
# AN ANALYSIS OF THE SOCIO-ECONOMIC IMPACT OF ILLEGAL, UNREPORTED, AND UNREGULATED FISHING ON SOMALIA'S COASTAL COMMUNITIES.

**BY**

LUQMAN ABDUKADIR JAMA

JMXLUQ001

MASTER'S DISSERTATION
SCHOOL OF ECONOMICS, FACULTY OF COMMERCE

FEBRUARY 2024

SUPERVISOR: EMERITUS PROFESSOR ANTHONY BLACK

# Abstract

Illegal, unreported, and unregulated (IUU) fishing poses a significant threat to the socioeconomic fabric of Somalia's coastal communities. This study employs qualitative research methods, including interviews and field observations in the districts of Eyl and Garad, to comprehensively analyze the impact of IUU fishing. Despite abundant fish stocks in Somalia's territorial waters, the fishing sector remains underdeveloped due to numerous challenges, relegating local fishermen to the margins of society.

Surveys conducted on Somalia's territorial waters reveal the presence of lucrative fish stocks along its extensive coastline, making it one of the richest fishing regions in Africa. However, the IUU fishing phenomenon, with an estimated 700 international vessels operating illegally in Somali waters annually, significantly hampers the potential benefits of the fishing industry. The economic losses attributed to IUU fishing, totaling around US$300–400 million per year (AfDB, 2017), exacerbate the already underdeveloped state of the fishing sector.
This research addresses the socio-economic impact of IUU fishing on two fronts: the examination of its effects on food security in the north-central coast of Somalia and the assessment of its impact on local economies and livelihoods. Interviews and field observations conducted in Eyl and Garad districts illuminate the hardships faced by local fishing communities. Participants shared distressing encounters with foreign vessels engaged in IUU fishing, emphasizing the urgent need for interventions to protect the livelihoods and well-being of those dependent on maritime resources. The study underscores the complex interplay between economic challenges, food security, and the consequences of illegal fishing practices, calling for concerted efforts to mitigate the detrimental effects on Somalia's coastal communities.

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|---|---|
| Student number | JMXLUQ001 |
| Student name | Luqman Abdukadir Jama |
| Signature of Student | Signed by candidate |
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# ACKNOWLEDGEMENT

All praise and thanks are due to ALLAH the almighty, who gave me the strength to write and complete this work. Isaac Newton said, “If I have seen further than others, it is because I have stood on the shoulders of giants,” so I would like to thank my beloved mother and father who give me the greatest love, mercy, support, encouragement, nourishment, happiness, protection from harmful things, teaching, and all great appreciation to me.

Second, I extend my sincere gratitude to my supervisor, Emeritus Professor Anthony Black, for his invaluable guidance and support throughout the course of this research. His wealth of experience and dedication have been instrumental in shaping the outcome of this thesis Finally, I would also like to grant my deep sense of gratitude to everyone who contributed to my thesis project development process through encouragement, technical support and much more cooperation, and for helping finish this project.

## DEDICATION

This thesis is dedicated to the resilient Somali fishermen who confront significant socio-economic challenges due to the pervasive issue of illegal fishing. Their unwavering fortitude in the face of adversity serves as an inspiration. Through their struggles, this dedication aims to bring to the fore the pressing need to address the multifaceted ramifications of illegal fishing within the Somali context. It is my sincere hope that this thesis will make a meaningful contribution to the discourse on sustainable solutions, ensuring the longevity and prosperity of Somalia's vital marine ecosystems and the communities that depend on them.

## LIST OF ABBREVIATIONS

| | |
|---|---|
| APA | American Psychological Association |
| EEZ | Exclusive Economic Zone |
| EU | European Union |
| EUCAP | European Union Capacity Building Mission in Somalia |
| FAO | The Food and Agriculture Organization |
| IUU | illegal, unreported, and unregulated |
| MCS | Monitoring, Control, and Surveillance |
| MT | metric tons |
| PSMA | Agreement on Port State Measures |
| RFMOs | regional fisheries management organizations |
| SAR | Synthetic Aperture Radar |
| UNDP | United Nations Development Program |
| VMS | Vessel Monitoring Systems |
| WB | World Bank |

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# CHAPTER ONE

# INTRODUCTION

## 1.0 Background

Globally, illegal, unreported, and unregulated (IUU) fishing threatens the sustainability of fisheries and marine ecosystems. It entails fishing operations that run counter to local, state, federal, and international laws and rules, or to conservation and management measures. It can take many different forms, such as fishing without a license, with outlawed gear, underreporting catch, and fishing in restricted regions. The problem of IUU fishing is complicated and transnational; it impacts not only the nations where it occurs but also those that consume or sell IUU catches. Up to 26 million metric tons of fish, valued at up to $23 billion, are thought to be caught each year through IUU fishing (Schmidt, 2018).

One of the nations most impacted by IUU is Somalia. It has had catastrophic effects on the nation's fisheries resources, marine ecosystems, and coastal residents. Foreign fishing fleets, particularly those from Asian nations such as China, Korea, and Taiwan, have targeted the country because of its extensive coastline, strategic location, and abundant fishing grounds (Omar, Mohamed, & Bambale, 2019). These fleets, which frequently fly flags of convenience and engage in unlawful fishing practices, have been damaging Somalia's fisheries, destroying marine habitats and endangering the livelihoods of coastal residents.

Somalia's fisheries governance and management system has been undermined by years of civil conflict, political instability, and poor governance. As a result, IUU fishing has flourished because the nation lacks the institutional frameworks, capacity, and resources to properly monitor, control, and enforce its fisheries rules and regulations (Sok, 2022). Additionally, piracy, human trafficking,

and gun smuggling are just a few of the other criminal activities that are frequently connected to IUU fishing in Somalia and present additional security and governance issues.

Several constraints have made it difficult for Somalia to combat IUU fishing. These include the absence of suitable surveillance and enforcement systems, ineffective legislative and regulatory frameworks, and the limited level of international support and cooperation (Petrossian, Marteache, & Viollaz, 2015). However, there have been some encouraging developments in recent years, such as the creation of a new federal government, the approval of a new constitution, and the negotiation of agreements and conventions with other countries concerning the governance and management of fisheries. Due to these developments, Somalia now has the chance to enhance its fisheries governance and management, combat IUU fishing, and encourage the sustainable use of its fisheries resources.

This study aims to provide a comprehensive analysis of foreign IUU fishing in Somalia, with a particular focus on its economic, environmental, and social impacts on coastal communities. Additionally, it seeks to assess the existing legal and regulatory frameworks in place to address this issue.

## 1.2 Problem statement

The fishing industry in Somalia, renowned for its wealth of fisheries resources, faces formidable challenges, primarily stemming from IUU fishing by foreign-owned commercial vessels. Operating within Somalia's territorial waters since the breakdown of its central government in the 1990s, these activities, estimated to be worth up to $400 million annually, pose a significant threat to the sustainable development of the industry. The impact of IUU fishing is profound, adversely affecting coastal communities that heavily rely on fish as a primary source of protein and nutrition. A critical starting point in understanding this issue is the inherent ineffectiveness of Somalia's governance structure, which has struggled to address and regulate fishing activities within its Exclusive Economic Zone (EEZ). The vastness and productivity of Somalia's EEZ, particularly its valuable fish resources like tuna, contribute substantially to the nation's economic potential. However, due to the absence of adequate monitoring and enforcement capacity within Somali waters, the exact extent of illegal fishing remains unclear.

This research aims to delve into the socio-economic impact of IUU fishing in Somalia's coastal communities, emphasizing the need for comprehensive analysis and intervention. The excessive utilization of marine resources due to IUU activities has led to the marginalization of local fishermen, contributing to piracy incidents as an alternative livelihood. While existing studies provide a broad overview of the economic consequences of IUU fishing and maritime piracy in Somalia, there is a distinct lack of detailed examination concerning the specific effects on local economies, livelihoods, and food security for Somali fishing communities.

This study will shed light on the engagement (or lack thereof) of Somali authorities in addressing the issue of foreign IUU fishing. It will explore the intricate web of stakeholders benefiting from Somalia's fisheries resources and the challenges faced by local communities. By offering a comprehensive view, this research endeavors to not only highlight the existing problems but also

propose effective and targeted interventions, ensuring the sustainable development of Somalia's fishing industry and the well-being of its coastal communities.

### 1.3 Theoretical Framework

This study draws on findings from Cashion et al. (2018), who examined fishing in Somali waters over many years and found that foreign fleets, often fishing without restrictions, have damaged local fish stocks. These fleets have reduced fish availability for Somali communities that depend heavily on fishing for both food and income. Local fishers face increasing competition from foreign vessels, which has put pressure on their livelihoods.

The study also uses common pool resource theory (Ostrom, 1990) to explore these challenges. This theory explains that when resources, like fisheries, aren't managed with clear rules, they tend to be overused. With weak enforcement in Somalia's waters, foreign vessels fish freely, leaving local communities with less. By looking at the impact of these practices, this study shows how important it is for Somalia to establish more robust management of its waters.

Using this framework, the study explores the effects of unregulated fishing on Somali coastal communities' food security and economy. It also highlights the potential benefits of local management practices to help protect these resources in the long term.

### 1.4 Objective of the study

The study's main objective is to analyse the socio-economic impact of illegal, unreported, and unregulated fishing in Somalia's coastal communities.

To achieve this objective, there are two sub-objectives in the study

- Examine the impact of foreign illegal, unreported, and unregulated (IUU) fishing on food security in the north-central coast of Somalia.
- Assess the effects of IUU fishing on local economies and livelihoods.

