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**MARITIME LAWS, POLICY AND GOVERNANCE -
A REVIEW OF JURISDICTION AND ENFORCEMENT
ISSUES AT INTERNATIONAL, AND NATIONAL LEVEL**

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CHAPTER 1

Maritime Laws, Policy and Governance

Review of Jurisdiction and Enforcement Issues at International and National Level

1.1 Introduction

a. International Maritime law is a system of laws, conventions, treaties and regulations that govern activities on the seas and oceans. It provides a legal framework that regulates activities on the high seas i.e. areas beyond any national jurisdiction as well in Maritime Zones within the jurisdiction of a state, such as, Territorial seas, Contiguous zone and Exclusive Economic Zones, and inland waterways (Jose, 2024). It covers a wide range of issues, from navigation, shipping, seafarer welfare, fishing, marine pollution and conservation of marine environments etc. Effective maritime governance is crucial for fostering global and regional trade, protection of life & assets at sea, protection of marine ecosystem and to harmonizes stakeholder interest for sustainable global prosperity. In fact, “International ocean governance is about managing the world's oceans and their resources together so that they are healthy and productive, for the benefit of current and future generations” (European Commission, 2024).

b. The United Nations Convention on the Law of the Sea, also known as UNCLOS, is widely recognized as the general legal framework within which all activities in the oceans and seas must be carried out (UN Secretary-General, 2003). Within the ambit of United Nations Convention on the Law of the Sea, the International Maritime Organization (IMO) has a mandate as a global legislative entity to further regulate maritime issues on the basis of many of its provisions (*International Maritime Organization*, 2024). The four pillars of IMO's policy and legislation are the Safety of Life at Sea (SOLAS) Convention, the International Convention for the Prevention of Pollution from Ships (MARPOL), the Convention for Standards of Training, Certification, and Watch keeping for Seafarers, and the Maritime Labor Convention.

c. With the institution of International maritime legal framework, the system of ocean governance has improved significantly in the last decades. However still there are emerging challenges related to maritime jurisdiction and enforcement at international and national level. The systemic failure in the governance of the maritime sector is evident from the widespread inability of many shipping policies to address the problems of environments, security, safety, and environmental concerns of oceans (Lukaszuk, 2019). The governance at sea is also complicated due to the spread of globalization and technology which has accelerated in recent decades and intensified the inadequacies of the marine governance system (Vallega, 2001).

d. Pakistan, fortunately, has a coastline of over 1000 km which extends from Sir Creek in the east to Gwadar Bay in the west. The maritime zones of

Pakistan comprise internal waters, territorial sea, contiguous zone, Exclusive Economic Zone (EEZ) and extended continental shelf. These zones and the economic activities are governed by various federal and provincial agencies (Gul & Shah, 2021a). After the 18th amendment, there are critical issues with the administration of these maritime zones such as ambiguity in jurisdictions, coordination and collaboration among federal and provincial governments, resource management, coastal infrastructure development, implementation of current laws and regulations, and disconnect among several agencies.

e. Pakistan operates a dualist legal system. Thus, an international law, treaty and convention did not automatically form part of Pakistan national legislation unless implemented through national legislation. Generally, IMO convention and protocols have been incorporated in into Pakistan's Law by either primary or secondary legislation, however there are certain laws and amendments mandatory to IMO instruments which have not been incorporated into national legislation. There is a need to conduct a gap analysis of international maritime laws, conventions and treaties vis national legislation as well as efficacy institutional frame of Pakistan for enacting national legislation in line with the international framework.

1.2 Problem Statement

Ocean governance involves a range of legal instruments, institutions, and organizations that collectively establish rules and policies for managing, conserving, and using the *ocean*. However, their implementation and enforcement at national level remains a challenge due to diverse reasons. As in the case of Pakistan, there are various ministries/ departments looking after maritime sector and are devoid of comprehensive spelled out regulatory frameworks and governance plans/policies in the maritime governance structure. These administrative issues serve as an impediment in the development of maritime sector, preservation of maritime interests, and enforcement of maritime laws. In this backdrop, there is need to take a holistic view of **International Maritime Institutional and Legal framework** and **Pakistan 's Maritime Institutional and Legal framework** with an aim to proffer suitable recommendation for improved governance of Maritime Sector of Pakistan.

1.3 Objectives of the Research

Following are the objectives of the Research:

- a. To review the legal and institutional framework of Ocean Governance at international level.
- b. To evaluate/ analyses the strengths and weaknesses of International Maritime Institutions of maritime governance.

- c. To evaluate/ analyses the strengths and weaknesses of International Maritime Law, Policy and Governance with respect its jurisdiction and enforcement at High Sea.
- d. To review the Maritime Sector of Pakistan and associated policies, laws of governance.
- e. To analyses the problems associated with the institutional framework of maritime governance in Pakistan.
- f. To assess role of various maritime agencies of Pakistan (Federal and Provincial agencies) with respect to governance and implementation of laws and regulation in PMZs.
- g. To provide policy recommendation on the structures of maritime Institutions and how to develop synergy between them.

1.4 Primary Research Questions

Following are the primary research questions:

- a. What are the governance and enforcement issues of International Maritime Law, Policies at International waters / High Seas?
- b. What are Governance issues of Pakistan Maritime Sector considering International Maritime Law, various policy framework?
- c. How does policy gaps can be addressed for effective implementation at international and national level?

1.5 Secondary Research Questions

Following are the secondary research questions:

- a. How does international maritime law evolve?
- b. What is the institutional framework of ocean governance at international level and issues related to enforcement and jurisdiction?
- c. What is the legal framework of ocean governance and issues related to enforcement and jurisdiction?
- d. What is the governance structure of Pakistan's maritime Sector?
- e. What is the problem of maritime governance in Pakistan?

- f. Which agencies are responsible for law enforcement in maritime zones?
- g. What are the issues of overlapping jurisdictions within Law Enforcement Agencies?
- h. How do federal and provincial agencies collaborate and coordinate their efforts to ensure effective governance of PMZs
- i. What are the possible solutions for Maritime Governance framework of Pakistan?

1.6 Literature Review

a. The intricate relationship between humans and oceans has been longstanding; prompting the establishment of laws and institutions dedicated to maritime governance. While reviewing literature, it has been established that a treasure of maritime literature is available on the internet and in many international journals. number of international authors have written on ocean governance and international maritime laws, however, very few have attempted on Pakistan Maritime Institutional and legal framework.

b. Yvonne Braatz, author of Maritime Law Third Edition 2014, states maritime boundaries are defined as the spatial limits within a country's jurisdiction over maritime resources and activities. The given boundaries governed by UNCLOS are essential for resolving disputes overseas while maintaining order throughout. UNCLOS has incorporated the responsibilities of nations on their use of the world's oceans (Yvonne, 2014).

c. Francesco Berlingieri, in his book International Maritime Conventions Volume II 2015, provides an extensive view on various international maritime laws and their roles concerning pollution, protection, and legal regulations. Maritime conventions are essentially treaties between states creating uniformity in ground of governing the seas and oceans. Ratification of these conventions bind states to the terms of the treaty and they must incorporate the rules into their national legal systems. In addition to binding conventions, there are certain instruments that have non-binding aspects such as resolutions and codes of practice. These are adopted by various international maritime organizations.. International organization's such as the IMO develop and promote implementation of these conventions, hopefully through proper cooperation states can effectively address the challenges faced in the maritime domain (Berlingieri, 2015).

d. While Schofield, Clive in his journal article "Options for Overcoming Overlapping Maritime Claims: Developments in Maritime Boundary Dispute Resolution and Managing Disputed Waters." states that due to lack of clear

guidance by the UNCLOS, boundaries are a cause of disputes between countries. For small disputes, states are encouraged to resolve their issues through negotiation and/or mediation. If this fails, issues can be brought up to the International Court Justice (ICJ) and the International Tribunal for the Law of the Sea (ITLOS)- to resolve disputes in a fair manner (Schofield, 2021).

e. Natalie Klein, within her book *Maritime Security and the Law of the Sea*, examines the significance of the constitution of the sea (UNCLOS). UNCLOS was adopted in 1982 and is the foundation for international maritime law. States are encouraged to combat activities that involve mysterious behavior such as illicit trafficking of drugs and illegal arms. Maritime terrorism, though not explicitly stated by UNCLOS, Klein discusses how its broader security provisions and the need for cooperation among states proves a basis for addressing terrorism at sea (Klein, 2011).

f. Puthucherril, Tony George in a journal article "Protecting the Marine Environment: Understanding the Role of Environmental Law and Policy." addresses the law and regulations that govern marine pollution. He stresses the importance of protecting the marine environment from harm caused by ships and other maritime disturbances. The International Convention for the Prevention of Pollution from ships (MARPOL) is the primary convention constituted to control pollution from ships. MARPOL Annex VI sets limits on emissions and pushes the use of cleaner fuels and technologies (Puthucherril, 2021).

g. Hussain, Mazhar, and Shaukat Hussain Bhatti in their journal article "A review article on an appraisal of maritime laws as a mechanism of community governance for sustainable development goals." published in 2023 discuss that Maritime law is crucial for regulating marine activities, ensuring peace and security, and fostering the blue economy. Despite international efforts and frequent legislation, significant flaws persist, posing threats to maritime governance and broader social rehabilitation. Further research and innovative solutions are essential for improving maritime governance and benefiting global society (Hussain & Bhatti, 2023a).

h. This review examined key areas including ocean governance, international maritime laws, UNCLOS, maritime boundaries, and environmental protection; all while having emphasis on Pakistan's maritime sector. It has been observed that plenty of literature is available with respect to institutional and legal framework of global maritime land scape; very little is written on the maritime policies, laws and governance at national level in perspective of Pakistan. Gaps include implementing international conventions, segmented institutional framework of maritime sector and enactment of laws to improve governance of maritime laws.

1.7 Limitations

Following limitations were encountered in the study:

- a. The scope of study is very broad to include ocean governance at international and national level. Covering this vast scope may not be possible within, therefore study has been restricted to cover ocean governance issues at international and national level.
- b. Absence of Maritime law experts both at national and institutional level.

1.8 Methodology

This paper employed qualitative research and has examined, through standard content analysis, relevant primary and secondary sources of data and information from various sources such as research papers, opinion articles, websites, online journals, and books / e-books. The research also consulted experts, pertinent national and international documents, and academics in peer-reviewed publications to gather a variety of pertinent prior assessments and viewpoints. The paper's analysis technique included an in-house session with experts to deduce findings and conclusions and to produce recommendations for practical actions, involving governance instruments proposed for Pakistan. Overall, this approach suggests that the research conducted in this paper is thorough and comprehensive, utilizing a range of sources and expert opinions to develop a nuanced understanding of the subject matter at hand. DG PMSA was consulted to gain insight into jurisdictional and governance issues in enforcing maritime laws at sea. Insight was also developed through interviews and focused discussion with naval operations experts.

1.9 Organization of Study

Due to the vast scope of the subject, the research focused on developing a foundational understanding of the legal and institutional framework of international and national maritime governance. Issues and challenges associated with jurisdiction and enforcement were analyzed to derive logical conclusions culminating to recommendations. The research has been organized in following chapters/ broader concept:

1. Historical Evolution of International Maritime Laws.
2. International Institutional Framework of Ocean Governance.
3. International Legal Framework of Ocean Governance.



4. Institutional Framework of Pakistan Maritime Sector.
5. Legal Framework of Pakistan Maritime Sector.
6. Conclusion and Recommendation

CHAPTER 2

Historical Evolution of International Maritime Law

2.1 Introduction

a. The historical evolution of international maritime law traces the development of legal frameworks governing the use of the world's oceans and seas (Anand, 2022). From ancient times to modern conventions; maritime law has evolved to address issues of navigation, trade, territorial waters, and environmental protection. This evolution reflects the changing dynamics of global politics, commerce, and technological advancements, shaping a complex and comprehensive legal system that ensures the orderly and equitable use of maritime resources.

b. Before historical study, it is crucial to clarify the key terms used in existing literature and throughout this paper. Defining these terms will facilitate a deeper understanding of the main concepts presented.

2.2 Definitions

a. **International Law.** 'International law' as is a set of rules, agreements, and principles that govern the relations and interactions between sovereign states, international organizations, and, in some cases, individuals. It aims to maintain peace and security, promote justice, and facilitate international cooperation on various issues such as trade, human rights, and environmental protection. Examples of international law include, The United Nations Charter, The World Trade Organization (WTO) Agreements etc (Hurd, 2024).

b. **Admiralty law.** Admiralty law specifically refers to the legal framework governing maritime matters, including issues related to ships, navigation, and seafaring activities. Admiralty law has its roots in ancient maritime customs and practices, often associated with the authority of admiralty courts. Geographically in the United States, the term "admiralty law" is commonly used.

c. **Maritime Law.** Maritime law is a broader term that encompasses admiralty law but also includes other aspects of maritime commerce, such as contracts, trade, and marine insurance. Maritime law has evolved over time to address a wider range of legal issues related to maritime trade and commerce. In countries other than US, "maritime law" is preferred term. In practical terms,

both admiralty and maritime law deal with similar topics, such as ship collisions, salvage, cargo disputes, and crew contracts (Rue, 2005).

d. **Ocean Governance.** Ocean governance is complex because much of the ocean is a common that is not 'owned' by any single person or nation/state. Ocean governance is the conduct of the policy, actions and affairs regarding the world's oceans. Within governance, it incorporates the influence of non-state actors, i.e. stakeholders, NGOs and so forth, therefore the state is not the only acting power in policy making. Effective ocean governance requires robust international agreements. In short, there is a need for some form of governance to maintain the ocean for its various uses, preferably in a sustainable manner (Haas et al., 2022).

e. **Legal Framework.** consists of the aggregation of laws enacted over time by the legislative authorities of a country or competent organizations having international mandate plus the common law and customary law, which have been accumulated through judicial pronouncements and traditional practices.

f. **Institutional Framework.** is the systems of institutions referring to all public and civil society organizations contributing to the implementation of a certain policy objective and responsible for managing, conserving, using public goods and services provided by the resources concerned (Ostrom, 2007).

g. **Customs and Traditions.** There are many unwritten customs related to maritime laws. Beyond formal legal codes, customs and practices played a significant role in governing maritime affairs. These customs often determined how disputes were resolved and how maritime activities were conducted. These customs played a vital role in the development of Maritime law. These are the established practices of maritime nations since ancient times that have acquired the status of unwritten laws. For example, the principle of "freedom of the seas," which allows ships of any nation to navigate international waters without interference, is one such unwritten law (Redij, 2023).

h. **Treaties.** Treaties are agreements between nations (Foulke, 1918). They can be bilateral, between two nations, or multilateral, among several nations. Key aspects of treaties are that they are binding (meaning, there are legal consequences to breaking them) and become part of international law. Treaties are formal agreements between two or more states on regional

matters. For example, the North Atlantic Treaty, which established NATO, is a key example of such an agreement.

i. **Conventions.** A convention (or event), in the sense of a meeting, is a gathering of individuals who meet at an arranged place and time to discuss or engage in some common interest. Conventions are also formal agreements between countries that establish common standards or rules on specific issues, typically of an international or global nature. They are legally binding for the countries that ratify them. Examples of conventions include, The United Nations Convention on the Law of the Sea (UNCLOS), The Geneva Conventions, The Convention on Biological Diversity (CBD), The Vienna Convention on Diplomatic Relations etc.

j. **Protocols.** A protocol signifies an instrument that creates legally binding obligations at international law. In most cases this term encompasses an instrument which is subsidiary to a treaty (UN Forum on Forests, 2004). The term 'protocol' is used for agreements less formal than those entitled 'treaty' or 'convention'. Protocols are additional treaties that supplement or amend an existing international treaty or convention. They provide specific details or address issues not covered in the original document, often adding new obligations, or clarifying existing ones. Protocols are legally binding for the countries that ratify them. Examples of protocols include, The Kyoto Protocol, The Montreal Protocol on Substances that Deplete the Ozone Layer, The Cartagena Protocol on Biosafety etc.

k. **Charter.** The term 'charter' is used for particularly formal and solemn instruments, such as the constituent treaty of an international organization. The term itself has an emotive content that goes back to the Magna Carta of 1215. Well-known more recent examples are the 1945 Charter of the United Nations (UN Forum on Forests, 2004).

l. **Judicial Pronouncements.** The Court's pronouncement on a controversy is its 'decision' or 'judgment', reflecting the conclusion drawn from the matter at hand. As law operates within and is shaped by society, it is inherently dynamic and subject to change. International Judiciary plays a pivotal role in driving this change, as judges interpret and redefine laws through their decisions, establishing precedents that provide a legal foundation for future cases. The International Court of Justice (ICJ) and International Tribunal for Laws of the Sea (ITLOS) are key judicial forums that resolve rules and principles, including those not explicitly written in law but derived through

judicial interpretation (Keyuan, 2010). These rulings, published in annual journals, are binding on all Admiralty courts or prize courts of United Nations member states.

m. **Admiralty / Prize Courts.** Each state has dedicated courts of maritime dispute resolutions, in accordance with the Admiralty jurisdiction of High courts Ordinance 1980, for disputes related to ships, cargo, crew, collisions, accidents, salvage, wreck removal, Maritime lines, navigation etc. Sindh High court and High court of Balochistan have jurisdiction. Such jurisdiction is also exercised by Lahore High court and Peshawar High court if the cargo is transported by air (The Admiralty Jurisdiction of High Courts Ordinance, 1980). The laws are enacted by legislature, under international laws. Those are improved / modified by judgements pronounced by the International Court of Justice and judgements of the local Admiralty courts.

n. **Declarations.** The term 'declaration' is used to describe various international instruments. However, in most cases declarations are not legally binding. The term is often deliberately chosen to indicate that the parties do not intend to create binding obligations but merely want to declare certain aspirations. Examples are the 1992 Rio Declaration on Environment and Development, the 2000 United Nations Millennium Declaration and the 2002 Johannesburg Declaration on Sustainable Development.

o. **Enforcement.** The act of compelling observance of or compliance with a law, rule, or obligation is called enforcement. This is directly done by law enforcement agencies like police and is indirectly done by courts (Polinsky & Shavell, 2007).

