individuals on board ships flying its flag (SUA Convention, Art. 6). Under the principle of *aut dedere aut judicare* (SUA Convention, Art. 10), the Philippines is further obliged to either take suspected criminals into custody and immediately prosecute them in accordance with its national laws or extradite them to a requesting SUA State party with whom it has an existing extradition treaty.

The Philippines’s extensive responsibilities under the SUA Convention should be carefully considered in view of the fact that Indonesia is not a State party to the same. Further study is needed to determine whether and to what extent SUA Convention provisions can be incorporated into future cross-border maritime enforcement agreements between the Philippines and Indonesia or, at the very least, in the SOP or Implementing Rules of the 2016 Joint Declaration.

3.3. Human Rights

The 2016 Joint Declaration potentially establishes a situation where both Indonesia and the Philippines mutually bestow on each other the right to conclude a lawful hot pursuit with the interception, arrest, or detention of pirates/armed robbers in each other's territorial waters. Given the situation, would either State be bound by human rights law? Do the obligations in international human rights law even extend to situations involving extraterritorial law enforcement? As in the issue of the use of force, the 2016 Joint Declaration is silent on the matter. The UNCLOS likewise makes no mention whatsoever of the application of human rights to such types of enforcement actions (Petrig, 2013:35). Fortunately, international case law provides useful guidance. The International Court of Justice (ICJ) in fact answered these questions in the affirmative on at least three occasions (*Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory*, 2004; *Armed Activities on the Territory of the Congo*, 2005; and *Application of the International Convention on the Elimination of All Forms of Racial Discrimination*, 2008), where it unequivocally asserted that States are bound by their respective human rights obligations (such as those found in, for example, the International Covenant on Civil and Political Rights of which both Indonesia and the Philippines are State parties) in relation to extraterritorial activities. Of course, such obligations only apply to the present situation if the State acting beyond its territory exercises either *de jure jurisdiction* (as the flag state or the state in whose territory an element of the crime is committed) or *de facto jurisdiction* (as the State exercising effective physical control) over the pirates/armed robbers (Petrig, 2014:139-40). In relation to this, the UN Human Rights Committee also stated in its General Comment No. 31 that "a State party must respect and ensure rights laid down in the [ICCPR] to anyone within the power or effective control of that State Party, even if not situated within the territory of the State Party" (para. 10).

Having established that international human rights extends to extraterritorial law enforcement actions (Tanaka, 2004:384; Petrig, 2013:32), attention necessarily turns to what specific principles and provisions might apply to the enforcement actions potentially sanctioned by the 2016 Joint Declaration. According to one commentator, these might include: (i) the right to be brought promptly before a judge, (ii) *non-refoulement*, (iii) fair trial guarantees, and (iv) the right to an effective remedy. Possible legal complications might also arise, however, in situations where one State subscribes to or observes a particular rule or principle of international human rights law while the other does not.

For Indonesia and the Philippines, one sticking point might be the application of Art. 6 of the ICCPR. One possible scenario relating to this provision concerns the post-conviction sentencing of pirates/armed robbers apprehended by Indonesian navy (*Tentara Nasional Indonesia-Angkatan Laut* or *TNI-AL*) or coast guard forces (*Badan Keamanan Laut* or *BAKAMLA*) in Philippine territorial waters. Under the Penal Code of Indonesia, acts of piracy or terrorism-related offenses (including piracy,

hijackings or violence against persons aboard vessels) resulting in death are considered crimes punishable by death. This is in stark contrast to Philippine laws, which currently prohibit the imposition of the death penalty for any crime (1987 Constitution of the Philippines, Art.III, Sec. 19(1); R.A. No. 9346), including those committed on board a Philippine ship (Revised Penal Code of the Philippines, Art. 2). In fact, Philippine criminal laws only impose the maximum penalty of *reclusion perpetua* in cases of piracy, armed robbery or kidnapping (Revised Penal Code of the Philippines, Arts. 122-123, 267, 296).

Another possible sticking point could be the application of the human rights-related safeguards found in Articles 7 and 8 of the SUA Convention. As pointed out in the preceding section, the problem lies in the fact that while the Philippines is a State party to the Convention, Indonesia is not. The provisions of the SUA Convention will only apply if both countries are States parties. This might mean that both countries will likely have different views on what would constitute an appropriate penalty.

3.4 Conclusion

The ASG presents a common threat to both the Philippines and Indonesia. As such, enhanced cooperative action between the two countries (and Malaysia) seems to be the best option for curbing criminality in the TBA. In relation to this, the Philippines-Indonesia 2016 Joint Declaration appears to pave the way for a legally acceptable modality for such enhanced cooperation even though its future operationalization would necessarily mean the relaxation of previous hard line convictions on sovereign jurisdiction. Accordingly, this paper has proceeded from that premise and instead, focused on a range of attendant legal and practical concerns.

Three broad concerns were addressed: the limits of the use of force, possible conflicts in criminal jurisdiction, and potential human rights issues. The bottom line analysis is that many pitfalls and challenges await both governments in the course of cooperative enforcement. At the minimum, these can more or less be addressed by having a thorough awareness of relevant issues and plugging any implementation gaps in subsequent SOPs or Implementing Rules. Ultimately, the Philippines and Indonesia should consider the merits of opening discussions on a binding cross-border maritime enforcement agreement that comprehensively addresses and clarifies the issues relating to an expanded right of hot pursuit.

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Island Ecological Vulnerability Assessment: The Case of Three Islands in Tangshan, China

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ABSTRACT

In response to an objective demand for island development and utilization, the paper has analyzed the progress on the study of island ecological vulnerability based on Three Islands in Tangshan Bay, Hebei Province, and developed an evaluation method of island ecological vulnerability on the basis of an island eco-resilience and disturbance analysis. Results reveal that the Three Islands of Tangshan Bay have in general a resilient ecosystem with moderate disturbance. Therefore, the Three Islands of Tangshan Bay are suitable for proper development and utilization activities. The evaluation method is applicable to island development and utilization in China, and is a reference of guiding value to island protection, development and utilization.

Keywords: Island; Ecosystem; Vulnerability Evaluation; Three Islands of Tangshan Bay

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Island is a special area in the economic development, and has particularity and importance for ecosystem protection. Subject to unique geographical location and particular weather conditions, islands have a quite unstable and vulnerable ecosystem and limited environmental carrying capacity, and thus may be easily damaged and leading to serious eco-environment problems. As one of the key factors that restricts the development and utilization of islands and coastal zones, eco vulnerability must be considered and respected. Eco vulnerability related concepts were first introduced at the 7thSCOPE Summit held in Budapest in 1989. It was at this summit that the concept of ecotone was officially confirmed, kicking off the studies on eco vulnerability. Henceforth, western scientists have unfolded studies on the contents, types and applications of eco vulnerability (Tuner et al,2003^[1]; Schroter et al., 2005^[2]; Adger,2006^[3]; De Lange et al.2009^[4]). Recent years also have seen some scholars studying the vulnerability of islands and coastal zones and making progress in island environmental vulnerability and environmental management, types of environment vulnerability and driving mechanism of the island's ecosystem[5][6][7][8]. However, there are still lack of in-depth studies on evaluation tools of eco vulnerability as the premise of island development and utilization.

For this reason, this paper reorganized the concepts in relation to island vulnerability, evaluated island eco vulnerability in cases of Yuetuo Island, Dawanggang Island and Shijiutuo Island of Tangshan Bay, Hebei Province, and developed an evaluation method of island eco vulnerability on the basis of island eco resilience and disturbance, providing theoretical basis and technical reference for rational development and utilization of island resources.

1. Concept System and Evaluation Method of Island Eco Vulnerability

1.1 Concept System of Island Eco Vulnerability

The concept of vulnerability originated in the study of natural disasters in the field of environmental research[9], and the studies on vulnerability have been unfolded in large quantities since the 1990s [10]. Right now, the concept of vulnerability has been applied to many fields, such as disaster management, ecology, public health, climate change and land use. For different application fields, the definition and concept of vulnerability have very big difference. For eco vulnerability, scholars have focused on the following aspects in the definition: (1) Eco vulnerability is integral. It is closely associated with the composition of ecosystem and the conditions of natural environment to which it belongs. But whether adverse natural conditions and structural features of an ecosystem can transform potential harms into real eco vulnerability depend more on external disturbances [11]. (2) Eco vulnerability is characterized by sensibility and instability, or an ecosystem can easily change under external forces or disturbances.

(3) Eco vulnerability is a relative concept. (4) Disturbances on ecosystem are multi-dimensional.

As far as islands are concerned, eco vulnerability can be construed as the impact on the ecosystem subject to external forces forecast and evaluated from explorations on its structure and functions, and its ability to resist external forces and recover from adverse effects, quantitatively and semi-quantitatively analyzed, described and identified. Island eco vulnerability is mainly concerned with what the main disturbances the study object is faced with, what factors influencing the structure of eco vulnerability and how to reduce eco vulnerability. The evaluation on island eco vulnerability is aimed at laying a good foundation for island development from the understanding of formation mechanism and change rule of island eco vulnerability so as to reduce adverse effects on the ecosystem during island development and utilization. In addition, the purpose of the evaluation is to determine the development and utilization suitability of islands, and thereupon put forward rational resourceutilization methods and ecological protection and recovery measures, and push forward island sustainabledevelopment and utilization.

1.2 Quantification of Island Eco Vulnerability

Island eco vulnerability is formed by an interaction of many factors, but depending on a source, points can be divided into its own factors and ecological system, including natural factors and human factors. This study argues that an islands' ecosystem of their own structure and the integrity of the resources, such as water, mineral, shoreline, beach and the surrounding waters, etc., its function is to maintain the integrity of the islands' ecosystem, called the ecosystem of the islands resilience. From the system of natural or man-made interference of the outside world, brings the sign of ecosystem vulnerability of the islands, disturbance is a force to island eco vulnerability. This study suggests that a single island's ecosystem shows high resilience and low disturbance, it is suitable for utilization. Therefore, the study on island eco vulnerability can be unfolded from the resilience (state) and disturbance (pressure) of the island's ecosystem.

1.2.1 Quantification of resilience of island ecosystem

The resilience of the island's ecosystem reflects the natural, potential anti-disturbance ability of different island ecosystems, mainly influenced by factors such as landform, weather and biocoenosis of island, and complementary and coordinating ability between ecological elements and eco subsystems. The resilience of an island's ecosystem can be computed based on the formula of resilience of general regional ecosystem in combination of unique island factors as follows:

$$El = \gamma * H * S * V * E / c_1 * c_2 \quad (1)$$

Wherein, El is ecological resilience, γ represents the regulation coefficient, H is the landscape diversity index and S is the biodiversity index, V stands for the vegetation index and E the nearshore hydrodynamics index, are the annual gradient of island temperature and precipitation. The landscape diversity index and vegetation

index can indicate the landform and vegetation coverage of the island, the biodiversity index signifies the complexity of the island's ecosystem, the precipitation manifests the fresh water conditions of the island, the nearshore hydrodynamics index showcases the self-purification ability of the island on pollutants and the stability of sand-mud island, the annual gradient of island temperature and precipitation indicates the climatic conditions of the island.

1.2.3 Quantification of island eco disturbance

The study on island eco disturbance needs to take natural disaster, environmental pollution, artificial destruction and invasion of alien species into full consideration, and incorporate these elements into the criteria layer. The index composition is shown in the table below.

Table 1. Evaluation Index System Composition of Island Eco Disturbance

Objective Layer	Criteria Layer	Index Layer
Island Eco Disturbance	Natural disaster	Meteorological disaster grade
		Geological disaster grade
	Human disturbance (artificial destruction, environmental pollution)	Landscape fragmentation rate
		Natural shoreline ratio
		Artificial structure area ratio
		Water quality compliance rate
		Sediment quality compliance rate
		Biological pollution status
	Bio-invasion	Distribution area of invasive species
		Density of invasive species

In the table, objective layer means evaluation aim of the index system. Criteria layer is composed of several corresponding estimate factors, and it is estimate indexes integrated from factors of the same kind. Index layer is the basic of the index system, it could get the number directly.

The index system described in the above table applies to general island ecosystems. Different indexes may be selected for different types of island and island environments.

To give a holistic evaluation on the island eco vulnerability, the indexes should be weighted to generate a comprehensive index that indicates island eco vulnerability. The analytic hierarchy process is adopted in this study to determine the weights of the evaluation indexes.

As studies in island eco disturbance are rarely seen, there is great uncertainty about the determination of evaluation criteria. This study deploys the vector protection method to indicate the island eco disturbance through the projection distance of the evaluation object on the ideal object.