The research questions will be:

1. How does IUU fishing affect food security in the north-central coast of Somalia? ·
2. What are the impacts of IUU fishing on local economies and livelihoods in the north-central coast of Somalia?

### 1.4 Methodology

This study investigates the social and economic impacts of IUU in Somalia's northern coastal communities, which are known for illegal fishing and piracy. It uses interviews, secondary data analysis, and field observations to consider the region's political, social, and economic context.

# CHAPTER TWO

## 2.0 Types and Definitions of IUU Fishing

Fishing that is unreported, unregulated, or both poses a significant problem for marine conservation and sustainable fisheries management. IUU fishing includes a variety of illicit and unsustainable fishing methods and is a complex problem. It is commonly acknowledged that the issue of IUU fishing poses a danger to the marine environment, ethical fishing, and the financial security of millions of individuals worldwide. As per the Food and Agriculture Organization of the United Nations (FAO), IUU fishing results in the annual taking of up to 26 million tons of fish with a market value of up to $23 billion. (Li & Amer, 2015). It accounts for around 20% of the global catchand significantly contributes to overfishing and the associated decline of fish populations. IUU fishing can take three different forms as set out in the following sections.

### 2.1 **Illegal Fishing**

Illegal fishing is a significant issue that threatens the long-term viability of global fisheries. It is defined as fishing practices that are carried out in contravention of laws, rules, or management and conservation measures that are either national or international. Illegal fishing is a problem that is universally acknowledged as being a serious danger to the marine environment, ethical fishing, and the financial security of millions of individuals worldwide. Illegal fishing methods include catching endangered or protected species, using prohibited fishing gear, fishing in protected regions, and going beyond the limits of catch or size restrictions. (Petrossian, Marteache, & Viollaz, 2015). Economic incentives are frequently at play since illegal fishermen can sell their harvest for less money than licensed fishermen, undercutting them and fostering unfair competition. As a result, illicit fishing may result in overfishing, fish population decline, and biodiversity loss.

Illegal fishing has a significant negative effect on fisheries throughout the world. Around 20% of the global catch is made up of this, which significantly contributes to overfishing and the decline of fish populations.

For many years, there have been efforts to stop illegal fishing, and numerous national, regional, and global initiatives have been put in place (Stacy et al., 2021). In addition to creating regional fisheries management organizations (RFMOs), implementing traceability and certification programs and adopting international agreements like the United Nations Fish Stocks Agreement and the International Code of Conduct for Responsible Fisheries are some of the measures that have been taken.

However, despite these efforts, the issue of illegal fishing persists. Illegal fishing is difficult to detect and prevent, as fishers may operate covertly and use sophisticated techniques to evade detection. Furthermore, many countries legal frameworks and enforcement mechanisms are weak, making it difficult to prosecute those who engage in illegal fishing practices.

It is essential to strengthen fisheries management and conservation measures, enhance monitoring and surveillance, and improve law enforcement to combat illegal fishing. This requires a comprehensive and collaborative approach that involves the cooperation of governments, industry, and civil society (Petrossian, Marteache, & Viollaz, 2015). For example, the use of satellite technology and electronic monitoring can help to increase transparency and detect illegal fishing activities. At the same time, the development of certification schemes and eco-labeling can help to promote sustainable fishing practices and create economic incentives for legal fishers.

### 2.3 Unreported Fishing

Unreported fishing occurs when fishing activities are not reported or documented and, therefore, not accounted for in official catch statistics or management measures. This type of IUU fishing is a significant challenge for sustainable fisheries management and marine conservation. Unreported fishing can lead to overfishing, depletion of fish populations, and loss of biodiversity, and it is often driven by economic incentives (Chuaysi & Kiattisin, 2020). Unreported fishing can take many forms, including fishing in areas where fishing is banned or restricted, fishing with prohibited gear or methods, catching protected or endangered species, and exceeding fishing quotas or size limits. These activities are often conducted covertly, making them difficult to detect and prevent.

One of the main challenges associated with unreported fishing is the absence of information on the extent and nature of the problem. Because unreported fishing activities are not recorded or documented, it is hard to accurately estimate the amount of fish caught through this type of IUU fishing. In some cases, fishers may intentionally conceal their catch to avoid paying taxes, fees, or penalties. In other cases, fishers may be operating in areas where monitoring and enforcement are weak or non-existent (Li & Amer, 2015). Unreported fishing occasionally has linkages to other criminal activity, such as the trafficking of drugs or people.

Numerous actions have been taken at all levels, including the international level, to address the issue of unreported fishing. The advancement of monitoring and surveillance has also been a priority in the fight against unreported fishing. This involves using satellite navigation and electronic surveillance. Additionally, the creation of eco-labeling and certification programs can serve to encourage sustainable fishing methods and offer financial incentives to licensed fishermen.

Unreported fishing is a significant challenge for the sustainable management of fisheries and marine conservation. It undermines the effectiveness of fisheries management and conservation measures, leading to overfishing, depletion of fish populations, and loss of biodiversity. Addressing this issue requires a comprehensive and collaborative approach that involves strengthening fisheries management and conservation measures, enhancing monitoring and surveillance, and improving law enforcement (Liddick, 2014). We can only maintain the long-term health of our marine environments and the means of subsistence for fishing communities by adopting steps to counteract illegal fishing.

### 2.4 **Unregulated Fishing**

Unregulated fishing is a type of IUU fishing that refers to fishing activities that are not subject to appropriate management measures or regulatory frameworks. This type of IUU fishing poses a significant challenge to sustainable fisheries management and marine conservation, as it can lead to overfishing, depletion of fish populations, and loss of biodiversity (Chuaysi & Kiattisin, 2020). Unregulated fishing can take many forms, including fishing in areas that are not subject to any management measures, fishing without permits or licenses, and using gear or methods that are not regulated or prohibited.

These activities can occur in both national and international waters, and they are often driven by economic incentives, as unregulated fishing can be more profitable than legal fishing.

The lack of appropriate management measures and regulatory frameworks is a main contributing factor to the problem of unregulated fishing. In some cases, fishers may operate in areas where there is no effective management or regulation, either because the area is not under the jurisdiction of any government or because the government lacks the capacity or political will to enforce regulations. In other cases, the regulatory framework may be weak or ineffective, allowing illegal

fishing activities to continue without consequence (Petrossian, Marteache, & Viollaz, 2015). Uncontrolled fishing can have a substantial effect on the marine environmentitiont and the fishing industry. Uncontrolled fishing can result in overfishing and fish population decline, which can have a domino effect on marine ecosystems and food webs. Additionally, if fish populations drop, fishermen may experience reduced income or even lose their livelihoods.

Unregulated fishing is a significant challenge for sustainable fisheries supervision and marine conservation. It undermines the effectiveness of fisheries management and conservation measures, leading to overfishing, depletion of fish populations, and loss of biodiversity. Addressing this issue requires a comprehensive and collaborative approach that involves strengthening fisheries management and conservation measures, enhancing monitoring and surveillance, and improving law enforcement (Petrossian, Marteache, & Viollaz, 2015). Only by taking action to combat unregulated fishing can we protect the long-term sustainability of our marine environment and the livelihoods of fishing societies.

## 2.5 Global Context of IUU Fishing

### 2.5.1 IUU Fishing as a Global Issue

Marine ecosystems, fish populations, and the economic well-being of millions of individuals who depend on fisheries for their food security and livelihood are all threatened by IUU) fishing, which is a global issue. The global backdrop of IUU fishing will be outlined in this section, along with its effects on the economy, the environment, and society and the measures taken to address them (Garcia, Barclay, & Nicholls, 2021). This section discusses the scale and scope of IUU fishing on a global level, providing an overview of IUU fishing activities in different regions of the world, including major hotspots, species targeted, and the economic value of IUU catch. It also highlights

the transboundary nature of IUU fishing and how it impacts not only the countries where IUU fishing occurs but also those that consume or trade IUU catches.

The exact magnitude of IUU fishing is challenging to determine due to its illegal and unreported nature, but various studies and reports provide insights into the extent of the problem. IUU fishing occurs in various regions of the world, including both developed and developing countries, and it affects both coastal and high-seas areas. Major IUU fishing hotspots include regions such as the Western Pacific, Eastern Pacific, Indian Ocean, and Western Africa. These regions are known for their rich marine resources, and IUU fishing activities are rampant due to weak governance, lack of effective enforcement mechanisms, and high demand for fish in global markets (Garcia, Barclay, & Nicholls, 2021). Various fish species are targeted by IUU fishing, including high-value species such as tuna, toothfish, and shrimp, as well as other commercially important species (Petrossian, Lettieri, & Clarke, 2022). IUU fishing also targets vulnerable and endangered species, such as sharks, turtles, and marine mammals, which further exacerbates the problem of overfishing and threatens marine biodiversity (Kadfak & Linke, 2021). The economic impact of IUU fishing is substantial, leading to global economic losses estimated between USD 26 billion and USD 50 billion annually, underscoring the significant financial toll on economies worldwide due to these illegal activities (Orlowski, 2020).