2.3 Historical Evolution

a. **Early Developed Codes.** Maritime law was first documented during the period of ancient Egypt. However, traces are not available. The earliest traced formal code was established in Rhodes Island in 900 BC. Rhodes was the birthplace of maritime jurisprudence, the maritime code of the later Eastern Empire, dating from the 7th or 8th century AD, was called the "Rhodian sea Law" (Ashburner, 1909). It provided detailed rules for carrying out trade and commerce in an efficient manner. Rhodian Sea Law, was body of regulations governing commercial trade and navigation in the Byzantine Empire beginning in the 7th century; it influenced the maritime law of the medieval Italian cities. The Rhodian Sea Law was based on a statute in the Digest of the Code of

Justinian commissioned in the 6th century and on maritime customary law originating on Rhodes in ancient times. The regulations concentrated on the liability for the cost of lost or damaged cargo. Cargo loss was greatest during storms, when part or all of it had to be thrown overboard in order to save the ship. Large amounts were also lost to piracy; from the 7th century on, there was increased danger of sea raids by Arab and Slavic pirates. Thus, the maritime law served as a form of insurance, dividing the cost of the losses between the shipowner, the owners of the cargo, and the passengers (Britannica, 2012). Greek city-state, also had maritime laws that governed trade, shipping, and naval activities. These laws were part of the broader legal framework of Athens and were enforced by the city's legal authorities. Rome did not become a maritime power until the Punic wars of the 3rd century BC. The Mediterranean, under Roman control, was not only the center of the Western world but also its principal commercial highway. European maritime law evolved as a uniform, supranational, comprehensive body of law. Mediterranean seaports maintained the Roman law to which they had become accustomed. The field of maritime jurisprudence gradually transited into the Middle Ages.

b. **Medieval and Renaissance.** During the Middle Ages and Renaissance, maritime trade flourished, leading to the development of laws governing shipping, insurance, and salvage. The Hanseatic League and the Consulate of the Sea in Barcelona were influential in shaping these early maritime laws (Kirk, 2013). Hanseatic League in the beginning dominated maritime trade in the North and Baltic Seas. It established a network of trading outposts in numerous towns and cities, notable among them the Kontors in London (known as the Steelyard), Bruges, Bergen, and Novgorod, which became extraterritorial entities that enjoyed considerable legal autonomy.

c. **Emergence of International Treaties.** The 17th centuries onwards saw the emergence of international treaties and conventions aimed at regulating maritime affairs. The Treaty of Westphalia (1648) and the Paris Declaration Respecting Maritime Law (1856) were early examples. Later, many treaties were concluded like, International Convention for the Unification of Certain Rules of Law relating to Bills of Lading (the Hague Rules of 1924) (Yiannopoulos, 1961).

d. **Laws Formulated by United Nations.** After World War-II, the development of United Nations played a vital role in shaping the international maritime laws. The United Nations Convention on the Law of the Sea (UNCLOS), adopted in 1982, is the most comprehensive international treaty

governing maritime affairs. It establishes the rights and responsibilities of nations in their use of the world's oceans.

e. Apart from UNCLOS, UN has developed / adopted many conventions like, United Nations Convention on the Carriage of Goods by Sea (Hamburg Rules) – 1978, United Nations Convention on Maritime Liens and Mortgages – 1993, International Convention on Salvage – 1989, International Convention on Maritime Search and Rescue (SAR) – 1979, United Nations Convention on the International Maritime Organization (IMO Convention) – 1948 etc. (Balkin, 2006).

2.4 Laws Formulated by International Organizations

a. Over the decades, IMO has complemented its role and has truly shaped itself as the competent international organization (Pozdnakova, 2023). It serves as source of international rules and standards on international shipping, and in fulfilling its mandate, IMO has expanded beyond what is explicitly stipulated in UNCLOS. Nevertheless, the work of the IMO is within the legal framework of UNCLOS. The dynamic relationship between UNCLOS and IMO allows the legal framework to evolve and respond effectively and flexibly to new challenges and developments. It is expected that States will continue to utilize the available mechanisms under IMO to improve the effectiveness of the international regulatory framework of shipping and contribute to the peaceful use of the oceans and the protection and preservation of the marine environment.

b. IMO has developed for safety, SOLAS (Safety of Life at Sea Convention), STCW (Standards of Training, Certification and Watchkeeping for Seafarers). For navigation. COLREG (Convention on the International Regulations for Preventing Collisions at Sea). For environmental protection, MARPOL (Marine Pollution Convention), OPRC (International Convention on Oil Pollution Preparedness, Response and Cooperation), and the HNS Convention (International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea). For security, ISPS Code (International Ship and Port Facility Security Code) and the SUA Conventions (Suppression of Unlawful Acts Against the Safety of Maritime Navigation) (Mensah, 2004). For ship recycling, Hong Kong Convention (International Convention for the Safe and Environmentally Sound Recycling of Ships).

CHAPTER 3

International Institutional Framework of Ocean Governance

3.1 Introduction

a. Ocean governance comprises the law of the sea as well as all related policy and normative dimensions that relate to the regulation of human activity at sea and increasingly places a strong focus on marine environmental protection and the conservation of marine resources, with the aim of ensuring a healthy and productive ocean while sustaining a resilient ocean-based economy.

b. Lloyd's Register was established in 1760 by merchants and marine underwriters who met at Edward Lloyd's Coffee House on Lombard Street in London. The coffee house was a popular gathering place for those involved in shipping and insurance. The aim was to provide traders and insurers with reliable information about the condition of ships, which was crucial for marine insurance purposes. The organization began by publishing an annual register of ships, classifying them based on their condition and seaworthiness.

c. Apart from the above, early institutions and legal frameworks were established, such as the International Maritime Committee in 1897. Key milestones included the creation of the League of Nations (1920) and the Permanent Court of International Justice (1922) (Quigley, 2024). The Hague Conference in 1930 aimed to address territorial waters and navigation rights but failed to reach a consensus.

d. Post-WW-II, the United Nations facilitated the creation of global maritime institutions like the Inter-Governmental Maritime Consultative Organization (IMCO) and the International Law Commission (Kusuma & Putra, 2024). The period saw a rise in new states using international organizations to protect their interests.

3.2 Major Ocean Governing Institutes

a. There are several international and regional Institutes which play a very significant role in regulating the maritime sector. The United Nation (Division of Ocean Affairs and Law of Sea) and the International Maritime Organization (IMO) are two key organizations focused solely on ocean-related matters. The

IOC encourages marine scientific research, while the IMO addresses shipping regulations and pollution from maritime activities. Other UN entities also prioritize ocean issues. Notably, the United Nations Environment Programme (UNEP), a year after its establishment in 1973, identified the protection and development of oceans and coastal areas as a primary focus and initiated the Regional Seas Program (RSP). Several other UN bodies are also involved in marine-related activities. These include the Food and Agriculture Organization (FAO) with its Committee on Fisheries (COFI), the World Meteorological Organization (WMO) which addresses global climate, the United Nations Educational, Scientific and Cultural Organization (UNESCO) which deals with marine sciences, the United Nations Conference on Trade and Development (UNCTAD) which focuses on technology transfer, and the International Seabed Authority (ISA) responsible for seabed mineral resources (Ridgeway, 2014).

b. The institutional diagram of ocean governing bodies is given below (UN, 2024a):

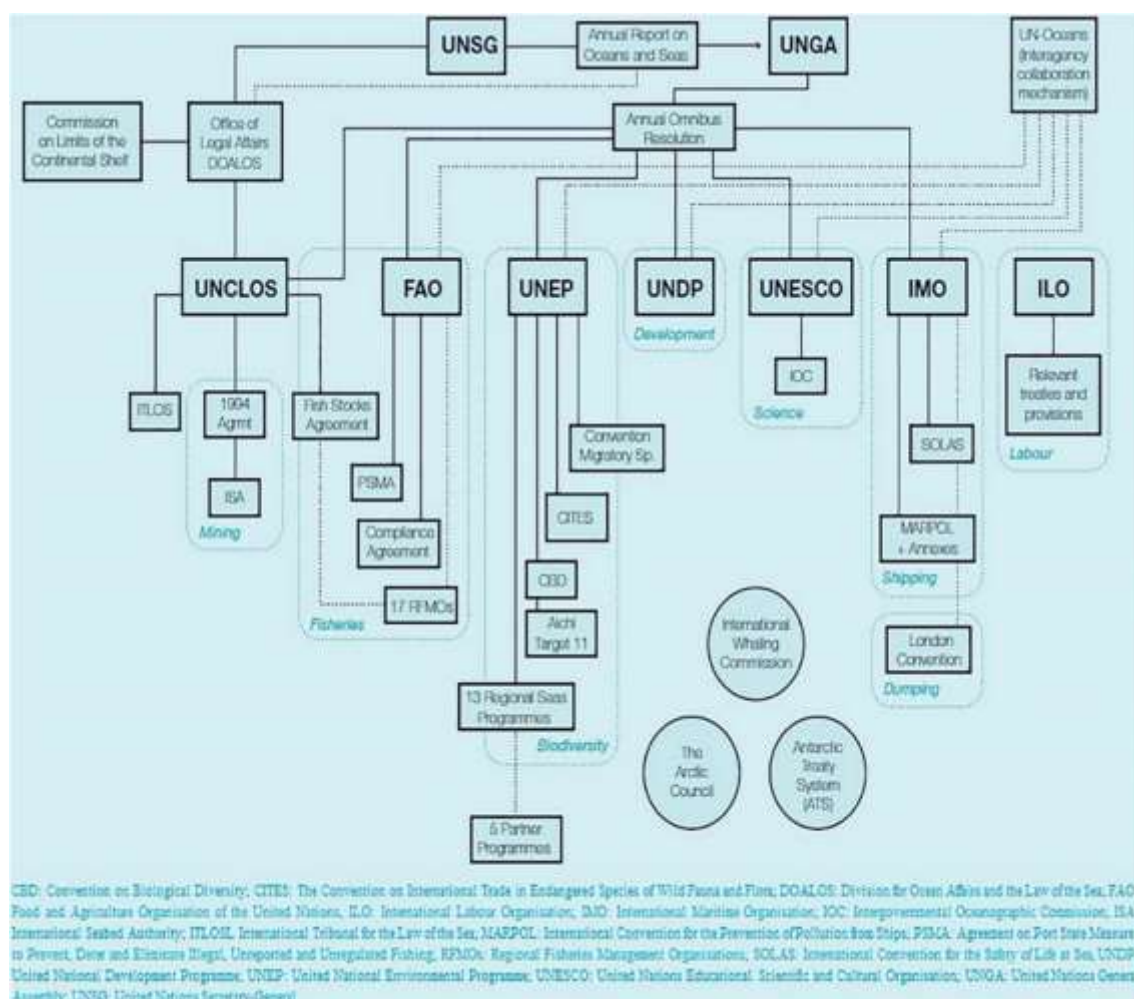


Figure 2.1: Institutional diagram of ocean governing bodies is given below (UN, 2024a)

3.3 UN Division for Ocean Affairs and the Law of the Sea (DOALOS)

DOALOS aims to enhance the understanding and appreciation of the United Nations Convention on the Law of the Sea (UNCLOS), the Agreement on the implementation of Part XI of UNCLOS, and the United Nations Fish Stocks Agreement (UN, 2024b). It provides information, advice, and assistance to States and intergovernmental organizations to ensure these agreements are applied uniformly and consistently. DOALOS handles depositary duties for the Secretary-General under UNCLOS, excluding treaty depositary functions (Gorina-Ysern, 2015). This includes maintaining and improving a geographic information system for States to deposit charts and geographical coordinates of maritime zones, including delimitation lines, and ensuring these are publicly accessible. DOALOS also implements relevant provisions of agreements with the International Seabed Authority and the International Tribunal for the Law of the Sea, maintaining association with these bodies.

3.4 Commission on the Limits of the Continental Shelf (CLCS).

The CLCS is established under the UN Convention on the Law of the Sea (UNCLOS) article 2 of annex II to make recommendations to coastal states on the establishment of the outer limits of their continental shelves beyond 200 nautical miles. The CLCS is a body of 21 independent experts in fields like geology, geophysics and hydrography, elected by the Meeting of States Parties to UNCLOS, reviews the scientific and technical data submitted by coastal states to delineate the outer limits of their continental shelves. The recommendations made by the CLCS are final and binding, unless the coastal state disagrees and submits a revised or new submission (Suarez, 2010). If a coastal state disagrees with the CLCS recommendations, it can make a revised or new submission within a reasonable time (Woker, 2024). The CLCS will then re-examine the new information provided by the coastal state. The CLCS encourages coastal states to resolve any disputes through diplomatic negotiations and consultations. The CLCS and its members can offer their good offices to facilitate such negotiations between disputing parties. As a last resort, disputes related to the CLCS recommendations can be referred to the ICJ for binding resolution, under the framework of UNCLOS (Seta, 2022).

3.5 International Maritime Organization (IMO)

The International Maritime Organization (IMO), an UN-specialized agency since 1958, is responsible for setting global standards in shipping safety, security, and environmental performance with 175 member states (Höfer & Mez, 2008). The IMO is instrumental in establishing global standards for the following areas:

- a. The IMO develops and enforces safety regulations pertaining to ships, crews, and passengers. The organization sets stringent standards for pollution control, including measures to address oil spills, waste disposal, and air emissions (Karim, 2015). The IMO addresses environmental issues such as ballast water management, the control of invasive species, and the mitigation of climate change impacts. The IMO devises measures to combat piracy, armed robbery, and terrorism at sea. The IMO formulates and adopts international conventions and treaties, which member states subsequently ratify. The organization develops and enforces regulations and guidelines to facilitate the implementation of these conventions. The IMO provides technical assistance and capacity-building programs to its member states.
- b. The IMO encourages the resolution of disputes through diplomatic negotiations. The IMO provides arbitration services for disputes related to its conventions under the purview of the IMO can be referred to the ICJ for binding resolutions. The IMO's dispute resolution mechanism is designed to foster cooperation, diplomacy, and the peaceful settlement of maritime disputes among member states (Tuffuor et al., 2024).

3.6 United Nations Educational, Scientific and Cultural Organization (UNESCO)/ Intergovernmental Oceanographic Commission (IOC).

- a. It is a specialized agency of the United Nations, UNESCO plays a central role in promoting international cooperation and coordination in ocean science, education, and policy. This mandate is primarily executed through its Intergovernmental Oceanographic Commission (IOC). UNESCO was established to advance peace, sustainable development, and human rights through international collaboration in education, science, culture, and communication. According to the UNESCO Constitution, the organization is

tasked with "maintaining, increasing and diffusing knowledge" and "recommending international agreements as may be necessary." (Liu, 2024).

b. The IOC encourages member states to resolve disputes through diplomatic negotiations and consultations. The IOC Council and the UNESCO Director-General can offer mediation services. Additionally, the IOC provides legal assistance and advice to developing countries in ocean-related disputes. Disputes can also be referred to the International Court of Justice (ICJ) for binding resolution under the framework of the United Nations Convention on the Law of the Sea (UNCLOS) (UNESCO & De L'unesco, 2007).

c. UNESCO, through IOC, is a key player in global ocean governance, facilitating international cooperation in marine science, education, and policy, and providing dispute resolution mechanisms for its member states. This institutional framework allows UNESCO to play a central role in promoting the sustainable management of the world's oceans.

3.6 International Seabed Authority (ISA)

International Seabed Authority was founded in Non 1994 with it's headquarter in Kingston Jamaica. It has 168-member state with Assembly of International Seabed Authority its main organ. ISA was established by the 1982 United Nations Convention on the Law of the Sea (UNCLOS) and the 1994 Agreement relating to the Implementation of Part XI of UNCLOS. The International Seabed Authority (ISA) is responsible for organizing, regulating, and controlling all activities related to mineral resources in the Area—the seabed, ocean floor, and subsoil beyond national jurisdiction—for the benefit of all humanity. Part of ISA's mandate includes ensuring the marine environment is effectively protected from any harmful effects that may arise from deep-seabed activities. According to the common heritage regime under UNCLOS, no state can claim or exercise sovereignty over any part of the Area or its resources. Activities in the Area must benefit all humankind, considering particularly the interests and needs of developing states. Additionally, the financial and other economic benefits derived from activities in the Area must be shared equitably and on a non-discriminatory basis. The ISA's regulations provide for dispute resolution primarily through arbitration, with limited grounds for the ISA to suspend or terminate contracts (Sun, 2017). ISA is committed to support the timely and effective achievement of the goals and targets of the 2030 Agenda for Sustainable Development of the United Nations through the implementation of

the economic, social and environmental mandates assigned to it by UNCLOS and the 1994 Agreement (Madureira et al., 2023).

3.7 Food and Agriculture Organization of United Nations (FAO)

Founded on 16 Oct 1945 with its headquarter at Rome Italy. It has 195-member state including 19 countries and the European Union. The Food and Agriculture Organization of the United Nations (FAO) offers legal advice and assistance to Member Nations in developing fisheries and aquaculture legislation, ensuring alignment with the Sustainable Development Goals (SDGs). Additionally, FAO considers international instruments related to fisheries conservation and sustainable use, such as the UN Fish Stocks Agreement (UNFSA), the FAO Compliance Agreement, and the FAO Port State Measures Agreement (PSMA). The FAO Guidelines for Deep-sea Fisheries in the High Seas, and the Voluntary Guidelines on the Marking of Fishing Gear. These instruments promote principles like the Human Rights Based Approach, stakeholder participation in decision-making, environmental impact assessment in deep-sea fisheries, and the ecosystem approach to fisheries (EAF) and aquaculture (Guggisberg, 2022). FAO assessment tools include guides for implementing the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) through national fisheries legal frameworks (J. N. Nakamura & Kuemlangan, 2023).

3.8 International Whaling Commission (IWC)

IWC was founded on 2 December 1946 with its headquarter in Impington United Kingdom. The IWC set catch limits for commercial whaling, but in 1985, it imposed a moratorium on all commercial whaling. Despite the moratorium, some countries continue to whale, either by not being party to the Convention or by taking exception to the moratorium. Notable examples include Norway and Iceland, which engage in small-scale whaling within their Exclusive Economic Zones (EEZs), each taking less than 1,000 whales annually. The IWC's responsibilities extend beyond setting catch limits for commercial whaling and have significant implications for other ocean users, particularly concerning ship strikes and marine sound. The IWC has become increasingly concerned about whale collisions with vessels. To address this, the IWC collaborates with the International Maritime Organization (IMO) to mitigate such incidents. One proposed solution is the creation or amendment of Traffic

Separation Schemes (TSS), which are ocean traffic lanes established by the IMO (Wright et al., 2016).

3.9 International Labour Organization (ILO)

3.18 The International Labour Organization (ILO) is devoted to promoting social justice and internationally recognized human and labour rights, pursuing its founding mission that social justice is essential to universal and lasting peace. The only tripartite U.N. agency, since 1919 the ILO brings together governments, employers and workers of 187 Member States, to set labour standards, develop policies and devise programs promoting decent work for all women and men. International Labour Organization's Maritime Labour Convention known as "MLC, 2006" came into force on 20 August 2013, effectively becoming binding in international law and established minimum working and living standards for all seafarers on those ships. What's more, it is also an essential step toward ensuring fair competition and a level-playing field for quality ship owners (ILO, 2024b).

