

AN APPRAISAL OF THE IMPLEMENTATION OF THE INTERNATIONAL LEGAL FRAMEWORK FOR THE PROTECTION OF LIVES AND PROPERTY AT SEA

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Abstract

International maritime law has developed an extensive legal framework aimed at safeguarding human life and property at sea through safety regulation, maritime security measures, and cooperative enforcement mechanisms. Despite the existence of comprehensive conventions governing maritime navigation and security, incidents involving ship casualties, piracy, and loss of maritime property continue to occur across global maritime domains. Thus, this study appraises the implementation of international legal frameworks designed to protect lives and property at sea. Using doctrinal legal methodology, the study evaluates the effectiveness of State compliance with obligations under major maritime conventions and examines institutional and operational challenges affecting implementation. The study found that the principal challenge confronting maritime safety governance lies not in normative inadequacy but in uneven enforcement, weak institutional capacity, and fragmented regulatory coordination. The study finally recommends enhanced compliance monitoring, strengthened port State control, regional cooperation, and capacity-building initiatives as essential strategies for improving the effectiveness of international maritime safety regimes.

Keywords: Maritime safety, implementation of international maritime law, protection of life at sea, maritime security, State responsibility.

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1. Introduction

The maritime sector remains indispensable to global trade, international transportation, and economic integration, with a substantial proportion of world commerce conducted through sea routes. Consequently, the protection of lives and property at sea has transcended domestic regulatory concerns and has become a significant subject of international legal regulation.¹ Over the years, the international community, principally through the International Maritime Organization, has developed an extensive body of conventions, protocols, and safety standards aimed at ensuring maritime safety and security. Instruments such as the International Convention for the Safety of Life at Sea (SOLAS), the International Ship and Port Facility Security (ISPS) Code, and related maritime regulations impose obligations on States to safeguard seafarers, vessels, cargo, and marine infrastructure from navigational accidents, piracy, terrorism, and other maritime threats. Despite these elaborate legal frameworks, incidents of maritime disasters, insecurity, and loss of property at sea continue to occur with alarming frequency across different maritime jurisdictions.

The persistence of maritime casualties and security breaches reveals a fundamental research problem concerning the gap between the existence of international legal norms and their practical implementation by States. While international maritime law has progressively evolved to address emerging risks associated with shipping, technological advancement, transnational crime, and environmental hazards, enforcement and compliance mechanisms remain uneven and, in many cases, inadequate. Several States, particularly developing maritime nations, continue to face challenges relating to weak institutional capacity, insufficient maritime surveillance, poor implementation of treaty obligations, and lack of effective inter-agency cooperation. This situation raises serious concerns regarding the effectiveness of the existing international legal regime in guaranteeing adequate protection of lives and property at sea. The study therefore seeks to critically appraise the extent to which international legal frameworks governing maritime safety and security are effectively implemented and whether State parties sufficiently discharge their obligations under international law.

¹ E Babatunde and M Abdulsalam, 'Towards Maintaining Peacefulness of the Sea: Legal Regime Governing Maritime Safety and Security in Nigeria' 12 *Beigin Law Review* (2021) 529-559

Existing scholarly works have extensively examined maritime safety conventions, piracy suppression, marine environmental protection, and the general development of international maritime law.² However, much of the literature concentrates predominantly on the normative content of maritime conventions without undertaking a comprehensive assessment of the practical challenges associated with implementation and enforcement. In addition, several studies focus narrowly on specific aspects such as piracy, marine pollution, or port security, with limited attention devoted to the broader relationship between maritime safety obligations and the actual protection of lives and property at sea. Furthermore, inadequate scholarly attention has been given to the implementation deficiencies experienced by developing maritime States and the implications of emerging maritime threats on the effectiveness of existing legal frameworks. This research therefore fills an important gap by undertaking a holistic appraisal of the implementation of international maritime legal frameworks and evaluating the extent to which such frameworks effectively achieve their protective objectives.

Against this backdrop, the study seeks to answer the following research question: To what extent have international legal frameworks governing maritime safety and security been effectively implemented to ensure the protection of lives and property at sea? In addressing this question, the research adopts the doctrinal method of legal research, relying primarily on international conventions, treaties, judicial decisions, textbooks, journal articles, official reports, and other relevant secondary sources for analysis and evaluation.

2. Conceptual Basis of Protection of Lives and Property at Sea

Protection of lives and property at sea encompasses legal measures designed to prevent maritime accidents, ensure vessel safety, and respond effectively to emergencies. The

² R Churchill and A Lowe, *The Law of the Sea* (Manchester University Press Manchester, United Kingdom 1999) 75, D Freestone, R Barnes and D Ong, *The Law of the Sea: Progress and Prospects* (Oxford University Press, Oxford, United Kingdom, 2006) 34, J Coppens, 'The Position of Flags of Convenience in International Law' *Revue Belge de Droit International* 45(1), (2012) 466–489, J Harrison, *Making the Law of the Sea: A Study in the Development of International Law*. (Cambridge University Press United Kingdom 2011) 126, A V Lowe and S Talmon, *The Legal Order of the Oceans: Basic Documents on the Law of the Sea*. Hart (Edits Publishing UK 2009) 239, S Ghosh, 'Flag State Responsibilities: Historical Evolution and Contemporary Issues.' *Journal of Maritime Law and Commerce*, 41(1), (2010) 91–119

concept integrates three interconnected dimensions: Perceiving maritime safety effort towards prevention of accidents through technical regulation.³ More so, maritime security connotes ensuring protection against unlawful acts such as piracy and terrorism.⁴ And importantly humanitarian obligations refer to rescue and assistance to persons in distress.⁵

International law recognizes preservation of life at sea as a universal humanitarian duty derived from customary maritime practice and codified in treaty law. The obligation applies irrespective of nationality, status, or location of persons requiring assistance.