IUU catches are often sold in global markets through complex networks of illegal, unreported, and unregulated supply chains, which makes it difficult to trace and prosecute IUU fishing activities. IUU fishing undermines the sustainability of legal fishing operations, distorts markets, and contributes to unfair competition, leading to economic losses for legal fishers and coastal communities (Petrossian, Lettieri, & Clarke, 2022). An important component of the issue is that IUU fishing occurs across international borders. The exclusive economic zones (EEZs) of coastal nations, which are regions that extend 200 nautical miles from their coastlines or high seas areas

outside the national jurisdiction, are frequent locations for IUU fishing. IUU fishing activities in one country's waters can have spill-over effects on neighbouring countries, as IUU fishers often operate across borders and exploit shared fish stocks. IUU catches are also traded globally, and IUU fish products can end up in the markets of countries that have no IUU fishing activities but are importers or consumers of IUU catches (Yuliantiningsih, Suherman, & Latifah, 2022). This makes IUU fishing a complex and interconnected problem that requires coordinated efforts at regional and global levels to combat effectively.

### 2.6 **Drivers of IUU fishing**

IUU fishing, or illegal, unreported, and unregulated fishing, is a global issue that poses significant threats to marine ecosystems, fish stocks, and coastal communities. This section will explore the IUU fishing drivers, which are the underlying factors that contribute to the occurrence of IUU fishing activities worldwide. One major IUU fishing driver is overcapacity in the fishing industry. Overcapacity refers to the situation where there are too many fishing vessels or too much fishing effort relative to the available fish stocks. This can result in a race to fish, where fishing vessels compete to catch as much as possible in a short amount of time, often disregarding fishing regulations and sustainability measures (Widjaja, Long, & Wirajuda, 2020). Overcapacity is often fueled by subsidies provided by governments to the fishing industry, which can lead to increased fishing capacity and pressure on fish stocks beyond sustainable levels.

Lack of effective governance and regulation is another driver of IUU fishing. In many regions, weak or inadequate fisheries supervision systems, including control, monitoring, and surveillance measures, create loopholes that are exploited by IUU fishing operators. This can include inadequate registration and licensing of fishing vessels, lack of proper documentation and traceability of fish catches, and loopholes in fishing regulations that allow for illegal or unreported

fishing activities to occur undetected. Corruption and lack of political will to enforce regulations and punish IUU fishing operators further exacerbate the problem. Poverty and the absence of alternative livelihood alternatives are also IUU fishing drivers (Widjaja, Long, & Wirajuda, 2020). In many coastal communities around the world, fishing is often the main livelihood and income source for local populations. However, poverty and lack of access to optional livelihoods can push vulnerable communities to engage in IUU fishing as a means of survival (Wilcox et al., 2021). This involves participation in unauthorized fishing activities, such as utilizing forbidden fishing methods or equipment within off-limits areas, aiming to increase the catch and resulting income.

Market demand for IUU catches is another driver of IUU fishing. IUU catches are often sold in black markets or laundered into legal supply chains to meet the demand for cheap seafood in global markets. IUU fishing may result in higher prices for the catches due to their rarity and lack of regulation. This creates an incentive for IUU fishing operators to continue their activities, despite the risks of detection and penalties. The limited supply and demand dynamics of IUU catches, along with access to niche markets that prioritize unique or "black market" products, can drive up prices. IUU operators can offer their catches at lower prices compared to legal operations since they avoid regulations, licensing fees, and other costs. Additionally, the lack of transparency and traceability associated with IUU fishing allows these catches to be sold as legal, further contributing to the higher prices they can command. The complexity of global seafood supply chains and lack of transparency can make it difficult to trace the origin and legality of fish products, enabling IUU catches to enter the market undetected. Weak law enforcement and enforcement gaps also contribute to IUU fishing. IUU fishing operators often take advantage of gaps in enforcement, such as a lack of patrol vessels, limited resources for surveillance, and corruption in law enforcement agencies, to carry out their activities with impunity. It is worth noting that the drivers of IUU fishing are interconnected and often reinforce each other (Lee & Viswanathan,

2020). For example, overcapacity in the fishing industry can exacerbate weak governance and regulation as more fishing vessels compete for limited fish stocks, making it difficult for fisheries management systems to effectively monitor and control fishing activities. Similarly, to how poverty and the absence of alternative sources of income can encourage vulnerable groups to take part in IUU fishing, enforcement gaps and lax law enforcement can allow IUU fishing operatives to carry out their operations unchecked.

### 2.7 **Economic Impacts**

IUU fishing has significant economic impacts on a global scale. Millions of individuals who depend on fish as their primary source of nourishment and money are at risk of having their livelihoods and food security threatened by this type of fishing, which undercuts attempts to maintain sustainable fishing techniques. IUU fishing also creates unfair competition for legitimate fishers, who must operate within the constraints of regulations and face higher costs associated with responsible fishing practices, such as monitoring and reporting requirements (Temple et al., 2022). Fish supplies being depleted is one of IUU fishing's most severe economic effects. IUU fishing is often associated with overfishing, which can lead to the collapse of fish populations and damage to marine ecosystems. This, in turn, can have significant economic impacts on the fishing industry and related sectors. For example, the decline of fish stocks can lead to lower catches, which can lead to reduced income for fishers and the processing and retail sectors (Zwoelfer, 2020). Additionally, as fish stocks decline, the cost of fishing can increase as fishers must travel further and use more expensive gear to catch the same amount of fish. This can lead to higher costs for fish processors and retailers, who must pay more for raw materials.

The loss of employment and income for genuine fishermen and fishing communities is another major financial consequence of IUU fishing. In many developing countries, the fishing sector is a

significant source of employment and income, and IUU fishing can undermine the sustainability of this sector (Jesperson & Henriksen, 2022). This, in turn, can lead to social and economic dislocation in fishing communities and contribute to poverty and inequality.

Furthermore, IUU fishing can also have significant economic impacts on related industries and suppliers, such as those involved in transport, packaging, and marketing (Jesperson & Henriksen, 2022). For example, the decline of fish stocks can lead to lower quality and safety standards for fish products, which can erode consumer confidence and lead to reduced demand for fish products. This, in turn, can have a cascading effect on related industries and suppliers, such as those involved in transport, packaging, and marketing.

Finally, IUU fishing can also have significant economic impacts on governments, which bear the costs associated with enforcing fishing regulations and combating illegal fishing activities. These costs can include investments in monitoring and surveillance technology, training and capacity-building programs for fishery management officials, and legal and judicial procedures for prosecuting and penalizing illegal fishers (Temple et al., 2022). IUU fishing has significant economic impacts on a global scale, affecting legitimate fishers, fishing communities, related industries, and governments. These impacts can lead to the depletion of fish stocks, loss of jobs and income, undermine the sustainability of the fishing sector, and contribute to poverty and inequality.

### 2.8 **Environmental Impact**

Globally, IIUU fishing has a considerable negative environmental impact. Fish populations may decline, and marine ecosystems may be harmed as a consequence of IUU fishing practices, which frequently use damaging fishing gear and methods. The decline of biodiversity as well as the collapse of food webs, can also be brought about by overfishing and irresponsible fishing methods.

Fish population decline is one of IUU fishing's most important environmental effects. Certain species' population collapses brought on by overfishing can have profound ecological effects on marine environments (Jesperson & Henriksen, 2022). Reducing a species' ability to reproduce and preventing population replenishment are two effects of removing juvenile and small fish from the population. This may have a number of negative ecological effects, such as the extinction of species, collapse of food chains, and changes to nutrient cycles.

The harm that IUU fishing causes to marine ecosystems is another problem. The natural equilibrium of marine ecosystems can be upset by destructive fishing methods like bottom trawling and the use of cyanide and dynamite. For instance, bottom trawling can destroy seafloor features like seagrass beds and coral reefs. These ecosystems may lead to a decrease in biodiversity and a disturbance of the food chain. (Temple et al., 2022). In addition to killing non-target species like coral and reef fish, the application of dynamite and cyanide can harm the habitats of the seafloor. In marine environments, these effects may have long-term ecological effects. Beyond the maritime environment, IUU fishing has negative effects on the environment.

IUU fishing practices have the potential to result in the unintentional capture of protected and endangered species like sharks, sea turtles and marine mammals. Bycatch is the term for the unintentional capture of these animals, which can have substantial ecological effects on both the individual species and the larger marine ecosystem. When large predatory species like sharks are eliminated, their prey populations may increase, which may have cascading ecological effects on the entire food chain. The unintentional capture of marine mammals and sea turtles can also directly affect these types of animals, which are frequently already under a lot of conservation pressure.

Besides these negative effects on the environment, IUU fishing may also have negative social and economic effects. Millions of people relying on fishing for their livelihood and food security may

be negatively impacted by the decrease in fish supplies (Wilcox et al., 2021). IUU fishing activities can cause the displacement of small-scale fishers and the undermining of their efforts to promote sustainable fishing practices. These social and economic impacts can have significant consequences for coastal communities and the broader economy. IUU fishing has significant environmental impacts on the globe that extend beyond the marine environment (Temple et al., 2022). IUU fishing has a number of negative effects, including the dwindling of fish populations, harm to marine ecosystems, and unintentional capture of non-target species. The long-term viability of the fishery and marine ecosystems, the promotion of the livelihoods and nutritional well-being of millions of people who rely on fishing for a living, and the support of the fishing industry all depend on addressing the issue of IUU fishing.

### 2.9 **Social Impact**

IUU fishing has far-reaching social repercussions in addition to having a considerable negative environmental impact. These effects, which have an impact on coastal populations, small-scale fishermen, and even consumers who rely on fish as a supply of protein and nutrition, can be experienced both locally and globally. The impact that IUU fishing has on small-scale fishermen and their means of subsistence are one of the most important societal effects. Small-scale fishers, who constitute a sizable fraction of the global fishing workforce, frequently lack the funding and technology to keep up with larger, industrial fishing vessels. By hindering efforts to encourage sustainable fishing methods and fair competitiveness in the fishing industry, IUU fishing activities have the potential to make this inequity even worse. (Temple et al., 2022). Fish stocks may be depleted, and small-scale fishers, dependent on fishing for their livelihood and food security, may be displaced as a result of IUU fishing practices like the application of harmful fishing gear as well as the targeting of economically valuable species.