3.10 International Hydrographic Organization (IHO)

The International Hydrographic Organization is an intergovernmental organization that works to ensure all the world's seas, oceans and navigable waters are surveyed and charted. Established in 1921, it coordinates the activities of national hydrographic offices and promotes uniformity in nautical charts and documents. It issues survey best practices, provides guidelines to maximize the use of hydrographic survey data and develops hydrographic capabilities in Member States. States are represented within the IHO by the national authority responsible for the provision of hydrographic and nautical charting services in each Member State. A Secretary General and two Directors are elected by Member States and administer the work of the Organization (IHO, 2024).

3.11 World Meteorological Organization (WMO)

WMO is the United Nations system's authoritative voice on the state and behavior of the Earth's atmosphere, its interaction with the land and oceans, the weather and climate it produces and the resulting distribution of water resources. As weather, climate and the water cycle know no national boundaries, international cooperation at a global scale is essential for the development of meteorology and operational hydrology as well as to reap the

benefits from their application. WMO provides the framework for such international cooperation for its 193 Member States and Territories. These activities contribute towards ensuring the sustainable development and well-being of nations (WMO, 2023).

3.12 Maritime Judicial Forums

States Parties are required to resolve disputes through peaceful means. In cases involving conservation and management measures, States must exert all efforts to reach a mutual agreement. If they cannot reach an agreement, the dispute must be brought before a court or tribunal. For disputes of a technical nature, States may refer the matter to an ad hoc expert panel. The procedures outlined in the United Nations Convention on the Law of the Sea (Part XV; Agreement, Article 30) for dispute settlement apply (*mutatis mutandis*) when the dispute pertains to the interpretation or application of the Agreement. In addition, International courts play a crucial role in resolving maritime disputes involving multiple jurisdictions and parties from different countries. There are following international courts and tribunals dedicated to maritime disputes (Tuffuor et al., 2024):

a. Dispute Settlement through legal forum

- (1) International Tribunal for the Law of the Sea (ITLOS)
- (2) International Court of Justice (ICJ)

b. Dispute Settlement through Arbitration

- (3) Permanent Court of Arbitration (PCA)
- (4) The London Maritime Arbitrators Association (LMAA)
- (5) Singapore Chamber of Maritime Arbitration (SCMA)

3.13 Challenges in Maritime Governance

Implementing necessary measures in ocean governance requires full engagement from all states and requires numerous challenges; as policies enacted onshore have significant offshore impacts and in the absence of a

global binding institution with supranational authority, enforcement remained an issue.

3.14 Disputes Over Maritime Boundaries

Geopolitical tensions frequently manifest in disputes over maritime boundaries, complicating the efforts of international maritime institutions. For example, the Eastern Mediterranean dispute between Greece and Turkey involves conflicting claims over maritime boundaries and resource rights. These disputes can escalate into broader geopolitical confrontations, undermining the stability of the region and complicating the work of organizations like the IMO and UNCLOS, which aim to promote peaceful and cooperative use of maritime spaces (Ioannides, 2020).

3.15 Overlapping and Conflicting Jurisdictions

International maritime institutions frequently contend with overlapping jurisdictions that present significant governance challenges. The International Maritime Organization (IMO) and the United Nations Convention on the Law of the Sea (UNCLOS) have mandates that sometimes overlap or conflict, particularly in contested regions such as the South China Sea. In this area, China, the Philippines, Vietnam, Malaysia, Brunei, and Taiwan all have competing territorial claims, leading to frequent disputes and complicating the enforcement of maritime laws. This lack of clear jurisdiction not only heightens regional tensions but also hampers coordinated international efforts to regulate and manage these waters effectively (Hong, 2012).

3.16 Difficulties in Enforcing Rules

The enforcement of international maritime regulations is particularly challenging due to the transnational nature of the seas. The IMO sets global standards for shipping safety and pollution control, but the responsibility for enforcement falls on individual countries. This can lead to significant inconsistencies, especially in international waters where no single nation has clear jurisdiction. For instance, the enforcement of fishing regulations on the high seas remains problematic, as international agreements are often undermined by the absence of a central enforcement authority, allowing illegal, unreported, and unregulated (IUU) fishing to persist (Ventura, 2015).

3.17 Lack of a Centralized Global Maritime Governance Structure

The global maritime governance framework is highly fragmented, with no single centralized authority overseeing all maritime activities. Various organizations, such as the IMO, UNCLOS, and regional fisheries management organizations (RFMOs), operate independently with different mandates and priorities. This fragmented structure results in regulatory inconsistencies and gaps, making it difficult to implement cohesive and comprehensive maritime policies. The lack of coordination among these bodies can lead to duplication of efforts, regulatory conflicts, and an overall inefficiency in managing global maritime affairs (Ridgeway & Rice, 2010a).

3.18 Insufficient Resources

Many international maritime institutions and their member states face significant resource constraints, hindering their ability to monitor and enforce regulations effectively. Regional fisheries management organisations (RFMOs), for instance, often lack the financial, technological, and human resources necessary to ensure compliance with fishing quotas and conservation measures. This inadequacy is particularly pronounced in developing countries, where limited budgets and technological capabilities impede effective maritime governance (Fischer, 2022).

3.19 Uneven Distribution of Resources

The disparity in resources among member states of international maritime organisations leads to uneven enforcement of regulations. Wealthier nations can afford advanced maritime surveillance and enforcement capabilities, such as sophisticated coast guards and satellite monitoring systems, while poorer nations struggle to meet basic regulatory requirements. This imbalance exacerbates inequalities in maritime safety and security, leaving some regions more vulnerable to illegal activities such as piracy, smuggling, and environmental degradation (McCabe, 2023).

3.20 Adapting to New Technologies

International maritime institutions must continuously adapt to emerging technologies that transform the maritime sector. Autonomous vessels and remote sensing technologies, such as those being developed by companies like Rolls-Royce, present both opportunities and challenges. The IMO is

currently working on developing regulations for autonomous ships, but the rapid pace of technological advancement makes it difficult to keep regulatory frameworks up to date. Ensuring safety, security, and environmental protection in the face of these new technologies requires proactive and forward-thinking governance (Vidan et al., 2019).

3.21 Responding to Climate Change

Climate change poses significant and complex challenges for international maritime institutions. Rising sea levels, increasing ocean acidification, and changing weather patterns impact coastal communities, marine ecosystems, and shipping routes. The IMO's efforts to reduce greenhouse gas emissions from ships are a crucial part of the international response to climate change. However, coordinated international action is required to mitigate these impacts and adapt to the changing maritime environment, which affects global trade, biodiversity, and the livelihoods of millions of people (Oberthür, 2003).

3.22 Lack of Transparency

Decision-making processes within international maritime organisations often lack transparency, which can undermine their legitimacy and effectiveness. For example, some regional fisheries management organisations (RFMOs) have been criticised for opaque decision-making processes that raise questions about the fairness and effectiveness of their measures. Enhancing transparency in these processes is crucial for building trust and ensuring that regulations are perceived as fair and legitimate by all stakeholders (Clark et al., 2015).

3.23 Holding States and Private Actors Accountable

Ensuring accountability for violations of maritime laws and regulations is a persistent challenge for international maritime institutions. The IMO's Ballast Water Management Convention aims to prevent the spread of invasive species through ship ballast water, but varying levels of enforcement and compliance among countries make accountability difficult to achieve. Developing robust monitoring and reporting mechanisms, along with stronger penalties for non-compliance, is essential for improving accountability and ensuring that international maritime laws are effectively enforced (Onwurah, 1819).

CHAPTER 4

Evaluation of International Maritime Legal Framework

4.1 Introduction

International Ocean governance and management frameworks are outlined in UN organizations' institutional structures (Hinds, 2003). This chapter examines legal framework of ocean governance in practice, identifies weaknesses, and highlights challenges. Due to the vast scope of international maritime laws, this chapter will focus on key, widely ratified laws, covering their background, structure, analysis, and findings on following:

- a. United Nations Convention on Law of the Sea 1982 (UNCLOS)
- b. International Convention Safety of Life at Sea 1974 (SOLAS)
- c. International Convention on Marine Pollution 1973/78 (MARPOL)
- d. International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978 (STCW),
- e. Maritime Labour Convention 2006 (MLC)
- f. UN Fish Stocks Agreement (UNFSA)
- g. Port State Measures Agreement 2009 (PSMA)
- h. Hong Kong Convention on Recycling of Ships (HKC)
- i. Biodiversity Beyond National Jurisdiction Agreement (BBNJ)
- j. San Remo Manual on International Law Applicable to Armed Conflicts at Sea 1994

4.2 The United Nations Convention on the Law of the Sea (UNCLOS)

a. United Nations Convention on the Law of the Sea (UNCLOS) is an international agreement governing all marine and maritime activities. With 168 countries and the EU as parties, it was adopted in 1982 and came into force in 1994. UNCLOS replaced the 1958 High Seas Convention and has been expanded to include the 2023 High Seas Treaty, protecting ocean life in international waters. This would provide measures including Marine Protected Areas and environmental impact assessments (UN, 2024).

b. UNCLOS (1982) sets the legal framework for coastal countries to manage marine resources and environment, covering Global agreements on key issues, Maritime zones and boundaries, Dispute settlement and Marine scientific research. Main contents of UNCLOS are PART-I on preamble, PART-II on Territorial Sea and Contiguous Zone, PART-III on Straits Used for International Navigation, PART-IV on, Archipelagic States, PART-V on Exclusive Economic Zone, PART-VI on Continental Shelf, PART-VII on High Seas, PART-IX on Enclosed or Semi-Enclosed Seas, PART-X on Right of Access of Land-Locked States to and From the Sea and Freedom of Transit , PART-XI on The Area, PART-XII on Protection and Preservation of The Marine Environment, PART-XIII on Marine Scientific Research, PART-XIV on Development and Transfer of Marine Technology, PART-XV on Settlement of Disputes, PART-XVI on General Provisions, PART XVII on Final Provisions. Apart from this, UNCLOS has nine Annexes to elaborate different information.

c. The above structure shows that UNCLOS establishes a comprehensive legal regime for the world's oceans and seas, governing all uses and resources. It combines traditional rules with new legal concepts, regimes, and concerns in a single instrument. The Convention also provides the framework for further development of specific areas of the law of the sea (IMO, 2024b).

4.3 Analysis of UNCLOS

a. UNCLOS promotes global cooperation on ocean issues, enables trade and research, and provides a legal framework for maritime activities, supported by a network of related treaties and organizations (House of Lords, 2022).

b. Besides widespread adoption and few formal disputes demonstrate UNCLOS's success and broad state support, UNCLOS achieved two key milestones i.e. Standardized maritime zone claims and resource management and Established dispute settlement mechanism. UNCLOS is widely praised for establishing laws and rules that have significantly reduced inter-state conflicts (Nguyen, 2019). Its flexible framework allows for adaptation and development of new regulations through other international bodies, making it a 'living treaty' that can evolve with changing circumstances.

c. Despite widespread adoption, UNCLOS provisions are often not enforced in practice. A key challenge is enforcement, a weakness in international law, particularly in the maritime domain. The principles of freedom of the high seas and flag state jurisdiction limit oversight, allowing vessels to operate freely on the high seas with no port or coastal state control.

d. Rising sea levels due to climate change cause coastal erosion, shrinking territorial waters, contiguous zones, and EEZs (Lal, 2017). UNCLOS doesn't address this issue, as climate change wasn't considered during its negotiation

in 1982. Baselines are expected to shift continuously, posing a challenge for coastal states.

e. Under UNCLOS, inhabited islands are entitled to 200-mile EEZs, allowing countries with overseas islands to extend their sea jurisdiction beyond their landmass. For example, India's Andaman and Nicobar Islands grant it a vast EEZ in the Bay of Bengal, larger than some regional countries' mainland, potentially leading to disputes.

f. The US has accepted the 200-mile limit but not ratified UNCLOS, due to concerns over the International Seabed Authority's (ISA) role in commercial seabed exploration and mining (Smith, 2017). In contrast, China has ratified UNCLOS but makes excessive claims in the South China Sea, seeking sovereignty over nearly all islands and adjacent waters, exceeding UNCLOS provisions and surpassing other's claims.

g. UNCLOS does not fully address certain emerging issues, like Maritime security (undefined in UNCLOS), Biodiversity loss and environmental degradation, Human rights and labor protections, Climate change impacts New technologies like autonomous maritime vehicles etc.

h. There is a worldwide general acceptance to the maritime limits and boundaries defined by UNCLOS, which has improved ocean governance (Houghton, 2014). It is enforced well at national level by all states except USA and China. The approach of major powers to UNCLOS erodes its authority, making developing nations conclude that UNCLOS is one of the techniques of controlling the world rather viewing it as a tool for equitable use of the sea.

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

a. The International Convention for the Safety of Life at Sea (SOLAS) outlines the minimum safety standards to be adhered to while constructing and operating merchant ships. As per the IMO Convention, signatory nations must ensure that their ships comply with these standards.

b. The SOLAS Convention is usually considered the most important international treaty regarding the safety of merchant vessels and seafarers.

c. After the enormous loss of life in the Titanic Disaster, the international community wanted to establish rules and regulations to prevent similar maritime accidents from happening again. Hence, the first conference on the Safety of Life at Sea took place in London in January 1914 (Andreadakis & Dalaklis, 2022).

d. The 1st SOLAS Convention was adopted on January 20, 1914, and was to enter force in July 1915, but it was delayed due to the war in Europe. The

2nd SOLAS Convention was adopted in 1929, entering into force in 1933; the 3rd in 1948, entering into force in 1965; and the present version was adopted in 1974, entering into force in 1980 (Raunek, 2024).

e. SOLAS has 14 chapters that are Chapter I on General Provisions, Chapter II on Construction, Chapter III on Lifesaving appliances, Chapter IV on Radio communications, Chapter V on Safety of Navigation, Chapter VI on Carriage of Cargoes, Chapter VII on Carriage of dangerous goods, Chapter VIII on Nuclear ships, Chapter IX on Management for the Safe Operation of Ships, Chapter X on Safety measures for high-speed craft, Chapter XI on Special measures to enhance maritime safety, Chapter XI on Special measures to enhance maritime security, Chapter XII on Additional security measures for bulk carriers, Chapter XIII on Verification of compliance and Chapter XIV on Safety measures for ships operating in polar waters.

4.5 Analysis on SOLAS

a. The original convention faced challenges in keeping up to date through amendments, which took time to implement. To address this, a new convention, SOLAS 1974, was adopted in 1974, incorporating all previous amendments and a new procedure for swift implementation of future changes. SOLAS 1974 entered into force on May 25, 1980, and has undergone numerous amendments since then (Raunek, 2024).

b. The rapid pace of technological advancements poses a significant challenge, as laws struggle to keep up. While scientists swiftly develop and commercialize innovative, cost-effective, and efficient technologies, lawmakers lag behind, spending extensive time debating jurisdiction, responsibility, evidence collection, and authenticity. This disparity is particularly evident in the rapid growth of information and communication technologies, highlighting the need for more agile and responsive legal frameworks (Babar, 2009).

4.6 The International Convention for the prevention of Pollution from Ships 1973/78 (MARPOL)

a. MARPOL 73/78 is the primary global convention preventing marine pollution from ships. It addresses operational and accidental pollution, covering all vessels, regardless of size or purpose, that generate oily waste through operations and oil transport. Initially adopted in 1973 by the International Maritime Organization (IMO), MARPOL was designed to evolve and address additional environmental concerns. The 1978 Protocol was added in response to tanker accidents, and the combined convention took effect in 1983. MARPOL is a pollution control regime that has achieved vessel-generated oil spills reduction by 77% since the late 1980s, demonstrating significant progress towards its goals.

b. The contents of MARPOL are well divided into annexes for clarity and segregation of subject matter. MARPOL initially consisted of five annexes, in 1997, a protocol was adopted to amend the Convention, and a new Annex VI was added, which came into force in May 2005. The technical requirements of MARPOL are included in following six separate Annexes (IMO, 2024a):

c. Annex-I on Regulations for the Prevention of Pollution by Oil, Annex-II on Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk, Annex-III on Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form, Annex-IV on Prevention of Pollution by Sewage from Ships, Annex-V on Prevention of Pollution by Garbage from Ships, Annex-VI on Prevention of Air Pollution from Ships

4.7 Analysis of MARPOL

a. MARPOL aims to minimize oil discharges into the sea, not eliminate them, by reducing them to a level equivalent to natural oil releases (Curtis, 1984). However, tracking oil spills is challenging due to drifting, making it hard to gather evidence unless caught in the act through aerial surveillance. The difficulties in detecting violations, high costs of evidence collection, and need for new technologies to meet judicial standards hinder many nations from implementing MARPOL effectively (Szepes, 2013).

d. According to international law, flag states have exclusive jurisdiction over ships on the high seas (Reuland, 1989). However, a 'jurisdictional vacuum' exists due to abuses, particularly by 'flags of convenience' states like Panama, Liberia, and the Marshall Islands, which have lax regulations and open registries (Powell, 2013). These states allow foreign vessels to fly their flag with minimal oversight, making it easy to register ships in countries that fail to enforce regulations, undermining enforcement on the high seas. Flag of Convenience states often fail to enforce MARPOL, hindering its objectives, as they rarely prosecute violations, despite being notified.

e. MARPOL requires ports to have reception facilities for waste that can't be discharged at sea. Although Annex I mandated operational facilities within a year of entry into force, many states still hadn't complied ten years later due to costs and lack of enforcement (Fitzmaurice, 2023).

f. Financial constraints hinder MARPOL compliance among port, flag, and coastal states. Subsidizing financially challenged states could improve compliance, but raises questions about funding sources, eligibility, and ensuring proper use of funds. Alternatively, rewarding compliant states with funding creates a chicken-and-egg problem, as states need resources to comply in the first place (X. Shi, 2015).

4.8 International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978

- a. The International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers (STCW) was adopted by the International Maritime Organization (IMO) to set uniform standards for the training and certification of seafarers. The convention ensures that seafarers are properly trained and qualified to competently perform their duties and responsibilities at sea, contributing to maritime safety, security, and environmental protection (Organization, 1978).
- b. The STCW Convention was originally adopted in 1978, The Convention entered into force in 1984 and has since been ratified by 166 parties as of 2024, making it a globally recognized and comprehensive framework governing seafarer training and certification standards (Heinonen, 2021). From 1995 to 2016, many amendments were inserted. These updates responded to emerging challenges in the maritime industry, ensuring the competency of seafarers in the face of technological advancements, environmental concerns, and new security threats.
- c. The convention comprises 17 articles and an annex, which is divided into eight chapters. These include Chapter I on General Provisions, Chapter II on Master and Deck Department, Chapter III on Engine Department, Chapter IV on Radiocommunications, Chapter V on Special Training Requirements for Personnel on Certain Types of Ships, Chapter VI on Emergency, Occupational Safety, Medical Care, and Survival Functions, Chapter VII on Alternative Certification, and Chapter VIII on Watchkeeping. The Manila Amendments further enhanced the structure by updating competency tables and training requirements (Kostylev & Loginovsky, 2020).

