NON-TRADITIONAL SECURITY CHALLENGES TO BLUE ECONOMY: A CASE STUDY OF PAKISTAN

BY

RIFFAT

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SUPERVISOR

PROF. DR. SHABNAM GUL

DEPARTMENT OF INTERNATIONAL RELATIONS

LAHORE COLLEGE FOR WOMEN UNIVERSITY, LAHORE

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A Thesis submitted in partial fulfillment of the requirements for the degree of MS International Relations at the International Relations Department, faculty of social sciences, Lahore College for Women University, Lahore

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RIFFAT

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CERTIFICATE

This is to certify that the research titled "Non-Traditional Security Challenges to Blue Economy: A Case Study of Pakistan" submitted by Ms. Riffat under the supervision of Prof. Dr. Shabnam Gul is accepted by the Department of International Relations, Lahore College for Women University, in partial fulfillment of the requirement for the degree of MS in International Relations.

Signature: _____ Date: _____

Prof. Dr. Shabnam Gul

Supervisor

Verified By

Signature: _____ Date: _____

Prof. Dr. Shabnam Gul

Chairperson

International Relations Department

Signature: _____ Date: _____

External Examiner

Signature: _____ Date: _____

Controller of Examination

Dedication

I dedicate this thesis to

Mr. Muhammad Ashraf and Mrs. Kulsoom Bibi,

Prof. Dr. Shabnam Gul,

And

Mr. Hafeez-Ur-Rehman and Mr. Atiq-ur-Rehman

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List of Abbreviations

AIS	Automatic Identification System
ASEAN	Association of Southeast Asian Nations
BE	Blue Economy
BIMSTEC	Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation
BLA	Balochistan Liberation Army
CMF	Combined Maritime Forces
CO2	Carbon Dioxide
COP	Conference of the Parties (to the UNFCCC)
CPEC	China-Pakistan Economic Corridor
CSO	Civil Society Organization
DWT	Deadweight Tonnage
EEDI	Energy Efficiency Design Index
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
FAO	Food and Agriculture Organization (UN)
FATA	Federally Administered Tribal Areas
GDP	Gross Domestic Product
GIS	Geographic Information System
GLOF	Glacial Lake Outburst Floods
HST	Human Security Theory
IHL	International Humanitarian Law
IMO	International Maritime Organization

IO	Indian Ocean
IOR	Indian Ocean Region
IORA	Indian Ocean Rim Association
IPCC	Intergovernmental Panel on Climate Change
IR	International Relations
ISI	Inter-Services Intelligence (Pakistan)
IUU	Illegal, Unreported, and Unregulated (Fishing)
LEAs	Law Enforcement Agencies
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MDA	Maritime Domain Awareness
MLAT	Mutual Legal Assistance Treaty
MNCs	Multinational Corporation
MOMA	Ministry of Maritime Affairs (Pakistan)
MRV	Monitoring, Reporting, and Verification
MSI	Maritime Security Initiatives
MSP	Maritime Spatial Planning
MSS	Maritime Security Strategy
NGO	Non-Governmental Organization
NS	National Security
NTS	Non-Traditional Security
PN	Pakistan Navy
PSDP	Public Sector Development Program
R&D	Research and Development

SAR	Search and Rescue
SDGs	Sustainable Development Goals
SDP	Sustainable Development Policy
SDT	Sustainable Development Theory
TS	Traditional Security
TTP	Tehrik-e-Taliban Pakistan
UAVs	Unmanned Aerial Vehicles
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
WIO	Western Indian Ocean

Glossary

- **Blue Carbon**: Carbon stored in coastal ecosystems like mangroves and seagrasses.

- **Blue Economy**: Sustainable use of ocean resources for economic growth and ecosystem health.
- **Blue Growth**: Economic growth based on sustainable ocean and coastal resource use.
- **Capacity Building**: Developing skills, knowledge, and infrastructure to improve maritime governance.
- **Chokepoint**: A narrow and strategic maritime route where sea traffic is concentrated and vulnerable to disruption
- **Climate Change Adaptation**: Adjusting natural or human systems to minimize harm from climate impacts.
- **Climate Resilience**: Ability of systems to adapt to and recover from climate impacts.
- **Coastal Erosion**: Loss of shoreline due to natural forces or human activity.
- **Coastal Vulnerability**: Susceptibility of coastal areas to harm from environmental and human pressures.
- **Coastal Zone Management**: Integrated approach to managing coastal areas, balancing environmental, social, and economic interests.
- **Disaster Risk Reduction (DRR)**: Strategies to reduce damage from natural hazards like storms or floods.
- **Ecosystem Services**: Benefits humans derive from ecosystems, including food, climate regulation, and recreation.
- **Environmental Security**: Linking environmental issues to peace, conflict, and human well-being.

- **Exclusive Maritime Zones**: Sea areas where a coastal state has special rights (e.g., EEZ).
- **Fisheries Management**: Regulation of fishing to sustain marine life and resources.
- **High Seas**: Areas of the ocean beyond national jurisdiction
- **Human Security**: Protection of people from economic, environmental, and social threats.
- **Hydrography**: Study of ocean features for navigation and maritime planning.
- **Illegal Maritime Migration**: Unauthorized sea-based movement of people across borders.
- **Illegal, Unreported, and Unregulated (IUU) Fishing**: Fishing activities that violate laws or regulations, harming marine resources.
- **Integrated Maritime Policy**: Coordinated management of ocean-related sectors and challenges.
- **Mangroves**: Coastal forests that protect shorelines and support marine life.
- **Marine Biodiversity**: Variety of species and ecosystems in ocean environments.
- **Marine Debris**: Human-created waste that ends up in the ocean, causing environmental harm.
- **Marine Pollution**: Introduction of harmful substances into ocean waters.
- **Marine Protected Areas (MPAs)**: Zones designated to conserve marine ecosystems and biodiversity.

- **Marine Spatial Planning (MSP)**: Organizing human activities in marine areas to reduce conflict and protect ecosystems.

  Maritime Boundary Disputes: Conflicts over jurisdiction and rights to marine areas between countries.

- **Maritime Infrastructure**: Physical structures like ports, docks, and navigation aids are essential for maritime activities.
- **Maritime Law (Admiralty Law)**: Legal framework governing shipping, navigation, and marine commerce.
- **Maritime Security Complex Theory**: A Framework explaining interconnected maritime threats in a region.
- **Maritime Surveillance**: Monitoring sea activities to detect threats, illegal activities, or environmental changes.
- **Maritime Terrorism**: Use of violence or threats at sea to achieve political or ideological goals.
- **MARPOL**: International Convention for the Prevention of Pollution from Ships
- **Naval diplomacy**: The use of naval forces to achieve diplomatic objectives, foster international cooperation, and promote peace without engaging in conflict.
- **Ocean Acidification**: Decrease in ocean pH caused by absorption of excess atmospheric CO2, harming marine life.
- **Ocean Energy**: Renewable energy sources derived from ocean waves, tides, and

- currents.
- **Ocean Governance**: Legal and institutional management of marine areas and activities.
- **Ocean Literacy**: Understanding of the ocean's influence on people and vice versa.
  Piracy: Unauthorized acts of robbery or violence committed at sea against ships or crews.
- **Port Security**: Measures to protect ports from crime, terrorism, and illegal trade.
- **Port State Control (PSC)**: Inspection regime to ensure foreign ships comply with international safety and environmental standards.
- **Sea Lines of Communication (SLOCs)**: Key maritime routes essential for global trade and naval movement.
- **Seafarers' Rights**: Legal protections and welfare measures for individuals working at sea.
- **Search and Rescue (SAR)**: Operations to find and assist people in distress at sea.
- **Smuggling**: Illegal transport of goods or people across borders by sea.
- **Strategic Waterways**: Key maritime routes essential for global trade and security.
- **Sustainable Development**: Meeting current needs without compromising future generations.
- **Sustainable Fisheries**: Fishing that preserves stocks and marine ecosystems.
- **Sustainable Tourism**: Tourism that conserves natural environments and benefits local communities.

- **Tran's boundary Pollution**: Pollution that originates in one country but crosses into another via air or water.
- **Transnational Crime**: Criminal acts like piracy or trafficking that cross maritime borders.

Abstract

The attention to security is reorienting from traditional also known as state-centric approaches to broader, non-traditional approaches centered on multifaceted and transforming global concerns. In the way that the 20th century was underpinned by the extraction of oil from land, the 21st century will be shaped by the Blue Economy. The Blue Economy, which involves the sustainable use of marine and maritime resources for economic growth, human development, and ecological preservation, has earned greater attention for coastal nations like Pakistan. With extensive coastal zones and strategic spots, Pakistan has strong prospects to grow sectors like marine tourism, shipping, fisheries, and port infrastructure. This research is to assess Pakistan's Blue Economy prospect by critically analyzing the evolution of policies, measures, and strategic initiatives executed throughout PM Imran Khan's Tenure (2018-2022). The importance of this research lies in investigating in which manner these non-traditional security threats (Such as Climate change, Maritime terrorism, piracy, illegal fishing, and smuggling) affect the sustainable development of Pakistan's Blue Economy. Using a descriptive approach, the research adopts primary and secondary data collection methods, based on semi-structured interviews, panel discussions, attending relevant conferences, as well as a systematic literature review. This mixed-method framework allows giving an in-depth knowledge of the challenges and strives to support policy-making recommendations that integrate economic growth with maritime security to foster sustainable Blue Economy progress in Pakistan.

Key words : Blue Economy, Climate Change, Piracy, Maritime Terrorism , Security

1.1 Introduction

The notion of the Blue Economy has undergone substantial changes since the 2030 Agenda for Sustainable Development was adopted by states. The Blue Economy initially focused mostly on socio-economic development, but it has now broadened to include a wide range of commercial endeavors that are connected to the seas either directly or indirectly. The Blue Economy is now commonly acknowledged as a key force behind sustainable development. It can generate wealth as well as support global economic systems that promote environmental protection and social equality. Yokova et al (2021) mention that the Blue Economy is currently the seventh largest economy globally, which highlights its amplifying significance on the global stage. The Blue Economy's central industries include waste disposal, mining (resource extraction), tourism, food, renewable energy production, fisheries, maritime transportation, maritime infrastructure, and the search for new marine resources. The United Nations Commission for Sustainable Development, as per the 2012 UNRIO+20 summits, main goals emphasized the need for innovative strategies for realizing the Blue Economy.

Over a long span, the ocean has been a source of well-being and coupling, economies all around the world. Nearly 38% of people on earth live 100 kilometers or shorter distance from the shores. It was indicating how important the seas are in figuring out how society settles and engages in commerce. As the planet's leading ecosystem, the oceans contain 97% of all water and are home to 80% of all living species. In 1980, the consumption of Oil and gas from the ocean floor made up 20% around the world, which is up from 30% in 2014. On that account, the Blue Economy is essential for supporting environmental and economic stability worldwide and entails a wealth of undiscovered resources.

The Blue Economy is evolving and is better known in many countries all over the world. In efforts to improve their maritime policies, some have even featured it on their national agenda. For Pakistan, the maritime sector has huge potential for economic development and regional connectivity. Pakistan has a 1050 kilometers coastline and an Exclusive Economic Zone (EEZ) of over 290,000 square kilometers. Regardless of these geographical advantages, Pakistan's Blue Economy now accounts for roughly $ US$1 billion, or 0.4% of its GDP. This contribution is scant in comparison to the massive untapped potential of its maritime capital. According to the evaluation, the total global Blue Economy is valued at over USD 24 trillion, but mankind is presently getting just around $US 5-6 billion each year. South Asian nations, namely India and Bangladesh as for now generate billions of dollars in revenue from their blue economies.

In contrast, Pakistan's Blue Economy produces just $US 450 million each year. However, the real potential of Pakistan's Blue Economy is expected to attain USD 100 billion (BOP, 2022). Fisheries are crucial to Pakistan's Blue Economy, along with the country's immense marine biodiversity, offering an abundance of fish species vital for both local and international export. The maritime sector is important to Pakistan's economic development, accounting for around 95% of total trade. This point out the significance of the country's ports and shipping facilities as crucial elements of the global supply chain. Pakistan's primary ports, such as Karachi port, Port Qasim, and the upcoming Gwadar port, are not just vital commercial hubs for Pakistan but also landlocked Central Asian countries.

Pakistan's strategic position strengthens its ability to grow as a maritime power. Its position at the Arabian Sea bifurcation makes it an important bridge between the Middle East, central Asia, and south Asia (Jehan, Kasi & Qadir, 2019). The development of Gwadar port under the flagship of China- China-Pakistan Economic Corridor (CPEC)

program, Pakistan has an exclusive chance to position itself as a vital center for international and regional commerce, cooperation, and connecting east and west. Regardless of the vast consideration provided by its maritime resources, Pakistan's Blue Economy is noticeably untapped. Many non-traditional security problems hinder the fulfillment of its capabilities. Among these issues are maritime terrorism, climate change, and unregulated exploitation of marine resources, piracy, and transnational smuggling (CPSD, nd). These challenges cross state boundaries and impose a serious threat to the far-reaching viability and expansion of Pakistan's Blue Economy.

Maritime terrorism is an intensifying problem for Pakistan's Blue Economy, mainly considering its strategic ports and trade routes. Trade stability and economic security are threatened by the terrorist strikes that target cargo vessels, offshore settings, and maritime infrastructure. However, there has yet to be much piracy in Pakistan's waterways, but raids by pirates remain frequent throughout the area, notably in the Arabian Sea and the Gulf of Aden. Such activities hazard the security of the sea lanes of communication and interfere with marine commerce. Additionally, threats to regional security, terrorism, and piracy deject foreign investment, which is important for the growth of Pakistan's Blue Economy, a maritime infrastructure. Another critical non-traditional challenge to the Blue Economy is climate change. Pakistan's coastal areas and marine resources are instantly threatened by the ramifications of climate change, which encompass rising sea levels, harsh weather conditions, and the degradation of marine ecosystems.

The potential of Pakistan's tourist and fishing sector may be threatened by some critical issues, including the effects of ocean acidification, species decline, and coral reef degradation. As well, the stability of coastal locales and important infrastructure, two elements that are essential to the Blue Economy, are at risk due to the intensification of climate-induced natural disasters like cyclones and flooding. Overfishing and various

marine reserves are key problems impacting Pakistan's Blue Economy. Fishing populations have been shrunken, and marine environments have been worsened as a result of insufficient control, evaluation, and enforcement of fishing activities. Illegal, unreported, and unregulated (IUU) fishing techniques make the issue worse and threaten Pakistan's fisheries sustainability in the long run. Pakistan must ratify strict fishing policies, monitoring, and surveillance, as well as encourage appropriate resource management with the aim of lessening these problems.

To vow that Pakistan's maritime resources are exploited properly and that future generations may take advantage of them. Pakistan's maritime zones are also emphatically threatened by transnational smuggling, which encompasses the trafficking of weapons, drugs people. Because of its rewarding location along important international maritime trade routes, the nation is continuously targeted by illegal activity. Smuggling jeopardizes economic growth, disrupts regional stability, and erodes Pakistan's law enforcement. From an economic viewpoint, it results in large revenue losses as smugglers sidestep taxation and customs techniques, thereby undermining the nation's capacity to accumulate import and export tariffs and taxes.

An inclusive and extensive strategy that includes enforcement of marine laws, regional cooperation, investment in resilient infrastructure, and a commitment to sustainable practices will be vital to ensure the preservation and sustainable coordination of these resources. Pakistan's Blue Economy can just reach its complete potential if these challenges are resolved; assuring its position as a maritime center that fosters regional integration, economic advancement, and environmental sustainability.

1.2 Problem statement

The concept of Blue Economy has attracted a lot of fascination in the twenty-first century as a sustainable paradigm for attaining long-term economic growth via the efficient use of the abundant resources provided by rivers, lakes, seas, and oceans. Together, these bodies of water, known as blue resources, have the capacity to significantly boost a country's economic growth by sustaining a range of industries, including fishing, renewable energy, tourism, and marine transportation. Between 2020-2030, the United Nations (UNO) has designated this time frame as the decade of ocean science for sustainable development, with the goal of halting the deterioration of aquatic ecosystems and advancing sustainable marine resources management.

Regardless of its significance, the Blue Economy faces a number of obstacles that restrict it from reaching its optimum potential, particularly in nations like Pakistan. However, in light of Pakistan's advantageous coastline location across the Arabian Sea, the Blue Economy's current 0.4% share of the national economy is excessively low. This point out a substantial inconsistency between the economic benefits that blue resources provide and their current potential. Comparing Pakistan's Blue Economy to those of other coastal states of South Asia, it has performed poorly in terms of supporting economic growth, creating jobs, and increasing commerce and exports. The coastal region, which should be flourishing because of the wealth of marine resources available, has seen weak economic development, unemployment, and poverty worsens as a result of this underperformance.

Traditional and non-traditional security challenges further exacerbate Pakistan's marine security. While India, a neighbor, is the conventional threat, the Blue Economy's sustainability is seriously threatened by non-traditional concerns, including smuggling, illicit, unreported, and unregulated (IUU) fishing, climate change, and maritime

terrorism. In addition to having an impact on the safety of maritime resources, these challenges also impede trade and the general expansion of the maritime sector. Therefore, the primary issue is the inadequate squeezing and handling of these unconventional threats that hinder Pakistan's Blue Economy. Strategies to deal with these issues must be enhanced immediately in order to assurance that the nation can thoroughly use its maritime resources, promoting economic development and sustainable growth. Moreover, to analyze the setbacks these non-traditional security concerns present to the growth of Pakistan's Blue Economy. This research aims to contribute a thorough framework for relocating from limited resources to abundance. By stressing sustainable growth, the research anticipation to support the formation of policies and provide solution that stimulates Pakistan's Blue Economy potential to be understood.

1.3 Research Questions

1. How do Contemporary concepts of Blue Economy differ from the traditional Ocean economy?
2. How do Non-traditional security challenges threaten Pakistan's Blue economic growth?
3. What are the main sectors that exemplify the potential of the Blue Economy in the context of Pakistan?
4. What formalized policy structure was introduced throughout 2018-2022 by the Former PM Imran Khan administration to institutionalize Blue Economy growth in Pakistan?

1.4 Research Objectives

The primary objectives of this research are:

- To give a conceptual understanding of the term Blue Economy by taking into view its origin and its difference from traditional concepts
- To analyze the extent to which Imran Khan's government (2018-2022) supports the Blue Economy integration in Pakistan
- To investigate the different Non-traditional challenges faced by the Blue Economy of Pakistan.

The secondary objective of this research is:

- To elaborate on the significance of the Blue Economy in setting out to achieve Sustainable Development Goals (SDGs) 13 and 14.
- To define the major sectors and potential of the Blue Economy with reference to Pakistan.
- To highlight the possible impacts of climate change and Maritime terrorism on different sectors of Pakistan's Blue Economy.

1.5 Literature Review

The main objective of this review is to identify and investigate the existing knowledge framework regarding the security issues to Pakistan's maritime and coastal wealth and how these issues impacted the growth of its Blue Economy. To establish the applicability and quality of the works contained in the review, define inclusion and exclusion criteria are set up. The inclusion criteria emphasize specific peer-reviewed articles, books, and reliable reports that cover components of the Blue Economy, maritime defense, and non-traditional security challenges concerning Pakistan or similar regions. As well as Studies that identify the impact of environmental hazards, maritime terrorism, climate change, and illegal fishing are mainly focused.

(Pauli, G, 2011) The idea of the Blue Economy surfaced in the early 2000s, harmonizing with a global transformation towards sustainability and environmental protection. It became prominent as a model that proponent for the sustainable exploitation of marine resources for economic development, services, and improved livelihood, at a same time safeguarding the health of marine ecosystems. The term Blue Economy itself was introduced by Gunter Pauli, a Belgian entrepreneur and eco activist, in his noteworthy book "The Blue Economy: 10 years, 100 innovations, 100 Million jobs" (2011). In this book, he suggests a model that attempts to align economic growth with ecological protection. At the crux of Pauli's perspective for the Blue Economy is the vision that economic progress can and should take place in balance with nature. A part of the important aspects of Pauli's perspective is the focus on deploying natural processes and ecosystem services as an element of industrial processes. This model aligns intimately with the concept of a circular economy, in which the goal is to create a cyclic system where waste is curtailed, and commodities are reused, renewed, and repurposed. The Blue Economy, as envisioned by Pauli, is based on the doctrine of the circular economy.

(UNEP, 2012) A significant report that assisted in defining the Blue Economy in more concrete terms was the Green Economy in a blue world report published by the United Nations Environment programe (UNEP) in 2012. This report sought to illustrate the potential of the Blue Economy as a tool for sustainable development, proposing a model that incorporated both green economy principles and marine ecosystems. The report showcases in what ways the Blue Economy could foster inclusive growth by offering job opportunities and wealth from marine resources. As well as overcoming ecological decline, and ensuring the perpetual sustainability of marine ecosystems. As stated by the UNEP report, the Blue Economy is out of the parameters of the exploitation of marine resources but about innovative management ways that ensure resource regeneration, economic growth, and environmental

stability.

(Sarker et al. 2018) They established a conceptual framework for blue growth, stressing that achieving the SDGs demands a joint effort from all stakeholders in the ocean-based economy. Blue growth refers to the sustainable management of ocean resources for economic growth, better livelihood, and jobs. The study points out key sectors such as fisheries, maritime transport, aquaculture, coastal tourism, and marine renewable energy as critical to blue growth. Sarker et al. underscored that to foster blue growth and meet the SDGs, cooperation among different stakeholders, including governments, businesses, local communities, researchers, and environmental organizations, is significant. Governments must form policies and a regulatory framework that promote the sustainable use of ocean resources and ensure adherence.

Researchers assist in evidence-based decision-making and environmental organizations advocate for conservation and ecosystem wellness. The study stressed that the success of blue growth relies on the collective efforts of various actors in balancing economic growth with environmental protection.

(Soma et al., 2018) In 2018, a study was conducted by Soma et al. on the European Union's integration of a blue growth framework, which aims to support sustainability and economic growth in European oceans and seas. The initiative's goals are to utilize maritime and marine assets through promoting their responsible use and long-term sustainability. The study emphasizes the significance of community innovation in achieving the targets of blue growth, revealing that reforms in governance and resource allocation are critical to fostering sustainable actions. Social innovation refers to modifying the behavior of different stakeholders, like government agencies, enterprises, the local population, and NGOs, to support joint efforts and develop a novel approach to managing coastal resources. Soma et al. highlight that the success of blue

growth in the EU depends on promoting trust, improving communication, and fostering collaboration among these diverse groups. They finalized that achieving blue growth requires not just technological and economic progress but also a transition in social dynamics and stakeholder relationships to affirm the sustainable management of marine and maritime resources.

(Atmanand et al. 2018) This study emphasized the potential of the Blue Economy to boost significant growth in India, especially in coastal and maritime industries. They focused that technological innovation is essential for safeguarding coastlines and mitigating the ramifications of natural disasters, including cyclones and tsunamis. The study insists upon the improvement of innovative early warning systems that could predict and alleviate the effects of such disasters, thereby securing coastal communities and industries that depend on these ecosystems. The researchers also point out the importance of monitoring technologies to monitor the health of the coastal ecosystem, mainly coral reefs. Coral reefs play a vital role in biodiversity, coastal protection, and fisheries; however, they are vulnerable to challenges like climate change, pollution, and overfishing. Atmanand et al. endorsed for advanced tracking system to collect real-time data on the coral reef situation and allow for timely interventions to preserve these key habitats. Through the adoption of these technologies, India could enhance protection of its coastline, support sustainable utilization of marine resources, and ensure long-term economic development in harmony with environmental safeguards.

(Voyer et al, 2018) A work carried out by Voyer et al. investigates the governance issues rooted in the Blue Economy as well as different non-aligned stances on the concept. They point out that though the Blue Economy has notable potential for fostering sustainable growth but its effective execution is fraught with obstacles. A major point of contention is the lack of a universally accepted definition of the Blue

Economy, which gives rise to different opinions over how ocean assets should be managed and whose concerns should be prioritized. The researcher highlights the three pillars of the sustainable approach that support the Blue Economy is ecological sustainability, economic development, and social justice. This approach provides a structure for balancing the demand for economic growth with the urgency of protecting marine ecosystems. Despite these, the critics claim that market-driven solutions such as the privatization and capitalization of marine resources could challenge shared goals. They highlight that these approaches may disproportionately favor large firms and developed states while neglecting the needs and rights belonging to the local communities, primarily in developing states. Considering these, Voyer et al. stress the importance of small-scale fisheries as an essential part of the Blue Economy.

(Modayil, 2019) Research by Modayil in 2019 investigates the increasing importance of ocean resources as a result of the depletion of land-based resources, fueled by urbanization and the expanding global population. As land-based resources become scarcer or harder to access, the ocean has revealed itself as a vital source for food, energy, and raw materials. His study also explores the negative impacts of climate change on aquaculture, a sector heavily dependent on ocean health. Rising temperatures, unpredictable weather patterns, and ocean acidification have contributed to dropping fish stocks and disturbance in marine ecosystems, threatening the feasibility of aquaculture. In spite of these issues, Modayil emphasized the potential of the Blue Economy as a pivotal force primed to accelerate both sustainable economic development and environmental protection. By utilizing ocean resources responsibly, the Blue Economy can assist in managing the risk associated with resource depletion and environmental degradation, thereby allowing countries and industries to grow while preserving the vitality of the ocean.

(Spalding. J. M, 2020) A study conducted by Mark J. Spalding in 2020 adopts a broader, worldwide point of view on the Blue Economy, focusing on the intensifying pressure on marine and shoreline habitats from pollution, excessive exploitation, and global warming. Spalding expressed that the Blue Economy signifies a transformation distant from traditional and Unsustainable maritime industry towards a more ecofriendly process that can promote ocean well-being as offering economic growth and social norms. He furthermore points out the significance of concise definitions and refers to the distinction between activities that call for support of ocean sustainability and those that weaken it. In the view of Spalding, the Blue Economy goes beyond traditional maritime industries such as fishing and shipping, but also emerging sectors including marine biotechnology, marine renewable energy, and coastal tourism. These domains have the possibility to grant new economic potential while contributing to ocean preservation measures. In contrast, the rapid increase in these industries must be closely eye on to avoid harmful ecological consequences, like pollution, environmental degradation, and overexploitation of marine resources. Spalding advocates for the development of a governance structure that can cover the entire spectrum of services provided by marine habitats. This includes services like carbon uptake, waste management, and recreation-related advantages, which are key to determining the sustainable development of ocean-based initiatives.

(Lee. H.K., 2020) One of the primary efforts in the literature on the Blue Economy is the analysis of Ki-Hoon Lee, Junsung Noh, and Jong Seong Khim (2020), who examined the bond between the Blue Economy and the United Nations Sustainable Development Goals. In their investigation, they emphasize that the Blue Economy is in sync with several SDGs, primarily SDGs 14 (life below water), which emphasize maintaining and sustainably exploiting ocean resources. The authors suggest that while the Blue Economy holds great promise for promoting economic growth, it must be

thoroughly managed to ensure that it does not contribute to environmental deterioration or aggravate existing inequalities. They also emphasize the need for balancing economic development with environmental resilience, pointing out that economic advancement in ocean-based sectors, such as marine tourism, offshore energy, and fisheries, can place considerable stress on marine ecosystems if not coordinated responsibly. The research by Lee, Noh, and Khim (2020) emphasizes the complex and interrelated nature of the SDGs, pointing out that the Blue Economy has direct ramifications not only for SDG14 but also for SDG15, which focuses on the need for biodiversity preservation, which is intimately tied to the health of marine ecosystems.