For some communities, this may lead to financial hardship and social upheaval, which may have long-term effects on their health and well-being.

The global commerce in seafood and fish products can be adversely impacted by IUU fishing, which can also have considerable effects on the wider economy. This can result in economic losses for legal fishing operations, which can have ripple effects throughout the supply chain, including for processors, retailers, and consumers. IUU fishing can also result in the loss of revenue for governments that rely on fishing as a source of income through taxes and licensing fees. Consumers who depend on seafood and fish products for their nourishment and health are also affected by the societal effects of IUU fishing, which extend beyond the fishing sector. (Sok, 2022). The sale and consumption of IUU-caught fish and seafood products can have health and safety implications, as these products may not be subject to the same quality control and safety regulations as legally caught and processed products. This can result in the consumption of contaminated or unsafe products, with significant health implications for consumers.

IUU fishing extends beyond environmental damage, significantly impacting global food security and the stability of marine populations. This jeopardizes the dietary needs of millions reliant on fish for essential protein and nutrients, as dwindling fish stocks and disrupted marine habitats limit the availability of fish and seafood products. (Lestari, Putra, & Larasuci, 2020). IUU fishing activities can also undermine efforts to promote sustainable fishing practices, which are necessary to ensure the long-term viability of global fisheries and the livelihoods of the millions of people who depend on fishing for their income and food security. In addition to these social impacts, IUU fishing can also have significant cultural and ethical implications. Many coastal communities and indigenous peoples have cultural and spiritual connections to the sea and rely on fishing for their cultural identity and well-being. The depletion of fish populations and the displacement of small-scale fishers can have significant impacts on these communities, affecting their cultural heritage

and way of life. IUU fishing activities can also have ethical implications, as they often involve the exploitation of vulnerable and marginalized communities, who are often subject to human rights abuses and forced labour. IUU fishing has significant social impacts on the globe that extend far beyond the fishing industry. The impact on small-scale fishers, the broader economy, consumers, food security, and cultural and ethical implications are just some of the consequences of IUU fishing (Lestari, Putra, & Larasuci, 2020). To encourage sustainable fishing methods, guarantee the long-term survival of the world's fisheries, and maintain the lives and nutritional well-being of millions of individuals who are dependent on fishing for a living, the issue of IUU fishing must be addressed.

## 2.10 Effect of Foreign IUU Fishing in Somalia

### 2.10.1 The extent of IUU Fishing in Somalia

Somalia's coastline is one of the longest in Africa, and its waters are rich in fish and other marine resources. However, the country has been struggling with a range of issues that have made it difficult to effectively manage and regulate its fisheries sector. These issues include political instability, weak governance structures, and a lack of resources and capacity. The prevalence of IUU fishing by other nations is one of the biggest problems facing Somalia's fisheries sector. For many years, foreign fishing boats, primarily from Asia, Europe, and the Middle East, have operated illegitimately in Somali waters, taking advantage of the nation's abundant fish reserves without authorization or regulation. (Jama, Ariffin, & Yusof, 2022). IUU fishing takes various forms, including unlicensed fishing, unregulated fishing and unreported fishing. According to a report by the Secure Fisheries program at the One Earth Future Foundation, foreign IUU fishing accounts for up to 40% of the total fish catch in Somali waters, resulting in significant economic losses for the country. The report estimates that Somalia loses up to $300 million annually in revenue due to foreign IUU fishing (Glaser, Roberts, & Hurlburt, 2019).

The high levels of foreign IUU fishing in Somali waters are partly due to the lack of effective governance and enforcement of fishing regulations. Somalia has been in a state of conflict and political instability for many years, which has resulted in weak governance structures and institutions. The country has not been able to effectively regulate and manage its fisheries sector, making it easier for foreign fishing fleets to operate illegally without fear of punishment. Another factor contributing to foreign IUU fishing in Somali waters is the demand for fish in international markets (Omar, Mohamed, & Bambale, 2019). Many countries, particularly in Asia, have a high demand for fish products, and as a result, fishing companies are willing to take the risk of operating illegally in Somali waters to meet this demand. The lack of regulation and enforcement of fishing laws in Somalia has made it a prime location for IUU fishing, which is now a lucrative and profitable industry for foreign fishing fleets.

The impact of foreign IUU fishing in Somali waters is devastating, not only for the country's economy but also for its environment and people.

The impact of foreign IUU fishing on local fishing communities in Somalia is particularly severe. Many people living in coastal communities depend on fishing for their livelihoods, and IUU fishing can threaten their economic well-being and food security (Okafor-Yarwood, Kadagi, Belhabib, & Allison, 2022). The amount of fish accessible to local fishermen may decrease as a result of overfishing by foreign fishing fleets in Somalian waters, making it more challenging for them to make a living. Foreign fishing boats have also been reported to engage in damaging and illegal fishing methods, like utilizing forbidden equipment or fishing in restricted regions, which can further impact the ecology and way of life of nearby residents.

In response to the problem of foreign IUU fishing in Somalia's waters, the country has taken various steps to try to combat the issue. These steps include the establishment of a coast guard to monitor and enforce fishing regulations, the development of national fisheries management plans,

and the signing of agreements with other countries to combat IUU fishing (Jama, Ariffin, & Yusof, 2022). However, these efforts have been limited by a lack of resources, capacity, and political will. Somalia's fisheries sector continues to face significant challenges, including weak governance structures, insecurity, and a lack of investment in the sector. Without effective regulation and management of its fisheries sector, Somalia will continue to struggle with foreign IUU fishing and the devastating impacts it has on the country's economy, environment, and people. Foreign IUU fishing is a significant problem in Somalia's waters, with foreign fishing fleets exploiting the country's rich fish stocks without permission or regulation. The problem is exacerbated by weak governance structures, political instability, and the high demand for fish products in international markets (Jama, Ariffin & Yusof, 2022). Foreign IUU fishing has a negative influence on the economy, environment, and people of the nation and jeopardizes the way of life for local communities that depend on the ocean for sustenance. Although initiatives have been taken to address the problem, more must be done to improve the governance and management of Somalia's fisheries sector and handle the underlying causes of IUU fishing.

### 2.11 Legal and Regulatory Frameworks to Address Foreign IUU Fishing

Somalia has taken various steps to combat foreign IUU fishing in its waters, including the establishment of a legal and regulatory framework to manage its fisheries sector (Lindley & Techera, 2019). One of the main challenges in addressing foreign IUU fishing in Somalia is the lack of reliable data on the scale and extent of the problem. Somalia's marine resources are vast, and the country's long coastline and proximity to key fishing grounds make it a prime target for foreign fishing fleets. However, accurate information on the number of foreign vessels operating in Somali waters and the amount of fish being caught is scarce. This lack of data makes it difficult to develop effective management and conservation strategies for the country's fisheries sector.

Somalia has started taking steps to enhance the surveillance and tracking of its waters in order to deal with this situation. A Fisheries Monitoring, Control, and Surveillance (MCS) Unit were established in the country in 2016 with the goal of monitoring and enforcing fishing laws within its territorial seas. (Jama, Ariffin, & Yusof, 2022). The European Union (EU), which has contributed financing and technical assistance to enhance Somalia's ability to track and regulate its fisheries industry, is a supporter of the MCS Unit. The creation of a Fisheries Management Information System (FMIS), which seeks to enhance data collection and management in the industry, has also received backing from the EU. In addition to the Fisheries Law, Somalia has created a National Plan of Action for the Management and Control of Fishing Capacity (NPOA-Capacity), which aims to control fishing capacity in the nation's waterways in order to combat overfishing and IUU fishing. (Weldemichael, 2019). In accordance with the plan, only a certain number of fishing vessels are permitted to operate in Somalian waters, fishing activity monitoring and surveillance will be improved, and the IUU fishing penalties and other fisheries-related infractions will be stiffer.

Despite these efforts, challenges remain in the effective enactment and enforcement of Somalia's legal and regulatory framework. One of the main challenges is the lack of resources and capacity, both in terms of funding and technical expertise. Somalia's fisheries sector has been severely impacted by the country's long-standing conflict and political instability, which have limited the government's ability to invest in the sector and develop the necessary infrastructure and human resources (Kuemlangan et al., 2023). Another challenge is the lack of coordination and cooperation between different government agencies and stakeholders involved in the management and regulation of the country's fisheries sector.

Somalia's political fragmentation and weak governance structures have made it difficult to develop effective mechanisms for coordination and cooperation, which are essential for the successful management of the country's fisheries resources.

Somalia has made significant efforts to combat foreign IUU fishing in its waters, including the establishment of a legal and regulatory framework and initiatives to improve monitoring and surveillance. However, implementation and enforcement remain weak due to a lack of resources and capacity, political instability, and a lack of coordination and cooperation between different stakeholders (Jama, Ariffin, & Yusof, 2022). Addressing these challenges will require sustained investment in the sector, capacity building, and improved governance structures. In addition, more financial and technical support from the international community will be needed to enable the effective administration and preservation of Somalia's fisheries.

Addressing the issue of foreign IUU fishing in Somali waters requires coordinated efforts from multiple stakeholders, including the Somali government and the international community at large. Implementing and enforcing effective regulations and monitoring mechanisms is crucial to combat IUU fishing and protect marine resources off the coast of Somalia.