4.9 Analysis of STCW

STCW Convention is highly detailed, providing a comprehensive framework for the qualifications of all personnel involved in ship operations. It has gained global recognition and importance due to its focus on enhancing maritime safety, improving working conditions for seafarers, and contributing to environmental protection. The STCW Convention establishes a global regulatory system for ensuring that seafarers are trained and certified to consistent standards. It focuses on safety, operational competence, and environmental responsibility. The convention also mandates periodic updates in training to keep seafarers up to date with new technologies and international regulations. However, it does not apply to non-commercial vessels and only applies to seafarers on ships over 500 gross tons. Despite this, it remains a critical element in the international maritime framework, contributing to the

objectives of the IMO and the UN's Sustainable Development Goals, particularly in maritime safety and environmental sustainability.

4.10 Maritime Labour Convention 2006 (MLC)

a. The Maritime Labour Convention (MLC), adopted by the International Labour Organization (ILO), establishes comprehensive rights and protections for seafarers worldwide. Often referred to as the "seafarers' bill of rights," the convention sets minimum working and living standards for seafarers while promoting fair competition among shipowners by ensuring globally uniform regulations. Its goal is to improve the working conditions of seafarers while safeguarding their rights to fair employment and welfare (Chang & Khan, 2023).

b. The MLC was adopted in 2006 and entered into force in August 2013, after ratification by 30 member states, representing at least 33% of global shipping tonnage. This convention consolidates and updates over 60 earlier maritime labor conventions and recommendations adopted by the ILO since 1920. The MLC covers a wide range of issues, including conditions of employment, accommodation, health protection, medical care, welfare, and social security protection for seafarers (Huang, 2022).

c. The MLC has been ratified by 105 countries as of 2024, representing over 90% of the world's shipping tonnage. Its global reach ensures that seafarers on most international vessels enjoy the protections laid out in the convention, regardless of where a ship is flagged (ILO, 2024c).

4.11 Analysis of MLC

The MLC provides a global framework for ensuring the welfare, safety, and working conditions of seafarers. By establishing minimum standards, it aims to eliminate substandard practices in the maritime industry, ensuring seafarers receive fair treatment. The convention has contributed significantly to improving seafarers' rights and conditions, as well as strengthening mechanisms for the enforcement of these standards. However, it does not apply to certain vessels, such as fishing boats or traditionally crewed ships. Nonetheless, the MLC remains a cornerstone of international maritime law, aligning with the objectives of the IMO and the ILO in promoting sustainable development, maritime safety, and social justice.

4.12 UN Fish Stocks Agreement (UNFSA)

a. The agreement was adopted on 4 August 1995 by the UN Conference on Straddling Fish Stock and came into force on 11 November 2001. The UN Fish Stocks Agreement aims to ensure the long-term conservation and sustainable use of straddling and highly migratory fish stocks within the framework of UNCLOS (Hayashi, 2001). The Agreement also spells out the

duties of flag States including those related to registration and records of vessels, authorizations, and compliance and enforcement.

b. The agreement has 50 articles and 13 parts that are, Part-I on General Provisions, Part-II on Conservation and Management of Straddling Fish Stocks And Highly Migratory Fish Stocks, Part-III on Mechanisms for International Cooperation Concerning Straddling Fish Stocks and Highly Migratory Fish Stocks, Part-IV on Non-Members And Non-Participants, Part-V on Duties of the Flag State, Part-VI on Compliance and Enforcement, Part-VII on Requirements Of Developing States, Part-VIII on Peaceful Settlement of Disputes, Part-IX on Non-Parties to this Agreement, Part-X on Good Faith and Abuse of Rights, Part-XI on Responsibility and Liability, Part-XII on Review Conference and Part-XIII on Final Provisions. Apart from this UNFSA has two Annexes to elaborate different information.

4.13 Analysis of UNFSA

International fisheries law is a complex field with various global, regional, and national instruments and practices (Ridgeway & Rice, 2010b). It primarily focuses on marine capture fisheries conservation and management under the law of the sea (J. Nakamura, 2023). Two key treaties form its foundation i.e. UNCLOS and UNFSA Understanding maritime zones under UNCLOS, and customary law is crucial, as rights and obligations vary per zone. Since fish migrate across boundaries, international law emphasizes cooperation and management among states for shared fish stocks, including transboundary, straddling, and highly migratory stocks (Schatz & Honniball, 2020).

4.14 Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (PSMA) 2009

a. The Port State Measures Agreement combats illegal fishing by controlling port access, inspecting vessels, and supporting developing countries, promoting sustainable fishing and marine conservation (FAO, 2016).

b. The Agreement on Port State Measures was adopted by the FAO Conference on 22 November 2009 and registered with the UN Secretariat on 26 January 2017 (Tønne, 2018). The agreement was open for signature from 22 November 2009 to 21 November 2010, and is subject to ratification, acceptance, or approval. The FAO Director-General serves as the depositary for instruments of ratification, acceptance, or approval. The Agreement on Port State Measures entered into force on June 5, 2016, thirty days after the deposit of the 25th instrument of ratification, acceptance, approval, or accession with the FAO Director-General, which occurred on May 6, 2016 (Ortiz, 2016).

c. PSMA has a preamble, 37 articles, five Annexes and 10 parts, which are PART-I on General Provisions, PART-II on Entry into Port, PART-III on Use of

Ports, PART-IV on Inspections and Follow-Up Actions, PART-V on Role of Flag States, PART-VI on Requirements of Developing States, PART-VII on Dispute Settlement, PART-VIII on Non-Parties, PART-IX on Monitoring, Review and Assessment and PART-X on Final Provisions. Apart from this, PSMA has five Annexes to elaborate different information. The structure shows that PSMA sets a comprehensive framework to combat illegal fishing, requiring docking permission, inspections, and blocking illegal catches from market entry, with optional application to own-flagged vessels.

4.15 Analysis on PSMA

- a. PSMA is the first binding international instrument to combat IUU fishing, which harms fisheries and marine ecosystems through unlicensed fishing, overfishing, and destructive gear use, and empowers port states to deny entry to suspected vessels.
- b. Developing nations struggle to enforce PSMA due to resource constraints and remote fish harbors (Dyck & Sumaila, 2010; Agnew et al., 2009). Lack of ratification by some countries, including those that tolerate IUU fishing, further undermines enforcement. Poor fishing communities along vast coastlines rely on fishing for survival. Implementing PSMA could deprive them of their only income source, worsening poverty.

4.16 Hong Kong Convention on Safe Healthy and Environmentally Sound Recycling of Ships

- a. Shipbreaking must be properly managed and regulated to protect the environment, safety, and worker health. Effective regulations govern institutions when properly implemented. However, until 2011, the South Asian Region lacked a legal framework for workplace safety in shipbreaking, despite the need for one.
- b. The Hong Kong Convention (2009) addresses health, safety, and environmental concerns in ship recycling. It ensures safe and eco-friendly recycling by regulating ship design, construction, operation, and preparation, as well as recycling facility operations. Key requirements include Inventory of Hazardous Materials on ships and Ship Recycling Plan for each vessel. The Convention will take effect on June 26, 2025, after ratification by 15 states representing 40% of global shipping tonnage and 3% of recycling capacity.
- c. The convention has one annex, and four chapters that are Chapter 1, on General Provisions, Chapter 2, on Requirements for Ship, Chapter 3, on Requirements For Ship Recycling Facilities and Chapter 4, on Reporting Requirements. Apart from this, HKC has seven Appendixes to elaborate different information. This structure reveals that the convention covers all the necessary aspects of the ships coming for the recycling / breaking.

4.17 Analysis of HKC

- a. With the Hong Kong Convention yet to take effect, the EU introduced its own Ship Recycling Regulation in 2013 to ensure environmentally sound and safe recycling of EU-flagged ships and those visiting EU ports (IMO, 2024c).
- b. Pakistan ratified the Hong Kong Convention on November 30, 2023, becoming the 23rd country to do so. The Hong Kong Convention (HKC) sets global standards for safe and eco-friendly ship recycling, aiming to prevent the export of hazardous ships to countries with inadequate recycling capabilities (Jain et al., 2013). However, it does not impose mandatory obligations on recycling states to enforce the reporting requirements, rather seeks making compliance voluntary.
- c. According to the Hong Kong Convention, 'ship recycling activities' are confined to operations within the shipyard premises. Beaching activities, crucial to ship recycling, often start in territorial seas, hours before reaching the beachhead or facility. This has sparked conflicts among government agencies, as the Hong Kong Convention only considers activities at the beachhead or facility, ignoring preceding actions.

4.18 Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ)

- a. The agreement aims to conserve and sustainably use marine biodiversity in areas beyond national jurisdiction, ensuring food security for a growing global population (Humphries et al., 2020). As the population exceeds 8 billion, concerns about food security and sustainability intensify. To address this, the agreement focuses on Supporting sustainable fishing practices, establishing marine protected areas and Enforcing effective management to replenish wild fish populations, ensuring long-term food security for future generations.
- b. BBNJ Agreement adopted on June 19, 2023, by UN-convened conference (Yu et al., 2023). Open for signature until September 20, 2025, and becomes UNCLOS' third implementing agreement. The BBNJ Agreement is open for signature by All States and Regional economic integration organizations. It will enter into force 120 days after the 60th country or organization ratifies, approves, accepts, or accedes to the agreement.
- c. BBNJ Agreement has 70 articles, a preamble, and 11 parts that are PART-I on General Provisions, PART-II on Marine Genetic Resources, Including the Fair and Equitable Sharing of Benefits, PART-III on Measures Such as Area-Based Management Tools, Including Marine Protected Areas, PART-IV on Environmental Impact Assessments, PART-V on Capacity-

Building and Transfer of Marine Technology, PART-VI on Institutional Arrangements, PART-VII on Financial Resources and Mechanism, PART-VIII on Implementation and Compliance, PART-IX on Settlement of Disputes, PART-X on Non-Parties to This Agreement and PART-XI on Good Faith and Abuse of Rights. Besides 11 parts agreement has ANNEX-I on Indicative Criteria for Identification of Areas and ANNEX-II on Types of Capacity-Building and Transfer of Marine Technology.

4.19 Analysis of BBNJ Agreement

BBNJ Agreement is a comprehensive framework for high seas conservation, including marine protected areas, benefit sharing, environmental impact assessments, and technology transfer. It is a landmark treaty to protect high seas biodiversity, promote international cooperation, and establish institutional frameworks for environmental stewardship. It could also enhance the health of shared marine ecosystems and resources and drive truly sustainable ocean-based economic growth.

4.20 San Remo Manual on International Law Applicable to Armed Conflicts at Sea

a. The Manual updates customary international law for armed conflicts at sea, reflecting post WW-II developments and addressing Enhanced civilian protection, Environmental protection during naval warfare and new military technologies and tactics. It provides a comprehensive restatement of the law, considering modern concerns and advancements (Letts, 2023).

b. The Manual was developed in 1994 by international experts to update the laws of naval warfare, last codified in the 1909 London Declaration (*The Conduct of Hostilities in International Humanitarian Law*, 2023). The drafting process involved global consultations with military, legal, and humanitarian experts to ensure that the manual reflected current state practice and legal interpretations, providing a comprehensive restatement of the law governing armed conflicts at sea.

c. Manual covers a wide range of topics, including the scope of application, regions of operations, basic rules, methods and means of warfare, interception and capture, and protection of persons and objects. It affirms that the rules apply equally to all parties to a naval conflict, regardless of who initiated hostilities, based on the principles of necessity and proportionality.

4.21 Analysis of The Manual

a. San Remo Manual is a comprehensive, authoritative restatement of modern international law governing naval warfare, affirming humanitarian principles and updating applicable law (Gill et al., 2022).

- b. The Manual is legally recognized but not binding on states (Doswald-Beck, 1995). It relies on states voluntarily complying with its provisions and customary international law for its implementation (Crawford, 2022). Its effectiveness depends on state practice and opinion juris (a sense of legal obligation) to crystallize its provisions into binding customary international law over time. The non-binding nature means the Manual cannot create new legal obligations for states, but only restate and clarify existing law. This limits its ability to progressively develop the law of naval warfare.

- c. The San Remo Manual's weaknesses also include limited coverage of recent naval warfare developments, such as unmanned maritime systems, artificial intelligence. It lacks strong enforcement mechanisms, as it's not a formal treaty, making it reliant on voluntary state compliance during armed conflicts at sea (Hernández, 2020).

CHAPTER 5

Institutional Framework of Maritime Sector of Pakistan

5.1 Introduction

a. At the time of independence in 1947 Pakistan inherited a well-established maritime infrastructure and organizational setup (Shahzad, 2023). This maritime sector has not flourished to exploit its full potential due to diversified reasons. As the maritime sector continued to follow the inherited bureaucratic system of governance and only a few necessary changes were made, with the passage of time (Aslam et al., 2023a). Since it was mostly neglected by the government of different times, the maritime sector of Pakistan did not prosper as compared to the maritime sectors in neighboring countries.

b. The maritime sector of Pakistan comprises of number of departments and organizations. This includes, shipping, ports and harbours, fishing, ship building and recycling, coastal zones, maritime security, maritime education, research and development, maritime environment, tourism and sports etc. In the existing setup the maritime trade, shipping, ports and harbours, marine academy, are under the Ministry of Maritime Affairs, fishing industry is under Ministry of Food and Agriculture, shipbuilding (KS&EW) is under the Ministry of Defence, fishing near coastal areas and ships recycling is a provisional matter, maritime environment is under provincial Ministries of Environment, maritime tourism and sports are under ministries of culture and heritage. Maritime institutions, responsible for governance of maritime sector, play a pivotal role in maintaining and regulating maritime affairs of the country. However, these institutions are not fulfilling desired objectives, rather further divide and create conflict in functioning of all stakeholders involved (Aijaz & Butt, 2021).

5.2 Maritime Governing Institutes of Pakistan

a. Ministry of Maritime Affairs (MOMA)

The **Ministry of Maritime Affairs**, previously known as the **Ministry of Ports and Shipping**, is a Federal Ministry of the Government of Pakistan. Minister of Maritime Affairs and Federal Secretary for Maritime Affairs looks after the affairs of Ministry. Ministry officials look over the administrative and policy matters of the Federal Ministry including policies, procedures, rules and regulations. Apart from that, the attached wings and departments established in Karachi deal with their respective domains under the administration of the Federal Ministry of Maritime Affairs. Different wing of MOMA are:

- (1) Directorate General of Port and Shipping (DGPS).

- (2) Mercantile Marine Department (MMD).
- (3) Government Shipping Office.
- (4) Karachi Port Trust.
- (5) Port Qasim Authority.
- (6) Gwadar Port Authority.
- (7) Pakistan National Shipping Corporation.
- (8) Marine Fisheries Department.
- (9) Korangi Fish Harbour.
- (10) Pakistan Marine Academy

5.3 Directorate General of Ports and Shipping

The office of the Directorate General of Ports and Shipping at Karachi is working as a wing of the Ministry of Maritime Affairs Islamabad (M. Z. Baig et al., 2024). The objective of the placement of this wing at Karachi is to facilitate the ministry especially on administrative matters related to ports and its authority's i.e. KPT, PQA, and GPA (Gul & Shah, 2021b). The wing gives technical and professional advice to the Government on all matters related to port and shipping, maritime training and port affairs. They deal with various legislations, Act, Rules and regulations and maintain safety and security standards as per IMO dictates. This wing coordinates work with other ministries, divisions, inter-governmental agencies and international organizations concerning Ports and Shipping affairs.

5.4 The Mercantile Marine Department

The Mercantile Marine Department is a Subordinate Office of the Directorate General, Ports and Shipping, Ministry of Maritime Affairs. The department was established in 1930 and is an integral part of Maritime Safety Administration of Pakistan. It is headed by Principal Officer is also Registrar of Ships and Superintendent of Light Houses. The important objectives of the department are to ensure the safety of life and property at sea and inland waters, safety of navigation and protection of Marine Environment through implementation of Merchant Shipping Ordinance, National Rules and International Maritime Conventions (Iqbal et al., 2022).

5.5 Karachi Port Trust

The port of Karachi is one of South Asia largest port and busiest deep water seaport located at significant geographic position; close proximity to major shipping routes of Strait of Hurmuz. It is also ideally located to offer gateway services to the maritime trade for the Central Asian Republics (CARs). The administration of the port is carried out by the Karachi Port Trust. which was established in 1857. Karachi Port has 30 dry cargo berths, 13 berths on West Wharves, 17 berth on East Wharves and 3 liquid cargo berths for POL & NON-POL products. The port also has two container terminals named as Karachi International Container Terminal (KICT) and Pakistan International Container Terminal (PICT), both are operated by the private sector on BOT basis. The port is also equipped with backed up system with good transit and storage areas, with rail and road services for handling, storage, and clearance of cargo. Presently, Karachi port handles more than 11.74 million tons of liquid cargo and 25.45 million tonnes of dry cargo, including 1,213,744 TEUs, which constitute approximately 60% of the import and export of the country. The Karachi Port is administered by a Board of Trustees, comprising Chairperson and 10 Trustees. The Chairperson is appointed by the Federal Government and is also the Chief Executive of Karachi Port Trust (Hasan, 2024).

5.6 Port Qasim Authority

Port Qasim was established through an Act of parliament on 29th June 1973. It is in Karachi's phitti creek of Indus delta region. The port started operation in 1980 with a dedicated Iron Ore Coal Berth for the bulk handling of imports of raw materials for Pakistan Steel Mill. The port presently has 18 berths (15 in private sector) with annual handling capacity of 89 million tons. All commodities ranging from minerals oils, edible oil, coal, rice, wheat, cement to fertilizers, general cargo, containers and LNG are being handled in the port at state-of-the-art terminals. It is the energy hub and only LNG Port of Pakistan. Port Qasim is well connected to hinterland through all modes of transportation. It connects directly to the national highway, motorway network leading to Afghanistan, CARs and the CPEC Routes. The Port is also connected to the National Railway network by a 14 kms Railway Line and dedicated railway station. Port operations run 24/7. The Port is under the administrative control of Ministry of Maritime Affairs, Government of Pakistan. Chairman is the chief executive of the port. All policy decisions are vested in PQA Board comprising seven members headed by Chairman, PQA. The Board is blend of public and private sector participation (Hasan, 2024).