(Roy. A, 2020) In 2020, Aparna Roy, in the scope of the Indian Ocean region, examined the growing relevance of the Blue Economy as an action for sustainable growth in the region. The IO is hosting about 1/3 of the world's population, several of whom are heavily dependent upon marine resources for their livelihood. The region is also facing a significant environmental crisis, including ecological damage, pollution, and overfishing, which puts at risk the long-term sustainability of marine resources. These problems are made worse due to regional fragility to climate change, which causes an instant effect on the well-being of the marine ecosystem and the sectors that depend upon it. Roy highlights that the Blue Economy could serve as a lane toward long-term growth in the IO region by encouraging sensible exploitation of ocean resources. Even so, she highlights several obstacles to the effective plea of the Blue Economy, such as a weak governance system, limited regional collaboration, and an inability to lead marine resources productively.

(Rao, A.I., 2020) In 2020, a central idea presented by Vice Admiral (Retd) Iftikhar Ahmed Rao in his book "Elements of Blue Economy" was that oceanic and coastal assets can be bedrock for long-term economic growth. It is a notable and timely effort

towards both policy and scholarly literature. The idea of the Blue Economy, as mentioned by Rao, highlights the incorporation of economic development, ecological sustainability, and ocean governance. His analysis is primarily important with regard to developing countries, including Pakistan, where coastal and maritime resources remain underleveraged, though with vast potential. The author argues that by way of strategic funding in sectors such as fisheries, port infrastructure, marine tourism, and shipping, and through coordination with global frameworks like the UNCLOS and Sustainable Development Goals (SDGs), states can achieve balanced economic advancement.

(Shahzad. M, 2020) In 2020, Dr. Sajid Mehmood Shahzad's in his book "Impact of Pakistan Maritime Affairs on Blue Economy in the Backdrop of CPEC," underscores the crucial significance of the Blue Economy littoral nation, primarily Pakistan. The analyses point out how strategic application of maritime resources, including fisheries, port infrastructure, shipping, and maritime tourism, can play a major role in national economic development, employment growth, and food security. He outlined the Blue Economy as a well-rounded opportunity for nations to broaden their economies, decrease reliance on traditional sectors, and improve regional integration through initiatives such as CPEC. The book additionally points out the strategic aspects of maritime affairs, stressing that states with have vigorous ocean economy sector can secure their maritime borders, protect resources, and exert expanded influence in regional geopolitics.

(Montemayor. C, 2018) In 2018, Cisneros-Montemayor et al studied what way global economy can achieve balanced and sustainable results through the implementation of the Blue Economy. The researchers utilize a fuzzy reasoning framework to integrate multiple factors and assess the fairness, feasibility, and sustainable development of Blue Economy projects. This study emphasized that states with effective governance,

well-developed infrastructure, and minimal corruption have a greater possibility of achieving sustainable and inclusive outcomes in their Blue Economy initiatives. But this research additionally indicates that states facing political instability, underdeveloped infrastructure, or widespread corruption may face challenges in fully tapping the potential of the ocean Economy and might find it is difficult to ensure that the advantages are allocated fairly. The researchers offer that decision makers should engage local people, different Stakeholders, and researchers throughout the planning process and implementation of Blue Economy approaches to ensure that they are built on a fact-based approach.

(Bax et al.2021) This study investigates the political and environmental issues associated with adopting the Blue Economy by concentrating on case studies from coastal countries such as New Zealand and Myanmar. Their research highlights the difficulties countries face in moving from a traditional Business as Usual (BAU) model described by an emphasis on economic growth, barren of environmental consideration, towards an approach that is connected with the Sustainable Development Goals (SDGs). They unveiled that fostering the Blue Economy required leveling economic development with maintaining ecological balance and sustainable resource allocation, a challenging dilemma that varies across states, relies on institutional capacity, political commitments, and environmental awareness. In each state (New Zealand and Myanmar), the transition to sustainable practices was unclear and involved tackling major political, economic, and ecological barriers. These examples stress the necessity for a flexible governance framework and willingness to address the problems of shifting to a more sustainable ocean economy.

(Agarwala, 2022) He points out the potential of maritime renewable energy sources such as tidal wave and ocean thermal energy as primary elements of the Blue Economy.

Although these energy sources hold great pledge for sustainable energy production, the research reveals the significance of conducting comprehensive environmental impact evaluation before implementing ocean-derived energy projects. These analyses are critical for realizing and mitigating the potential impacts on marine ecosystems, like marine life, habitats, and biodiversity. Agarwala emphasizes the significance of collaboration between the public and private sectors to exploit the potential of marine renewable energy. Public-private partnerships are considered vital for providing the essential funding, expertise, and infrastructure; meanwhile, international cooperation can assist in standardizing best practices and speeding up the development of marine energy technologies. The study highlights that many marine areas with considerable renewable energy capacity remain underexplored, and collective efforts from various stakeholders are necessary to ensure the responsible and sustainable growth of ocean-based energy.

Systematic literature review of some important literature on the Blue Economy

Author, year	**Title**	**Objectives**	**Methodology**	**Findings**
Gunter Pauli, 2011	" The Blue Economy: 10 years, 100 innovations, 100 Million Jobs"	The primary objectives of this book were to introduce and promote the concept of Blue Economy as an innovative model that	Pauli adopts a qualitative approach by discussing case studies of businesses and initiatives that implement Blue Economy principles.	The book suggests that the Blue Economy can significantly contribute to job creation, poverty reduction, and environmental restoration.

		aligns economic growth with environmental sustainability.		
RIO+20, 2012	“ uture we want”	To promote the adoption of the Blue Economy and its integration into development plans. And stress the need for a renewed focus on the role of ocean biodiversity and natural resources in sustainable development.	The method behind the creation of the document was a combination of collaborative diplomacy, stakeholder engagement, and evidence–based decision making. It involved inclusive negotiations among UN member states, civil society, and international experts.	The results of the RIO+20 conferences were summarized in the outcome, which emphasized a global commitment to sustainable development and poverty eradication.
Fayyaz, N, & Salman, A 2023	“Blue Finance: What is it and Why Does It Matter for Pakistan?”	To assess Pakistan's potential to leverage blue finance instruments in	The article utilizes a qualitative approach, drawing on policy documents, case studies, and global examples of blue	Pakistan lacks a cohesive framework for managing its Blue Economy.

				The article
		its Blue Economy.	finance.	emphasizes the need for a clear policy and institutional structures to ensure that blue finance is effectively implemented.

Syed .R & Safdar. A, 2022	"Revisiting Blue Economy: Challenges and Prospects for the Maritime Sector of Pakistan"	To evaluate the challenges and opportunities within Pakistan's maritime sector, particularly regarding the Blue Economy.	The article takes a descriptive qualitative approach, analyzing existing data, reports, and studies on Pakistan's maritime sector and its potential for Blue Economy development.	Despite its vast coastline and resources, Pakistan's maritime sector remains underdeveloped. Fisheries are a major contributor, but the sector is hindered by overfishing, a lack of modernization, and poor governance.

Aijaz. M, H.O.Nooreen & Abbas A,2024	"Deep Dive into Pakistan's Ocean Economy: An Evaluation of Performance and Constraints"	To evaluate the current performance of Pakistan's ocean economy.	The article adopts a qualitative research methodology, synthesizing secondary data from various studies, reports, and global case studies.	By enhancing fisheries management, improving infrastructure, and adopting sustainable marine practices, Pakistan can unlock substantial economic growth in its coastal regions.
Naz & Rashid,2024	"Unveiling the maritime opportunities: analyzing the Blue Economy potential within the framework of the China-Pakistan Economic Corridor"	To explore Pakistan's Blue Economy potential in the context of the China-Pakistan Economic Corridor (CPEC), emphasizing the enhancement of maritime	The authors employ qualitative research methods, utilizing descriptive and exploratory approaches to assess how CPEC can bolster Pakistan's maritime sector.	This study contributes valuable insights into the integration of maritime opportunities within CPEC, advocating for a balanced approach that promotes economic growth

		capabilities through CPEC initiatives.		while preserving marine ecosystems.
Hussain, 2022	“Pakistan’s Blue Economy Potential, Challenges and Prospects"	To provide an in-depth analysis of Pakistan's maritime resources and the potential of its Blue Economy.	Employs a qualitative research approach, analyzing existing literature, policy documents, and strategic reports to assess Pakistan's Blue Economy.	The vast potential of Pakistan's Blue Economy advocates for a unified approach to overcome existing challenges. By adopting strategic initiatives and fostering collaboration, Pakistan can transform its maritime sector into a significant economic engine.

Table 1.1 Systematic Literature Review

Source : Author

1.6 Research Methodology

The non-traditional security issues that Pakistan’s Blue Economy faces are covered in this study. A mixed approach method was applied to fix the problem. By using a mixed

strategy, we were able to answer the questions using both qualitative and quantitative techniques. In order to understand complicated human-ocean interactions, it is evident that both quantitative and qualitative methodologies are becoming increasingly required (Nielsen and Dhaen, 2014; Bennett and Dearden, 2013).

The gathering, analysis, and interpretation of quantitative data in terms of numbers and amounts is not enough to reveal and elucidate in more depth the underlying causes of human cognition, emotion, and action. Therefore, a mixed technique provides a rational foundation, methodological adaptability, and a thorough comprehension of lesser and more complicated issues (Maxwell, 20160.

1. Research Design

The descriptive research design was utilized to provide a deeper grasp of the Blue Economy idea. Descriptive research offers a foundation and a starting point for subsequent studies. Because it may provide light on policy creation, program planning, and decision making, we chose a descriptive study design. Different regions may face different issues related to the Blue Economy. Through descriptive study, localized issues in certain seas or coastal regions might not be widely recognized might be found, enabling focused action. According to Neuman (2013), descriptive research is the best method for investigating these relatively recent and little-studied issues. It enables you to grasp the nature of these difficulties and document them methodically without having to change any variables. This method is especially helpful when the issues at hand are not fully understood or in the early phases of development.

2. Data Collection

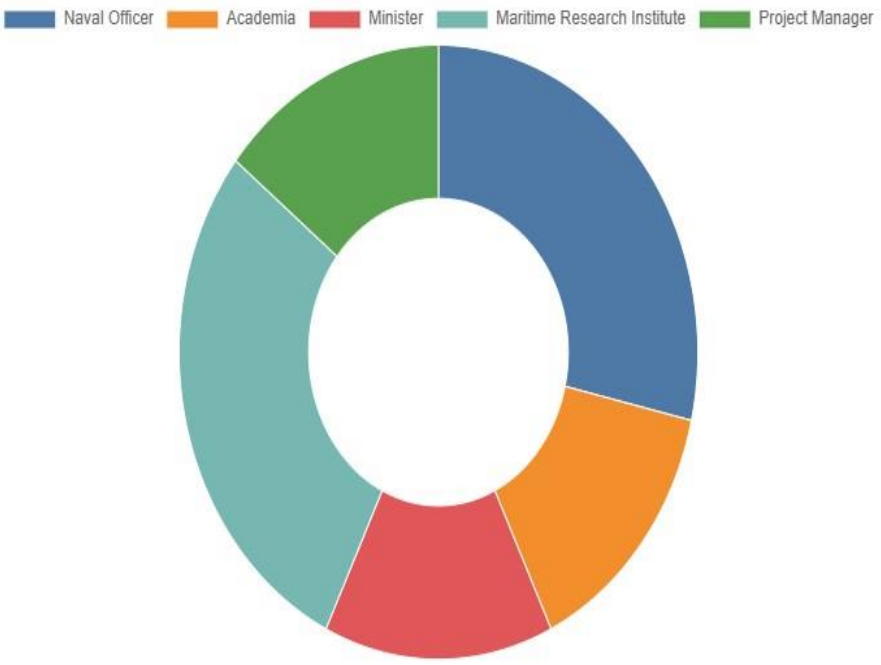
This thesis utilizes both primary and secondary sources. Primary data includes semistructured interviews, official policy statements, official press releases by government ministers and official policy documents .

Primary Data

To enrich, expert perspective on the Blue Economy, qualitative data was obtained via written and face-to-face interviews together with practitioners in the maritime sector. Interviews were adopted as a primary method as they offer participants to give a comprehensive, nuanced observation made from their domain-specific knowledge and experience, which plays a key role in exploring complex, diverse topics such as maritime sustainability and economic growth.

Sampling

Altogether, 7 experts were determined by purposive sampling, purposive sampling is used when we need participants of specific quality and characteristics. Respondent incorporating individuals from naval institutions, maritime research organizations, and academia. Below are their professional Distribution



Interviews: In some cases, as an alternative to conducting live interviews, respondent were given a set of semi-structured questions, which they answered at their convenience. The interview questions adopted in this analysis are outlined in Appendix I. This technique was utilized to facilitate respondents' busy schedules and to stimulate deep thinking, reflective answers.

Focused Group Discussion: Additionally, to get a specialist opinion, the author participated in a Focused group discussion (see Appendix II). Focused Group Discussions help to explore complex behavior, attitudes and motivation that are not easily capture by survey. Participant usually builds on each other responses and group dynamics, leading to the deeper insight. The distribution of speakers by sector and origin is summarized in Figure 1.2 and 1.3 .

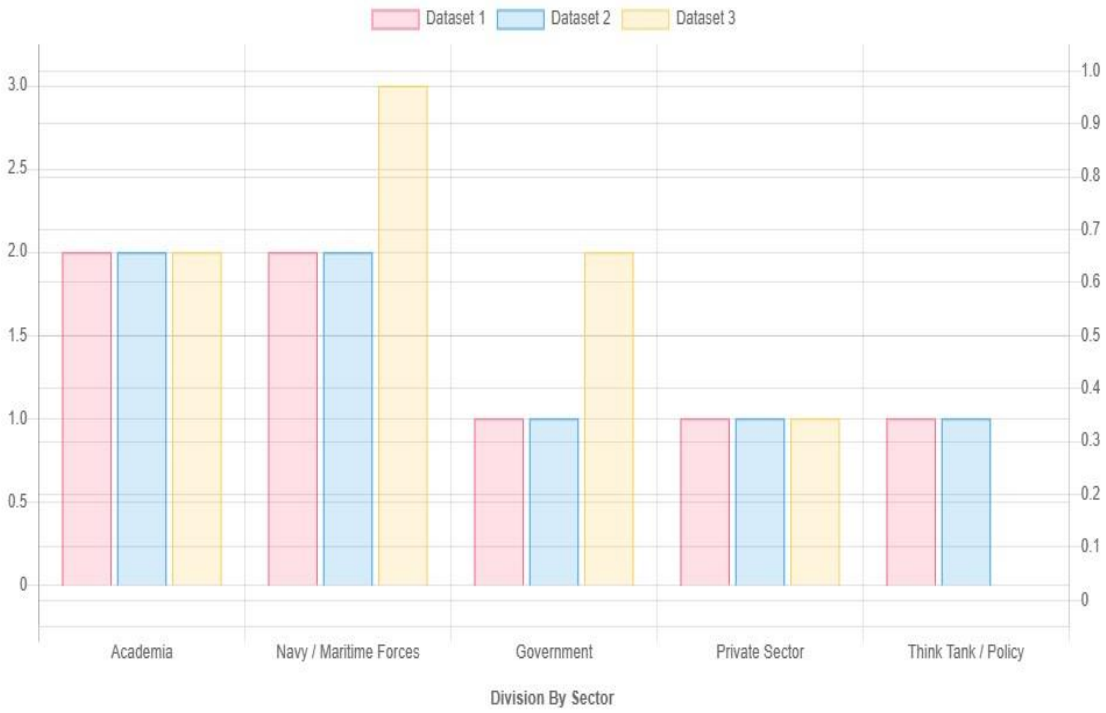


Figure 1.2 : Division of Participants by Sector

Source Developed by Researcher

To understand the Global trends in Blue Economy and Non-traditional security challenges , the data gather from both national and International experts .

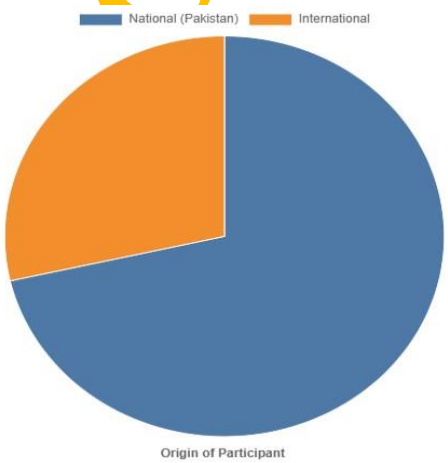


Figure 1.3: Origin of Participants Source:

Developed by Researcher These sessions

offer further settings and support to

validate key themes emanating from the interviews. Views from the panel and conference were recorded via comprehensive notes and used to augment the written data. Every participant was informed of the research purpose, and their authorization was obtained prior to taking part. Below is distribution of participant of focused group discussion on the bases of expertise.

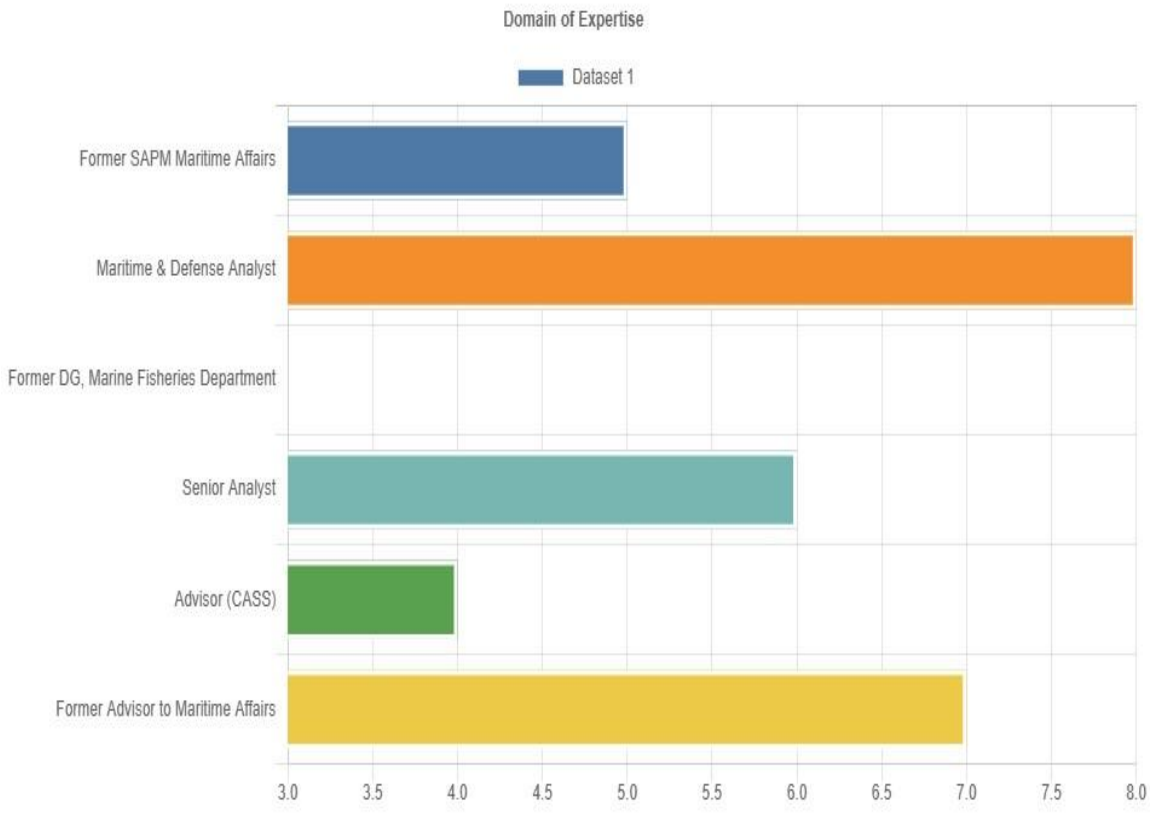


Figure 1.4: Domain of Expertise

Source : Developed by Researcher

Secondary Data

In order to examine the non-traditional security challenges facing Pakistan's blue economy, this research adopts a secondary data collection method through a comprehensive literature review.

Systematic Literature Review: The collection of secondary data involved systematic literature reviews conducted at desks. In order to identify and evaluate research, a systematic literature review employs precise, predetermined criteria, guaranteeing an impartial and open procedure. This is critical in an area like the Blue Economy, where biases may readily permeate research if not thoroughly controlled, and where there are several stakeholders (government, enterprises, NGO, and local people). During the Literature assessment the Material studied by Researcher is

- Academic writings
- Government Reports
- Press Release
- Policy Papers
- Issue Briefs
- Media Reports

3. Data Analysis Technique

Thematic analysis was used to analyze both primary and secondary data. It enables researchers to extract information from descriptive resources, such as interview transcripts, in order to identify patterns and similarities, providing valuable insights. Thematic analysis is a flexible approach that can be utilized in a collection of research frameworks and is appropriate for search themes that are present through data collection (Braun and Clarke, 2006).

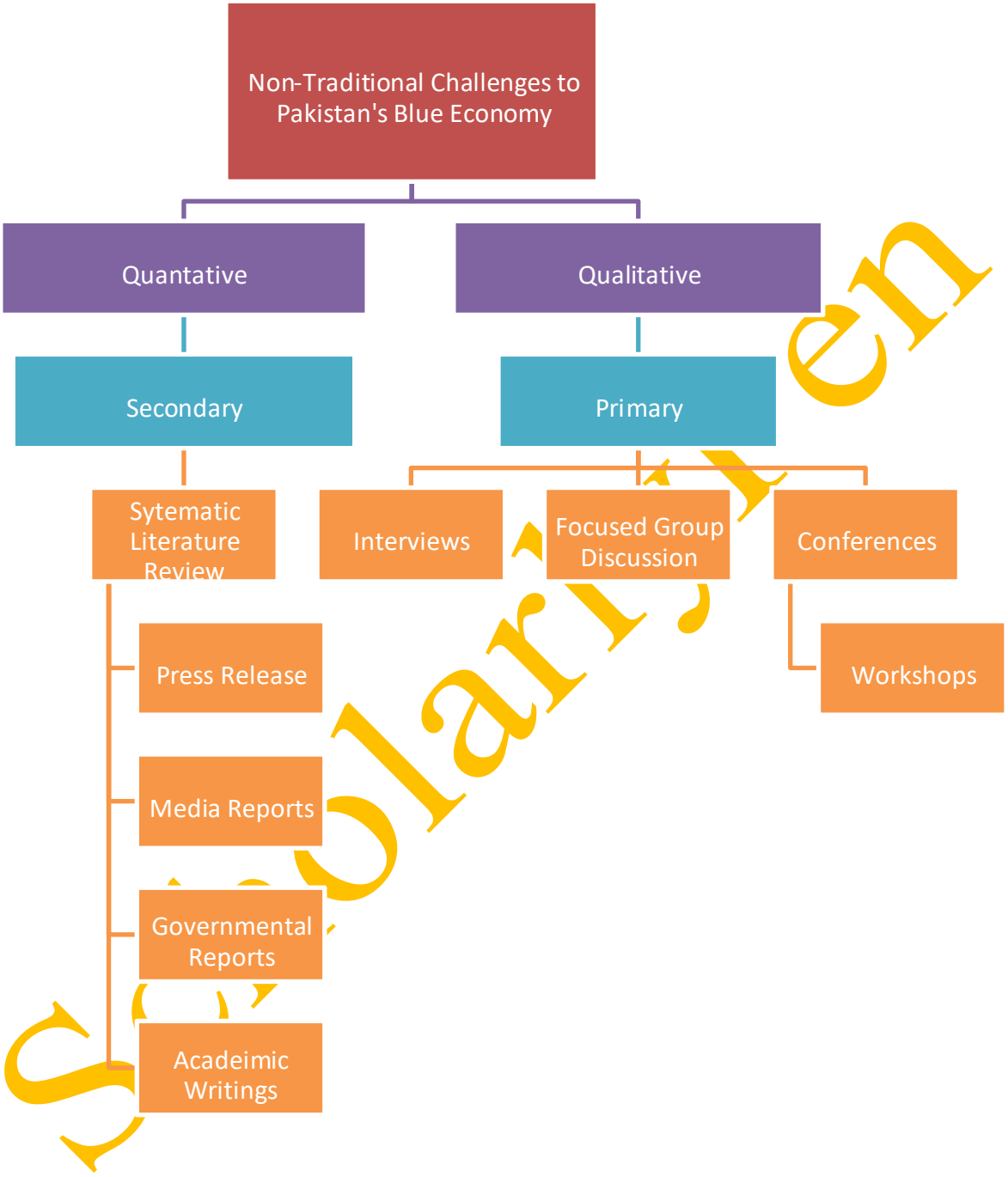


Figure 1.5: Research Methodology
Source : Developed by Researcher

1.7 Plan of study

Chapter 1: Introduction

This chapter describes the Blue Economy idea, spotlighting its rising relevance to global and national economies, with a particular focus on Pakistan. The chapter will offer a thorough overview of Pakistan's marine resources and in what manner they could promote economic development. The introduction will outline the main research concepts, aims, and methods will lay the blueprints for the rest of the study. Eventually, this chapter will offer a brief description of the thesis structure, leading the reader along the research process and chapter arrangement.

Chapter 2: Theoretical and Conceptual Framework

This chapter will provide the theoretical framework for reviewing the Blue Economy by means of integrated lenses of sustainable development theory and Human security theory. Further, the chapter encompasses a conceptual framework to point out the significance of safeguarding people and social groups from non-traditional security challenges, including climate change, overfishing, maritime terrorism, smuggling, and the deprivation of coastal livelihoods.

Chapter 3: The Blue Economy of Pakistan: History and Potential (2018-2022)

This chapter will offer a brief historical background of the concept of Blue Economy in the context of non-traditional security issues in Pakistan's Blue Economy. The chapter notably analyzes the measures carried out by former Prime Minister Imran Khan (2018–2022) to advance the Blue Economy within the national policy discourse.

Core policy considerations initiatives adopted by the (MOMA) Ministry of Maritime Affairs, like the formulation of a National Blue Economy Policy, the restoration of port infrastructure, boosting of maritime awareness, and measures to address (IUU) fishing. This chapter indicates the latent possibility within Pakistan's Blue Economy.

Chapter 4: Non-Traditional Security Challenges Blue Economy: A Case Study of Pakistan (2018-2022)

This chapter will pinpoint the conceptual understanding of traditional and nontraditional security as well as thoroughly analyze non-traditional security issues that affect Pakistan's Blue Economy. The chapter will apply different case studies, qualitative research, and accessible statistics to explore the whole scope of each challenge. It will also examine present policy solutions to these threats; make clear their effectiveness, and find options for improvement.

Chapter 5: Conclusion

The last chapter will offer an overview and principal conclusion of the research, containing the primary non-traditional security challenges that have been discovered and how they influence Pakistan's Blue Economy. Realistic recommendations will be made, with stress on methods to lessen the difficulties that have been found.

1.8 Significance

The significance of this research is that it tackles different crucial and hitherto untouched elements that have a direct impact on the growth and sustainability of Pakistan's Blue Economy. Simultaneously, considerable attention has been placed on the potential economic benefits of the Blue Economy. Especially in the context of natural resources, trade, and marine industries, little attention has been paid to the specific security threats and risks that Pakistan faces to gain the complete potential of its maritime resources.

Researching the interconnection of these non-traditional challenges and Pakistan's Blue Economy offers gathering comprehensive understanding of the threats to which the

country is vulnerable, as well as actionable realization into how to minimize these issues. The study aims to contribute to the fabrication of efficient maritime policies and implementation mechanisms that will assist Pakistan's Blue Economy progress while securing its marine ecosystems. Potent governance is important for allowing commercial activities like fishing, shipping, and offshore resources exploitation to develop without threatening environmental sustainability or national security. By paying attention to the regulatory and institutional frameworks necessary to solve these difficulties. Our research can have a guiding influence on Pakistan's ability to protect its maritime assets and assure the progress of its Blue Economy.