**2.12 Economic, Environmental, and Social Impacts of Foreign IUU Fishing in Somalia**

Foreign IUU fishing has had significant economic, environmental, and social impacts on Somalia. The nation's extensive marine resources and lengthy coastline make it a top target for overseas fishing fleets, which have harmed marine ecosystems, depleted fish stocks, and threatened the livelihoods of coastal residents. (Taghizadeh, 2021). The loss of revenue for Somalia's fisheries industry is one of the most important economic effects of foreign IUU fishing. Although the fish populations are being depleted and the marine ecosystems are being harmed, Somalia's fisheries sector still has the potential to make a significant economic contribution to the country. According to a report by the World Bank, foreign IUU fishing costs Somalia an estimated $300 million per

year in lost revenue (Inman, 2020). The $300 million annual revenue loss estimate for Somalia due to IUU fishing is based on the significant impact of foreign-operated trawlers within Somalia's Exclusive Economic Zone (EEZ). This loss of revenue has a ripple effect on the entire economy, as it reduces the government's ability to provide services and invest in infrastructure and undermines the livelihoods of people who depend on the fisheries sector.

Another challenge is the lack of coordination and cooperation between different governments. These environmental impacts have long-term consequences not only for Somalia but also for the global community, as marine ecosystems are essential to the health of the planet and the well-being of people everywhere. The social impacts of foreign IUU fishing in Somalia are also significant, particularly for coastal communities relying on fishing for their livelihoods. The depletion of fish stocks has led to a decline in catches, reducing the income and food security of fishers and their families (Jama, Ariffin, & Yusof, 2022).

The use of destructive fishing methods has also damaged fishing gear and equipment, leading to additional costs and losses for fishers. In addition, the presence of foreign fishing vessels in the Somali context has led to several adverse outcomes. Firstly, they have depleted local fish stocks due to overfishing and destructive practices. This has negatively impacted local fishers who rely on these resources. Secondly, local fishers have suffered economic losses due to competition and reduced catch rates, leading to poverty and economic instability in coastal communities. Lastly, disputes over fishing grounds, cultural differences, and language barriers have resulted in social tensions and conflicts between foreign fishing crews and local fishers. These social impacts threaten the resilience and well-being of Somali coastal communities by undermining social cohesion and creating economic and social instability.

The impact of foreign IUU fishing in Somalia extends beyond the fisheries sector, affecting other sectors of the economy, such as tourism and transportation. The degradation of marine

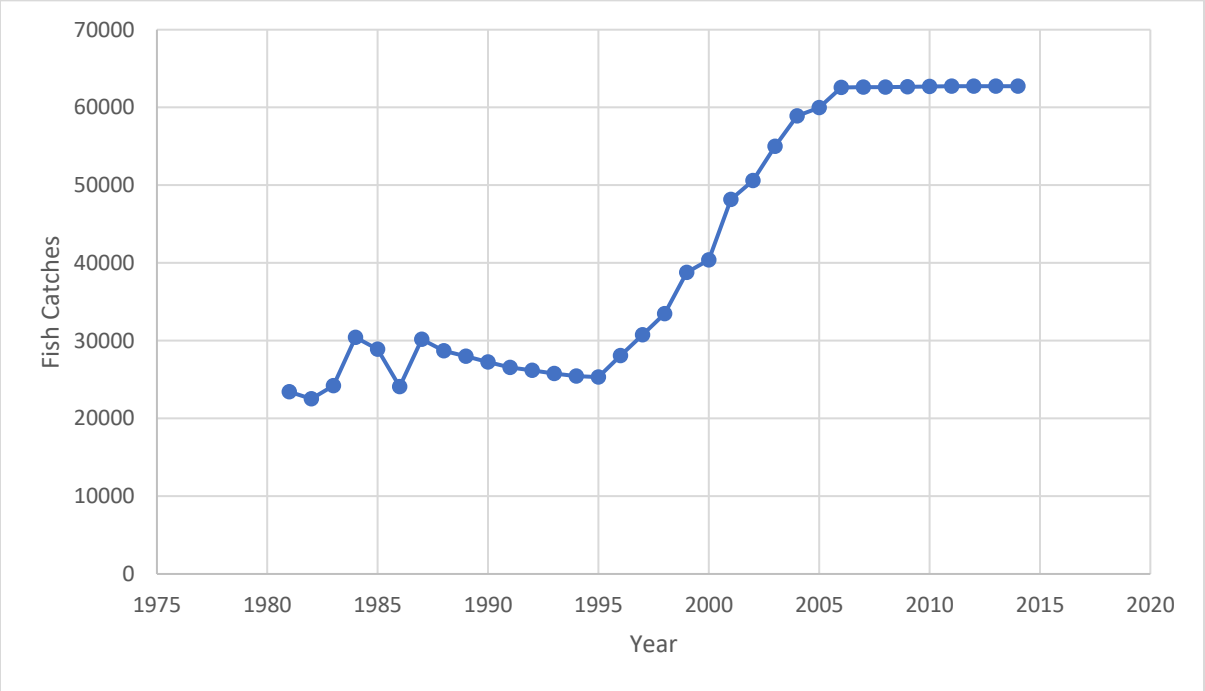
environments has also affected the country's coastal infrastructure, such as ports and harbours, which are critical for the country's a trade and economic development (Taghizadeh, 2021). In addition, the IUU fishing industry has been directly linked to the rise of piracy, particularly in areas such as the Western Indian Ocean and Somalia's waters, as well as the Gulf of Guinea. This harmful practice by foreign vessels that deplete local fish stocks has resulted in reduced catches and economic hardship for local fishermen. Coupled with limited economic opportunities and poor governance, this has driven some to turn to piracy as an alternative livelihood. For instance, the increase in piracy off the coast of Somalia in the early 2000s was partly caused by IUU fishing's impact, which prompted local fishermen to defend their waters and seek compensation for their losses through hijacking and ransom demands.

Furthermore, the Gulf of Guinea's complex relationship between IUU fishing, maritime piracy, and armed robbery at sea underscores the broader security issues facing the region. IUU fishing not only depletes fish stocks, but it also contributes to the economic conditions that fuel piracy, making it a catalyst for maritime insecurity.

Addressing the financial, environmental, and social impacts of foreign IUU fishing in Somalia requires a multi-faceted approach that includes strengthening the legal and regulatory framework, improving monitoring and surveillance, investing in sustainable fishing practices, and supporting the development of alternative livelihoods for affected communities (Taghizadeh, 2021). Strengthening the legal and regulatory framework involves improving the capacity of Somali authorities to enforce fishing regulations and prosecute IUU fishing operators. This may require international support to build the capacity of Somali institutions and to improve coordination between regional and international partners (Weldemichael, 2019). In order to follow fishing vessels and identify IUU fishing practices, modern technologies like automatic identification systems (AIS) and satellite imaging are being used to improve monitoring and surveillance.

Promoting ethical fishing methods, such as the deployment of selective gear and the imposition of closed seasons to allow fish stocks to repopulate, is part of investing in sustainable fishing techniques. Supporting the development of alternative livelihoods for affected communities involves promoting economic diversification and investing in sectors such as agriculture, tourism, and small-scale fisheries.

2.13 **Estimated IIU Fishing in Somali Waters (metric tons)**




Sources: Glaser et al.

The data on foreign IUU fishing in Somali waters for the period from 1981 to 2014 documented in the study conducted by Glaser et al. (2019)

The data shows a gradual increase in foreign IUU fishing from 1981 to 2004/5. After 2004/5, the IUU fishing level remained relatively constant until 2014. The year with the highest recorded IUU fishing is 2013, with an amount of 62,735 metric tons of fish

The year with the lowest recorded IUU fishing is 1982, with 22,521t. The average IUU fishing over the entire period is approximately 37,481mt. The average year-to-year change in IUU fishing is approximately 2,057mt, indicating a relatively stable pattern in recent years.

A line graph was developed to depict the progression of foreign fishing activities within Somali maritime zones across the outlined timeline. The graphical representation indicates a pronounced escalation in IUU fishing occurrences between 1981 and 2001. After this surge, the chart demonstrates an equilibrium phase characterized by sustained high levels of IUU fishing activities. The data also reveals a concerning trend in foreign IUU fishing in Somali waters, with a notable increase in the earlier years and a persistently high level from 2001 to 2014. The issue of IUU poses a substantial challenge to the sustainable management of fisheries in the region. It highlights the need for enhanced enforcement and international cooperation to curb illegal fishing.

The data enable an assessment of the scale of the IUU fishing operations. However, additional insights regarding the interventions implemented to combat IUU fishing throughout this timeframe would enrich the analysis, offering a more holistic understanding of the efforts to mitigate such activities.

## 2.13 Socio-economic Impacts of IUU Fishing on Coastal Communities in Somalia

### 2.13.1 Impact on Livelihoods and Food Security

The effect of IUU fishing on Somalia's coastal villages extends far beyond mere economic loss, striking at the heart of food security and the traditional livelihoods dependent on rich marine biodiversity. With an expansive coastline that harbors invaluable marine life, these communities have historically leaned on fishing as a cornerstone of their sustenance and economic stability. Nevertheless, the relentless advance of IUU fishing has depleted critical fish populations and disrupted the age-old balance between nature and local fishing practices, thereby threatening the subsistence and prosperity of these communities. One of the major IUU fishing impacts on

livelihoods in coastal communities is the loss of income for fishers and their families (Okafor-Yarwood, Kadagi, Belhabib, & Allison, 2022). IUU fishing, particularly by foreign vessels, has contributed to fish stock overexploitation, resulting in reduced catches and lower incomes for local fishers. As fish stocks decline, fishers have to spend more time and effort to catch fewer fish, resulting in decreased income and financial instability. This has a direct impact on the well-being of fishers and their families, as they struggle to meet their basic needs and provide for their households.