5.7 Gwadar Port Authority

In September 1958, after realizing the importance of Gwadar, Pakistan paid 3 million Pounds in order to buy back the enclave from the Sultanate of Oman, ending over 200 years of Omani rule. From 1998 to 1992 a mini port was built.

In 1992, Karachi Port Trust initiated a project for the development of a deep-water port at Gwadar. On March 22, 2002, the groundbreaking ceremony of the project was performed by the President of Pakistan, General Pervez Musharraf and PRC Vice-Premier, Wu Bang Guo. Gwadar Port became formally operational on 14 November 2016, when it was inaugurated by Pakistan's Prime Minister Muhammad Nawaz Sharif. On 14 January 2020, Pakistan operationalized Gwadar Port for Afghan transit trade. On 31 May 2021 Gwadar Port become fully Operational, along with the availability of online booking for the delivery of goods (Zhao & Munadi, 2023).

5.8 Pakistan Shipping Corporation (PSC) Shipping

At the time of independence Pakistan's shipping industry was managed by private owners (Shazad & Javaid, 2016). Some private shipping companies obtained old ships, previously used for the transportation of soldiers across the Atlantic during the second world war. These ships were then utilized to transport pilgrims for Hajj and for the transportation of cargo. In 1963, the National Shipping Corporation was established. Before the separation of East Pakistan, the national fleet rose to 71 vessels. These were ocean going ships, owned by 9 private shipping companies and the National Shipping Corporation. Following the creation of Bangladesh, the national fleet reduced to 57 vessels. In 1974, shipping was nationalized in Pakistan. Nine private shipping companies, which had a total of 26 ships merged to form Pakistan Shipping Corporation (PSC). Two state owned shipping companies, namely, the National Shipping Corporation and the Pakistan Shipping Corporation later merged to become the Pakistan National Shipping Corporation (Malik, 2010). National Tanker Company (NTC) was established in 1981 as a subsidiary of PNSC. A tanker named "JOHAR" was procured. Later in 2003 the NTC was also merged into PNSC and ceased to exist. PNSC is an autonomous corporation, which functions under the overall control of the Ministry of Maritime Affairs, Government of Pakistan. It manages a fleet of 12 ships, real estate, and a repair workshop. The Merchant Shipping Policy was introduced in 2001 by the Federal Government to boost private investment in the shipping sector by providing many incentives to revive the shipping sector, however, no encouraging response was observed from private sector due to inconsistent government policies and complicated bureaucratic procedures.

5.9 Fisheries Departments – Governance

a. Fishing beyond territorial waters i.e., deep sea fishing is a federal government responsibility. Marine Fisheries Department (MFD) is a government department of Pakistan and part of the Ministry of Maritime Affairs (Kalhoro et al., 2024). The Marine Fisheries Department (MFD) Karachi, an attached department of MINFAL (Federal Ministry of Food, Agriculture Livestock, is responsible for the implementation of Deep Sea Fishing Policy and the regulation of exports of fish and fishery products (M. R. Ali, 2018). MFD also

looks after the future development plans of fishing industry and coordinates with provincial fisheries departments and other national and international agencies on matters pertaining to fishing. The MFD under MIFAL is also responsible for the collection of data at provincial and national level for policy formulation. It also issues licenses to fish processing units for exporting processed fish.

b. In addition to the role of government, cooperative societies also play an important role in organizing the fisheries. There are many cooperative societies, primarily in the harbor areas. Fishermen's Cooperative Society of Karachi, Balochistan Fishermen's Cooperative Society of Gwadar, Fishermen's Association of Mekran, and Anjuman Ittehad-e-Mahigiran (Association of United Fishermen) in Balochistan are the major cooperative societies (Nazir et al., 2015).

c. Fishing within territorial waters (up to 12 nautical miles) is a provincial responsibility (Baset, 2020). All provinces have Departments of Fisheries, and each Department has a Directorate under it to deal with fisheries (M. W. Khan, 2006). The basic function of provincial governments is the implementation of work in the fishery sector, and the operation of fish harbors under their jurisdiction. Inland fishing and fish farming are also under the control of provincial governments, which supply breeds, run hatcheries, provide extension services, collect primary data and promote fisheries through producing literature, brochures and holding seminars. The provincial Departments of Fisheries (DOF) in Punjab, KPK and Sindh are working actively towards conservation and management of inland waters and the development of aquaculture in their respective provinces (Kausar, 2017). In Balochistan, the DOF is involved mainly in marine fisheries but also has a component responsible for inland fisheries. The fisheries departments in the tribal areas previously known as FATA (now included in KPK), NA (Northern Area, now Gilgit Baltistan) and AJK are relatively small and mainly focused on trout fisheries. The Water and Power Development Authority (WAPDA) also has a fisheries department responsible for the regulation and auction of fisheries rights in the large dams. There is a fisheries research unit at the National Agricultural Research Center (NARC).

d. In Punjab, 74 fish hatcheries are operated by the private sector while 14 hatcheries and nurseries are operated by the public sector. There are 5 hatcheries in Sindh, located at Chilya (Thatta), Mirpur Sacro and Sukkar. In Balochistan, there are 8 warm water fish hatcheries and about 30 trout farms cum hatcheries are operating in the KPK. The DOFs provide technical guidance, juveniles at subsidized rates to farmers. Besides this it provides other services for establishment of trout hatcheries/farms under private ownership. The government has also successfully transferred the technology gained by the Provincial Fisheries Departments to the private sector and as a result the number of farms is increasing.

5.10 Karachi Shipyard and Engineering Works (KS&EW)- Shipbuilding and Repairs Industry

a. Pakistan despite having great potential has always been lacking in the shipbuilding and ship repair services. The only shipyard in Pakistan, Karachi Shipyard and Engineering Works (KS&EW), was a project of PIDC (under Ministry of Industries). It was shifted to Defence Production Division on the pretext that the facility is producing defense products for Pakistan Navy only. India and Bangladesh have dozens of shipyards, while Pakistan has only one, that too under Ministry of Defence Production (Gazzola, 2022). The construction of new commercial Shipyards is governed by the Ministry of Defence Production Division. The ministry works in coordination with defense and civil scientific research organizations.

b. Located at the crossroad of world trade route, Pakistan has a great potential to provide ship-repair facilities to foreign merchant ships. Karachi Shipyard and Engineering works is providing Shipbuilding and Ship Repair facilities to local and foreign customers. Major local customers of KS&EW include Pak Navy, PNSC, PMSA, KPT, PQA, GPA and wide range of customers from industrial sector of Pakistan. Facilities installed, are well suited to build and repair medium size ships up to 18,000 TDW and multipurpose cargo vessels up to 26,000 TDW. Various workshops and facilities make KS&EW completely independent of any outside support for its production and repair activities. Since its inception, Karachi Shipyard has constructed and delivered over 445 Crafts for PN, KPT, PQA and several foreign clients including China, Iran and UAE (Sanjrani et al., 2017).

c. Ministry of Defence production is planning to build two more shipyards: one in Gwadar and other in Karachi (The Newspaper's Staff Reporter, 2014). There are plans to upgrade the KS&EW as well. It is interesting to note that in this process the Ministry of Maritime Affairs or the Ministry of Industries have not been engaged.

5.11 Shipbreaking/Recycling- Governance

Shipbreaking or recycling in Pakistan is a provincial matter under Balochistan Development Authority. Environment Protection Agency, Balochistan also looks after shipbreaking in Gaddani beach. DC Lasbela is responsible for ensuring law and order in the Gaddani beach area. Casual ship-breaking activity along Gadani beach was observed before the independence in 1947 (Akbar, 2022). After independence, some commercial groups made serious efforts to develop this casual business activity into a regular industry. However, despite sincere efforts Gadani beach lacked necessary infrastructure and facilities including roads, utilities or accommodation or medical services for workers (Sarraf et al., 2010). Realizing the economic potential of the ship-breaking industry, the Government of Pakistan in 1978 announced number of

incentives including declaration of Gadani as a port, reduction in the import duties on ships earmarked for recycling. A government task force was also tasked to address the infrastructure and logistic support for Gadani beach. From 1969 to 1983, Gadani beach saw a golden era of ship-breaking industry and at that time Gadani was the largest shipbreaking yard in the world. At that time Gadani shipbreaking industry provided employment to more than 30,000 workers directly, while more than half a million people earned their living indirectly, through trade and industries which used ship scrap as raw material. However, increased competition from rival ship-breaking yards in India and Bangladesh, coupled with relatively high import duty for decommissioned vessels, led to a disastrous decline in Gadani's business after 1985. At present it lacks the international safety standards required by HKC. Following are the institutions involved in governance of shipbreaking/shiprecycling:

- a. **Pakistan Ship Breakers Association.** It is an NGO of the yard owners and importers of the businessmen who own the shipbreaking yards and import the ships for recycling.
- b. **Shipbreaking Labour Union.** It is an NGO of labor contractors who provide manpower for break the ships.
- c. **Planning and Development department of Government of Balochistan.** After the 18th constitutional amendment shipbreaking governance is now under the provincial government that has Baluchistan Development Authority to regulate all activities. A composite statute to govern this important industry is being developed by the provincial government.

5.12 Management of Coastal Tourism

Coastal Tourism, being all-inclusive of coastal-based activities i.e. seafood restaurants, water sports, coastal resorts are suitable for exploitation. Ministry of Maritime Affairs is only focused on port and shipping (Gul & Shah, 2021). The potential in coastal tourism is neglected because after the abolishment of the Ministry of Tourism (Post 18th Amendment), tourism falls in the provisional domain while Pakistan Tourism Development Corporation (PTDC) is under federal cabinet division that acts as a facilitator only. Presently there is no federal and provisional dedicated authority dealing with coastal tourism.

5.13 National Institute of Oceanography (NIO) -Oceanic Surveys and Scientific Research

- a. National Institute of Oceanography (NIO) located in Karachi was established by the Ministry of Science and Technology, Government of Pakistan. The spectrum of research undertaken by this institute is very large (Inam & Kidwai, 2011). It includes following:

- (1) Fisheries Resources Appraisal
- (2) Oceanographic Surveys
- (3) Coastal Hydraulics and Seabed Surveys
- (4) Marine pollution Surveys
- (5) Marine Exploration and Geo-engineering Surveys
- (6) Environmental Surveys (seawater intrusion etc.)
- (7) Shrimp hatchery and farming studies
- (8) Collaboration with HPN for extension in Continental Shelf

b. Pakistan Council of Research in Water Resources (PCRWR) works under the Ministry of Science and Technology (MoST) (Rasheed et al., 2021). The management of the Council consists of the Board of Governors, the Chairman, and the Executive Committee. Since its inception, PCRWR has played its role as a national research organization by undertaking and promoting research in various disciplines of the water sector like irrigation, drainage, surface, and groundwater management, desertification control, rainwater harvesting, and monitoring as well as water conservation.

5.14 Other Institutions of Maritime Governance

Apart from the aforesaid institution following are a few more departments that are not directly related with maritime affairs but they play an important role in the governance of maritime affair:

- a. Ministry of Energy Petroleum Division (MoEPD) deals with granting of Exploration and Production (E&P) rights on offshore Blocks (spread as a grid in the offshore region of Pakistan) through a Production Sharing Agreement (PSA) (Chaturvedi, 2013).
- b. Pakistan Space and Upper Atmosphere Research Commission (SUPARCO) deals in providing satellite imageries of the disaster hit areas at sea.
- c. Pakistan Meteorological Department (PMD) provides cyclone and weather warnings.

5.15 Regulating Maritime Environment

- a. Pakistan's Maritime Environment sector is headed by the Director-General Ministry of Climate Change which formulates the national policy, plan strategies, and programs concerning disaster management which includes environmental protection, preservation, pollution, ecology, forestry, wildlife, biodiversity, climate change, and desertification. The ministry also coordinates monitors and implements environmental agreements with other countries, international agencies, and forums (Jaffry, 2017). It also focuses on issues relating to Sustainable Development, Water and Sanitation, sustainable urbanization. It is responsible for Multilateral Environmental Agreements (MEAs) including UN framework Convention on Climate Change on (UNFCCC) and Kyoto Protocol (Mirza, 2020).
- b. Pakistan Environmental Protection Agency (PEPA) is responsible to implement the Pakistan Environmental Protection Act, 1997 in the country to provide for the protection, conservation, rehabilitation, and improvement of the environment, for the prevention and control of pollution, and promotion of sustainable development (Asghar et al., 2024). PEPA also provides all kinds of technical assistance to the Ministry of Climate Change. Provincial Environmental Protection Agencies SEPA of Sindh and BEPA of Balochistan are responsible for controlling, monitor and combat coastal / land-based pollution.
- c. Maritime Security Agency (MSA) is responsible for the monitoring of oil/other liquid cargo spillages in maritime zones. Although, it has the limited spill-combating ability, yet it can effectively coordinate activities of different agencies involved.
- d. Port Authorities are responsible to protect the marine environment within their prescribed limits. This includes tasks of monitoring and combating spills also (Hassan, 1996).
- e. Now we shall discuss a few issues that shall transpire the extent of absence of coherence between the institutions that are responsible for governing the maritime affairs of Pakistan.

5.16 Law Enforcement Agencies

- a. **Pakistan Navy.** is the third dimension of the armed forces of the country responsible for sea ward defence of the country. However, in aid to civil power or in disaster relief operations its resources are always used (Pakistan Navy, 2024).
- b. **The Pakistan Maritime Security Agency (MSA).** an independent law enforcement agency which operates under Pakistan Maritime Security Agency,

1994, Defence Division (Ministry of Defence) in terms of the Rules of Business, 1973. Its mission is to provide protection to the Pakistan's maritime interests and enforcement of maritime law with jurisdiction over the domestic and international waters of Pakistan including the exclusive economic zone. Pakistan Maritime security agency should not be confused with Pakistan Coast Guards which is an independent law enforcement agency that operates under Pakistan Coast Guards Act, 1973, under Interior Division (Ministry of Interior and Narcotics Control). PMSA was created on 1 January 1987 in compliance to the UN Convention on Law of the Sea of 1982. Apart from enforcing maritime law, the PMSA conduct to assists in military operations against human trafficking, smuggling, and deep sea search and rescue (PMSA, 2024).

c. **Pakistan Coast Guards (PCG)**. is a sea and land-based troops serving under one command. It has on its inventory vessels and marine equipment besides means to operate on land surface (PCG, 2024). This combination lends the force capacity and capability of conducting very limited operations on land as well as in the Sea.

5.17 Governance Issues- Maritime Institutional Framework

Following institutional challenges persist in governance of Maritime Affairs in the ministry and its subsidiary organizations (IMO, 2022):

a. **Staffing / Recruitment.** The Ministry of Maritime Affairs (MoMA) oversees multiple entities responsible for maritime affairs, including the Directorate General Ports and Shipping (DGPS) and several port authorities. MoMA employs a limited number of personnel with technical expertise relevant to the implementation of mandatory IMO instruments.

b. **Communication and Coordination.** There is a lack of effective coordination and communication among the various entities involved in maritime administration, which hampers the implementation of IMO obligations.

c. **Record Keeping and Document Management** The current record-keeping practices do not adequately ensure the protection of electronic records, which poses risks to data integrity.

d. **Training and Capacity Building.** While some entities conduct regular training and exercises, there is no comprehensive training strategy that encompasses all aspects of maritime safety and pollution prevention.

e. **Monitoring and Evaluation.** The approved strategies for implementing IMO instruments lack proper communication to all relevant

entities, and there is insufficient monitoring to evaluate their effectiveness.

5.18 Intra-Provincial Jurisdiction Issues

- a. The following overlaps exist between federal and provincial authorities:
 - (1) The registration of fishing vessels is conducted by the Merchant Marine Department (MMD) under the Ministry of Maritime Affairs (MoMA), while fishing licenses are issued by the Marine Fisheries Department for deep sea fishing. Here both the departments, i.e. MMD and MFD are federal therefore there is no jurisdictional issue. However, registration of fishing vessels is mandate of MMD, but fishing licences are issued by the fisheries departments of the Sindh and Balochistan governments. This duality of mandate has delivered instances where provincial fisheries departments have issued licenses to unregistered fishing vessels (DG PMSA, 2024).
 - (2) Although the registration of a vessel is a prerequisite for obtaining a fishing license, licenses are frequently issued without registration due to the federal MMD's authority over registration and the provincial fisheries departments' authority over licensing.
 - (3) Additionally, there is a jurisdictional dichotomy where licenses for fishing in territorial waters are issued by provincial fisheries departments, while licenses for deep-sea fishing are issued by the Mercantile Marine Department.
- b. The Exclusive Fishery Zone (Regulation of Fishing) Act of 1975 serves as the foundational legal framework for regulating fisheries (Noman et al., 2022). Rules under this Act were established in 1990, detailing the imposition of penalties and the registration procedure. Instead of updating these rules, a deep-sea fishing policy was introduced in 1995, which provided for the issuance of licenses to foreign vessels under joint venture arrangements, often to the detriment of local fishermen. When the call for applications for these licenses was advertised, local fishermen staged protests, leading to the Prime Minister's intervention in 2016 to amend the policy to include local stakeholders. Legal challenges ensued, resulting in the suspension of the policy. The rules were amended again in 2021 to expand the advisory board's role in managing these issues. However, the situation remains unclear as to whether the original rules or the policy should prevail.
- c. The Exclusive Fishery Zone (Regulation of Fishing) Act of 1975 prohibited trawlers from fishing within 12 nautical miles. However, while Balochistan maintained this prohibition through an ordinance in 1981, Sindh allowed trawling within its jurisdiction (Abbas et al., 2013). These autonomous

provincial decisions have blurred the regulatory framework, a situation further complicated by the 18th Constitutional Amendment, which granted greater jurisdictional authority to provinces over territorial waters (Aliya & Qazi, 2024).

d. In response to political outcry in Balochistan against trawlers fishing in its territorial waters, the Balochistan Fisheries Department in 2022 authorized its officials to carry weapons. This move raises significant concerns as it diminishes the impact of weaponized patrols by the PMSA and increases the risk of casualties due to potential misunderstandings or confusion. To date, ten meetings have been held to address this issue, involving the PMSA, the Ministry of Defense, and the Balochistan Fisheries Department, with the most recent meeting occurring on May 25, 2024. It is noteworthy that the Sindh Fisheries Department has not armed its officials.