1.9 Delimitation

This research is limited to a probe of the non-traditional issues confronting Pakistan's Blue Economy, with an attention on rising challenges such as climate change, marine pollution, maritime terrorism, IUU fishing, and piracy impeding sustainable capital management. The study categorically excludes traditional security issues, such as territorial struggles and military conflicts, which are commonly labeled as maritime security concerns. The study's emphasis is on the governance, policy, and environmental perspective of non-traditional difficulties, neglecting traditional security issues and more general regional security threats.

Theoretical and Conceptual Framework

2.1 Overview

This chapter offers a theoretical and conceptual framework for realizing and addressing the concerns related to Pakistan's Blue Economy by synthesizing the principles of human security and sustainable development. The theory of sustainable development provides a fundamental perspective, underlying the significance of aligning economic development, environmental protection, and social equity. It calls for long-range solutions that promote the prudent management of ocean resources, supporting eco-stability as promoted by economic and social development. In addition to this, the human security framework provides a wider, people-centered security strategy that moves the spotlight from traditional and state-centric aspects related to the security and uplift of individuals and the population. It covers a spectrum of nontraditional threats, including resource scarcity, socio-economic vulnerability, and environmental degradation, which directly impact human welfare and the livelihood of coastal communities. Through the fusion of these two theoretical models, the chapter develops a multifaceted approach to maritime governance.

This holistic blueprint supports the drafting of regulations that are both ecologically driven and collaborative, understanding the mutual reliance between environmental stewardship and human well-being. The chapter commences by analyzing the traditional definitions and attributes of the coastal economy, marine economy, maritime economy, and ocean economy. It considers the ways in which these concepts have developed progressively and their areas of interaction with one another yet continue to differentiate by their economic activities and primary domains.

Through defining a clear distinction between these concepts, the chapter gives the foundation for a more subtle grasp of the Blue Economy. The next part of the chapter examines thoroughly the idea of the Blue Economy itself, focusing specifically on its

wider and more holistic method. Compared to the more precisely defined economies outlined above, the Blue Economy focuses on sustainability, ecological protection, and social consideration. Further, this chapter investigates the traditional and nontraditional sectors within the framework of the Blue Economy.

2.2 Key Definitions of Blue Economy

Different stakeholders define the Blue Economy in various ways. These definitions reflect diverse perspectives and priorities.

- According to the Ocean Climate Action Plan, the Blue Economy is the balanced utilization of ocean assets to better livelihoods and employment, by taking into account the health of ocean ecosystems. It indicates economic operations that are ocean healing and coastal ecosystems, as well as promotes wider economic opportunity, and eliminates activities that majorly lead to greenhouse gas emission or threaten them.
- As Blue Economy defined by UNECA (2016), is which concept that promotes long-term and equitable economic development through the use of every domain of seas, oceans, lakes, and rivers.
- The United Nations in 2017 defined the Blue Economy entails several economic sectors and framework that affect the sustainability of marine and maritime resource utilization.
- According to the World Bank, the Blue Economy is the sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of the ocean ecosystem.
- European Commission defines it as "All economic activities related to oceans, seas, and coasts. It covers a wide range of interlinked established and emerging sectors.

- The Commonwealth of Nations considers it an emerging concept that encourages better stewardship of our ocean or blue resources. Conservation International adds that the Blue Economy also includes economic benefits that may not be marketed, such as carbon storage, coastal protection, cultural values, and biodiversity.
- The Indian Ocean Rim Association (IORA) is a regional governance organization that strongly advocates for Blue Economy cooperation and governance to preserve the oceans' resources for future generations. According to IORA Blue Economy will contribute towards food security, poverty alleviation, the mitigation of and resilience to the impact of climate change, enhanced trade and investment, enhanced maritime connectivity, enhanced diversification, job creation, and socioeconomic growth.
- The center for the Blue Economy says" it is now a widely used term around the world with three related but distinct meanings- the overall contribution of the oceans to economies, the need to address the environmental and ecological sustainability of the oceans, and the ocean economy as a growth opportunity for both development and developing countries.
- The FAO definition has a focus on livelihood and promotes the concept of a Blue Economy as a coherent approach for the sustainable, integrated, and socioeconomically sensitive management of oceans and wetlands, focusing on capture fisheries, aquaculture, ecosystem services, trade, and social protection of coastal communities.

After a comprehensive analysis of various definitions of Blue Economy by different scholars and organizations, some common points are finds below in

(Figure 2.1)

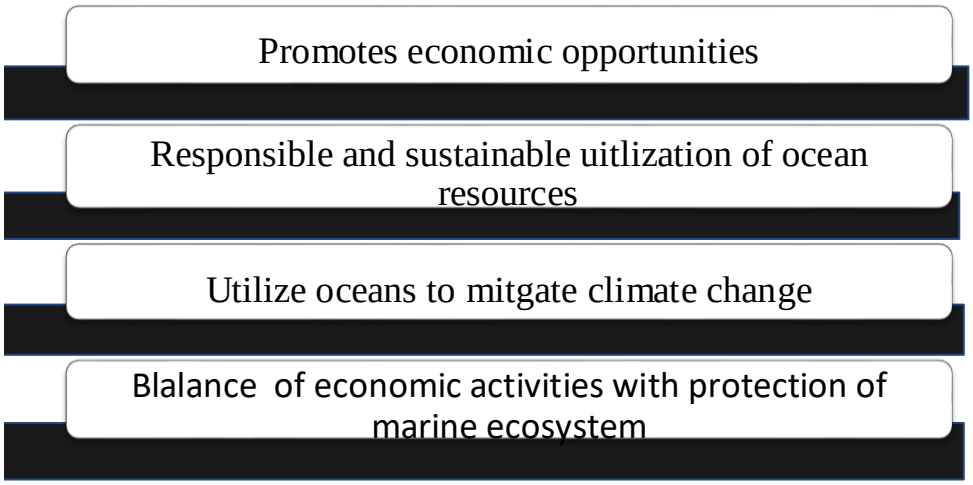


Figure 2.1: Key commonalities in definitions of Blue Economy

Source: Developed by author; sources listed in Appendix IV

Evaluating these different definitions indicates that while standpoints on the Blue Economy fluctuated slightly in emphasis, a noticeable and consistent core idea: the Blue Economy mainly focuses on the ecologically sound and responsible utilization of marine and coastal resources to cultivate economic development, improves livelihoods, and affirms environmental resilience. Definitions from WWF and Keen et al. point out the critical integration of development and ecological sustainability, promoting an inclusive approach to mutual sharing and sustaining ecological health. In parallel, institutions such as NOAA and the State Department of State, stressing the tangible economic findings like job creation, energy production, and food security, which show the Blue Economy's contribution to backing human well-being.

The integration of innovative financing and structural reforms in Ebarvia's definition shows the demand for proactive governance to balance between economic and environmental goals adequately. Benzaken et al. emphasize the global policy consideration of the Blue Economy, at the same time recognizing challenges in practical implementation. In collaboration, these definitions imply that the Blue Economy is a

holistic concept covering social, economic, political, and ecological dimensions, calling for unified efforts across domains to attain sustainable ocean progress.

2.3 Conceptual Framework

The term Blue Economy has attained greater importance in contemporary discussions about sustainable growth and the upcoming development in ocean governance. Even so, its definition, still under debate, especially when it is in relation to other terminology like the ocean economy, coastal economy, ocean economy and marine economy (see table 2.1). Despite some common ground in their activities they describe, the way they are conceptualized and the implications they carry vary significantly, causing notable analytical challenges in making a clear distinction among them. This complicated nature, along with the tendency to blend these ideas in both academic debate and policy considerations, triggers important queries about the clarity and functionality of the Blue Economy as a foundational roadmap for searelated economic tasks. The "Blue Economy" is commonly portrayed as a thorough and unified strategy to ocean governance, with the intent to balance economic development, environmental protection, and social justice.

Sr. No	**Economy Type**	**Definition**	**Examples**
1	**Blue Economy**	Balanced utilization of ocean resources for economic development, environmental health, and social justice.	Eco-tourism, Sustainable fisheries, offshore energy

2	**Ocean Economy**	Economic practices based on the ocean commonly give less attention to sustainability.	Commercial fishing, oil drilling, seabed mining,
3	**Marine Economy**	Ocean-based industries are concerned with resource consumption and industrial benefits.	aquaculture, Shipping,
4	**Coastal Economy**	Economic practices in coastal areas promote local community well-being and livelihoods.	Coastal tourism, local fishing, and small-scale aquaculture
5	**Maritime Economy**	An economy grounded in ocean or sea transport, ports, and a naval support system.	Shipping, building and breaking, port operations, transport

Table 2.1 Definition of core maritime terms

Source: Based on data from UNCTAD, 2014 & Fabinyi et al., 2021

The United Nations Conference on Trade and Development (UNCTAD, 2014) points out the Blue Economy as a model that promotes sustainable utilization of ocean capital for economic growth while maintaining and retention of marine environment.

Yet, the implementation of this framework is highly complicated, and the idea continues to undergo various interpretations.

This wider spectrum of interpretations gives rise to ambiguity, making it hard to simply delineate the Blue Economy from other relevant notions. The obstacles in framing and distinguishing between the Blue Economy and similar terms also emerge from the lack of uniformity in the treatment of these concepts adopted by various stakeholders.

Governments, academics, NGOs, and business owner often interpret the term in markedly different ways, according to their priorities (Fabinyi et al., 2021).

This difference in understanding results in a fragmented interpretation of what the Blue Economy is and the manner in which it is applied, further impeding efforts to define a clear, cohesive plan for its deployment.

2.3.1 Interpretation of concept by Silver et al.2015

The idea explored by Silver et al. in 2015 is mainly discourse-based, which indicates the various narratives or perspectives of several stakeholders, like environmental NGOs, the corporate sector, high-income states, and small island countries. In 2018, Voyer et al. Provide a revised observation-based view that evaluates real-world practice and domains that lie in the Blue Economy, which moves the conversation from abstract discourse to tangible, real-world applications. The four lenses stated in the text illustrate diverse perspectives or priorities related to the ocean's contribution to the economy and community (as represented in Figure 2.2). The four lenses are

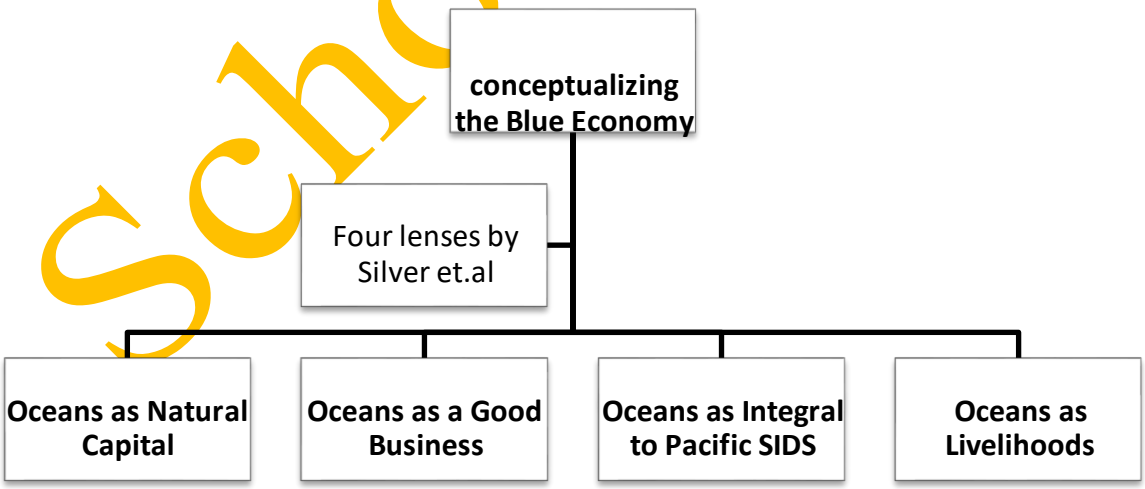


Figure 2.2 Conceptualizing the Blue Economy

Source: Silver et.al 2015

Oceans as Natural Capital: This paradigm focuses on the oceans, particularly serving as a foundation of ecosystem services that are required to be protected. The main objective is preserving biodiversity and the long-term stewardship of marine resources to uphold them for the next generations. This perspective is fueled by environmental aspects and highlights the intrinsic significance of oceans, which is immeasurable merely by their growth potential. While this viewpoint is key for the safeguard of marine ecosystems, it commonly overlooks the well-being of coastal and island people who depend upon ocean resources. Stringent preservation regulations may periodically set limits on local economic undertakings, resulting in friction between nature preservation and community-based advancement.

Oceans as a Good Business: This paradigm focuses on the ocean as a venue for economic commercialization and revenue generation. Industry domains, like fisheries, trade, shipping, tourism, and oil extraction, are key to this lens. Developed states, commonly with the financial ability to allocate resources to ocean-based business, drive this model to stimulate development and growth. On the other hand, the marketdriven business can lead to economic growth, but it mostly contributes to the overexploitation of marine resources and environmental hazards. These techniques can lead to short-term economic benefits over long-term availability, which can cause ecological degradation, including overfishing, environmental destruction, and marine pollution. In addition, it may neglect the socio-economic effects on local stakeholders and local fishers who are subject to larger and more powerful players in the market.

Economic and Cultural Development: This spotlights the ocean's important role in the cultural and economic growth of the Pacific Island state. These countries depend upon the ocean not only for economic benefits, like fisheries and tourism, but also for

cultural belonging, social unity, and environmental mitigation. The ocean is framed as both a source of economic well-being and a part of the islanders' tradition and culture. The uncommon obstacles faced by SIDS are commonly marginalized in wider Blue Economy discourse driven by developed states.

The economic concerns of SIDS are commonly at odds with those of developed states, which may seek advanced ocean resource exploration or tourism that does not regularly uphold local needs and eco-friendly practices. Additionally, climate change effects, just like coral reef destruction and rising sea levels, which further complicate the association between SIDS and the ocean, make ensuring the protection and sustainable utilization of marine resources even more crucial.

Oceans as Livelihoods: This lens highlights the oceans' pivotal for supporting the livelihoods of island and coastal societies that lean on fishing for food security and financial resilience. The priority is given to promoting sustainable, traditional fishing practices that can boost local well-being while playing a role in poverty reduction. Pay attention to local fisheries is vital, give attention to the need to make sure that coastal communities take advantage of ocean resources. Though ecological aspects commonly take a supporting role in this approach, they might bring about overfishing or resource depletion if not handled responsibly. In addition, small-scale fisheries are commonly at risk then the larger-scale profit-driven pressure of the private sector, and without necessary assistance, they may struggle to sustain their way of life.

2.4 Theoretical Understanding

The idea of the Blue Economy has developed into a vital domain for a country's progress, notably for coastal states such as Pakistan. Including the sustainable exploitation of marine resources for economic development, enhanced living standards,

and ecological health, Pakistan's Blue Economy possesses transformative power. Even so, this potential is growingly limited by a set of non-traditional security threats such as climate change, illegal fishing, smuggling, and maritime insecurity. Within this multifaceted and interrelated landscape, the classic approach to development and security falls short. In place of theories of human security and sustainable development, provide a more inclusive and delicate, and nuanced analytical model to understand and tackle these emerging challenges.

The sustainable development exemplar, as put forward by the World Commission on Environment and Development (WCED) in 1987 which argues for a balance triad: environmental integrity, financial stability, and social inclusivity. Within the framework of Pakistan's Blue Economy, this theory extended beyond the normative assertion as well as integral to the overall strategy. Pakistan's coastal and marine ecosystems, including fisheries, mangroves, and coral reefs which are facing mounting pressure because of overexploitation, climate-induced transformation, and pollution. Such habitats are at the same time economic resources and ecological survival.

From a rational perspective, sustainable development provides a system-based strategy that recognizes the relationship between ecological health and economic growth. As an example, overfishing might enhance short-term revenue but result in long-term stock depletion, threatening food security and means of living. Pollution caused by industrial runoff might facilitate urban economic hubs but wipe out marine biodiversity and tourism prospects. Hence, the sustainable development theory uncovers the false binary between economic gain and environmental oversight, promoting the policies that integrate environmental costs and strive for lasting resilience instead of short-term exploitation.

Even though sustainable development offers the in situational logic for reform, the framework of human security introduced a fundamental individual-centric orientation. According to the United Nations Development Program 1994, human security switches attention from territorial security to the safety and well-being of humans from prolonged threats like poverty, environmental degradation, and social inequalities. In the case of Pakistan's Blue Economy, this transition is notably significant.

Coastal communities in Pakistan are more heavily impacted by climate-induced vulnerabilities, including sea-level rise, floods, saline intrusion, and cyclones. Additionally, communities that rely on traditional fishing face critical risk posed by illegal, unreported, and unregulated fishing strategies adopted by industrial fleets. These go beyond merely ecological or economic problems; these are also security threats which eroding people's basic rights, livelihood, and sovereignty. The human security model encourages policymakers to raise questions, like Security from what? Or Security for whom? Security from what**?** It supports measures that enhance community resilience, balanced access to assets, and integrated decision-making. Critically, human security uncovers the flaws that are usually covered u by statecentric development and microeconomic models. It is by sustainable development through stressing participatory governance, social equality**,** and justice between generations, which is a key principle and essential for a long-term blue growth strategy.

2.4.1 Sustainable Development Theory

The sustainable development framework is a holistic model that aims to harmonize economic growth, social equity, and environmental sustainability to affirm the prosperity of both present and next generations. This idea has evolved gradually in response to intensify fear about the adverse effect of uncontrolled industrialization, environmental devastation, and social injustice .knowing the historical roots, evolution,

and relevance of this theory is vital to comprehend its importance in today's global setting .traditionally, the foundation of sustainable development exist in conventional practices of indigenous groups that focused on harmony with nature and prudent management of resources. However, it was only practice before the Industrial Revolution that called for a formal theory of sustainable development to come into view.

Over this duration, rapid industrial expansion triggered widespread exploitation of natural capital, pollution, and environmental degradation. Founding scholars like Thomas Malthus expressed worries about population expansion and the planet's insufficient means to support humanity (Malthus, 1798). This apprehension paved the way for later green movements. The modern discussion around sustainable development began to take shape in the mid-20th century. Environmental disasters, population pressures, and scientific warnings prompted public concern and political action. The publication of Silent Spring by Rachel Carson in 1962 brought attention to the harmful effects of pesticides and highlighted the interconnection between human activity and environmental health (Carson, 1962). This was followed by the 1972 report *The Limits to Growth* by the Club of Rome, which used computer models to show how exponential economic and population growth could lead to resource exhaustion and environmental collapse if no changes were made (Meadows et al., 1972).

A major turning point in the evolution of sustainable development theory came with the 1987 publication of the Brundtland Report, titled *Our Common Future*. Following the Brundtland Report, sustainable development gained international recognition and policy momentum. The 1992 Earth Summit in Rio de Janeiro was a landmark event where countries adopted Agenda 21, a comprehensive plan for sustainable action globally (United Nations, 1992). The summit also popularized the concept of the three

pillars of sustainable development: Economic Sustainability, Social Inclusion, and Environmental Protection. This integrated approach became the foundation for future international agreements and national policies. Over the years, sustainable development theory has continued to evolve. The adoption of the Millennium Development Goals (MDGs) in 2000 marked an effort to address global poverty, health, and education, with indirect links to sustainability (United Nations, 2000). This was expanded further with the 2015 launch of the Sustainable Development

Goals (SDGs), a set of 17 interconnected goals designed to address a broad range of global challenges, from climate action and clean energy to gender equality and responsible consumption (United Nations, 2015). The SDGs represent a more comprehensive and inclusive approach to sustainable development, recognizing the complexity and interdependence of global systems.

A key area of sustainable development is the principle of the Blue Economy, which draws attention to the sustainable use of ocean and maritime assets for economic development, refined livelihoods, and the health of the marine ecosystem. The Blue Economy corresponds fully to sustainable development's goals(SDGs) to foster economic activities like fisheries, maritime trade, renewable ocean energy, and tourism, while maintaining the preservation of the marine ecosystem and biodiversity (United Nations, 2017). It admits the ocean's crucial role in food security, climate protection, and global economic development, emphasizing the need for systematic management practices that balance progress with ecological care. The Blue Economy stands as a real-world example of sustainable development trends in marine and ocean contexts, helping to deal with both environmental threats and socio-economic growth in coastal populations (OECD, 2016).

Promoting sustainable blue innovation leads to a cleaner production, low-carbon jobs, and new intellectual economies correspond to the goals of Agenda 2030 and SDGs, especially goals 14, 13, and 1 (Life below Water, Climate Action, and no poverty). From an ecological perspective, the Blue Economy supports nature naturebased approach like marine protected areas, regulating fishing techniques, pollution decline, and ecosystem preservation. These practices help to sustain ocean biodiversity, low carbon emissions, and boost the oceans' capacity to alleviate climate change. Green marine operations also help make certain that natural resources such as coral reefs and fish stocks sustain output and tough over time. In terms of coast, the Blue Economy fosters enduring development by committing capital to ocean sectors, including renewable marine energy, eco-tourism, green agricultural practices, and maritime transport.

Such domains generate revenue and jobs, mainly in the coastal population, while reducing environmental harm. Through the development of these sectors, states can expand their economies, overcome poverty, and increase resistance to environmental and market jolts. It exemplifies the unification of ecosystem sustainability with economic progress and social integration, the main foundation of sustainable growth. Moreover, the Blue Economy confronts various Non-traditional security threats that challenge its sustainability and endurance.

2.4.2 Human Security

The theory of human security has gone through a deep transformation beyond its classic state-centric view, extended to include a broad range of risks to individuals and populations. Primarily focused on military defense against foreign attack, the perception of security evolved substantially. But after the Cold War, realizing that menaces to individual well-being often emanate from economic uncertainty,

environmental erosion, social injustice, and other non-military threats (UNDP, 1994). Human security, hence understood as the protection of people's liberation from fear and want, places a strong focus on economic stability, personal security, food security, health security, environmental security, and community security (as shown in fig2.3). This human-focused model emphasizes that security extends across geopolitical lines, focusing on the multifaceted and interdependent challenges that impact daily life (Tadjbakhsh & Chenoy, 2007). This enlarged concept is especially pertinent when taking into account the Blue Economy that encourages the sustainable use of marine and coastal resources to stimulate economic growth, improve means of living, and protect the ocean ecosystem (OECD, 2016). The Blue Economy goals to ensure sustainable economic progress with environmental protection, which ensures that marine resources are utilized without undermining the health of the oceanic environment or the prosperity of present and future generations. Since millions of people worldwide rely on marine assists for food, cultural identity, and employment, the Blue Economy fundamentally overlaps with human security via connected sustainable resource coordination with community and economic strength.

The association between human security and the Blue Economy develops into particular importance in the context of non-traditional security challenges that put at risk the long-term viability of marine environments and the economic resources that they maintain. Such threats, including overfishing, trafficking, pollution, climate change, and piracy) is poses direct and indirect threats to coastal populations and states' economies identical For example, in the Arabian Sea, IUU fishing has become a significant obstacle, depleting fishing resources that play a crucial role in food security and local commerce (FAO, 2020). Overfishing not just reduces biological assets but also poses a risk to the economic security of small-scale fishers dependent on these populations, thereby increasing social fragility and endangering community harmony.

Ecological degradation associated with pollution is another critical issue in the Arabian Sea (Khan, A., 2025). Expanded shipping activities and coastal urban growth have caused the influx of pollutants and plastic discarding, which negatively affect marine biodiversity and ecological function. Oil spills and industrial discharge, moreover, aggravate environmental risks, jeopardizing the well-being of fisheries and tourism sectors, both essential parts of the Blue Economy (Halpern et al., 2015). These ecological stresses reduce ecological stability, increasing the fragility of coastal communities to economic crises and food shortages, which are core matters in the human security framework.

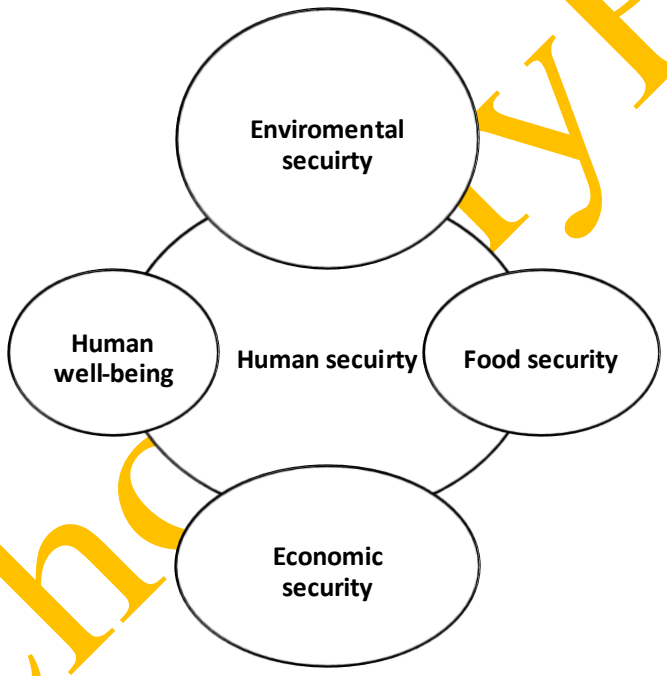


Figure 2.3 Understanding Human Security

Source: Author, compiled using information from different sources (Appendix V)

In addition, the Arabian Sea is a focal point for various kinds of maritime crime, such as piracy, illegal and forced human smuggling, and illegal trade.

Piracy near the shores of Somalia and in adjacent waters has interrupted shipping lanes and threatened seaborne trade, affecting the regional market and amplifying the dangers to seafarers' lives (UNODC, 2019). Rings involved in human smuggling and illegal trade take advantage of sea routes in the region, putting at risk to vulnerable groups to exploitation and violation of human rights. Such criminal activities sabotage governance and law enforcement measures, as well as disrupting the coastal population and complicating the balanced utilization of marine resources. Tackling these issues needs a human security approach that emphasizes the safety, dignity, and economic well-being of impacted populations instead of just focusing on territorial sovereignty.

Climate change deepens these issues through modifying ocean temperatures, increasing sea-level rise, and intensifying the occurrence of extreme weather phenomena. In the Arabian Sea, increasing water temperature and altering monsoon patterns have shifted fish migration and breeding cycles, undermining conventional fishing methods (IPCC, 2022). Coastal populations face increased risk of inundation and habitat loss, putting at risk residences and infrastructure. The consequent community displacement and loss of income source amplify economic and personal insecurity, as well as highlight the importance of climate resilience. Blue Economy is a strategy rooted in human security tenets.

A human security viewpoint promotes integrated policies that emphasize peoplecentered results together with environmental sustainability and economic growth. This involves a comprehensive governance action-oriented framework that engages the local population, empowers marginalized communities, and promotes equal access to the advantages of marine resources. Regional alliance between Arabian Sea littoral nations is significant to harmonized enforcement against unlawful activities,

carry out conservation steps, and strengthen resistance to climate impacts. Efforts, including the PERSGA, exemplify an undertaking to support partnership for marine biodiversity preservation and eco-friendly use in vicinal water.

In addition, decentralized resource control has proven successful in certain areas of the Arabian Sea coastal zone. Consider the case of small-scale fishing communities in Oman have applied joint management strategies that incorporate local wisdom with research-based monitoring, which is leading to sustainable governance of the marine ecosystem and enhanced social equity (FAO, 2020). These strategies are in line with human security by securing people's means of living and strengthening the social structure that mitigates the impact of economic and environmental crises. Human security presents an extensive and people-centered analytical framework for interpreting complex challenges experienced by the Blue Economy, notably in areas such as the Arabian Sea.