Given that the evaluation object set is $X = \{X_1, X_2, X_3, \dots, X_n\}$, which can be a set of different islands or different development stages of an island; the index set is $K = \{K_1, K_2, K_3, \dots, K_n\}$; the evaluation object X_i is the attribute value (index

value) of index K_i , denoted as r_{ij} ($i=1, 2, \dots, m; j=1, 2, \dots, n$); matrix $R = (r_{ij})_{m \times n}$ reflects the evaluation matrix or attribute matrix of the evaluation object set X to index set K. Through the dimensionless method, the evaluation matrix composed of Z_{ij} is $Z = (Z_{ij})_{m \times n}$. The evaluation object consisting of the ideal value of evaluation indexes $Z_j^* = \max \{Z_{ij}\}$ is the ideal evaluation object.

Under the action of weight vector W, the augmented weighted standard evaluation matrix is built.

If each decision-making objective is considered as row vector (vector), the modulus of vector will be the value of the row vector, which is,

$$M_j = \|A_j\| = \sqrt{\sum_{i=1}^m [w_i z_{ij}]^2}$$

The direction of vector forms a certain angle with vector A^* and the cosine of the included angle is:

$$d_j = \frac{A_j \cdot A^*}{\|A_j\| \cdot \|A^*\|} = \frac{\sum_{i=1}^m w_i z_{ij} \cdot w_i}{\sum_{i=1}^m [w_i z_{ij}]^2 \cdot \sum_{i=1}^m [w_i]^2} \quad j=1, 2, \dots, n$$

Therefore, the projection of each evaluation object A_i on the ideal object A^* is:

$$Y_j = M_j d_j = \sqrt{\sum_{i=1}^m [w_i z_{ij}]^2} \cdot \frac{\sum_{i=1}^m w_i z_{ij} \cdot w_i}{\sqrt{\sum_{i=1}^m [w_i z_{ij}]^2} \cdot \sqrt{\sum_{i=1}^m w_i^2}} = \frac{\sum_{i=1}^m z_{ij} \cdot w_i^2}{\sqrt{\sum_{i=1}^m w_i^2}} = \sum_{i=1}^m z_{ij} \left(\frac{w_i^2}{\sqrt{\sum_{i=1}^m w_i^2}} \right)$$

The projected value Y_j can be taken as the evaluation index for island disturbance. It's evident that $0 < Y_j < 1$ and Y_j is the greatest and optimum value, which means that the island ecosystem is under the strongest disturbance. Hence, a comprehensive evaluation can be conducted on the disturbance of the evaluation objects based on the projected value Y_j .

1.3 Evaluation on Island Eco Vulnerability

1.3.1 Evaluation process

The resilience of the island's ecosystem is the supporting condition for eco vulnerability and can be taken as the first-level meaning of eco vulnerability, thus first grade evaluation takes the resilience of the island's ecosystem as the evaluation criteria. The disturbance of external systems is the direct cause for eco vulnerability to show and can be taken as the second-level meaning of eco vulnerability, thus second grade evaluation takes the disturbance of the island's ecosystem as the evaluation criteria. The evaluation process is as follows:

- (1) Island status survey: a survey focusing on the eco-environment of the island through such methods as remote monitoring, ground investigation, historical data collection and statistics.
- (2) Island vulnerability evaluation: an evaluation on eco resilience and disturbance through quantitative evaluation methods based on the understanding of the eco-environment status of the island.
- (3) Comprehensive analysis evaluation: A comprehensive evaluation on the vulnerability of the island's ecosystem based on the first grade and second grade statistic evaluation results, and a judgment on the suitability of island development and utilization.

1.3.2 Graded comprehensive evaluation

(1) Determination of evaluation score

We take analytic hierarchy process to consider weight factor for the index and in accordance with the quantitative evaluation methods of island eco vulnerability, we can obtain the evaluation index of island eco resilience and disturbance. To grade the evaluation, the evaluation must be determined as follows:

Existing standard may be used to determine the evaluation score. In case of no standard, the ideal value or target value may be taken as reference. The standard value is 100 points and the other values can be determined through the ratio of actual value to standard value as follows:

$$C_i = F_i/F_0 \times 100$$

Wherein, F_i is the value of Factor i ; F_i represents the actual measured value of Factor i , and F_0 standards for the standard value, target or idea value of Factor I .

(2) Graded evaluation

The first grade evaluation mainly reflects how well the ecosystem can resist disturbance and recover and repair itself after the disturbance. Therefore, the greater the value, the more stable and less vulnerable the ecosystem. The second grade evaluation primarily indicates the disturbance of the island's ecosystem. Hence, the greater the value, the more vulnerable the ecosystem. See the graded evaluation criteria in the following table.

Table 2. Evaluation Grading Criteria of Island Eco Vulnerability

	<20	21~40	41~60	61~80	>81
First grade evaluation	Weak stability	Low stability	Moderate stability	Good stability	High stability
Second grade evaluation	Weak disturbance	Relatively weak disturbance	Moderate disturbance	Relatively strong disturbance	Strong disturbance

A graded comprehensive evaluation on the vulnerability of the island's ecosystem can present more accurate, clear and targeted evaluation results. For instance, the vulnerability of an island graded as high stability and strong disturbance indicates that the island has high eco resilience, but is under strong disturbance. Therefore, caution should be exercised in development to protect its ecological environment, an island graded as high stability and relatively weak disturbance in terms of vulnerability showcases that the island has high eco resilience and is under relatively weak disturbance, and development can be unfolded.

2. Island Eco Vulnerability Evaluation of Three Islands of Tangshan Bay

2.1 Island Status

Located in the coastal areas of Tangshan, Hebei Province, the Three Islands of Tangshan Bay is adjacent to Binhai New District in the west, Caofeidian Industrial Zone in the northwest, and Jingtang Port Area in the northeast. The three uninhabited islands, Yuetuo Island, Dawanggang Island and Shijiutuo Island, cover a land area of 11.96km², 22.41km² and 4.04km², with a total land area of 37.75km².

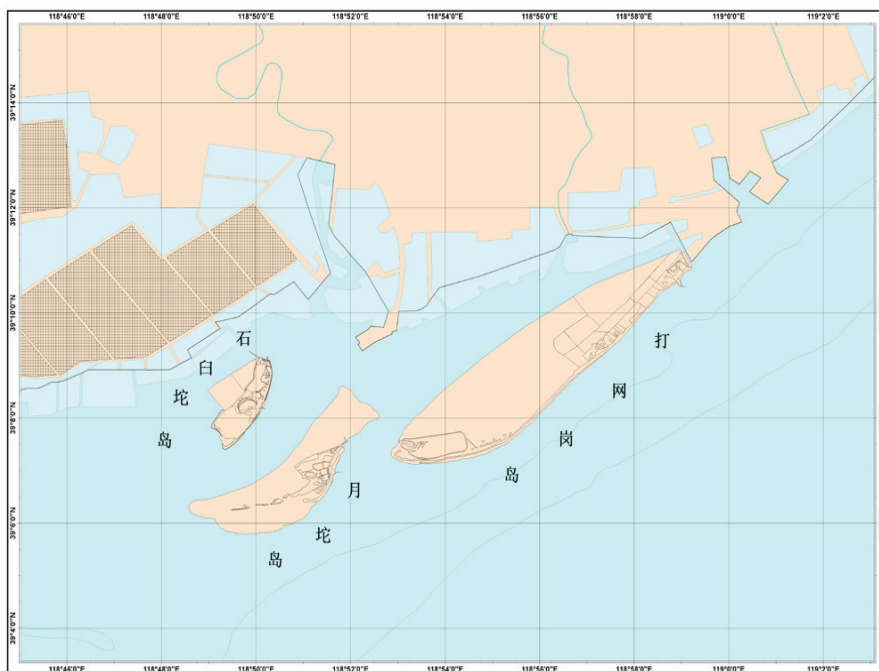


Figure 1. Geographical Location of Three Islands of Tangshan Bay

2.2 Data Acquisition

This study is designed to monitor the land resources, ecological resources, energy resources and marine environment conditions of the Three Islands of Tangshan Bay through such methods as remote sensing and interpretation, field investigation, questionnaire-based survey and historical data collection.

2.3 Island Eco Resilience Analysis of Three Islands of Tangshan Bay

The island eco resilience represents the foundation level of its eco vulnerability. As another important indicator of how well the ecological environment can support the island's economic activities, island eco resilience is the ability of self-maintenance and self-regulation of the ecological environment deviating from original balance under external disturbance. In accordance with the above-mentioned methods, the quantitative study on eco vulnerability reveals the results in the table below.

Table 3. Index Values Influencing the Eco Resilience of Three Islands of Tangshan Bay

	Dawanggang Island			Yuetuo Island			Shijutuo Island		
Year	2003	2008	2010	2003	2008	2010	2003	2008	2010
H	1.6	1.64	1.5	1.87	1.9	1.72	1.92	1.9	1.92
S	0.302	0.256	0.301	0.376	0.361	0.433	0.372	0.296	0.336
V	0.283	0.278	0.261	0.293	0.296	0.299	0.315	0.274	0.337
E	0.632	0.715	0.678	0.611	0.62	0.63	0.532	0.566	0.526
C1	0.016	0.04	0.024	0.056	0.049	0.048	0.024	0.021	0.056
C2	0.374	0.17	0.355	0.14	0.145	0.392	0.362	0.348	0.264
EI	0.144	0.123	0.094	0.161	0.177	0.075	0.138	0.119	0.077

Notes: H, S, V, E, c1, c2 and EI in the table respectively represents the landscape diversity index, biodiversity index, vegetation index, nearshore hydrodynamics index, annual gradient of island temperature, annual gradient of precipitation, and eco resilience.

2.4 Island Eco disturbance Analysis of Three Islands of Tangshan Bay

2.4.1 Determination of index system

The evaluation on the island eco disturbance adopts the vector projection method by building the evaluation index system. Because of the differences of islands in terms of latitude and climatic zone, the evaluation index system is adjusted on the basis of the abovementioned index system framework according to the actual conditions of the Three Islands of Tangshan Bay. The adjusted evaluation index system is shown in the table below.

Table 4. Evaluation Index System of Eco disturbance of Three Islands of Tangshan Bay

Objective Layer	Criteria Layer	Index Layer
Island eco disturbance A	Natural disasterB1	Island geological disaster grade C1
	Human disturbance B2	Landscape fragmentation rate C2
		Natural shoreline ratio C3(%)
		Artificial structure area ratio C4(%)
		Water quality compliance rateC5(%)
		Sediment quality compliance rate C6(%)

In accordance with the meaning and valuation method of the indexes in the evaluation index system of eco disturbance, the base data of these indexes can be calculated and obtained in combination of the original index data collected, as shown in the table below.

Table 5. Base Data of Eco disturbanceof Three Islands of Tangshan Bay in 2010

	C1	C2	C3	C4	C5	C6
Yuetuo Island	Low	0.32	67	1.52	73.5	82.1
Dawanggang Island	Low	0.46	72	2.43	78.3	76.5
Shijituo Island	Low	0.22	53	1.58	80.6	86.6

2.4.2 Eco disturbance evaluation of Three Islands of Tangshan Bay

The eco disturbance of Three Islands of Tangshan Bay is evaluated based on the evaluation model introduced in the above section, complemented by the previously defined index system and base data, in two grades.

(1) Computation of second grade evaluation objectives

The second grade evaluation has 2 different objectives, namely, contributions of the indexes at different grades to the upper indexes. The evaluation results at two grades are computed as per the methods previously introduced, as shown in the table below:

Table 6. Computation of Second Grade Evaluation Index

Second Grade Evaluation			Yuetuo Island	Dawanggang Island	Shijituo Island
Evaluation Objectives	Index Layer Index	Weight Coefficient			
Natural Disaster	Island geological disaster grade	1	1.000	1.000	1.000
	Evaluation value		1.000	1.000	1.000
Human Disturbance	Landscape fragmentation rate	0.422	0.295	0.269	0.125
	Natural shoreline ratio	0.103	0.766	0.833	0.470
	Artificial structure area ratio	0.201	0.040	0.134	0. 030
	Water quality compliance rate	0.165	0.766	0.786	0.833
	Sediment quality compliance rate	0.109	0.719	0.697	0.848
	Evaluation value		0.416	0.432	0.337

(2) Computation of second grade evaluation objectives

The first grade evaluation objectives are the overall evaluation objectives, computed based on the results of the second grade evaluation through the same process of the second grade evaluation. The evaluation conclusion is the evaluation value under the overall objectives and the relative value of the eco disturbance of the Three Islands of Tangshan Bay, listed in Table 7. It can be seen from the evaluation results that Dawanggang Island is under greatest disturbance, consistent with the fact that this island is most developed and utilized among the three islands.

Table 7. Computation of First Grade Evaluation Index

First Grade Evaluation			Yuetuo Island	Dawanggang Island	Shijutuo Island
Evaluation Objectives	Index Layer Index	Weight Coefficient			
Eco disturbance of Three Islands of Tangshan Bay	Natural disaster	0.196	1.000	1.000	1.000
	Human disturbance	0.804	0.416	0.432	0.337
	Evaluation value		0.495	0.509	0.427

2.5 Comprehensive Evaluation on the Eco vulnerability of Three Islands of Tangshan Bay

The comprehensive evaluation results of eco vulnerability of Three Islands of Tangshan Bay are computed as per the previously defined comprehensive evaluation methods of island eco vulnerability and the results of eco resilience and eco disturbance, as shown in the table below.

