

ASSESSING THE SECTORIAL MANAGEMENT OF
BLUE GROWTH IN PAKISTAN



By

Jawaria Abbasi

PIDEFMPHIL2018PP02

Supervisor

Dr Junaid Alam Memon

PIDE School of Public Policy

**PAKISTAN INSTITUTE OF DEVELOPMENT
ECONOMICS, ISLAMABAD**

2021

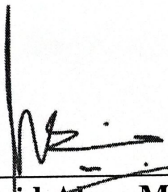


Pakistan Institute of Development Economics, Islamabad
PIDE School of Public Policy

CERTIFICATE


This is to certify that this thesis entitled: “**Assessing the Sectorial Management of Blue Growth in Pakistan**” submitted by **Ms. Jawaria Abbasi** accepted in its present form by the School of Public Policy, Pakistan Institute of Development Economics (PIDE), Islamabad as satisfying the requirements for partial fulfillment of the degree in Master of Philosophy in Public Policy.

Supervisor:



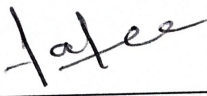
Dr. Junaid Alam Memon
Assistant Professor,
Pakistan Institute of Development Economics,
(PIDE) Islamabad.

External Examiner:



Dr. Zahid Asghar
Professor and Director,
School of Economics, Quaid-e-Azam University,
(QAU) Islamabad.

Head,
PIDE School of Public Policy:



Dr. Hafsa Hina,
Assistant Professor/HOD
Pakistan Institute of Development Economics,
(PIDE) Islamabad.

Author's Declaration

I, _____ hereby stated that my M.Phil thesis titled, _____”
is my own work and has not been submitted previously by me or anyone for taking any degree from Pakistan Institute of Deveolpment Economic or anywhere else in the country/world. At any time if my statement is found to be incorrect even after my Graduation the university has the right to withdraw my degree of M.Phil.

Date: ___ Aug, 2021

Signature of Student:

Jawaria Abbasi

DEDICATION

I dedicate this thesis to the unwavering support of my parents whose continuous efforts, dedication to the cause of education and prayers have enabled me to be where I as a woman feel intellectually empowered to make a difference. Thank you Ami and Abu.

I also dedicate this thesis to the indigenous people of coastal communities with the hope that one day when we as a nation realize the importance of humans, they will be the first to make the difference.

ACKNOWLEDGEMENTS

As my thesis meets a professional end, I would like to acknowledge the very hardworking people who have been an integral part of my thesis process. I would like to start by thanking Allah Almighty for blessing me with not only the best intellectual mentors but also by giving my efforts in the right direction. The journey that began in a class, with a simple idea, took the efforts of many people to reach its logical and academic end. However, I do believe that this is neither the end nor the start, rather it is this beautiful process of learning that is yet to make me learn a lot.

I thank my supervisor, Dr Junaid Memon, for his never-ending support of my cause of thesis. It was these long haul discussions that he took out the time to indulge in with me just so I could be clear in my head. I would like to thank him for not only taking out the time for these discussions but also going a long way to help me arrange interviews, the required technical support and literally anything that could have been a hindrance at all. This document is evidence of not only my efforts but the efforts of my supervisor without whose guidance and direction this would not have come to be what it is.

I would like to thank Dr Ghulam Samad for his faith and trust in me. His trust was not only a motivator for me to embark upon this journey but his constant support during the process of my intellectual growth regarding the topic has been phenomenal. Dr Ghulam Samad has been very kind in allowing me to discuss the topic with him at great length. Moreover, his guidance in the process of data collection has been one of the biggest factors in the timely completion of my thesis. This document would not have been the same without his support.

I would also like to thank the most esteemed members from different members segments of the blue economy who were kind enough to take out some time for the interviews. I can say with all my sound mind that people such as Ms Zubaida Birwani, Mr Hussain Jarwar, Ms Fiza Qureshi and Ms Nida Hameed have been the biggest asset for this thesis. Meeting these people and to the length they have assisted me in data collection process was unlimited. The work done by these intellectuals for the Blue Economy and indigenous people of coastal areas is a motivation for not only my thesis but also for many other projects.

In the end, I would also like to thank my dear friend, Mr Shahmeer Haider for his unwavering support in the drafting of this document. Specially at the moment when I was about to give up, his support, assistance and constant assurance that I can do my best was the best motivator. I am indebted to moral and intellectual support by him.

This thesis is an effort to acknowledge the small efforts that we as a nation can take to not only harbingers an inclusive growth strategy for the nation as a whole but also serves us as a reminder about the criminal negligence that is being undertaken by our state institutions towards the coastal communities. With such massive potential at hand, I believe that all these efforts are directed solely towards the social and economic betterment of the coastal communities. I pray for us to see the day where we as a nation start to consider the lives of these people as the asset to the nation.

Sincerely Thank you,

Jawaria Abbasi.

ABSTRACT

Pakistan is a marine rich country with a coastline of approximately 990 KM long and 240,000 sq in area . The concept of The Blue Economy or Blue growth is regarded as maximizing the benefits that can be derived from marine resources and increase socio-economic development while protecting and preserving the environment and ensuring sustainable usage. The Blue economy sectors in Pakistan including the major export sectors such as shipping and fishing are not sustainability optimized and far from the desired policy manifestations. This study aims to identify the potential avenues of blue growth in Pakistan like shipping and fisheries through sectorial concentration. The study also identifies the policy and practice gap and its causes in fisheries and shipping.

The study has used qualitative data from both primary and secondary resources. The primary resources including key informant discussions and secondary sources such as existing policies and Literature. Responses were analyzed based on the six-point approach of thematic analysis. The sectorial concentration was determined based on the location quotient. The Results Showed that there are major opportunities for investment as the Location quotient was below the efficient number. While the result of the thematic analysis showed major practice and policy gaps in the maritime sector of Pakistan. These loopholes are institutional, political, implementation and technological lag along with the socio-ecological concerns and lack of private investment.

The result suggests that Pakistan can optimize the Blue economy for the socio-economic development of the country through an integrated policy framework, inter-institutional collaboration, review of shipping and fishing policies according to the principles of sustainable growth. The Policy discourse must have relied on environmental sustainability and cooperation between the local communities, institutions and policymakers to ensure a national co-evolution program based on preservation of the ocean and bio-diversity.

Keywords: *Blue Economy, Coastal communities, Fishing, Shipping, Sectorial Assessment*

Contents

| | |
|--|----|
| ABSTRACT..... | vi |
| List of figures:..... | 1 |
| List of Tables: | 1 |
| Chapter No: 1 | 1 |
| Introduction..... | 1 |
| 1.1. Background of the study: | 1 |
| 1.1. Problem statement | 3 |
| 1.2. Objectives..... | 4 |
| 1.3. The rationale of the study:..... | 5 |
| Chapter: 2..... | 6 |
| Literature Review..... | 6 |
| 2.1. Introduction | 6 |
| 2.2. Blue economy..... | 7 |
| 2.3. Why shift towards a sustainable “blue Economy”? | 10 |
| 2.4. Domains of the blue economy..... | 12 |
| 2.5. Potential of the blue economy in Pakistan | 13 |
| 2.6. Gwadar and CPEC, a potential in emergence: | 19 |
| 2.7. Blue Growth and Global Economy | 21 |
| 2.8. Existing framework/ policies/practices | 22 |
| 2.9. Research Gap..... | 23 |
| 2.10. Theoretical framework: | 25 |
| Chapter 3..... | 28 |
| Methodology | 28 |
| 3.1. Data and Methodology..... | 28 |
| 3.2. Research Paradigm/Model:..... | 29 |
| 3.2. Data Analysis Techniques..... | 30 |
| Chapter 4:..... | 33 |
| Sectorial Assessment | 33 |
| 4.1. Location Quotient | 33 |
| 4.1.1. Sector 1: Fisheries..... | 34 |
| 4.1.2. Sector 2: Shipping:..... | 35 |

| | |
|--|----|
| 4.2. Assessing the sectorial management of Blue growth in Pakistan: Elinor Ostrom framework..... | 37 |
| 4.2.1 Fisheries:..... | 37 |
| 4.2.1.1 Management of fisheries in Pakistan | 37 |
| 4.2.1.2 Resource Allocation | 39 |
| 4.2.1.3 Direct and indirect use: | 41 |
| 4.2.2. Shipping:..... | 43 |
| 4.2.1. Management of shipping in Pakistan:..... | 43 |
| 4.2.2. Resource allocation:..... | 44 |
| 4.2.3. Direct and indirect use | 45 |
| Chapter: 5..... | 47 |
| Thematic Analysis | 47 |
| 1. Institutional and political lags:..... | 47 |
| 2. Poor implementation mechanism..... | 56 |
| 3. Socio-ecological concerns: | 62 |
| 4. Technological and research issues:..... | 69 |
| 5. Lack of private sector investment | 75 |
| Chapter 6:..... | 81 |
| Assessment of Shipping and fishing management in Pakistan..... | 81 |
| 6. 1. Fishing..... | 81 |
| 6 . 2. Shipping | 83 |
| 6.3. Location quotient as an indicator of Institutional incapacities: | 84 |
| Chapter 7:..... | 86 |
| Conclusion and recommendation..... | 86 |
| 7.1. Conclusion: | 86 |
| 7. 2. Recommendations:..... | 90 |
| REFERENCES: | 92 |

List of figures:

| | |
|---|----|
| Figure 1 Cargo Handling by PQA sources: https://www.pqa.gov.pk/en/port-operations/port-performance | 16 |
| Figure 2 Gawadar Port: Source: Shahzad, 2019. | 20 |
| Figure 3 Traffic Assessment: Source: Alam, 2019 | 20 |
| Figure 4 Theoretical Framework (Author's own) | 25 |
| Figure 5 SocioEcological. Framework (Sickor, He & Lestrin, 2017) | 30 |
| Figure 6 The EEZ zone of Pakistan | 38 |
| Figure 7 Contextualization of Ostrum framework with theme 1 (Author's own)..... | 55 |
| Figure 8 Contextualization of Ostrum framework with theme 2 (Author's own)..... | 61 |
| Figure 9 Accountability in Policies (Bayrakçı, Göküş, & Taşpınar)..... | 66 |
| Figure 10 Contextualization of Ostrum Framework with theme 3 (Author's own)..... | 68 |
| Figure 11 Contextualization of Ostrum Framework with theme 4 (Author's own)..... | 74 |
| Figure 12 Inclusive management Framework of Marine economy (Author's own)..... | 89 |

List of Tables:

| | | |
|---------|--|----|
| Table 1 | Industries of Blue Economy (EIU, 2015) | 13 |
| Table 2 | UNCTAD..... | 15 |
| Table 3 | Phases of Thematic Analysis (Maguire, 2017)..... | 31 |
| Table 4 | Uses of Fisheries (Author's own)..... | 42 |
| Table 5 | Uses of Shipping (Author's Own)..... | 46 |

Chapter No: 1

Introduction

1.1. Background of the study:

Humans and oceans have an inextricably complex relation developed through evolutionary processes extending over eons. Today approximately 3 billion people or 38% of the world population depend on marine life for their livelihood because they are living near coastal areas. And population growth will increase this number by 3 Billion (Creel, 2003).

Oceans support life on earth by being the largest source of oxygen, moderating the climate and controlling the weather. Oceans are the largest source of freshwater (rain through ocean), food and transportation (Carrington, 2018) The strategic importance of the ocean is spread over centuries of warfare among countries to take hold of maritime supremacy. Moreover, the impact of humans on oceans has not been a friendly one. According to a report published by (Carrington, 2018) in Guardian, huge fishing fleets, global transportation and maritime pollution have rendered destruction to the oceanic biodiversity. Not more than 5% of the remaining ocean wilderness enjoy the status of maritime protection area; whereas, only 13% of the marine life remains untouched by humans, therefore, representing the true colours of marine life (Carrington, 2018). This situation is changing the socio-ecological patterns of the planet. Crop and rain patterns have changed drastically and the sea levels have risen about 8 inches during the last century. (NASA, 2010)

Environmental chaos is evident through the rise in global temperature and oceans warming. Human's over intrusion into oceanic processes remain a grave threat to maritime biodiversity.

Life yet the importance of blue structure for national economies cannot be denied. Heavy reliance on oceans for trade is the key driver of economic growth across the globe, therefore, it is high time that sustainable procedures be adopted toward blue economy to make it more ocean inclusive, environmentally friendly and ecologically sound

The Blue Economy or Blue growth is regarded as maximizing the benefits that can be derived from marine resources and increase socio-economic development while protecting and preserving the environment and ensuring sustainable usage. (Smith-Godfrey, 2016). The basis of the Blue Economy lies in the objective of achieving long-term prosperity for the wellbeing of mankind while preserving the ecosystem, especially the sea. The blue economy is the cornerstone of Sustainable Development Goal (SDGs 14): “to conserve and sustainably use the oceans, seas, and marine resources for sustainable development.

The blue economy has many sectors in Pakistan such as Shipping, ports, seafaring, fishing, aquaculture, shipbreaking, coastal tourism and offshore basins. Economic stability is a dream of Pakistan. Being a maritime state, Pakistan can use its oceanic resources including increasing trade and exploring natural resources for economic benefits. Many in government and scholarly circles see Sustainable "Blue initiatives" to maximize economic, environmental and social benefits. Pakistan has an approximately 1050 km long coastline and the Exclusive Economic Zone covering about 240,000 sq. km (Pakistan, 2016). There are myriads of opportunities to explore in the coastal area.

The concept of blue growth involves sustainable approaches to economic growth and conservation of marine ocean resources. For sustainable ocean-led development, there is a need to find out gaps in policy and practice and ensure a sustainable approach for growth.

1.1. Problem statement

Pakistan is a maritime nation and using its oceanic resources for socio-economic development. The country has an approximately 990 Km long coastline and provided livelihood opportunities to the coastal communities of Sindh and Baluchistan. Additionally, the fisheries sector made a significant contribution to the national economy of Pakistan (World Bank, 2013). The coastal communities are forced to live a poverty-stricken life due to underdevelopment. Developing countries like Bangladesh and India are attempting to fully utilize maritime resources as a parallel economy.

The blue economy concerning Pakistan comprises multiple sectors such as; fisheries, shipping, ship breaking, tourism, aquaculture, renewable energy, oil and gas extraction, ports development and coastal communities' development. The country is not using all the potential sectors of growth. The management of the sectors is complicated. Even the sectors that are more mature in Pakistan like shipping and fishing are not adding desired socio-economic and environmental value and are far from the policy objectives.

Despite having great maritime potential, Pakistan is suffering from sea blindness. Pakistan is mainly utilizing sectors of maritime like fisheries, shipping and ship breaking. Other sectors are largely neglected. However, the present government is taking steps for the development of the Blue Economy in the country("New 'Blue economy policy' to help save foreign exchange, hopes

PM," 2020). The announcement of shipping policy is one such example. Along with this, the maritime potential of Pakistan is not estimated. The review of marine resources management in Pakistan and define an integrated policy for sustainable growth is the need of the hour.

Pakistan has few policy documents regarding the regulation of the maritime economy, though these documents are not covering many important aspects of sustainable growth and socio-economic development. For instance, the fishing policy is more like targeting commercial fishing than considering the socio-economic options of the fishing community. There are practices in maritime sectors that are not sustainable, and they also differ from the existing policy framework. It can be assumed that there is a practice and policy gap in the maritime sector. This gap might be the reason for underdevelopment in the Maritime sector and the absence of sustainable practices. So, there is a need to identify whether the existing practices are aligned with the existing policies and international treaties of sustainable growth of which Pakistan is a signatory or not.

Blue economy can provide opportunities for economic growth while preserving the environment and natural resources and improve the socio-economic condition of people by providing job opportunities and alleviating poverty. This study aims to identify the potential avenues of blue growth in Pakistan like shipping and fisheries through sectorial concentration. The study also identifies the policy and practice gap and its causes in fisheries and shipping. After analyzing sectorial concentration and with the help of policy practice gap study proposes policy intervention for sustainable blue growth in the shipping and fishing sector.

1.2. Objectives

- To assess the management of selected sectors; fishery and shipping through the practice-policy lens.

- Identifying sectorial concentration of shipping and fisheries using location quotient for efficient allocation of maritime resources.
- To propose policy recommendations based on the existing practice policy gap for socio-economic and environmental sustainability in shipping and fishing.

1.3. The rationale of the study:

Blue Economy refers to the utilization of oceanic or marine resources for socio-economic development while preserving the environment and natural resources through sustainable development approaches. However, Pakistan has not yet explored the full potential of the Blue Economy in Pakistan. Therefore, this study considers Blue Economy as a tool for socio-economic development while preserving biodiversity. The author has attempted to identify sectorial concentration using a location quotient for efficient allocation of maritime resources. The existing Literature also talks about the policy and practice gap in the maritime sector of Pakistan. This study has assessed the management of maritime sectors and their practices concerning the principles of sustainable Blue growth. The study had identified management gaps in two selected sectors i.e. shipping and fishing and provided policy recommendations for sustainable Blue Growth. These recommendations will be helpful for policy makers, management of shipping and fishing sectors and practitioners of the Blue Economy in the country.

Chapter: 2

Literature Review

2.1. Introduction

Literature from various scholars is included in this section particularly the work of Smith-Godfrey (2016), Pauli (2010), Llewellyn, English & Barnwell (2016), Doyle (2018), McIlgorm (2016) and Humayun & Zafar (2014) and reports by IUCN, FAO and World Bank. Existing work helps in understanding Blue Economy, its prospects, potentials and role in development. Sustainability is on the global agenda of the United Nations (UN). The Blue Economy is regarded as the separation of socio-economic activities from environmental degradation and maximizing the benefits that can be derived from marine resources. The basis of the Blue Economy lies in the objective of achieving long-term prosperity for the wellbeing of mankind while preserving the ecosystem, especially the sea. The blue economy is also in Goal 14 of the Sustainable Development Goals (SDGs): “to conserve and sustainably use the oceans, seas, and marine resources for sustainable development” (United Nations, 2015). The ocean as its main source provides a substantial amount of food, oxygen, balancing climate change by absorbing carbon dioxide and is the mean of global trade. About 90% of total global trade is carried out by the ocean every year (Bari, 2017). According to the commonwealth 2018, the overall ocean economy is US\$1.5 trillion every year, and by 2025 about 34% of world oil will come from offshore (Javed, 2019) Additionally coastal water can be a source of energy.

Pakistan as a maritime nation owns huge reserves of untapped blue resources. The long coastline of Pakistan is utilizing these resources but there is a need to explore more and use these resources

according to the principles of sustainability. At a time when the population of Pakistan is rapidly growing and the need for food is proportionally increasing, the marine resources can act as a parallel economy. According to the Malthus theory of population equilibrium, population multiplies geometrically and food grows arithmetically. Historically, this geometrical increase in population and the need for food shifts explorations of natural resources towards new avenues. In this new era of economic boom “ocean” as a natural resource is a centre for economic development.

The concept of “Blue economy” is explored to understand the aspects of this study. Along with these answers to the questions are explored from the literature like, what are the domains of the blue economy? What is the potential of the blue economy in Pakistan? What are the Existing frameworks/ policies/practices? How social and economic development is linked to blue growth? And why Pakistan needs a sustainable framework for blue growth?