The diverse and hazardous environmental degradation, maritime offense, and climate crises necessitate comprehensive strategies that put human well-being first, environmental sustainability, and economic stability. By rooting Blue Economy strategies in human security, parties involved understand that marine development is not limited to offering support for economic growth, as well as the safety, integrity, and long-term viability of coastal communities supported by the ocean’s resources.

Even though the theories of sustainable development and human security are commonly illustrated as cooperative and supportive, reinforcing frameworks but indepth critical assessment reveals some strain and hands-on challenges in incorporating them well. From one point of view, human security’s effectiveness is rooted in its clear focus on the individual and grassroots level, underscoring current threats like poverty, health crises, violence, and environmental pitfalls. It expands security apart from the

traditional state-centric lens by placing human rights and welfare at the center. This individual centric strategy is important due to sustainable development goals (SDGs) is impossible unless it address the vulnerabilities and protection of vulnerable populations.

With respect to this, human security establish a moral basis for sustainable development, encouraging policy makers that development is at its core focused on enhancing human well-being that is not just economic measures or ecological objectives. However, a central problem stems from the varying time framework and spatial dimensions of the two theories. Sustainable development is typically described as a fundamental and worldwide process involving core transformation in economic systems, resource allocation, and governance models. It demands a careful balancing of future generations' needs with current requirements, commonly involving difficult compromises between economic growth, social justice, and environmental protection.

Human security, on the other hand, tends to tackle short-term and localized challenges to people's security and welfare, which may cause immediate crisis-driven countermeasures. This variation in focus can create policy-related issues, and acute human security challenges may urge governments to focus on rapid economic growth or the use of natural resources that compromise enduring sustainability. As well as the conceptual scope of human security, despite being strength, it can likewise be a drawback. Its inclusive definition includes community, food, environmental, personal, health, and government stability, which risks diverting attention and entangling implementation.

As a matter of fact, governments and institutions might find it difficult to operationalize such an extensive agenda, which leads to isolation. Sustainable development blueprint with its clear objectives and benchmarks (like the SDGs), could offer clear policy

guidance targets, though they can occasionally overlook the lived challenges of insecurity that human security points out. There is an additional political aspect to this correlation. Sustainable development commonly entails multilateral agreements and an international governance framework, where economic and environmental objectives can be negotiated in general terms. Human security focuses on individual freedom and protection from aggression and hardship. This may restrict the political will to completely assimilate human security matters into sustainable development policies (Reprinted from Tavanti, 2013). It challenges states' sovereignty and may trigger political backlash, primarily where a dictatorial government finds human security agendas perceived as many threat to their control.

3.1 Overview

This chapter goes over the historical transformation of the Blue Economy paradigm in Pakistan, following its steady emergence from an outlying idea to a strategic state priority. It starts with an overview of key aspects of how maritime and coastal resources were conventionally untapped in Pakistan. The chapter considers the latent capacity of Pakistan's Blue Economy in the context of global patterns. It takes into account Pakistan's strategic position, economic fragility, and climate resilience, which are factors that ensure blue growth is both critical and optimistic.

The Idea of Blue Economy was publicized academically and in media reporting before 2018, Federal Minister for Maritime Affairs Ali Haider Zaidi denoted the first formal recognition of the Blue economy in official discourse in term of Pakistan. So this research investigates the development and concentration on the Blue Economy throughout the governance of Pakistan Tehreek-e-Insaf over the period 2018-2022. From strategy formulation to port upgrade, key initiatives were taken to tap into the economic, environmental, and key significance of the Arabian Sea. Particular attention is paid to initiatives that intend to broaden fisheries, promote sustainable coastal populations, promote coastal tourism, and boost international maritime collaboration. The contribution of institutions such as the Pakistan Navy and the Ministry of Maritime Affairs is pointed out as they steered a fundamental overhaul and endorsed an idea of blue growth. Through reviewing millstone, challenges, and overlooked prospects, this chapter gives in-depth analyses of how maritime economic growth was dreamed of during the particular period, and its outcomes for Pakistan's sustainable economic adaptation and regional connectivity.

3.2 Blue Economy and Pakistan

Pakistan's association with its blue potential has developed gradually over time, molded by historical neglect, political realignment, and, as of late, by the transnational debate around the BE. Conventionally, the ocean was a means of living for coastal populations such as the Baloch, with traditional fishing and classical maritime dhow building growing strongly over centuries (Pastner, 1978). Still, it wasn't before the 21st century, notably after the 2012 UNO Rio+20 Conference, when the idea of the Blue Economy gained international stature and within Pakistan's policy loops. This summit intimated Sustainable Development (Goal 14), calling on states to sustainably control and safeguard marine ecosystems, thus paving the way for a rethinking of blue resources as an instrument for economic development.

Pakistan's realization of this agenda remained in the realm of words until the 2000s. The MMP (Merchant Marine Policy of 2001) was the initial major effort to revive the shipping industry, which had declined following the 1970s because of nationalization lapse and mercantilist economic policies. The Merchant Marine policies granted tax relief to encourage the private stakeholders to uphold the state's flag vessels. Yet, as a result of uneven implementation and limited legal support as a policy, not an act, its effects were minimal.

The 2010s introduced a more interconnected focus on sustainable seas. Pakistan amended the MMP in 2019 to prolong its legitimacy to 2030, providing additional incentives like duty-free exemption, income, and consumption tax, as well as rolling out the LTFF (Long-Term Finance Facility) to assist investors in obtaining vessels. In spite of these modification, Pakistan lifted so far only approximately 10–11% of its cargo, much lower than the 40–60% permitted by the UNO liner code of 1974, lost about $5 billion each year in deliver to foreign carriers (Yousuf & Ali, 2020).identifying

this shortfall, the Government of Pakistan announced 2020 as the year of Blue Economy a symbolically significant gesture. The MOMA took efforts to revive the sector, pointing out Gwadar Port's advancement private investment perks, and steps to enhance port and customs competence .however, deep-rooted structural weakness endured: slow bureaucratic processes, heavy cost of compliance (400 hours for duty collection and clearness to 196 in Korea), as well as lack of skills development in the shipping labor force effected reforms insufficient without more thorough institutional restructuring. Alongside the shipping domain, the fish farming and aquaculture industries have also witnessed a sporadic progression.

Even though Pakistan's Exclusive Economic Zone is nearly 30% of its expanse of land (NIO, 2020), its seafood trade continues below $500 million. Overfishing, weak by catch management (Moazzam, 2012), and the absence of advanced aquaculture methods jeopardize sustainability. FAO reports bring attention to the potential, mainly in shrimp and tuna shipments, that the lack of a combined fisheries policy has caused slums. Policy paper issued by PEMSEA and World Bank stresses that fisheries management modifications are key to any productive Blue Economy approach; nonetheless, Pakistan does not have a coherent governance model to tackle this. Maritime tourism marks another overlooked chance in Pakistan's blue growth trajectory.

The National Tourism Policy of 1990 identified beach and shoreline tourism and resulted in the creation of a Beach Development Authority. Even so, following the 18th Constitutional Amendment, tourism fell under provincial authority, and maritime tourism suffered from an inter-governmental coordination shortfall. On the other hand, India's coastal state Kerala, featuring a 600 km coastline, is turning into an important global tourism center, which is showing that natural boundaries and potential can be captured with strategic planning. Pakistan, in spite of its 990 km coastline, continues to

lack essential maritime infrastructure-related activities, including scuba diving, boating, and tourist cruises (Ahmed & Mahmood, 2017).

Another notable blow has been the disintegration of Pakistan's shipbuilding industry, formerly well known in the region for building dhows. Classical artisans are currently earning low wages and are underappreciated, as many move to other countries. The regulatory sector continues to employ about 3,500 workers (NIMA), lacking legal recognition, technical assistance, or R&D in marine engineering; this traditional sector risks elimination. Considering these factors, past development and policy evolution in Pakistan have been primarily responsive instead of strategic. Documentation such as the "Year of the Blue Economy" and tax incentives serve as the right direction, but lack legal alignment, like integrating the Merchant Shipping Ordinance, Merchant Marine Policy, and harbor regulation; these steps will not produce lasting outcomes. The model by the Ethiopian shipping authority, which requires state carriers to end restrictions on FOB imports which serves as a groundwork Pakistan could follow.

In addition, top regional approaches, like trade regulation in Turkey or coastal tourism development in Sri Lanka, offer an actionable plan for Pakistan's much-needed maritime reforms. Pakistan's Blue Economy indicates historical trends of missed opportunities, governance void, and policy gaps, regardless of its abundant natural resources. From the colonial fishing era to post 2020 Blue Economy narrative, the state's maritime industry persists as a continued to be marginalized in the country's economic blueprinting. For Pakistan to harness its maritime potential, it needs to go beyond the fragmented policy framework and symbolic gestures. It calls for a unified, enacted National Blue Economy framework rooted in legal enforceability, collaborative engagement, and climate resilience. Only after that can be seas, which are historically overlooked, evolve into a catalyst for sustainable national progress.

3.3 Economic Attributes of Blue Economy

The economic exploitation of marine and coastal assets is far from a new phenomenon. Instead, it has long provided a foundation for development trends in island and coastal states. Traditionally, ocean-based activities like shipping, fisheries, and coastal tourism provided a bedrock role in shaping countries' economies, primarily among SIDS and states with vast coastal zones. Nevertheless, what is more and more observable in recent discourse is not the emergence of ocean-based trade activity itself, but the increasing acceptance of the ocean's strategic significance to sustainable development and enduring economic stability.

Recent conceptual models have highlighted the ocean's twofold role: as a catalyst for economic growth and as a finite natural system requiring responsible management. The birth of the Blue Economy approach shows this duality, framing the marine ecosystem not solely as simply resource to be exploited, but instead as key natural capital that supports sustainable development. This shows a significant shift away from conventional growth models, which tend to pass on environmental costs.

Statistically, the global marine economy is considerable. As stated by OECD 2016 projection, it contributes roughly US$1.5 trillion every year and approximately 2–3% of global GDP. Detailed data show that marine operations, including tourism and shipping, lead the sector, producing US$880 billion, as marine assets extraction and marine-based manufacturing added US$377 billion to US$107 billion in that order(as illustrated in Table 3.2). These data highlight the range of ocean-related economic action and demonstrate a complex interconnected value chain with global trade, food security, and energy production. Circularly, over one billion people depend on fish as an essential source of protein (OECD, 2012; Roberts & Ali, 2016), showcasing the marine's role in food availability and human progress.

Estimates by the OECD point to a major growth in ocean-based industries by 2030, having the possibility of more than twice the percentage contribution to global enriched, exceeding about US$3 trillion every year (Rayner et al., 2019). This development is likely to be fueled by capital-intensive domains like offshore wind energy, aquaculture, shipbuilding, and fish processing.

Cross-state's comparisons provide additional example of the diverse economic dependencies on marine resources., in 2010 the National Ocean Economics Program reported in the United States that the Blue Economy added more than US$258 billion which is 1.8% of GDP and offer 2.7 million jobs .on the other hand, China's Blue Economy made up about 10% of its GDP during the year 2014, give job to 9 million people. Similarly, Indonesia mentions that marine-related activities account for as much as accounting for 20% of its GDP, which is evidence of both capability and variation of Blue Economy plans covering multiple developmental settings

(Economist Intelligence Unit, 2015; Roberts & Ali, 2016).

Region/state	Year	Ocean Economy Contribution	Percentage of GDP	Jobs in millions (Approx.)	Key Sectors
Global (OECD)	2016	$ (USD)1.5 trillion	2–3%	350	Tourism, shipping, fisheries, aquaculture, research
Maritime Services	2016	$(USD)880 billion	–	–	Shipping& Tourism
Marine-based Resources	2016	$ (USD)377 billion	–	–	Fisheries & aquaculture

Maritime Manufacturing	2016	$(USD)107 billion	–	–	Shipbuilding & equipment
Global outlook	2030	> $ (USD)3 trillion	–	–	aquaculture, Offshore wind, & shipbuilding
United States	2010	$ (USD)258 billion	1.8%	2.7	Ports, tourism, fisheries
China	2014	$(USD)962 billion	10%	9	Marine manufacturing & fisheries

Table 3.1 Blue Economy Potential

Source: Author, data gathered from multiple official documents (see details in Appendix VI)

The theoretical transformation of the Blue Economy, particularly since the Rio+20 Conference indicates a wider reconsideration of how economic growth is framed in terms of ecological systems (Anon, 2014). The Blue Economy is more frequently accepted as a policy model by governments aiming to harmonize economic development with ecological sustainability.

Still, this transformation raises key questions concerning governance, institutional capacity, and the threat of a selection-based model under the cloak of sustainability (Wenham et al. 2019). Although the marine economy provides considerable potential for growth, jobs, and advancement, its sustainable realization demands a holistic reconfiguration of what way ocean resources are valued, regulated, and overseen. The risk lies in surpassing growth-centric approaches that foster an inclusive,

ecosystembased operational framework that can tackle both socio-economic demands and the ecological brink of the marine ecosystem.

3.3.1 Sectors of Blue Economy

The Blue Economy extends to the seas, rivers, oceans, and lakes, and uses the results for consumption and as a catalyst for economic development in an eco-friendly approach. As per the annual fiscal overview of the EU Blue Economy that was active in Brussels in 2018, there exists a gap between established and emerging areas of the Blue Economy. The common understanding sectors of the Blue Economy are the below:

- Fishery and Aquaculture
- Maritime Transportation
- Coastal tourism
- Cruise Ship Industry
- Marine biotechnology
- Sea water desalination
- Deep sea mining, oil/ gas drilling
- Renewable Energy
- Ship and boat building
- Maritime construction
- Defense and security

- Research and education

Based on the Maritime Doctrine of Pakistan, they are also the established sectors of the Blue Economy of Pakistan. Yet, Pakistan has made no progress in offshore oil and gas drilling.

3.4 Potential of Pakistan's Blue Economy

Ocean resources play a major role in the economic progress and growth of any state, and the nations holding the coastline have the overwhelming upper hand on the country which does not have a coastline or shorelines. Each coastline state acknowledges the significance of its maritime resources and utilizes the assets to the fullest extent. Pakistan, even with a direct route to the sea, has failed to utilize the sea and its resources to maximum benefit primarily due to a limited understanding of maritime issues. Economic experts considered that if the blue resources are tapped to their full potential, then this sector can develop above one million jobs in Pakistan.

The oceanic sector of Pakistan is a significant contributor to its national economic and military strength, as 95 % of its commerce and trade take place via sea (Rao, I. A., 2025) (see table 3.2). The open waters create an opportunity for free and unimpeded trade and a gateway to the states around the world. It is the right time for Pakistan to take comprehensive and concrete steps to increase awareness of maritime issues in the state.

Eventually, it has to shift focus to the sea to extract its resources to fulfill the future demands. Pakistan, as a developing nation, must accord more importance to the maritime segment to acquire enough economic benefits (Mukhtar, A Personal Communication, 2025). Maritime strength involves not only maritime defense, but also naval harbors, seaports, merchant ships, and their integral infrastructure. China Pakistan

Economic Corridor (CPEC) is the ventures that illustrate that the stakeholders acknowledge the significance and value of its maritime domain and utilize it as an untapped resource. The fundamental explanation behind CPEC is to foster regional unity and the economic development of Pakistan and the Chinese leading presence at sea as well. Pakistan's Blue Economy, though still developing, carries strong potential to boost sustainable economic growth, expand national revenue stream, and enhance food and energy sovereignty (Naz, S., & Rashid, M. I.,2024).

The country's prime location following key international sea routes, paired with a coastline surpassing 1,000 kilometers and a sizable Exclusive Economic Zone, gives a firm geographic and ecological basis for the growth of a healthy Blue Economy. With sufficient resources in modern fishing technologies, temperature-controlled logistics, and export-grade production complexes, Pakistan can increase both quantity and worth of its seafood exports (Hasan, M., 2024). The sector currently sustains millions of livelihoods, and an upgrade in quality rules and regulation oversight could open the availability of high-value international markets, especially in North America and the EU.

Marine Sector	Estimated Annual Contribution (USD)	% of GDP	Notes
Total Blue Economy Potential	~$1 billion	~0.4%	Shows combined input from all maritime domains

Shipping	Approximately $8–10 billion (by 2030–2035)	–	current data not specified: Potential future contribution;
Aquaculture & Fisheries	Approximately $17–18 billion (by 2030–2035)	–	Potential future contribution
Tourism	Approximately $300 million	~0.1%	Current contribution of maritime tourism
Exports of seafood	Approximately $450 million	~0.2%	Current contribution.
Ship Recycling (Gadani)	Approximately $10 million	–	Potential contribution if fully utilized.
Mangroves	Approximately $20 million	–	Future potential

Table 3.2 Pakistan's Blue Economy: Estimated Contributions by Sector

Source: Report of SDPI & BOP, 2022

Marine culture, which entails the farming of marine organisms like seaweed, mollusks, and finfish, stands as a developing frontier in Pakistan's Blue Economy. The country's warm oceanic coastal zone and supportive climate are ideally fitting for this kind of aquaculture (Safdar, A., Personal communication, 2025). Mari culture has the twofold benefit of offering significant economic gain while lessening pressure on wild marine resources, aligning well with key ideas of sustainability. With dedicated intervention from public and private investors, this sector has the potential to be a reliable source of

human capital and foreign trade earnings. In addition, the ecofriendly management of fisheries can maintain a long-term supply of marine resources, supporting both economic security and food availability.

The potential of the seaborne energy project also offers Pakistan a notable means for economic advancement. Offshore and seaside zones are believed to hold rich resources of oil and natural gas, the eco-friendly utilization of which could increase energy self-sufficiency and curtail the use of imported fuels. The inclusion of ecological impact review and advanced drilling technologies can assist harmonization of economic benefits with responsible environmental management. Moreover, there is a possibility for the advancement of marine-based renewable energy, such as wind and tidal power, which play a role in a cleaner and wider-ranging energy mix. Tourism, coupled with Pakistan's coastline, is an additional field of untapped opportunity. With its pristine beaches, unique biodiversity, and historical landmarks like Gwadar and Ormara, the coastal areas are ideally located to become a venue for both domestic and international tourists (Ullah, N. 2021).

Strategic advancement of infrastructure, lodging services, and environmentally driven tourism projects has the potential to transform the coastal belt into a key revenuedriving industry. Aside from its economic impact, tourism can foster regional growth and cultural exchange, promoting a more inclusive growth strategy. Notably, Pakistan has commenced measures to unlock its Blue Economy. Latest modification to maritime policies, increased interest in marine conservation, and capital allocation to port infrastructure shows an enhanced understanding of the sector's value (Ibrahim. A. personal communications, 2025). Institutions such as partnerships with international organizations and the Pakistan Maritime Affairs Division are setting

foundation for better streamline and visionary maritime governance.

3.4.1. Seaborne Trade potential

Pakistan's strategic positioning offers significant benefits in terms of maritime trade. Along a coastline extended across 1,050 kilometers, it is located at the doorway of the Strait of Harms critical international chokepoint for goods and oil carried by sea (Ullah, Personal communication, 2025). Pakistan is positioned 74th among coastal nations, pointing to the maritime potential that is still not fully utilized. The country's proximity to the Gulf, which provides access to major global shipping lanes, signifies that Pakistan can be crucial to global trade logistics, notably for energy transportation.

Recently, the Pakistan National Shipping Corporation (PNSC) has managed a small fleet of 12 vessels, which regulates roughly 10% of the state's seaborne trade, surpassing 100 million tons every year (Pakistan Today, 2023). Moreover, Pakistan's contribution to global maritime trade is comparatively small, indicating the need for enhanced investment in shipbuilding, enlargement of the national fleet, and maritime services to expand market shares of this expanding global trade market.

Sr.No	**Name of zones**	**Area**
1	Continental shelf	350
2	Adjoins zone	24
3	EEZ	200
4	Territorial waters	12

Table 3.3 Different sea zones of Pakistan

Source: MFF Pakistan, 2016

3.4.2. Aquaculture and fisheries resources

The fisheries sector is still among the most vital components of Pakistan's Blue Economy. Though it currently contributes just 0.3% to Pakistan's GDP, the nation's rich blue resources demonstrate considerable growth opportunities. The fisheries segment has a notable prospect for economic development, mainly in light of Pakistan's vast Exclusive Economic Zone (EEZ), which stretches over 290,000 km², diverse marine ecosystem. Pakistan's aquatic production in fiscal year 2022 contained 468,000 metric tons of sea fish, with major export revenue, mainly $310 million in fish exports (APP, 2023). Even so, the wild-catch fisheries sector is encountering difficulties like overfishing and suboptimal resource allocation. Although Pakistan has a suitable agricultural environment for aquaculture, such as both pure and non-saline water bodies, the state's aquaculture sector remains less developed as to regional challengers such as India and Bangladesh. With improved management, aquaculture could sustainably increase Pakistan's fish production, possibly exceeding 560,000 metric tons every year in the coming decade, corresponding to regional development.

3.4.3. Shipping and Port Infrastructure

Despite the fact that Pakistan has three major ports like Port Qasim, Karachi Port, and Gwadar Port, their utilization rate stays below 50%, showing insufficient use of the present infrastructure (Dawn, 2024). Pakistan's ports have long-term excess capacity, and in spite of rising Afghan trade, the possibility for expansion remains mostly untapped (shown in Table 3.4). These ports could remain as a main node for not limited regional trade but also global shipping, as long as systematic enhancement and advancement efforts are executed.

Ports	Cargo Handled	Imports	Exports

Karachi Port Trust (KPT)	51.65(Million Tones)	32.85(Million Tones)	12.78(Million Tones)
Port Qasim Authority (PQA)	34.3(Million Tones)	Data unclear	Data unclear

Table 3.4 Shipping Sector: Export and Import (FY 2023–24)

Source: Report of Pakistan Bureau of Statistics, KPT and PQA, 2024

The government needs to focus on port planning, involving the development of a blueprint in a joint effort with international organizations. This kind of plan would streamline port operations, enhance productivity, and boost income through increased commerce logistics, particularly in the framework of increasing global shipping bulk. Improving port capacity, optimizing multimodal transport systems, and driving the progress of specialized terminals can markedly improve the throughput, making Pakistan a more alluring trade partner and maritime center.

4.4.4. Shipbuilding

In the past, Pakistan has had prominent visibility in shipbreaking, especially at Gadani, among the world's largest shipbreaking yards. This industry has been heavy workforce and has added to Pakistan's Blue Economy through the supply of affordable labor for dismantling large vessels. Even so, Pakistan's shipbuilding capacity is relatively low, the state's only shipyard having a wharf capability of just 26,000 Deadweight tons (DWT), which is small compared to leading shipyards able to hold vessels of up to 600,000 DWT (Riaz Haq, 2020) (as shown in Table 3.5).

Sector	Export	Import

Dry Cargo	17.66(Million Tons)	22.58(Million Tons)
Liquid Bulk Cargo	1.14(Million Tons)	10.27(Million Tons)
Total Cargo	18.80(Million Tons)	32.85(Million Tons)

Table 3.5 Transport Sector: Export and Import Data (FY 2023–24)

Source: Karachi Port Trust Report, FY 2023–24

This offers a chance for investment in boat-building facilities to boost local manufacturing capabilities. By taking advantage of Pakistan's extensive human resources and strategic location (deep seashores appropriate for docking). Pakistan could assume a leading role in the region in shipbuilding, especially in the assembly of smaller, highly advanced vessels or in ship refurbishment and servicing. This would, apart from supporting the state's shipping industry in addition facilitate fulfilling the growing worldwide demand for vessels as maritime trade keeps developing.

3.4.5. Renewable Energy from Offshore

One more key, although underexplored element of Pakistan's Blue Economy is its offshore wind energy capacity. The nation's coastal belt is nestled in a wind corridor that is 180 km long and 60 km wide, with an overall projected wind power potential of 50,000 MW. Capitalizing on this renewable energy resource would be key to expanding Pakistan's energy source blend, notably as the nation seeks to lessen its dependence on fossil fuels and switch to cleaner energy solutions. Critical analysis, data, and findings are shown and analyzed thoroughly for all zones. The capacity factor of zone 1 is 46% followed by (40.4%) Zone 2, (29.3%) Zone 3, and (37.5%) Zone 4.

Research found that Karachi is the best-suited position for a 50 MW wind farm with the greatest wind velocity and the least deviation in wind direction each year (Ahmad et al., 2022). The AEDB (Alternate Energy Development Board) has made progress in advancing renewable energy projects; however, to completely harness the offshore wind energy potential, massive infrastructure resources dedicated to wind turbine projects, grid connectivity, and local expertise are essential. Offshore wind could be a major factor in Pakistan's energy security, cut down on energy prices, and promote economic growth in coastal regions.

3.4.6. Tourism

Pakistan's coastal regions possess notable prospects for tourism development, covering all aspects from beaches and eco-friendly parks to archaeological spots and cultural landmarks. Sites including Hingol National Park, the vaults of Muhammad Bin Qasim's soldiers, and the Baluchistan Sphinx are unrefined but highly promising for cultural tourism and eco-tourism (Peaceful Pakistan Network, 2020). Through the development of tourism facilities such as hotels, resorts, and community centers, Pakistan can harness its coastal charm and attract both national and international tourists.

Moreover, Pakistan has one of the greatest inland waterways systems across the globe, covering 30,000 kilometers. Traditionally, the Indus River system acted as a vital transportation gateway for goods. Latest efforts, like the Punjab Government's Inland Water Transport Development Company, showcase the potential of inland water transport (IWT) to improve traffic flow, reduce transportation costs, and provide a sustainable alternative for transporting large quantities. Enlarging the IWT infrastructure may serve as a key player in reducing CO2 emissions and encouraging green mobility solutions.

3.4.7. Seabed Resources

Pakistan's Exclusive Economic Zone (EEZ) and extensive continental shelf, spanning roughly 290,000 km², are considered to be plentiful in seabed resources, like minerals, oil, and natural gas. Offshore oil and gas survey in Pakistan started in the 1960s, with 18 initial wells drilled until now; however, the potential of these resources is mostly unexploited (Ahmed, S., Nazeer, A., & Khan, I., 2022).

With improvements in exploration tools and partnerships with international energy firms, Pakistan could attain considerable offshore oil and gas reserves, which could act as a major catalyst for economic growth. In addition, the sustainable management of marine resources must be ensured through strong governance practices, mainly in areas where offshore oil extraction and seabed mining may disrupt marine biodiversity. Upgrading the regulatory mechanism for sustainable resource drilling
will be critical in promoting long-lasting gains from these resources.

3.5 Development of the Blue Economy in Pakistan (2018-2022)

Throughout the 2018–2022 periods, Pakistan saw revitalized commitments towards developing its Blue Economy, signaling a major change in national economic agendas. At the outset, a unified vision was created that aligned the country's maritime milestone for the UN Sustainable Development Goals, primarily SDG-14, which prioritizes protecting and sustainably capitalizing on marine and ocean resources (PID, 2021). In 2020, the Khan government made a landmark reform by labeling it the "Year of the Blue Economy," indicating a change in strategy toward the responsible use of maritime resources. This proclamation was formalized at a cabinet meeting and publicly approved by the Ministry of Shipping and Maritime Affairs under the leadership of Syed Ali Haider Zaidi (Xinhua, 2020). The following Timeline highlights the following timeline

highlights key Initiatives and projects related to the Blue Economy during Former PM Imran Khan's Government.

Merchant Marine Policy 2019

A central practical result of this transformation was the (MMP) Merchant Marine Policy 2019, which unveiled multiple financial measures aimed at renewing

Pakistan's state shipping sector. As part of the reforms was a decline in gross tonnage tax, relief from customs and income tax for vessels registered nationally, and exclusive mooring rights at national ports (PIDE, 2021). These efforts were taken to shut down Pakistan's dependence on foreign shipping companies, which led to an economic setback of more than $5 billion each year in cargo charges (PIDE, 2021). Moreover, the policy facilitates shipping companies to secure funding through the State Bank of Pakistan's LTFF, called Long-Term Financing Facility, additionally promoting the private sector's active role in maritime supply chain management and vessel purchase.