Table 8. Evaluation Table of Eco vulnerability of Three Islands of Tangshan Bay

	Yuetuo Island			Dawanggang Island			Shijutuo Island		
	2003	2008	2010	2003	2008	2010	2003	2008	2010
Resilience	79	67	51	88	97	40	75	65	42
Disturbance	~	~	42	~	~	49	~	~	46

The eco vulnerability of Three Islands of Tangshan Bay is measured through eco resilience and disturbance. Disturbance reflects the ability of the three islands to withstand external disturbance. The analysis on the eco resilience in 2003, in 2008 and in 2010 indicates that the three islands have increasingly deteriorating resilience which is moderate to high. By 2010, the three islands had been under moderate disturbance, revealing that they have relatively high eco resilience and are subject to moderate eco disturbance as a whole. Therefore, these three islands are suitable for proper development and utilization activities.

3. Summary

After defining the concept and meaning of island eco vulnerability, this paper has taken island eco vulnerability as the evaluation criteria for island development and utilization, and developed the quantification methods composed of island eco disturbance and eco resilience in combination of the typical characteristics and elements of an island ecosystem. The Three Islands of Tangshan Bay have been adopted for verification on the island eco vulnerability evaluation criteria. The evaluation results reveal the suitability of these three islands for development and utilization, providing theoretical basis and technical reference for sustainable and rational development and utilization of island resources, and protection of island ecosystem.

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An Analysis of Contemporary Issues in Maritime Safety from the Quality Management Approach

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ABSTRACT

This study identifies safety as an element of service quality in maritime transport and discusses contemporary issues associated with maritime safety in light of the quality management approach. This paper argues that safety is an element of service quality and it has also been revealed that there are five contemporary issues that have impacts on the management of safety in the maritime transport industry, namely, human factor, effective communication, safety culture, commerciality versus safety and chain of safety links. Safety culture, as part of the quality and organisational culture, is the most important factor and deemed to be the root of other issues. Factors affecting the contemporary issues of maritime safety are also discussed. It is argued that these issues, viewed from the quality management approach, are of critical importance to the management of safety and thus a clear comprehension in this respect will contribute to the cause of maritime safety improvement.

Keyword: service quality, maritime safety, maritime industry, quality management, safety culture

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1. Introduction

Maritime safety issues dates back to the dawn of trade by sea and men on boats. Today, although maritime accidents and casualties have relatively decreased, the magnitude of this issue retains its importance. Indeed, while international conventions like SOLAS are designed to ensure safer shipping, a uniformity of standards in safety is still far from being reached. Many contemporary issues of maritime safety thus need further investigation. It is proposed that safety, as an important element of quality of the maritime transport service, can therefore be effectively managed with the application of quality management philosophies and principles. In this respect, this paper aims at diagnosing and analysing the contemporary issues of maritime safety from the perspective of quality management in the shipping industry.

2. Safety as an element of service quality

With more than 90% of world trade by volume being transported by sea, maritime transport remains the backbone facilitating international trade and globalization (International Maritime Organisation, 2017). Maritime transport, as an important link in the total transport chain, is a service industry and the notion of service quality is critically important. A number of studies show that the quality of service in maritime transport is a critical factor which is essential in the customers' selection of shipping lines and port operators (Pearson, 1980; Brooks, 1985, 1990; Slack, 1985; Murphy *et al.*, 1989, 1991, 1992; Lopez and Poole, 1998; Frankel, 1993; Tongzon, 2002; Ha, 2003; Ugboma *et al.*, 2004; Pantouvakis, 2006; Thai, 2008; Cho, Kim and Hyun, 2010). Moreover, shipment safety is classified as one of the selection criteria and an attribute of service quality. Literature survey about quality dimensions in maritime transport suggests that the quality of maritime transport services is defined by a number of dimensions from both service providers' and service buyers' perspectives. A recent study (Thai, 2008) specifically built and validated the ROPMIS model of service quality in maritime transport which consists of six dimensions (*Resources*, such as equipment and facilities availability, etc.; *Outcomes*, such as shipment safety and security, etc., *Process*, such as staff's attitude and behaviour, etc., *Management*, such as knowledge and skills of management and operators, etc., *Image*, such as company's reputation for reliability in the market; and *Social responsibility*, such as environmentally safe operations, etc.). Clearly, safety is an essential element of service quality in maritime transport both from the perspectives of customers, service providers and the environment (Thai, 2008).

There have been numerous publications about quality in shipping, discussing quality that is broader than merely providing quality service. Hawkins (2001) pointed out that quality in shipping also means safety as safe maritime transport results in huge savings from accidents. Bengtson (2000) argued that there are three elements contributing to quality shipping, namely quality of ships, quality of people and quality

of management. MPA Singapore (2000) concluded from an international conference regarding quality shipping that a 'quality' ship or operation is one that is in accordance with the applicable international standards of the day as well as any other related or additional standards set and adopted by others. In this respect, they also acknowledge that 'quality' seafarers are fundamental to quality shipping. This aspect of safety as an element of service quality in maritime transport has been reflected consistently and repeatedly in many recent studies, such as European Maritime Safety Agency (2009), Thai *et al.* (2014), Yuen and Thai (2015), Thai (2016), Madar and Neacsu (2016), Yuen and Thai (2017), to name just a few.

The concept of service quality in shipping encompasses the critical importance of safety and environmental protection in the overall dimension of corporate social responsibility. The fact is that shipping accidents are grand events and thus concerns for safety and environmental protection is likely to have impacts on the shipping company's image. When an oil spill occurs it is not only the shipping company's shareholders who suffer the loss of their properties, but also the stakeholders, for instance, fishery and tourism industries, who have to bear the consequences of such an accident. For example, the Exxon Valdez tanker accident in Alaska in 1989, which spilled more than 10 million gallons of oil, is still considered as the most damaging oil spill in US history, and it ranks as number one worldwide in terms of environmental damage. Approximately, the spill had an impact on 1,300 miles of coastline and caused the deaths of an estimated 250,000 seabirds, 2,800 sea otters, 300 harbour seals, 250 bald eagles, up to 22 killer whales, and billions of salmon and herring eggs. The clean-up effort cost Exxon \$2.5 billion alone, and the company was forced to pay out \$1.1 billion in various settlements (Walters, 2014). In addition to the upfront costs of the Exxon Valdez disaster in which the company expressed a slow response time and refusal to accept responsibility, the company's image was permanently tarnished. Angered customers cut up their Exxon credit cards while others boycotted Exxon products. Several years after the accident, 54% of the people surveyed in a study said they were still less likely to buy Exxon products (University of Florida, 2001).

Ruiter (1999) argued that the objectives of responsible participants in shipping and the objectives of public authorities are very similar, that is both want the rules to be complied with by everybody and both parties want to reward quality. Gratsos (1998) defined quality shipping as 'safe, efficient, reliable seaborne transport operated in an environmentally responsible fashion'. In defining quality shipping industry, Eliades (2002) also argued that:

Quality shipping industry means the industry of the transportation of people and goods by sea whose basic features are respect of human life and property at sea together with a high regard and respect for the environment in which we all live; an industry where the prospect and the pursuit of economic return does not invalidate the commitment to the values just mentioned.

The Green Award, initiated by the Port of Rotterdam, is a typical example of the industry recognition with regards to the social responsibility dimension of quality in maritime transport (Green Award, 2004). It is indicated that the Green Award Flag can be awarded to vessels which are 'extra safe, extra clean' and meet high but manageable technical and managerial requirements. It is also noted that there have been increasing number of ports and nautical providers recognising the value of the Green Award and offer special rates and other advantages to Green Award vessels. In fact, the notion of social responsibility not only applies to shipping companies but also to ports. It is noted that a port community is always concerned with environmental issues that ports are dealing with in their operations and management, for instance, reception facilities for ships or interests in other environmental considerations. It is obvious that ports' behaviour towards and how they deal with these issues will certainly affect the perception of their shareholders as well as the stakeholders at large on the quality of their services, and subsequently their image and reputation. Today, more and more port entities recognise the importance of public opinion on business ethical issues, and strive for business objectives in a socially responsible manner. The Ecoports project whose main goals are to harmonise the environmental approach of ports in Europe and to exchange experiences and implement best practices on port-related environmental issues, is a typical example (Ecoports, 2004). Clearly, it can be seen from the above that service quality in maritime transport means not only *safe, reliable* (Service), *efficient* (Management) transport services but also *socially responsible behaviour and activities regarding safety and environmental protection concerns*. The latter is clearly an attribute of the social responsibility dimension of quality. Safety is thus illustrated as an element of service quality in the maritime transport industry, and the quality management application in addressing the contemporary issues of maritime safety shall result in effective safety outputs for the industry and for the society at large.

3. Contemporary issues of maritime safety

3.1 *The human factor in maritime safety*

The most important contemporary issue involving maritime safety is the human factor, which is defined as 'the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance' (International Ergonomics Association, 2017). In the context of maritime safety, this is commonly referred to as the "human element", which is explained as 'the people's ability and capability to deal effectively and safely with the complexity, difficulty, pressures and workload of their daily tasks, not only in emergency situations but also during routine operations' (UK Maritime & Coast-guard Agency, 2016). Numerous studies have shown that there are many contributing factors embedded in the human factor which can act

as pre-cursors to human errors and, in turn, maritime accidents or incidents. Nevertheless, the 12 most common ones, as synthesised by the UK Maritime & Coast-guard Agency (2016), are *fit for duty*, *situational awareness*, *alerting*, *communication*, *complacency*, *culture*, *local practices*, *teamwork*, *capability*, *pressure*, *distractions* and *fatigue*.

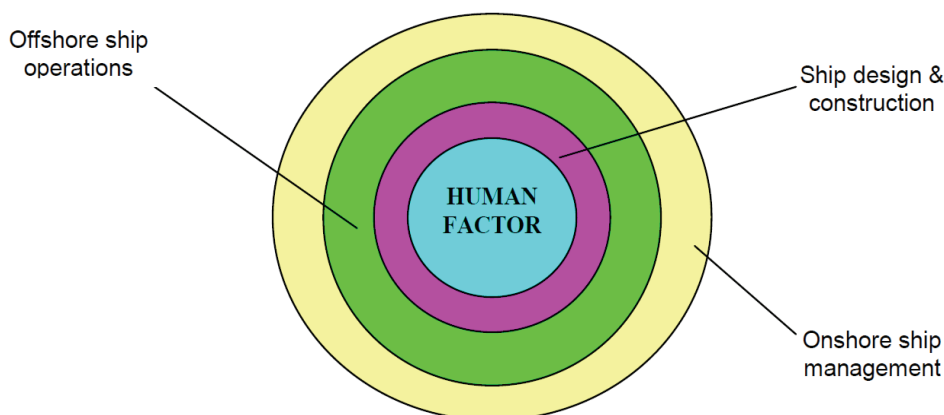
It has been argued that in many cases the ship safety is closely related to human errors (Goulielmos and Tzannatos, 1997; Wang and Zhang, 2002; Heinz, 2013; Nicolae *et al.*, 2016). According to some sources, more than 80% of the causes of maritime accidents are attributable to human errors, and in the causation chain of shipping accidents they are found consistently to be responsible for four out of every five casualties (Mitchell and Bright, 1995; Kristiansen, 1995; Payer, 1995; Pelecanos, 1999; Grech *et al.*, 2008). In another study, the Transport Safety Board of Canada (TSB) also found that 200 out of 273 accidents involving vessels in Canadian pilotage waters were due to human errors (TSB 2004). More specifically, it was indicated by Rothblum (2000), cited in Berg (2013), that human errors contribute to 84-88% of tanker accidents, 79% of towing vessel grounding, 89-96% of collisions, and 75% of fires and explosions.

Studies about human errors in shipping have also indicated that there are several classifications of factors contributing to this issue. Findings from a report of the UK P&I Club revealed that about 65% of human errors are operational and the remaining 15% are associated with the ship design and construction (Goulielmos and Tzannatos, 1997). When discussing the human factor in pilotage, Pelecanos (1999) argued that there are two sets of factors affecting the performance of human being, namely, the physiological factors such as stress and fatigue and the psychological ones such as attitudes and behaviour and personality. Wang and Zhang (2002), in addition, indicated that there are four categories of components, competency, *organisation and methods*, *communication and design*, contributing to the human system on board a ship. They highlighted the importance of effective education and training, management, communication and design so as to reduce the human errors.