2.2. Blue economy

The blue economy, in general, is the management of marine resources. The blue economy is defined by multiple stakeholders and there is no general definition of the term blue economy. The concept of “Blue Economy” is used to promote socio-economic growth and inclusion while ensuring the preservation of environmental resources and sustainability of the oceans and coastal areas (WorldBank, 2017b). According to the United Nations Conference on Trade and Development (UNCTAD), Blue economy or ocean economy refers to the same outcomes as Green economy i.e. improving the social status and wellbeing of a human without compromising the environment. The Blue Economy is the maximum and sustainable utilization of the marine/ocean resources for socio-economic development. While this development should not be based on

environmental degradation and sacrifice. (Eugui, Onguglo, Razzaque, Fevrier, & Roberts, 2014). The Australian government has defined “Blue economy” in her report, “Marine Nation: 2025” as; “type of economy that brings social and economic benefits that are efficient, sustainable and equitable”(OPSAG, 2013)

The ocean has been used for food and trade from ancient times. In the past, people relied on agricultural resources and they settled near water bodies (Holt, 1969). However, the exponential growth of population has depleted the marine resources and degraded the environment. On World Economic Forum (WEF) Al Gore, a great environmentalist while declaring a global emergency for ocean resources has mentioned that almost 40% of the marine life has been lost in the past 40 years (Mathuros, 2019a). According to the data almost 3 billion people are living within 200 km of coastal lines and by 2025 this number is expected to be double i.e. 6 billion population(Creel, 2003). This huge population and increasing influx towards coastal areas are creating stress on ocean resources and increasing the need for a sustainable ocean economy.

According to the Economist, the difference between the ocean economy and Blue Economy lies in its utilization. The blue economy or in other words sustainable ocean economy refers to the balance between the health of the ocean and economic activities at the ocean (EIU, 2015). A sustainable ocean economy mitigates the risk of degradation of ocean resources and ecological damage.

The concept of “Blue Economy” focuses on social inclusion, economic development and environmental preservation through collaboration and policy frameworks, while using ocean/blue resources in a sustainable manner (Eugui et al., 2014). As per this definition, Sustainable ocean development is a focus in any marine activity that is used for human development.

The coastal zone of Pakistan is almost 990 km long and the Exclusive Economic Zone (EEZ) covers 240,000 sqm. This makes the offshore area of Pakistan 50,000 sqm. In other words, EEZ has become the second-largest province of Pakistan (Humayun & Zafar, 2014). Blue economy acknowledged marine resources as the main source of economic development and focuses on its sustainable development (Naghmana, 2014). However, for optimal socio-economic development, Pakistan needs better management of these natural resources.

The maritime sector is the bedrock of Pakistan economy with its larger shares in trade and import of oil and coal etc. Pakistan is exporting oil and its export is 100% dependent on the sea, which means that day to day life activities of Pakistan's economy is based on the sea (Naghmana, 2014). On the other hand, almost 95% of the trade is via sea and CPEC has increased the importance of the sea route for the economy of Pakistan. Additionally, the food and nutrition need of coastal communities and other areas of the country is also dependent on marine resources such as the sea. The fisheries sector provides jobs to almost 390,000 people of Pakistan directly and almost 400,000 people indirectly such as transportation and retailing etc. Fish is the major export commodity of Pakistan. The growing population has increased the demand for fish globally and it will increase by 50% by the next 15 years (WorldFish, 2018).

The author of this paper fully acknowledged the use of marine resources for the socio-economic development of the country. However, there are many untapped resources of the "blue economy" that needed to be explored. Additionally, the use of marine resources is not sustainable and they are depleting rapidly. This emphasizes the need for intervention based on the principles of sustainability and explores new avenues and domains of the blue economy.

2.3. Why shift towards a sustainable “blue Economy”?

Ocean Economy is a parallel economy in Pakistan. The ocean contains a large part of Pakistan’s geographical location. The Blue economy is defined by the Economic Intelligence Unit as the “greening of ocean economy” (EIU, 2015b) Which means that “Blue economy” is a shift from the old, brown economy, where the ocean was considered as a mean of extraction of natural resources and waste dumping. The concept of sustainable growth of the economy emerged due to the demand of rising need for food security, environmental conservation, ecological freedom and practicality of technological implications. The rapid urbanization and mass production have put at stake the very existence of living organisms.

Global warming is crippling our oceans’ ability to capture carbon and produce oxygen, exacerbating climate change. An increase in earth’s temperature, melting of glaciers, warming of oceans, extreme weather, the decay of marine life and food scarcity are all results of global warming. Another issue that is faced by the ocean is plastic pollution. Every year approximately 8 million metric tons of plastic is being dumped into oceans. According to Al-Gore, a great environmentalist, at current rates, “the weight of plastic will be more than the weight of fish” in the world’s oceans by the year 2050. (Mathuros, 2019b).

Apart from pollution, another issue for the marine ecosystem is the disproportion between fish hunting and fish birth. Most of the fisheries are consumed by humans even beyond the limit and the rest is damaged by fertilizers used in farming. Overall half of the wildlife population has been lost by earth since the late 70s, while the marine population has fallen by 40% including the vanishing of bluefin tuna and sharks just in the last 40 years (Carrington, 2014) There is a need for

better stewardship of ocean for present and future generation. In this new economic era, marine life is the main source of food. Unsustainable exploitation of resources not only damages the ecosystem but also negatively impacts the human need for food supply. Though the technology of the fourth industrial revolution has damaged the ecosystem, still there is a silver line. Marine life can bounce back when it is left to heal and its recovery is tremendous.

“When you protect areas from fishing, recovery is spectacular.”

[Michelle Bachelet, UN High Commissioner and President of Chile (2006-2010)]

Food security is identified as the biggest challenge of this era by the United Nations (UN) and world leaders. This demand for food security has put additional pressure on natural resources and majorly on the ocean. Fisheries are a major source of food. Due to the overfishing, the stock of fish has depleted to 30% in South Asia (Khan & Khan, 2011). Apart from overfishing, ocean grabbing is another problem in this sector. Ocean grabbing is occurring when small scale fishermen are exploited by taking away control of their work and communities through policies, laws and practices (Jennifer Franco, 2014). These practices are usually carried out without considering sustainable principles of growth and environmental degradation.

The dynamic and unfolding relationship between the ocean economy and development has many sectors and perspectives. Ocean economy is not a new concept. People from ancient ages use the ocean as their main source of livelihood. However, the lack of sustainable policies, vested interests of political elites, absence of capacity building measures, absence of research and development and lack of awareness about the ocean grabbing and environmental hazards and sea blindness has created social, economic and environmental problems. “Blue growth” refers to the ocean economy

concerning sustainable development. Without adopting a sustainable framework the concept of blue growth is no different from ocean grabbing.

2.4. Domains of the blue economy

The domains of the blue economy are vast and it has become a parallel economy in the world. Endeavours towards the new sources of energy and food are increasing the importance of maritime sectors or blue economy globally. According to the World Bank report two-thirds of the food, consumption is expected to grow by 2030 and the major part will be from the sea sources such as fish (WorldBank, 2013).

Apart from food other blue economy has also other domains. World Bank has identified these domains of the blue economy; aquaculture, trade and commerce, maritime transport, seafood harvesting extraction of minerals, coastal development and protection, marine tourism, marine biotechnology and renewable energy (WorldBank, 2017b).

The Intelligence Unit of the Economist (EIU) has also identified the domains of the Blue economy by mentioning the ocean as the main driver of economic development in the next century. These domains also include; trade and transportation, seafood, minerals, energy resources, recreation activities, R&D and technology, coastal ecosystem protection, carbon control and water disposal (EIU, 2015a).

The aforementioned domains contributed largely to economic activities. There are various kinds of industries and activities linked with these basic domains. Few industries are already established such as fisheries, oil and gas, shipping, shipbuilding and energy development. However, there is a vast number of emerging and new industries such as; biotechnology, Pharmaceuticals,

Chemicals, deep seabed mining, eco-tourism, habitat protection, R&D and assimilation of solid waste (EIU, 2015a).

| Established Industries | New and Emerging industries |
|---|---|
| Fisheries | Aquaculture and multi-species Aquaculture |
| Oil and Gas extraction | Renewable energy |
| Shipping | Desalination |
| Shipbuilding | Bio-carbon |
| Ports development | Eco-tourism |
| Socio-economic development of Coastal communities | Technology and R&D |
| | Protection of natural habitats |
| | Assimilation of nutrients |
| | Chemicals |
| | Deep seabed mining |

Table 1 Industries of Blue Economy (EIU, 2015)

2.5. Potential of the blue economy in Pakistan

Pakistan is a maritime nation with a long coastal area and Special Economic Zones. The maritime sector of Pakistan is financially intensive and it can play a positive role in building a sound environment of investment and economic profitability. The fisheries sector is a major source of food and nutrients in Pakistan. This sector provides jobs to almost 390,000 people of Pakistan directly and almost 400,000 people indirectly such as transportation and retailing etc. Fish is the

major export commodity of Pakistan. The growing population has increased the demand for fish globally and it will increase by 50% by the next 15 years (WorldFish, 2018). Pakistan exported \$32.168 million of seafood in 2019. Fish and fishery products that are exported are 130,830 metric tons earning the value of US\$ 293.887 million. (Pakistan Economic Survey, 2019)This is higher than the previous export of seafood. However, the potential for seafood export is much more than this. The value of Pakistan's fish is relatively low at \$2.27 to \$2.5 per kilogram as compared to \$ 7 per kg in the region. Pakistan exports seafood majority to China but at a low cost due to poor fish quality and deteriorating transportation methods. Along with China Pakistan export fish to Italy, Indonesia, UK, Middle East, South Korea etc but the poor quality of fish decline net benefit. According to the World Bank, the underlying potential of fisheries is relatively higher than its current value(WorldBank, 2013).

Shipping is another major industry in Pakistan. Today 90% of the world trade is carried out by the sea. Pakistan is blessed with strategically important geographical locations. As the country is near the major shipping points such as the Strait of Hormuz, Bab ul Mnadeb and Malacca. Gawadar port is located at the mouth of the start of Hormuz, which has increased the shipping potential of the country(Javaid, 2016). However, Pakistan has only 10 ships in its fleet and all of these are public ships. The country has no private ships due to red-tap and difficulty in doing business. Additionally, Pakistan is not providing any ease for the ships holding its flag such as ease in registration etc. Therefore, the private sector of Pakistan is carrying the flag of other countries with convenience registration such as Panama. Pakistan has huge potential in shipping and the seafaring sector still country pays \$ 4-5 billion annually in sea freight("Pakistan: Shipping sector's potential," 2019). Therefore, the country needs a comprehensive strategy for utilizing the full potential of the industry.

Shipbreaking is another sector of the maritime industry in Pakistan with huge potential.

The shipbreaking industry is one of the renowned and developed industries in Pakistan. Most of the shipbreaking is carried out in India followed by Bangladesh and Pakistan (Hoffmann, 2018).

The recycling process is cost-effective in Pakistan due to heavy tides, cheap labour and long beach.

The recycling process is cost-effective in Pakistan due to heavy tides, cheap labour and long beach.

In 2017 shipbreaking was less as compare to tanker recycling. 3459 Thousand of gross tonnage sold for demolition to Pakistan in 2017 as compared to Bangladesh 6 260 and India's 6 323 (Table:

2). Both India and Bangladesh are ahead of Pakistan despite heaving favourable natural conditions in Pakistan. Additionally, shipbreaking is a source of steel as 95% of the ship is made up of steel and 18-20% contribution in steel is by this industry (Hoffmann, 2018). Furthermore, this industry is also labour intensive and employers are directly and indirectly involved in this sector.

Top countries handling tonnage of shipbreaking in 2017 (Thousand of gross tons)

| | India | Bangladesh | Pakistan | China |
|--------------------------|-------|------------|----------|-------|
| Oil tanker | 1935 | 3245 | 0 | 1 |
| Dry bulk carriers | 1062 | 1460 | 2527 | 2464 |
| Container ship | 1755 | 892 | 748 | 650 |
| Offshore Vessels | 318 | 57 | 77 | 90 |
| Total (Including others) | 6323 | 6260 | 3459 | 3445 |

Table 2 UNCTAD

According to Pakistan Shipbreaking Association, almost 20,000 individuals are directly involved in the shipbreaking industry. Realizing the global potential of oil tanker recycling, Pakistan needs ISO certification for recycling oil tankers so that it can be a leader in the shipbreaking industry.

Ports are a key player in international trade and logistics which is a basic pillar for economic expansion and growth. Ports play an important role in transporting freight at the cheapest rate along with its ports provide employment opportunities to a large chunk of the nation. Pakistan has a 990 km long coastal area and it joins the Persian Gulf and Indian ocean which is a strategic oil line (Pakistan, 2016). Pakistan has three commercial ports, Karachi port, Bin Qasim Port and recently developed Gawadar port. Karachi Port has 33 berths that handle liquid cargo, container carriers and bulk carriers. Karachi port (<http://kpt.gov.pk/>) handled 54.685 tons of cargo per annum, while Port Qasim has handled 45.5 million tons of cargo in FY 2017-18 (Fig: 1) (<https://www.pqa.gov.pk>).

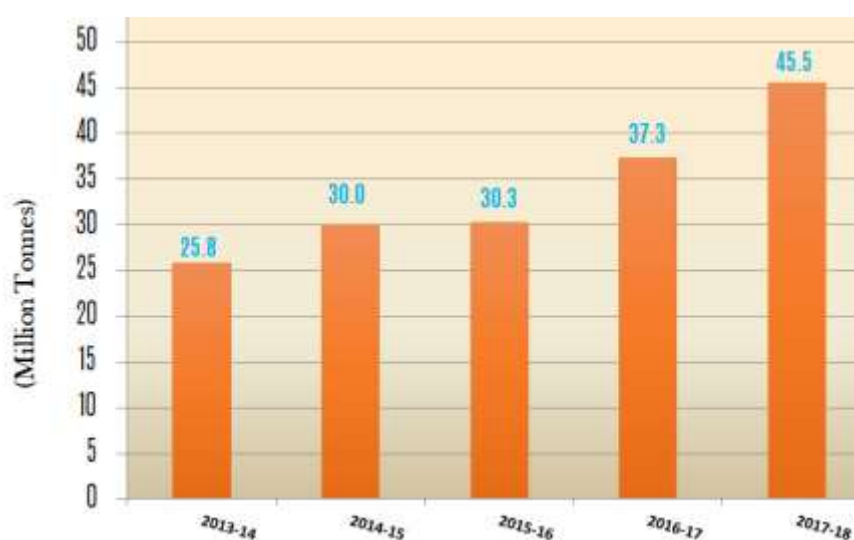


Figure 1 Cargo Handling by PQA sources: <https://www.pqa.gov.pk/en/port-operations/port-performance>

The third commercial port of Pakistan is Gawadar which has great strategic importance due to the Strait of Hormuz, which is the world most important and major oil passageway and Gawadar is situated at the entrance of the Persian Gulf and 624 nautical Km away from the Strait of

Hormuz(Malik, 2012). This is warm water and a deep seaport that has the potential to serve as an economic hub of the region. Currently, Gawadar has a capacity of handling 13 million tons of cargo which will be 400 million tons by the year 2030 (Naz, 2018). Pakistan needs to solve issues of connectivity and improve the socio-political situation so that Gawadar attract more cargo because it has not attracted much up till now (Humayun & Zafar, 2014).

World seaborne trade was 10.7 billion tons in 2017 and it is expected to grow additionally 3.8% till 2023(Hoffmann, 2018). With the increase in global trade volume, the demand for a fleet has also increased globally. According to the International Chamber of Shipping(ICS) global demand for seafaring is increasing and currently, there is a shortage of seafaring officers (SEAFARERS, 2018). Currently, India, China and Russia are top manpower providers in the seafaring sector according to ICS. Pakistan's share in the global market is declining after 2010 and this represents the inability of the country to get maximum out of this demand(Humayun & Zafar, 2014). Pakistan can contribute to a large number of seafarers and this will provide employment opportunities for youth and increase revenue in the national economy. Pakistan should invest in training seafarers and produce more officers. The country's foreign and shipping ministry should use diplomatic ties for creating employment opportunities for seafarers to major seafaring countries like Singapore and Greece etc.

Tourism is one of the largest economic sectors globally. Tourism has contributed US \$8.9 Trillion that is 10.3 % of global GDP and 330 million of employment in 2019 according to the World Travel & Tourism Council's (WTTC). Maritime tourism is the main component of tourism. According to the EU study on policy measures for coastal and Marine Tourism, coastal tourism contributed 5% of global GDP ECORYS (2013)The current trend has forecasted rapid growth in this sector. However, Pakistan has been ranked 125 out of 141 countries in global tourism in 2017

and it has received only 1% of total spending in tourism by the foreigner in South Asia . Growth in the cruise industry has seen significant progress with 25.8 Million people using a cruise in 2017 (UNWTO, 2017). Pakistan has great potential in maritime tourism and Hingol National Park, Mud volcano, cruise ship, beach lagoons, beach sports, fishing and sailing boat etc cater a great deal of economic prosperity in this regard but the primary approach should be public and the private venture. Pakistan needs to develop a comprehensive tourism policy and ensure the engagement of the public and private sectors for infrastructure development. Pakistan being a new entrant in the emerging field of maritime tourism must look at the countries such as Maldives and Thailand for gaining a better insight into the potential prospect of this emerging sector.

Coastal communities are made up up the largest chunk of our population. People from Baluchistan to Sindh live around the sea in this long coastline and their livelihood is dependent upon the blue economy. The major source of their livelihood is from sea i.e fisheries. These areas have another great asset that is mangroves. These coastal communities are largely affected by pollution, flood and they have affected the environment by their activities like overfishing and the use of illegal nylon nets. These coastal communities are not only rich in fishing but they have greater opportunities in tourism, oil extraction and shipping etc. there is a need to adopt a sustainable integrated option to groom the coastal communities so that they may use their potential fully.

2.6. Gwadar and CPEC, a potential in emergence:

Gwadar, a small coastal town in Baluchistan in the South of Pakistan, is the centre stage of the \$50 billion CPEC project and a part of the Chinese Belt and Road Initiative (BRI). Gwadar is a deep-sea port that has great potential in terms of trade, marine transportation, off-shore exploration, tourism, aqua resort and deep-sea fisheries (Humayun & Zafar, 2014). The execution of the master plan offers a wide range for the deep port including subsidized fishing, trade and recreational tourism thereby contributing up to 20 billion USD to the national economy and on the other hand, will provide more than 1.2 million jobs for the locals. So, the success of CPEC and the development of Gwadar will give a great impetus to Pakistan's Blue economy. Gwadar development will pave the way for many subsidiary industries like ship-making, ship-breaking, shipyards construction, tourism and hoteling etc. CPEC has been fueling the emergence of Gwadar Port as an international strategic trade and energy corridor or as a TEC (Shahzad, 2019). With optimized access to the land-locked countries including the CAR's the Gwadar Port has emerged as one of the most strategically important economic processes for the country. The very obvious benefits of this include the increase in the income generated from the port because of the double handling of the cargo other than the fact that it also facilitates the direct shipment of the country's exports and imports (Shahzad, 2019). Following is the diagrammatical map of phase 1 and 2 for ensuring energy transit routes.

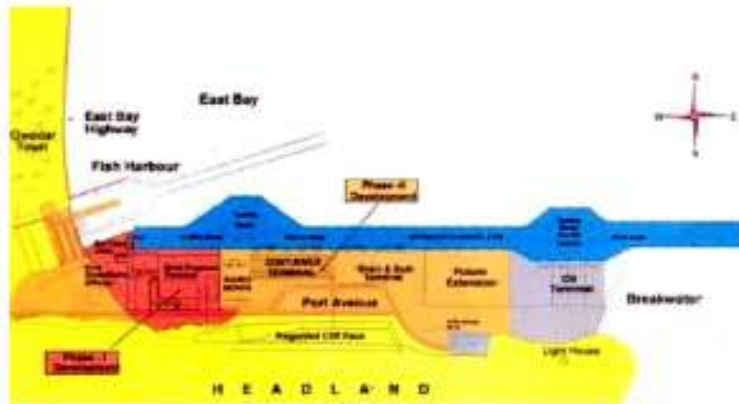


Fig. 2 Phases I and II of Gwadar Port

Figure 2 Gawadar Port: Source: Shahzad, 2019.