10 Billion Tree Tsunami 2019

In conjunction with financial reforms, environmental responsibility took a critical role in the government's Blue Economy initiative. The bold mangrove rehabilitation under the "10 Billion Tree Tsunami" initiative demonstrates a dedication to reversing damage to the coastal ecosystem. Reforesting more than 214.9 km square of mangroves offers numerous advantages, including shoreline protection from erosion, habitat revival of the marine ecosystem, and carbon absorption is growing as a critical component of the global climate action plan.

New Shipping Policy 2020

In 2020, the government rolled out a holistic shipping policy providing significant tax relief involving trade duties, income tax, consumption tax, and maritime tongue charges prolonged until 2030. Ships under Pakistani flag registry were awarded preferred

docking rights at local ports, and both homegrown and international companies became entitled to long-term financing by the State Bank of Pakistan's

LTFF scheme, well known as Long-Term Financing Facility (The Express Tribune, 2020 & PIDE, 2021). These steps were taken to promote local documentation of vessels, enhance Pakistan's maritime influence, and reduce reliance on international shipping companies.

Moreover, the policy internet to increase job opportunities for local seafarers, in line with the objectives to establish a skilled maritime labour forces (Associated Press of Pakistan, 2020). On the other hand, the policy's progress has been restricted by ongoing non-traditional security challenges that disrupt maritime activities and investments. In contrast to conventional military threats, non-traditional security threats entangling issues as piracy, terrorism, smuggling, illegal fishing, environmental damage, and maritime conflicts that have become more effective in the region's challenging security landscape.

Kamyab Jawan Program 2021

In 2021, the government introduced a strategic plan as a part of the Kamyab Jawan Program by finalizing an important MOU (Memorandum of Understanding) among the four top financial banks and the Ministry of Maritime Affairs. This partnership aims to deliver soft loans to fish folk communities, a sector classically plagued due to restricted availability of formal credit and commercial services (The Nation, 2021 &Business Recorder, 2021). The protocols set up solely financing counters at strategic fishing harbors, such as Korangi, that function as an easily reachable point where fishermen are able to request a loan to upgrade their machinery and functional capability. The main objectives of this program were multidimensional.

The financing intends to empower fishermen to purchase advanced ships and an onboard freezing system, key tools for safeguarding, catch quality, and limited loss after harvest, which is a critical flaw that has historically eroded profit margin in the fisheries industry. This program aimed to supply working capital support, easing short-term financial pressure that tends to push fishermen to depend upon exploitative middlemen and informal creditors. By facilitating straightforward access to costeffective finance, the program aims to empower the fishing population in economic terms and promote youth-led business initiatives within coastal regions, aligning with broader goals aimed at poverty reduction and social development as well as employment creation (The Nation, 2021). From a microeconomic scale, fisheries exports were valued at around $450 million, demonstrating the sector's small share of Pakistan's Blue Economy. Yet, the government outlined ambitious plans to broaden this plan, which figure to $2.5 billion, highlighting the sector's hidden and unrealized potential as a key generator of foreign exchange revenue and rural development.

Meeting this target demands more than just financial investment but also renewal and enhanced supply chain efficiency, enabled through an MOU funding support system intended to tackle this directly. Initial data shows that the scheme creates instant positive results in terms of expanding financial access, empowering marginalized fishing groups into the established banking networks, and promoting investments that were previously unachievable because lack of proper collateral or credit history. This integration marks an important milestone toward a structural shift, reducing overreliance on informal and expensive loan sources that commonly continue the cycle of debt burden (Business Recorder, 2021).

AMAN Naval Exercises 2021

In February 2021, the AMAN naval exercise conducted under the command of

Admiral Muhammad Amjad Khan Niazi represented a major development in Pakistan's naval diplomacy and geostrategic security agenda. As a joint and collaborative venture among multiple navies hosted by Pakistan, it is focused on confronting various non-traditional security challenges within maritime spaces. Such as piracy, narcotics smuggling, human trafficking, maritime terrorism, and illegal fishing, which threaten regional peace and security.

The blue carbon efforts represent a unified understanding of environmental safeguard as a key element for economic development throughout the maritime industry. Nevertheless, the operational effectiveness of the policy relies greatly on effective loan distribution and the facilitation of sustained technical support. Make sure the loan reached the rightful beneficiaries. Demand effective administrative cooperation among banks, harbor leadership, and local authorities. Additionally, fishermen need proper training on the upkeep and effective use of advanced equipment, combined with business growth skills, to fully leverage the financial input. Without long-term capacity building initiatives and tracking procedures, there was a possibility of loans being wrongly allocated or the risk of higher default rates, weakening the program's long-term availability.

Significance of PM Imran Khan's Blue Economy Policies

The policy model followed during the previous government's tenure provides a critical basis for promoting Pakistan's Blue Economy within the scope of the current administration. In terms of governance and development studies, institutional sustained action is key for the effective realization of prolonged, detailed sectorial ambitions, including maritime economic development (North, 1990). The previous government's formulation of a detailed Blue Economy policy represents a major organizational

achievement, placing maritime affairs as a key national development objective and offering a unified strategic vision.

This harmonization boosts policy acceptance and establishes a favourable environment for the contemporary government to ensure consistent progress in the agenda, thereby lowering the cost linked with policy reforming and boosting stakeholder trust (Grindle, 2004). The low-interest loan program, which is called the Kamyab Jawan initiative, is highly relevant from a developmental economics viewpoint. By expanding capital accessibility among underserved fishing

communities, these police focus on vital issues like market failure, financing barriers that impede sectorial upgrade and economic expansion (Stiglitz & Weiss, 1981). The capacity of these initiatives to encourage local entrepreneurship and upgrade fisheries production capacities aligns with sustainable livelihood frameworks, which focus on wealth creation and resilience in vulnerable communities (Scoones, 1998). The present government's capacity to grow and develop these financing mechanisms, enhanced through technical outreach services, could improve productive capacity; expand export profile, and socio-economic resilience in coastal regions.

Infrastructure development funding in port upgrading and delivery system corridors reflects vital infrastructural elements affecting trade performance (Limao & Venables, 2001). The increase in port capacities and strong connectivity facilities integration of Pakistan more successfully within the worldwide maritime trade system, which subsequently triggers economic development via clustering benefits and trade assistance (Rodrigue, 2020). The contemporary administration's priorities are the integration and stabilization of these investments, which can alleviate current bottlenecks and minimize the state's freight costs, which is a major cause of trade inefficiency.

Limitations Realizing the Full Potential of Blue Economy

Still, realizing these gains demands attention to persistent governance barriers like bureaucratic fragmentation and lack of regulatory uncertainty, which commonly overlook infrastructural funding (World Bank, 2017). Eco-friendly initiative, involving mangrove rehabilitation and blue carbon programs, captures the blend of ecological policy and economic policy frameworks. However, the recorded issue of marine pollution and damage to the ecosystem underscores the urgency for robust marine zoning strategies and an enforcement system to safeguard these natural resources (Agardy et al., 2011). The existing administration role in formalizing a stronger environmental regulatory and monitoring framework is vital for preserving marine ecosystem services that support tourism, fisheries, and climate mitigation.

Even with these advanced reforms, the policy's execution is confronting critical structural issues. The maritime domain remained scattered among more than 40 government agencies, resulting in organizational insufficiency and poor intradepartmental coordination. Regulatory monitoring was lax, and the maritime legal framework was incomplete and updated from the beginning of the 2000s. These gaps reduce the effectiveness of changes and hinder the execution of the new policy model. The government interacts with the academic community, NGOs, civil society, individual business s, and development associates to formulate a cross-sectorial approach. As per official report, the policy aspired unleash over $US100 billion in possible economic benefits from different sectors is such as fisheries, coastal tourism, shipping, marine biotechnology and offshore energy (PID, 2021). Back then, the tangible contribution of the maritime industry to GDP was approximately 0.4%, with seafood export generating about $US450 million and blue tourism fetching nearly $US300 million every year.

In addition, the previous tenure's experience shows the importance of institutional aptitude and cross-agency coordination to overcome execution shortfall. The decentralized governance system reveals a collective action problem and demand for enhanced policy coherence and integrated maritime governance (Ostrom, 1990). The present government can harness this knowledge to improve institutional frameworks, foster inter-sector partnerships, and automate digital governance technologies, thereby optimizing policy delivery and resilience management. The former government's Blue Economy policies serve as an essential and institutional base for the current government's effort.

However, ecological threats remained intense. Heavy loss of marine biomes and the extensive tainting of marine life with micro plastics signaled continuity and serious pollution problems. These challenges threatened more than just biodiversity, but also the means of living that rely on a healthy marine environment. The ongoing deterioration despite afforestation activities showcased the limitation of present measures and the imperative for holistic maritime-based regulations. Specialists appeal for more robust monitoring and execution, spotlighting a gap between policy purpose and ecological circumstance, stressing that sustainable development should be paired with strict ecological preservation. Outside these domain-specific challenges, structural barriers that hinder the complete realization of the ocean economy are potential.

The government's measure was slowed down by bureaucratic stagnation, an antiquated institutional system, and poorly integrated coordination between nearly 40 agencies accountable for several maritime operations. Such a complex structure causes insufficiencies that weaken policy implementation and blur accountability. In addition, the premature pullback of the Pakistan Islands Development Authority, conceived as a model shoreline infrastructure project, illustrated the danger associated with

implementation without proper ecological assessment and stakeholder interaction. Regulatory and public resistance demonstrated the critical role of inclusive and accountable governance, which aligns economic development objectives with ecological environment protection and community support. Finally, infrastructure shortfall remained despite strategic funding for port expansion and freight routes.

The success of this modernization counted heavily on a complementary framework that fostered green infrastructure projects, simplified customs clearance, and improved maritime security protocols. Without this harmony, physical improvements are threatened by underutilization or are unsuccessful in attracting ample private sector investment.

Non-Traditional Security Challenges to Blue Economy: A case Study of Pakistan (2018-2022)

4.1 Overview

This chapter provides a comprehensive exploration of the idea of traditional and nontraditional security threats, understanding their different characteristics, shifting

patterns, and relevance to current security frameworks. It commences with an overview of the vast opportunities provided by Pakistan's maritime sphere, encompassing the advancement of maritime transport, fisheries, aquaculture, tourism, offshore energy production, and various coastal industries. The discourse focuses on the relevance of the Blue Economy in enhancing Nations' adaptive capacity and reducing reliance on conventional land-based sectors.

The chapter's second section examines the non-traditional security challenges that present a significant threat to the growth and sustainable practices of Pakistan's ocean economy. Such as maritime terrorism and piracy, which pose a risk to the safety of sea lines of communication and maritime trade? Similarly, climate change disrupts coastal infrastructure, fisheries, and marine ecosystems. As well as illegal activities like IUU fishing and smuggling, these are challenging state sovereignty, overexploiting marine resources, and destabilizing the economy. These threats are amplified by structural weaknesses, limited maritime monitoring, and the absence of a holistic maritime security strategy.

In tackling these issues, the chapter's closing section provides policy recommendations intended to strengthen Pakistan's capacity to regulate and preserve its maritime concerns. These entail improving maritime domain awareness, revamping naval and coast guard infrastructure, upgrading legal and institutional mechanisms, fostering a regional maritime alliance, and embedding climate adaptation measures into marine resource governance. The chapter concludes that effectively addressing this non-traditional security challenge is vital for unlocking the utmost potential of Pakistan's Blue Economy and promoting its lasting sustainability.

4.2 Traditional and Non-Traditional Security Challenges

Pakistan, regardless of its considerable coastline and extensive marine resources, has overlooked utilizing the prospects of the Blue Economy, which is a sector globally acknowledged for leading sustainable economic development. Emanating from the Rio+20 Conference of the United Nations in 2012 and backed by SDG 14, the Blue Economy framework is designed to capitalize on ocean resources for financial wellbeing, the creation of jobs, and environmental protection. Pakistan's incapacity to wholly incorporate and put this concept into practice of its national strategy, notably when the state faces prolonged economic slowdown, trade deficits, and increasing joblessness. The data indicate that if adequately expanded, Pakistan's blue growth could provide a sustainable solution to some of the state's utmost critical challenges. Pakistan holds around 1050km of coastline, a 240,000km square Exclusive Economic Zone, and a further 50,000km square of continental shelf. According to these figures, Pakistan is classified the world's important coastal countries.

However, the shipping industry, which forms the basis of international trade and handles approximately 90% of Pakistan's volume of trade which is still severely undeveloped. The Blue Economy of Pakistan has a prolonged struggle from traditional challenges stemming from past neglect, obsolete fishing methods, and the exclusion of coastal groups. The lack of a solid maritime culture, insufficient investment in marine industries, and the stagnation of maritime infrastructure have caused significant foundational flaws. These basic challenges have not simply hindered the sector's growth, but also made it more prone to emerging non-traditional challenges.

Climate change, illegal fishing, maritime terrorism, marine pollution, and smuggling now pose extra risk to Pakistan's already vulnerable maritime region. In addition, the restricted scholarly and policy consideration of non-traditional security challenges is

commonly due to conceptual gaps and systematic resistance, which have resulted in Pakistan being unable to handle them effectively. The traditional and non-traditional threats are interrelated with the previous deterioration of the foundations, which is essential to address the latter. An enduring and protective Blue Economy will demand that Pakistan tackle both ranges of challenges at the same time through holistic reforms, greater understanding, and long-term blueprint development.

In the 21st century, security is no longer articulated only by military menaces or territorial disputes. Non-traditional security issues hold various defining attributes that set them apart from traditional security threats(showing in Table 4.1) (Iqbal, K. 2013). Foremost, they are non-military, which means they refrain from involving armed conflict or military aggression; however, their effect can be equally, potentially even more devastating. Next, they often span nations, which mean they traverse state borders and cannot be managed or addressed by the unilateral action of a country. Third, these threat commonly entails non-state actors, like as terrorist groups, multinational corporations, civil societies and criminal networks, Fourth, they have tendency to influence environmental and human security instantly, sabotaging public health, food security, economic systems, and ecological resilience .finally, they need join efforts and multilateral responses to effectively tackle these problems otherwise no single nation cannot tackle it in isolation (*Chaudhuri, S, S. 2013)*.

Feature	**Traditional Security**	**Non-Traditional Security**
Actors	State, military, government	State, individual, and non-state actors

Core	Sovereignty, power, territory	environment, economy, Human well-being
Kind of threats	Military aggression, conflicts, war	Climate change, disease, crime, and food unavailability
Dynamics	State-centric, armed conflict, violent	Trans border, often non-violent
Response	Defense, deterrence	Cooperation, collaboration, governance, resilience

Table 4.1 Difference between Traditional and Non-traditional security challenges

Source: Author, compiled by a different document (See in Appendix VII)

4.3 Non-traditional Security Challenges Facing Pakistan's Blue Economy

The idea of non-traditional security attracted attention in the post-Cold War era, mainly during the 1990s, at the time researcher and policy maker began to discern that the end of great powers rivalry did not essentially escort about international peace and stability .rather, new threats surfaced that could not be resolved through military approach (Caballero-Anthony, M., & Cook, 2010). The emergence of intrastate conflicts, racial clashes, refugee crises, ecological disasters, and economic crises highlighted the drawbacks of the traditional security structure. Organizations such as the United Nations (UNO) and regional bodies like ASEAN and the AU (African Union) started

to widen their security initiatives to encompass human development, ecological preservation, and transnational border crime.

The United Nations Human Development Report of 1994 was highly significant, proposing the notion of "human security", which stressed safety from lasting menace such as hunger, disease, and repression, and also protection from immediate interruption in everyday routine Pakistan, along with its strategic coastline throughout the Arabian Sea and its crucial Gwadar Port acting as a bedrock of the China-Pakistan Economic Corridor (CPEC), confronted with a sophisticated maritime security environment. Recent discussion on maritime security, on a global and regional scale is emphasizes that non-traditional threats like climate change, terrorism, piracy, illegal smuggling, and illegal exploitation of marine assets cannot be addressed unilaterally. For Pakistan, these threats are grounded in reality, so they are rapidly and directly influencing economic stability, national security, and regional peace (Ali, L. Personal Communication, 2025). Unfolding global risks, like environmental degradation, resource scarcity, organized crimes have triggered the rise of what are termed nontraditional security challenges (Chatterjee, A. 2014). Among such, IUU fishing, climate change, piracy, maritime terrorism, and maritime smuggling (CPSD.n.d) have develop into a serious threat to economic security and stability, lets discuss them one by one.

4.3.1 Indicator 1: Climate change

Climate change and Environmental degradation stand for one more pressing nontraditional security challenge for Pakistan’s Blue Economy. Eco-threats are increasingly deemed as a crucial non-traditional security challenge in the maritime sector. Climate change alters the oceanic balance that is essential to the execution of Blue Economy domains. The rising ocean temperature has led to a substantial transition

in the dispersion of marine species, primarily fish. As the ocean becomes warmer, fish relocate to cooler waters, regularly departing from the traditional fishing belts of coastal states, particularly those in equatorial and adjacent regions. These reallocations undermine the sustainability of the state's fisheries and directly affect the livelihoods of millions who depend on marine assets.

For states that lack the competency in compliance, these migrating stocks and bargain over shared access deals with other countries, this can imply a lasting loss of key income and protein sources(Economist Impact,2019).in addition, these shifts can aggravate geostrategic strains between neighboring states over fishing rights, particularly in zones where maritime boundaries are previously unclear and disputed. The consequences of the warming of seas and oceans expand beyond fisheries. Coral reefs, which perform the role of key marine habitats and entice billions of dollars in annual tourism income, are especially vulnerable.

4.3.1.1 Corals Reef degradation

Corals are intensely susceptible to temperature anomalies; yet a one or two degree Celsius elevated sea surface temperature can induce coral bleaching, which is a stress response that hampers corals and causes large-scale mortality. The decline of coral reef ecosystems causes the depletion of biodiversity and lessens the natural attractiveness of coastal areas, impacting both fisheries that rely on reef-dwelling species and tourism domains that depend upon unspoiled underwater environments. States in the Indian Ocean, the Caribbean, and Southeast Asia, plenty of which small island LMICs face especially severe risk in this regard (Anagha P. 2022). Mangroves are essential for coastal protection, acting as a natural shield against surge tides and coastal erosion, and offering a breeding ground for different marine species (Khan. A Personal communication, 2025).

Among the most significant ecological ramifications of coastal advancement has been the deforestation of mangrove forests parallel to the Sindh coastline. Over time, mangrove cover in Pakistan has declined from around 600,000 hectares in the 1960s reduce to under 100,000 hectares in 50 years (IUCN Pakistan, 2012).in spite of these setbacks, preservation initiatives have caused some good outcomes. The Sindh Forest Department, in partnership with WWF-Pakistan and IUCN, has recovered roughly 140,000 hectares of mangroves during the period 2012-2023. In addition, the entire mangrove forest area in Pakistan extends from 1,338.16 km² in 2016 to 1,573.57 km² in 2020 (News Desk, 2024).

4.3.1.2 Ocean Acidification

Ocean acidification, a subsequent effect of increased carbon dioxide soaking up by the oceans, entails an equally subtle risk. As atmospheric carbon dioxide levels rise, a greater amount dissolves into ocean waters, producing carbonic acid and dropping the pH of ocean water. Acidification undermines the ability of marine organisms, like shellfish and corals, to develop and sustain their calcium carbonate shells and mineralized body parts. This affects the reproductive and long-term survival rate of critical species within the marine food web, triggering a chain reaction on

biodiversity, aquaculture, and fisheries.

4.3.1.3 Extreme Weather Events

For the Blue Economy, this leads to an evaluated risk level for seafood supply chains and a possible decline in export income, especially for economies that rely extensively on shellfish and mollusk farming. In addition to its chemical and heat stress, climate change becomes evident in physical form through rising sea levels. The thermal dilation of ocean water, accompanied by the melting glaciers and polar ice cap, is leading to a slow but sustained escalation in global sea levels(see Figure 4.1) (Centre Scientifique

de Monaco, 2015). Moreover, the induration of low-lying areas jeopardizes the residential communities, agricultural land, and tourism resorts, forcing governments to invest considerable assets in disaster risk management and adaptive capacity building. Severe weather-related disasters, a further ramification of climate change which threaten the reliability and sustainability of Blue Economy sectors. Cyclonic storms such as hurricanes and typhoons are becoming more common and more extreme which causing billions of dollars in damage every year. These phenomena damage fishing fleets, coastal hotels, aquaculture facilities, and other coastal infrastructure. The volatility of such disasters brings a facet of uncertainty to blue economic planning and revenue. In addition, the repeated damage to capital assets and livelihoods can cause enduring socio-economic migration, dislocation, and amplification of poverty in coastal communities.

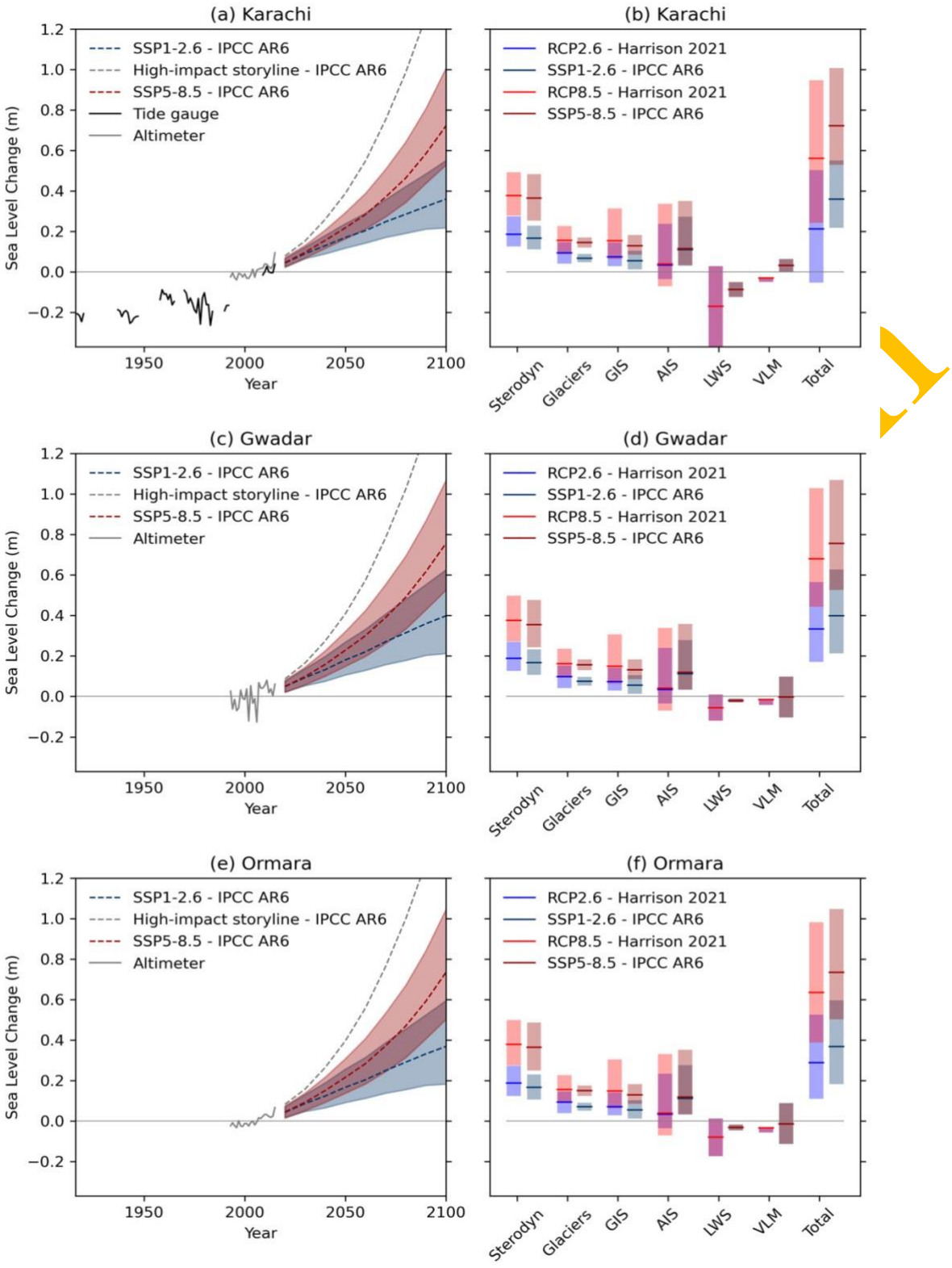


Figure 4.1Sea Level Rise in Karachi, Gwadar, and Ormara.

Source: Legeais et al. (2018)

This process led to wide-ranging consequences for coastal infrastructure, human settlements, and economic activities. Ports are fundamental to global trade and a pivotal

element in Blue Economy value chains is prone to flooding, cyclones, and coastal erosion (as we can see in Figure 4.2). Destruction of port infrastructure can cause disruption in the supply chain, elevate insurance costs, and decrease the allure of a nation as a trade or investment center.

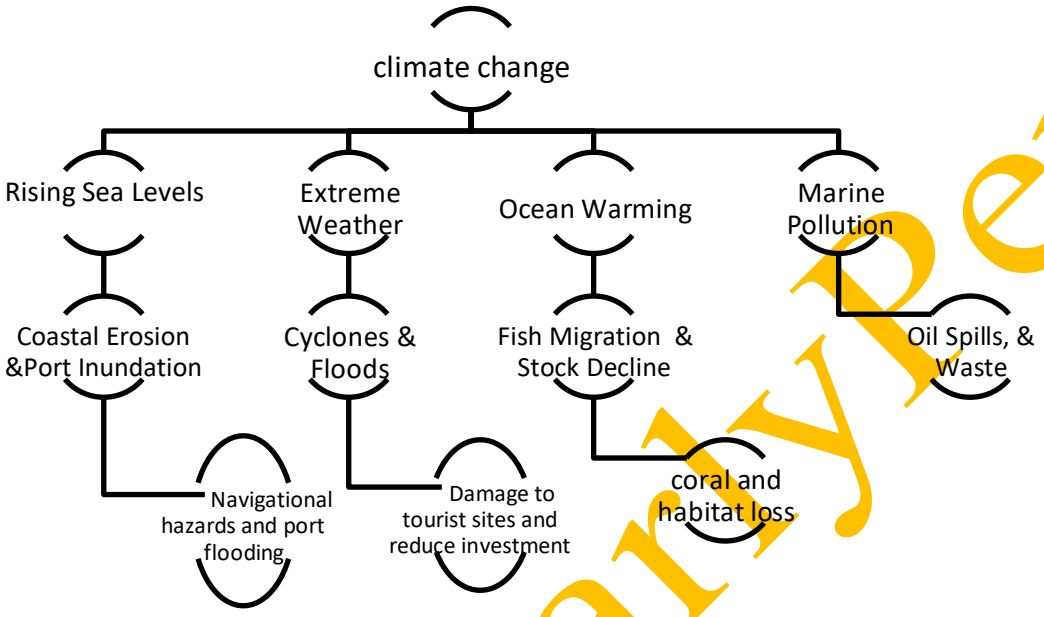


Figure 4.2 Climate change effects on Blue Economy

Source: Author, Developed by reviewing relevant literature (details in Appendix VIII)

Direct and Indirect Impact on Blue Economy

The Indian Ocean, like faces rising sea levels, increasing ocean temperature, and pollution, collectively they lead to the degradation of the marine environment. Climate change worsens the fragility of coastal communities through flooding, hurricanes and cyclones, and loss of agricultural land (see Map 4.1) (Vallangi, 2021).