It is therefore obvious that the quality of people in shipping plays a critical role in achieving high level of maritime safety. Although the analysis from other reports argued that the human factor is accounted for more than 80% of causes of maritime accidents, the author's viewpoint is that this element is attributable to all errors in the system which leads to mistakes and disasters. Indeed, when we look at the maritime transport chain, it can be seen that the people are at the centre of all operation systems, from the ship design, construction to ship registration, operations and management, from offshore to onshore activities (See Figure 1). While there are many factors embedded in the human factor which may lead to accidents and incidents, these exist at both the core system (ship design and construction), to the inner layer, ship-based system (offshore ship operations) and to the outer layer, company-based system (onshore ship management). In this respect, one can argue that technical shortcomings such as an inherent vice or latent defect of equipment,

for example, an engine cylinder, may be the main factor contributing to the accident, and it is a technical shortfall. However, such equipment is a product and its quality is subject to the careful operations not only during the production but also from the design stage, in which people have the main input. While automation can be considered as the effective solution to eliminate human errors at the operational level, the issue remains its magnitude. It is strongly perceived that any system is only as good as its core, the human being, and this also applies to maritime safety. While one may argue that human errors are inevitable, we should strive for 'zero tolerance' behaviour for defects, an important quality management mandate which has been very much advocated by gurus such as Crosby (1980).

Figure 1. The human factor in maritime safety



Source: Author

As Crosby (1980) stated that quality management is all about prevention, and quality and productivity always increase as variability decreases (Deming 1986), it is essential that the human factor be addressed at the roots of a good management system, in education and the process control by operating companies. Therefore, quality of education programs at institutions in which safety is part of the training, and harmonised standards of training among institutions in the world using international standards such as the STCW 1995/1998 as a base, are deemed extremely important in this respect.

3.2 *Effective communication*

The importance of communication as a critical success factor of quality management, both within different functional business units in an organisation and between an organisation and its suppliers and customers, has been widely discussed (Black and Porter, 1996; Ahire *et al.*, 1996; Flynn *et al.*, 1994; Sureshchandar *et al.*, 2001; Lakhal *et al.*, 2006; Yeh and Lai, 2015). In the context of maritime safety, poor communication between various agents involved in ship navigation has constantly been identified as one of the main causes of maritime accidents. For instance, in a recent report on navigational claims during the period of 2004-2013, the Swedish

Club revealed that many navigational claims still occur due to procedures not being properly followed by crew members, and officers not communicating with each other properly. In addition, poor communication between both vessels and bridge team members and a lack of situational awareness all play a part (Swedish Club, 2014).

Peters (1984) emphasised the strategic importance of communication in that ‘the only things that the superstar companies understand is that the strategic distinctive competence of their institution is a strength borne of communication and implementation’. Studies about maritime safety have also highlighted effective communication as another important contemporary issue and this has been recognised by most maritime organisations around the world. From the standpoint that maritime safety should be viewed from a total system approach, communication is existent and represented in both horizontal and vertical dimensions as well as at both operational and management levels of the maritime transport network. Communication in the vertical dimension and at operational level includes that among players on board a ship such as between the ship master/watch-keeping officers and the pilot, or between the ship master/watch-keeping officers and the ship crew. At the management level, the communication is conducted between the players on board a ship and its operating/management company ashore. On another hand, communication in the horizontal dimension is illustrated through that between a ship and its operating/management company and other players in the maritime transport system. At the operational level, this is the communication between players on board a ship and the maritime safety related agencies ashore, such as the VTS (Vessel Traffic Service) and ATN (Aids-to-navigation) authorities or the Harbour Master and between a ship and other players beyond the ship such as the tug operator. At the management level, the communication relationship is represented between a ship operating/management company itself and flag states and port states, as well as at the higher level between the flag state where the ship is registered and the international organisations which have interests on maritime safety, such as the IMO. These maritime safety related communication relationships are illustrated in Table 1.

Table 1. The matrix of communication in maritime transport chain

Dimensions Levels	Vertical	Horizontal
Operational	Communication among players on board a ship	Communication between players on board a ship and agents ashore or with players beyond the ship such as tug operator
Management	Communication between players on board a ship and its operating/management company ashore	Communication between a ship operating/management company and a flag state; and between a flag state and peak bodies/organisations

Source: Author

In practice, effective communication, in both dimensions and at both levels, has been proved as a critically important factor contributing to the improved maritime safety. The communication between a pilot and a ship’s master/watch-keeping officers, for instance, is the most important of this type at the operational level. In this respect,

effective communication between these players is vital to the safe operations of a ship and to better understanding each player's duties and responsibilities. In fact, some differences may result from the fact that pilots and masters/ship officers do not share common ideas of what is required. While one group generally believes that it is providing adequate information, the other group might feel they are not getting enough information, and hence this is the question of effective communication. On the other hand, these groups sometimes do not even exchange the necessary information for the management of the ship's safety. For example, in the investigation of a maritime accident, the Transport Safety Board of Canada found that both the pilot and the second mate did their own calculations of the vessel's position, but they did not exchange and cross-check the information (TSB, 2004). This communication issue between pilots and the ship's master/watch-keeping officers is echoed again in a recent accident in November 2007 in which the 901-foot-long M/V Cosco Busan sideswiped the San Francisco-Oakland Bay Bridge, resulting in two fuel tanks ruptured and more than 53,000 gallons of fuel oil spilled into the San Francisco Bay (CBS News, 2009). In this accident which costs more than \$70 million for oil spill clean-up, it was reported that there was a lack of communication between crew members, in that the ship's captain and pilot had little discussion about how the pilot planned to guide the ship through dangerous local waters.

A study about Maritime Safety Management System (MSMS) was conducted by the Australian Maritime College (2005) as a project for the International Association of Maritime Universities (IAMU). As part of the research methodologies, a survey questionnaire was sent out, during January – May of 2004, to 157 maritime organisations addressing the person in charge of safety. These organisations include port authorities/harbour masters, port operators/stevedoring companies and key actors in the aids-to-navigation (ATN) activities such as VTS (Vessel Traffic System) authorities, lighthouse authorities, etc. The targeted respondents are members of the International Association of Ports and Harbours (IAPH), the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) and global port operators ranked by Drewry Shipping Consultants. By the cut-off date, fifty three returned questionnaires were received, representing a 34% response rate. The majority of responses came from port authorities/harbour masters, followed by marine ATN/lighthouse authorities, maritime administrations and port operators/stevedoring companies. In terms of international representation, all continents are represented with prevailing responses from Europe, followed by Asia and others. This reflects the maritime dominance in each continent.

This study clearly showed that effective communication is a critical success factor of maritime safety (AMC 2005). When respondents, consisting of port authorities/harbour masters, port operators, VTS managers, ATN authorities in the international shipping community, were asked to indicate the importance of communication relationships among players in the maritime safety chain, 87% of them stated that the communication relationship between pilot and ship master/officers as 'very important', 13% as 'important' and ranked this as the most important relationship,

followed by the one between the players on board the ship and the VTS manager which was considered as ‘very important’ by 79% of respondents. The ranking of these communication relationships is presented in Table 2.

Table 2. The importance of communication relationships in the maritime transport chain

Relationships	Mean	Standard deviation	Rank
Between Pilot and Master/Ship officers	4.87	1.10	1
Between ship staff and VTS manager	4.75	1.66	2
Between Master and Ship officers	4.62	1.81	3
Between ship staff and Harbour Master	4.53	2.06	4
Between Master/Ship officers and crew	4.40	2.03	5
Between ship staff and tug operator	4.21	1.72	6
Between ship staff and port staff	4.08	1.88	7
Between port staff and independent contractors/visitors	3.57	2.49	8

Source: Australian Maritime College (2005)

Note: relative ranking based on factors’ mean scores; 1=not at all important, 5= very important

In addition, when asked to state the view on the communication relationships among players at the management level, nearly 87% of respondents also considered these as the key communication relationships which affect safety environment. Furthermore, about 60% and 40% of respondents respectively expressed their view as ‘strongly agree’ and ‘agree’ to the statement that the effective communication among players at operational and management levels is viewed as very important in the management of safety. It has been illustrated that communication has a vital role to play in the management of maritime safety, and effective communication at all levels and in all dimensions will have great positive impacts on the cause of reducing human errors, and thus greatly contributing to the safety improvement of maritime transport operations.

3.3 Safety culture

Safety culture, as another contemporary issue of maritime safety, can be considered as the root of other factors which affect the management of safety. In this respect, in order to understand the importance of safety culture in improving safety of maritime transport, one needs to first understand the implications of organisational culture to the business practices of any organisation. The term culture refers to basic assumptions and beliefs that are shared by the members of an organisation, that operate unconsciously, and define, in a basic ‘taken for granted’ fashion, an organisation’s view of itself and its environment (Schein, 1985). Peters and Waterman (1982) and Hofstede *et al.* (1990) argued that shared value and perceptions of daily practices are the core of an organisation’s culture. Van, Dirk and Sanders (1993) defined culture as ‘something collective and not a characteristic of individuals’, and ‘as a mental software and therefore invisible and intangible’. These authors, in their research of measuring the organisational culture within the perspective of quality management, concluded that the organisational culture supports dimensions of quality like reliability

and durability through the strong emphasis on rules (process orientation). In this respect, an organisational culture is to some extent a set of traditions, values, perceptions and beliefs, an unwritten set of guidelines for all employees in that organisation to follow. From this perspective, it is quite understandable that an organisational culture differentiates one company from another even when they are operating in the same type of business and it is a dominant factor in the business environment. There is no doubt that a strong organisational culture is not only vital but also the key factor in success. In another perspective, it is perceived that an organisational culture can sometimes be the main cause of difficulties that a company may face as it can make the senior management extremely conservative and thus not receptive to new and creative ideas, as well as the changing business environment. In such cases, a change of culture is deemed the critical factor. Although a culture change is always perceived as very difficult due to its characteristics as mentioned above, it is also believed that such a change is inevitable for the vital existence of any organisation.

When it comes to safety, it is strongly perceived that a culture in this respect should be created and maintained in the company, and safety culture should become a part of the quality culture of the organisational culture. Safety culture has been defined as 'a series of belief, norms, attitudes, roles and social and technical practices which are established to minimise the exposure of employees, managers, customers and third parties to hazard' (Dyrhaug and Holden, 1996). Weick (1987) also indicated the safety culture concept as 'a clear understanding of the system and its safety features, positive attitudes towards safety measures, and an incentive system that encourages safety in operations'. In this respect, it is perceived that if there is a paradigm shift to include safety in the organisational culture, the management of safety will be greatly improved, since a culture of safety, as an organisational culture, will play a critical role in shaping the operations and management practices involving the safety issue. It is argued that while safety culture may not be the only determinant of safety in organizations, it plays a substantial role in encouraging people to behave safely (Berg, 2013), and thus accidents and incidents can be avoided considering that a large proportion of their causes is related to human errors, especially in the maritime safety context.

The safety culture involves two main elements, namely 'management commitment' and 'employee involvement'. These appear to be the two most important dimensions in the creation of safety culture. It can be then perceived that good safety performance involves much more than simply the preparation of well-structured company safety procedures and standards, since it is empirically illustrated that many safety problems have their roots in poor management attitude towards safety, and thus safety culture is very much an 'attitude of mind'. A safety culture instilling a learning approach to accidents and injury is necessarily inspired and fostered by the management level and then communicated to operational level. It is also necessary that safety culture is inspired among sectors of the maritime transport chain, since a sector without safety culture can let the others down and thus affect the whole chain.

In the study about MSMS conducted by the Australian Maritime College (2005), when asked to indicate their views on key safety issues, 66% and 34% of respondents respectively 'strongly agreed' and 'agreed' that a positive safety culture is a key determinant of a successful MSMS; 68% and 30% of them 'strongly agreed' and 'agreed' that there should be high level of commitment from senior management and involvement of all employees in order to inspire the safety culture throughout the organisation; and 68% and 32% of respondents 'strongly agreed' and 'agreed' that the safety culture should be inspired and communicated to all sectors within the MSMS. Moreover, 62% and 38% of respondents respectively indicated inculcation of a safety culture and minimisation of the effect of human factors on risks as 'very important' and 'important', and ranked this as the most important factor to the success of a good maritime safety plan. Clearly, the safety culture as part of the organisational culture has a critical role to play in the management of safety, and success in maritime safety will only be achieved as this culture is inspired and maintained as a way of doing business (Blome and Ek, 2014). Three key components to developing an effective safety culture include *commitment from the top*, *measuring current performance and behaviour*, and *modifying behaviour* where required so that company's employees 'believe in safety, think safety and are committed to safety' (International Chamber of Shipping, 2013). In so doing, many accidents simply will not happen because virtually all so called "accidents" are in fact preventable (International Shipping Federation, 2017).