5.19 Enforcement /Jurisdiction Issues - Pakistan Maritime Security Agency (PMSA) and the Pakistan Coast Guard (PCG)

a. The jurisdictional authority between the Pakistan Maritime Security Agency (PMSA) and the Pakistan Coast Guard (PCG) has been a source of confusion. The PCG was established under the Pakistan Coast Guard Act of 1973, while the PMSA was established under the Pakistan Maritime Security Act of 1994. Despite the PMSA commencing operations on January 1, 1987, prior to the enactment of its founding statute, the PCG had already been operational, thereby predating the functional existence of the PMSA.

b. This jurisdictional ambiguity was further exacerbated when the PCG established a marine company equipped with a limited number of weaponized floating vessels and boats.

c. Under the PMSA Act of 1994, the PMSA was vested with the powers of a customs officer, police officer, and fisheries officer, with the mandate to enforce national and international laws within territorial waters. Additionally, the PMSA was tasked by the International Maritime Organization (IMO) with conducting Search and Rescue (SAR) operations in the North Arabian Sea (Iftikhar, 2021). Conversely, the PCG Act of 1973 did not authorize the PCG to enforce laws at sea but rather limited its jurisdiction to land-based operations.

d. Ideally, the establishment of the PMSA should have resulted in the dissolution of the PCG's marine company, with its floating resources (boats, vessels, etc.) being transferred to the PMSA. However, this did not occur due to vested interests in retaining control over resources and budgets.

e. The retention of marine resources by the PCG, albeit limited, has perpetuated confusion regarding seaward jurisdiction. This confusion was further compounded by a Statutory Regulatory Order (SRO) issued by the Federal Board of Revenue (FBR) in 2014, which prescribed the functional limits

of the PCG to be within 20 kilometers of the coastline. The PCG misinterpreted this as a seaward boundary, whereas, if intended for the sea, the limit should have been expressed in nautical miles rather than kilometers. Despite repeated attempts by the PMSA to clarify that the PCG does not have seaward jurisdiction, the PCG has persistently denied these assertions. The matter was escalated by the PMSA to Naval Headquarters (NHQ) for resolution, which subsequently involved the Joint Staff Headquarters (JSQ) and the Ministry of Defense. Nevertheless, the disagreement remains unresolved. A simple resolution could be achieved by inserting the phrase “Functions shall be limited towards land” into the 2014 FBR SRO (DG PMSA, 2024).

f. It is noteworthy that the section officer who signed the 2014 SRO also signed the SRO granting customs officer powers to PMSA officers. The origination of such controversies from a single office within the FBR reflects the lack of thorough consideration when issuing SROs that confer legal powers. This is indicative of a bureaucratic approach characterized by a lack of critical analysis (DG PMSA, 2024).

5.20 Registration of Fishing vessel

The Mercantile Marine Department (MMD) is responsible for registering boats engaged in fishing beyond 12 nautical miles. However, the MMD lacks the capacity to register all boats, as evidenced by the significant disparity between the number of boats manufactured annually and those registered (Shah et al., 2019). This gap underscores the MMD’s limited capacity for monitoring and enforcement. The implementation of an effective Vessel Monitoring System (VMS), operated through PMSA pickets, could address this issue. Initial data collection identified 28,000 boats departing Karachi harbor. This data needs to be digitized to ascertain the VMS requirements. The government of Balochistan, however, purchased 750 VMS units without adequate data, leading to a National Accountability Bureau (NAB) investigation due to suspicions of corruption, resulting in the units being sealed.

5.21 Illegal Jetties

a. Another significant challenge is establishment of illegal jetties and unauthorized landing sites, which hampers regulations regarding catch, facilities, security, disaster prevention and preparedness, health issues, and gender considerations (Moazzam, 2022). Therefore, effective monitoring and control surveillance mechanisms remain flawed. It affects real data collection by survey of jetties and landing sites to enumerate owners and operators for the purpose of strengthening inspection, certification and enforcement of other regulations. The standing issues are the use of banned nets, illegal trawling, poaching, and gaps in registration of vessels and Vessel Monitoring System (VMS).

b. The establishment of PMSA pickets in settled coastal areas such as Karachi, Ketī Bandar, Ormara, and Gwadar would facilitate the assessment of Pakistan's fishing fleet (Zafar, 2021). However, numerous illegal jetties exist from which boats can bypass these pickets, both when departing to sea and when landing their catch. The elimination of these illegal jetties across the entire coast is challenging, particularly considering the poverty among local fishermen, many of whom have no other means of livelihood, especially along the Makran Coast.

5.21 Overfishing

a. Overfishing in Pakistan is significantly influenced by the inadequacies of its institutional framework governing the maritime sector. Despite the existence of the National Fisheries Policy (NFP) and the National Maritime Policy (NMP), both frameworks have proven ineffective in addressing the challenges posed by overfishing and ensuring sustainable management of marine resources. The NFP aims to tackle issues such as poverty and environmental degradation but has not led to substantial growth in the fisheries sector due to poor implementation and lack of technological advancement. Similarly, the NMP, established in 2002, is outdated and fails to meet contemporary governance needs, resulting in a coherence index score indicating poor alignment with sustainability goals (Aslam et al., 2023a). Furthermore, the rise of small-scale artisanal fisheries and insufficient institutional development exacerbate the overfishing crisis, highlighting the urgent need for a comprehensive reevaluation and strengthening of these policies to promote sustainable practices and protect marine ecosystems.

b. The Pakistan Maritime Security Agency (PMSA) plays a crucial role in addressing the challenges of overfishing within Pakistan's maritime zones. As highlighted in the literature, the PMSA is tasked with enforcing legal instruments that govern maritime activities, which include combating illegal, unreported, and unregulated (IUU) fishing practices that threaten fish stocks and overall maritime security (M. Khan & Sadiq, 2022). The decline in capture fisheries production, attributed to overexploitation beyond sustainable limits, underscores the need for effective regulatory measures by the PMSA. Moreover, the economic significance of marine fisheries, which contribute substantially to Pakistan's economy, necessitates a balanced approach to resource management. The PMSA's enforcement capabilities are essential not only for preserving fish stocks but also for ensuring the long-term viability of the fishing industry, which is vital for local nutrition and economic prosperity (Mohsin et al., 2017). Thus, the PMSA's role is integral to both maritime security and sustainable fisheries management in Pakistan.

c. The continuous increase in the annual production of boats has inevitably led to overfishing. The use of Gujja nets has resulted in the mass depletion of various marine species, severely disrupting the marine ecosystem.

Consequently, the shrimp season has been drastically reduced from seven months to just two months (DG PMSA, 2024).

5.22 Smuggling

a. The smuggling of oil, drugs, and weapons in Pakistani seas presents significant challenges for local institutions, particularly the Pakistan Maritime Security Agency (PMSA). The maritime zones of Pakistan face non-traditional security threats, including narcotics trafficking, which is exacerbated by the country's geographical proximity to Afghanistan, the world's leading opium producer. The PMSA is tasked with enforcing laws to counter these threats, but it struggles with limited resources and corruption within various agencies. Moreover, the intertwining of money laundering with drug trafficking complicates enforcement efforts, as illicit funds are often funneled through informal remittance systems like Hundi and Hawala, which are difficult to regulate. The Pakistani government has implemented strategies such as international cooperation and public awareness campaigns to combat narcotics, yet challenges remain in effectively curbing these activities due to logistical constraints and a lack of comprehensive data (Afzal et al., 2024). Thus, while efforts are underway, the multifaceted nature of these security threats continues to hinder institutional effectiveness in Pakistan's maritime zones.

b. Smuggling of Iranian diesel and petrol through boats and skiffs occurs regularly in the delta of the Dasht River at Kantani Hore near the border. Approximately 4.4 million liters are smuggled daily, with the fuel being stored in wells near the shore for later distribution to coastal areas. An estimated 2,000 skiffs are involved in this illicit activity. It is likely that, in addition to fuel, drugs and weapons are also smuggled. For instance, a boat carrying 760 kilograms of methamphetamine ("ice") was apprehended two months ago.

5.23 National Seabed Authority

This institute has recently completed a study on establishing the Pakistan National Seabed Authority as a unified body to oversee offshore explorations within and beyond the extended continental shelf. It is anticipated that this authority will be established soon to facilitate coordination with the International Seabed Authority (ISA). The ISA ensures the equitable distribution of international seabed resources. To secure its share of proposed exploration projects in the Indian Ocean, near the Carlsberg Ridge, Pakistan must coordinate with the ISA. A National Seabed Authority would also enable monitoring of India's ongoing explorations in the region, preventing potential intelligence gathering and environmental degradation near Pakistan's extended continental shelf. Regrettably, Pakistan failed to respond to the ISA's invitation for nominations to its Technical and Legal Commission, allowing India to secure a position while Pakistan did not (Babar & Afzal, 2024). Notably, all nominees

were appointed without elections due to the limited number of submissions. This incident highlights Pakistan's lack of priority regarding ISA affairs (Babar & Afzal, 2024).

5.24 Climate Change

The institutional framework governing the maritime sector in Pakistan is significantly challenged by climate change, necessitating urgent reforms. The National Maritime Policy (NMP) of 2002 is outdated and lacks coherence with current sustainability needs, particularly in addressing climate-related issues such as pollution control and ecosystem conservation. This inadequacy is compounded by the broader National Climate Change Policy (NCCP), which, while providing a framework for climate action, suffers from implementation weaknesses and lacks actionable measures. Furthermore, the vulnerability of coastal regions to sea-level rise underscores the need for improved governance and data accessibility to inform decision-making. The integration of climate adaptation strategies within the maritime governance framework is essential, as highlighted by the need for coherent policies that align with both national and international obligations. Thus, a comprehensive review and revitalization of the institutional framework are critical for enhancing resilience in Pakistan's maritime sector against climate change impacts. E.g the Pasni harbor has been closed since 2010 due to underwater land instability and mud volcanic activity, both consequences of climate change (IPSweb, 2023).

5.25 Marine Pollution

The institution responsible to combat marine pollution is the Pakistan Maritime Security Agency. The Pakistan Maritime Security Agency (PMSA) employs several measures to combat marine pollution, primarily through legislative and technological initiatives. The agency advocates for stricter pollution control standards and the enforcement of existing laws, which include the prohibition of plastic bags and the promotion of extended producer responsibility to mitigate waste disposal issues. Additionally, PMSA emphasises the adoption of advanced technologies for wastewater treatment and oil spill response, alongside regular monitoring and surveillance of marine environments (N.-A. Baig & Askari, 2024). It plays a crucial role in managing marine oil spills, as highlighted in the BARRACUDA-XI 2022 SAR and Marine Oil Spill Exercise. Organized by PMSA, the exercise aims to enhance inter-agency coordination and refine response procedures for marine oil spills and search and rescue (SAR) operations. PMSA leads efforts to strengthen cooperation among ministries and agencies, test emergency procedures, and evaluate command and control capabilities. By coordinating resources and providing logistical support, PMSA ensures that participating units are well-equipped to handle emergencies. Additionally, PMSA showcases its ability to manage oil spill responses and SAR operations, highlighting its role in promoting maritime awareness both nationally and internationally. The exercise also provides a

realistic training environment, focusing on key aspects like MEDEVAC, SAR operations, and combating maritime pollution, ultimately verifying the effectiveness of national distress alert mechanisms and the suitability of materials and methods used in these critical operations. Despite these efforts, challenges remain, such as inadequate enforcement of regulations and insufficient treatment facilities for industrial and municipal waste, particularly in areas like Karachi Harbour (Shahzad, 2023). The integration of international conventions into domestic law is also crucial, as it can enhance the legal framework governing marine pollution in Pakistan (Qayum & Zhu, 2018). Overall, while PMSA is taking steps to address marine pollution, the effectiveness of these measures is hindered by implementation challenges and the need for a more robust legal framework. Numerous registered, unregistered, licensed, and unlicensed fishing vessels discharge millions of tonnes of waste material into the harbor. Additionally, bilge water is often emptied into the harbor, contributing to overall pollution, especially by boats operating from illegal jetties where there are no law enforcement measures in place.

5.26 Conclusions

A maritime sector, which comprises of different socio-economic segments, can be made prolific and cost-effective through a strong and efficient governance system. It is an established fact that poor governance leads to corruption, malpractices, ineffectiveness, unrestrained working etc. at all levels of management in the public departments (Dayanandan, 2013). In the present context, Pakistan's maritime sector is confronted with a variety of governance issues, which have become a hindrance in its smooth functioning and desirable development over the period. This portrays a pessimistic outlook of governance and management at various segments of maritime sector in Pakistan. We need to review the overall institutional framework of governance, the policies and bylaws governing the maritime sector in Pakistan with a serious concern for development and growth in the short term and long term. Hard political, administrative, economic, and social decisions are required to bring paradigm positive shift in the orthodox system of management and working of maritime sector (Ismail & Rizvi, 2010).

CHAPTER 6

Policy / Legal Framework - Maritime Sector of Pakistan

6.1 Introduction

a. The maritime sector is of crucial importance to Pakistan's economy (Askari et al., 2020). The country is blessed with over one thousand kilometers of coastline, the Exclusive Economic Zone (EEZ) with an area of about 290,000 sq. km including the Continental Shelf. This area is used for different purposes comprising maritime trade, fishing, conservation, mining, exploration and marine research. The seaborne trade plays an important role in the socioeconomic development of the country. The maritime sector of the country makes up 3-4 percent of national GDP through indirect contribution from various maritime sectors.

b. The foundation for national maritime policies and laws is rooted in the overarching framework of international maritime laws and conventions. These international laws and regulations establish the rights, responsibilities, and obligations of nations with respect to the use and management of seas. National maritime policies and laws must align with and complement the overarching international legal framework to ensure compatibility and facilitate the smooth functioning of maritime activities. This alignment allows for the seamless movement of vessels, goods, and people across national boundaries, promoting global trade, transportation, and economic development. The interplay between national and international maritime laws ensures a balance between the exercise of national sovereignty and the principles of international cooperation and shared responsibility (Humphrey, 1945).

6.2 National Maritime Policy

a. The National Maritime Policy of 2002, served as a foundational legal document for managing the country's maritime affairs (Aslam et al., 2023a). However, this policy, now over two decades old, has become outdated. It fails to keep pace with the rapid advancements in technology, international law, and global maritime norms, thereby exposing the country to legal and economic vulnerabilities.

b. While the 2002 policy was a pioneering initiative that established a legal framework for port development, shipping regulations, and maritime security, its failure to evolve has hindered Pakistan's ability to compete on a global scale. The policy does not address technological advancements, such as *automation* (Andrei & Scarlat, 2024) and artificial intelligence, which have since emerged as critical components of modern maritime operations. The absence of legal provisions for smart port technology, automated logistics, and the integration of digital tools in maritime operations places Pakistan's ports and shipping industry at a disadvantage compared to neighboring countries, which have incorporated these innovations into their legal frameworks and are reaping the benefits.

c. Additionally, international conventions and treaties have evolved significantly, particularly in environmental sustainability (Basaran, 2016). The International Maritime Organization (IMO) has introduced new regulations aimed at reducing greenhouse gas emissions from ships, along with other legal advancements concerning the protection of marine biodiversity and the sustainable management of marine resources. The 2002 policy did not incorporate these developments, rendering its legal provisions inadequate by today's international standards and risking non-compliance with current norms. The legal ramifications of this shortfall could potentially damage Pakistan's standing in the international community, subjecting it to sanctions or other legal consequences.

6.3 Merchant Marine Policy

In 2001 Pakistan adopted the Pakistan Merchant Marine Policy 2001 which was subsequently amended in 2019. This policy aimed at incentivizing the private sector to participate in the mercantile shipping business (Aslam et al., 2023b). The objectives of this policy were to:

- a. Facilitate and attract private sector investment in shipping.
- b. Create an environment conducive for unimpeded growth of the maritime sector.
- c. Deregulate to provide a free environment for investment in the maritime sector.
- d. Maximize sea borne trade of the country through the merchant marine fleet flying Pakistan flag.
- e. Make the Pakistan merchant marine sector internationally competitive.
- f. Ensure efficient operation of Pakistan ports and harbors through availability of harbor crafts such as tugs and pilot boats.
- g. Make tangible contribution to the Pakistan economy by augmenting foreign exchange earnings and reducing freight bills to create an environment conducive to development and rapid expansion of maritime related services; and to enhanced utilization of trained manpower in the maritime sector by augmenting Pakistan's training facilities so as to enhance productivity and make them internationally marketable.

6.4 Pakistan Shipping Policy 2024 (PSP-2024)

The Pakistan Shipping Policy 2024 (PSP-2024) will replace the aforesaid Merchant Marine Policy with following additional objectives:

- a. Make Pakistan's merchant marine sector internationally competitive, contributing significantly to foreign exchange earnings.

- b. Institute a centrally administered dedicated desk/officer to facilitate and resolve ship owners' related matters efficiently.
- c. Ensure the efficient operation of the country's ports and harbors in accordance with global standards and best practices.
- d. Develop the shipbuilding and ship repairs industry in Pakistan, capitalising on its deep-sea shores, strategic Gulf location, and cost-effective labor force.
- e. Minimize the national freight bill paid to external shipping companies in foreign exchange, ensuring economic prudence and resource optimization.
- f. To increase compliance and alignment of international regulations in particular decarbonization of shipping and ports as per IMO forthcoming and prevailing laws.

6.5 Deep Sea Fishing Policy 2018

The Deep Sea Fishing Licensing Policy, 2018, issued by Pakistan's Ministry of Maritime Affairs, outlines the regulatory framework for fishing within Pakistan's Exclusive Economic Zone (EEZ) and includes provisions for Fishing Zones, dividing the EEZ into three zones with specific jurisdiction for provincial and federal authorities. It emphasizes Fishing in Zone-III for Local Fishing Fleet, outlining the types of vessels and gear permitted, while Fishing in Zone-III for Foreign Joint Venture Fishing Fleet is allowed under stringent conditions. The policy includes detailed Requirements and Penalties for violations of fishing rules, as well as the Procedure for Submission of Applications and Grant of Fishing Licenses, which must comply with Terms and Conditions for Operations. Additionally, the policy addresses the Fishing Vessel Specifications and Operations through mandatory requirements like the installation of Satellite-based Vessel Monitoring Systems (VMS). It also includes rules on Joint Ventures for foreign entities, specific fees and penalties in Annex A and B, and sets the Procedure for Pre-qualification of applicants for fishing licenses, aiming to eliminate unregulated fishing, conserve fish stocks, and promote sustainable practices

6.6 National Environmental Policy

The National Environment Policy of Pakistan (2005) provides a detailed framework to manage and protect environmental resources, with a significant focus on the maritime domain. It outlines strategies to address pollution in coastal waters, promote water conservation, and protect marine biodiversity. The policy mandates establishing a Marine Pollution Control Commission, enforcing standards for water quality, and implementing the National Oil Spill Contingency Plan. It also emphasizes sustainable fisheries and the protection of marine ecosystems against encroachment and pollution, aiming for

conservation through integrated coastal management and compliance with international maritime obligations.