Furthermore, a traffic assessment of the Gwadar Port concluded that the Port can be a viable option in the long term management of trade. Moreover, the report concluded that in the recent terms due to the unavailability of infrastructure and communication network, the transshipment network can help the Port in being an effective transit to the Central Asian countries but this still needs aggressive financing and marketing. Following are the results of the traffic assessments (Alam & Li, 2019)

Traffic Assessment

(000 tons)

| | 2005 | 2010 | 2015 | 2020 | 2025 |
|--------------------------------|------|------|------|------|------|
| Afghanistan | | | | | |
| • General Cargo (000 Tones) | 113 | 135 | 150 | 166 | 184 |
| • Containers (000 TEUs) | 8 | 9 | 10 | 11 | 12 |
| Central Asian Republics | | | | | |
| • General Cargo (000 Tones) | 530 | 577 | 622 | 690 | 750 |
| • Containers (000 TEUs) | 47 | 54 | 58 | 61 | 65 |
| TOTAL | | | | | |
| • General Cargo (000 Tones) | 643 | 712 | 772 | 856 | 934 |
| • Containers (000 TEUs) | 55 | 63 | 68 | 72 | 77 |

Figure 3 Traffic Assessment: Source: Alam, 2019

Sectorial assessments have revealed that in the long run, the blue economy of the country is highly dependent on the productive capacities of the country to ensure swift recovery of the economy in the Blue sector. Issues, as highlighted above, must be dealt with full capacities to ensure that the best of impacts can be generated for maximum employment and impact factor on the long-run economy.

2.7. Blue Growth and Global Economy

The blue economy is an existing component of global trade and has been the oldest medium for trade in the world. One recent estimate states that the value of the ocean is more than 24 trillion USD (Kumar, 2017). World seaborne trade was 10.7 billion tons in 2017 and it is expected to grow additionally 3.8% till 2023 (Hoffmann, 2018). With the increase in global trade volume, the demand for a fleet has also increased globally. According to the International Chamber of Shipping (ICS) global demand for seafaring is increasing and currently, there is a shortage of seafaring officers (SEAFARERS, 2018). Currently, India, China and Russia are top manpower providers in the seafaring sector according to ICS. Pakistan's share in the global market is declining after 2010 and this represents the inability of the country to get maximum out of this demand (Humayun & Zafar, 2014). Tourism is one of the largest economic sectors globally. Tourism has contributed US \$8.9 Trillion that is 10.3 % of global GDP and 330 million of employment in 2019 according to the World Travel & Tourism Council's (WTTC). Maritime tourism is the main component of tourism. According to the EU study on policy measures for coastal and Marine Tourism, coastal tourism contributed 5% of global GDP (ECORYS, 2013) the current trend has forecasted rapid growth in this sector.

2.8. Existing framework/ policies/practices

The blue economy is important for the social and economic development of the country. For the development of the maritime sector, a comprehensive and integrated policy is essential. Pakistan has its Maritime policy of 2002. This policy focuses on the protection and promotion of maritime interest and the development of coastal zones. After the 18th amendment maritime economy which was a federal subject under the maritime zone act of 1976 also ignored blatantly. In 2018 Pakistan launches its first maritime doctrine. This document is an effort to lay the foundation of blue growth in Pakistan. Pakistan also has established a policy on Fisheries and Aquaculture (2007) and revised “Deep Sea Fishing policy of 2018”. But under the constitution, fishing is a federal subject up to 12 Nautical Miles in the sea and Aquaculture is a provincial subject. Here a comprehensive framework is needed for both federal and provinces for the development of Aquaculture.

Pakistan was once a leader of shipbreaking in the World but now Bangladesh is a leader in Industry (Hoffmann, 2018) Apart from a business loss this industry also comes up with environmental and health hazards due to unsustainable shipbreaking. According to the “NGO shipbreaking platform” due to the environmental conditions and unsafe processes life span of workers is low as 40 years (“Problems in Ship breaking,” 2020) Pakistan is a signatory of the “Basal Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal” which asked about sustainable shipbreaking. The basic reason for the downfall and unsustainable building of the shipbreaking industry is the lack of planning and innovation. Pakistan has established the ministry of ship and Port in 2004. Ministry should ensure the building of both sectors on the principle of sustainability.

Pakistan has no single document on shipping policy. Pakistan National Shipping Corporation Regulations, Merchant Marine Policy 2001 and amendment in the Merchant Marine Policy 2019 combine to form the National Shipping Policy. PNSC regulations deal only with the organization and employees and have no direct shipping policies. The Ministry of Maritime Affairs only provides policy guidelines, through Merchant Marine policy 2001 and its amends in 2019, to all entities handling shipping in Pakistan. However, the policy document needs to work on the sides like, public-private partnership, infrastructure building and to identify other enablers for achieving the full potential of the industry.

The document of Vision 2025 Pakistan states SDGs related to sustainable development. Vision 2025 agreed on the principle that Pakistan will use the resource base efficiently and sustainably– with outcome-based benchmarks agreed in line with regional and global standards (Pakistan Vision 2025, 2018). The document also mentioned its objectives about ensuring food security to all segments. According to the National food policy, fisheries and aquaculture are of great value and contributed a huge share in the food security of the country. The policy document intended to ban illegal fishing. However, there is a need for a sustainable framework to meet these challenges and ensure sustainable blue growth in Pakistan for existing and potential sectors.

2.9. Research Gap

Pakistan has huge potential for the blue economy with a long coastline and EEZ but this sector is not fully developed so that socio-economic sustainability can be achieved while preserving oceanic resources from depletion. Pakistan is utilizing oceanic resources to some extent but the existing literature presents a bleak picture of the oceanic economy concerning both socio-economic and

environmental sustainability. The existing sectors are far from optimization, thus depriving indigenous coastal communities and polluting the ocean. Additionally, Pakistan operates its maritime regime under an outdated and non-comprehensive policy framework with many enforcement issues, therefore, a legislative and enforcement foundation needs to be laid that can lead the existing maritime regime towards sustainable Blue growth in Pakistan. This study aims to analyze the existing practices of the oceanic economy and sectors in Pakistan. The study will identify whether the existing practices are sustainable or not. This study aims to identify sectorial concentration using a location quotient for efficient allocation of maritime resources. In the end, the author has given policy recommendations for socio-economic and environmental sustainability in Pakistan.

2.10. Theoretical framework:

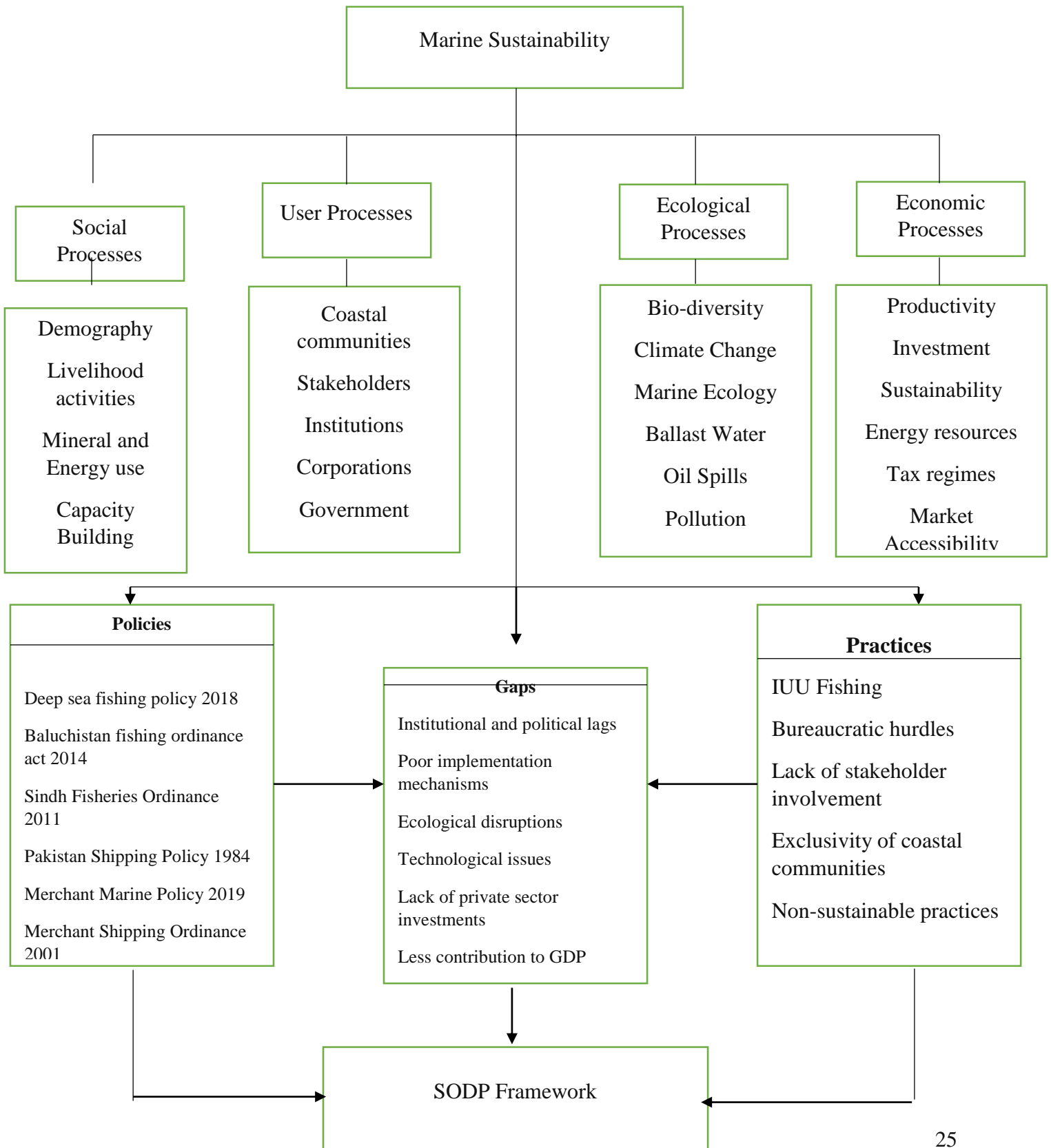


Figure 4 Theoretical Framework (Author's own)

The theoretical framework is an interactive and non-linear framework that takes into account the component mechanism of the Elinor-Ostrom framework and merges it with the thematic perspective obtained by the author. The practice policy gap has been identified through thematic analysis using primary and secondary data. The contextual analysis of themes identifies policies and the practice lags obtained in the form of gaps. Keeping in light the objective perspective into marine sustainability the theoretical conceptualization of key variables is based on the interpretation provided by the Elinor-Ostrom framework. The original Elinor-Ostrom framework is based on a static conceptualization of tier-based management systems whereas the updated framework takes into account the dynamic process that is involved in the user and management rights.

The framework drives the base variables from the Elinor-Ostrom framework and amongst each key variable has identified principle variables that are the following:

1. Social process
2. User process
3. Ecological process
4. Economic process

All these processes correspond to the possibility of inaction that results in policy ineffectiveness. This policy ineffectiveness is identified as the policy gap. The policy gaps correlate with the systematic overview of identified themes. The concerned policies have been studied and key variables are associated with insight obtained through Focal person interviews. The socio-ecological processes take over the common view that competition is an essential mechanism when

it comes to common-pool resources however the framework using the Elinor-Ostrom framework identifies the perspectives that common-pool resources can be optimized through cooperation and coevolution. A stakeholders perspective is referred to as the base of action and multiple solutions have been identified in the recommendations sections.

Chapter 3

Methodology

3.1. Data and Methodology

In this study, the author has attempted to use both primary and secondary data. Primary data has been collected through structured and semi-structured interview based questions. The author has collected face to face as well as telephonic interviews to gain a primary insight into both the fishing and shipping sectors. The interviews were conducted with the expert of fishing and shipping sector. In total 10 interviews were conducted. The insights from those interviews were then used to construct a thematic analysis. The thematic analysis was conducted using the wide existing accounts of literature and then links were developed as major themes instead of the link-up between the literature, policy documents and the interviews. This helped the author in developing and understanding the policy and practice gap from the main stakeholders including the policymakers of shipping and fishing sectors.

Moreover, the secondary data was collected from different sources such as PSLM, World Data Bank and online sources to calculate the location quotient for the industry. The location quotient helped the author in determining the sectorial concentration of both the fishing and the shipping sector. This helped the author in understanding the key determinants of the social dynamics of the sectors. A Location Quotient is a way of quantifying how concentrated industry or even a particular demographic group is within an area compared to the country as a whole. This is used to understand the dynamics of a particular industry to make optimized decisions. The formula requires sectorial employment data to be compared to aggregate sectorial employment. It is calculated as

$$(e_i/e)/(E_i/E)$$

Where:

e_i = employment in the sector “i” in the regional economy

e = total employment in the region

E_i = employment in the industry “i” in the regional economy

E = Total employment in the national economy.

The location quotient is a very practical tool to analyze intervention dynamics for a particular sector. Therefore, the Location Quotient will be calculated concerning the cross-sectorial intervention paradigm for a sustainable blue economy.

3.2. Research Paradigm/Model:

For understanding the management perspective of both these sectors Elinor Ostrum updated framework of socio-ecological management has been used. All the data required in the framework has been collected using the existing literature and existing policy documents because the management component of the framework requires an insight into the distributive efficiency and structures of the marine ecology. This framework discusses the management of natural resources in three tiers. The data from existing policies according to the rights mentioned in the socio-ecological framework i.e management rights, authoritative and user rights are collected (Sikor, He, & Lestrelin, 2017)

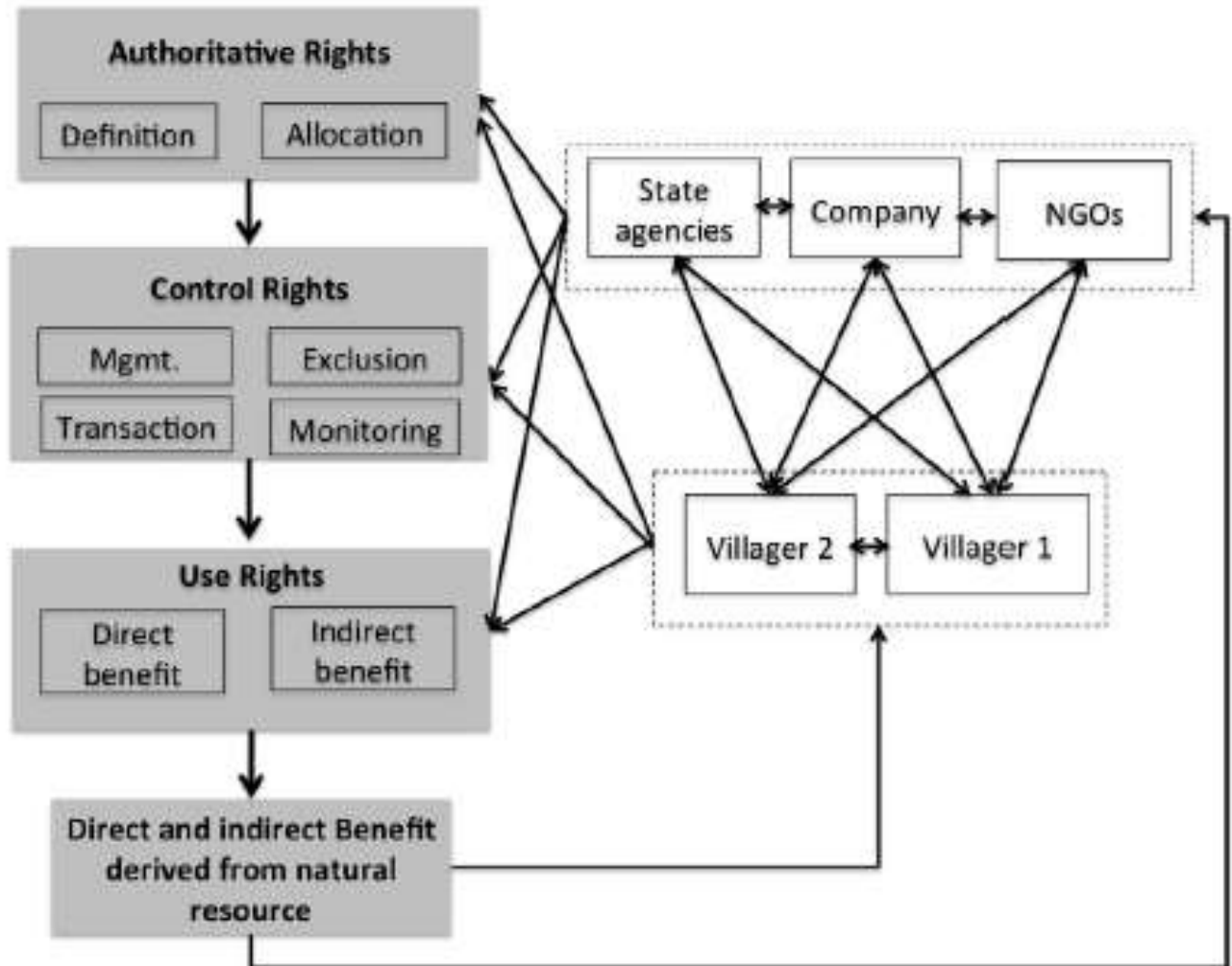


Figure 5 SocioEcological Framework (Sickor, He & Lestrlin, 2017)

3.2. Data Analysis Techniques

Thematic analysis has been conducted to obtain an insight into the working dynamics of the sectors. The thematic analysis follows a cohesive 6 step approach to fulfil the requirements. The 6 step approach is the following (Maguire, 2017)

| Phases | Analytical processes |
|-------------------------------|---|
| Familiarization with the data | <ul style="list-style-type: none"> i) Narrative Preparation (transcribing ideas) ii) Re-listening/Reading the data |
| Generation of initial codes | <ul style="list-style-type: none"> i) Coding systematic patterns within the data ii) Collecting data relevant to each code |
| Searching for themes | <ul style="list-style-type: none"> i) Organizing codes into potential themes ii) Gathering all data relevant to the potential themes |
| Reviewing themes | <ul style="list-style-type: none"> i) Checking the workability of the potential themes ii) Checking the workability of themes with the data collected iii) Reviewing the data to search for additional themes iv) Generation of the thematic map for the analysis |
| Defining and naming themes | <ul style="list-style-type: none"> i) On-going analysis to refine the specifics of each theme and the overall story of the analysis ii) Generation clear definitions and names for each theme |
| Producing the report | <ul style="list-style-type: none"> i) Selection of clear examples ii) Final analysis of certain extracts iii) Relating analysis to the research objective |

Table 3 Phases of Thematic Analysis (Maguire, 2017)

The major themes have been identified in the analysis section. The major themes have been identified based on the recurrence of those themes in the literature reviewed and the interviews conducted. Moreover, these themes work significantly through the stakeholder's perspective to obtain direct insight into the working of these sectors. The recurring themes were a direct output orientation of the author's questions concerned with the sustainable economic, social and environmental policy perspectives. The participant's insights focused on the major causes of poor policy implementation. These insights were then analyzed in the context of the literature to develop a theoretical foundation of the issues. The thematic analysis is coherent and brings to light the practice-policy gap. This has allowed the author to develop a recommendation for social, economic and environmental sustainability

Chapter 4:

Sectorial Assessment

4.1. Location Quotient

Secondary data from the PBS is based on the following variables; employment in each sector in the regional economy, total employment in the region, employment in the industry in the regional economy and total employment in the national economy. The location quotient is a very important measure when it comes to understanding the industrial dynamics within a certain region. The location quotient of the fishing has been calculated using data from secondary sources such as the fishing data has been collected through agricultural data whereas the data for shipping has been collected using the transportation data.