3. Legal Framework for the Protection of Lives and Property at Sea

Maritime law has long recognized the importance of protecting lives and property at sea, reflecting the inherent risks associated with maritime activities and the duty of states and maritime actors to ensure the safety and welfare of individuals and property on board ships.⁶ This part explores key elements of the legal framework established to safeguard lives and property on the sea, including relevant provisions of international conventions and treaties.

3.1 United Nations Convention on the Law of the Sea (UNCLOS)

UNCLOS often referred to as the "constitution for the oceans," constitutes a comprehensive legal framework governing the rights and responsibilities of states in maritime affairs. Several provisions of UNCLOS are relevant to the protection of lives and property on the sea as follows:

3.1.1 Duty of States to Cooperate in the Rescue of Persons and Property: Article 98(2) of UNCLOS⁷ provides that every coastal State shall promote the establishment, operation and maintenance of adequate and effective search and rescue services and shall, where circumstances so require, cooperate with neighbouring States for this purpose through regional arrangements. The article imposes a duty on states to cooperate in the rescue of persons in distress and properties at sea. It emphasizes the principle of maritime solidarity and requires states to render assistance to any person and properties found at sea in danger

³ D Freestone, R Barnes and D Ong, *The Law of the Sea: Progress and Prospects* (Oxford University Press, Oxford, United Kingdom, 2006) 56

⁴ R Churchill and A Lowe, *The Law of the Sea* (Manchester University Press Manchester, United Kingdom 1999) 83

⁵ *ibid* 86

⁶ J Kraska, *Maritime Power and the Law of the Sea: Expeditionary Operations in World Politics*. (Oxford University Press USA 2011) 291

⁷ (1982) 1833 UNTS 3

of being lost. This obligation extends to masters of ships, who are required to provide assistance to persons in distress without endangering their own safety or the safety of their ships.⁸ The duty to render assistance under Article 98(2) requires states to ensure that appropriate measures are taken to assist any person found at sea in danger of being lost. This obligation extends to all ships, regardless of their nationality or flag, and applies to situations where persons are in distress due to shipwreck, collision, or other maritime accidents.

Moreover, Article 98(2) specifies that the assistance provided should be rendered without prejudice to the rights and obligations of states under international law, including the provisions of UNCLOS itself. This means that states and masters of ships must act in accordance with the principles of international law while providing assistance, taking into account factors such as safety, security, and the protection of the marine environment.⁹

3.1.2 Duty to Cooperate in the Repression of Piracy

Article 100 of the UNCLOS¹⁰ provides that all States shall cooperate to the fullest possible extent in the repression of piracy on the high seas or in any other place outside the jurisdiction of any state. The article creates a universal jurisdiction requiring States to take joint action against piracy activities, share information, conduct naval patrols, arrest and prosecute pirates, protect ships, cargo, and persons at sea. This provision creates a comprehensive safety and security framework aim at safeguarding lives and property at sea through international cooperation.¹¹

On the other hand, Article 106 of UNCLOS¹² provides that ships without nationality or ships used for piracy are *hostis humani generis* (an enemy of mankind). Such ships are liable to seizure and dealt with by any State on the high sea. This is the cornerstone of universal jurisdiction against piracy.¹³

3.1.3 Duty of the Flag State: Article 94 of UNCLOS requires every State to effectively exercise its jurisdiction and control over ships flying its flag in administrative, technical, and social matters. The Article addresses the duty of states to take measures for the safety

⁸ *ibid*

⁹ R Churchill and A Lowe, (n 6) 43

¹⁰ United Nations Convention on the Law of the Sea (UNCLOS) (1982) 1833 UNTS 3

¹¹ R Churchill and A Lowe (n 6) 56

¹² United Nations Convention on the Law of the Sea (UNCLOS) (1982) 1833 UNTS 3

¹³ J A Roach and R W Smith, *Excessive Maritime Claims* (3rd Ed Brill Nijhoff 2012) 332

of navigation and the prevention of accidents at sea.¹⁴ This provision underscores the importance of adopting effective regulatory and enforcement measures to mitigate risks to maritime safety and to protect vessels and other properties from harm. It encompasses various aspects of maritime safety, including ship construction and equipment standards, navigation rules, and the prevention of collisions, groundings and investigation of casualties.¹⁵ This provision emphasizes the importance of ensuring the safety of maritime traffic to protect vessels and maritime properties from harm. Key aspects of Article 94 include establishment of navigational rules, avoidance of collision, maintenance of safe shipping lanes, and promotion of safe navigation practices.¹⁶