Food security in Somalia's coastal areas is significantly impacted by IUU fishing as well. For most coastal communities, fish is a major protein and nourishment source, and IUU fishing has meant that there is less fish accessible for local consumption and for sale in local markets as a result of the decline of fish stocks brought on by IUU fishing. As a result, coastal neighborhoods may experience greater food insecurity and a lack of readily available, affordable fish, which can result in starvation and other health problems, especially for women and children.

IUU fishing also disrupts local fishing activities, as foreign vessels often encroach on traditional fishing grounds and compete with local fishers for resources. This can result in conflicts and tensions between local fishers and foreign IUU fishing vessels, further undermining the livelihoods and food security of coastal communities. Additionally, IUU fishing can cause local fishermen to relocate to new fishing grounds or stop fishing entirely due to the decrease in fish species and the resulting loss of income. In Somalia, IUU fishing has societal effects on coastal communities that go beyond issues with the economy and food security. (Lindley, Percy, & Techera, 2019). The social and cultural structure of coastal communities frequently includes a significant amount of fishing, with generations-old knowledge and customs being passed down. The disruption of local fishing activities due to IUU fishing can result in the loss of cultural heritage and identity, as well as social cohesion within communities. Moreover, IUU fishing can also contribute to social

tensions and conflicts between different communities as they compete for dwindling fish resources or face challenges from foreign IUU fishing vessels. These social impacts can have long-term consequences for the resilience and well-being of coastal communities, further exacerbating the challenges they face.

### 2.14 Social and Cultural implication

IUU fishing has profound social and cultural implications for coastal communities in Somalia. These implications go beyond the economic and environmental impacts and encompass various aspects of social and cultural life, including social cohesion, community dynamics, gender roles, and traditional practices. One of the social implications of IUU fishing is the erosion of social cohesion and community dynamics within coastal communities. Fishing has traditionally been a central aspect of the culture and way of life for many coastal communities in Somalia, with close-knit social networks and communal decision-making processes. However, IUU fishing disrupts this social fabric by creating conflicts over depleted fish stocks, illegal fishing activities, and unequal distribution of benefits (Belhabib, Sumaila, & Le Billon, 2019). This can lead to social tensions, disputes, and the breakdown of traditional community structures, affecting the social cohesion and well-being of coastal communities.

Gender roles and dynamics within coastal communities are also affected by IUU fishing. In many fishing communities, men are primarily engaged in fishing activities, while women play essential roles in supporting the fishing households through the processing and marketing of fish, as well as managing household activities (Weldemichael, 2019). However, IUU fishing often leads to overfishing, resulting in decreased fish catches and reduced incomes for fishing households. This can impact women's roles and status within the community, as they may have to take on additional responsibilities to cope with the economic challenges, such as engaging in alternative livelihood activities or migrating to seek work, which may disrupt traditional gender roles and dynamics.

IUU fishing can have cultural implications as it challenges traditional practices and customs related to fishing in coastal communities (Jama, Ariffin, & Yusof, 2022). Many coastal communities in Somalia have traditional norms and practices related to fishing, such as customary rules for access to fishing grounds, seasonal closures, and taboo areas. IUU fishing undermines these traditional practices by operating outside of legal and customary frameworks, depleting fish stocks, and disregarding local rules and regulations. This can erode the cultural significance of fishing as a way of life, disrupt traditional knowledge and practices, and challenge the authority of local customary institutions, which can have far-reaching cultural implications for coastal communities. Moreover, IUU fishing can negatively impact the health and well-being of coastal communities in Somalia. IUU fishing activities involve destructive gear, overfishing, and harvesting undersized fish, which can result in the depletion of fish stocks and damage marine ecosystems. This can directly impact fish availability as a food source for coastal communities, which rely heavily on fish as a critical source of protein and essential nutrients (Weldemichael, 2019).

As a result, IUU fishing can contribute to malnutrition, food insecurity, and health issues among vulnerable populations, including women and children. The social and cultural implications of IUU fishing in Somalia are intertwined with the economic and environmental impacts and collectively contribute to the overall vulnerability of coastal communities. The detrimental consequences of IUU fishing on coastal populations in Somalia may be made worse by the breakdown of social cohesion, alteration of gender roles, difficulties with traditional customs, and repercussions on health and wellbeing. Therefore, addressing the social and cultural implications of IUU fishing is crucial for achieving sustainable and inclusive fisheries management that respects local customs, promotes social cohesion, and ensures the well-being of coastal communities.

Coastal communities should actively participate in fisheries management decision-making processes as part of efforts to alleviate the social and cultural effects of IUU fishing in Somalia.

This entails including traditional regional institutions, local leaders, women's organizations, and various other players in the creation and execution of fisheries management strategies (Oxford Analytica, 2020). Incorporating traditional knowledge and practices into fisheries management strategies can help ensure that local customs are respected, and traditional practices are recognized and integrated into management plans. This can also empower local communities to take ownership of their fishery resources and play a role in their conservation and management.

### 2.15 Piracy in Somalia

The relationship between Somalia's piracy problem and illegal, unreported, and unregulated (IUU) fishing is complex, and it has had a big impact on both regional Somali populations and global maritime trade. The decline of marine resources brought on by IUU fishing was one of the major causes of the growth of piracy off the coast of Somalia in the early 2000s. Foreign ships engaged in illegal fishing in Somalian waters, frequently from nations with lax laws or enforcement. These behaviours included entering territorial waters without permission, using restricted gear, and taking more fish than allowed. As a result, local Somali fishermen no longer had as much access to fish due to the overexploitation of the fish stocks in Somalian waters.

For Somali fishermen, the reduction in fish populations had serious economic repercussions. The decreased availability of fish threatened their traditional livelihoods and economic stability. Communities who had relied on the sea for their livelihood for many generations found themselves suddenly unable to make ends meet. Because of this, many fishermen have turned to piracy as a substitute form of employment and a means of defending their fishing grounds from further exploitation. Individuals who had previously relied on fishing for their subsistence began to find piracy appealing. Beyond the specific Somali setting, piracy and IUU fishing are linked. International marine activities, as well as coastal states, are both impacted by IUU fishing, which

is a global problem. The issue was made worse by the local pirate organizations' actions. Commercial fishing operations in Somali waters have faced significant challenges due to piracy, with vessels often targeted by pirates and subjected to ransom demands. This complex interplay between piracy and IUU (Illegal, Unreported, and Unregulated) fishing complicates efforts to combat illegal fishing practices. The presence of foreign IUU fishing fleets, particularly from Iran, Yemen, and Southeast Asia, has been exacerbated by Somalia's weakened state institutions amid four decades of civil war, making enforcing fishing regulations and the fight against IUU fishing more difficult. These state institutions, crippled by corruption and disorganization, often issue conflicting authorizations, allowing IUU fishing to thrive as a form of transnational crime facilitated by both foreign operators and local Somali agents (Bahadur, 2021).

### 2.16 Fishing Sector Recovery after the Civil War

The fisheries industry in Somalia encountered numerous difficulties and a dramatic collapse following the civil war. Infrastructure for fisheries collapsed as a result of the war, and fishing communities broke apart. A whole generation of fishermen disappeared, and more than 2,000 lost their jobs. The predicted 300,000 tons of finfish and 10,000 tons of crustaceans in Somalia's fisheries were not harvested, and the country's yearly catches were far lower (Yusuf, 2020). Until now, international assistance organizations have spent millions of dollars to enhance Somalia's fisheries. Most of the buildings, factories, equipment, and fishing gear were lost or destroyed during the conflict. During this time, foreign organizations only sent a small number of emergency supplies of fishing gear to the fisheries sector.

After the civil war, efforts were undertaken to restore the fishing industry. Small-scale fishing programs in Somalia and Somaliland have been supported by international organizations like the Food and Agriculture Organization (FAO), United Nations Development Program (UNDP), World Bank, European Union (EU), and different local groups. These initiatives seek to combat poverty,

advance artisanal fishing, and encourage economic diversification (Oxford Analytica, 2020). Despite these initiatives, Somalia's persistent insecurity has made the revival of the fisheries sector more difficult . Infrastructure constructed after independence was destroyed, and for more than 20 years, no new infrastructure has been created. Additionally, the sector's expansion and the change in the means of subsistence for fishing communities have been hampered by a lack of focused support and insufficient finance.

### 2.17 Stakeholders' Role in the Fishery Sector

The stakeholders are essential to the growth and revival of Somalia's fisheries industry. International organizations can generate employment, enhance nutrition, and increase Somalia's foreign exchange through increasing seafood consumption, export substitution, and production transformation. International aid organizations, such as the Food and Agriculture Organization (FAO), have actively supported efforts to promote Somalia's fisheries. The FAO conducts research, organizes programs, and offers nutrition and food security information. They collaborate closely with the Somali government and other groups to finance infrastructural projects, offer technical support, and advance sustainable fishing methods.

In addition, UNDP funding has supported research projects and the establishment of pilot fisheries development initiatives in Somalia, highlighting the international commitment to revitalizing the country's marine resources and fisheries sector. This effort underscores the crucial role of sustainable fisheries management and development in promoting economic growth and food security within the region (University of Rhode Island & Transafrica Consultancy Services LLC, 2015). They want to help with economic recovery, artisanal fisheries development, and poverty reduction. Similarly, the World Bank has supported initiatives to improve fishing communities' quality of life and the industry's management. Their assistance includes post-harvest handling

facilities, infrastructural development, and training. Initiatives for capacity building and governance in the maritime industry, particularly Somalia's fisheries, have been supported by the European Union (EU).