The formula requires sectorial employment data to be compared to aggregate sectorial employment. It is calculated as

$$(e_i/e)/(E_i/E)$$

Where:

e_i = employment in the sector “i” in the regional economy

e = total employment in the region

E_i = employment in the industry “i” in the regional economy

E = Total employment in the national economy

4.1.1. Sector 1: Fisheries

As the value of location quotient is

e_i = employment in sector “fishing” in the regional economy = 0.4 million

e = total employment in the region = 5.19 million

E_i = employment in industry “i” in the regional economy (Agriculture) = 35 million

E = Total employment in the national economy = 61.71 million

$0.4/5.19/35/61.71$

$0.0263/0.5671$

$=0.0984$

As the value of the calculated location quotient is less than 1.50 therefore it can be concluded that the sector is not at all concentrated. Location quotient has been used for understanding the industrial dynamics within a concentrated region. This allows us to understand the factor analysis of the industry. The low value of the location quotient is an indication of the fact there is still a lot of room for investments. This opportunity must be analyzed in the context of investments options available to the industry. Under the deep sea fishing policy, the fishing sector of Pakistan was to raise the contribution of fishing to the national economy whilst working on poverty alleviation. Both of these objectives have not been met yet as most of the fishermen have been complaining about the non-availability of fish within the first 2 zones of the sea. The lack of fishing capacity in

the first two zones is creating obscurities in Zone III. This is one of the biggest voids in the fishing policy that needs to be tackled through public-private partnership and policy implementation. The intervention is the public-private partnership will allow sustainability to prevail. The current net being used is not only cheap but has more capacity to catch fish than the authorized net. The public-private partnership will not only ensure the availability of these nets but will also ensure that the policy is being implemented as per the regulation. The non-availability of fish in the first two prescribed zones i.e Zone I and Zone II is posing a great threat to Zone III. Therefore we can conclude that the use of Public-private partnerships will allow the rapid transformation of equipment and enhance modern technology in the region.

There are high and very lucrative choices available not only for investments but also for coastal uplifting in the region. Moreover, there are many management issues in the sector as well. These issues can be observed through the non-market competitive regime under which the fishing sector along with other maritime sectors is suffering. Furthermore, the data suggest that policy interventions are a very much-needed task because of the untapped and unexplored resources being wasted

4.1.2. Sector 2: Shipping:

e_i = employment in sector “shipping” in the regional economy = 0.2 million

e = total employment in the region = 5.19 million

E_i = employment in industry “Shipping” in the regional economy (Services/ Commercial Transportation) = 2.4 million

E = Total employment in the national economy = 61.71 million

0.02/5.19/2.3/61.71

0.0038/0.0372

0.1021

As the value of the calculated location quotient is less than 1.50 (i.e 0.1021) therefore it can be concluded that the sector is not at all concentrated. There are high and very lucrative choices available not only for investments but also for coastal uplifting in the region. Moreover, there are many management issues in the sector as well. These issues can be observed through the non-market competitive regime under which the shipping sector along with other maritime sectors is suffering. Under the Merchant Marine Policy of 2001, it was stated that the shipping sector should be made attractive for private investment while working on sea-borne trade under the Pakistani flag. The policy objective remains intact whereas the industrial dynamics indicate the non-applicability of the sector. Pakistan has a huge potential for cargo growth from 5% to 40% by the year 2030 and this can only be achieved through policy interventions.

4.2. Assessing the sectorial management of Blue growth in Pakistan: Elinor Ostrom framework

4.2.1 Fisheries:

4.2.1.1 Management of fisheries in Pakistan

In Pakistan, fisheries are carried out majorly in Baluchistan and Sindh. Pakistan has coastal areas and Exclusive Economic Zones (EEZs). The management of this sector is divided into three zones, under the Deep Sea Fishing policy of 2018. These zones are; Zone-1 (0-12 NM) that is under the provincial jurisdiction of Sindh or Baluchistan. And local fisherman is allowed to carry out fishing in this zone. The second is Zone-II (12-20 NM) and is managed by the Federal government. However, the federal government has created a buffer zone and opportunities are provided to the local fisherman. The third Zone-III is (20- 200 NM) and is under the jurisdiction of the Federal. The foreign fisherman is allowed to carry out the operation in this area after getting permission and a certificate from the federal government. That fisherman who is allowed in Zone-III is not allowed to carry out fishing in Zone-I or II.

For fishing in Zone-III, The fishing policy of 2018 has also identified the types of net and vessels used. The use of trawlers is also banned as per the written document of the policy. For locals as well as foreigners, who want to carry out fishing in Zone-III needs registration from the Mercantile Marine Department and a license for fishing from the Marine Fisheries Department of Pakistan.

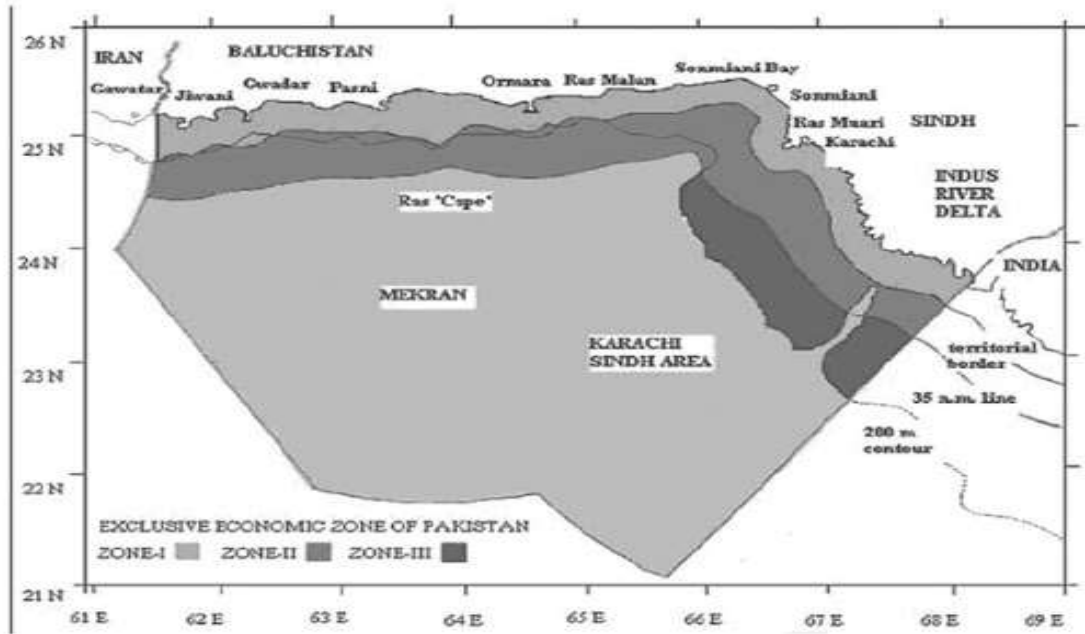


Figure 6 The EEZ zone of Pakistan

The management of the fisheries is difficult because of the complexities involved in the natural process. Usually, fisheries, like many other natural resources are considered as common property. Additionally, aquaculture and fish raised in ponds etc is also becoming a part of fisheries management. In Pakistan, the federal government is responsible for making policies, planning, research, training, assessment of the stock, data collection and export etc. The fishing policy of Pakistan has to underline three objectives of fisheries management. These objectives are; poverty alleviation, increase in the national economy of Pakistan and food security. The management of Pakistan fisheries is mostly revolved around the one objective that is export of fisheries and increase in the national economy. The other objectives are neglected (Nazir, Yongtong, Kalhoro, Memon, & Mohsin, 2015)

Despite management efforts, many mismanagement issues are yet to be tackled. These issues are; unsatisfactory fisheries system, lack of performance, lack of monitoring facility and lack of scientific research implementation. In Pakistan, current regulations are not satisfactory to attain a sustainable level. The international laws on fishing are not fully implemented in Pakistan. Along with this, there is no legal system for the fish caught in our country. These mismanagement problems need scientific help and research. However, Pakistan is ignoring regulation and implementation of research in fish management.

4.2.1.2 Resource Allocation

According to the socio-ecological framework of Elinor Ostrum, resource allocation has been discussed instead of legislative rights distribution. Under the control right segment of the framework, the fishing rights in Pakistan has been distributed in three zones as discussed earlier. According to the Fishing policy (2018) ("DSFL Policy," 2018), the legislation has been discussed at the federal (for zone III) and provincial level (For zone I & II). However, the allocated frequency of resource on the provincial level is not only obsolete but it has not been updated since 2011 for Sindh and 2014 for Baluchistan.

Baluchistan has a fishing ordinance of 1971 ("Balochistan fisheries ordinance," 1971), that deal with the resource distribution and allocation of fisheries. This ordinance is amended in 2014 but no major changes take place except the clause related to the confiscation and destroying of banned fishing gear. According to the Baluchistan fishing ordinance, licensing authority is bestowed upon any representative appointed by the government of Baluchistan. The licensing takes into account, the net gearing and license. Fishing is not allowed without a license. Furthermore, net-like gujja or wire net, trawls and ring net is not allowed. A license permits the person for fishing within 12

nautical miles with a mesh net size not less than 5 inches and Turki nets having a mesh size not less than 2.5 inches. Apart from this fishing gear shall be clear of navigational channels.

To protect the fishing stock and ensure sustainable usage while protecting the ocean health, explosive substances or poison and any other toxic material are not allowed to use in the ocean. Along with this, any individual operating fishing without a fishing license will be arrested and his gear will be confiscated. Illegal fish catch is another issue. To sustainably utilize the illegal fish catch, the magistrate or Assistant commissioner will auction the fish and money will be returned to the poacher in case of acquittal.

Similar to Baluchistan, Sindh also has its ordinance. The Sindh has “Sindh Fisheries Ordinance 1980” which was amended in 2011. According to this ordinance, the government of Sindh can grant a license for fishing to anybody after full filling the prescribed terms and conditions ("sindh fishing ordinance ", 1980). The 2011 amendment annulled the lease granted for fishing permanently. The ordinance has listed the species of fish and when fishing is prohibited. Along with specific kinds of nets are also banned especially with smaller mesh. Furthermore, the size of fishing that can are allowed to catch is also prescribed. The ordinance also banned the use of explosive material or waste disposal in water. These steps are listed in the ordinance to ensure the environmental safety and sustainable resource allocation of fisheries in the province. The main stakeholders in the fish market include the dealers and the fisherman. Both these stakeholders are regulated under the Sindh Fisheries Ordinance 1980 as amended in 2011 subsection (1), (2) and (3) of Article 3 of the above-stated law. This law legislates the licensing of both stakeholders. Under this act, no individual or a group of individuals is allowed to procure or trade fish in the market. The government issues license through its appointed members and thus issues the license

under the prescribed notions of the law. The law for licensing is similar in both the cases of Sindh and Baluchistan. Both the stakeholders in this regard are regulated by the provincial acts under the same clauses.

The tax regime in the fishing sector is distributed under the sales tax and the value addition regime. Although no exclusive tax policy has been implemented for the fishing sector in Pakistan yet the overwhelming potential of the sector has been asking for zero tax rates. The 17% value-added tax on the local production and distribution of the fish is an added burden on the final consumer, therefore, putting an inverse pressure on the demand of the product in the long run. Moreover, the sales tax on the export side of the fisheries is an added burden to the final value addition of the exported product. This lowers the potential of the growth and therefore has made the country lose its comparative advantage over the resource.

4.2.1.3 Direct and indirect use:

The importance of the ocean is as important at the micro-level as it is at the macro level. The contribution of the ocean is more than just nominal. The horizon swells wide upon individual welfare as it does upon accumulative welfare. Following are some of the ways that the ocean economy has direct and indirect impacts;

| Direct and Indirect Uses | Evidence |
|---------------------------------|--|
| Food security | According to the UN, 45% of Pakistani children under 5 are stunted, 32 per cent are underweight and 15 per cent suffer from acute malnutrition (USAID, 2018). Fish consumption is a major source of nutrition and beneficial for children and maternal health. |
| Economic security | Fisheries contribute 2.10 % of agriculture and 0.7% of GDP (PBS, 2019). The fisheries sector employs 490,000 direct fishermen and is a major source of income for coastal communities. |
| Empowerment | The women of coastal areas made fishing nets and they are their steady source of income along with fishing. |
| Recreational services | Pakistan is a record holder for Telang Queenfish species. The very unique feature of Pakistan's sea fishing is the number of species that are the potential asset of recreational growth for the country (Zafar, 2021) |
| Capacity building | The deep Fishing policy has allowed foreign trawlers. The influx of modern technology helps in capacity building. |
| Ecosystem and biodiversity | The excessive, illegal Unreported and Unregulated fishing has caused major damage to the fish stock and biodiversity in Pakistan (WorldBank, 2017a) |

Table 4 Uses of Fisheries (Author's own)

4.2.2. Shipping:

4.2.1. Management of shipping in Pakistan:

Shipping is the only source of transportation through the sea. More than 90% of world trade. Similarly, Pakistan's economy is largely dependent on shipping due to the import of oil. Pakistan has three significant ports, Port Qasim, Karachi and Gawadar. Shipping operations are carried out through these ports. Pakistan has several documents and entities for the management of shipping.

The Ministry of Maritime Affairs (MoMA) is the main institute that manages the shipping and all other domains. To manage the shipping, the Ministry has three policy documents; Pakistan National Shipping policy (1984), merchant Marine policy (2001) and Merchant Marine policy amendment (2019). Pakistan has also announced, "Transshipment policy, 2020" which is still in its working stages. Along with these policy documents, there are shipping entities. These entities are; Pakistan National Shipping Corporation (PNSC), Merchant Marine Department, port Qasim, Karachi port and Gawadar Port Authorities.

These ports and PNSC raise their capital. They only take guidance from the shipping policy documents. PNSC deals with the employees and it has no personal policy or regulation document. The Pakistan National Shipping policy 1984 only deals with the service-related concerns and administrative issues concerning the corporate governance of the shipping sector. Merchant Marine policy of 2001 as amended in 2009 renders its management to attract private sector investment and increase the growth of maritime sectors. By ensuring a conducive environment to

develop rapid growth of maritime related industries. The policy also has clauses related to the registration of ships. The ships are registered by Merchant Marine policies and permanent residence of Pakistan can do that. Even for the temporary registration of ships, a Pakistani national is required. For the chartered vessels companies, management and control will take place in Pakistan.

All three ports and PNSC has a private investment. They have a semi-autonomous administrative structure. Port authorities run their ports as per their own rules and regulations. They all take policy guidelines from the national policy document.

4.2.2. Resource allocation:

Pakistan had nine private shipping companies and a national shipping corporation (NSC) and accumulated 71 ships by the year 1970. Nine private shipping companies had 26 ships at that time. After the nationalization of 1974, 9 private shipping companies were merged into National Shipping companies and Pakistan had a total of 51 vessels (S. M. Shahzad, 2016). Now Pakistan National Shipping Corporation (PNSC) is the only company dealing and managing the shipping sector of Pakistan. The PNSC currently have only eleven ships and they have a capacity of 831,000 tons of deadweight (DWT) (PNSC, 2021).

According to PNSC Pakistan's deadweight tonnage of Pakistan Merchant Fleet is 831000 (DWT). The DWT has been increasing for quite a long period. The inability of Pakistan's shipping policy to accommodate shipping vessels is the biggest contributor to this issue. The limited number of flag-bearing ships is caused by the freight bill to increase from 1.5 billion dollars in 2001 to 5 billion USD in 2019. The average increase in the annual freight bill is 12.5%. This is the amount of bill

that the country is paying to foreign countries to export and import freight. Merchant marine policy 2001 has been objectifying inclusion of the private sector in the shipping industry but up till now, it has not been able to attract any sort of companies. Although it allows privately owned vessels to register under the Pakistani flag thereby creating employment and revenue however the industry yet awaits any such inclusions.

4.2.3. Direct and indirect use

Elinor Ostrum in his socio-ecological framework identifies direct and indirect benefits of any resource distribution under the user rights. These rights help in identifying the user based interference to develop a sustainable approach towards natural resource distribution. The rights are necessary for identifying the rules ad rights spectrum and how a collaborative framework can be used to attain a socially optimal solution.

| Direct and indirect uses: | Evidences: |
|----------------------------------|---|
| Employment | According to the data collected on the transportation sector, the shipping sector has total employment of 0.2 million (Pakistan Economic Survey, 2019). The sailing ships don't engage many workers. However, activities on port generate enormous employment opportunities. |
| Increase in Trade. | According to the World Bank, South Asian countries; Pakistan, India and Bangladesh needs to improve their shipping and container ports because this is critical for the trade growth in the region (WorldBank, 2019a) |
| Freight cost | The freight bill of Pakistan was \$5 billion in 2019 (NIMA, 2019). The data indicates that the freight bill has constantly increased since the year 2001. An increase in Pakistan Flag carrier ships can reduce this cost. |
| Revenue | Shipping and ports development can create additional jobs and revenue. According to the study, a 1% increase in port cargo quantity can increase 7% of the GDP (Munim, 2018) |
| Technology | According to the International Logistic Performance Index (LPI), Pakistan is ranked 122 while India is at 44. This ranking focus on the need for technology development for supply chain reliability, service and efficiency. |

Table 5 Uses of Shipping (Author's Own)

Chapter: 5

Thematic Analysis

The process:

Thematic analysis is a method used to analyze qualitative data. This data can be interviews or any set of text. In this study, primary data is used that is collected through the interviews. The total number of participants is nine. These participants were experts in the industries and involve in the process of policymaking at a certain level. The sample size was limited, telephonic and face to face interviews was held due to the Covid-19 travel restriction.

The questions of the interview are generated based on the socio-ecological framework of Elinor Ostrum. The policy and practice gap is found out by using the text from interviews and existing documents. Based on this information, the author has identified the major theme as a practice policy gap and sub-theme as a cause of the gap. In later stages, these themes are used to propose recommendations for sustainable ocean development in the country.

1. Institutional and political lags:

The maritime sector in Pakistan has been explored at a very limited level even though the country possesses enormous potential. These levels are mostly linked with fishing and shipping. There are

certain policy documents for both the sectors at the provincial and federal levels. However, the country has no single document under the name of “Blue economy” despite declaring the year 2020 as the year of the blue economy.

The shipping sector comprises multiple policy documents, departments and ports. The departments are Pakistan National Shipping Corporation (PNSC), Merchant Marine Department, Port Qasim, Karachi Port and Gawadar Port Authorities. These departments are taking policy guidelines mainly from the merchant Marine policy (2001) and Merchant Marine policy amendment (2019).

The merchant marine policy has drafted many objectives; attracting private sector investment and decreasing the national freight bill is two of them ("Merchant Marine policy ", 2001). Clause 4(i) of the Merchant Marine Policy has exempted the ships from all kinds of import taxes and duties until 2020. However, no private sector ships are registered during this time. The freight bill of Pakistan is also continually increasing. Hence, despite giving incentives policy has not given any outcomes.

Similarly, the fishing sector has policies at the provincial and federal levels. The Deep Sea fishing Policy of 2018 has divided the coastal areas into three zones. Each province has its policy to manage the fishing sector in Pakistan. The Deep Sea Fishing policy has enlisted its objectives as; poverty alleviation, food security and increase in national income. But the data shows that the fishing sector has a 1 per cent contribution to the GDP (PBS).

At provincial levels, marine fishing is in Baluchistan and Sindh. Both the provinces have their policy documents. These policies are market-based and support commercial fishing. The indigenous fishing communities are facing multiple issues like depletion of stock, presence of non-

fisher folk communities, presence of unregulated private sector investment and lack of participation in the policymaking process.

These practice policy gaps are supported by the literature and interviews. However, the point to ponder is the reason behind these practice policy gaps. The institutional and political lags are the major cause behind this gap. The interview with the expert of the industries has pointed out some reasons for institutional lags that are listed here.

i. Lack of trained individuals in the Mercantile Marine Department for ship registration

The ship registration procedure is shifting from traditional methods to open registries in the world after 2015 (Chen, 2017). This allows the ship owners to register under an ant Flag of convenience. Countries with an easy registration process and less lengthy have more registered ships as compared to other countries. Currently, Panama has the easiest ship registration process without the restriction of any country or bureaucratic hurdle and low taxes. Panama has 8517 vessels registered. While Pakistan has no single vessel from the private sector (Attorneys, 2021). The reason for the number one ship registry country lies in the fact that Panama offers a very easy online registration process. Along with this, the foreign owner has no obligation to pay income tax in Panama.