3.1.4 Duty of the Coastal State: Article 211(4-6) of UNCLOS¹⁷ pertains to the preventing, reducing, and controlling pollution of the marine environment by vessels. It establishes obligations for states to enact and enforce laws and regulations to prevent, reduce, and control pollution from ships, including discharges of oil, chemicals, sewage, and other harmful substances. By addressing the threat of pollution, Article 211 contributes to the protection of marine ecosystems and the preservation of maritime properties. By regulating ship pollution, prevention of harmful practices, international corporation, liability and compensation, and environmental protection¹⁸

3.2 International Convention for the Safety of Life at Sea (SOLAS) 1974

The International Convention for the Safety of Life at Sea (SOLAS)¹⁹ stands as one of the most significant treaties governing maritime safety standards. Enacted in response to the tragic loss of life resulting from maritime disasters, particularly the sinking of the RMS Titanic in 1912, for the safety of life at sea. SOLAS establishes comprehensive regulations aimed at enhancing the safety of ships and seafarers.²⁰ It addresses various aspects of ship design, construction, equipment, and operation to mitigate the risks associated with maritime activities. It mandates the implementation of specific safety measures, including

¹⁴ (n 6) Article 94

¹⁵ *ibid* Article 94 (3, 4 & &)

¹⁶ J Coppens, 'The Position of Flags of Convenience in International Law' *Revue Belge de Droit International* 45(1), (2012) 466–489

¹⁷ n 6

¹⁸ S Ghosh, 'Flag State Responsibilities: Historical Evolution and Contemporary Issues,' *Journal of Maritime Law and Commerce*, 41(1), (2010) 91–119

¹⁹ 1184 UNTS 2 (Entered into force on 25th May 1980)

²⁰ A V Lowe and S Talmon, *The Legal Order of the Oceans: Basic Documents on the Law of the Sea*. Hart (Edits Publishing UK 2009) 239

the provision of life-saving appliances (Chapter III), fire detection and extinguishing systems (Chapter II), navigation equipment (Chapter V), and emergency procedures.²¹ Furthermore, SOLAS requires ships to undergo regular inspections and surveys to ensure compliance with safety standards and to obtain certificates attesting to their seaworthiness. These certificates serve as evidence of a ship's compliance with SOLAS requirements and are essential for obtaining authorization to operate in international waters.²² Additionally, SOLAS encourages international cooperation and coordination in matters relating to maritime safety. It establishes mechanisms for sharing information, conducting joint exercises and drills (Chapter IX), and providing assistance to ships in distress. By fostering collaboration among states and maritime organizations, SOLAS seeks to enhance the effectiveness of safety measures and improve the response to maritime emergencies.²³ One notable example of SOLAS's adaptability is the incorporation of requirements related to the Global Maritime Distress and Safety System (GMDSS). The GMDSS revolutionized maritime communication and distress alerting by introducing automated systems and satellite technology to ensure rapid and effective response to emergencies at sea (CHAPTER IV). SOLAS amendments mandating the implementation of GMDSS equipment on ships reflect the convention's commitment to leveraging advancements in technology to improve safety standards.²⁴ Moreover, SOLAS continues to play a crucial role in addressing contemporary challenges such as maritime terrorism. It was amended in 2002 to include maritime terrorism and security in response to 9/11 terrorist attacks against United States of America. It establishes international maritime security rules meant to be applied to ship engaged in international voyages and port facilities (Chapter XI-2), it makes the International Ship and Port Facility Security (ISPS) Code mandatory. The objective is to detect and prevent unlawful act such as terrorism, sabotage, use of ships as weapons and transport of terrorists or dangerous materials. It was further amended in 2010 and introduced passenger ship safety through improved life-saving appliances, enhanced fire protection systems and safer design standards for passenger vessels. Also it was amended in 2014 with focus on passenger ship

²¹ J Harrison, *Making the Law of the Sea: A Study in the Development of International Law*. (Cambridge University Press United Kingdom 2011) 126

²² *ibid* 127

²³ International Maritime Organization, 'Maritime Safety,' <

<https://www.imo.org/en/OurWork/Safety/Pages/Default.aspx> > Accessed on 20th February 2026 @11:22am

²⁴ *ibid*

evacuation and safety. It established mandatory damage stability requirements and improved evacuation procedures for passenger ships. Furthermore, it was amended in 2016 with focus on container safety, the key development was the introduction of Verified Gross Mass (VGM) requirement for containers before loading on ships. Its purpose is to prevent accidents caused by incorrect container weight declarations. Another amendment was made in 2020 with focus on modern navigation and safety technology. It established updates to Global Maritime Distress and Safety System (GMDSS) which is a new safety rules for autonomous and digital navigation systems.²⁵

It was further still amended in 2021 to take care of cyber threat, it therefore, incorporate digital risk governance, chapter IX makes the International Safety Management (ISM) Code mandatory through IMO Resolution MSC.428(98) providing that ship owners must include cyber risk management within Safety Management System (SMS)²⁶ and it was also amended in 2023 and adopted by IMO; it was amendments to Chapters II-1, II-2, V and XIV. These amendments were adopted in 2023 and scheduled to enter into force in 2026.