The EU promotes the growth of maritime governance, regulatory frameworks, and law enforcement capabilities through missions like EUCAP Nestor. This supports sustainable fishing methods and aids in the fight against IUU fishing.

Collaborating with the Somali government and other stakeholders, local and international non-governmental organizations (NGOs), including Oxfam and STIDIT, have also contributed significantly to supporting fisheries programs (Oxford Analytica, 2020). These organizations offer funding, technical know-how, and on-the-ground assistance to promote sustainable fishing methods, enhance livelihoods, and strengthen fishing communities' ability.

### 2.18 Global Efforts to Combat IUU Fishing

Dealing with a global issue like IUU fishing requires international cooperation. International organizations, governments, and civil society have made substantial efforts in recent years to address IUU fishing through a variety of methods, including stricter rules, improved surveillance and enforcement, and enhanced cooperation and coordination among stakeholders. The Agreement on Port State Measures (PSMA) is the first legally binding international agreement created with the express purpose of preventing, discouraging, and banning IUU fishing. Participating nations are required to put several safeguards in place to stop fish that have been captured illegally from being sold at their ports. These actions consist of improved inspection processes, information sharing between nations, and the application of fines on vessels found to be engaging in IUU fishing. Over 70 nations have ratified the PSMA since its establishment in 2009, and its application has been proven to be beneficial in discouraging IUU fishing practices (Sok, 2022).

The efforts of Regional Fisheries Management Organizations are an important global initiative to address IUU fishing. (RFMOs). These businesses, which have operations throughout the world, are in charge of overseeing the fisheries in their various regions. Many RFMOs have created rules and management strategies to stop IUU fishing, including the implementation of catch limits, the development of vessel surveillance systems, and the employment of observation programs to track fishing operations. RFMOs serve a critical role in encouraging sustainable fishing methods and safeguarding the long-term health of global fisheries, even though their success in combating IUU fishing varies. There are additional efforts to stop IUU fishing through enhanced collaboration and cooperation among stakeholders in addition to these formal activities. For instance, the Global Fisheries Enforcement Training Workshop, sponsored by the United States and other nations, brings enforcement officers from different parts of the world together to exchange best practices and improve their ability to identify and prevent IUU fishing activity (Temple et al., 2022). The same is true of projects like the Global Register of Refrigerated Transportation Vessels, Supply Vessels and Fishing Vessels, which works to increase transparency and traceability in the world's fishing industry and make it harder for IUU fishing vessels to operate covertly.

Civil society has also played an important role in combating IUU fishing through advocacy, research, and direct action (Temple et al., 2022). Environmental organizations such as Greenpeace and WWF have campaigned for stronger regulations and better enforcement of existing measures, while the Pew Charitable Trusts and the Environmental Justice Foundation have conducted research and analysis to better comprehend the scope and IUU fishing effect. Other groups, such as the Sea Shepherd Conservation Society, have engaged in direct action to disrupt IUU fishing practices, including through the use of non-violent tactics to prevent illegal fishing vessels from operating. Despite these efforts, IUU fishing remains a significant challenge, and there is a need for continued action and cooperation to address the problem. One area where further progress is

needed is in the development and enactment of effective monitoring, control, and surveillance (MCS) systems (Lestari, Putra, & Larasuci, 2020). MCS is crucial in detecting and deterring IUU fishing activities, and there is a need for improved technology and infrastructure to support these efforts, particularly in developing countries. Another area where further progress is needed is in tackling the main causes of IUU fishing, including poverty, weak governance, and the lack of economic opportunities in many fishing communities. Efforts to promote sustainable fishing practices and support the livelihoods of small-scale fishers can help to address these underlying issues and reduce the incentives for engaging in IUU fishing activities.

### 2.19 Technological Innovations and Tools for IUU Fishing Detection and Monitoring

Technological innovations have played a crucial role in addressing the issue of IUU fishing worldwide. With advancements in satellite technology, electronic monitoring systems, and data analytics, there has been a significant improvement in the ability to detect and monitor IUU fishing activities. These technological tools have been utilized in various ways to enhance Monitoring, Control, and Surveillance (MCS) efforts, providing valuable information for combating IUU fishing. Satellite technology has revolutionized IUU fishing detection and monitoring. Satellites equipped with high-resolution imaging sensors can capture images of vast ocean areas, allowing for the identification of fishing vessels and their activities in near real time. Satellite-based systems, such as Automatic Identification Systems (AIS) and Vessel Monitoring Systems (VMS), enable authorities to track vessel movements, identify suspicious behaviour, and detect potential IUU fishing activities. Moreover, satellite-based Synthetic Aperture Radar (SAR) technology can detect vessels even in remote areas and adverse weather conditions, making it a valuable tool for IUU fishing surveillance.

Electronic monitoring systems have also emerged as a promising approach for IUU fishing detection and monitoring. These systems involve the use of onboard cameras, sensors, and GPS

devices on fishing vessels to collect data on fishing activities, which are then transmitted in real-time to authorities for analysis. Electronic monitoring systems provide reliable and verifiable data on catch, location, and fishing gear used, enabling authorities to verify compliance with fishing regulations, detect IUU fishing activities, and take appropriate enforcement actions (Omar, Mohamed, & Bambale, 2019). Data analytics also play a crucial role in IUU fishing detection and monitoring. Advanced data analytics techniques, such as machine learning, data fusion, and pattern recognition, can process large volumes of data from various sources, including satellite imagery, AIS, VMS, and electronic monitoring systems, to identify patterns and anomalies indicative of IUU fishing. These analytics tools can automatically detect IUU fishing activities, such as unauthorized transhipment, fishing in prohibited areas, and underreporting of catches, enhancing the accuracy and efficiency of IUU fishing detection efforts.

The use of technology in IUU fishing detection and monitoring has shown promising results in many regions around the world. For example, in the Central and Western Pacific Oceans, the use of satellite technology, electronic monitoring systems, and data analytics has significantly improved the ability to detect IUU fishing activities, resulting in increased enforcement and a decline in IUU fishing. Similarly, in the Antarctic and Southern Ocean, the use of satellite-based AIS and VMS has helped to monitor and enforce fishing regulations, leading to IUU fishing activity reduction. Despite the potential of technology in combating IUU fishing, there are challenges in adopting and implementing these tools. One major challenge is the cost associated with the acquisition, installation, and maintenance of technological systems, which can be prohibitive for some countries, especially developing nations. Moreover, there may be limitations in the coverage and accuracy of satellite-based systems, particularly in remote areas with poor satellite coverage or challenging weather conditions. There may also be concerns regarding data privacy and security, as IUU fishing data often involves sensitive information that needs to be

appropriately managed and protected (Jesperson & Henriksen, 2022). Technological innovations and tools have significantly contributed to IUU fishing detection and monitoring efforts globally. Satellite technology, electronic monitoring systems, and data analytics have improved the accuracy, timeliness, and efficiency of IUU fishing detection, providing valuable information for MCS efforts. However, challenges remain in terms of cost, coverage, accuracy, and data privacy. Further research and development, as well as international collaboration, are needed to harness the full potential of technology in combatting IUU fishing and ensuring sustainable fisheries management worldwide.

### 2.20 Efforts Made to Combat IUU Fishing in Somalia

Combatting IUU fishing in Somalia has been a daunting task due to various factors, including a lack of effective governance, limited resources, and insecurity in the region. However, there have been efforts made at various levels to address IUU fishing in Somalia, including national, regional, and global initiatives. At the national level, Somalia has taken steps to combat IUU fishing through the development of legal and regulatory frameworks. In 2014, Somalia adopted a new fisheries law, the Somali Fisheries Law, which aims to regulate fishing activities in its waters and combat IUU fishing (Jama, Ariffin, & Yusof, 2022). The law includes provisions for vessel registration, licensing, and monitoring, as well as penalties for IUU fishing activities. Somalia has also established a Fisheries Monitoring, Control, and Surveillance (MCS) Unit to enforce the fisheries law and combat IUU fishing. The MCS Unit conducts patrols, inspections, and monitoring of fishing vessels and works in collaboration with other national agencies, such as the Coast Guard and the Ministry of Fisheries and Marine Resources, to combat IUU fishing activities.

Additionally, Somalia has cooperated with regional organizations, such as the Intergovernmental Authority on Development (IGAD), the Indian Ocean Tuna Commission (IOTC), and the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in the Western

Indian Ocean (ReCAAP), to enhance regional coordination and cooperation in addressing IUU fishing. These regional efforts include information sharing, joint patrols, and capacity-building initiatives to strengthen the ability of Somalia and other states in the region to stop IUU fishing (Weldemichael, 2019). Furthermore, Somalia has engaged in international partnerships to fight IUU fishing. For instance, Somalia has collaborated with international agencies like the United Nations Development Programme (UNDP) and the Food and Agriculture Organization (FAO) to promote the growth of its capacity for fisheries management and to fight IUU fishing. These collaborations have offered support, capacity building, and technical help in fields like MCS, data gathering, and policy development.

Despite these efforts, IUU fishing continues to be a persistent challenge in Somalia, and the effectiveness of the measures implemented so far has been limited. One of the main challenges is the lack of adequate resources and capacity to effectively enforce the fisheries law and combat IUU fishing. Somalia faces challenges in terms of vessel monitoring, control, and surveillance, as well as limited resources for patrolling its vast coastal waters. Additionally, the insecurity and instability in the region have hindered the effectiveness of IUU fishing enforcement efforts, as illegal operators often operate with impunity in areas where government control is weak.