In Pakistan, the registration procedure is very difficult and time-consuming. This process started from approval of the names, advertisement in newspaper and lengthy documentation procedure. This process is manual (MoMA, 2002). While the Mercantile Marine Department of Pakistan, which register ships has limited officers and yet they are not trained well to handle the procedure efficiently and in a timely.

Top ship registering countries such as Panama, Cyprus etc are providing 24/7 registry services. And it took a ship 24 hours to delete its previous registration and register under new FOC (Javed, 2019). During the interview, most of the participants has highlighted bureaucratic hurdles, slow and lengthy procedure of ship registration as a major cause of no private investment in the shipping sector of Pakistan. One of the participants from the National Institute of Maritime Affairs (NIMA) mentioned that the Mercantile Marine Department has an absence of a trained workforce. There are a limited number of employees and they are working manually. This has caused a slowdown in the registration process. He further stated that NIMA has identified that policy has no lags but the implementation mechanism of ship registration is very faulty.

The mercantile Marine Department is responsible for the registration of ships under the ship registration ordinance of 2002. The duties of the department are vast in nature. However, the department has only 42 employees as per the official company profile of the department. They are also working manually. Lack of capacity building and training of employees is making the procedure more lengthy and cumbersome. The absence of digitalization is another hurdle that needs to be taken care of.

ii. Absence of integrated policy:

Fishing in Pakistan is the major source of employment, food and export. The coastal communities are particularly involved in this sector (Shah et al., 2018). Their major source of income and food is from direct fishing or related indirectly to this sector. In Sindh and Baluchistan coastal areas, women knit the net for fishing by hand. According to an estimate by SDPI, 68 % of women are engaged in agriculture and fisheries while the percentage of the male member is 32% (SDPI, 2009).

The Deep Fishing policy has introduced nylon nets and banned other forms of the net with thin meshes. These nets are made by women at home. These nets allow them to catch more fish and especially small fish. However, this is not a sustainable practice. But women of coastal communities have lost their alternate source of income due to this policy option. Recent studies have indicated that industrial fishing and foreign trawlers have limited the role of women in fishing. This has a socio-economic impact on the livelihood of fishing communities. Most of the fishermen or women, spend their time and earn a steady income after retirement from fishing through weaving cotton nets. The ban on the net and no alternative policy option has further deprived women economically (Saigol, 2011).

The majority of the participants were of the view that there is a need for participatory policy. And the policy should focus on the socio-economic uplifting of the coastal communities. One of the participants, who is a resident of Ibrahim Hyderi (A fisherfolk village) has mentioned that there is no integrated and pro fishermen policy at the provincial level. The absence of integrated policy has increased the unhealthy competition in fishing. Historically indigenous people were doing need-based fishing and now it's a profit maximization business. This approach has depleted the resources and impacted on biodiversity of marine life.

During an interview, one of a participant who has worked in coastal communities and fisheries sector of Pakistan has narrated that, the fishing communities are living poverty-stricken life despite having resources. The other participants were of the view that lack of inclusive policy and poor management of fishing sectors are the major causes of less socio-economic development in the coastal areas. Another participant has quoted Hayat Jat, a fishing village of Sindh, which is almost 90 km east of Karachi is among the poorest village in the country. This village is rich in marine life but poor management, policy lags and absence of a policy for capacity building have to dwell

the village into the slums of poverty. One of the participants has mentioned a pilot programme in Badin. This program was aimed to provide an alternative source of income through aquaculture to the housewives. The project has shown a hundred per cent success rate. She focused on engaging fisher folks into similar business instead of providing them other sorts of works like sewing etc which they are unable to do.

The fishing communities and villages have no additional skills. The education level is very low in these areas. The families transfer the knowledge of fishing practices and weaving net to their generations. Now they are complaining about the decline in fish stock. Along with this women have lost their source of income because of the ban on the cotton net. In some areas, these practices are continued. Due to the lack of knowledge about sustainability, climate change and efficient fishing and no alternate source of income, people are still using these nets in some areas. An alternate policy option is needed to provide sustainable livelihood options to the people of coastal areas for their socio-economic development. The Badin aquaculture program is the best alternative source of income for them. However, a participatory policy is needed for this step.

iii. Lack of stakeholders involved in policymaking and implementation

Blue economy refers to the use of ocean resources while ensuring socio-economic and environmental sustainability. These principles of sustainability are involved in multiple levels and can be achieved through the participation of different stakeholders. The ocean economy is a complex phenomenon so is the management of natural resources. It involves different stakeholders at the management level such as federal and provincial in Pakistan. Then the resource allocation also varies from federal to provincial. The user's rights that involve both direct and indirect rights

have multiple dimensions and uses within the country. This complex system of ocean resource management needs an inclusive and participatory policy that should involve stakeholders from different levels.

Stakeholders engagement is considered as a key to the success of any policy in many studies. A productive and sustainable blue economy can be achieved through the engagement of stakeholders (Mackenzie, Assad, Heymans, & Behrens, 2019) These stakeholders can be managers of natural resources i.e federal and provincial government, decision or policymakers i.e. lawmakers, users of ocean products i.e. fisher communities and traders, socio-economic communities i.e. coastal communities of Sindh and Baluchistan, private investors, other departments i.e. PNSC and environmentalists (Mackenzie et al., 2019).

The fishing community of Pakistan and people from the fishing villages are major stakeholders in the fishing policy. Their livelihood depends on this sector. They have no alternative source of income or education except fishing or weaving nets. Their involvement in the policymaking process is important so that they can help implement the policy. During the interview, participants have highlighted this issue in both the fishing and shipping policy of Pakistan. One of the participants has quoted the protest by fishermen communities in Sindh against the DSF policy of 2018. They have a reservation that the DSF policy has allowed foreign/ Chinese trawlers in zone III. They are using ban nets and catching even small fish. Which result in declining the fish stock. One of the participants claims that more than a policy failure this is the result of the absence of stakeholder's engagements in the policymaking process.

The involvement of the other stakeholders is equally important for the success of any policy. As mentioned by a participant, Pakistan needs to listen to the concerns of private sector investors so that the shipping sector can get private investment. Similarly, the participants have also focused

on the engagement of people from academia. This will aid the government to find out lags in existing policies and find out best practices for amendments.

The participants of the interview mentioned that fishermen communities have historical rights in coastal areas. One of the participants mentioned the historical protest by fishermen against rangers that were granted fishing permission in Badin and Thatta on special request in the 80s? However, later they occupied the lakes and ponds and they had appointed foreign contractors. The fishermen community had to sell the fish to them. Fisherfolk held a long protest in 2004 against the contractors. The participants were of the view that this was due to the lack of stakeholders' engagement and the absence of a participatory approach.

The engagement of stakeholders is not only vital for the policymaking process but is the key ingredient for the implementation of the policy. Stakeholders at root level such as fishing or shipping community are the pillar that ensures the implementation of the policy. One such example was quoted by one of the participants of the interview. He quoted that during a visit to Ibrahim Hyderi, a fisherman was using a ban net. He caught very small fish in it. On a question about whether he is aware that these nets are not allowed? He replied that they didn't find big fish and we are all about our food. What is the ban or not? What is harmful are not? What the government is saying? We are not concerned with that with an empty stomach. Their engagement in the policy process helps the policymakers in knowing the problems so that an alternative option can be set for them.

The major issue in Pakistan is not making policy but its implementation. For blue growth sectors like fishing and shipping, Pakistan has existing policies. There are multiple other factors behind the lack of implementation but stakeholders' engagement is one of those. Engagement will allow in crafting a policy that will ensure social, economic and environmental sustainability.

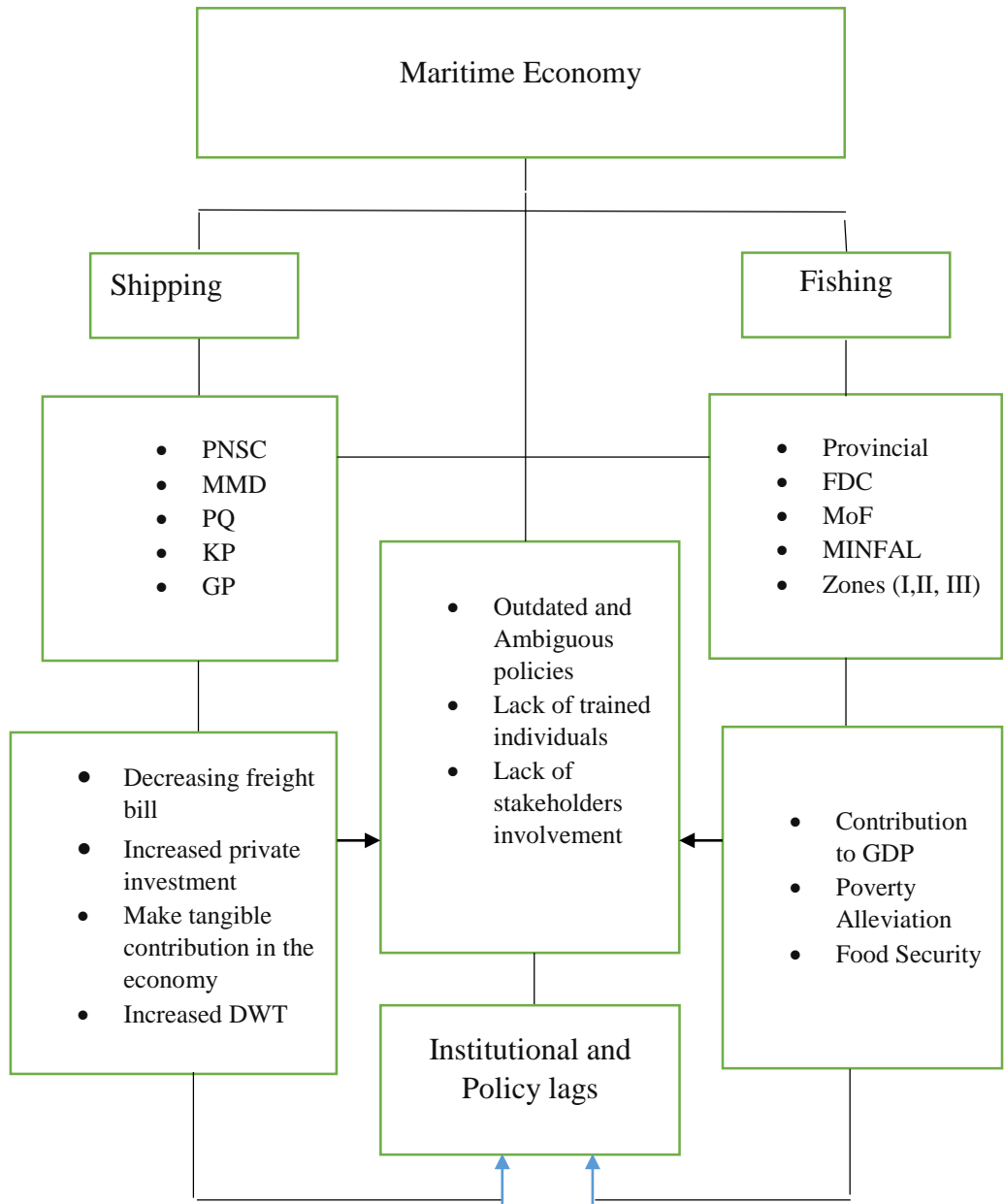


Figure 7 Contextualization of Ostrum framework with theme 1 (Author's own)

2. Poor implementation mechanism

Policies cannot be considered to fail while judging on their own merits. However, the major lags that halted the progress of policy depend upon the implementation process. The factors that affect the implementation of the policies are complex and multifaceted in the domain. There could be multiple causes and potential solutions depend upon the situation and its context (Rittel, 1973).

Multiple factors are identified by academia for policy failure in Pakistan. These factors are mainly; corruption, red-tapism, insufficient human and financial capital, over-enthusiastic policies, poor policy evaluation and monitoring, absence of stakeholders engagement and lack of centralized vision (Sirajul, 2015).

Pakistan Deep Sea fishing policy and provincial policies of Sindh and Baluchistan have banned the use of small mesh nets and Illegal, unreported, unregulated fishing. However, these practices are very common in the region. So here the issue is not about the policymaking but it is about the implementation of the rules that are set by the policy. Similarly, the shipping policy has not achieved its single objective so far.

i. Multiple Authorities over different coastal zones:

In Pakistan after the 18th amendment policy making and implementation has been delegated to the provinces at some level. Every province has its fishing policy and department. At the federal level Fisheries Development Commissioner (FDC) is working on the fisheries sector. FDC is working under the Ministry of Food Agriculture and Livestock. The shipping sector has its multiple policies

and its different department are working in this sector such as PNS and Merchant Marine Department.

During an interview on the implementation question, the participants were of the view that the ambiguity over distribution and management of coastal zones and multiple authorities has caused many issues. One of the participants said that under the Sindh Fish ordinance illegal practices of fishing are crimes and the offender has to pay a fine and imprisonment. The ban nets such as Bullo and Gujja etc still in use and this is the one reason behind the decline of fish stock also. When the administration arrest anyone, local communities started protesting. Another participant mentioned that illegal fishing is very common mostly because of the ambiguities about zones. The provincial government has jurisdiction over 12 NM. While fishermen are also fishing in EEZ without licenses. It is difficult for them to identify the zones and their jurisdiction. They consider the sea as open water and their primary source of income. So they are ready to find out the fish to all extend. Apart from this foreign trawlers are also violating the zones.

Mangroves forests are very important for fish breeding. There are issues like the illegal cutting of mangroves in coastal areas. The participants of the interview highlighted the policy gap in mangroves management. The major issue is multiple authorities who are controlling the management of mangroves. For instance, the Sindh Forest Department, Port Qasim and Sindh Board of revenue are managing the mangroves forest in Indus Delta.

In the shipping sector, there are ports authorities, Pakistan National Shipping Cooperation (PNSC), and Merchant Marine department and multiple policy documents. One of the participants of the interview has shown his concern about the absence of one policy document in the shipping sector. He mentioned that currently port authorities and PNSC has a different working mechanism. The

unanimous policy does not help full for them in the current situation unless the management of the ports and PNSC is on similar patterns.

Policy implementation needs centralized authority. Pakistan has a ministry of Maritime Affairs. But fishing is under the ministry of food and livestock. Similarly, the shipping sector has many layers and one single document can't be helpful here. Thus there is a need to end ambiguities and the sector of the Blue economy needs to manage under one umbrella so that socio-economic and ecological sustainability can be assured.

ii. Absence of regulatory body for sport fishing:

IUU fishing is one of the biggest challenges that are not only faced by Pakistan but is a worldwide problem (USAID). This issue has social, economic and environmental implications (Nazir, Yongtong, Kalhoro, Memon, Mohsin, et al., 2015). IUU fishing is a serious threat to the health of the fish. It also affects biodiversity and declines the fish stock which is a threat to the food security of the coastal communities (Leroy, Galletti, & Chaboud, 2016). The IUU fishing in Pakistan is based in Karachi and Gawadar. Fishermen use gill nets to catch rare and ban species. They carried out the operation in EEZ and international waters. This is usually carried out through unregistered vessels.

The participants of the interview highlighted another problem that is linked with IUU fishing. Recreational fishing is common in Pakistan. However, there is no regulatory body for sport fishing. People carried out IUU fishing under the umbrella of sport fishing. One of the participants, who is working in coastal communities of Pakistan stated that the absence of a regulatory body for sport fishing is aiding IUU among other factors.

Pakistan fishing policy needs control over IUU fishing for the achievement of its three objectives of food security, poverty alleviation and income generation. Pakistan has huge potential for sport fishing. As described by one of the participants, Pakistan has unofficially broken the record of the largest Cobia and Mackerel fish many times. And there are many rare species of saltwater in the out coastal belt of Pakistan. Thus the absence of a regulatory body for sport fishing has not only neglected the investment but also provided a way for IUU fishing in the region. Combating this problem in Pakistan needs cooperation from other sectors for private investment in the sportfishing sector.

iii. Conceptual lags in DSF

The policymaking process is not static but it evolves. The process of the policy started from the identification of the problem, then policy formulation, implementation and monitoring and evaluation. The steps of monitoring and evaluation are critical for designing and implementing policy. It ensures the steps to take and eliminate for the achievement of the long term policy objectives through identifying the lags (OECD, 2021). The policies lags can be of recognition or conceptual, implementation, decision making and effectiveness lags. The implementation lags are linked with the implementation of the policies. They occur between the design of the final draft of the policy and its implementation. Multiple stakeholders and government agencies are responsible for this lag (Pülzl, 2007). The decision-making lags occur during the policy-making and stakeholders' engagement process. While conceptual lags occur in the present policy documents. These all lags cause the effectiveness lags of the policy by failing policy on its merit of objectives. The Fishing and Shipping policies of Pakistan have covered many concerning areas. However, there are still some lags left behind. These lags are mainly caused by the lack of stakeholders'

engagement and poor evaluation and monitoring process. During an interview one of the participants has highlighted the conceptual lags in the DSF policy of Pakistan. He quoted an example from the policy as it seizes the traditional resource rights of the coastal communities or local fishermen by allowing open access to the fish. The policy has defined fish as an open-access resource. Under this policy, foreign trawlers are entering the water and local fishermen are protesting against them. The policy should be sustainable and ensure its objectives are full filled especially poverty reduction and food security.

Another conceptual lag is identified in the DSF is linked with IUU fishing. One of the participants highlighted that policy has focused on the overexploitation of the shrimps. However, the fisheries of all species are exploited. FAO has highlighted that shrimps are fully exploited but the other species are also exploited in Pakistan. Thus the policy needs a long-run plan to ensure sustainable fishing in the country.

Pakistan needs an inclusive policy under the umbrella of Blue Growth. The federal and provincial level policies are not aligned on many levels. The issues related to the IUU are not local level but it is an issue of national security. Thus the country needs to remove its policy lags at all levels.

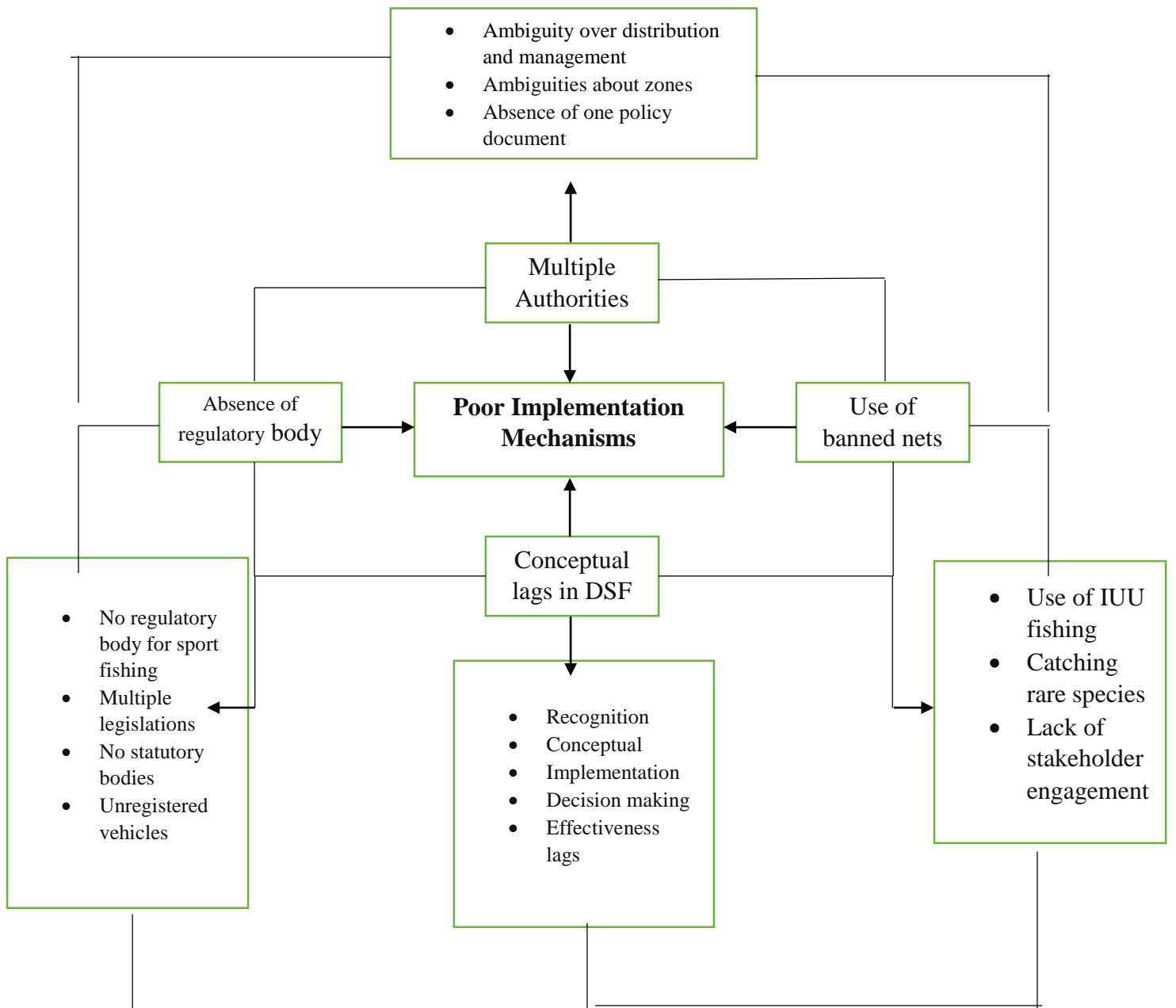


Figure 8 Contextualization of Ostrum framework with theme 2 (Author's own)

3. Socio-ecological concerns:

Marine transportation is the main driver of world trade. Every year, tons of liquid and dry cargo is transported through containers and ships. In the business world, this is the most efficient means of transportation. Nevertheless, marine transportation is the major cause of marine pollution. The accidental oil spills, ballast water, greenhouse gas emission, air pollution, water noise pollution and garbage are threatening the ocean species and biodiversity.