Latest SOLAS amendments was in 2024 Amendments (MSC.550(108)), adopted by the IMO Maritime Safety Committee in May 2024 and entered into force on 1st January 2026, was on environmental sustainability and ecosystem protection [safety of navigation (Chapter V); ISM Code (Environmental Protection Policy) Chapter IX; Carriage of Dangerous Goods (Chapter VII); Polar Code (Environmental Sustainability in Polar Waters) (Chapter XIV)]. It also changes some provisions, it is key changes include mandatory reporting of containers lost at sea, stronger fire safety rules for cargo and ro-ro passenger ships new fire detection systems in cargo ship control stations, regulations ensuring fuel supplied to ships does not endanger safety and ban on PFOS (Perfluorooctane Sulfonate) firefighting foam because of environmental risks.²⁷

These recent amendments to SOLAS have introduced measures to enhance ship security, including the adoption of the International Ship and Port Facility Security (ISPS) Code, which sets out comprehensive security requirements for ships and port facilities to prevent security threats and ensure the safe and secure movement of goods and people.

²⁵ Edwin Egede, 'The Nigerian Territorial Waters Legislation and the 1982 Law of the Sea Convention' *The Journal of Maritime and Coastal Law* Vol 19, No 2 (2024) 315

²⁶ Mandatory compliance became effective on 1st January 2021.

²⁷ Arif Ahmed, 'International Law of the Sea: An Overlook and Case Study' 8 *Beijing Law Review* (2017) 21-40

Furthermore, SOLAS amendments have incorporated provisions to address environmental concerns, such as the prevention of marine pollution from ships. Regulations governing the discharge of pollutants, the management of ship-generated waste, and the use of environmentally friendly technologies contribute to the protection of the marine environment and the promotion of sustainable maritime practices.²⁸

3.3 The Geneva Convention on the High Sea 1958

The Geneva Convention on the High Seas of 1958 complements UNCLOS and SOLAS by addressing additional aspects of maritime law, including the protection of lives and properties on the high seas. This convention serves as a foundational instrument for regulating activities beyond national jurisdiction and promoting cooperation among states in the governance of the high seas as follows:

3.3.1 Duties of Master of Ships

Article 13 of the Geneva Convention on the High Seas²⁹ underscores the duty of masters of ships to render assistance to any person found at sea in danger of being lost. This provision reflects the longstanding maritime tradition of rendering aid to those in distress and reinforces the principle of solidarity among seafarers. It reflects the fundamental understanding that the sea is a vast and often unforgiving environment where individuals and vessels are exposed to numerous hazards and dangers. In such circumstances, the obligation to provide assistance to those in distress is not merely a legal requirement but a moral imperative deeply ingrained in maritime culture.³⁰

By emphasizing the duty of masters of ships to intervene without hesitation when encountering persons in distress at sea, the provision seeks to ensure that no individual is left behind or abandoned in perilous circumstances.³¹ It underscores the importance of collective action and shared responsibility in addressing common challenges and promoting safety and security at sea.

²⁸ International Maritime Organization, ‘MARPOL’ < <https://www.imo.org/en/OurWork/Environment/PollutionPrevention/Pages/MARPOL.aspx> > Accessed on 15th January 2026 @10.34am

²⁹ April 29, 1958, 13 U.S.T. 2312

³⁰ M H Nordquist, J N Moore and T H Heidar, *Legal Order in the World's Oceans: UN Convention on the Law of the Sea*. (Edds Brill Nijhoff. 2012) 272

³¹ *ibid* 275

3.3.2 Prohibition of Seizure of Ships and Arrest

Article 12 of the convention³² prohibits the seizure of ships and the arrest of persons on board ships engaged in international navigation, except in specific circumstances defined by international law such as illegal fishing, smuggling, custom violation, pollution offences and security branches. The convention provides, if the pursuit must be carried out, it must begin while the foreign ship or one of its boats is within internal waters, the territorial sea, or the contiguous zone of the pursuing state and it may only begin after a visual or auditory signal has been given at a distance enabling it to be seen or heard. This provision aims to safeguard the freedom of navigation and prevent undue interference with lawful maritime activities. It underscores the principle of non-interference in the affairs of ships operating on the high seas and emphasizes the importance of respecting the rights and freedoms of seafarers.

Article 12 reflects the international community's recognition of the need to maintain stability and security in the maritime domain. By prohibiting arbitrary seizures and arrests, the provision contributes to the preservation of peace and order on the high seas, fostering an environment conducive to maritime trade, navigation, and cooperation.