3.4 Commerciality versus safety

While it is necessary to promote safety in maritime transport operations, the question is how to remain focussed on safety whilst operating in a commercially responsible manner. The safety provisions are usually considered to be a cost burden dictated by law, and thus a necessary evil. There has always been a certain conflict between commercial efficiency and safety, indicating the fact that resources, which are available for safety, should be spent in the most cost-effective way. This can be done, taking into consideration the preventative measures policy, through the Formal Safety Assessment (FSA) with the application of risk management and cost-benefit assessment (CBA) techniques. FSA is a process which involves hazards identifications, risk assessment, studying alternative ways of managing those risks, carrying out cost-benefit assessment of alternative management options, and finally, making decisions on which option to select (IMO, 2004).

A study by Grote and Kunzler (1996) found that conflict between safety and commerciality can more likely be solved in favour of safety in organisations where safety is understood as an integral part of the primary task of the work system ('positive safety culture'). However, this by no means indicates that the commercial issue is downgraded in such organisations. The main question is to incorporate safety as an indispensable part of the operation systems whereas commerciality and safety are treated on equal footing, especially in the maritime industry where the profit margin is slim and safety plays a vital role. In addition, it is strongly perceived

that the relationship between commerciality and safety is only compromised as every employee in the company thoroughly understands the co-existent status of the two issues, and that improved safety will prevent productivity loss and cut costs in the long run. In this respect, it is important that safety should be built into organisational management, and managers should clearly understand the hidden costs of accidents, comprehend that 'good management is good safety', so as to inspire this to their employees (Pater 1990).

In the study of Australian Maritime College (2005) regarding MSMS as mentioned previously, 53% and 45% of respondents expressed their view respectively as 'strongly agree' and 'agree' with the statement that safety and commerciality issues should be treated on the equal footing in the maritime industry because safety is an indispensable part of all operation systems; 60% and 40% of the respondents also 'strongly agreed' and 'agreed' respectively with the key safety issue that safety should be a part of the work practice in every operation of the organisation. It is thus safe to state that safety is as critical as the commercial pressure and the right perception and implementation of business practices towards this issue will lead to positive impacts on the bottom line of an organisation.

3.5 The chain of safety links

It is said that the safety of a system is affected by various factors such as design, manufacturing, installation, commissioning, operations and maintenance (Sii *et al.*, 2001). In the case of maritime transport, a ship's safety is substantially affected by many technical factors, including shipowner management quality, crew operation quality, enhanced survey program, degree of machinery redundancy, fire-fighting capability, navigation equipment level, corrosion control, preventive maintenance policy etc. (Burton *et al.*, 1997). Moreover, it can be seen that these factors involve a number of organisations in the shipping industry such as port states, flag states, classification societies, maritime institutions etc. with their peak bodies being international organisations such as the International Maritime Organisation (IMO), International Association of Classification Societies (IACS), International Association of Maritime Universities (IAMUs) etc. Maritime safety thus cannot be achieved without international cooperation among various organisations involved in ensuring maritime safety. In this respect, the responsibilities of these organisations can be likened to links in a chain, and it is obvious that a chain is as strong as its weakest links (Mitropoulos, 2002). The most important link in the maritime safety chain is the shipping company (Swedish Ship-owners Association, 2004), in which the human element – seafarers – is the most important component (Bowring, 2006).

From the commercial perspective, the operations of a ship involve collaborative working relationships with many other stakeholders during shipping transactions such as port operators, port authorities, charterers, marine underwriters, financiers etc. Their role in maritime safety, including the safety of the ship, her crew, her cargo and operations, cannot be neglected since their inputs will either directly or

indirectly contribute to maritime safety. For example, the commercially safe operations of a ship lie in the hands of a bareboat charterer during the charter period, while the safety of the ship, her crew and cargo is also dependent on how a common shipper exercises his due diligence in declaring his cargo's characteristics. It was also found in a recent study which examined stakeholders involved in a novel system for enhancing maritime safety that the participation of market players such as charterers, crewing agencies, equipment manufacturers, icebreaking assistance, pilot vessels, shipping agencies etc. is crucial (Wolejsza, Thombre and Guinness, 2015). Indeed, maritime safety-related legislations can only be successful if supported and implemented by the industry as a whole, including these market players, and it is them in the industry that offer the greatest potential to accelerate the process of quality shipping, and the eventual demise of substandard shipping (Mykoo, 2003).

As safety is an element of service quality in maritime transport and because of the above characteristics, it is important that the management of safety should be conducted from a broader perspective of Group-Wide Quality Control (Ishikawa, 1990) or Total Quality Management, whereas the line of safety management is extended up to the suppliers and down to the customers, or in other words, to all stakeholders of the shipping company (see Figure 2).

Figure 2. The maritime safety chain

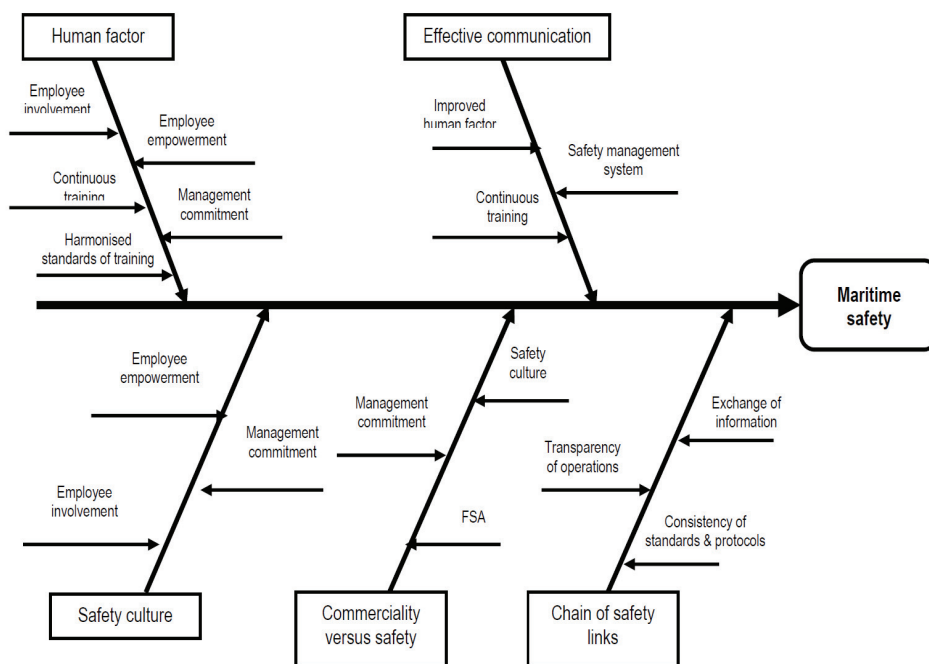


Source: Author

While one link in the chain can be claimed as the main responsible player for maritime safety, it is strongly believed that an increased effort or investment in establishing and maintaining high quality operations by only one link in the chain

is of little use without commensurate effort by all the others involved (Mitropoulos, 2002). This is understandable as the management of safety in maritime transport is closely governed by all links in the chain and they are strongly related to each other as far as safety issue is concerned. Being in the same safety chain, it is necessary that all links need not only to measure up their responsibilities but also work collectively for the common aim of safe and efficient maritime transport. In this respect, effective communication across levels within a link and among links is very essential. Transparency of operation and the free exchange of information are key elements in building and maintaining the cooperation and mutual trust required to strengthen the safety chain (Mitropoulos, 2002). Moreover, it is critically important that standards and protocols should be consistently used among various organisations across the maritime safety chain in order to achieve effective cooperation through shared mutual trust in each other works. This has been indicated by professionals as the key safety issue in the maritime industry. Result from the Australian Maritime College's study mentioned previously affirmed this as 38% and 60% respectively of respondents 'strongly agreed' and 'agreed' that consistency in all sectors of the maritime transport is essential to achieve an effective MSMS. Clearly, together with other contemporary issues, strengthened and effective chain of safety links is a critical issue that needs to be achieved in order to have a safe and efficient maritime transport industry, as illustrated in Figure 3.

Figure 3. Contemporary issues of maritime safety



Source: Author, based on Australian Maritime College (2005)

4. Conclusion and policy implications

In this paper, contemporary issues of maritime safety have been reviewed and discussed. The quality management approach to contemporary issues of maritime safety, namely, human factor, safety culture, communication, commerciality versus safety and chain of safety links is necessary to identify the core factors affecting these issues and thus contribute to the improvement of safety management in maritime transport. It has also been revealed that the inculcation and inspiration of safety culture within an organisation and among organisations in the maritime transport chain play a critical role as a pre-requisite for any safety management system. In this respect, management commitment, employee involvement and empowerment, continuous training, harmonised and consistent standards, among others, are essential factors for effective and sound planning and management of safety in the maritime transport network. Besides, relevant organisations in the maritime safety chain also need to pay attention to other important aspects such as the human factor and effective communication, among others, since they contribute to the effective (ineffective) management of maritime safety.

These contemporary issues of maritime safety should be addressed at either micro (organisational) or macro (governmental) policy levels, or both, since some issues have their magnitude of importance spanning across both levels. For example, while the issue of human factor i.e. awareness, skills, etc. of seafarers and shore-based staff can be ideally tackled at the organisational level i.e. shipping companies, at the same time it should also be dealt with at the governmental and inter-governmental/international level, especially when it comes to establishing a harmonised standard of seafarer training and education. This, in turn, requires the coordination and support of not only shipping companies, but also other stakeholders in the maritime industry such as flag states, class societies, etc. Clearly, this also involves the chain of safety link, which is another contemporary issue of maritime safety. The effective management of maritime safety therefore requires both quality management and even supply chain management approaches, since it relates to the involvement of all parties who are at the upstream and downstream of shipping companies which jointly make safer seas and cleaner oceans.

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The Regulation of Maritime Fishing under the Algerian Law

OunassaBoukhmis*

ABSTRACT

The over exploitation of marine living resources has always aroused the interests of the international community; this has resulted in the development of rules and laws for the conservation and preservation of living marine resources. Although legal mechanisms are progressively set up in order to end the development of illegal, unreported and unregulated fishing (hereinafter IUU fishing), such activities still continue. In its turn, Algeria has adopted an approach for the protection of environment in the framework of sustainable development; thus making necessary amendments to the previous texts in order to include this approach in the new laws. Also, Algeria as a member of the international community, affected by the phenomenon of IUU fishing strives to reconcile the requirements of rational exploitation of its fishery resources with international demands of conservation of fish stocks and preservation of the Mediterranean Sea. To do so, it has adopted provisions organizing the activities of maritime fishing. At the same time, deterrent measures have been prescribed to ensure legal and sustainable fishing. However, national legislation still require the incorporation of certain provisions of the international conventions that Algeria are currently ratifying or require ratification; regarding tools and possibilities offered by them in the prospect of developing maritime fishing and fighting IUU fishing.

Keywords: Algerian law – Mediterranean Sea - Fisheries and aquaculture - foreign flag vessels - IUU fishing – international & regional instruments.

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1. Introduction

This manuscript set out the Algerian legal system related to fishing and aquaculture, a sector that has not been accorded the importance which it deserves in the policy of the State, view of the challenges that it confronts. The aim of this manuscript is to describe and analyze the Algerian fishing and aquaculture laws and regulations, expose their progress and highlight the contribution of amendments and new laws and their impact on the development of fishing and aquaculture, that allows to pinpoint the gaps and propose solutions. That explains why in Algeria, the maritime fishing sector has been abandoned for a long time because of several reasons such as : the insufficiency of qualified personnel¹⁾, an old fleet and administrative difficulties. The main reason for this abandonment was that the department of maritime fishing in Algeria was not stable at the administrative level; it was supervised by different ministries in turn: (Ministry of Irrigation, Ministry of Transport, Agriculture...), and at each time it was relieved of some prerogatives. In 1999, the Ministry of Fishing & Fishery Resources was established. During the period (1999-2016) the sector has known a restructuration on legislative, professional²⁾ and material³⁾ aspects, simultaneously with the creation of the National Agency for Sustainable Development of Fisheries and Aquaculture "ANDPA" in 2014. The board of directors of the agency is composed of representatives of various ministries in relation with maritime fishing activities. It aims to guarantee the coordination that will achieve the goals set. In 2016, the sector of maritime fishing was again placed under the supervision of the Ministry of Agriculture, Rural Development and Fisheries.

2. Overview of fisheries in the Mediterranean Sea

Before considering the regulation of maritime fishing under the Algerian law, it is important to recall that, in view of the particularity of the Mediterranean Sea which covers 2.51 million km², it is one of the largest semi-enclosed seas. The Strait of Gibraltar connects it to the Atlantic Ocean, of which the Mediterranean Sea is a part, and the Suez Canal connects it to the Red Sea, and the Indian Ocean. The Mediterranean is generally considered a distinct sea from the Black Sea, to which it is connected via the Dardanelles and Bosphorus, though some regional treaties apply to both Seas (Irinì Papanicolopulu, 2013).