In Pakistan, the shipping industry is the biggest source of chemical discharge. Karachi being the hub of shipping and fishing activities has faced a major pollution problem. Apart from the chemicals linked with ships, industrial waste and water pollution is also damaging biodiversity. The other waste includes plastic, hospital waste and industrial waste (Liu, 2013).

According to the WWF, approximately 60% of the litter on the seashore is plastic. Apart from these unsustainable activities like mineral extractions also undermines biodiversity in coastal areas.

According to the IUCN, fish stock is declining in Pakistan. Some species like grouper, catfish, shrimps and sharks that were present here in vast numbers are not found now. FAO during their survey in coastal lines has identified pollution as a serious threat along with other factors behind the decrease of fish stock.

Pakistan has identified the issue of water pollution and its impact on biodiversity. There is multiple international legislation to control the issue of marine pollution. Some of these are convention on biological diversity, the convention on endangered species, Paris agreement, Convention on Law of the sea, Ballast water treatment and Stockholm convention. However, the country needs a

national plan of action to tackle this issue on a priority basis. According to the World Air quality index, Karachi is ranked 12 on the live air quality city index. Apart from air, fishermen are complaining about the decrease in fishing stock and this has put their livelihood at risk.

i. Lack of sustainable practices in fisheries management and marine pollution:

The fishing policy of Pakistan focuses on sustainable fishing practices. However, illegal, unsustainable fish management and the catch is in practice. There is a debate that the decline in fisheries stock or natural resources is due to poverty. But in reality, the pollution, unsustainable practices cause a decline in fisheries stock and then causes poverty (Khan & Khan, 2011). Pakistan is also facing poverty and malnutrition problems. The coastal communities are losing their only source of income due to unsustainable practices and marine pollution.

During our interview, participants have identified the unsustainable practices of fisheries as a cause of marine pollution and depletion of fish stock. During an interview, one of the participants mentioned that there are no treatment plants in Sindh. Industrial and other waste is dumped into the ocean, thus polluting it. He also mentioned that foreign trawlers capture a large number of fish and separate Tuna from them and dump the dead fish again in the sea. Thus creating pollution and depleting stock.

One of the participants mentioned that there is no law to curb ghost nets and plastic in the sea. Ghost net that is abandoned by the fishermen or they are lost during the fishing is killing the other species of the sea such as tortoises, dolphins, lobsters and fish in Sindh and Baluchistan. Upon question, another participant mentioned that when the net is damaged, fishermen through them

into the water instead of carrying extra weight on launch and most of them are unaware of the effect they are causing to the biodiversity of the ocean.

The presently used nets are made of plastic and they remain in the sea forever. One of the participants mentioned that WWF has estimated that there are thousands of ton nets in the sea. WWF has started a program “unique species” and Pakistan has retrieved tons of ghost nets from few islands of Sindh. However, the capacity building and awareness campaigns are only solutions according to the interview participants.

Participants highlighted that the fish that is exported by Pakistan has low value in the region. Fishermen catch trash fish and they earn hardly 300 rupees per day. There are thousands of small fish in 2 kg of trash. The exported trash fish is also bought at low rates. Fishermen have no plants to clean the fish and pack and then sell. The quest to earn livelihood daily and the absence of alternative income options led them to ignore banned practices. Apart from this, there is no proper waste management of trash and plastic thrown in the sea. This has further worsened the stock of fish.

ii. Depletion of agricultural land and Cutting of Mangroves

The Indus delta has fertile land but for the past few decades land is submerging into the sea due to sea intrusion. Multiple research from 1997-98, 2007 to 2008, almost 60% of the coastal land is submerged into the sea. This situation has caused socio-economic deprivation in the area. Most of the people are migrating from the area.

There are multiple causes of sea intrusion. The major causes highlighted by the literature are the construction of large water reservoirs and upstream canal networks. The participants of the

interviews have highlighted the issue of depletion of agricultural land and sea intrusion. They have highlighted that according to the policy IRSA is bound to distribute 27MAF from Indus water to the delta region and ocean. This freshwater is important for biodiversity and the growth of fish and mangroves. Sea intrusion is also caused due to the absence of freshwater.

Along with freshwater Mangroves are also very critical for fishing and ocean biodiversity. They provide breeding grounds for commercially important fishing such as shrimps, lobsters and crabs. These fish provides billion of rupees in export. According to the report of IUCN, almost 98 species of fish are present in mangroves. This important flora is exploited in coastal zones due to multiple reasons like; increase in population and overcutting of mangroves. One of the participants of the interview, who hails from one of the coastal villages mentioned three major reasons for illegal mangroves cutting. These reasons are; household fire as a substitute for gas, construction in Karachi, industries like matchbox and housing societies like DHA. In some cases, people cut the mangroves illegally and in some cases, they get permission from the forest department or any other regulatory authority. Here the major gap lies in both policy and practice. The integrated approach and involvement of local stakeholders can tackle the issue more effectively.

iii. Lack of accountability mechanism

If policies are not evaluated or implemented then they are nothing but a piece of paper. Accountability and implementation of policies go hand to hand. Public administrators are responsible for the implementation along with politicians. They engage other stakeholders like civil society and non-governmental organizations in the policy process. If they are failed to

implement policy or achieved its objectives they will be held accountable by the public and respective institutions. The accountability can be administrative, legal, professional and political in types

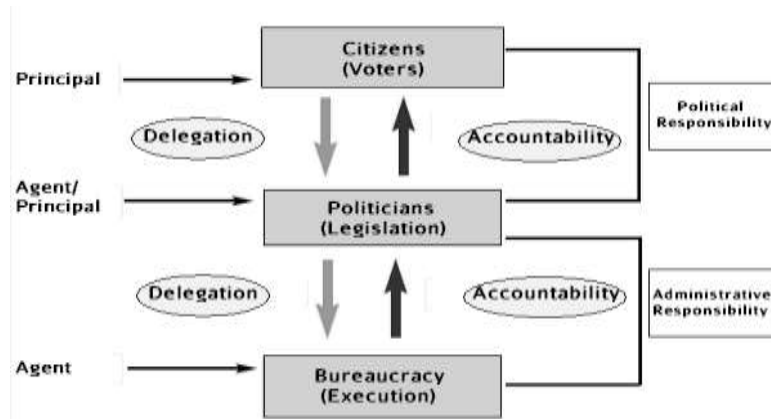


Figure 9 Accountability in Policies (Bayrakçı, Göküş, & Taşpınar)

Citizens have an active role to play in the democratic world for the policy implementation process. In the fishing and shipping sector of Pakistan, there are laws and policies. Pakistan is also a signatory to the international conventions for marine pollution control.

During our interview, the participant was of the view that a loophole in the monitoring of coastal areas by the administration is instigating the fishermen and coastal communities to use illegal practices. Accountability is essential for fishing and it applies to everyone who is linked with this sector directly or indirectly. The fishing sector has identified pollution as a factor behind the decline of fishing stock. Industrial wastage is another major cause of ocean or marine pollution. One participant mentioned that the Karachi coast has approximately 8000 small and large industries. Along with this when the ships transport the material from the Karachi port, they release toxic material into the ocean. There is no accountability for this wastage that is directly dumped into the ocean. This is a policy implementation failure.

Marine pollution, ballast water, industrial wastage and ghost net are major threats to the marine biodiversity in Pakistan. The objectives of fishing and shipping policy should be based on the principles of the blue economy that consider socio-economic and ecological sustainability as a pillar of growth.

iv. Social deprivation and unregulated investments:

Blue economy has one main pillar as social uplifting. The indigenous communities are in an extremely deprived situation. They are in a vicious circle of poverty and loans. The private investor who is not indigenous fisherfolk is giving the loan to local people on the interest rate. They are also bound to sell fish to the same person they buy the loan. In other cases, they work on the trawlers of that private investor.

The interviews participants have highlighted a very critical issue of unregulated private sector investment in the fishing sector. One of the participants has mentioned that the private contractor buy big trawlers and they hire local fishermen by giving them loans. They hardly earn money to return a loan for one tour. And for the next tour, they again need a loan for diesel, food and other necessary items. The investors are giving them a loan on their terms. The fishermen are suffering due to the absence of subsidies or any other loan policy at the national and provincial levels.

Another issue is the absence of social safety nets. There are no education or health facilities in coastal areas. Apart from this, they don't have life or boat insurance. People are unaware of basic health care and safety. Drugs, pan and gutka are very common in these areas. As a result majority of the people are suffering from mouth and lungs diseases. These communities need social safety nets for the education of their children and women.

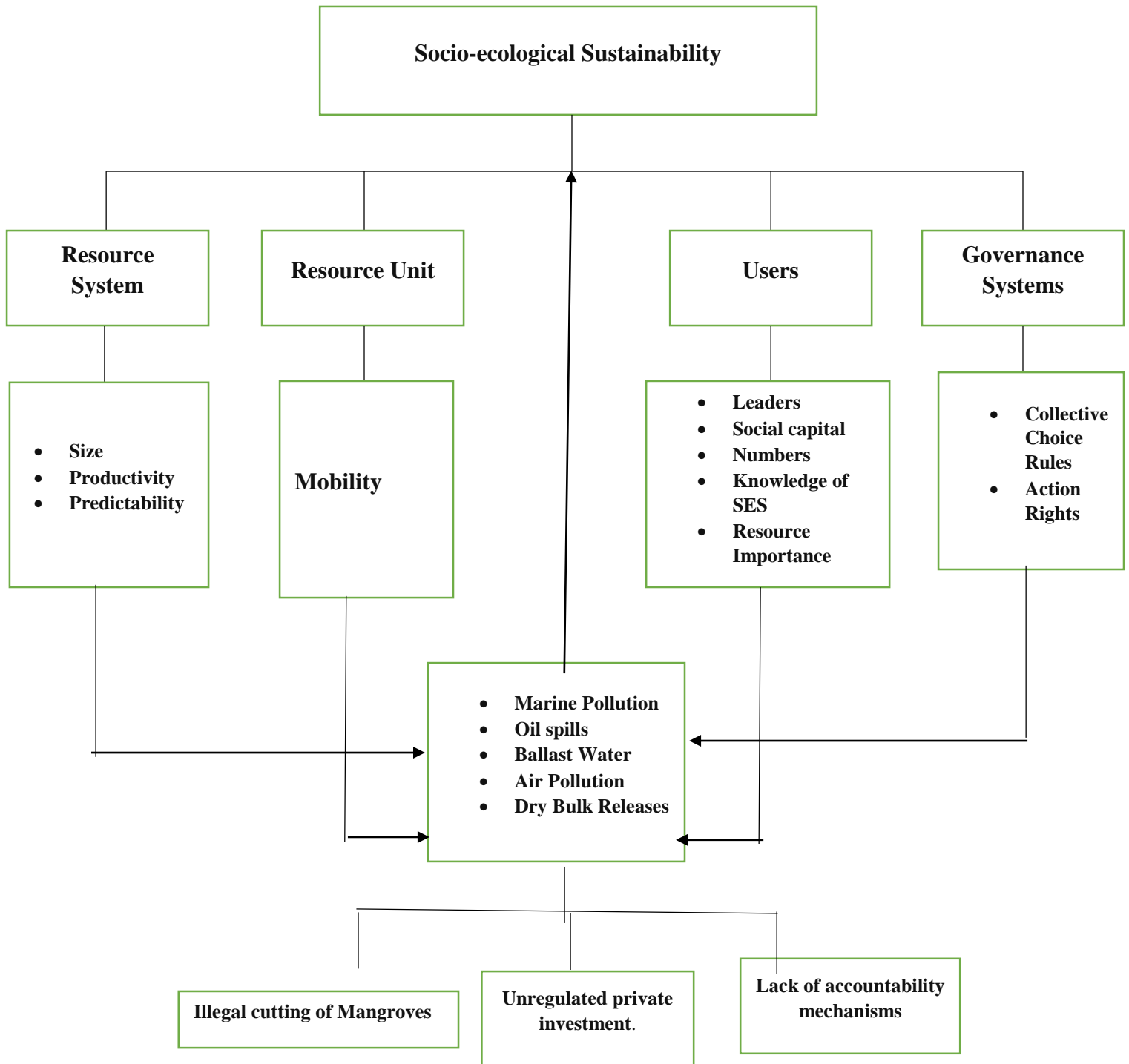


Figure 10 Contextualization of Ostrum Framework with theme 3 (Author's own)

4. Technological and research issues:

The future of the Ocean economy is linked with technological advancement and innovation in the field thereby making it one of the most important issues that need to be tackled to ensure human existence. There are several advancements like aquaculture, biotechnology, marine mapping and sea transportation etc that are already adopted by the ocean economies. James Bellingham, Director at the Woods Hole Oceanographic Institution mentioned that the future of ocean research and the economy is driven by technology, the majority of ocean exploration today is conducted by robots and their role is incredible for future advancement in the ocean economy (Saunders, 2020).

Organization for Economic Cooperation and Development (OECD), in its report; “the Ocean Economy in 2030” has mentioned that science, technology and innovations are the major drivers of the ocean economy (OECD, 2016). Apart from the existing ocean technology, there would be a string of technologies to stimulate the sectors of the ocean economy. These technologies are; satellite technologies, big data, Subsea engineering and physical sensors etc. all of the existing and promising technologies have one common goal of economic and environmental sustainability.

According to the EU, maritime technology has created an additional value of \$ 21 billion net income only in shipping sectors (EuropeanUnion, 2020). Technology development also helps to reduce marine pollution and environmental hazards that are created by oil spills or sea transportation. According to the European Union report of 2020 on Blue Economy, innovation and technology impact the ocean economy and facilitates by providing surveillance of pollution and illegal activities, intervention for preservation and protection and communication through satellites and sensors etc.

Pakistan is not advanced in technology. The exploration of marine resources, their usage, estimation and management need technological advancement. The fishing and shipping sectors in Pakistan are not working on the principles of sustainability and the absence of technology use is one reason. Ocean economy requires knowledge and data. This data about the underwater species and their assessment will be helpful for the growth of the blue economy in the country. However, technological advancement is pivotal for this knowledge.

i. Pakistan is ranked lowest in GIT and LPI index

The technological inventions in the early 18th and 19th centuries opened up new corridors of modern technology. The invention of the Chronometer by John Harrison in the 18th century opened up new avenues of prosperity and expansion for the British. It was due to the invention of the “chronometer” that they successfully calculated the longitude of the ocean and navigated around safely. Technology is inevitable for all the sectors of blue growth. It is not only important to explore the existing resources of the ocean but also essential for the sustainable management of oceanic resources.

Pakistan is far behind in technology. Even in the South Asian region, Pakistan has the lowest spending of 0.2% of GDP in research and development. Along with this Pakistan is ranked lowest in the global competitive index ranking of South Asian countries (UNIDO, 2020). Global Information Technology report that measures the driver of the technology revolution has ranked Pakistan 110 out of a total of 143 countries (WEF, 2019). This index is the indicator of the poor technological advancement in Pakistan.

During an interview, our participants have highlighted the lack of technological innovation in the marine field as a big hindrance to the growth of the blue economy. Most of the participants were of the view that Pakistan can solve its financial crisis and generate employment by investing in shipping and port. This sector has huge potential and growth opportunities. Pakistan can use the International tool of LPI (logistics performance Index) to revitalize its shipping industry. LPI is a tool that identifies challenges and opportunities in the logistics sector. In the LPI ranking of 2019 Pakistan was ranked 122 out of 160 countries. Participants show concern about this low ranking and further mentioned that Pakistan takes 2 to 3 days for clearance on ports. While India takes 1 day for clearance. This difference is because of the technological advancement in India.

The LPI index highlighted the issue of shipping and ports. However, the lack of technological advancement is affecting other fields also. Such as exploration of the species, cleaning oil spills, monitoring deep-sea activities and marine biotechnology. Satellite technology and sensor have created an evolution in the field of the blue economy. Pakistan needs to invest in marine technology for sustainable growth and socio-economic development.

ii. Absence of IoT, Big data and digitalization at ports

With the advancement of technology and the introduction of 4th generation technology shipping and port, the sector has also revolutionized. Technologies like IoT, Big data and AI are prioritized in the manufacturing, transportation and aviation industries. This innovation has introduced the concept of smart ports or digitalized ports.

United Nations Economic Social Commission on Asia and Pacific has defined smart ports as eco-friendly ports. They maximize the profit and optimize logistics flow automatically. They are

energy efficient and use technologies like AI and IoT. Smart ports provide operational excellence and new business and investment opportunities (UNESCAP, 2019). These ports also reduce cost and speed the response time.

One of the participants of the interview, who is working in the shipping and shipbreaking sector has mentioned that Pakistan's shipping and port system is not efficient. Countries are using big data and IoT to manage their port infrastructure. The Karachi and Port Qasim have limited capacity. However, Gawadar can handle more cargo. It is a shorter route for many countries including China. Converting Gawadar port from a conventional port to a smart port will not only attract foreign investment but also provide development opportunities to the indigenous people of Baluchistan. The big data is largely used in ports and expert believes that those who are not using AI and big data are at the risk of losing their market share. She further added that digitalization can help in ship registration and clearance procedure. PANAMA has an online registration procedure and one can register ship within 24 hours. These technologies are used for the preventive maintenance of ships. If Pakistan wants to develop its shipping sector then technology should be a priority in this sector.

The IoT, Big Data and digitalization has revolutionized the shipping and fishing sector across the globe. It is easy to track ships and predict their faults. Furthermore, digitalization has reduced the time of doing things. Paperless registration can help attract private sector investment. For the socio-economic and ecological sustainability of the ocean, economic technology is an important pillar.

iii. Absence of technology to monitor fish capture

Overfishing has been highlighted as a major cause of the destruction of fishing stock. According to the FAO, nine out of the fourteen species of fish are already depleted in Pakistan. FAO has also predicted that the annual shrimp capture will also be declined by 40% in the coming 20 years (FAO, 2018). There are multiple reasons behind the overfishing in Sindh and Baluchistan as well as EEZ. The fishing policy of Pakistan and the provincial ordinance has banned overfishing. However, the country has failed to implement this policy.