Warming ocean water can affect fish dispersal and reproduction cycle, destabilize traditional fisheries, and pose a threat to food security. Additionally, environmental

degradation can cause resource scarcity, escalating contention over fishing grounds, natural reserves of gas and oil, and minerals lying below the seabed. These ecological changes can further lead to migration, as individuals forced to move due to natural disasters or depleting resources seek refuge in another place, possibly undermining regional stability both socially and politically. Moreover, extreme weather events such as cyclones and hurricanes disrupt port infrastructure, obstruct shipping, and amplify maritime accidents.

Map 4.1 *Climate* ***Change in Arabian Sea***

Source: Mongabay, 2025(https://news.mongabay.com/2025/03/in-pakistan-sea-level-rise-displacement-follow-fisherfolk-wherever-they-go/)

Case of Karachi Port

Coastal cities such as Karachi are primarily susceptible to the consequences of rising sea levels, coastal erosion, and thermal warming. Karachi, which contains Pakistan's largest port and business center, is currently facing frequent flooding because of unpredictable weather patterns and rising tides. A report of the British High Commission warns that if the current trajectory of sea level increase continues at the

same rate, then Karachi will potentially be submerged under the sea by 2060 (IIPS, n.d). Two major ports two ports (Karachi Port and Port Qasim) manage more than 95% of the state's maritime trade.

Moreover, Karachi, which economic hub of Pakistan's Blue Economy, is also ranked one of the most climate-vulnerable cities in South Asia. As per the report of the Asian Development Bank, Karachi is at great risk from sea-level rise, prolonged cyclonic activity, and intensified sea water intrusion (ADB, 2014).

Cyclone Biparjoy: For example, Cyclone Biparjoy hit land close to the Sindh coast in June 2023, seriously damaging Karachi and the districts of Thatta, Sajawal, and Badin. This cyclone caused evacuation and intensified emergency preparedness strategy to mitigate the destruction of infrastructure and disturbance to port activities (See Fig 4.3) (Jones, B., .2023).

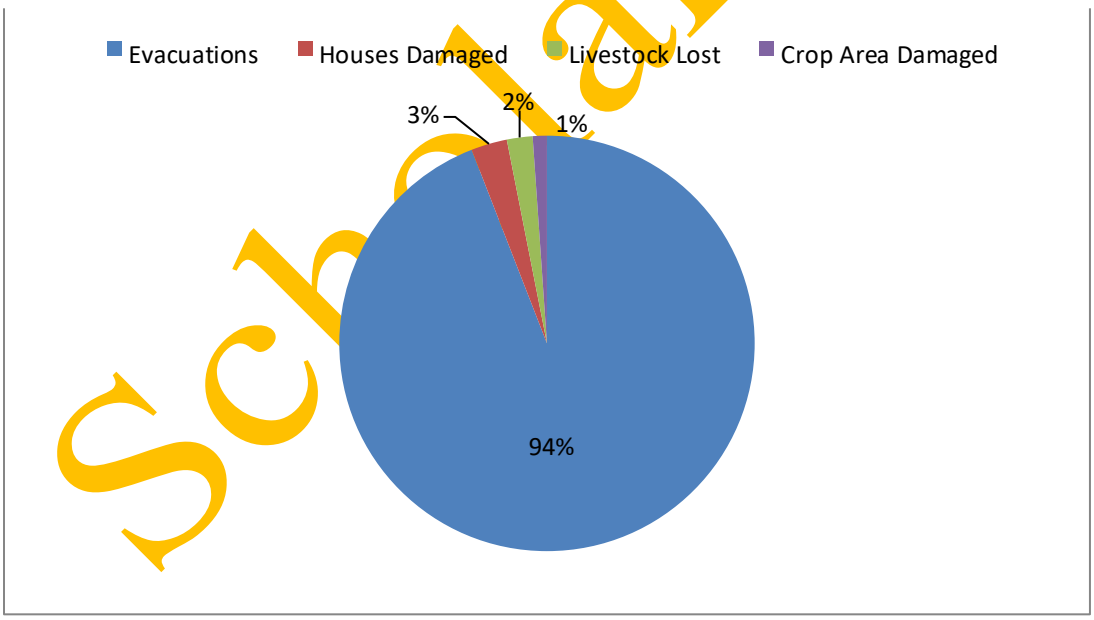


Figure: 4.3 Cyclone Biparjoy

Source: Developed by Researcher

Moreover, during June and July 2024, an uncommon incident of mass seashell washups was recorded along Karachi's beaches. Scientists trace this to the extreme heat and changed wind patterns, which put pressure on marine ecosystems and reflected growing

ecological imbalance (Aj English News, 2024). The deterioration of the marine environment, fueled by industrial waste, pollution, and unchecked coastal development, is harming the health of the Arabian Sea and limiting its ability to sustain marine life. As reported by the Pakistan Meteorological Department and environmental studies, the sea level rise near Pakistan's coast is at risk of inundating low-lying areas, driving migration and introducing a new base of economic and social instability.

Furthermore, marine pollution, mainly plastic and oil spills has heavily affected biodiversity and the economic well-being of the coastal population dependent on fishing. Pakistan's maritime sectors hold huge potential for economic development via its Blue Economy, including sectors such as tourism, fisheries, shipping, and coastal innovation. Even so, this potential is become more vulnerable by environmental degradation. Current data point out that sea levels near Pakistan's coast have been rising on average of 1.1 mm per year, with an area-based specific rate in Karachi potentially boosted due to land settling and coastal refinement. These changes have resulted in an increase in frequency and intensity of coastal flooding, which is posing a serious threat to industry, infrastructure, and poor communities in the city's coastal zone.

The depletion of marine ecosystems and climate-driven migration has a far-reaching effect for the socioeconomics of coastal population. Fisher folk groups, like those in Ibrahim Hyderi and Rehri Goth along Karachi, indicate a reduction in fish stocks, ingress of saline water into freshwater sources, and relocation due to coastal inundation (Mongabay, 2025). Recently, visitors to mangrove-lined creeks along Manora and Karachi's Clifton Beach have verified report of radiant phytoplankton on marine algae that release a shimmering blue light when agitated. These groups, that are fully reliant on maritime and marine resources for their means of income, are commonly marginalized in planning mechanism and limited resilience infrastructure.

Recent biodiversity protection program, such as mangrove reforestation projects backed by the World Wildlife Fund (WWF) and Pakistan Navy, have intended to undo some of these patterns. As an example, the "One Billion Tree Tsunami" the plan entails mangrove cultivating in the coastal zones, fabricating Pakistan among the limited states in the world where mangrove area is growing. Additionally these gains continue to be at risk from industrial expansion and lenient enforcement of coastal land-use regulation. Marine pollution, especially from domestic waste and industrial use are intensifies the condition. Karachi generates about 1.8 billion liters (approximately 472 million gallons) of industrial and domestic wastewater per day, with roughly 80% of this dumped discharge into the Arabian Sea. Pollution of this kind injuries not only marine life as well as affects the source of income coastal communities rely on fishing.

The 2003 Tasman Spirit oil spill, among the most severe man-mad environmental crises in Pakistan, point out the sensitivity of the maritime sector to environmental hazards. The spill expelled around 30,000 metric tons of low viscosity crude oil into the Arabian Sea, impacting 16 KM of Karachi's coastline and resulting serious damage to marine ecosystems (Rana, 2003). A study conducted by the Pakistan Institute of Development Economics (PIDE) stated that the financial consequences of ecosystem damage in Pakistan may make up to 6% of GDP per year, with shoreline destruction playing a key role (World Bank, 2020). The detachment between financial planning and environmental protection in the maritime domain risks sustaining this economic deplete and escalating inequalities.in the face of adversity, nature offers a clear warning of the ocean's lasting enigma and potential.

4.3.2 Indicator 2: Maritime Terrorism and Piracy

Maritime terrorism and piracy have surfaced as the two leading threats to maritime security globally, immediately affecting the economic growth potential of coastal

nations. A state like Pakistan, whose economic growth depends upon utilizing the Blue Economy. Pakistan's territorial boundaries along the Arabian Sea position it at the crossroads of Sea Lines of Communication (SLOCs) that enable across 90 %t of its trade (Abbas, 2024). The key advantage of ports such as Karachi and Gwadar is as striking as their vulnerability to violent non-state entities who strive to undermine economic activities by carrying out piracy or terrorism. This obstruction endangers not only Pakistan's economic development but also regional stability and global maritime commerce.

Maritime terrorism is a niche segment of terrorism that entails illegal acts of violence or the menace of violence accomplished at sea, in coastal areas, and targeting maritime infrastructure. Maritime terrorism is determined by political, dogmatic, and religious aims (Ong-Webb, 2006). The aim is typically to instill fear, articulate a political position, disrupt global trade, and promote an issue. Terrorist assaults in the maritime realm can take different forms. Among these are bombings using vessels loaded with explosive or underwater devices, attacks on port infrastructure or offshore oil and gas facilities, and hijackings of commercial vessels.

Open waters like seas and oceans cover vast, commonly unmonitored spaces that enable spotting and prevention of terrorist actions, notably difficult. A ship regularly covers great distances along international waters, making governance and execution complex. Maritime piracy means criminal acts carried out at sea, often including the robbery or hijacking of vessels and ships. Over the course of history, piracy has been a key threat to maritime trade and transportation, leading to both economic losses and putting lives at risk. Pirates commonly operate in exposed and poorly controlled waters in which shipping lanes are crowded and heavily trafficked, making merchant vessels key targets because of the valuable goods they possess.

The underlying cause of piracy is often rooted in economic gain, and pirates may detain crews for demand payments and snatch ships to sell their cargo unlawfully. Contemporary, piracy has advanced in step with technology and variation in maritime security (Shea, N. E. 2012). Though classical pirate attacks entailed mounting ships with weapons and overrunning the crews , in modern times pirates every so often making use of speedboats, navigating system , and even high-tech communication systems to organize attacks more adequately .moreover , both phenomena commonly coincide within operational methods and outcomes . Pakistan's maritime sector has experienced examples of both, pointing the urgency of understanding their separate and collective influence on the Blue Economy.

Pakistan's Blue Economy has been a key aspect of national advancement plan, primarily with the start of the China-Pakistan Economic Corridor (CPEC) that stresses Gwadar Port as a key element for regional linkage and commerce. The enlargement of poor infrastructure, fisheries development, offshore energy exploration, and maritime tourism projects are crucial for diversifying Pakistan's economic base. Even so, the longevity of these projects is based on ensuring maritime security. Disruptive effects of piracy and maritime terrorism pose an immediate threat to the feasibility of these areas increasing operational threats, inflating costs, and putting of investment.

Pakistan Legal Efforts to Overcome Terrorism and Piracy

As per legal requirements, Pakistan is subject to multiple international conventions which regulate piracy and maritime terrorism, main of them is (SUA) the Suppression of Unlawful Acts against the Safety of Maritime Navigation Convention 1988 and (UNCLOS) the United Nations Convention on the Law of the Sea 1982. UNCLOS outlines piracy in Article 101as any unlawful violent act, detention, and destruction carried out for private ends on the international water. Mainly, piracy under UNCLOS

must happen outside legal reach of any individual state, conventionally on the high seas. On the other hand, maritime terrorism is commonly covered by the SUA Convention, which deemed act of violence criminal targeting vessels and port infrastructure instead of it location, stressing the need for security against politically motivated aggressions.

Case of USS Cole 2000: One prominent example showing the maritime terrorism risk in the region is the 2000 strike on the USS Cole in the Yemeni port of Aden, in which Al-Qaeda spies used an explosive-laden boat to devastation of the USA Navy destroyer (Naval History and Heritage Command, n.d). Although not inside Pakistan's territorial waters, this assault was carried out in the extended Arabian Sea basin and signaled the exposure to the risk of naval and commercial ships and crafts to asymmetric maritime menaces. The long-term effect of maritime strikes in the Arabian Sea, coming from the USS Cole bombing due to aggression against commercial tankers, highlights the capacity and possibility scale of maritime terrorism's impact.

Case of M Star and Limburg: After this, attacks on bulk liquid carriers like the Japanese oil tanker (M Star) in 2010 and the French vessel (Limburg) in 2002 emphasized the importance of intensified maritime security (Ravid, 2021). These events exemplify in what way maritime terrorism can disturb essential maritime trade routes, devastate infrastructure, and result in environmental harm by oil spills, having a direct effect on regional economies, including Pakistan's. Piracy incidents directed against vessels off Pakistan's coast have been a smaller number, but still important.

The absence of legal framework enforcement capacity in a few coastal areas has sometimes authorized pirates and armed robbers to carry out operations unchallenged, especially attacking fishing boats and light cargo ships. The danger of piracy surges throughout periods of political instability, social deprivation, and economic hardship,

causing it remains a constant concern for Pakistan's maritime regulatory bodies. For piracy, the regulatory framework permits cross-border jurisdiction, which means any state, such as Pakistan, can detain and bring to trial pirates seized on the high seas.

Pakistan's national legal framework includes these obligations via the Pakistan Maritime Security Agency Act 1994 and the Prevention and Control of Offences at Sea Act 2000. These laws enable the Maritime Security Agency (MSA) and Pakistan Navy (PN) to seize lawbreakers, perform naval surveillance, and bring charges for piracy and terrorism at sea (Pakistan Maritime Security Agency, n.d). Additionally, Pakistan's partnership with regional collaborators under forums such as IONS (the Indian Ocean Naval Symposium) and IORA (the Indian Ocean Rim Association) is boosting regional maritime governance and joint security efforts.

Piracy and Pakistan

The previous context of piracy in the Arabian Sea and contagious water, while not as evident as in regions such as the Horn of Africa, has seen irregular intensification linked to financial hardship and political volatility. Piracy in Pakistan's littoral water commonly intertwines with smuggling, rebel violence, and illegal fishing, particularly in Baluchistan, where separatist groups have strived to disrupt maritime infrastructure ventures. These resistance groups at times adopted strategies indistinguishable from piracy, like attacking vessels, extracting money from maritime business, or hijacking boats for financial gain and political influence(as we can see in Figure 4.5). Not only do these acts jeopardize physical capital as well as impair the operation of ports, shake investor confidence and confine maritime business activities. The financial costs of maritime terrorism and piracy to Pakistan's Blue Economy are multidimensional.

Suicide Attack on Gwadar port: A notable example is the 2024 suicide attack on Gwadar Port Authority, which resulted in 10 deaths and raised significant concerns about the security of CPEC investments. The instant impacts involve physical destruction of ships and port facilities, logistical loss, and physical harm and mortality to crew members. Even so, more intense are the indirect economic consequences. Insurance-related expenses for shipping companies' uptick in the danger-prone region, making it costlier to carry out trade via Pakistani ports. Shipping industries may reassign vessels' path to avoid the zone, considered risky, expanding traffic times and costs.

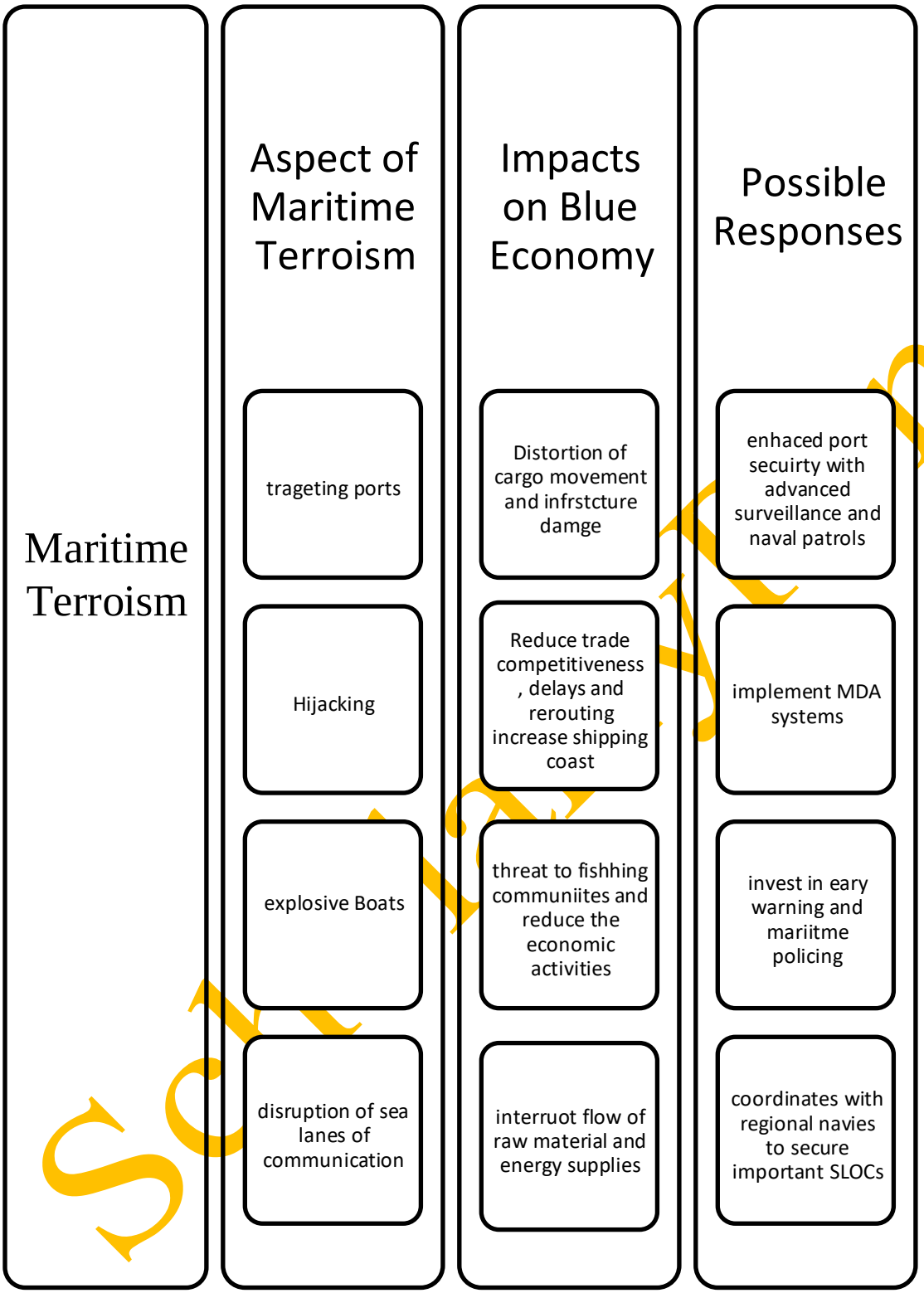


Figure 4.4. Impacts of maritime terrorism on the Blue Economy

Source: Author, Drawing after reviewing existing relevant studies (details in Appendix IX)

The fishing sector, a backbone of Pakistan's Blue Economy, is especially vulnerable. It maintains livelihoods for roughly 1.5 million people near the coast and plays a part in food security and export revenue. Piracy and maritime terrorism upset fishing activities by limiting access to fishing grounds and by posing an explicit risk to fishing boats. The amount of increased security measures, like convoy protection, armed watchmen, and port security updates, places more strain on public and private shareholders. These economic strains disturb the supply chain, increase prices, and decrease Pakistan's trade competitiveness.

4.3.2.1 Fishing Downsizing

This insecurity commonly results in cutback fishing exertion and production, which in turn impacts the accessibility of a key source of protein for the population. In addition, the reallocation of resources toward immediate security risk can hamper the adaptation of sustainable fishing methods and the upgrading of the sector, as well as jeopardize long-term resource oversight and environmental balance. Fishermen have claimed attacks and threats from militant clusters and pirates, which force many to sidestep certain zones or limit their operations, negatively impacting fish landing. This scenario weakens community welfare and undermines the sustainability of fish stocks, as expelled fishermen may rely on regulatory or illegal fishing in a different region, escalating ecological degradation.

4.3.2.2 Tourism under Threat

The growing coastal tourism sector in Pakistan also contends with notable threats. The stunning nature and cultural legacy of coastal areas like Gwadar and Karachi provide significant tourism potential, which might broaden the scope of the Blue

Economy. Security challenges arising from maritime terrorism hinder tourism and investment alike. In November 2011, some militant personnel attempted a terrorist

strike along Karachi's Sea View beach, attacking a nearby religious site, but were detained by police, leading to their deaths as well as two officers. This terrorist aggression shows serious security risks to the public and tourist spots in Karachi (Tribune, 2011). Physical attacks and acts of violence in maritime zones generate a sense of insecurity, slowing development in hospitality, sport, boating, and supporting services, and finally curbing economic diversification. The marine tourism domain also struggles due to the influence of maritime insecurity.

Assessment of threat and instability restrains tourists from travelling to Pakistan's coastal zones, islands, and beaches, resulting in the local communities' loss of economic opportunities associated with ecotourism and outdoor activities. In 2018, armed radicals carried out an assault on the Chinese consulate located near the Karachi port. This incident points out how terrorist attacks near coastal areas can directly harm maritime tourism by undermining the outlook of safety (AP news, 2018). The resulting economic standstill limits investment in sustainable maritime tourism facilities and reduces diversification of Pakistan's Blue Economy, weakening the strategies to develop alternative revenue channels and employment.

Piracy and maritime terrorism also threaten the development of Pakistan's offshore energy field. Pakistan's offshore zones across the Arabian Sea carry notable potential for oil and natural gas extraction, key to minimizing the country's energy import reliance. However, the large financial investment and technological demands of offshore drilling require modifications to detect security disruptions. Assaults or disruptions against offshore stations and service boats could halt production, lead to an ecological crisis, and reduce foreign investment.

Threats to SLOCs

Security worries increase operational costs and push back project competition, slowing down the fulfillment of economic benefits from offshore resources. An additional aspect of threat challenges the Sea Lines of Communication (SLOCs) that nearly reach Pakistan's coast.

These shipping routes are significant for energy imports, export products, and crude material. Turmoil due to terrorist attacks or piracy, like hijacking oil tankers or closing maritime channels, could cause serious energy shortages and financial uncertainty. Given Pakistan's reliance on maritime routes for approximately 90% of its commerce and energy flow, prolonged insecurity at sea would have a chain reaction on multiple sectors, such as manufacturing, transportation, and merchandising.

Case of Baloch Insurgency: In Pakistan's setting, the Baloch insurgency introduces a complicated security challenge that is linked with maritime terrorism issues. The Baluchistan independence movements have long-standing attacks on infrastructure projects associated with Gwadar port and energy pipelines, triggering worries over maritime attacks. Although no prominent maritime terrorist strike has taken place in Pakistan's waters, considerable risk still exists in light of insurgency history of wrecking, and militant operations. On March 20, 2024, rebels associated with BLA raided Gwadar Port, a critical Chinese-invested maritime infrastructure in Pakistan. The attack was launched against government and security installations along the port, highlighting how these insurgent attacks jeopardize critical maritime infrastructure (Ship Technology, 2024).

This stresses the importance of comprehensive security actions that include land-sea coordination and collaborative efforts in the region. Coastal erosion and severe weather conditions threaten port facilities and the coastal population, reallocating assets from

security to disaster mitigation. The damage to the marine environment also subverts the fisheries and tourism latent, weakening resilience to security threats. Climate-compelled displacement and resource scarcity could ultimately escalate maritime conflicts or criminal operations, further entangling the maritime security environment. The surrounding maritime zone of Pakistan has experienced the emergence of terrorism beyond direct assaults alone on naval infrastructure, as well as in broader sea-based criminal acts like piracy and hijacking.

Case of Hijacking Pakistan Navy frigate in Karachi: The 2014 efforts to take over a Pakistan Navy frigate in Karachi, conducted by militants associated with Al-Qaeda, exemplify the inherent vulnerability in Pakistan's maritime sector. The offender using small and agile vessels or ships to move closer and try to take control of a heavily defended naval ship points to asymmetric tactics exploited by terrorist groups to take advantage of the natural complexities of the maritime environment (The Maritime Executive, 2014). These strategies describe in what way terrorist groups harness the porous and broad nature of maritime spaces, particularly in urban harbor settings, where military and non-military facilities coexist, to undermine state control and impede the fundamental security system.

Case of Iranian Fishing Vessel 2024: The 2024 unlawful seizure of an Iranian fishing vessel, containing Pakistani citizens among its sailors, demonstrates the human cost and transnational aspects of maritime insecurity across the region (The Hindu, 2024). These incidents highlight significant concerns regarding the safety of Pakistani (as map 4.2 showing Somalia piracy) crew members and vessels steering regional waters that are prone to exploitation by a network of trans border criminal and terrorist cells. The financial implications for Pakistan for protecting its maritime sector against maritime terrorism and piracy are unparalleled. The Blue Economy is

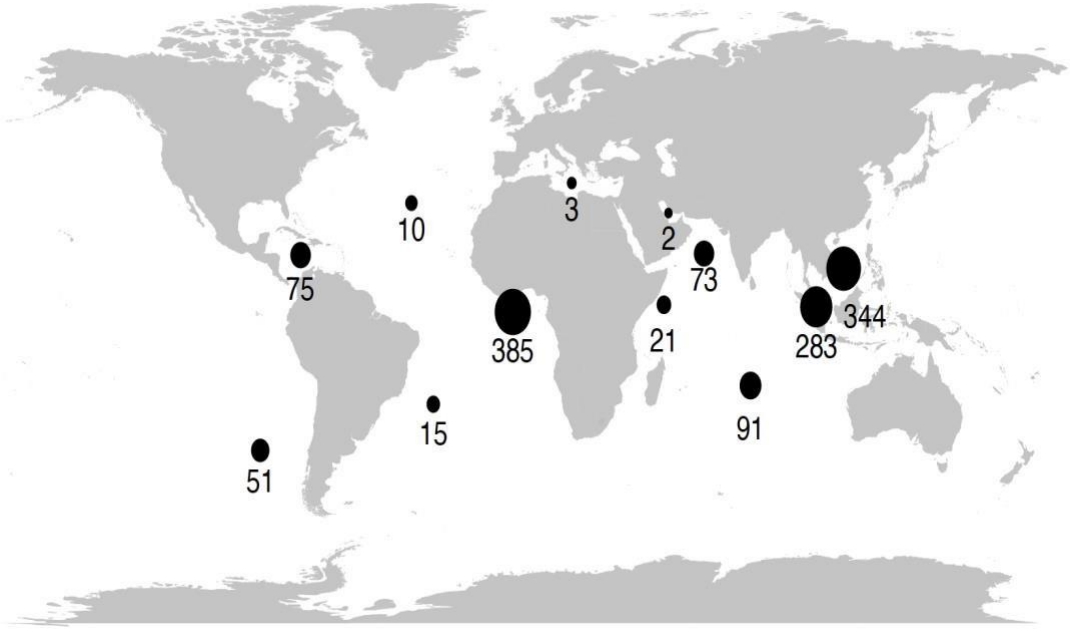
anticipated to add considerably to Pakistan's GDP growth over the next years, stimulated by improved maritime trade, modernization of the fisheries department, offshore energy extraction, and tourism advancement (Pakistan Today, 2025). Any disturbance stemming from insecurity will reduce these benefits, possibly negating gains in poverty mitigation and economic expansion. While piracy particularly includes criminal acts for private catch up to the high seas, terrorism aims to derail state and trade activities by politically charged violence.

Map 4.2. High-risk area of Somali maritime piracy.

Source: United Kingdom Hydrographic Office

Both menace Pakistan's port facilities, shipping lanes, fisheries, offshore energy extraction, and evolving tourism industry. Pakistan's legal devotion to domestic maritime laws, UNCLOS, and the SUA Convention offers solid foundations for prosecuting the culprit and coordinating internationally. But the potency of these

blueprints relies on increasing maritime domain awareness, tackling the root of socioeconomic disparities, regional cooperation, and political factors. Thoughtfully, terrorist groups utilizing sea-based strategies against Pakistan aim to obstruct state authority and disrupt military capabilities, operating as a kind of asymmetric warfare. Through focusing on naval infrastructure and commercial maritime facilities, these entities seek to confront Pakistan's sovereignty and challenge its capacity to protect vital maritime realms. The map 4.3 shows the total number of piracy incidents from 2015 to 2020 by region. South America is subdivided into three regions.