3.3.3 Duty of the Flag State to Render Assistance to Persons in Distress at Sea

Article 10 of the Convention³³ obliges states to ensure that persons on board ships flying their flag receive humane treatment and respect for their fundamental rights. This provision reflects the principle of flag state jurisdiction, whereby states are responsible for regulating the conduct of ships flying their flag and ensuring that they comply with applicable international standards and norms. It underscores the importance of upholding human rights and ensuring the well-being of seafarers, regardless of their nationality or status. Article 10 recognizes the unique vulnerabilities of individuals at sea and the need for robust legal protections to safeguard their dignity and rights. It encompasses various aspects of human rights, including the right to life, liberty, and security of person, as well as the prohibition of torture, cruel, inhuman, or degrading treatment or punishment.³⁴ Moreover, Article 14 underscores the role of states as guarantors of human rights at sea, emphasizing their duty to enforce and uphold international standards and to hold accountable those who violate the rights of persons on board ships flying their flag. By promoting adherence to

³² n 26

³³ ibid

³⁴ (n 5) 120

human rights principles, the provision contributes to the creation of a safe, fair, and inclusive maritime environment.

4. Implementation Mechanisms for The Protection of Lives and Property at Sea

The effective enforcement of laws and regulations is crucial for ensuring the protection of lives and properties on the sea. Various mechanisms exist to enforce maritime laws and uphold safety and security standards in the maritime domain.³⁵

4.1 Flag State Implementation: Flag States bear primary responsibility for enforcing maritime safety standards. They must ensure vessel inspection, certification, and compliance with international conventions. However, ineffective regulatory oversight has allowed some vessels to operate under —flags of convenience, weakening enforcement.³⁶

4.2 Port State Control: Port State control has emerged as a critical enforcement mechanism. States may inspect foreign ships entering their ports and detain vessels that fail to comply with international safety requirements.³⁷ This system compensates for failures of flag State supervision and enhances overall compliance.

4.3 Coastal State Responsibilities: Coastal States must maintain navigational safety systems, maritime surveillance, and search and rescue infrastructure within their maritime zones.³⁸ Effective implementation requires coordination among naval authorities, maritime agencies, and regional partners.

4.4 Use of Military: Article 21 of the Geneva Convention on the High Seas³⁹ provides a legal basis for states to utilize military forces in enforcing maritime law and suppressing unlawful acts on the high seas. This article acknowledges the unique challenges posed by maritime crimes such as piracy, terrorism, and illicit trafficking, which often require robust and coordinated responses from state authorities.⁴⁰ It authorizes states to employ military assets, including naval vessels, aircraft, and special operations forces, to deter, intercept, and neutralize threats to maritime security and navigation. The use of military forces in

³⁵ *ibid*

³⁶ R Churchill and A Lowe, *The Law of the Sea* (3rd Ed Manchester University Press 1999) 257

³⁷ Erik J Molenaar, 'Port State Jurisdiction' 38 *Ocean Development & International Law* (2007) 225

³⁸ (n 33) 263

³⁹ (1958) 13 U.S.T. 2312

⁴⁰ D Fleck, *The Handbook of the Law of Visiting Forces*. (Oxford University Press United Kingdom 2013) 237

maritime enforcement serves multiple purposes such as deterrence, interdiction,⁴¹ response to emergencies, international cooperation.⁴²

While the use of military forces in maritime enforcement is essential for combating transnational maritime crimes, it must be conducted in accordance with international law, including principles of proportionality, necessity, and respect for human rights.

4.5 The Civilian Ship and Non-Military Vessels: Article 12 of the Geneva Convention on the High Seas⁴³ emphasizes the crucial role of civilian ships and non-military vessels in ensuring maritime safety and providing assistance to individuals in distress at sea. This provision underscores the humanitarian obligation of masters of ships, irrespective of their vessel's nature or purpose, to render aid to those in need on the high seas. It reflects the longstanding maritime tradition of solidarity and mutual assistance among seafarers, rooted in the recognition of the inherent risks and challenges of maritime travel. The duty to render assistance outlined in Article 12 encompasses various situations, including search and rescue operations, emergency situations, and humanitarian assistance.⁴⁴

Article 12 recognizes the fundamental principle that the safety of life at sea is paramount and that all vessels, regardless of their nature or function, have a responsibility to contribute to maritime safety and rescue operations. By upholding this duty, masters of ships demonstrate their commitment to the preservation of life and the protection of human rights in the maritime domain.⁴⁵

4.3 The National Courts of the Country in Custody of Suspects: In cases where maritime crimes occur or suspects are apprehended at sea, the national courts of the country in custody of suspects play a pivotal role in ensuring accountability and justice. These courts have jurisdiction to investigate, prosecute, and adjudicate cases involving maritime offenses, including piracy, maritime terrorism, illegal fishing, and other unlawful activities. They serve as forums for legal proceedings, where evidence is presented, witnesses are

⁴¹ C Fournet, *International Crimes and the Ad Hoc Tribunals* (Cambridge University Press UK 2009) 87

⁴² S J Hansen, 'Piracy in the Greater Gulf of Aden: Myths, Misconceptions and Remedies' (NIBR Report, Norwegian Institute for Urban and Regional Research 2009) 91

⁴³ n 26

⁴⁴ IMO *International Convention on Maritime Search and Rescue (SAR)*, 1979 and International Maritime Organization p. 221