On the question of why overfishing is a problem in Pakistan despite having policies? One of the participants of the interview suggested that Pakistan has no proper mechanism to monitor fish catch. There are technological methods like EM and GPS tracking. EM is an electronic monitoring system. EM use a camera and sensors for monitoring fish catch. This method provides data about the sustainable and unsustainable practices of fishing. Though this is a new technology it can be helpful in Pakistani vessels. Some ports used logbooks to monitor the data of fish catch. They record daily capture and then use a computer to analyze the data. However, this is not an error-free method. The use of cameras and sensors is the better option. He further suggested that the use of devices like Turtle exclusive devices has a positive result.

The fishing sector is overexploiting in Pakistan. This has serious socio, economic and ecological repercussions. The coastal communities that are dependent on fisheries further suffer because of the decline in the fishing stock. Pakistan needs a responsible and sustainable fishing system. This can't be possible without the integration of technology and scientific research. Blue growth and SDGs demand sustainable social and economic growth while preserving biodiversity. And the use of technology can increase efficiency and sustainability.

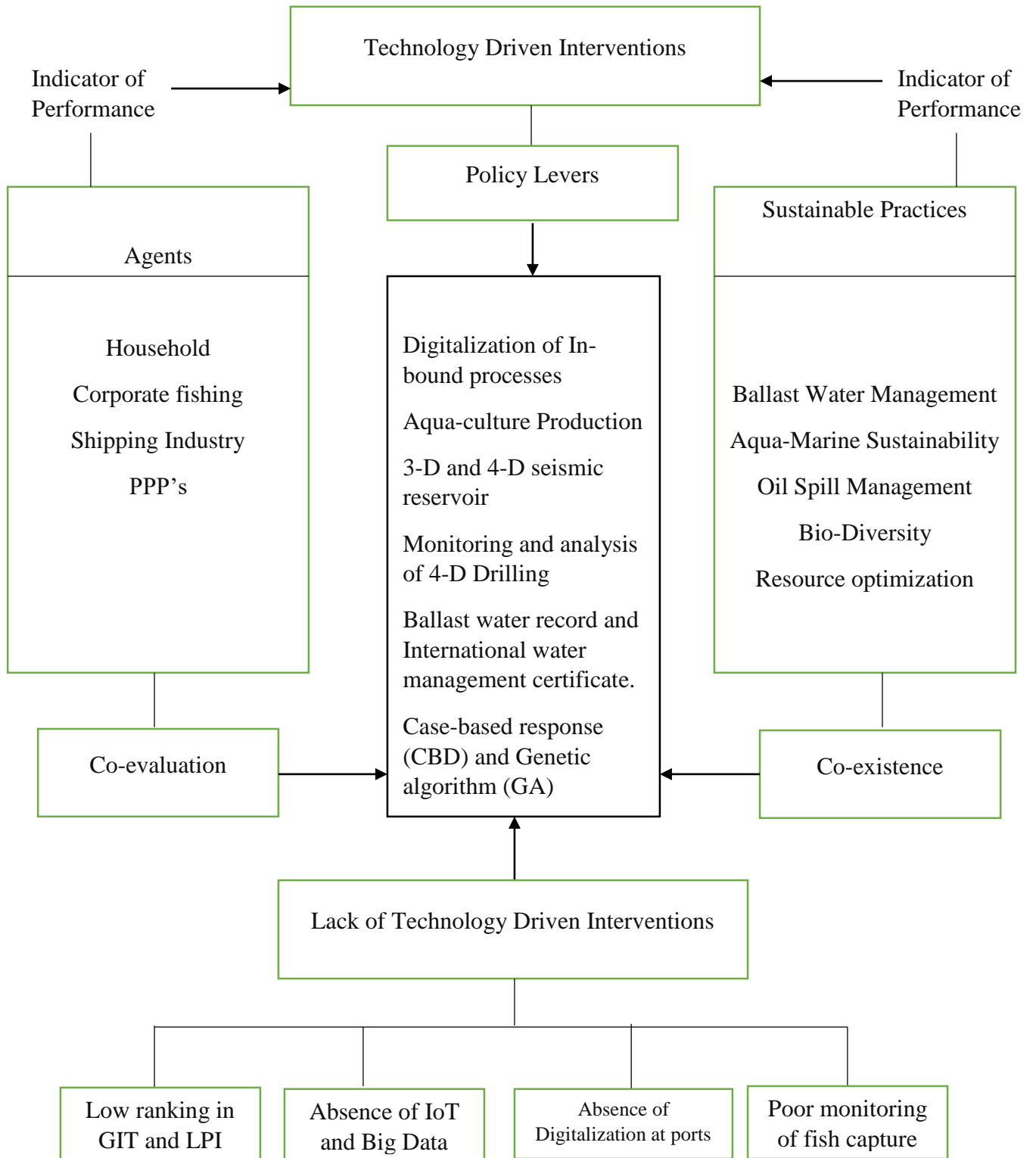


Figure 11 Contextualization of Ostrum Framework with theme 4 (Author's own)

5. Lack of private sector investment

The blue economy comprises different financial sectors and policies. The management of the blue economy like fisheries, shipping, tourism etc is a complex phenomenon because it requires different stakeholders' engagement. Especially in developing countries like Pakistan sustainable management of oceanic resources required collaboration between the private and public sectors. Developing countries rely on foreign aids or assistance for projects like sustainable ocean development or preservation of ocean biodiversity. But these states usually have a fluctuating flow of cash and foreign direct investment. Whereas, the blue growth requires long term financing for different sectors.

Philanthropic and public investment can't harness blue growth in a country. Understanding the need for private investment in the ocean economy, IUCN has launched a private-sector coalition program in 2016. This program aims to help the developing or small states to preserve their ecosystem and endangered species. The private sector at the national level has also a key role to play in the management of ocean resources. Business and economic activities are the engine to create more opportunities, reduce poverty and provide employment. This also provides an alternative source of income to coastal communities. These development require innovation, technology, stable financing mechanism through collaboration between the public and private sectors (EIU, 2015b).

South Asian Maritime nations like India, Sri Lanka and Bangladesh are encouraging private sector investment in the blue economy sector. India has initiated its program Sagar Mall and around 577 projects are undergoing. The majority of the investment in this program is from the private sector.

These projects are linked with port development, smart port, port connectivity, shipyards and the development of coastal communities (India, 2016). India has 27 shipyards and 19 of them are privately owned. Similarly, Bangladesh is also following the World Bank recommendation of public-private collaboration in the blue economy.

Pakistan is a developing country. The long term financing project is not possible without private sector investment. The shipping policy of Pakistan has its one main objective, “to attract private sector investment”. But the country has not yet a single penny of private investment in the shipping sector despite giving many incentives in the policy. According to the World Bank, the public-private partnership is essential for blue growth. For this private and public actors should create a clear and measurable target. Along with this, private investment should be regulated legislatively so that a profitable return can be achieved (UNDESA, 2017). However, Pakistan is facing a major balance of payment crisis and paying a higher amount in freight bills. The fishing sector is creating low revenue as compared to its potential. Even the exported fish rate is quite low in the region because of the poor quality of packing. Pakistan can earn more from these two sectors through a private-public partnership.

i. Bureaucratic hurdles and red-tapism

Pakistan has always underperformed when it comes to the collaboration between the public and private sectors. The private sector can bring special technologies and ensure the implementation of their strategies. There is no doubt in the fact that the private sector tends to work more in a sustainable way by using advanced technology. The economic crisis gives a chance for smart work and private investment in the country. Unfortunately, Pakistan has failed to achieve benefits from such opportunities. World Bank has highlighted that the GDP has a 10% share of private

investment and that is very low. This low investment has also decrease employment and labour productivity. Improving the business environment and removing bureaucratic hurdles are necessary to attract private and foreign direct investment in Pakistan (WorldBank, 2019b).

The merchant marine policy of Pakistan aims to incentives the private sector. During our interview, upon a question on policy objective failure of private investment in the shipping sector, participants have highlighted that the bureaucratic hurdles and corruption are the major reasons. The updated shipping policy draft has exempted tax for Pakistani nationals till 2030. However, this is not a reason for policy failure. One of the participants mentioned that they had an interview with the 2 companies who had invested in the Pakistan shipping sector in 2002 and then withdraw. Both companies mentioned that the custom/FBR and cumbersome procedure was the reason we quit this industry. One of the participants who visited the Mercantile Marine Department stated that the department is behind the time and they have no modern technological equipment or workforce to do the registration process quickly. The ship registration process in countries like PANAMA is completed in one day. However, in Pakistan it takes months.

Pakistan is paying 4-5 billion dollars in terms of freight bills every year. The country is already facing an economic crisis and this huge amount is an additional cost on the national exchequer that can be minimized easily. Pakistan needs to attract private investment in the fishing and shipping sector. This can is achieved without removing obstacles like red tarpism and bureaucratic hurdles. Currently, the GDP share of shipping is very low. The sector has huge employment opportunities. Many other industries are linked with the shipping sector of Pakistan. Thus the government needs to solve the issues of bureaucracy and hire competent individuals in the Merchant Marine department.

ii. Need for Capacity building of local communities

In the management of natural resources capacity building is necessary for improving the management and performance of the selected sector. Capacity building involves the training of the local community, spreading knowledge and developing a network for the implementation of policies. According to Charles, the institutional sustainability for the fisheries focuses on the capacity to maintain, manage and policy implementation. Capacity building is one of the main indicators that show whether the rules concerning the management of marine resources are implemented or not. The local or indigenous communities own natural resources (Irving Hartoto, Adrianto, Kalikoski, & Yunanda, 2009). There are many examples where the indigenous population or community stood for the protection of natural habitats. One such example is the Chipko movement in India. Where women protest for forest policy and save natural resources.

In Pakistan fishing stock is decreasing rapidly. The policy has identified pollution, use of unsustainable fishing and overfishing as a major causes. One of the participants from the interview highlighted that the local fishermen community is still using banned nets. He mentioned that during his visit to one of the fishing communities in Sindh. He questioned fishermen why he is using “gujja” which is banned and the Sindh ordinance has imposed a fine on it. He replied that we have to spend weeks without eating anything if we stop using this net. They were using this net because small fish or trash is caught in these nets. Do they know what the policy says but they didn’t know why these nets are banned? They don’t have any alternative source of income. Thus they are compelled to do overfishing and use the banned net.

The policy can’t bear fruit without the capacity building of local communities. Coastal communities of Pakistan needs training for a sustainable fish catch. They also need support to buy

sustainable net that is expensive for them to buy. Along with this, they need awareness campaigns and workshops. These workshops should highlight the issues of natural resource conservation and provide technical support to local communities. The training programs must include training for an alternative source of income. Without the capacity building of local communities, sustainable fishing is not possible. The private sector has a huge potential in this sector. They can train individuals and provide them with opportunities for entrepreneurship. They can ensure sustainable fishing by investing in modern and sustainable techniques. But for this government need to devise a policy and ensure a conducive environment for private investment.

iii. Sea blindness:

The blue economy is the utilization of all sea resources for sustainable economic growth. Ocean economy has huge potential in Pakistan. OECD estimated that the ocean economy has a potential of 3 trillion USD and employment generation of 40 million people. This would be a double value by 2030 (OECD, 2020). The Ocean economy encompasses numerous activities like fishing, shipping, tourism, ship breaking, tourism, marine chemistry, biotechnology and renewable energy. Only the fisheries sector is estimated to produce \$650m annually in Pakistan. According to FAO, 400,000 people are directly employed in the fishing sector.

Pakistan has a long coastline of 990km and Exclusive Economic Zones and continental shelves. The shipping sector has huge potential in Pakistan. But the country is performing very low with only 11 ships. Upon questioning to one of our interviews responded that the biggest problem Pakistan is facing in terms of the Blue economy is sea blindness. He mentioned that our Baluchistan has more beautiful islands than the Maldives. Our people are travelling every year to the Maldives, Bali etc for enjoying the island. Those areas are untapped. Pakistan needs public-

private investment in this area. But the fact is even local Pakistani people are unaware of these beautiful places. Another participant mentioned that the shipping industry and shipbreaking have huge potential. Pakistan is third in the world in the ship breaking industry. But the private-sector investment is also needed in this sector. Especially for capacity building and providing health facilities to the employees.

Ocean economy is untapped in Pakistan. Public investment is not enough to build this sector. A public-private partnership is needed for the sustainable development of this sector. There is also a need to advertise the shipping policy of Pakistan. Other sectors also need due attention. Sea blindness is the biggest hindrance in private sector investment.

Chapter 6:

Assessment of Shipping and fishing management in Pakistan

6.1. Fishing

Coastal areas of Pakistan are rich in a variety of aquatic species. Seawater has many types of fish. Fish is the most valuable food commodity in the country. It is not only a source of nutritionist diet but also a core source of employment for coastal communities. Fishing communities earn their livelihood by selling and exporting fish to the local and international markets. Pakistan is facing food security as well as ecological issues. Fishing stock is declining in Pakistan as fishermen are complaining about trash fish and low costs. The indigenous communities are suffering from livelihood threats and poor socio-economic status. Along with this Pakistan is facing an economic crisis. The country needs to include more refined products in its export bucket.

Despite having enormous potential and long coastlines along with EEZ, the fishing sector is underperforming. The location quotient of the fishing sector is 0.0984. The location quotient is used to find out the industrial concentration of any sector within that region. If the value is less than 1.5 it is an indication that the sector is least concentrated and there is huge investment potential. According to FAO, aquaculture is also performing low in-country. As compared to India at 6.8 % and Bangladesh at 5.9% it's growing in Pakistan at the rate of 1.5%. The fisheries sector is also contributing less to national GDP despite having policies at the federal and provincial levels for fisheries management. The fisheries sector is facing numerous problems.

Fishing stock is declining in Pakistan and pollution is one of the major causes (Khan & Khan, 2011). Seawater pollution is mainly due to untreated industrial waste, agricultural runoff including

pesticides, household garbage, ghost nets and plastics. Plastic bags and bottles are effluent even in the seashore of Karachi. Apart from these land resources of pollution, the oil discharge from the ships and ballast water is another major source of seawater pollution. These activities are affecting the harvesting of fish. The majority of the fish lay their eggs and grow under mangroves. While mangroves are disappearing due to the absence of freshwater (Hannan, 2012).

The Deep-Sea Fishing policy of Pakistan has three main objectives; poverty reduction, food security and increase in GDP. These objectives can't be achieved without sustainable fishing practices. Along with DSF 2018, provinces have also their fishing policies. These policies focus on revenue generation and control of IUU fishing. However, so far none of the objectives is achieved at the national or provincial level. The GDP share of fishing is still low. Fish of Pakistan is exported at low cost and local fishermen are protesting for their livelihood at risk and complaining about a decrease in fish stock. They are using ban practices and nets. Fishermen have even reservations about DSF policy.

There are multiple reasons for a practice policy gap in the fishing sector. Some of these are highlighted earlier. Such as lack of stakeholders involvement, absence of policy at some level like sports fishing, no proper monitoring and evaluation mechanism, conceptual lags in policies, absence of technology for fish catch monitor and lack of accountability mechanism. The fishermen communities are after their livelihood. Sustainable practices and implementation of the policy is a secondary thing for them. If in case they are interested in sustainable practice, those practices are unaffordable for them. They use a handmade net, prescribed nets are expensive for them. These practices are a hindrance to the socio-economic development of coastal communities. There is a need for a comprehensive framework at the national level under the umbrella of the Blue economy for a sustainable ocean economy in Pakistan.

6 . 2. Shipping

Pakistan has an import volume worth 5 bn USD only in Dec 2020 (PBS, 2020). Pakistan import oil, minerals, fuels, machinery, electric equipment, iron and steel. Approximately the country has a trade of over 70 billion USD. The country has three major ports and a long coastline. The country has only 10 government-owned ships and no private sector ships. However, before the nationalization of the shipping sector in 1971 Pakistan had 57 ships and 10 privately-owned companies. Despite having the potential of the shipping sector and policy to incentivize private investment in the sector, Pakistan has not born any fruit yet. The country is facing a major balance of payment issue. In 2020 Pakistan has paid 5 bn USD in terms of the freight bill. Apart from this sea-farer from Pakistan are struggling to find out a job in the industry.

Gawadar a newly built port of Pakistan is known as a game-changer for Pakistan and the region. It is located in the under the developed province of Pakistan; Baluchistan. Public or private sector investment in the shipping sector can revitalize the provincial as well as the national economy. Many indirect sectors are linked with the shipping sector such as ports development, exports of domestic goods, shipyard or shipbuilding companies and shipbreaking etc. Additionally, Pakistan can save billions in terms of sea fare and earn in terms of taxes and export duties

According to the data, the location quotient of the shipping sector is 0.1021. This means that concentration in this sector is very low and there is a huge chance of investment. The shipping policy of Pakistan has incentivized the private sector investment but the policy has not achieved its objectives. Multiple reasons are identified for the practice and policy gap in the shipping sector. These reasons are; lack of trained individuals in Mercantile Marine Department, absence of

technology like AI, IoT, big data and digitalization, low ranking in LPI index, bureaucratic hurdles, trust issues with payment and lack of capacity building.

Private sector investment is crucial for the shipping sector. The policy has given tax leverages. But the sector has failed to attract private investment. Pakistan needs to advertise its shipping policy. Most people are unaware of the incentives given by the government. Secondly, the bureaucratic hurdles and long procedure of ship registration needs improvement. Technology has an important role to play here. The introduction of digitalization and smart port can optimize the working of the sector. Pakistan needs an approach based on public-private partnership for sustainable development of the shipping sector.

6.3. Location quotient as an indicator of Institutional incapacities:

Location Quotient as stated earlier is an indicator of the sectorial concentration with regards to saturation of employment and opportunities of investment. Assuming a negative linear relationship between investment and the value of location quotient we can conclude that the lower the value of location quotient higher are the opportunities of investment as there is very little competition that exists in the industry. However, there are certain limitations to this assumption because of a certain dynamic process. Firstly many factors induce a pro-investment environment within an economy. These factors include the overall stability of the economy, the role of institutions, security concerns and returns on investment and many other factors. Moreover, it is not right to assume thoroughly based on the location quotient that the investment will be a good decision because it does not take into account the tax regime and net present value of the investment. Moreover in a macroeconomic context investment is a function of income, people will invest only if they have a sufficient income or they hope to generate a sufficient stream of income. The decision of investment is dynamic

therefore it can be stated that although it is feasible to invest in the sector however the components needed to induce the investments can be the following. These factors have been taken in context from the User component of the Elinor-Ostrom.

- Estimated return on investment
- Institutional credibility
- Incentives such as tax exemptions
- Bureaucratic efficiencies
- Resource allocation
- Macro-economic conditions
- Long term growth

As estimated by the author the location quotient for fishing and shipping are 0.0984 and 0.1021 accordingly, therefore, we can assume that it is quite feasible for an investor to invest in both these sectors because both these sectors provide a sufficient growth prospect for the investor. However, the situation on the ground is quite different. The variability arises in the contextualization of the Elinor-Ostrom dynamics. With bureaucratic hurdles and institutional incapacities, the shipping sector of Pakistan has shrunk its fleet from 51 vessels in 1974 to 11 vessels in 2020. The decline has been rapid and persistent. Institutional incapacity complemented by bureaucratic hurdles proved to be the catalyst in the process. Most of the vessels are registered in Panama because of incentives such as fewer registration fees and an efficient system. Pakistan with its more than 700 km of coastal belt has a huge growth potential however there is a huge work that needs to be done in national capacity to make these sectors more lucrative and investment-friendly.