Map 4.3 Piracy Incident from 2015-2020

Source: Sandkamp et al. (2021). Data from International Maritime Organization

The emerging instability not only threatens Pakistan's defense stance but also signals gaps that hostile actors may want to exploit in a wider geopolitical struggle. Piracy and maritime terrorism, though, impose both direct and indirect threats to all sectors and domains that are linked with the Blue Economy of Pakistan. The ongoing threats create an environment of uncertainty and increased risk, discouraging both foreign and local investors from investing funds in maritime infrastructure ventures.

Primarily, large-scale developments connected to the CPEC (China-Pakistan Economic Corridor), notably those based on Gwadar port, call for securing maritime factors to bring and maintain investment. The elevated risk profile related to maritime terrorism may result in project setbacks, uplift security costs, and possibly investor withdrawal, thus hindering the development of critical maritime sectors like shipbuilding, coastal logistics, port expansion, and offshore energy extraction.

Piracy and Maritime terrorism likewise present a major challenge to the management and implementation of maritime laws and ecological guidelines important for the safeguard of marine ecosystems. The reallocation of maritime security assets focused on counterterrorism and antipiracy operations commonly causes in decline in monitoring of illegal fishing, pollution, and other eco-damaging behavior. These regulatory gaps create situations conducive to illegal, unregulated, and unreported (IUU) fishing and environmental harm, thus putting at risk to ecological bases of Pakistan's Blue Economy and undermining its sustainability.

Regionally, the problem of piracy and maritime terrorism fuels greater instability in the Arabian Sea and the broader Indian Ocean. The maritime industry in this area is marked by disputed territorial claims, geostrategic rivalries, and a tangled mesh of alliances, each of which is further complicated due to the presence of militant nonstate actors utilizing sea lanes for illicit objectives. As a littoral state, Pakistan has to deal with these challenges, balancing its state security stakes tied to regional cooperation priorities. The possibility of maritime terrorist attacks leading to largescale regional instability is magnified by the interlink age of maritime trade and security, where the chain reaction of insecurity rapidly goes beyond state boundaries.

Implications of Inaction

The ramifications of maritime terrorism and piracy go beyond the scope of present physical attacks on naval and commercial ships. Pakistan's extensive dependence on its seaports, especially Karachi and the evolving Gwadar port is positions the state's economic backbone directly in the realm of these threats. Both ports work as a central point for the nation's import-export economy; on the other hand, disruptions stemming from pirate or terrorist activities risk a ripple effect on the economy. In spite of different legal instruments, challenges are still faced in enforcement and prosecution. Piracy and maritime terrorism are commonly carried done by non-state actors that function across jurisdictional boundaries, undermining policing efforts. The global partners' countermeasure against maritime terrorism and piracy highlights the importance of multilateral agreements. In the wake of piracy off Somalia early in the 2000s, international naval alliances, for example, the Combined Maritime Forces (CMFstarted joint patrols and blockade operations in the Indian Ocean, which likewise assist Pakistan's maritime security obliquely. Pakistan strengthens its Naval Diplomacy and Builds Strategic Partnership by working with states such as USA, UK, Turkey, and Japan as well as working within a Coalition like CTF-51.

Pakistan has worked alongside these coalitions, engaged with the regional joint action plan, namely the Indian Ocean Naval Symposium, to exchange information, conduct joint exercises, and improve monitoring abilities. These joint efforts are necessary in confronting transnational maritime challenges that no individual state can effectively tackle solo. Pakistan's maritime infrastructure, especially in Baluchistan, shows inconsistencies in surveillance and governance, which armed groups may exploit. Enhancing maritime sector awareness through upgraded radar networks, AIS (Automatic Identification Systems), and community involvement with coastal populations is hence crucial to enhance monitoring and mitigation.

The socio-political aspects of piracy and maritime terrorism further entangle their mitigation. Coastal population swayed by militant activity or piracy typically encounter socioeconomic deprivation and discrimination, which can sustain a violent cycle and illicit activity. Tackling these underlying issues is key to sustainable maritime security and viable Blue Economy growth. Engaging the local population in maritime governance and offering alternative sources of income can cut down motivation for support for piracy activities and backing for terrorist groups.

4.3.3 Indicator: Illegal Fishing

Illegal, Unreported, and Unregulated (IUU) fishing is mostly known as one of the leading substantial non-traditional security challenges sabotaging the sustainable growth of the Blue Economy. Different from conventional security issues that are frequently state-centric and related to military, IUUF function primarily in the shadow of maritime governance, manipulating inadequate regulatory control, poor surveillance infrastructure, and socio-economic flaws (Poling, G.B., & Cronin, C., 2017). The BE, which hinges on sustainable and responsible utilization of marine resources, is gravely at risk from the complex patterns of IUUF. This unlawful fishing operation disrupts ecological stability, drains the state's economy, escalates poverty in the coastal population, and erodes the rule of law at sea. Therefore, posing multilayered threats that go further than environmental degradation into financial and
social instability.

Collectively, these activities form a shadow economy that is calculated to be the cost of the global fishing sector between $10 billion and $23 billion every year. This statistic, despite being shocking in its own right, ignorance the far-reaching implications that IUUF has on marine ecosystems, coastal sources of income, and global food sovereignty (FAO, 2015). One of the key immediate consequences of

IUUF is a decrease in fish stocks, which disrupts the long-term yield of fisheries. Overfishing is a worldwide problem intensified by IUUF, as these illegal operators frequently neglect catch limits, use forbidden fishing blocks, or attack protected species. This unregulated extraction triggers a steep drop in vulnerable populations, destabilizing the ecological balance and loss of biodiversity. As numerous fish species are vital components of the food web and sustain the ocean ecosystem, IUUF triggers the eventual downfall of vital marine habitats like coral reefs, sea grass beds, and coastal mangroves. Following ecological harm feeds back into financial losses, as vigorous ecosystems are vital for sustaining the fishery industry and tourism industries fundamental to the Blue Economy.

Fiscal deficit attributable to IUUF stretches well past the immediate depletion of reserves. Coastal and small island states, which typically rely on fisheries for occupation, revenue, and food sovereignty, bear the brunt of it. In states with insufficient capability for maritime surveillance and execution, transnational fleets and foreign criminal networks tap marine assets with impunity.

Items	**Products Amount**
Mobile phones	US$1100 million
Diesel	US$874 million
Plastic	US$222 million
auto parts	US$184 million
Vehicles	US$175 million

Tyre	US$118million
steel sheets	US$112million
Tea	US$77million
Cigarettes	US$27million
Television	US$9million
Garments	US$2.5million

Table 4.2 Smuggled Products and their Mountainous Worth FY2022

Sources: The Express Tribune 2023, the Dhaka Tribune 2023, Customs Today 2023

4.4.3.1 Illegal Trade and Revenue Loss

Illegal maritime trade is another key issue that affects global security and regulation. It entails the illicit shipping of goods, people, or materials by sea, often to evade taxes, sidestep sanctions, or deliver black market items. This pumps out valuable financial rents that might serve as national development. The decrease in tax revenue from fishing licenses, public funds, and connected sectors constrains government spending on infrastructure project, education, and health that reinforcing pattern of poverty in coastal population. As well small-scale fishers, who depends on inshore water for livelihood and income, are usually the most vulnerable, dealing with reducing stock level and unjust competition from commercial-scale illegal operators.

Below Figure show the impacts of Illegal Fishing on Pakistan's Blue Economy.

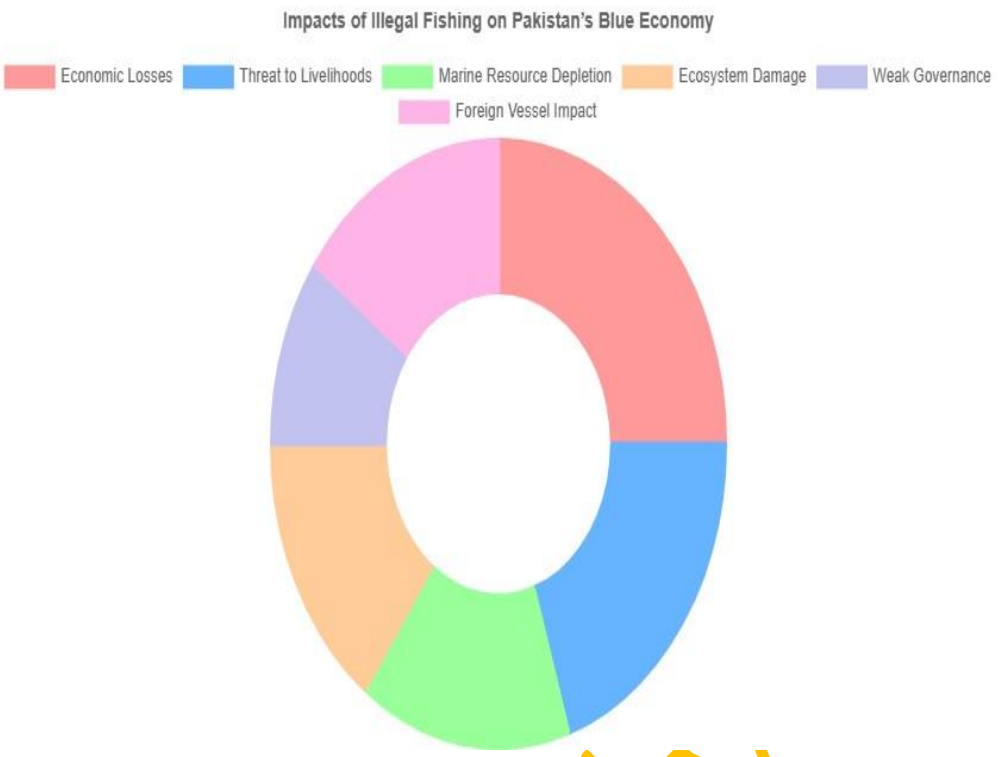
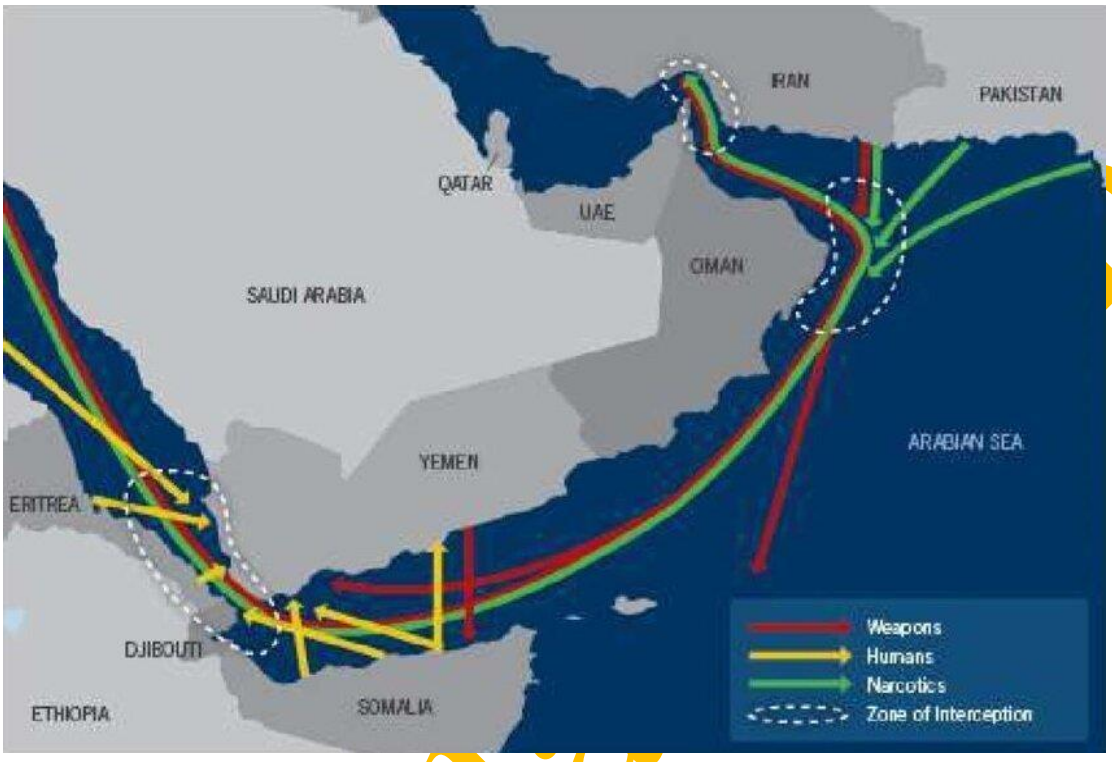


Figure 4.5: Sectors impacted by Illegal Fishing
Source: Developed by Researcher after Analysis of Literature

This criminal activity encompasses drug trafficking, arms trading, human smuggling, and the shipping of fake goods, as well duty duty-free goods. Smugglers tend to manipulate weak maritime surveillance, operate using falsified records, and deploy advanced methods, notably hidden compartments, unauthorized ships, and mid-sea cargo transfer intend to avoid detection.

The ramifications of maritime smuggling are intense. From the economic perspective, it leads to billions of dollars in revenue loss for legitimate businesses and the government. In terms of security, smuggling allows the transport of weapons and other hazardous materials that might result in to increase in terrorism and conflict (shown in map 4.3). Human smuggling, more specifically, usually results in intense human rights abuses, involving exploitation, forced labor, and loss of life at sea. Environmental degradation is another matter of concern; primarily in cases of hazardous materials are carried or discharged illegally. The impact of IUUF and smuggling surpasses purely

economic loss to affect the stable food supply and social stability. The decline of fish stocks because of illegal fishing methods poses a threat to the supply of affordable protein sources for the coastal population.



Map 4.3. ***Smuggling through the Indian Ocean***

Source: Anwar et.al, 2024

4.4.3.2 Economic Cost of Illegal Fishing

The Sindh coast covers key fishing areas, namely Karachi, Badin, and Thatta, accommodating a large community of artisanal and professional fishers. The water in the region teems with fish and shrimp species, playing a major role in national fish production, which is approximately 800,000 metric tons annually for Pakistan. Data from several fisheries studies and research indicate that illegal fishing makes up 2030% of the overall catch in Sindh waters. As stated by the Pakistan Fisheries Department's statistics from 2019, Sindh loses roughly about PKR 5-7 billion (approximately $30-40 million USD) every year due to illegal fishing practices

(Hamid, Z. 2017). A primary zone for illegal fishing in Pakistan is the shoreline along Karachi, Gwadar, and near the Sindh coastline.

This region is teeming with demurral fish breeds and shrimp, which hold economic value for both domestic intake and export markets. Illegal trawlers tend to enter Pakistan's waters, mainly during the period when fish stocks are limited, increasing the pressure on fragile marine resources. A well-known example is dated to 2017, while the Pakistan Maritime Security Agency (PMSA) captured some Indian trawlers for illegal fishing along the Sir Creek area, a disputed region between Pakistan and India (Dawn, 2017). These vessels were detected using illegal fishing tools like bottom trawlers that not only breach Pakistani maritime law but also cause considerable loss to marine habitats. The Pakistan Maritime Security Agency (PMSA) in 2020 claimed to have captured 30 Indian trawlers working without permission in Sindh's waters, several of which were spotted using banned fishing tools and breaching catch quotas. The trawlers were alleged to practice non-selective fishing for shrimp and other premium and high-demand species which depriving Pakistani local fishers.

Local artisanal fishers often report run-ins with these illegal vessels, which don't just reduce their catch but sometimes involve aggressive tactics to overcome competition. Hence, individuals' cases reflected a large pattern that threatens Pakistan's coastal ecosystems and the ocean economy. For instance, a case in 2019 compiled by the Food and Agriculture Organization (FAO) calculated that illegal fishing totaled up to 30% of the overall catch in Pakistani coastal waters, which resulted in serious economic losses.

Baluchistan Case Study

In Baluchistan, the scenario is notably severe. The province's offshore fisheries are rapidly reducing due to uncontrolled IUUF, worsened by overfishing, unlawful net

fishing by Sindh-based trawlers, and a lack of a VMS (Vessel Monitoring System). This cumulative pressure is decreasing fish stocks and imperiling the Blue Economy. Localized fishers, who are supported by traditional methods, are unduly impacted as industrial trawlers overexploited the fishing stock before they entered inshore waters. The Baluchistan coast undergoes repeated raids by Iranian fishing vessels, with PMSA evidence showing that dozens of transnational boats are captured every year for illegal fishing along Pasni and Gwadar (The News, 2018). Data from 2018 cited an example where Pakistani patrol boats caught Iranian vessels poaching in Pakistani waters, fishing again using banned nets as well as fishing during the closed fishing period (Newswire International, 2022).

These attacks have not only affected fish stocks but have also heightened diplomatic strains between Iran and Pakistan. Fueling the crisis, outmoded infrastructure like inadequate cold capacity and processing sites deters fishers from enhancing the value of their catch, pressuring them to sell at below market rate to a broker. The Gwadar area holds strategic significance as Pakistan builds its deep-sea port within the scope of China-Pakistan Economic Corridor (CPEC), involved in poaching a menace not limited to marine resources, as well as to security and economic ventures. Different studies and official reports show that illegal fishing in the Baluchistan coast makes up about 25-35% of the whole fish catch in this area.

4.3.3.3 Depleted Fishing Stock

As per 2017 analyses by the Pakistan Agricultural Research Council, illegal fishing in Baluchistan causes an estimated economic setback of nearly $50 million each year, mainly because of depleted fish stocks and decreased export income. Shrimp, among the most important resources in Baluchistan's fisheries industries, is primarily vulnerable. Every year, shrimp catch, which hovers around 15,000 to 20,000 metric

tons, is greatly affected due to illegal trawling activities that harm shrimp reproduction grounds and shrink population recovery rates (Malik, 2023). The ineffective enforcement and surveillance system allows these illegal ongoing activities to continue unabated, moreover, threatening the long-term functioning of the fisheries industry in Pakistan.

The fiscal consequences of IUUF and smuggling on Pakistanis are considerable. The FBR (Federal Board of Revenue) confiscated smuggled items with an estimated value of Rs106.08 billion over fiscal year 2023-24, showing marked growth from the previous year. This upward trend signifies worsening issues in limiting unlawful trade activities. The state actions to tackle these issues, like the formation of a National Anti-Smuggling Strategy and the creation of Joint Contingency Plans (JCPs), area move towards improvement .still, the potency of these initiatives rely on sustained political motivation, adequate funding, and proactive involvement from local communities The formation of 54 JCPs (Joint Check Posts) and IP-JCPs (InterProvincial Check Posts) in 2023 geared to enhanced enforcement counter to smuggling.

Still, the relentless characteristics of these activities highlight the importance of more extensive and sustained measures that must be taken to tackle the fundamental causes of smuggling and successfully dismantle these illicit bodies (Sarfraz, 2024). The fisheries industry in Pakistan, in spite of its potential, still adds little to the state economy. Fish production hit 800,000 metric tons in 2022, with just 25% exported, producing $496 million. This poor performance is linked to different risks, such as overexploitation, inadequate infrastructure, and illegal fishing practices. Measures to tackle IUU fishing are continuous and include various international and regional bodies. Tools, namely satellite monitoring, maritime tracking technology, and a list of known violator ships, are increasingly utilized to spot and deter illegal actions. Regulatory

systems such as the Port State Strategy Agreement empower nations to deny access and assistance to vessels charged with IUU fishing, assisting in close ports to unlawfully caught fish. Regional cooperation and information exchange are vital for successful enforcement, primarily in areas with concurrent jurisdictions. To conclude the whole idea and concepts of chapter map out in figure below.

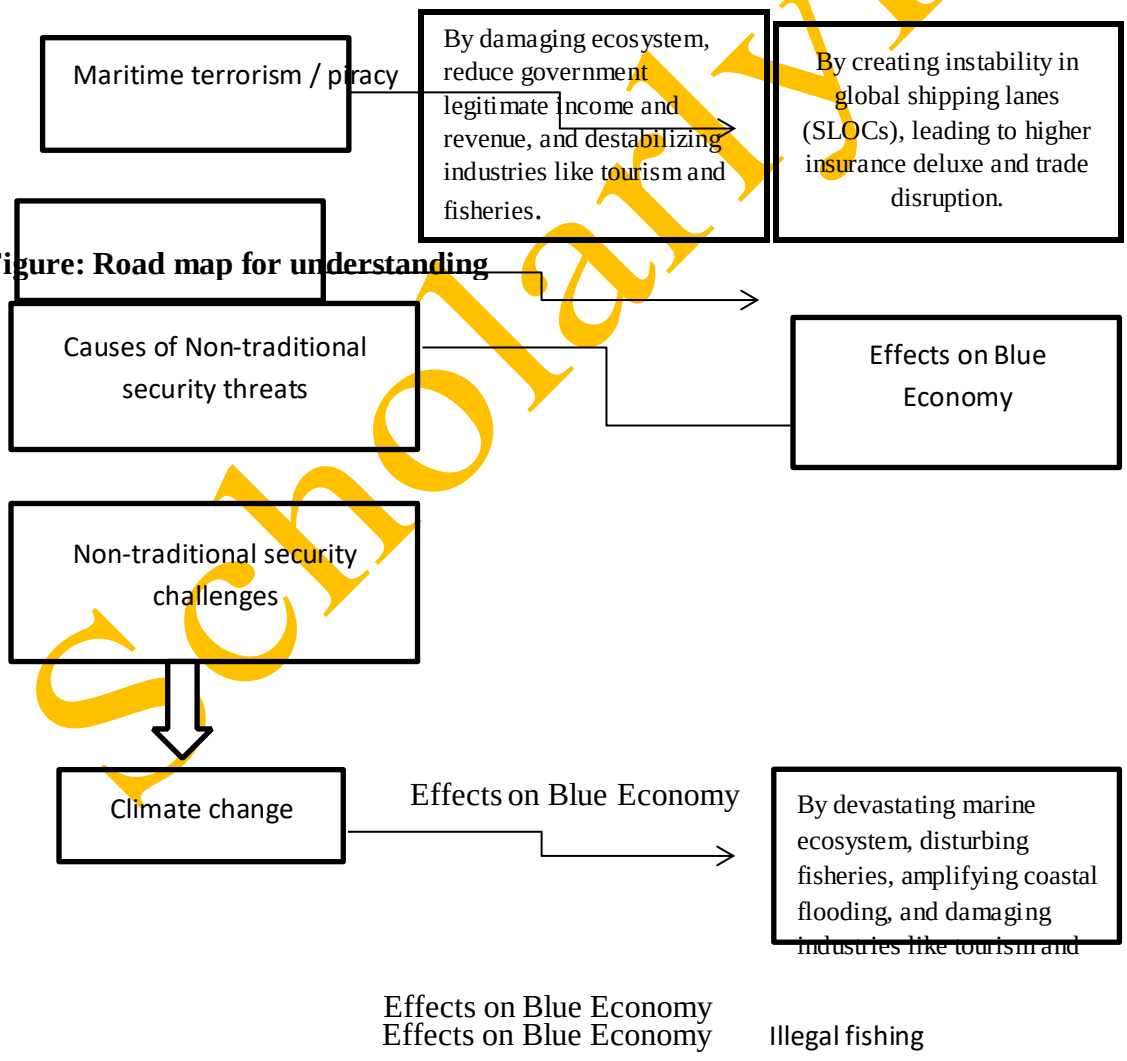
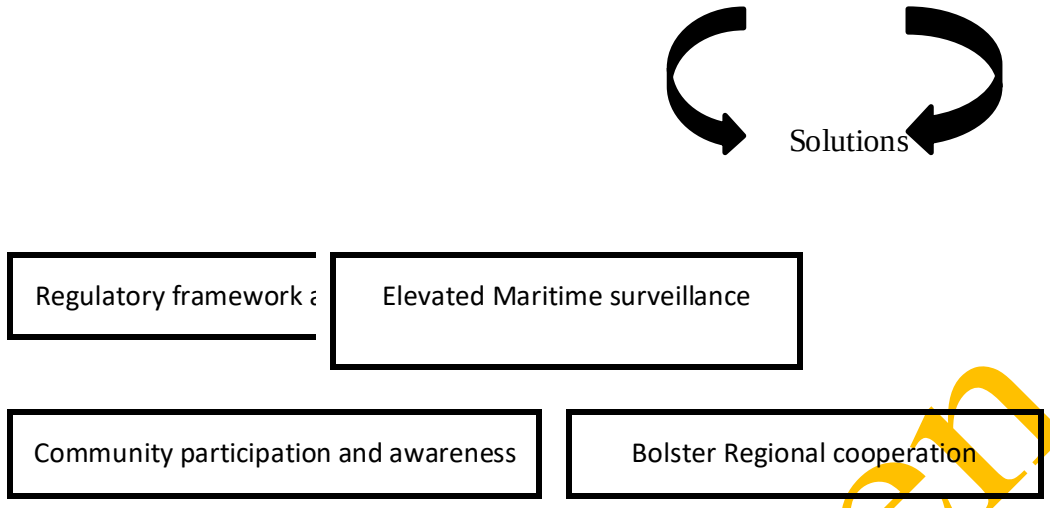


Figure: Road map for understanding



This thesis finds that responding appropriately to these challenges needs a holistic approach anchored in institutional reforms, upgrading policy guidelines, technological advancement, capacity building, and regional and international collaboration.

5.1 Conclusion

Pakistan's vital geographical location along the Indian Ocean and Persian Gulf trade routes adds weight to its maritime magnitude. Pakistan's Blue Economy presents a significant opportunity under its strategic maritime location and vast marine wealth. Despite this, the materialization of this potential is impeded by deeply grounded systemic and theoretical limitations. Leading the list is ineffective governance, marked by a lack of cohesion in institutional frameworks, insufficient policy execution, and a noticeable absence of strategic vision. Accumulating this is an enduring state of sea blindness, throughout the policymaking sphere and public awareness, which has caused maritime affairs to fly under the radar and investment. In governance, obstacles are widely acknowledged in prior studies; this research indicates that the conception of non-traditional security threats is not fully explored and commonly marginalized in Pakistan's marine-oriented discourse.

5.2 Discussion and Analysis

Concerns, including climate change, illegal fishing, piracy, smuggling, marine pollution, and maritime terrorism, receive minimal attention or are completely excluded in most studies. This limited viewpoint restricts the parameters of analysis and policy formulation, as well as neglecting the complex issues that have a direct effect on the endurance of Pakistan's Blue Economy. Within the non-traditional security threats, climate change stands out as the most considerable. Pakistan, located in one of the most climate-vulnerable parts of the world, faces growing threats due to rising sea levels, shifting fish populations, coastal degradation, and extreme weather events. These ecological transformations not only threaten marine ecosystems but also create an enduring challenge to coastal livelihoods and the state's food security. Even so, climate change is still inadequately prioritized in the state's maritime strategic and regulatory framework.

A main analysis of this research is the insufficient academic involvement of the complete spectrum of non-traditional maritime challenges. The studies often concentrate primarily on governance and institutional fragility, with limited critical analysis of environmental and security perspectives. Furthermore, a considerable absence of conceptual clarity regarding what defines non-traditional security within the framework of the Blue Economy. This theoretical difference restricted the growth of integrated strategies able to tackle complex, interlinked maritime threats. Marine pollution represents an additional significant issue that demands attention.