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- 1) - The main future technical needs in Algeria were linked to the training of inspectors. Final report : Working group on illegal, unreported and unregulated (IUU) fishing in the GFCM area of application- Madrid, Spain, 19-21 April 2016; Compliance Committee (COC), General Fisheries Commission for the Mediterranean , FAO. p. 03.
 - 2) - A maritime population of 80,000 (direct and indirect jobs), statistics for the year 2013 given by the national statistical office. www.ons.dz
 - 3) - A fleet of 4778 registered gear, with a capacity of 69.711 GT, average age of construction in 1996, (report delivered in 2015). "The State of Mediterranean and Black sea fisheries 2016"; General Fisheries Commission for the Mediterranean, Food and Agriculture Organization of the United Nations Rome, 2016. p. 29.

In addition, the Mediterranean Sea has not large stocks of fish or species of special interest for the world trade, therefore fishing is practiced only by coastal countries; except Spain and Italy are interested in an advanced level of activities in the exploitation of Mediterranean fisheries⁴⁾. Furthermore the risks of conflicts can arise from the establishment of the Exclusive Economic Zones (hereinafter EEZ) by the twenty one (21) coastal states of the Mediterranean, from the extent of the high seas and the restriction of rights related to this zone essentially the freedom of navigation, that lead Mediterranean States to establish an exclusive fishing zone in order to avoid the conflicts (Umberto Leanza, 1992; Irini Papanicolopulu, 2013)⁵⁾.

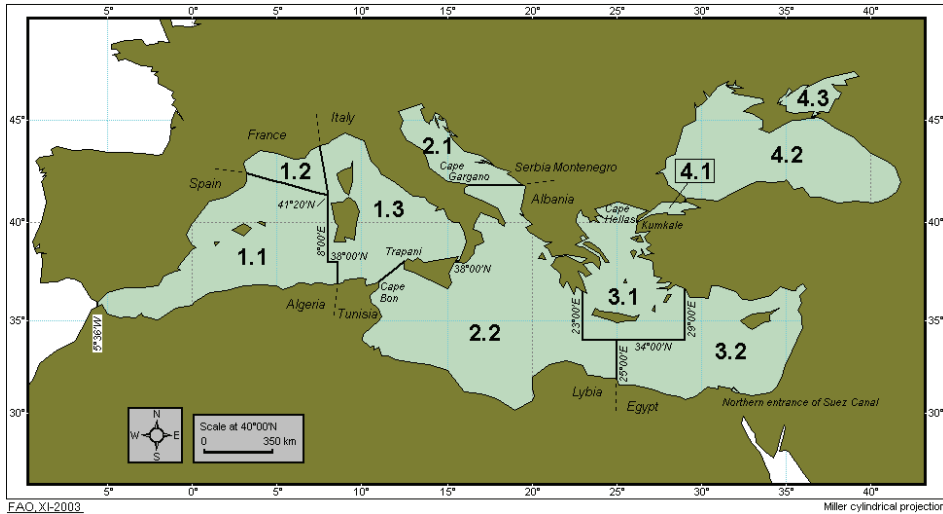
Because of the earlier reasons that make the Mediterranean unique, it is the fact that several Coastal States, instead of proclaiming an EEZ extended their jurisdiction up to two hundred (200) nautical miles (hereinafter nm) from their coasts, have created sui generis jurisdictional zones, which are not explicitly provided in the United Nations Convention on the Law of the Sea (hereinafter UNCLOS). These zones are known as “fisheries zones”, where States exercise exclusive rights and jurisdiction with regard to fisheries. Their width is established according to different criteria, and their extension is sometimes reduced so as to avoid delimitation issues with neighbouring States; their names also vary (Irini Papanicolopulu, 2013). This practice is inspired by the European Convention on Fisheries signed in London in 1964 by twelve States, which in its turn is inspired by the joint Canada / United States project (Umberto Leanza, 1992).

In fact, the evolution of fishing techniques and the increase in catches have led several States to establish fisheries zones (Umberto Leanza, 1992), these areas remain reduced comparing to the whole zone subjected to the regime of the high seas in the Mediterranean Sea (Anne-Paule GOUIN, 2007).

4) - The marine capture production of the Mediterranean and Black Sea is estimated at 1.111 776 tonnes in 2014, less of 10, 6 per cent of 2013.

5) - An exclusive economic zone has been claimed by Morocco (1980), Syria (2003), Cyprus (2004), Tunisia (2005), Libya (2009), Lebanon (Decree No 6433 of 1 October 2011) and France (Decree No 2012-1148 of 12 October 2012). Albeit no legislation is available.

Figure 1. FAO fishing area, Area 37: Mediterranean and Black Sea.



Source: UN Atlas of the Oceans

3. The Algerian fishing zone

Algerian territorial sea extends to (12) nm measured from straight baselines; adjacent to it, a (12) nm contiguous zone was established in 2004 in order for the enforcement of customs, fiscal, immigration, and sanitary laws and regulations. About the EEZ, Algeria in its turn, as a geographically disadvantaged country⁶⁾, preferred reserved a fishing zone along the Algerian coast called “reserved fishing zone” than establishing an EEZ. The reserved fishing zone is created by legislative Decree N° 94-13 (1994), and was maintained in Law N° 01-11(2001) on fisheries and aquaculture⁷⁾. The reserved fishing zone is located beyond the national territorial waters, and is adjacent to them. The extent of this zone is calculated from the baselines to (32) nm between the western maritime boundary (with Morocco) and RasTénés⁸⁾, and to (52) nm from RasTénés to the eastern maritime boundary (with Tunisia)⁹⁾, so as not to reach the equidistance line with Spain and Italy.

Such zone is not provided in UNCLOS ratified by Algeria¹⁰⁾ that raises the question of its legal regime. In order to answer to this question, it is first necessary to expose the rights of national and foreign flag vessels in the zone under the law

6) - According to article 70 of the UNCLOS, the concept of a geographically disadvantaged State extends to coastal States, including States bordering an enclosed or semi-enclosed sea.

7) - Article 104 of Law N° 01-11, of 03 July 2001, amended and supplemented by Law N°15-08, of 02 April 2015, has been issued in order to repeal the legislative Decree N° 94-13, of 28 May 1994 laying down general rules for fisheries.

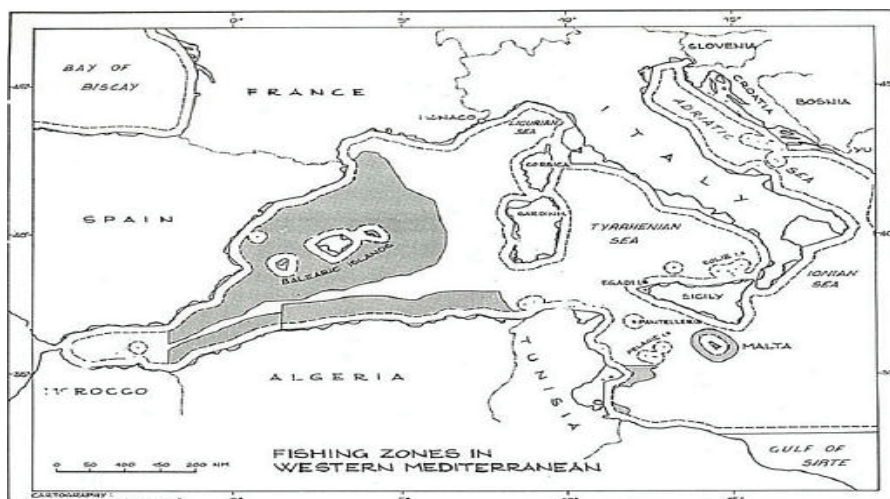
8) - A coastal city located to the west of the capital Algiers.

9) - Article 34 of Law 01-11.

10) - By the Presidential Decree of 22 January 1996 ratifying the United Nations Convention on the Law of the Sea, Official Journal of Republic of Algeria (O.J.R.A) n° 6 of 22 January 1996.

N°01-11 (2001), amended and completed by the law N° 15-08 (2015).

Figure 2. Fishing zones in western Mediterranean.



Source: Claudiane Chevalier from Pr. Scovazzi.

3.1 Rights of fishing under the law N°01-11

The fishing activity in Algeria is regulated by the Law N° 01-11, where article n° 02 provides that waters under national jurisdiction shall be understood to mean the internal waters, territorial waters and waters of the reserved fishing zone as defined by the legislation in force, as elucidated above. Moreover, the Algerian legislature reserves fishing in waters under national jurisdiction only to vessels flying Algerian flag in the broad sense, including vessels acquired in the form of credits, or chartered by Algerian natural or moral persons of Algerian law.

For the ships flying foreign flag operated by natural or moral person of foreign nationality, the Algerian law has taken two different positions. Under the Law N° 01-11, the article 23 provides that the Minister of Fisheries and Fishery Resources may temporarily authorizes ships flying foreign flag to carry out commercial fishing operations only in the reserved fishing zone. However, the article 24 of the same Law extends this right to the case of scientific fishing¹¹⁾ or commercial fishing of large migratory fish to waters under national jurisdiction including territorial sea, whilst the commercial fishing of highly migratory fishers can only be practiced Beyond the six (06) nm measured from the baselines to the outer limits of the reserved fishing zone(Umberto Leanza, 1992). As a result, Algeria didn't only open its reserved fishing zone for foreign ships; but also the half of its territorial sea estimated at twelve (12) nm.

The commercial fishing of highly migratory fishers is regulated by the Executive

11) - UNCLOS does not provide for this type of fishery, but organizes marine scientific research in Part XIII, which raises questions about the nature of scientific fisheries, is the legislature refers to the provisions of marine scientific research restricted to research only on marine biological resources?.

Decree N° 06-367 (2006). With regard to the conditions for the issuance of a fishing license to foreign vessels provided in, ship-owners must submit an application package about the individualisation of the vessel or vessels to put into operation; technical characteristics of the fishing gear to be used; list of the crew to be embarked; an official ship-owner's certificate issued by the country of origin and a document justifying the prior agreement of the flag State, endorsed by the competent authorities. The fishing license shall be issued by the Minister of Fisheries after consultation with the Minister of National Defence. The role of the Ministry of National Defence here is dominant regarding of its mission to ensure the security of the national territory; a mission translated by competences that have been procured as we will see hereafter, thus it is associated with the procedure for the issuance of a fishing license by exercising guardianship over the National Coast Guard Service(NCGS), a structure within the national naval police force.

In addition, the holder of fishing license for highly migratory fishers must embark two (02) inspectors from the fisheries administration and the national coastguard service¹²⁾. The fishing license is no transferable, its issuance is subject to the payment of fees lay down by the legislation in force and it is valid for one year. In its relationship with the national administration, the master of the authorized foreign vessel is obliged to communicate his different nautical positions to the territorially competent maritime administration and fisheries administration¹³⁾once a week and at the end of the campaign. In the case of non-compliance with the laws and regulations in force; the fishing license can be withdrawn by the competent administration¹⁴⁾.

3.2 Rights of fishing under the law N°15-08

In the second period, after the adoption of law N°03-10 (2010)¹⁵⁾relative to the protection of the environment in the frame of the sustainable development; the maritime fishing sector has been affected by the new national policy of the sustainable development, thereby Algeria has adopted a new fishing regulation. The law N° 15-08 (2015), amending and supplementing Law N°01-11, lays down the basis for the exploitation, conservation and the preservation of the living marine resources of waters under national jurisdiction, and the fundamentals essentially based on the concept of responsible fishing. The “*responsible fishing*” is one of the innovations introduced by the Law, defined in the article 02 as follow: “*responsible fishing means the rational exploitation of fishery resources so as to ensure their sustainability and minimize the impact of Fishing activity on the environment*”.

The new amendments in the frame the new policy have made possible for foreign

12) - Article 08 of the Executive Decree N° 06-367. In addition and according to article 09, the holder of the fishing license is required to take a minimum of 10% of the crew, seamen and / or trainees of Algerian nationality.

13) - Article 20a of Law N° 01-11 stipulates that vessels armed and equipped for fishing must have on board a positioning beacon under penalty of sanction prescribed in Art 79bis.

14) - Articles 15, 16 & 17.

15) - Chapter 03 of the law dedicated to the prescriptions of the protection of water and aquatic spaces. O.J.R.A n° 43 of 20 July 2010.

vessels complying with the conditions to benefit only from the scientific fishing license, and to carry out scientific fishing in all waters under national jurisdiction, including internal and territorial waters without specifying a specified distance as was provided in Law N° 01-11. About commercial fishing, the Algerian legislator is retreating from its previous position to authorise foreign vessels to carry out commercial fishing operations in the reserved fishing zone; he has not prescribed any provisions concerning the authorisation for foreign vessels to carry out commercial fishing operations in waters under national jurisdiction, including the reserved fishing zone (Abdeldjalil BELALA, 2004)¹⁶).

The banning of vessels flying the foreign flag from commercial fishing in waters under national jurisdiction appears inconsistent with Algeria's international commitments in this field. However, article 03 specifies that the Law “*defines the general rules for the management and development of fisheries and aquaculture, in accordance with the State's international commitments on the exploitation, conservation and preservation of biological resources of waters under national jurisdiction...*”. In this context, the Algerian authorities have a unilateral commitment to protect certain aquatic species threatened with extinction by ensuring “... the conservation of marine mammals, birds and sea turtles in accordance with international conventions” (article 16 paragraph 2), that justifies the ban of fishing¹⁷).