Chapter 7:

Conclusion and recommendation

7.1. Conclusion:

Pakistan has huge potential for Blue growth in terms of long term coastal management for sustainable growth. The long coastline is spread over two provinces i.e. Sindh and Baluchistan. The blue economy of Pakistan has mass potential for shipping, fishing, tourism, ship breaking and minerals exploration. However, the inability of the provincial and federal institutions to engage local and non-local communities at a policy level has levelled the growth to a halt for more than a decade. Although fishing and shipping sectors are one of the functional sectors of the maritime economy yet both of these sectors are functioning highly under potential even when the relevant policies exist. This study has identified major themes that run as the major practice-policy gaps in the fishing and shipping sectors of Pakistan through focused group discussions, focal persons interviews and content analysis.

The management practices of fishing and shipping sectors are marred by lucrative bureaucratic corrupt practices resulting in inefficiencies, lags, social inequalities, and long term miseries for the coastal communities. With just over a little more than ten vessels the shipping sector of Pakistan faces the worst shipping crisis in history. On the other hand, the indigenous fishermen are the main victim of mismanagement of the fisheries sector. According to the socio-ecological framework of

Elinor Ostrom; natural resources can be optimally utilized by cooperation and coevolution. This framework is based on interaction among; resources such as ocean water; resource units such as fish, governance systems such as organization or government bodies and users such as individuals of coastal communities and other stakeholders. The management of resources involved all these socio-ecological systems and their cooperation.

In alignment, with the research objectives, the author has inducted thematic perspectives obtained through focused group discussions to identify practice-policy gaps in the fishing and shipping sector thereby laying a staunch influence on sustainability. As mentioned in the theoretical framework, four components are involved in marine sustainability based on the socio-ecological framework. These components or processes are; social-economic, users and ecological processes. For the sustainable and optimized utilization of these resources and their components policies and institutions are required. The gap between policy and practice is the reason for unsustainable practices in both sectors and policy failure.

The thematic analysis of the study helps the author to find out five major practices and policy gaps in both sectors and their causes. The major gaps are due to institutional and political lags, implementation issues, and ecological issues, lack of private investment and absence of capacity building. There are multiple causes of these gaps and they are majorly linked with institutional failure, bureaucratic hurdles and technological issues.

Poor implementation is the direct outcome of poor regulation in this case. The lack of the private sector in the marine economy is one of the major factors of deprivation in the region. Coordination failures resulting in a lack of cooperation with the stakeholders has caused a lack of security, lack of social rights, disruptions in social nomenclature and mobilization of socially corrupt elements in the working dynamics of the marine sector. Moreover, technological interventions are the key

to the social welfare of the indigenous people. Mass technology should be incorporated under a phase-based scheme so that massive technological interventions might not corner the indigenous community

Inclusive management Framework of Marine economy:

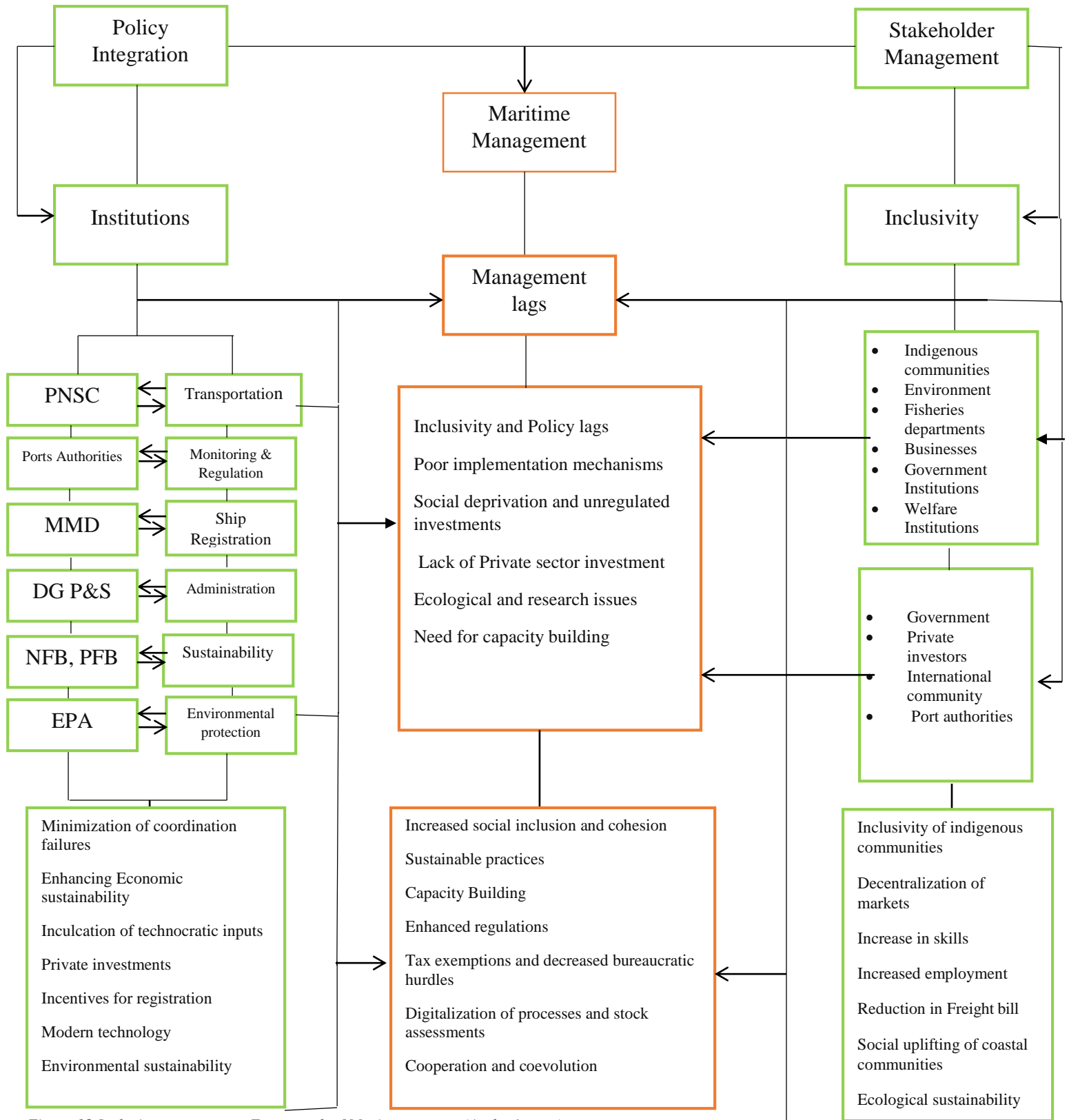


Figure 12 Inclusive management Framework of Marine economy (Author's own)

7. 2. Recommendations:

The following policy recommendations are drive from the analysis:

1. An integrated policy process must be initiated to take on board the indigenous communities of fishermen as primary stakeholders so that cohesive and long term policy solutions can be generated.
2. Coordination failures must be minimized through inter-institutions collaboration based on research, social uplifting and social inclusion of indigenous communities so that sustainable technological inputs can be used for the social uplifting of the coastal communities
3. As a measure of social uplifting, loans schemes must be introduced for the local fishermen as a means to invest in social uplifting so that exploitative private loans can be discouraged and the vicious circle of poverty can be broken.
4. Technocrats must be inculcated within the management of marine sectors to develop capacity building through training on technology and the safety of fishermen.
5. Private investment in the shipping and fishing sector must be regularized so that the indigenous people must not be marginalized.
6. Private sector investment in shipping must be encouraged through legislation and strong implementation so that the investors feel safe and long term investments can be obtained.
7. Pakistani ship owners who are registered under other countries flags must be given incentives such as tax exemptions and investment safety so that they might register under the Pakistani Flags thereby reducing the freight bill of Pakistan.

8. Modern technology is the key to resource optimization therefore the registration process must be digitalized for minimizing bureaucratic hurdles. Moreover, regular stock assessments must be conducted to keep the policy updated.
9. The ship mounted monitoring systems must be made compulsory so that the ships can be monitored in case of any violations.
10. Policy discourse must have relied on environmental sustainability and cooperation between the local communities, institutions and policymakers to ensure a national co-evolution program based on preservation of the ocean and bio-diversity.

REFERENCES:

- Alam, K. M., & Li, X., Baig, Saranjam. (2019). Impact of transport cost and travel time on trade under China-Pakistan economic corridor (CPEC). *Journal of Advanced Transportation*, 2019.
- Attorneys, P. (2021). Panama Maritime Vessel Registration - Panama Offshore Legal Services. Retrieved from https://www.panama-offshore-services.com/panama_maritime_vessel_registration/
- Balochistan fisheries ordinance, (1971).
- Bari, A. (2017). Our Oceans and the Blue Economy: Opportunities and Challenges. *Procedia Engineering*, 194, 5-11. doi:<https://doi.org/10.1016/j.proeng.2017.08.109>
- Carrington, D. (2014). Earth has lost half of its wildlife in the past 40 years, says WWF. *The Guardian*
- Carrington, D. (2018). Almost all world's oceans damaged by human impact, study finds. *Guardian*.
- Chen, J. L., Kevin X, Liu, Xiang. (2017). The development of ship registration policy in China: Response to flags of convenience. *Marine Policy*, 83, 22-28.
- Creel, L. (2003). *Ripple Effects: Population and coastal region* Washington POPULATION REFERENCE BUREAU
- DSFL Policy, (2018).
- ECORYS. (2013). *Study in support of policy measures for maritime and coastal tourism at EU level* (MARE/2012/06 -SC D1/2013/01-SI2.648530). Retrieved from Brussels <http://www.adriaticgreenet.org> ›
- EIU. (2015a). *The blue economy Growth, opportunity and a sustainable ocean economy*. Retrieved from
- EIU. (2015b). Investing in the Blue Economy—Growth and Opportunity in a Sustainable Ocean Economy. .
- Eugui, D., Onguglo, B., Razzaque, M., Fevrier, S., & Roberts, J. (2014). *The Oceans Economy: Opportunities and Challenges for Small Island Developing States*. Paper presented at the

United Nations Conference on Trade and Development (UNCTAD), Newyork and Geneva

European Union. (2020). *Blue sectors contribute to the recovery and pave way for EU Green Deal*. European Commission. Retrieved from <https://ec.europa.eu/jrc/en/news/2020-blue-economy-report-blue-sectors-contribute-recovery-and-pave-way-eu-green-deal>

FAO. (2018). *Comprehensive assessment of Pakistan's marine fisheries resources*. Retrieved from <http://www.fao.org/pakistan/news/detail-events/en/c/462720/>

Hannan, M. (2012). Constraints on mangrove forests and conservation projects in Pakistan. *16*(1), 51-62.

Hoffmann, J. (2018). *REVIEW OF MARITIME TRANSPORT 2018*. Retrieved from New York

Holt, S. J. (1969). The Food Resources of the Ocean. *Scientific American*, *221*(3), 178-197.

Humayun, A., & Zafar, N. J. P. P. T. J. o. t. I. o. P. S. (2014). Pakistan's 'Blue Economy': Potential and Prospects. *11*(1), 57-76.

India, G. o. (2016). SagarMala: Investment Projects under SagarMala Scheme | IIG.

Irving Hartoto, D., Adrianto, L., Kalikoski, D., & Yunanda, T. (2009). Building capacity for mainstreaming fisheries co-management in Indonesia.

Javaid, S. M. S. a. U. (2016). Development of Shipping Sector in Pakistan: Options and Proposed Strategy. *Journal of Political Studies*, *23*(2), 537:559.

Javed, H. (2019). Blue economy an unexplored heaven. *Daily Times*

Jennifer Franco, P. V., Timothé Feodoroff, Carsten Pedersen, Ricarda Reuter, Mads Barbesgaard. (2014). *The Global ocean Grab*. Retrieved from

<https://www.tni.org>

Khan, S. R., & Khan, S. R. (2011). Fishery degradation in Pakistan: a poverty–environment nexus? *Canadian Journal of Development Studies / Revue canadienne d'études du développement*, *32*(1), 32-47. doi:10.1080/02255189.2011.576140

Kumar, A. (2017). 4. Global Environment Facility (GEF). *International Environmental Law*, *28*, 471-477.

Leroy, A., Galletti, F., & Chaboud, C. J. M. P. (2016). The EU restrictive trade measures against IUU fishing. *64*, 82-90.

- Liu, T.-K. W., Meng-Wei Chen (2013). Influence of waste management policy on the characteristics of beach litter in Kaohsiung, Taiwan. *Marine Pollution Bulletin*, 72(1), 99-106.
- Mackenzie, B. C., Louis, Assad, L. P. d. F., Heymans, J. R., Nicholas Thomas, Julie Anderson, Clarissa, & Behrens, J. C., Mark Desai, Kruti (2019). The role of stakeholders in creating societal value from coastal and ocean observations. *Frontiers in Marine Science*, 6, 137.
- Maguire, M., & Delahunt. (2017). Doing a thematic analysis: A practical, step-by-step guide for learning and teaching scholars. . *All Ireland Journal of Higher Education*, 9.
- Malik, H. Y. (2012). Strategic Importance of Gwadar Port. *Journal of Political Studies*, 19(2).
- Mathuros, F. (2019a). Al Gore Declares "Full Blown Global Emergency" [Press release]
- Mathuros, F. (2019b). *Al Gore Declares "Full-Blown Global Emergency" for Earth's Oceans*. Paper presented at the Globalization 4.0: Shaping a Global Architecture in the Age of the Fourth Industrial Revolution, Davos-Klosters, Switzerland.
- Merchant Marine policy (2001).
- Munim, Z. H., Schramm, . (2018). The impacts of port infrastructure and logistics performance on economic growth: the mediating role of seaborne trade. *Journal of Shipping Trade*, 3(1), 1-19.
- Naghmana, H. (2014). Pakistan's 'Blue Economy': Potential and Prospects. *The Journal of the Institute of Policy Studies*, 11(1), 57-76.
- Naz, A., and Fatima Ali. (2018). Gwadar port: as an economic hub for Maritime trade in the world corridor (CPEC). . *Journal of Business and Social Review in Emerging Economies*, 4(1), 7-16.
- Nazir, K., Yongtong, M., Kalhor, M. A., Memon, K. H., & Mohsin, M. (2015). A preliminary study on fisheries economy of Pakistan: plan of actions for fisheries management in Pakistan. *Canadian Journal of Basic Applied Sciences*, 3(01), 7-17.
- Nazir, K., Yongtong, M., Kalhor, M. A., Memon, K. H., Mohsin, M., Kartika, S. J. C. J. o. B., & Sciences, A. (2015). A preliminary study on fisheries economy of Pakistan: plan of actions for fisheries management in Pakistan. 3(01), 7-17.
- New 'Blue economy policy' to help save foreign exchange, hopes PM. (2020). *Dawn*.

- NIMA. (2019). *Pakistan's seaborne trade: Estimation of freight bill 2018*. Retrieved from <https://bahria.edu.pk/nima/wp-content/uploads/2019/09/PolicyPaper005-NIMA-FreightBill2018-18Jun19-ProofRead-final-forPrintDispatch.pdf>
- OECD. (2016). Science, technology and innovation in tomorrow's ocean economy. In *The Ocean economy in 2030*
- OECD. (2020). *OECD work in support of a sustainable ocean*. Retrieved from <https://www.oecd.org/ocean/OECD-work-in-support-of-a-sustainable-ocean.pdf>
- OECD. (2021). *Policy Monitoring and Evaluation*. Retrieved from <http://www.oecd.org/gov/policy-monitoring-evaluation.htm#>
- OPSAG. (2013). *Marine Nation 2025: Marine Science to Support Australia's Blue Economy*. Retrieved from *Pakistan Economic Survey*. (2019). Pakistan GOvernment of Pakistan
- Pakistan, M. (2016). *A Handbook on Pakistan's Coastal and Marine Resources*. MFF Pakistan, *Pakistan*. Retrieved from Pakistan
- Pakistan Vision 2025*. (2018). Pakistan
- Pakistan: Shipping sector's potential. (2019). *hellenic shipping new*.
- PBS. (2019). *Economic Survey Islamabad: Government of Pakistan*
- PBS. (2020). Pakistan Total Imports [Data-Chart-Forecast]. . <https://www.ceicdata.com/en/indicator/pakistan/total-imports>
- PNSC. (2021). About Us Retrieved from <https://www.pnsc.com.pk/about-us>
- Problems in Ship breaking. (2020).
- Pülzl, H., Treib, Oliver. (2007). Implementing public policy. *125*, 89-107.
- Rittel, H., Webber, Melvin (1973). Dilemmas in a general theory of planning. *Policy sciences*, *4*(2), 155-169.
- Saigol, R. (2011). Women's Empowerment in Pakistan: A scoping study. *Aurat Publication and Information Services Foundation*.
- Saunders, J. (2020). The Role of Research and Technology in the Changing Ocean Economy: Proceedings of a Workshop—in Brief.

- SDPI. (2009). Pakistan: Country Gender Profile. Retrieved from http://www.sdpi.org/research_Programme/human_development/country_gender_profile
- SEAFARERS. (2018). Global supply and demand for seafarers. from SEAFARERS |
- Shah, S. B. H., Mu, Y., Abbas, G., Pavase, T. R., Mohsin, M., Malik, A., . . . Soomro, M. A. (2018). An economic analysis of the fisheries sector of Pakistan (1950-2017): Challenges, opportunities and development strategies. *International Journal of Fisheries Aquatic Studies*, 6(2), 515-524.
- Shahzad. (2019). Gwadar Port Growing Beyond Economic Glory. 07. doi:10.14741/ijmcr/v.7.6.20
- Shahzad, S. M. (2016). Development of Shipping Sector in Pakistan: Options and Proposed Strategy. *Journal of Political Studies*, 23(2).
- Sikor, T., He, J., & Lestrelin, G. J. W. D. (2017). Property rights regimes and natural resources: a conceptual analysis revisited. 93, 337-349.
- sindh fishing ordinance (1980).
- Sirajul, H. (2015). Public policy process in Pakistan: Key causes of public policies failures. *J Journal of Economic Social thought*, 2(2), 127-131.
- Smith-Godfrey, S. (2016). Defining the Blue Economy. *Maritime Affairs: Journal of the National Maritime Foundation of India*, 12(1), 58-64. doi:10.1080/09733159.2016.1175131
- UNDESA. (2017). The potential of the blue economy: Increasing long-term benefits of the sustainable use of marine resources for small island developing states and coastal least developed countries. In: World Bank.
- UNESCAP. (2019). *Digitalization and Port Productivity*. Retrieved from <https://www.unescap.org/sites/default/files/2.5>
- UNIDO. (2020). *United Nations Industrial Development Organization MVA Database*. Retrieved from: <https://www.unido.org/>
- UNWTO. (2017). *UNWTO Tourism Highlights*: UN.
- USAID. (2018). *Food Assistance fact sheet of Pakistan*. Retrieved from Retrieved from <https://reliefweb.int/sites/reliefweb.int/files/resources/8.11.17%20Pakistan%20Fact%20Sheet%20Final.pdf>

WorldBank. (2013). *FISH TO 2030 Prospects for Fisheries and Aquaculture*. Retrieved from Washington DC

WorldBank. (2017a). *Revitalizing Pakistan's Fisheries*. Retrieved from <http://documents1.worldbank.org/curated/en/122481529566117025/pdf/Revitalizing-Pakistan-s-Fisheries-Options-for-Sustainable-Development.pdf>

WorldBank. (2019a). *Competitiveness of South Asia's container ports*. Retrieved from <https://www.worldbank.org/en/region/sar/publication/south-asia-ports-competitiveness>

WorldBank. (2019b). *Improving Pakistan's public and private investment*. Retrieved from <https://blogs.worldbank.org/endpovertyinsouthasia/improving-pakistan-s-public-and-private-investment>

WorldBank. (2017b). *The Potential of the Blue Economy: Increasing Long-term Benefits of the Sustainable Use of Marine Resources for Small Island Developing States and Coastal Least Developed Countries*. Retrieved from World Bank, Washington DC.:

WorldFish. (2018). *Transforming food systems through fish*. Retrieved from Penang, Malaysi:

Zafar, S. A. (2021). *Pakistan game fishing*. Retrieved from <http://www.pgfa.org/submit-a-fishing-report/>