⁴⁵ *ibid*

heard, and judgments are rendered in accordance with national laws and international legal standards.⁴⁶

The involvement of national courts in the prosecution of maritime crimes serves several purposes. Firstly, they uphold the rule of law by holding perpetrators of maritime crimes accountable for their actions. National courts ensure that individuals who engage in illegal activities at sea are subject to legal proceedings and face appropriate penalties under domestic and international law. Secondly, they provide suspects with the opportunity to defend themselves and receive fair trials in accordance with due process rights and procedural safeguards. Defendants are entitled to legal representation, presumption of innocence, and other fundamental rights enshrined in national constitutions and international human rights instruments.⁴⁷

Moreover, national courts address the rights and interests of victims of maritime crimes by providing avenues for redress, compensation, and restitution. Victims may participate in legal proceedings as witnesses or parties to the case, seeking justice and accountability for the harm they have suffered. Additionally, national courts collaborate with other states and international organizations to combat maritime crimes effectively.⁴⁸ They exchange information, evidence, and legal assistance, facilitate extradition and mutual legal assistance, and coordinate joint investigations and prosecutions to enhance the effectiveness of law enforcement efforts.⁴⁹

5. The Challenges of the Protection of Lives and Properties on the Sea

Protecting lives and properties on the sea presents a myriad of challenges that require diligent attention and effective strategies to overcome.⁵⁰ These challenges span from navigational hazards to resource constraints, each posing distinct obstacles to maritime safety and security. Understanding and addressing these challenges is essential for

⁴⁶ (n 3) 163

⁴⁷ *ibid*

⁴⁸ CLiss, 'Armed Robbery and Piracy in Southeast Asia: Organizing Safety and Mutual Security in the Malacca Straits,' *Asian Survey*, 47(3), (2007) 511–532

⁴⁹ *ibid*

⁵⁰ E J Molenaar, 'Port State Jurisdiction: Toward Comprehensive, Mandatory and Global Coverage,' *Ocean Development & International Law*, 38(1–2), (2007) 225–257

enhancing the resilience of maritime operations and ensuring the well-being of individuals and assets at sea.⁵¹

5.1 Lack of Updated Charts of Some Regions

A significant challenge in maritime navigation is the lack of updated navigational charts for certain regions. Outdated or inaccurate charts can pose serious risks to vessels, increasing the likelihood of accidents, groundings, and collisions. Mapping and charting remote or less-frequented areas of the sea remain a logistical and technological challenge, leaving navigators with limited information to safely navigate through these waters.⁵²

Without access to reliable and up-to-date charts, mariners face heightened risks of navigational errors, collisions, and groundings, particularly in unfamiliar or poorly surveyed waters.⁵³ Furthermore, the challenges associated with mapping and charting remote or less-frequented areas of the sea are compounded by logistical constraints and technological limitations.⁵⁴ Moreover, the rapid pace of environmental change, including sea level rise, coastal erosion, and the melting of polar ice caps, further complicates efforts to maintain accurate navigational charts. These dynamic environmental processes can alter coastlines, shift underwater features, and create new navigational hazards, necessitating regular updates to maritime charts to reflect these changes accurately.⁵⁵

5.2 Lack of Adequate and Sufficient Aid to Navigation

Adequate aid to navigation, including lighthouses, buoys, and navigational beacons are essential for safe maritime navigation. However, many regions still lack sufficient aids to navigation, particularly in developing countries or remote areas with limited infrastructure. The absence of these navigational aids increases the risk of maritime accidents and

⁵¹ M Q Mejia, 'Evolution of the Port State Control System and its Impact on Maritime Safety and Environmental Protection,' *WMU Journal of Maritime Affairs*, 4(1), (2005) 1–30

⁵² D L Torrens, 'Protection of the Marine Environment in International Law: Toward an Effective Regime of the Law of the Sea,' *Queen's LJ*, 19, *Queen's University, Kingston, Ontario, Canada* (1993) 613.

⁵³ *ibid*

⁵⁴ V J Tassin, *Regulation and Protection of Water in International Law: Terrestrial and Marine Perspectives*. (Edward Elgar Publishing, Cheltenham, United Kingdom 2017) 105-142

⁵⁵ *ibid*.

hampers search and rescue efforts during emergencies⁵⁶ particularly in regions where maritime traffic is high or where navigational hazards are prevalent.⁵⁷

Moreover, the absence of sufficient aids to navigation can hamper search and rescue operations during maritime emergencies. Navigational aids such as lighthouses, buoys, and beacons not only help mariners to navigate safely but also serve as reference points for search and rescue teams responding to distress calls or incidents at sea. Without these aids, search and rescue efforts may be delayed or compromised, reducing the effectiveness of response operations and increasing the risk to the lives of mariners and passengers in distress.⁵⁸