This change in the position of the Algerian legislation has influenced the text of the Law by inserting new expressions with new meanings, such as “*illegal fishing*” instead of “*fishing without authorization*” which was used to describe fishing practices by foreign vessels contrary to the provisions of the Law; but the use of the expression “*illegal fishing*” is the result of prohibiting these vessels from fishing.

3.3 *The legal regime of the reserved fishing zone in Algeria*

From the aforementioned, and with regard of the rights exercised by Algeria in the reserved fishing zone that are similar to the rights that the Coastal State could exercise over the EEZ as provided in UNCLOS, that is to say beyond the territorial waters justified by the obligation to ensure the conservation and management of marine resources, also to preserve and organize access to the fishing grounds of the area concerned or of the species concerned. The principal aim of the exercise of sovereign rights over the reserved fishing zone is to ensure optimum management of the fishery and, a fortiori, to ensure a constant optimum yield of the fishery.

This extent is noteworthy in Law 01-11 by the submission to the authorization of the fishing activities practiced by foreign vessels in the reserved fishing zone,

16) - The article 23 provides the possibility for vessels flying the foreign flag to be authorized was repealed. This situation results from the redeployment of part of the fishing fleets of neighbouring countries due to restrictions imposed by the EU's Common Fisheries Policy as well as by Asian countries specializing in certain species.

17) - The situation in the Mediterranean and Black Sea is alarming, as catches have dropped by one-third since 2007, mainly attributable to reduced landings of small pelagic such as anchovy and sardine but with most species groups also affected. FAO. 2016. The State of World Fisheries and Aquaculture 2016. Contributing to food security and nutrition for all. Rome. p. 05.

then in Law N°15-08 by the prohibition of these vessels from all fishing activities, except of scientific fishing considering the changing circumstances. The extent of the exercise of sovereign rights over the reserved fishing zone is further confirmed by the procedures for prosecution of foreign vessels and penalties provided by law in the case of offenses, procedures and penalties that will elucidate with more details below.

According to Part V of UNCLOS devoted to the EEZ provisions, the Coastal State enjoys sovereign rights only for economic purposes in the zone - as indicated by the name of the zone - as set out in article 56 of the Convention, without being able to extend its national sovereignty. The comparison between the provisions on commercial fishing by foreign vessels in the Algerian fishing zone and the provisions of UNCLOS organizing fishing by these vessels in the EEZ reveals that the Algerian legislature in its drafting of Law N° 01-11 and Executive Decree N° 06-367, was based on the contents of the articles of Part V of the UNCLOS, in particular as regards the fixing of the conditions for issuing fishing licenses, the boarding of controllers, payment of fees, the indication of species authorized to fish and the setting of quotas, and the obligations of ship-owners and masters of fishing vessels.

Being satisfied with the rights granted to the Coastal State in the EEZ only in the fishing field, Algeria has lost the possibility of enjoying the other rights related to the EEZ if it were established, so it should have declared a ZEE in order to benefit from all the rights reserved for this zone including the width, a position that Algeria has never adopted (Umberto Lanza, 1992)¹⁸). It remains to be recalled that the establishment of the reserved or exclusive fishing zone belongs to customary law insofar as nearly twenty one Mediterranean States have preferred to establish this zone rather than an EEZ, which nevertheless, accession of Coastal States.

4. General conditions for practicing fishing and aquaculture

Fishing and aquaculture are practiced in Algeria within the framework of a national policy that ensures their development and makes them eligible for support from the State. Also a national scheme for the development of fishing and aquaculture activities was set up, that the conditions for elaboration and approval are regulated¹⁹). Within this national scheme, the State shall promote the integration of fishing and aquaculture activities, by promoting the concession of sites on the coast and inside the country for the purpose of the establishment of fishing ports, shelters and all other fishing and aquaculture facilities²⁰). To accomplish the promotion of fishing and aquaculture products, other arrangements may, where appropriate, be laid down by regulation.

18) - Algeria did not ratify the conventions of 1958. During the proceedings of the Third Law of the Sea Conference, Algeria declared itself expressly opposed to the establishment of the exclusive economic zone.

19) - Art 05.

20) - Art 06. Also many privileges are prescribed in other related laws as the law for the investment.

4.1 Fishing

The fishing in Algeria is a subject of an authorization issued by the territorially competent fisheries administration on payment of fixed fees. The fishing of highly migratory fishers is restricted to vessels flying Algerian flag only, armed and equipped in accordance with the legislation and regulations in force concerning fishing, safety and maritime navigation²¹⁾. The exploitation of seaweeds and sponges shall be carried out on the basis of a concession established by the administration in charge of estates, and issued by the territorially competent fisheries administration after the payment of fees fixed by the law of finance²²⁾. High seas fishing is encouraged, but the national fleet have not an appropriate vessels to practice it.

4.2 Aquaculture

Aquaculture is directly affected by other sectoral laws such as the land law, including the use of public domains as the water law, environmental law, animal health and animal disease law, fisheries law and trade law. Many of the issues and concerns involved are not unique to aquaculture and may be regulated under a more general legislative regime. In addition, many of the laws and regulations in place may not even apply directly to aquaculture and are thus often applied to the sector in an inconsistent manner. Conflicts may arise within the range of legislation applicable to aquaculture or among the agencies and institutes involved (Patrice TallaTakoukam & Karine Erikstein, 2013).

It has especially become common to regulate capture fisheries and aquaculture in the same piece of legislation, even though aquaculture as an activity is closer to agriculture than capture fisheries. In countries where the aquaculture sector is being developed governments find it useful to have the same authority enforce and control both sectors. However, the two should be separated both legally and institutionally. From a legal point of view, existing fisheries legislation often does not form an adequate basis for regulating aquaculture (Patrice TallaTakoukam & Karine Erikstein, 2013)²³⁾.

In Algeria, aquaculture is regulated in the same law with capture fisheries, both are supervised by the Ministry of Agriculture, Rural Development and Fisheries. In the beginning there were some lacks when the law allowed to aquaculture farmers to deal only with the fisheries administration, without intervention of the estates administration that is involved. In the same time there was no collaboration between the two administrations, which create a blockade for farmers. Later, in order to avoid the previous situations, the amendment had integrated the administration in charge of estates in the administrative processes. In fact, the exercise of aquaculture is carried out on the basis of a concession established by the administration in charge

21) - Art 35bis.

22) - Art 37.

23) - Numerous countries have enacted specific rules relating to aquaculture under aquaculture-specific legislative text, 1 basic fisheries law, 2 water law, 3 or another piece of legislation. 4 These laws tend to set up some principles on aquaculture and then invest the legitimate authority with the power to regulate aquaculture.

of estates; and issued by the territorially competent fisheries administration on payment of fixed fees²⁴).

4.3 The exploitation of coral

The coral reefs in Algeria had suffered for a long time from illegal exploitation, which conducts the authorities to set up a new regulation to confront this practice. The amendments of the law 01-11 include new arrangement about the exploitation of coral. First a new definition was adopted about the coral in the finished state; the previous definition deal with coral only as a biological resource. The coral in the finished state means coral worked and transformed²⁵); which must be carried out in a rational manner using the appropriate diving equipment and systems in identified exploited zones²⁶). These exploited zones shall in all cases be subject to a public concession granted to natural or moral persons of Algerian nationality. The concession is established by the authority responsible for domains acting on behalf of the State, and issued by the territorially competent fisheries administration, on payment of fixed fees.

To benefit properly from the concession, the captain of the coral ship is required to maintain a dive register; complete a summary declaration of the coral caught and respect the annual quota authorized witch may be exceeded within the limit of the percentage fixed by regulation. The export of coral is authorized only in the finished state; its holding and circulation (raw or semi-finished coral) are subordinated to a document justifying its legal obtaining and the traceability related thereto²⁷).

5. Prescribed measures for combating illegal fishing

For combating (IUU) fishing²⁸) in accordance with the policy of the sustainable development, Algeria has adopted provisions considered more stringent than those envisaged in the international conventions ratified by it, in particular UNCLOS. These provisions are applied to Algerian nationals as well as to foreigners. The Law N° 01-11 provides penalties for non-compliance or infringement of the provisions governing fishing. In order to ensure compliance with these provisions, a fishery police agency has been set up, sea police inspectors are empowered to investigate and record infringements of the provisions in force²⁹).

24) - Aquaculture production in Northern Africa, excluding Egypt is estimated of 0.02 per cent of the world total production in 2014. *The State of World Fisheries and Aquaculture 2016*. p. 27.

25) - Art 02: The coral in the finished state means coral worked and transformed: 1- in the shape of a pierced ball and mounted on a wire; 2 - drilled barrel-shaped and mounted on wire; 3- in the form of a nugget pierced and mounted on a wire; 4- in the form of a cabochon; 5- shaped and carved.

26) - Art 36.

27) - Arts 36bis, ter&quart.

28) - IUU fishing represents some 26 million tons of fish per year, or more than 15 percent of the total catch production in the world. *The State of World Fisheries and Aquaculture 2016*. p. 06.

29) - All infringements detected were typically recorded in an information system at the disposal of relevant na-

For national vessels, penalties for infringements are generally related to fishing without registration or without an appropriate authorisation, non-compliance with fishing provisions in places and times limited, use of prohibited instruments and substances, the hindrance of the smoothness of fishing operations and the lack of communication and submission requirements³⁰⁾.

For foreign vessels, the law provides that any fishing vessel flying the foreign flag that has carried out illegal fishing in waters under national jurisdiction will be arrested and taken to an Algerian port and detained by the verbalizing agent until the final decision is pronounced from the competent court³¹⁾. For this purpose, and in its mission to protect marine living resources in waters under national jurisdiction, the fisheries police enjoy important prerogatives, as the boarding of a vessel flying the foreign flag may take place beyond the waters under national jurisdiction when the pursuit has started within the national waters. The right of pursuit as inspired from article 111 of UNCLOS; shall cease as soon as the vessel pursued enters the territorial waters of the country to which it belongs or in that of a third State. If the foreign ship refuses to stop or tries to flee, the Algerian vessel in charge of the fishing police will fire a warning shot; if the foreign fishing vessel refuses to comply and in case of absolute necessity, real projectiles shall be used taking all precautions to avoid touching people on board³²⁾.

The penalties provided in the aforementioned infringements vary between imprisonment and / or fines for nationals, so for foreigners Algeria literally adopts - although it is a reserved fishing zone and not an EEZ - the provisions of The UNCLOS prohibiting the coastal State from resorting to imprisonment or other corporal punishment as a sanction for violations of fisheries laws and regulations in the EEZ, unless the States concerned agree otherwise³³⁾. In this regard, in the case of an offense and in accordance with the provisions of UNCLOS, in addition to the fines that foreign-flag vessels must pay³⁴⁾, they may be arrested, detained, seized, brought to court or confiscated; without prejudice to the criminal liability of the legal person in accordance with the rules laid down by the criminal code.

Concern the illegal exploitation of coral, the amendment of the law 01-11 had included new chapter with five articles (from Art 102 ter to Art 102 nonies) devoted

tional administrations.

30) - With regard to national fishing vessels, recent developments were described in the establishment of VMS by Algeria, based on VHF transmission (AIS), which was expected to be installed on roughly 1 000 units over 15 m. At the same time, work was still under way to establish a FMC, as some technical problems were hampering the completion of this task.

Final report : *Working group on illegal, unreported and unregulated (IUU) fishing in the GFCM area of application*. p. 03.

31) - Article 94 of law 01-11.

32) - Article 96 of law 01-11. In 2015, no cases of IUU fishing concerning foreign fishing vessels had been detected in Algerian waters. FAO: Final report on *working group on illegal, unreported and unregulated (IUU) fishing in the GFCM area of application*. p. 03.

33) - Article 73 paragraph 03. Although this is not an EEZ, Algeria wishes to respect its international commitments in accordance with the conventions it has ratified.

34) - Estimated heavy fines between 5.000.000 and 8.000.000 DA (45.300 to 72.500 USD), in case of recidivism, the fines can be increased between 10.000.000 and 20.000.000 DA (97.700 to 181.400 USD); arts 98 and 99 of Act 15-08.

to this infringement. The penalties for illegal exploitation of coral without concession, contrary to the law or without documents justifying its legal obtaining and the traceability; vary between imprisonment³⁵⁾ and / or payment of fine³⁶⁾; in addition to confiscation of the product exported in its raw or semi-finished state, contrary to the provisions subscribed in the Law in force. Furthermore, without prejudice to these provisions, any offense related to coral shall give rise to the seizure of the vessel and fishing gear and to the withdrawal of the maritime master's fascicle from the master of the vessel and its removal from the sea.