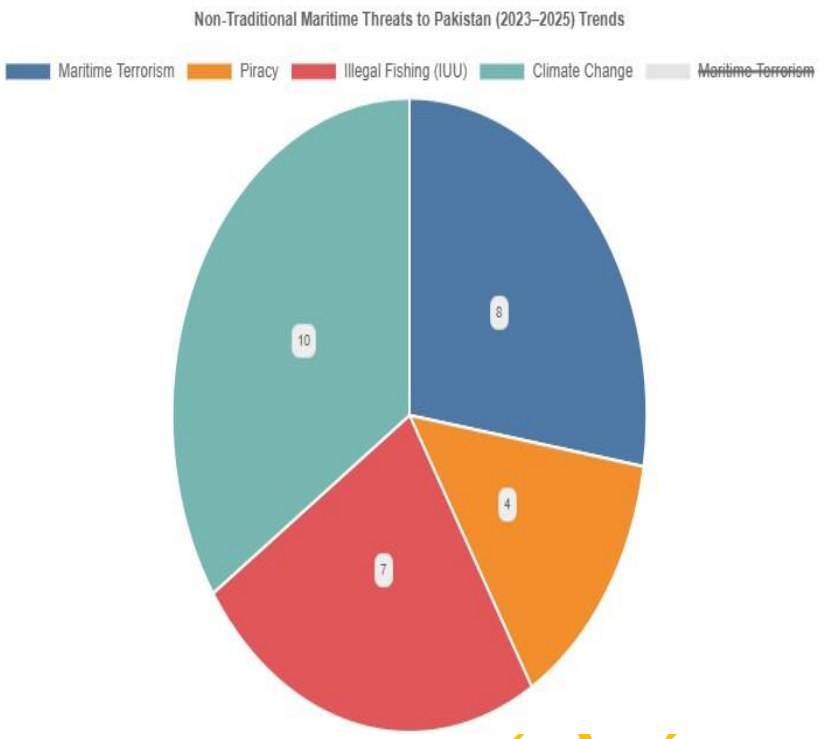
5.2.1 Qualitative Insight

After conducting interviews with Primary participants, this research found that maritime terrorism, piracy, smuggling and illegal fishing also play a role in the weakening of Pakistan's maritime security. Though less existential than climateinduced

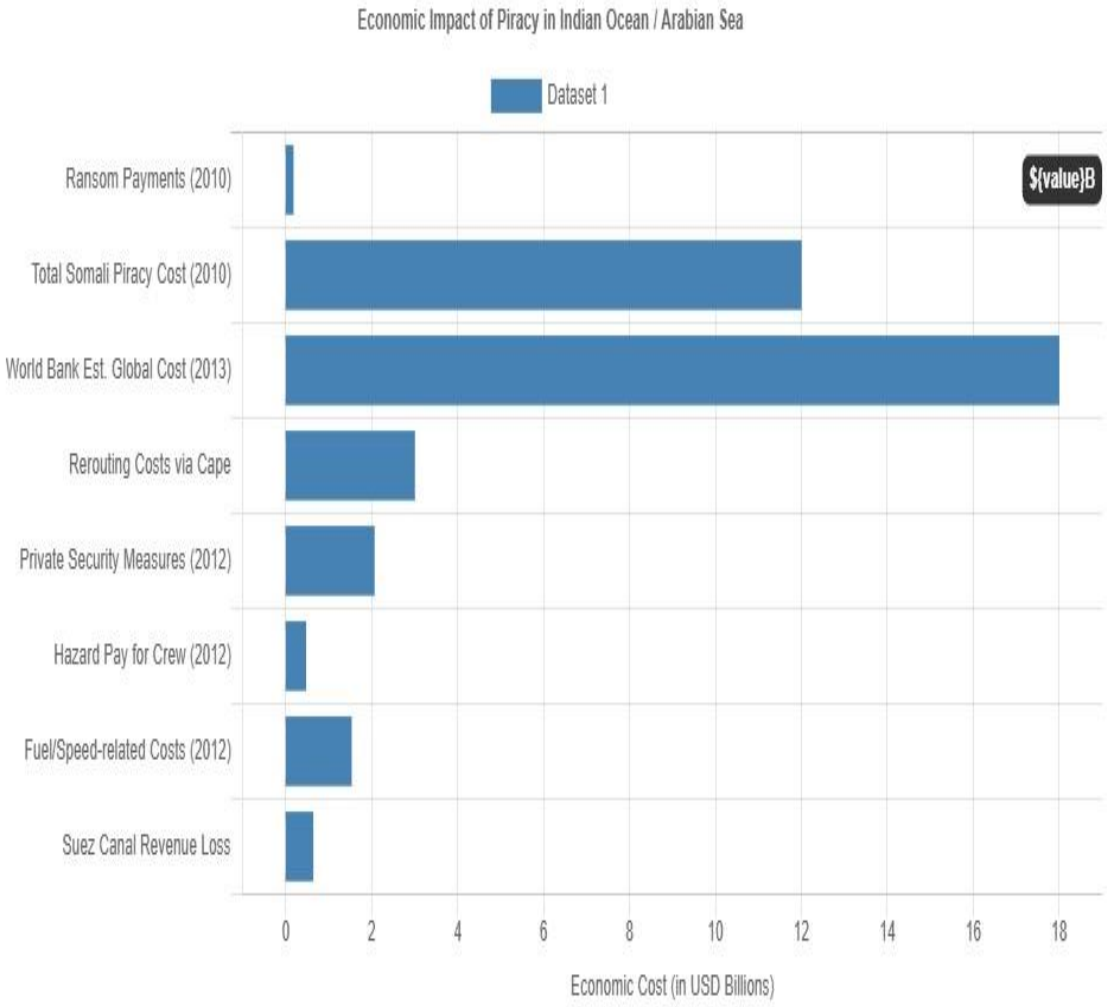
threats, these practices compromise the legal economic system, undermine state authority over coastal areas, and challenge regional maritime ties. Maritime terrorism, while presently narrow in focus, remains an underlying risk owing to evolving geopolitical conflict and the strategic significance of ports such as Gwadar. Uncontrolled industrial waste, unmanaged municipal discharge, and growing plastic pollution are degrading aquatic biomes, reducing fish stocks, and putting biodiversity at risk. Both sustainable development theory and human security theory emphasize the importance of confronting non-traditional security challenges as a fundamental to managing ecological and economic well-being. Tackling these non-traditional challenges is not merely a matter of environmental oversight but also a strategic key to advancing and securing the advancement of Pakistan's Blue Economy. Thus, fostering Pakistan's Blue Economy entails moving away from a narrow governancecentric strategy to a multifaceted framework that includes elements of ecological resilience, coastal security, and governance reform.

5.2.2 Quantitative Insight

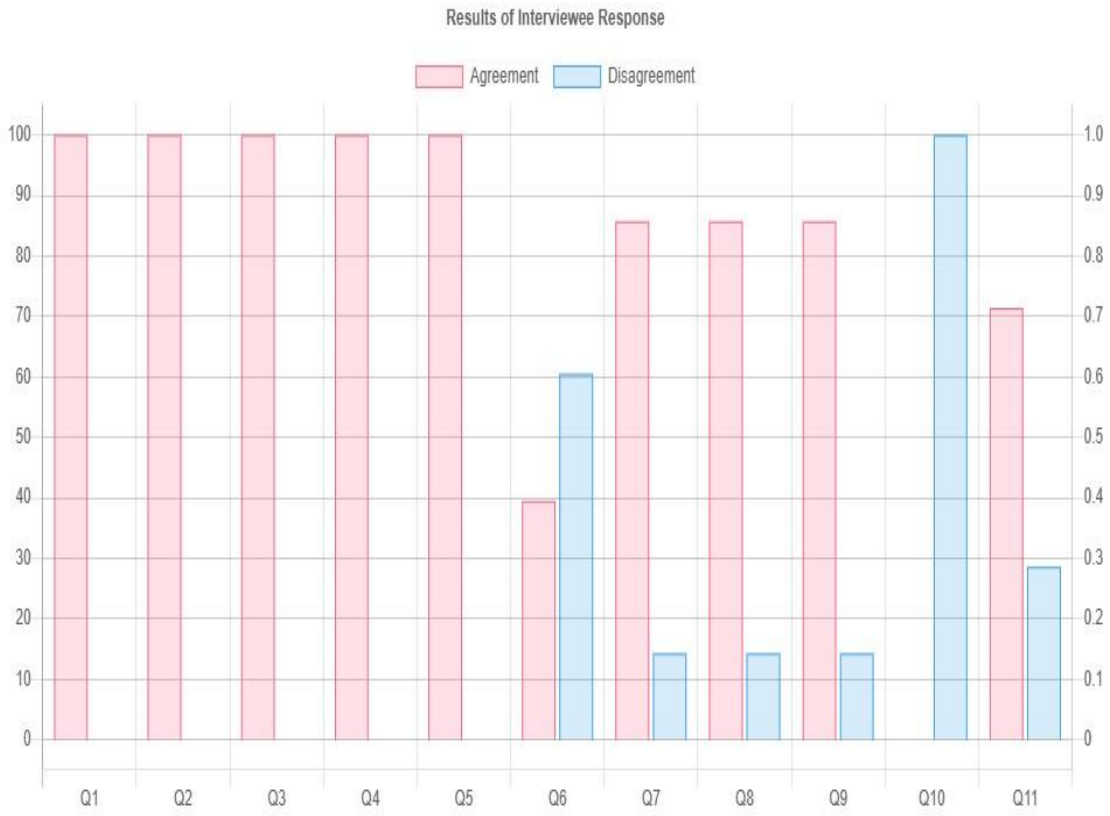
These ecological consequences directly impact Pakistan's economic stake in fisheries and blue tourism. Still, marine pollution remains neglected as a key matter, commonly neglected in bureaucratic responsibilities and ineffective enforcement measures. Climate change mitigation, pollution control, and eco-friendly resource management must act as key cornerstones of the Blue Economy strategy. Simultaneously, academic and policy dialogue should advance to include a deeper insight into nontraditional challenges, underpinned by empirical research and intersectional cooperation. Although governance continues to be a foundational problem, it must not be seen in isolation.



1. The above pie chart show the Non-Traditional Maritime secuirty threats to Pakistan(2023-24).Climate change is most signifcant threat to Blue Economy of Pakistan during this period . Maritime Terrorism comes in second number .piracy ranks lowest of all threat .



2. The above Bar chart shows the Piracy trends in Indian Ocean. The Ghrap shows the Multi-deminsional economic Impact of Piracy. It is difficult to find updated and current data of Piracy cases specially related to Pakistan. Most of avaiable data focus on border regional trends in Indian ocean.



3. The above bar chart shows the level of agreement and disagreement among interviewee regarding the Non-Traditional Security challenges to Blue Economy of Pakistan. A significant number of respondents show agreement with most of the questions. They point out critical policy gap and government inaction to resolve these problems.

5.3 Key Findings

This research reveals that while the PM Imran Khan's government undertook significant steps to promote the inclusion of non-traditional maritime security within the national security framework, its implementation was hindered by systemic

limitations. Indicator:

1

Climate change in Arabian Sea can cause of rise in temperature and pH of Water. Due to change in water pH and temperature, Pakistan saw roundabout 15% decline in overall fish production between 2015 to 2020. Similarly Rising sea level in lowlaying areas of Sindh and Baluchistan damage the infrastructure. Climate change poses a serious threat to Pakistan's Blue Economy. It cans directly and indirectly affecting coastal ecosystem, marine biodiversity, and economic activities.

Indicator: 2

Terrorist incidents more than doubled in 2024. And most of them related to the Maritime investment and activities. Such attacks deter international shipping lines, delays in development project and increase insurance premiums. Maritime terrorism disproportionately large impact on investor confidence, operational environment and local business. Maritime Terrorism poses serious threat to Blue Economy of Pakistan after climate change.

Indicator: 3

Overfishing with banned nets and the presence of foreign deep-sea trawlers, especially under controversial agreements with Chinese firms, have reduced fish stocks and destroyed breeding grounds. Illegal, unreported, and unregulated (IUU) fishing is one of the most severe and persistent challenges to Pakistan's blue economies, resulting in large-scale resource depletion and financial losses.

The evidence shows that although the government made notable efforts to introduce these concerns in policymaking, mainly through projects like enhanced climate

resilience**,** improved maritime surveillance, as well as the Pakistan Navy's involvement in a regional security alliance**, a** notable gap persisted. Despite the presence of certain acknowledgement of the foundational efforts undertaken during the preceding administration, the contemporary leadership seems to be tackling these issues in a sporadic, unreactive manner. A broad-based approach to address nontraditional security challenges remains underdeveloped. These results are based on reviewing the respondents' opinion and evaluation. As shown in Table 5.1, the degree of agreement across core questions highlights the shared view domains requiring further attention.

The progress of Pakistan's Blue Economy relies on detecting and managing a broader set of associated risks. Climate change, in particular, presents the most urgent and farreaching challenge, requiring immediate strategic attention. Similarly, addressing marine pollution and maritime crime is essential for long-term sustainability. Without acknowledging and integrating these dimensions, Pakistan risks losing not only economic opportunities but also the ecological balance and security of its maritime domain.

This study emphasizes the importance of comprehensive, visionary policies that can unlock possibilities for progress while protecting state and regional maritime concerns. This thesis finds that responding appropriately to these challenges needs a holistic approach anchored in institutional reforms, upgrading policy guidelines, technological advancement, capacity building, and regional and international collaboration. Based on the findings of this research, the following tangible steps are recommended.

5.4 Recommendations

- Improving maritime institutions establishes the basis for effective governance, stability, and sustainable growth can be built. Recently, Pakistan's maritime

governance has been marked by fragmentation and misalignment among various agencies like the Pakistan Maritime Security Agency, port authorities, fisheries department, the Ministry of Maritime Affairs, and Environmental bodies. This organizational scattering and fragmentation cause inefficiencies, convergences, and lapses in enforcement, which adversaries manipulate to undermine endogenous maritime security and stability. Hence essential to create a centralized National Maritime Authority endowed under a clear framework and adequate resources to integrate all maritime affairs among domains. Such a body would improve the decision-making process, foster coherent policy formulation, and strengthen accountability across maritime institutions. Critical insights can be extracted from the maritime governance framework adopted by states like Australia and Norway, where consolidated institutional models have markedly better maritime security and resource coordination.

Pakistan must also allocate resources to skills development for important maritime institutions by focusing on merit-based selection, perpetual professional training, and the improvement of technical capacity. Structural reforms must incorporate transparent mechanisms to counter corruption and maintain regulatory alignment with local and international maritime laws. These kinds of reforms would not solely enhance operational effectiveness, but also foster trust among international investors and partners vital for Blue Economy initiatives.

- The advancement and consistency of maritime policies act as another essential axis of reform, crucial to tackling the intricacies of Pakistan's maritime obstacles. The current regulatory framework is commonly responsive, fragmented, and has no strategic outlook. An extensive and well-defined National Maritime Policy needs to be formulated that aligns with worldwide legal standards like the United Nations

Convention on the Law of the Sea (UNCLOS) and includes the economic, environmental, and security aspects of the maritime domain.

This policy must outline specific aims and goals for sustainable fisheries management, continuation of maritime security, and an adaptation strategy, thus offering a blueprint for collaborative efforts across agencies. However, the policy should include provisions for a public-private joint venture to mobilize investment and innovation in technology. Stability and coherence in policy realization should be made possible by legislative support and systematic checking mechanisms that include stakeholder feedback, such as from academia, coastal communities, industry, and civil society (Chatterjee, 2014). The involvement of scientific data and threat evaluation in policy-making will help respond to evolving challenges proactively instead of reactively. By creating a strategic and progressive policy framework, Pakistan can establish a conducive atmosphere for private sector involvement and cross-border coordination, which are vital for the sustainable growth of its Blue Economy.

- A key recommendation is the evolution of an extensive maritime security framework geared towards the complex and dynamic nature of non-traditional challenges. The present security architecture particularly pays attention to traditional naval defense, with minimal integration of further maritime security agencies like customs authorities and coast guards. Non-traditional challenges, including piracy, smuggling, illegal fishing, trafficking, and maritime terrorism, entail a comprehensive security strategy that brings together legal structure, interagency coordination, and global cooperation. Pakistan should set up a tailored maritime security policy that outlines clear responsibilities and a specific role, standard operating practices, and a mitigation framework for different threat scenarios.

This strategy must further stress the following of international maritime security protocols like the International Ship and Port Facility Security (ISPS) develop and collaborate with regional organizations such as the Indian Ocean Rim Association's maritime safety initiatives. Improving legal instruments to bring charges for crime at sea competently is important, along with improving judicial capacities to address challenging maritime security cases. Additionally, the policy should include community participation strategies, understanding the vital role of the local coastal community in maritime monitoring and information gathering. By following a comprehensive maritime security model, Pakistan will be more prepared to prevent, detect, and tackle diverse security challenges that threaten its Blue Economy.

- Improving maritime domain awareness (MDA) is just as critical in responding to non-traditional maritime challenges and ensuring Pakistan's maritime interests. MDA refers to the well-managed collection, analysis, and circulation of information, including activities and bodies in the maritime context. Present Pakistani maritime monitoring abilities greatly depend on conventional radar and constrained air patrol, which are not enough to secure the extensive Exclusive Economic Zone (EEZ) and coastal frontier securely. Investments should focus on updating surveillance infrastructure by incorporating satellite-based detection systems, automatic identification systems AIS (automatic identification systems), maritime radar outposts, and UAVs (unmanned aerial vehicles). Developing a consolidated Maritime Information coordination center would support immediate data sharing and cooperation between naval forces, customs, coast guards, and environmental agencies. The integration of enhanced data processing, artificial intelligence, and machine learning has the potential to boost the predictive abilities of maritime security activities (ICSF, 2023). Strengthen MDA, not simply enhancing reaction time to incidents, including piracy or illegal

fishing, as well as support environmental surveillance and emergency response. Collaboration with nearby countries and international allies in intelligence sharing is essential for building a multifaceted maritime picture and tackling crossnational maritime threats. In light of this, prioritizing MDA is vital for upholding maritime real-time awareness and security of the Blue Economy from non-traditional challenges.

- The advancement of marine biotechnology serves as a forward-looking recommendation in line with the worldwide development of harnessing ocean resources for high-value economic initiatives. Marine biotechnology covers the study and application of marine organisms for pharmaceuticals, functional foods, green energy resources, and environmental mitigation. Pakistan's assorted marine biodiversity, extending from coral reefs to mangroves, contains hidden potential for biotechnological advancement, which can foster economic variation and facilitate job growth. To capitalize on this prospect, the government needs to create specialized research institutions and a development center focusing on marine sciences and life sciences.

  PPP and international collaborations will be essential for driving technological advancement, capacity building, and market development of biotech products. Additionally, a well-defined regulatory structure is critical for establishing control over bio prospecting activities, protecting IP rights, and ensuring environmental sustainability (SDPI, 2022). Spending on learning and development programs in biochemistry, marine science, and associated fields will foster a well-prepared workforce to support this domain. In addition, marine biotechnology actions should be embedded within national Blue Economy methods to achieve coordinated development and funding distribution. In light of global demand for

sustainable and organic products, marine biotechnology demonstrates a potential avenue for Pakistan to maximize the benefits extracted from its marine assets beyond conventional fisheries and shipping.

- Investment in coastal infrastructure is a key recommendation to change Pakistan's maritime domain into a catalyst for economic growth. Ports are the pillar of maritime trade and industrial exercises, and their advancement is vital for developing efficiency, security, and environmental sustainability. The expansion of Gwadar Port as a key transshipment hub in the framework of the China-Pakistan Economic Corridor (CPEC) initiative illustrates the possibility of infrastructure investment to boost economic development. Moreover, infrastructure must be followed by institutional modification to confirm transparency and strong governance. Joint public-private initiatives should be advised to capitalize on private sector expertise and financing for the project and maintenance of shipyards, logistics, and port networks.

  Moreover, capital investment should surpass ports to such areas as coastal road networks, cold chains, and storage facilities, key for the fisheries. Environmental concerns must be embedded into infrastructure projects to minimize oceanic pollution and ecosystem destruction, such as through the execution of green port initiatives. In addition, investments in a digital communication system for port management can advance operational productivity and security.

The recommendations serve as a foundation for a comprehensive and cross-sectorial policy framework that integrates security, environmental governance, regional collaboration, and economic growth. To conclude this thesis, it is imperative to stress the need for the future resilience and advancement of Pakistan's Blue Economy relies on the state's ability to envision, align with, and mitigate these non-traditional security

challenges through a dynamic policy framework, strategic investments, and integrated maritime governance reforms.

While this study outlines the primary non-traditional security challenges confronting Pakistan's Blue Economy, namely environmental degradation, climate change, maritime crime, and economic vulnerability—it does not claim to be exhaustive. Given the dynamic and multifaceted nature of these issues, considerable scope remains for further scholarly inquiry. Future research may benefit from more comprehensive empirical analyses, comparative regional studies, and detailed policy evaluations. Such efforts would serve to deepen understanding and contribute to the development of effective, context-specific strategies for safeguarding Pakistan's maritime domain.

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Appendix

I. Questionnaire that was asked by the interviewee Research

Title:

Non-Traditional Security Challenges to the Blue Economy: A Case Study of Pakistan

Researcher:
Riffat **Ashraf**
MS Scholar, Department of International Relations, Lahore College for Women University (LCWU)

Participant Consent Statement:

Thank you for agreeing to participate in this study. This interview is part of academic research, and all your responses will be kept strictly confidential. Your name or affiliation will not be disclosed in any publication or presentation. The data collected will be used solely for academic purposes. You have the right to withdraw at any time.

Section A: General Information

(*Only general information is required. Please feel free to skip any part you are uncomfortable with.*)

1. **Your area of expertise:** _____
2. **Age:** _____
3. **Professional experience related to marine/ocean economy (if any):** _____
4. **Organization type:**
   ☐ Public ☐ Private ☐ Academic ☐ NGO ☐ Other: _____
5. **Gender:** ☐ Male ☐ Female ☐ Prefer not to say ☐ Other: _____

Section B: Closed-Ended Questions (Yes/No)

Question	Yes	No
1. Is Pakistan facing non-traditional security challenges to its blue economy?		
2. Are climate-related risks (e.g., sea level rise, ocean acidification) threatening Pakistan's maritime zone?		
3. Is illegal, unreported, and unregulated (IUU) fishing undermining sustainable fisheries in Pakistan?		
4. Is marine pollution affecting the ecological health of Pakistan's coastal waters?		
5. Do non-traditional threats (e.g., smuggling, trafficking, resource overuse) impact maritime governance?		
6. Is Pakistan adequately investing in blue economy sectors like marine tourism, renewable energy, and aquaculture?		
7. Does the blue economy have the potential to significantly boost Pakistan's GDP and coastal livelihoods?		
8. Can sustainable ocean resource management help Pakistan address food and energy security?		
9. Are local coastal communities sufficiently engaged in blue economy planning and risk management?		
10. Do you believe the blue economy is adequately prioritized in Pakistan's national policies and planning?		
11. Can regional cooperation in the Indian Ocean help Pakistan overcome shared maritime security challenges?		

Section C: Open-Ended Questions

1. **How would you define the blue economy in the context of Pakistan?**
2. **In your view, what is the current potential of Pakistan's maritime resources (e.g., fisheries, ports, coastal tourism, offshore energy)?**
3. **What policy or institutional reforms would you recommend to strengthen the blue economy?**
4. **What actions should be taken to improve environmental sustainability in marine and coastal development?**
5. **In your expert opinion, what is the most critical challenge currently facing Pakistan's blue economy?**
6. **What is your recommendation or vision for the future of Pakistan's blue economy in the next 10 years?**

Closing Statement:

Thank you! Your input is incredibly valuable and will contribute significantly to both academic research and policy-level insights.

✦ Details of participants in the interviews

Name	Designation	Field of Expertise
Cdr. Muhammad Azam Khan	Senior fellow at Pakistan Navy War College	Maritime security, Maritime doctrine &Blue Economy
Lt. Cdr. Sufian Ullah	Director Research Wing MCE	Geopolitics of the Indian ocean, strategic studies, Blue Economy & Nuclear deterrence
Mr. Irfan Farooq	Research Scholar, Former Submariner	Submarine Development, Non-Traditional Security
Dr. Asyia	Assistant Professor, Kinnard College	Non-traditional security, maritime strategy
Mr. Ahmad Ibrahim	Research Associate, PNWC, MCE	Challenges to the Blue Economy, Maritime Security
Mr. Anas	Lecturer, Lahore Garrison University	Blue economy, IndoPacific region, and the USA strategic Alliance
Ms. Lariab Ali	Former Research Assistant of the project CPEC and Blue Economy at NUML	Blue Economy, Nontraditional maritime threats

II. Details of conferences attended by author to gather primary data

✦ 3rd IMC-25 "Navigating Legal Waters: Upholding Maritime Law and Governance" Organized by CRIMA (Minhaj University Lahore), 27 February 2025**.**

Speakers Name	Institute	Relevant theme
Dr. James Kraska	Charles H. Stockton Chair, US Naval War College	Non-traditional security challenges
Dr. Mustafa Tuner	Associate Professor, Naval War College, Turkey	Non-traditional security challenges
Commodore M Jawed Akhtar SI(M)Retd	Former Advisor to Maritime Affairs	Pakistan's Blue Economy potential
Rear Admiral Naveed Ahmad Rizvi HI(M)	Former commandant, PNWC, Lahore	Security trends in the indian ocean
Ms. Hira Sarwar	Lecturer, Karachi University	Blue Economy and Sustainable Development
Ms. Alia Shahid	DG, port and shipping, Karachi, Ministry of maritime Affairs	Pakistan maritime shipping and future challenges
Mr. Muhammad Jawaid Iqbal	CEO, Shoaib Shipping Agencies, Karachi	Shipping industry of pakistan

- Young voice for the ocean at the European Ocean Days, conferences and summits, European Ocean Day 3-7 March 2025, organized by the European Commission in Brussels, Belgium

Session	Date	Mode
Mission: Restore our ocean and water forum	4 March 2025	Live streaming
Fisheries and Ocean Dialogues	5 March 2025	Live streaming
Towards a water Resilience strategy for the European Union	6 March 2025	Live streaming

- **1st international conference on peace and security: Trends in regional and global perspective (12th – 14th Feb 2025), Department of International Relations, LCWU.**

Speakers Name	Area of discussion

Prof. Dr. Sajid Mehmood Shahzad (VC Minhaj University Lahore)	Non- Traditional security challenges in South Asia
Dr. Maryam Azam, Assistant Professor, LCWU	Prospects and challenges to Pakistan's Blue Economy

III. Details of the Panel discussion in which the author becomes part Roundtable discussion " Navigating Pakistan's Blue Economy: Strategic Insights and Future Roadmap" is being organized by the Institute of Policy Studies, Islamabad, on 3 Feb 2025.

Panelist	Designation
Vice Admiral (r) Iftikhar Ahmed Rao	Former SAPM Maritime Affairs
Cdr(r) Syed M. Obaidullah	Maritime &Defense Analyst
M. Wasim Khan	Former DG, Marine Fisheries Department
Prof. DR. Azhar Ahmad	Senior Analyst
Dr. Usman Chohan	Advisor (CASS)
Cdre(r) M. Jawad Akhtar	Former advisor to maritime Affairs

IV. FAO, Indian Ocean Rim Association, UNECA (2016), NOAA, Benzaken et al. (2022), Ecorys Economic (2012), and Whisnant and Reyes (2015)

V. UNDP (1994), Tadjbakhsh & Chenoy (2007), OECD (2013)

VI. Economist Intelligence Unit (2015), Roberts & Ali (2016), NOP United States, OECD

VII. S. H. Awan (2024), F. Ullah, M. Z. Naseer, & A. Haq (2024), A. Halili (2023), and A. Martin (2023)

VIII. World Bank (2025), OECD (2025), European Commission (2024), and World Bank (2023)

IX. Royal United Services Institute (n.d.), Center for International Maritime Security (n.d.), Hairan News (2024) & West Africa Peace & Security Network (n.d.)