6.7 National Fishing Policy

As there is no fishing policy dealing with Aqua Culture, there is a need to develop a national policy relating to the said subject that defines Aqua Culture, provides broad guidelines to Federal and Provincial Governments to ensure effective management of relevant resources. The Provincial Governments may make their own strategies, plans and programs in pursuit of such policy and to regulate fishing in the territorial waters of each province.

6.8 Other Policies to be Developed

Apart from the aforesaid policies, following policies are being developed:

- a. Blue Economy Policy
- b. Maritime Education Policy (Ministry of Education)
- c. Maritime Awareness Campaign Plan (Ministry of Information in coordination with Maritime Affairs Division)
- d. Integrated Coastal Zones Management Policy (Ministry of Maritime Affairs)
- e. Marine and Coastal Tourism Policy (provincial tourism departments)
- f. Offshore Hydrocarbon Policy (Ministry of Energy Petroleum Division)

6.9 Ratification of International Maritime Law by Pakistan

a. Signing an international agreement is an initial, non-binding step, while ratification is the final, binding process that commits a country to the legal obligations and responsibilities outlined in the treaty (Raustiala, 2005). Ratification is the critical step that transforms a signed agreement into a legally binding commitment for the country.

b. Major International Maritime Laws, that Pakistan has ratified are appended below (ILO, 2024a):

- (1) United Nations Convention on the Law of the Sea (UNCLOS) - Ratified in 1997
- (2) International Convention for the Prevention of Pollution from Ships (MARPOL) - Ratified in 1973/1978

- (3) International Convention for the Safety of Life at Sea (SOLAS) - Ratified in 1965
- (4) Convention on the International Regulations for Preventing Collisions at Sea (COLREG) - Ratified in 1965
- (5) International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) - Ratified in 1984
- (6) International Convention on Civil Liability for Oil Pollution Damage (CLC) - Ratified in 1995
- (7) International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (FUND) - Ratified in 1995
- (8) International Convention on Maritime Search and Rescue (SAR) - Ratified in 1983
- (9) Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation (SUA) - Ratified in 2000
- (10) International Convention on the Control of Harmful Anti-Fouling Systems on Ships - Ratified in 2007
- (11) International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM) - Ratified in 2010
- (12) Honking Convention for ship recycling- 2023

c. By ratifying these maritime conventions, Pakistan has committed to implementing their regulations and standards to ensure the safety, security and environmental protection of its maritime domain and activities (M. Khan et al., 2024). The major international conventions ratified have been incorporated in the national laws. Adopting international laws certainly improves the governance at home and with the international community. Such laws help improve the national policy also. International laws transpire jurisdiction hence help shape enforcement mechanism.

6.10 Updating the Ratified International Conventions

Pakistan operates a dualist system where international treaties must be incorporated into national law to be enforceable. This process is often slow and resource intensive. Many amendments to mandatory IMO instruments, including the 1988 Protocol to the Load Lines Convention, have not been transposed into national legislation. The Merchant Shipping Ordinance, 2001, while comprehensive, is outdated and does not reflect current international standards.

6.11 Adoption of Upcoming International Conventions

a. **Hong Kong Convention (HKC)**. The Hong Kong Convention requires safe and environmentally friendly ship recycling, prioritizing workers health, disposal of hazardous waste prior commencement of dismantling processes. Pakistan has signed the convention and must enact commensurate laws and regulations once it takes effect (M. Ali & Pearce, 2020). The shipbreaking industry at Gadani, Balochistan, generates significant revenue for Pakistan. However, the current regulatory framework is inadequate, with only a single statute in the pipeline to ensure safe and sustainable shipbreaking practices. Delays in finalizing this legislation, due to bureaucratic inefficiencies, threaten the industry's future. To maintain competitiveness, Pakistan must expedite the law-making process. Neighboring countries like India and Bangladesh have already ratified the convention and are ahead in developing relevant laws, leaving Pakistan at risk of falling further behind, particularly given its current political and economic instability. Pakistan may lose the opportunity of earning huge revenue by not shaping its laws and regulatory framework as per the dictates of the HKC (Gull et al., 2023). This institute has recently submitted its recommendations to the relevant corners.

b. **BBNJ Agreement**. Although the agreement remains to be ratified and enforced, Pakistan must adopt a proactive approach to develop policies and laws governing the management of areas beyond national jurisdiction (Aziz, 2023). The high seas harbor vast genetic resources and biodiversity, holding immense potential for the development of medicines and cosmetics. To tap into this potential, Pakistan should prioritize research on the availability of such resources within its national waters and exclusive economic zone. By discovering and characterizing this biodiversity in a timely manner, Pakistan can position itself to access funding from developed nations for research and technology development, in line with the BBNJ agreement. This strategic approach will enable Pakistan to unlock the economic benefits of its marine resources and stay competitive in the global arena (Safdar & Fatima, 2024).

c. **Green shipping MARPOL (ANNEX VI)**. The International Maritime Organization's (IMO) marine pollution regulations, specifically Annex VI of MARPOL, aim to control carbon emissions from ships (Čampara et al., 2018). Although Pakistan has yet to ratify this annex, it is crucial to do so without hesitation. As a potential future shipbuilding nation, Pakistan can benefit from embracing environmentally friendly ship engine manufacturing. Ratifying MARPOL Annex VI will enable Pakistan to send existing ships back to manufacturers for modifications to minimize carbon emissions (Y. Shi, 2017). Moreover, Pakistan should adopt a forward-thinking approach by only purchasing ships equipped with engines that meet the annex's emission standards, ensuring a sustainable and environmentally responsible maritime industry.

d. **Maritime Laws of Pakistan**. To regulate the maritime sector having immense opportunities. Pakistan has so far made many laws (Hussain & Bhatti, 2023b). We shall now take a panoramic view of Pakistan's maritime legal

landscape. Laws that empower the **law enforcement agencies**, and regulate their operations, conduct in their respective jurisdiction are important maritime laws (Usman et al., 2021). Pakistan has so far framed following laws in this regard:

- (1) Pakistan Navy Ordinance 1961
- (2) The Maritime Security Agency, Act 1994
- (3) The Pakistan Coast Guards Act, 1973
- (4) Wartime Instructions to Merchant Ships
- (5) Joint Maritime information Organization Act, 2018
- (6) Pakistan Maritime Zones Act 2023

e. Maritime disputes are ultimately decided at **judicial forums**. Following are the laws and procedures to be applied in this regard in Pakistan:

Admiralty Jurisdiction of High Courts Ordinance, 1980

The forms used in the Admiralty Division of the Supreme Court in England under the Rules of the Supreme Court Act, 1883

Rules under the Colonial Courts of Admiralty Act, 1890

The Arbitration of (Protocol and Convention) Act, 1937

The Commercial Documents Evidence Act, 1939

f. Living resources of the sea are very important, every coastal state exploits these resources. The laws that regulate **Fisheries in Pakistan** are listed hereunder, however there are provincial laws also those are listed in the article 5.42 onwards:

- (1) The Fisheries Act, 1897
- (2) The Pakistan Fish Inspection and Quality Control Act, 1997
- (3) The Exclusive Fisheries Zone (Regulation of Fishing) Act, 1975
- (4) The Exclusive Fishery Zone (Regulation of Fishing) Rules 1990
- (5) Exclusive Fishery Zone (Regulation of Fishing) Rules, 1990 as amended by S.R.O. 981(I)/2021
- (6) Deep Sea Fishing Licensing Policy, 2018 - S.R.O. 43(KE)/2018 in supersession of amended policy notified previously under S.R.O. 682(1) 2009, dated 15th July 2009

- (7) Fishing Vessels Inspection Rules, 2020
- (8) Fishing Vessels Registration Rules, 2021
- (9) The Pakistan Trade Control of wild Fauna and Flora Act 2010

g. Trade and commerce is an important global activity, no nation can survive without international trade. Laws related to **Carriage / Trade** are listed hereunder:

- (1) Bill of Lading Act, 1856
- (2) Carriage of Goods by Sea Act, 1925
- (3) Imports and Exports (Control) Act, 1950
- (4) Law relating to Bills of Lading signed as Protocol at Brussels in different years
- (5) The Marine Insurance Act, 2018
- (6) Rules of International Chamber of Commerce, 2020 incorporated in *Foreign Exchange Manual of State Bank of Pakistan*.

h. **Ports and Harbours** play a crucial role in maritime trade therefore regulating affairs of ports and harbours is very important. Laws Governing Ports and Harbours are appended below (Ministry of Law and Justice, 2024):

- (1) The Karachi Port Trust Act, 1886
- (2) Ports Act, 1908
- (3) Lighthouse Act 1927
- (4) Port Qasim Authority Act, 1973
- (5) The Korangi Fisheries Harbour Authority Ordinance, 1982
- (6) Gwadar Port Authority Ordinance 2002
- (7) The Karachi Port Security Force Ordinance, 2002
- (8) Pakistan Island Development Authority Ordinance 2020

i. **Shipping** is the sector that gave birth to the maritime laws, Following are the Shipping laws of Pakistan (Ministry of Law and Justice, 2024)

- (1) Coasting-Vessels Act, 1838

- (2) Inland Mechanically Propelled Vessels Act, 1917
- (3) Pakistan National Shipping Corporation Ordinance 1979
- (4) Special procedure for ship breaking industry rules 1997 Sales Tax Act 1990
- (5) Merchant Shipping Ordinance 2001
- (6) National Institute of Oceanography Act, 2007
- (7) Merchant Shipping (Pilot Ladder) Rules, 2020
- (8) State Bank's Long-term Financing Rules Shipping Sector 2020
- (9) Licensing Rules 1998 (Seamen Recruiting Agencies)
- (10) Examination and Certification of Deck Officers and Safe Manning Rules 2006
- (11) Examination and Certification of Engine Officers and Safe Manning Rules 2005
- (12) Radio Installation, Radio Equipment, Navigation Equipment Rules 2002
- (13) Tonnage Rules 2002
- (14) Registration of Shipping Rules 2002
- (15) Navigation, Collision and Accident Rules 2003

j. The **laborers** that work in the ports and docks are of unique category, their affairs are dealt with special laws that are following (Ministry of Law and Justice, 2024):

- (1) Pakistan Dock Laborers Act 1934
- (2) Pakistan Dock Laborers Regulations, 1948
- (3) Dock Workers (Regulation of Employment) Act, 1974

k. **Revenue** collection is important to manage affairs of the state, through maritime trade huge revenue is collected, following are the Revenue Laws related to Maritime trade:

- (1) Custom Act, 1969
- (2) Sales Tax Act 1990

(3) Customs Rules, 2001

l. Apart from the living resources in water column of EEZ, continental shelf has many minerals and hydrocarbons beneath it the laws that govern **Offshore Exploration** are listed below:

(1) Petroleum Act 1934 as amended by Petroleum (Amendment) Act 2023

(2) Regulation of Mines, Oil fields and Mineral Development (Government Control) Act, 1948.

(3) Pakistan Offshore Petroleum (Exploration and Production) Rules, 2023.

m. Safety of men and materials is of prime important, laws for **Safety** in Maritime Sector are appended below:

(1) The Dangerous Cargoes Act, 1953.

(2) Pakistan Merchant Shipping (Carriage of Hazardous and Dangerous Substances by Ships) Rules, 2009.

(3) Merchant Shipping (Safe Manning, Hours of Work and Watchkeeping) Rules, 2021.

(4) Merchant Shipping (Medical Examination) Rules, 2021.

n. At the federal level, the Pakistan **Environmental Protection Act** (PEPA) of 1997 remains the primary legislation governing environmental protection. However, with the 18th Constitutional Amendment, the subject of environmental protection has been devolved to the provinces. Consequently, each province has enacted its own environmental laws.

6.12 Analysis of National Maritime Laws of Pakistan

a. **Pakistan Maritime Zones Act 2023.** The legal regime governing **Pakistan's maritime zones** has evolved with the enactment of the Pakistan Maritime Zones Act, 2023, Government of Pakistan, Act No. XXXII of 2023, which replaces the Territorial Waters and Maritime Zones Act, 1976, Government of Pakistan, Act No. LXXXII of 1976. Here is a comprehensive comparative analysis of the two statutes, highlighting both the continuity and the substantive changes in Pakistan's maritime law. The 2023 Act reflects a significant shift towards a more detailed and modern regulatory framework, aligning Pakistan's maritime governance with contemporary international standards and addressing emerging maritime challenges. New additions are as following (Hayat, 2024):

(1) Name of statute was changed from "Territorial Waters and Maritime Zones Act to "Pakistan Maritime Zone Act".

- (2) Right of innocent passage was introduced and elaborated.
- (3) A new section on removal of offshore installations was provided.
- (4) New provisions related to Environmental Protections, Prohibition of Pollution and Dumping were included.
- (5) Procedure to exercise Jurisdiction over Offences on Foreign Ships was provided.
- (6) New provisions on Seaworthiness of Ships to Avoid Pollution or Dumping were included.
- (7) The Right of Hot Pursuit was elaborated.
- (8) New provision on Immunity of Foreign Warships was included
- (9) Attempt and Abetment of Violations (Section 21)
- (10) Following comprehensive definitions have been added to the statute:
 - i. **Baseline:** The low water line or where applicable the system of straight lines, as notified from time to time in the official Gazette from which breadth of the territorial sea is measured.
 - ii. **Territorial Sea:** This zone extends up to 12 nautical miles from the baseline of Pakistan's coast. Pakistan has full sovereignty over this area, allowing it to enforce laws, regulations, and customs within its boundaries.
 - iii. **Contiguous Zone:** Beyond the territorial sea lies the contiguous zone, which extends an additional 12 nautical miles from the baseline. In this zone, Pakistan can exercise control to prevent or punish violations related to security, immigration, customs, and the protection of archaeological and historical objects within the contiguous zone.
 - iv. **Exclusive Economic Zone:** The EEZ extends up to 200 nautical miles from the baseline. Within this zone, Pakistan has special rights regarding exploration and exploitation of natural resources in both water column and seabed underneath. Foreign vessels enjoy freedom of navigation in these waters but must respect Pakistani laws related to resource management.

- v. **Continental Shelf:** The continental shelf of Pakistan encompasses the submarine areas beyond the territorial sea, extending to the outer limit measured three hundred and fifty nautical miles from the baseline. Pakistan possesses full and exclusive sovereign rights over its continental shelf, including rights related to resources, scientific research, construction of structures, and the protection of the marine environment.

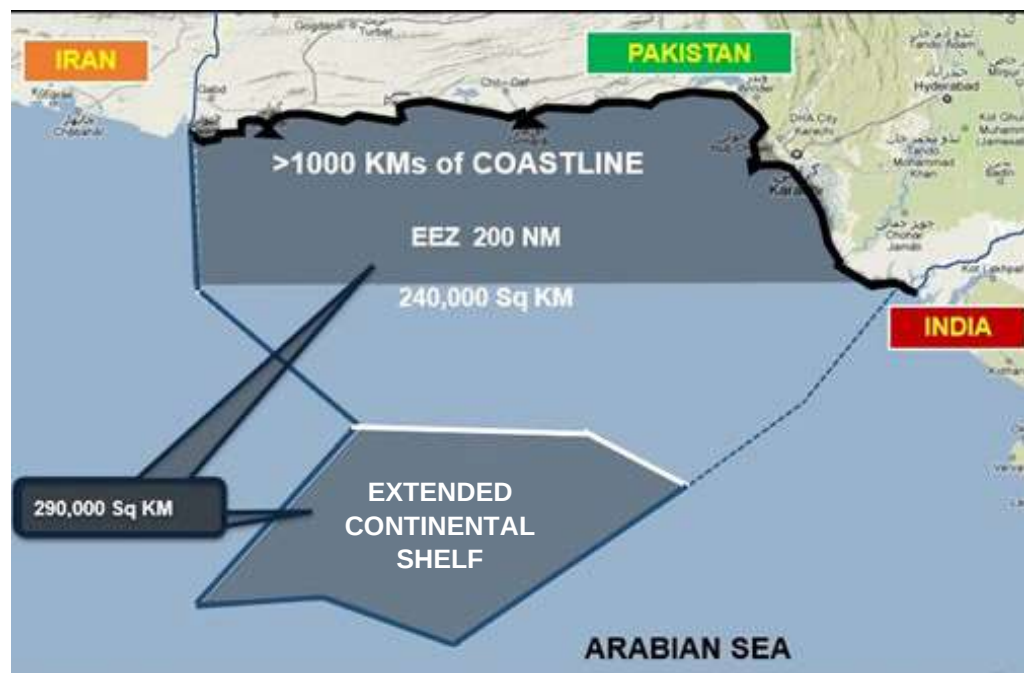


Figure 2.2: Depiction of Pakistan Maritime zones and extended continental shelf

(11) New provisions on Trial of Offences, Arrest Without Warrant and Search Procedures were included. Besides providing Post-Arrest Procedures and Disposal of Perishable Property.

(12) Punishments for Violations were provided, and New Offences were introduced.

b. The Maritime Zone Act, 2023, marks a step towards enhanced maritime governance, but it falls short in addressing future challenges such as:

- (1) Assigning responsibilities for autonomous vessel operations
- (2) Regulating drone usage by merchant vessels in territorial waters

6.13 Pakistan Maritime Security Agency Act

a. Section 2 (e) of Pakistan Maritime Security Agency Act, 1994, Government of Pakistan, Act No. X of 1994 defines "Maritime Interest of Pakistan" in following words:

“maritime interest of Pakistan” means rights. control, jurisdiction and sovereignty over Maritime Zones and includes the sovereign rights or Pakistan to explore. exploit. conserve, manage the living and non-living resources and other activities for economic exploitation, exploration and to safeguard the unauthorized exploitation or resources of Pakistan seas and prevention thereto from damage through pollution.

b. The present language of the aforesaid section means that unauthorized exploitation of the resources of Pakistan is to be safeguarded rather combated. To correct the language of the section, the word “against” needs to be inserted after the word “safeguard”. Similarly, section 2 (l) of this statute provides as under:

“territorial waters”. “Contiguous Zone”. “Continental Shelf” And “Exclusive Economic Zone” shall have the meanings respectively assigned to them in the Territorial Waters and Maritime Zones Act. 1976 (LXXXII of 1976).