5.3 Resource Constraints

Resource constraints, including financial limitations and inadequate maritime infrastructure, pose significant challenges to maritime safety and security. Many countries struggle to allocate sufficient resources for maritime surveillance, law enforcement, and search and rescue operations. Limited budgets hinder the deployment of maritime patrols, acquisition of advanced technologies, and training of personnel, weakening the overall capacity to protect lives and properties at sea.⁵⁹ Resource constraints present significant challenges to maritime safety and security, particularly in regions with limited financial resources and maritime infrastructure. The effective protection of lives and properties on the sea requires substantial investments in maritime surveillance, law enforcement, search and rescue capabilities, and navigational infrastructure.⁶⁰

However, many countries struggle to allocate sufficient resources to these critical areas, compromising their ability to address maritime threats and respond effectively to maritime emergencies. Financial limitations often restrict the deployment of maritime patrols, acquisition of advanced technologies, and training of personnel, limiting the capacity of maritime authorities to monitor and enforce maritime regulations effectively. Inadequate

⁵⁶ N Harvey, 'Protecting Private Properties from the Sea: Australian Policies and Practice' *Marine Policy*, 107, (2019) 566

⁵⁷ V J Proulx, *Transnational Terrorism and State Accountability: A New Theory of Prevention*. (Hart Publishing, 2012) 162

⁵⁸ *ibid*

⁵⁹ D M Bush, O H Pilkey and W J Neal, *Living by the Rules of the Sea*, (Duke University Press Durham, North Carolina USA 1996) 216

⁶⁰ C Schreuer, 'The Responsibility of States for the Acts of International Organizations' *American Journal of International Law*, 95(3), (2001) 628–631

funding for maritime surveillance systems, such as radar networks, coastal monitoring stations, and satellite surveillance, can leave vast maritime areas under-monitored and vulnerable to illicit activities, including piracy, smuggling, and illegal fishing.⁶¹

Additionally, resource constraints may hinder investments in navigational infrastructure, such as aids to navigation, hydrographic surveys, and charting activities, leading to outdated or incomplete navigational charts and increased navigational hazards. Limited budgets for search and rescue operations can impede the timely response to maritime emergencies, prolonging the duration of distress situations and increasing the risk to the lives of mariners and passengers in distress.⁶² Moreover, resource constraints can impact the capacity of maritime authorities to address emerging maritime threats and challenges, such as marine pollution, maritime terrorism, and cyber threats. Without adequate resources for training, equipment, and intelligence gathering, maritime agencies may struggle to adapt to evolving threats and implement effective countermeasures to protect maritime assets and infrastructure.⁶³

5.4 Poor Security Cooperation among Some National Militaries

Effective maritime security requires cooperation and coordination among national militaries, coast guards, and law enforcement agencies. However, in some regions, poor security cooperation among neighboring countries undermines efforts to combat maritime threats such as piracy, smuggling, and illegal fishing. Disputes over maritime boundaries, jurisdictional issues, and lack of trust among nations can impede joint patrols, intelligence sharing, and collaborative enforcement actions, leaving maritime areas vulnerable to criminal activities.⁶⁴ One of the significant challenges in ensuring maritime safety and security is the lack of effective security cooperation among some national militaries. While international law provides a framework for cooperation in addressing maritime threats and challenges, including piracy, terrorism, and illegal activities at sea, poor coordination and

⁶¹ *ibid*

⁶² D J Rasmussen, M K Buchanan, *et al*, 'A Flood Damage Allowance Framework for Coastal Protection with Deep Uncertainty in Sea Level Rise.' (American Geophysical Union (AGU) Washington, D.C., USA. 2020) 23

⁶³ A Singh, 'Legal Measures against Maritime Piracy: A Case Study of Indian Ocean Region.' *International Journal of Law and Management*, 62(2), (2020) 154–172

⁶⁴ D D A Laffoley, *Et al.*, *The Protection and Management of the Sargasso Sea*. (Sargasso Sea Alliance 2011) 342

communication among military forces can undermine efforts to combat maritime threats effectively.⁶⁵

The lack of effective security cooperation among some national militaries not only undermines maritime safety and security within their respective jurisdictions but also has broader implications for regional stability and security. In regions where maritime boundaries are disputed or where maritime security threats transcend national borders, such as the Gulf of Guinea or the South China Sea, poor security cooperation among neighboring countries can exacerbate tensions and increase the risk of maritime conflicts.⁶⁶

6. Preferred Solutions

6.1 Addressing the challenge of outdated navigational charts requires collaborative efforts among governments, international organizations, and the maritime industry. Investing in advanced surveying technologies, such as multibeam sonar and satellite imagery, can facilitate more efficient and accurate hydrographic surveys, enabling the timely production of updated charts for critical maritime routes and navigational areas. Additionally, enhancing international cooperation and information-sharing mechanisms can help improve the availability and accessibility of navigational data, ensuring that mariners have access to reliable information to navigate safely and effectively in all maritime environments.⁶⁷

6.2 Establishing and maintaining aids to navigation requires ongoing investment in infrastructure, equipment, and personnel, which may be challenging for countries with limited maritime resources or pressing socio-economic needs. As a result, many navigational channels, harbors, and coastal areas remain underserved by essential navigational aids, leaving mariners vulnerable to navigational hazards and maritime accidents.⁶⁸

Addressing the challenge of inadequate aids to navigation requires concerted efforts at the national, regional, and international levels.⁶⁹ Governments and maritime authorities must

⁶⁵ *ibid*

⁶⁶ (n 47) 618

⁶⁷ (n 51) 165

⁶⁸ J Xia, *et al.*, 'Opportunities and Challenges of the Sponge City Construction Related to Urban Water Issues in China' *Science China Earth Sciences*, 60, (2017) 652-658

⁶⁹ C Z Raymond, 'Piracy and Armed Robbery in the Malacca Strait: A Problem Solved?' *Naval War College Review*, 62(3), (2009) 31-42

prioritize investment in navigational infrastructure, allocate sufficient funding for the establishment and maintenance of aids to navigation, and enhance collaboration with international organizations and industry stakeholders to improve navigational safety standards and practices.