If a foreign person convicted of illegal fishing of coral in waters under national jurisdiction, he shall be punished with imprisonment of three (3) to five (5) years and a fine of ten million dinars (10.000.000 DA) to twenty million dinars (20.000.000 DA). The competent court shall order the seizure of the vessel and confiscation of the gear found on board or prohibited and the coral caught and the destruction of the prohibited craft, if any. In the case of a subsequent offense, he shall be punished with imprisonment of three (3) to five (5) years and a fine of thirty million dinars (30.000.000 DA) to sixty million dinars (60.000.000 DA) in addition to requisitioning the vessel that was used to commit the offense³⁷⁾.

6. The commitment of Algerian fishing regulation with international instruments

6.1 At the international level

So far, Algeria has not been a party to the FAO Agreement of 1993 to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, neither to the UN Fish Stocks Agreement from 1995³⁸⁾, but within the policy of encouraging High Seas fishing (article 06 of law 01-11), it is expected that Algeria accept the FAO Compliance Agreement from 1993³⁹⁾. Concerning the FAO Port State Measures Agreement to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing from 2009 (PSMA hereinafter)⁴⁰⁾, that aims to intensify the global collaboration between governments, port authorities, coast guards, navies and other stakeholder institutions with the ultimate goal is to eliminate IUU fishing. The rational and sustainable management was needed, the effective management of fish stocks required regional cooperation. In this meaning, Algeria even is not yet a party to the PSMA participated to a regional workshop that serves the regional cooperation, which will be the cornerstone of effective enforcement of the application of the PSMA and to limit the impacts of IUU fishing on

35) - From six (6) months to years (5) years.

36) - From 10.000.000 to 60.000.000 DA (97.700 to 543.900 USD).

37) - Articles 102 octies & nonies.

38) - Entered into force on 11 December 2001.

39) - Entered into force on 24 April 2003.

40) - Entered into force on 5 June 2016.

the long-term sustainability of fisheries, on food security, and on biodiversity conservation⁴¹⁾. It's important to note down that Algeria even is not a party in some international fishing instruments⁴²⁾, has adopted its national legislation in accordance with no ratified instruments rules.

About the non-obligatory instruments, such as the Global Code of Conduct for Responsible Fisheries, which was unanimously adopted by the FAO Conference on 31 October 1995, provides the framework needed for national and international efforts to ensure sustainable Bio aquatic resources in an environmentally friendly way. Also, the International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (hereinafter IPOA-IUU), that was developed as an optional instrument within the framework of the Code of Conduct; nothing deters Algeria to inspire from the content of these instruments its national legislation, that makes it consist with principles and standards applicable to the conservation and development of all fisheries.

6.2 At the regional level

There are two main fisheries organizations have competence on Mediterranean fisheries. The first one is the General Fisheries Commission for the Mediterranean (hereinafter GFCM); witch is a Regional Fisheries Management Organization (RFMO). The GFCM initially started its activities as a Council in 1952, when the agreement for its establishment came into force and became a Commission in 1997; Algeria joined the GFCM since December 11th, 1967. The main objective of the GFCM is to ensure the conservation and the sustainable use, at the biological, social, economic and environmental level, of living marine resources as well as the sustainable development of aquaculture in the Mediterranean and in the Black Sea and connecting waters. The GFCM is currently composed of 24 members (23 member countries and the European Union)⁴³⁾ who contribute to its autonomous budget to finance its functioning, in addition of the 23 members, there are 3 Cooperating non Contracting Parties (Bosnia and Herzegovina, Georgia and Ukraine). Though the main threat for

41) - For this purpose a FAO Workshop on Implementing the Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (the Agreement) that was held in Tirana, Albania, from 29 February to 4 March 2016. The workshop was attended by 42 participants from 16 coastal countries of the Mediterranean and Black Sea (including Algeria), in addition to representatives from one non-governmental organization (NGOs), one intergovernmental organization, one regional fishery management organizations (RFMO) and the European Commission.

This workshop is one of a series of regional workshops being held globally. He highlighted that the objectives of this workshop were to: raise awareness on the negative effects of IUU fishing and the benefits of developing and integrating strengthened and coordinated port State measures into existing Monitoring, Control and Surveillance (MCS) tools; inform relevant stakeholders of the provisions and requirements of the PSMA; and identify the needs and challenges for the implementation of the PSMA at national and regional levels.

42) - For illustrative purpose, Algeria is not yet party in the International Convention for the Regulation of Whaling of 1946.

43) - FAO Major Fishing Areas, MEDITERRANEAN AND BLACK SEA (Major Fishing Area 37), CWP Data Collection. In: *FAO Fisheries and Aquaculture Department* [online]. Rome, Updated 1 October 2004. <http://www.fao.org/fishery/area/Area37/en>

Mediterranean fisheries is over-fishing, the GFCM does not determine quotas, due also to the wide variety of species present and fished in Mediterranean waters. It has however taken a number of measures on fishing gear and methods, minimum size and closed areas (Irimi Papanicolopulu, 2013).

The second fishery organization has competence on Mediterranean fisheries is the **International Commission for the Conservation of Atlantic Tunas** (hereinafter ICCAT), which is an inter-governmental fishery organization responsible for the conservation of tunas and tuna-like species in the Atlantic Ocean and its adjacent seas. The ICCAT determines catch quotas and other conservation and management measures for Bluefin tuna stocks and other species, including swordfish, and has adopted measures to specifically combat IUU fishing including trade sanctions. ICCAT recommendations specifically applying to the Mediterranean are regularly endorsed by the GFCM compliance with them however is still far from satisfactory (Irimi Papanicolopulu, 2013). Algeria joined the ICCAT since February 16th, 2001.

Furthermore the two fishery organizations have competence on Mediterranean fisheries; the 1996 Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean and the Contiguous Atlantic area (hereinafter ACCOBAMS); entered into force on the 1st of June 2001, aims at the protection of cetaceans and has been ratified by most Mediterranean States including Algeria that became a party since 2007⁴⁴).

Concerning the relation of the marine living resources with the environmental protection; it is important to recall that the Mediterranean States have concluded one of the first regional treaties for the protection of the marine environment, the Barcelona Convention, originally adopted in 1976 and modified and renamed in 1995. The Convention is further implemented by protocols dealing with specific types of pollution, and other tools to protect and preserve the marine environment. The Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean, apart from providing rules for the creation of national protected areas, it created also a List of Specially Protected Areas of Mediterranean Importance (SPAMI List). The SPAMI list includes a number of protected areas created in the maritime zones of coastal States as well as one protected area that includes also portions of the high seas⁴⁵). For this purpose two areas were created along the Algerian coast, it's about *Banc des Kabyles Marine Reserve* at east of the Capital, and *Habibas Islands* at the west. The most important protected area of Mediterranean is the *Pelagos Sanctuary* for the Conservation of Marine Mammals, created by the 1999 Agreement concerning the Creation of a Marine Mammal Sanctuary in the Mediterranean, concluded between France, Italy, and Monaco for the protection of an area containing habitat suitable for the breeding and feeding needs of all cetacean species regularly found in the Mediterranean Sea (Irimi Papanicolopulu, 2013).

On the trade aspect, an EURO-MEDITERRANEAN AGREEMENT was signed on 22 April 2002, establishing an association between Algeria and the European Community and its member States⁴⁶). This agreement aims among other things to

44) - Presidential Decree n° 07-95 of 19 mars 2007 ratifying the agreement on the conservation of cetaceans of the black sea, Mediterranean Sea and contiguous Atlantic area, O.J.R.A n° 20 of 25 mars 2007.

45) - It includes 34 sites (as per last update of the SPAMI List in February 2016).

promote trade and the expansion of harmonious economic and social relations between the parties and establish the conditions for the gradual liberalisation of trade in goods, services and capitals. According to the chapter 2 of this agreement titled “*agricultural, fisheries and processed agricultural products*”, parties should apply provisions indicated in the agreement to products originating in the Community and Algeria falling within chapters 1 to 24 of the Combined Nomenclature and of the Algerian Customs tariff. Algeria and the Community shall progressively establish a greater liberalisation of their reciprocal trade in agricultural, fisheries and processed agricultural products of interest to both Parties⁴⁷⁾. For that purpose, two protocols were attached listing the products falling under the agreement; the protocol N°3 and the protocol N° 4 on the arrangements applying to imports into the community of fishery products originating in Algeria and vice versa. According to the EU standards, this agreement impose to Algerian and European exporters to deal with fisheries products with respect with international instrument rules and recommendations.

7. Conclusion

The legal system of Algerian fisheries helps the sustainable fisheries in Algeria by encouraging and improving the scientific fishing in all waters under national jurisdiction, including internal and territorial waters even by national or foreign vessels, further, by the restriction of the right of fishing only for vessels flying Algerian flag in the purpose to preserve the marine living resources from the overexploitation and from the extinction of some species. Also the prescribed measures for practice fishing and aquaculture, and the penalties provided for combating IUU fishing or non-compliance fishing seem satisfying so far.

The legal system of Algerian fishing and aquaculture knows several gaps that the law N°15-08 refer to the executive authority to adopt other arrangements may, where appropriate, be laid down by regulation in order to accomplish the promotion of fishing and aquaculture. Unfortunately a large part of these arrangements are till now not issued, that obviates the good execution of laws and regulations.

To improve the Algerian legal system concerning the resource management including fish stocks assessment, Algeria has to make efforts by adopting rules that organize clearly the scientific fishing conducted by national or by foreign vessels, and by the insertion of new technologies systems in both scientific fishing and the fishing operations, and also by cooperating with neighbouring states and involved international and regional organisations to exchange databases for the benefit of all.

The current framework of Algerian fisheries legislation is not even completed and needs to be more detailed as shown above, provides a platform for the construction

46) - This Agreement replaces the Cooperation Agreement between the European Economic Community and Algeria; and the Agreement between the Member States of the European Coal and Steel Community and Algeria, both of which were signed in Algiers on 26 April 1976.

Official Journal of the European Union; 10.10.2005.

47) - Article 13 of the Agreement.

of a full maritime, legislative and institutional structure in accordance with the national, regional and international perspectives. So the government has to adopt an appropriate maritime policy to make better by reforming and strengthening the legislation in force.

Today, Algeria is facing two challenges, on one hand, the obligation to supply the population estimated at 40.4 million inhabitants⁴⁸⁾ with the necessary fish food needs, especially since the average of fish consumption is less than the world one⁴⁹⁾. On the other hand, it should fulfil this obligation within a responsible supply; while respecting the marine environment and sustainable development, the sustainability of the exploitation of marine resources is guaranteed.

Even if Algeria has not ratified some international or regional conventions, or has not acceded to international or regional organizations related directly or indirectly to the organization and conservation of sea fishing; it remains obliged to comply with its provisions in order to fulfil its obligations under the UNCLOS that refers to these conventions and organizations.

8. Acknowledgements

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48) - Official statistics of 01st January 2016. Statistics National Office.

49) - The average fish consumption as food per capita fish supply is 2–5 kg/year (in live weight equivalent), (AVERAGE 2011–2013); while World per capita fish supply reached high of 20 kg in 2014. The State of World Fisheries and Aquaculture 2016. p. 74.

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Notes to Contributors

Manuscript. Submissions should be clear and concise. Manuscripts will be accepted with the understanding that their content is unpublished and not being submitted for publication elsewhere. All parts of the manuscript, including the title page, abstract, tables and legends should be typed in English. Allow margins of at least 3cm on all sides of typed pages. Pages must be numbered consecutively throughout the paper.

Title. Must be as brief as possible and consistent with clarity (6 to 12 words). Authors should also supply a shortened version of the title suitable for the running head, not to exceed 50 character spaces.

Author Affiliation. Include the full names of authors, academic and/or professional affiliations and the complete mailing address of the author to whom proofs and correspondence should be sent.

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Mathematical Notation. Use only essential mathematical notation as it is costly to typeset and may limit readership. Where mathematical notation is essential, keep it simple and in conformance with conventions of the profession.

References. Citations within the text must include author name(s) and the data in parentheses [i.e., Smith, Jones, and Cutler (1993)]. Use *et al.* in the text only when four or more authors are cited. Do not use *et al.* in the references. Alphabetize the reference section and include all text citations. For more information, consult the *Chicago Manual of Style*. Follow these examples:

Journal Koenig, E. F. (1984) Fisheries Regulation Under Uncertainty: A Dynamic Analysis. *Marine Resource Economics* 1(2):193-208.

Book Heaps, T., and J. F. Helliwell. (1985) *The Taxation of Natural Resources. Handbook of Public Economics*, Vol. I, A. J. Auerback and M. Feldstein (eds.), pp.21-72. Amsterdam : North-Holland.

Data and Documentation. Data sources, models and estimation procedures are expected to be documented to permit replication by other researchers. Data used in the analyses should be made available to other researchers for replication purposes. Submission of appendices, model documentation and other supporting materials is encouraged to facilitate the review process.