6.14 Fisheries Laws

a. The fisheries sector, a vital dimension of maritime affairs, necessitates critical examination of its regulatory framework. This includes:

- (1) Evaluating the applicability of existing laws to modern technologies, such as Vessel Monitoring Systems (VMS)
- (2) Addressing the post-18th constitutional amendment changes, where fishing within territorial waters is a provincial subject, while deep-sea fishing is a federal subject

b. Trade, a significant aspect of maritime affairs, relies heavily on outdated laws that require comprehensive overhauling to keep pace with rapid technological and procedural developments. This includes:

- (1) Regulating ports and harbors to facilitate efficient cargo handling
- (2) Governing ship operations and crew management
- (3) Safeguarding dock laborers' rights, aligning with global standards

c. Revenue collection, crucial for every economy, is significantly sourced from maritime trade. Customs duty regulations, although reviewed annually, require ongoing refinement to ensure effectiveness. Moreover, circulars and directives issued by DGPS and MMD are not legally binding, which limits their enforceability.

6.15 Provincial Maritime Laws

a. The jurisdiction of the federal as well as provincial governments for policy making management and law enforcement is an important part. According to Clause 36 Fourth Schedule (Federal Legislative List) read with Article 70(4), fishing and fisheries beyond territorial water is a federal subject, whereas within the limits of territorial waters (12 nm) comes under provincial jurisdiction. Jurisdiction issue is the foremost challenge which creates friction between provincial governments of Sindh and Balochistan post 18th amendment. Territorial sea, in which more than 70 % (approximately 734.5 km) is Makran coast of Balochistan, (730 to 770 km according to two scales of measurement) while 266.5 km is Sindh coast, (Memon et al., 2016) had previously been a federal subject for fishing and fisheries-related law enforcement through PMSA. After the 18th amendment, both provinces have grievances against each other as well as PMSA regarding fishing and fisheries laws in territorial and international waters which need to be addressed effectively. Even before the said constitutional amendment there were many laws of these provinces to regulate fishing and ancillary coastal matters.

b. Maritime **Laws of Balochistan** are listed below:

- (1) The Balochistan Sea Fisheries Ordinance, 1971
- (2) Balochistan Sea Fisheries Rules, 1971
- (3) Baluchistan Environmental Protection Act, 2012
- (4) The Balochistan Ship Breaking Industry Rules, 1979
- (5) Marshal Law Order No. 155/84 regarding Shipbreaking in Balochistan
- (6) Balochistan Coastal Development Authority Act, 1998

c. Maritime **Laws of Sindh** are listed below:

- (1) The Sindh Fisheries Ordinance 1980
- (2) Sindh Fisheries Rules 1983
- (3) The Karachi Fisheries Harbour Authority Ordinance, 1984
- (4) The Sindh Environmental Protection Act, 2014
- (5) Sindh Coastal Development Authority Act, 1994

6.16 Synopsis of Provincial laws overview

Even though provincial governments of Sindh and Balochistan have passed Fisheries Ordinances which give them extensive powers to regulate fishing activities including banning illegal gear, closed areas, and restrictive seasons in their respective areas. However, the provincial fishery sectors have no overarching policy framework or wherewithal to implement these regulations and to govern their maritime zones. There are amendments made by provinces regarding mesh size regulations, but suitable strategies have not been developed to include ignored aspects like aquaculture and governance mechanisms to make current policy holistic (M. Khan & Sadiq, 2024).

6.17 Conclusions

Lawmaking in Pakistan is a relatively straightforward process. Whenever an international convention is ratified or an internal requirement arises, laws can be enacted by introducing a bill in the legislature. If the legislature is not in session, the President can promulgate an ordinance for federal laws, or the Governor of the relevant province can do so for provincial laws. Pakistan has not been remiss in making laws, as evidenced by the numerous laws already in place. However, the ease of lawmaking, regardless of implementation or enforcement mechanisms, has led to a proliferation of laws, increasing the likelihood of duplication on a particular subject. One way to adopt international conventions is by adding a schedule to an existing statute. Lawmaking occurs in offices, chambers, and halls, but implementation takes place at the operational level, which can be challenging due to poor enforcement or jurisdictional confusion. This issue needs to be addressed at the operational level and will be discussed in the next chapter, which covers the institutional framework of maritime sectors.

CHAPTER 7

Conclusions and Recommendations

7.1 International Maritime Legal and Institutional Frameworks

- a. International laws and organizations do not guarantee good governance but can provide a basis for responsible and effective management by individual countries. In the absence of a supranational authority, ocean governance and enforcement of International maritime laws emerge as major challenges in maritime domain. There is a need to establish international authority for the implementation of International Maritime Laws.
- b. Diverse understanding and interpretation of maritime laws that these are meant to meet interests of the developed countries; create complex issues of enforcement and jurisdiction. There is a need to standardize interpretations of maritime laws to reduce enforcement and jurisdictional issues
- c. Implementing necessary measures in ocean governance requires full engagement from all states and poses numerous challenges, as policies enacted onshore have significant offshore impacts. To fully achieve effective ocean governance, various dimensions such as regional cooperation, public engagement, science education, and ethics need to be addressed.
- d. The most obvious shortcoming of international organizations and national authorities is the fragmentation and lack of coordination between different programs and institutions.
- e. The general acceptance of maritime boundaries set by UNCLOS has enhanced ocean governance. However, enforcement at high seas is problematic due to the lack of an international policing body, leaving compliance to the flag states. Many vessels, out of sight of their regulators, often disregard international laws. While most nations enforce these laws nationally, the USA and China are exceptions. This undermines UNCLOS's authority, leading developed nations to view it as a tool for global control rather than for equitable sea use.
- f. Enhance international cooperation and coordination among maritime organizations and states is important to implement ocean governance measures.
- g. Climate change is already impacting all aspects of marine life, yet current ocean governance structures remain largely unprepared for these climate-driven changes in coastal waters. The novel dynamics introduced by climate change necessitate governance systems that can anticipate and adapt to rapidly changing conditions while minimizing negative consequences.

- h. MARPOL is a hybrid of international, environmental and maritime law. Marine pollution is a concept which crosses national boundaries, and is governed by International, Regional and Domestic Laws. This has resulted in overlaps of applicable laws and regulations as well as jurisdiction.
- i. The Basel Convention's flexible definitions of hazardous" and "waste" allow exporters to bypass regulations. It lacks strong enforcement, enabling continued waste shipments to developing countries, which struggle with limited resources and expertise. Uniform standards disregard disparities between developed and developing nations. The US and key ship recycling countries like India, Bangladesh, and Pakistan have not ratified it, limiting its global effectiveness and hindering ocean governance.
- j. The Hong Kong Convention (HKC) emphasizes environmental, health, and worker safety, overlapping with various legal frameworks. Regulating ship recycling through multiple jurisprudences is challenging. HKC includes compliance mechanisms like inspections and certification, but effective implementation requires coordination across ministries. It doesn't prohibit sending ships to non-party states, allowing unsafe practices. Developing countries dominate recycling but struggle to meet HKC standards due to limited resources. The Convention's broad scope complicates governance.
- k. SOLAS primarily impacts shipbuilding nations, while developing countries focus on port facility standards. The IMO should hold regular expert conferences to update SOLAS with new technologies.
- l. The Port State Measures Agreement (PSMA) 2009 has been widely accepted internationally, with many nations ratifying it to combat Illegal, Unreported, and Unregulated (IUU) fishing. It has improved ocean governance by establishing controls against IUU fishing. However, developing nations may struggle with financial challenges in implementing the agreement.
- m. Global fisheries law is supported by treaties like the 1993 Compliance Agreement and 2009 Port State Measures Agreement, along with FAO's non-binding instruments. Managed by RFMOs and bilateral commissions, the field is dynamic and intersects with various international laws. Despite threats like overfishing and climate change, recent management initiatives show that scientifically informed planning can improve fish stocks. Enhanced coordination among ocean governance bodies is essential for progress.
- n. The COLREGS 1972 are outdated due to autopilot and AI navigation. Assigning responsibility in autonomous vessel accidents is challenging. Legal analysis is needed to determine if current laws apply or need updates. New technology can automatically stop vessels in close quarters, but COLREGS don't emphasize this.

7.2 National Maritime Legal and Institutional Frameworks

- a. **Maritime Governance in Pakistan.** A range of authorities are often involved in the administration of maritime sectors, from fisheries to environment to maritime authorities to shipping industries to harbor industries. This mechanism is considered inadequate and incoherent and thus poses a serious challenge to for development of maritime sector. The establishment of a single Governance entity with certain powers and representatives from different sectors could decrease the institutional ambiguity that comes with the maritime sector being under a wide range of authorities such as fisheries, shipping, ports, maritime tourism, etc. Establishment of Maritime Regulatory Authority is strongly supported.
- b. **Effective Maritime Governance.** Nevertheless, effective governance in Pakistan's maritime sector requires coordination among various bodies, regular dialogue, and strong advocacy for law reforms. Poor governance leads to corruption and inefficiency, hindering development. A centralized communication framework among all maritime entities to improve coordination and ensure consistent application of policies is required to be established.
- c. **Active Role in Global Maritime Governance.** By actively engaging in international maritime forums and promoting itself as a responsible maritime nation, Pakistan can strengthen its role in shaping global maritime policies and standards Pakistan's candidacy for the IMO Council 2026-27 is an opportunity to showcase its commitment to sustainable maritime practices. Pakistan's transition will require significant international assistance, with IMO playing a pivotal role in facilitating technology transfer, funding, and global partnerships aimed at achieving common sustainability goals. Continued cooperation with the IMO through projects like SENSREC (Sustainable and Environmentally Sound Ship Recycling in Pakistan).
- d. **Personnel Training.** A comprehensive training program that includes all relevant personnel from different entities to enhance their understanding of mandatory IMO instruments is required to be developed.
- e. **Electronic Record Management.** A comprehensive electronic records management system to ensure the protection and integrity of maritime records is required amongst all entities of MoMA.
- f. **Harmonization of Laws with International Standards.** The process for incorporating international treaties into national law to ensure timely compliance with IMO obligations needs to be simplified. Merchant Shipping Ordinance and related laws to align with current international standards and

incorporate necessary amendments to IMO instruments is needed. Legislation is required to enable certain circulars and directives issued by DGPS and MMD to have binding authority. Ratification of International Labor and Seafarer Welfare Conventions in line with global obligations, to boost Pakistan's credibility and compliance with international norms is imperative.

g. **Compliance Monitoring.** A robust monitoring mechanism to evaluate the effectiveness of the strategies adopted for implementing IMO obligations is required.

h. **Sustainable and Green Shipping.** Maritime shipping is integral to the global economy. Over 80 per cent of goods are traded by ships. The International Maritime Organization (IMO) has made new regulations for sustainable green shipping. There is need to align Pakistan's Shipping and Shipbuilding industry as per emerging conventions and treaties. Gradually privatizing the national merchant ships fleet requires active consideration.

i. **Sustainable Shipbuilding & Recycling.** Pakistan needs to continue investing in sustainable shipbuilding, and technologies that promote efficiency and reduce environmental impact. The upcoming LNG, LPG, and methanol terminals at Karachi, alongside digitalization efforts and green maritime corridors. Pakistan needs to consider ratification of the MARPOL Annex-VI. There is a dire need for institutionalizing a government-level compliance mechanism in line with international conventions, including the HKC, as well as a focus on gender balance and inclusivity in the maritime workforce.

j. **Maritime Policies.** There is a need to adopt consistent long-term policies that are dynamic rather than static. The most important being revision of National Maritime Policy that must include each sector of the Blue Economy to ensure optimal use of ocean resources, rather than sticking to few ordinances and regulations. Input of stakeholders; having the responsibility of governance is of core importance to kick start Blue Economy in Pakistan. National Fisheries Policy (NFP), National Maritime Policy (NMP) and Merchant Marine Policy (MMP) are required to be strengthened for implementation by updating regulations and ensuring effective enforcement. Regular reviews and updates of these policies are required to address emerging challenges and to ensure sustainable resource management. At present there is no exclusive policy regarding Aquaculture. Formulation of comprehensive policy/strategy that includes establishing a robust regulatory framework, developing a national aquaculture policy, and scaling up production through cluster farming and Mariculture is required.

k. **Implementation of Sustainable Fishing Practices.** Sustainable fishing mean fishing in responsible way that prevent overfishing, minimize bycatch and maintain Biodiversity. There is a need to implement regulations as per international fishing standards to avoid overfishing. Pakistan can also

play its role in Indian Ocean Tuna Commission and also study and take action on the new High Seas Treaty. Effective implementation of this Treaty will rely on international cooperation, knowledge sharing and streamlined conservation goals.

l. **Small Scale Fisheries – Sustainable Practices.** Institutional frameworks to support small-scale fisheries and promote sustainable practices is required to be developed. A comprehensive consultation and coordination effort involving the Fisheries Board, Inter-Provincial Coordination Committee (IPCC), Customs, and the Ministry of Defense is essential to effectively address fisheries related issues.

m. **Federal and Provincial Jurisdiction Regarding Fishing.** Overfishing creates friction between Sindh and Balochistan post-18th amendment. Fishing beyond territorial waters is federal, while within 12 NM is provincial. Both provinces have grievances against each other and PMSA. Despite Fisheries Ordinances, there's no overarching policy framework or resources to implement regulations. Besides this, strategies for aquaculture and governance are lacking.

n. **Registration of Fishing Vessels.** There are overlaps between federal and provincial authorities in Pakistan. The Merchant Marine Department (MMD) handles vessel registration, while provincial fisheries departments issue fishing licenses, often without registration. MMD struggles to register all fishing vessels, highlighting limited monitoring capacity. Implementing a Vessel Monitoring System (VMS) could help, but data digitization is needed.

o. **Critical Examination of Fisheries Sector.** Fisheries sector's regulatory framework is required to be critically examined to implement a Vessel Monitoring System (VMS) with proper data digitization to improve monitoring and reduce corruption and to address post-18th amendment changes by clearly defining the roles and responsibilities of provincial and federal authorities in territorial and deep-sea fishing. Clarify and streamline the roles of Marine Fisheries Department (MFD) under DG Ports & Shipping to better coordinate with Provincial Fisheries Departments to avoid overlaps in vessel registration and fishing licenses. Besides enhancing MFD's capacity to register boats beyond 12 nautical miles.

p. **Review of Exclusive Fishery Zone Act.** The Exclusive Fishery Zone (Regulation of Fishing) Act of 1975 is required to be reviewed and updated to address current challenges and ensure regulatory clarity. Besides harmonizing fishing regulations between Balochistan and Sindh, especially regarding trawling limits.

q. **Illegal Jetties & Gujja Nets.** To Eliminate Illegal Jetties, alternative livelihood programs be developed for local fishermen to reduce reliance on

illegal jetties and unauthorized landing sites. Measures to control boat production and use of Gujja nets are required to be implemented to prevent overfishing and protect the shrimp season.

r. **Armed Fisheries Officials.** Safety concerns are required to be addressed by reviewing the decision to arm fisheries officials by Balochistan Fisheries Department and considering alternative measures and foster regular dialogue and coordination between federal and provincial authorities is essential to resolve ongoing issues.

s. **Jurisdiction issues PMSA/ PCG.** The jurisdictional authority between the Pakistan Maritime Security Agency (PMSA) and the Pakistan Coast Guard (PCG) is unclear. The PCG, established in 1973, predates the PMSA, which began operations in 1987. The PCG's marine company and a 2014 SRO by the Federal Board of Revenue (FBR) have further complicated seaward jurisdiction. The PMSA has broader enforcement powers, while the PCG's jurisdiction is land-based. Despite attempts to resolve the confusion, it persists due to vested interests and bureaucratic issues. Jurisdictional authority between PMSA and PCG is required to be clearly defined and delineated to avoid overlaps and confusion. Besides this revocation or amendment to the 2014 SRO by the FBR be considered to clarify seaward jurisdiction. Fostering cooperation and coordination between the PMSA and PCG is important to enhance enforcement and resource management.

t. **PMSA Resource Allocation.** Adequate resources are required for Pakistan Maritime Security Agency (PMSA) to monitor and combat IUU fishing, smuggling of oil, drugs, and weapons through sea routes.

u. **Climate Change.** Pakistan's maritime sector faces significant challenges from climate change, necessitating urgent reforms. The outdated National Maritime Policy (NMP) and weak implementation of the National Climate Change Policy (NCCP) fail to address current sustainability needs. Improved governance, data accessibility, and integration of climate adaptation strategies are essential. Pasni harbor has been closed since 2010 due to climate-related instability.

v. **Marine Pollution in Pakistan.** Marine pollution especially around Karachi, is caused by industrial discharges, municipal waste, agricultural runoff, and shipping activities. Only a small fraction of Karachi's wastewater is treated, leading to heavy metal contamination in coastal waters. Institutional challenges, including inadequate law enforcement and governance issues, exacerbate the problem. Oil spills further threaten marine ecosystems. The Pakistan Maritime Security Agency (PMSA) combats pollution through legislative and technological measures, but comprehensive reforms and international cooperation are needed to address these issues effectively.

w. **Wastewater Treatment Facilities.** To Combat Marine Pollution, wastewater treatment facilities in Karachi need improvements and strict enforcement of regulations on industrial discharges, municipal waste, and agricultural runoff is required.

x. **Adaptive Legislation - Technological Advancements.** Trade in maritime affairs depends on outdated laws needing overhaul to match technological and procedural advancements. This includes regulating ports for efficient cargo handling, governing ship operations and crew management, and safeguarding dock laborers' rights to align with global standards. Maritime laws be reviewed to reflect technological and procedural advancements, ensuring efficient port regulation, ship operations, crew management, and dock laborers' rights. Simplify the legislative process to reduce duplication and ensure clear, enforceable laws. Besides this modernization of laws governing judicial forums for maritime disputes be considered to incorporate current technological and procedural standards.

y. **Laws That Need to Be Updated.** The laws governing judicial forums for maritime disputes need comprehensive reform, as outdated legislation fails to address modern technological and procedural advancements. Maritime Zones Act 2023 is required to be updated to include provisions for autonomous vessel operations and drone usage in territorial waters. Section 2(e) of the Pakistan Maritime Security Agency Act needs to include "against" after "safeguard" for better resource protection. Amendment to Section 2(l) of the Pakistan Maritime Security Agency Act to align with the definitions in the updated Maritime Zones Act 2023. Alignment of Offshore Exploration Rules 2023 with the new Pakistan Maritime Zone Act 2023 is required. Merchant Shipping ordinance 2001 needs to include new protocol on load lines.

z. **Smuggling.** Oil, drugs, and weapons smuggling through Pakistani sea challenges the Pakistan Maritime Security Agency (PMSA) due to limited resources and lack of jurisdiction. Proximity to Afghanistan exacerbates narcotics trafficking. Money laundering through informal systems complicates enforcement. Despite government strategies, logistical constraints and lack of data hinder effectiveness. Iranian fuel smuggling is rampant, involving 2,000 skiffs and 4.4 million liters daily, with drugs and weapons also likely smuggled.

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