6.3 Addressing the challenge of resource constraints requires a multi-pronged approach that involves prioritizing maritime safety and security in national budgets, enhancing international cooperation and assistance, and leveraging innovative solutions and technologies. Governments and maritime authorities must allocate sufficient funding for maritime safety and security initiatives, including the development of comprehensive maritime strategies, capacity-building programs, and infrastructure investments.⁷⁰

Additionally, international organizations and donor agencies can provide technical assistance, training programs, and financial support to help countries strengthen their maritime capabilities and address maritime security challenges. Collaborative initiatives, such as joint patrols, information-sharing agreements, and regional cooperation mechanisms, can enhance maritime domain awareness and improve the effectiveness of maritime law enforcement efforts.⁷¹ Furthermore, the private sector can play a crucial role in supplementing government efforts by investing in maritime security technologies, providing training and expertise, and participating in public-private partnerships to enhance maritime safety and security.

6.4 Addressing the challenge of poor security cooperation among some national militaries requires a comprehensive approach that involves diplomatic engagement, capacity building, and confidence-building measures. Governments and military leaders must prioritize maritime security cooperation as a key component of national security strategies and allocate sufficient resources for joint training exercises, information sharing, and collaborative patrols.⁷² Additionally, regional and international organizations can play a crucial role in facilitating dialogue, promoting confidence-building measures, and providing technical assistance to enhance the capacity of national militaries to cooperate effectively on maritime security issues. By fostering a culture of cooperation and mutual

⁷⁰ *ibid*

⁷¹ (n 53) 219

⁷² (n 58) 345

trust among neighboring countries, stakeholders can strengthen regional maritime security frameworks and mitigate the risks posed by maritime threats and challenges.⁷³

Addressing these challenges requires concerted efforts at the national, regional, and international levels. Enhanced investment in maritime infrastructure, capacity-building initiatives, and strengthened cooperation among stakeholders are essential for overcoming the obstacles to the protection of lives and properties on the sea.

7. Conclusion

The protection of lives and property on the sea is a complex and multifaceted challenge that requires concerted efforts from the international community. While significant progress has been made in establishing a robust legal framework for maritime safety and security, and its implementation, persistent challenges and emerging threats necessitate continuous adaptation and innovation. Based on the above preceding discussion, the following findings are made by the research:

The research revealed the intricate and multifaceted nature of the legal framework governing maritime safety and security. The multitude of international conventions, treaties, and customary principles creates a complex landscape that can be challenging to navigate for stakeholders involved in maritime affairs.

Despite the existence of comprehensive legal instruments, persistent challenges such as the lack of updated navigational charts, inadequate aids to navigation, resource constraints, and poor security cooperation continue to pose significant obstacles to maritime safety and security. These challenges underscore the need for ongoing efforts to address gaps and vulnerabilities in the legal framework.

Effective maritime safety and security require collaboration and cooperation among governments, international organizations, and industry stakeholders. The research highlighted the importance of enhancing information-sharing mechanisms, promoting joint initiatives, and fostering partnerships to address maritime threats and challenges comprehensively.

In today's dynamic maritime environment, adaptation and innovation are essential for addressing emerging threats and challenges. The research emphasized the need for

⁷³ *ibid* 346

continuous adaptation of legal frameworks, implementation of new technologies, and development of best practices to enhance maritime safety and security in a rapidly evolving landscape.

Finally, the following recommendations are made:

That governments and international organizations should prioritize investment in navigational infrastructure, including the development and maintenance of updated navigational charts, aids to navigation, and maritime surveillance systems. Adequate funding is essential to address gaps in navigational safety and enhance maritime domain awareness.

That stakeholder should strengthen international cooperation and information-sharing mechanisms to improve maritime domain awareness and enhance the effectiveness of maritime law enforcement efforts. Promoting joint initiatives, sharing best practices, and fostering partnerships can help address common challenges and vulnerabilities.

That capacity-building assistance and technical support should be provided to developing countries and remote maritime regions to strengthen their maritime capabilities and address maritime security challenges. Training programs, knowledge-sharing initiatives, and technology transfer can help enhance the capacity of maritime authorities to respond to emerging threats. That effort should be made to promote the ratification and implementation of international conventions and treaties related to maritime safety and security. Encouraging adherence to established standards and regulations can promote consistency and coherence in maritime governance and enhance compliance with international Law