Another challenge is the lack of comprehensive and accurate data on IUU fishing activities in Somalia (Hamasi & Ichani, n.d.) IUU fishing, by its very nature, is clandestine and often goes unreported.

Despite these challenges, some progress has been made in combatting IUU fishing in Somalia. The establishment of the Somali Fisheries Law and the MCS Unit demonstrate the commitment of the Somali government to address IUU fishing. Regional and international partnerships have also provided support in building capacity and enhancing coordination.

However, the fight against IUU fishing in Somalia is ongoing, with significant strides made and challenges that persist. Okafor-Yarwood, Kadagi, Belhabib, and Allison (2022) highlight the multifaceted approach adopted to address this issue, emphasizing the need for comprehensive strategies.

Investments in resources and capacity-building are central to Somalia's monitoring, controlling, and surveilling its coastal waters. This encompasses the provision of adequate funding and equipment for the Monitoring, Control, and Surveillance (MCS) Unit, including patrol vessels, communication systems, and surveillance technologies. Training and capacity-building for MCS officers are also crucial for enhancing their operational effectiveness.

Data collection and information sharing are crucial for understanding the scale and nuances of IUU fishing activities in Somalia. Developing a robust database and fostering information exchange among national, regional, and international partners are critical steps towards informed decision-making and enhanced enforcement actions.

Addressing the root causes of IUU fishing involves tackling underlying social and economic drivers such as poverty, lack of alternative livelihoods, and governance issues. Initiatives to provide sustainable alternatives for coastal communities and improve governance in the fisheries sector are essential for mitigating the allure of IUU fishing practices.

Moreover, strengthening regional and international cooperation forms a critical component of the strategy against IUU fishing. Enhanced collaboration, information sharing, joint patrols among countries in the region, and support from international organizations underscore the collective effort required to address this challenge effectively.

A multi-stakeholder approach involving governments, civil society organizations, academia, and local communities is crucial for a holistic response to IUU fishing in Somalia. Engaging local communities and leveraging the roles of various actors in raising awareness, research, and

advocacy are pivotal for the success of interventions aimed at protecting Somalia's marine resources.

Fishing in Somalia has significant economic, environmental, and social impacts, particularly on coastal communities. Efforts to combat IUU fishing in Somalia have been made at national, regional, and international levels, including the establishment of legal and regulatory frameworks, regional partnerships, and international collaborations. However, challenges such as limited resources, lack of accurate data, insecurity, and governance issues continue to hinder the effectiveness of these efforts (Glaser, Roberts, & Hurlburt, 2019). To enhance the effectiveness of IUU fishing interventions in Somalia, increased investment in resources and capacity-building, improved data collection and information sharing, addressing root causes of IUU fishing, strengthening regional and international cooperation, and engaging local communities and other stakeholders is crucial. By taking a multi-faceted and collaborative approach, it is possible to combat IUU fishing in Somalia and safeguard food security and the livelihood of coastal communities.

# CHAPTER THREE

# METHODS

## 3.1 Introduction

This chapter outlines the methodological framework employed in the research to investigate the impacts of illegal, unreported, and unregulated (IUU) fishing on the coastal villages of Garacad and Eyl District in Somalia. This chapter concludes with a description of thematic data analysis, quality assurance, and my role as a qualitative researcher using secondary data.

## 3.2 Research Design

### 3.2.1 Research context

This study aims to analyze the impact of illegal, unreported, and unregulated (IUU) fishing on Somalia's coastal communities, with a focus on the north-central coast. It employed qualitative research methods, such as interviews and field observations, to gather rich and in-depth data on the topic to comprehensively explore the socio-economic consequences of IUU fishing in the specified region of interest.

### 3.2.2 Qualitative research approach

The study uses a qualitative approach to examine IUU fishing's complex effects. Qualitative research embraces the richness and meaning of individuals' lived experiences in their context to gain a deeper understanding (Teherani, Martimianakis, Stenfors-Hayes, Wadhwa, & Varpio, 2015). Qualitative research examines individuals' or groups' contexts to better understand their subjective accounts. The study's methodology, findings, and recommendations are framed by the research context.

### 3.2.3 Interpretivist research paradigm

Unlike positivism, Interpretivism emphasizes the subjectivity of human experiences and the importance of understanding how people interpret their actions (Alharahsheh, & Pius, 2020). This study focuses on quantifiable impacts and local communities' diverse and subjective experiences. This method allows for an exploration of how community members understand IUU fishing changes. Interpretivism stresses the importance of context in human behavior (Potrac, Jones, & Nelson, 2014). Historical reliance on marine resources, cultural ties to fishing, and economic dependence on the fishing industry are important in the IUU fishing study. The interpretivist perspective allows researchers to examine these contexts and how they affect community responses to IUU fishing.

## 3.3 Sampling Strategy

To ensure diversity of opinion, purposive sampling is used (Rai, & Thapa, 2015). Local fishermen, community leaders, and union representatives are deliberately chosen. The availability and willingness of Somali coastal communities in the north-central coast to participate determined this study's sample size. Purposive sampling selected people who have firsthand knowledge of IUU fishing and its effects on food security, local economies, and livelihoods. A total of 15 individuals were interviewed, comprising 14 respondents from diverse backgrounds within each district, alongside one representative from the local federal government. The research design aimed to ensure a comprehensive understanding of perspectives at both the grassroots and governmental levels.

## 3.4 Data Collection

This study combined semi-structured interviews, field observations, and secondary research to gather data and identify themes. Semi-structured interviews allowed participants to share their

experiences in their own words and offered flexibility for in-depth discussions beyond set questions (Creswell & Poth, 2018). This approach provided insights into how IUU fishing affects food security, local economies, and livelihoods along Somalia's north-central coast.

Identified stakeholders were interviewed about the impact of IUU fishing on their communities. Interviews were recorded with an MP3 recorder to ensure accuracy, and transcripts were prepared verbatim. Field observations added contextual understanding, enhancing the findings drawn from the interviews.

Open-ended questions encouraged participants to speak freely, revealing the diverse impacts of IUU fishing on coastal communities. The semi-structured format helped capture the nuances and complexities of their experiences, offering a more comprehensive view of the issue.

### 3.5 Data Analysis

Data analysis was conducted using NVivo software, with thematic analysis serving as the primary method to explore the socioeconomic impacts of IUU fishing. Thematic analysis was chosen for its ability to help organize and interpret qualitative data meaningfully (Braun & Clarke, 2006).

The analysis involved five main steps:

Data Examination: An initial review helped establish a baseline understanding of the content.

Generating Initial Codes: Open coding in NVivo segmented the data based on themes and study objectives. NVivo's tools, like coding stripes and nodes, aided in organizing this information (Saldaña, 2016).

Reviewing Themes: Codes with similar meanings were clustered to form broader topics, concentrating on primary issues such as economic effects and youth migration.

Refining Themes: Using axial coding, related codes were connected and organized into larger categories, highlighting meaningful patterns in the data (Corbin & Strauss, 2015).

Defining Themes: Each theme was named to capture its essential idea, such as "economic loss," to ensure alignment with the study's primary focus.

### 3.6 Ethical considerations

Ethical approval was obtained from the University of Cape Town (UCT)'s Commerce Ethics Committee, and permission from the Ministry of Fisheries of Puntland State, Somalia, was secured through an approval letter for the research project (see Appendix A). The current study also received ethical clearance from the Faculty of Commerce (COM/00405/2023, see AppendixA).

The research followed the ethical standards the American Psychological Association (APA) set out for studies involving human subjects. According to the interpretive report, the Principal Investigator (PI) ensured that important ethical issues like non-maleficence, anonymity, confidentiality, and informed consent were respected to safeguard the rights of participants.

Respondents were explicitly informed that the study was completely safe and that they could withdraw their consent at any moment. Furthermore, participants were assured that no data would be used without their explicit consent and that their personal information would be safeguarded. Lastly, participants were debriefed to resolve any apparent issues while gathering the data.

### 3.7 Rigour

The data's integrity was maintained using Lincoln and Guba's (1986) criteria of credibility, transferability, dependability, and confirmability. The thematic analysis proceeded precisely, consistently, and honestly, meeting these standards.

- **Credibility.** Credibility pertains to the degree of trustworthiness of data and the processes used for data analysis (Lincoln & Guba, 1986), as well as the recognition of conclusions by individuals who have similar experiences.
- **Dependability.** The dependability of a study pertains to the consistency of its findings and the presentation of evidence indicating that if the study were to be duplicated under the same or similar circumstances with the same or similar participants, the results would be identical (Guba, 1981).
- **Transferability.** The findings of this study will satisfy the criterion of transferability if they remain intelligible and applicable to contexts beyond the current study circumstance, as assessed by the level of similarity between the two contexts.
- **Confirmability.** Confirmability, as defined by Lincoln and Guba (1986), refers to the extent to which the conclusions of a study may be independently checked or supported by others, typically through an auditing procedure.
- **Reflexivity** is closely associated with the rigour of a study, as it involves the researcher's introspection on how their actions may have influenced the research process. In order to maintain objectivity in this study, I carefully consider my own identification and recognise the potential influence of my background and personal beliefs on the interpretation of participants' perspectives during the analysis process.

### 3.8 Limitations

The qualitative nature of the study limits the generalizability of findings to broader populations. However, the focus on in-depth exploration and understanding compensates for this limitation.

# CHAPTER FOUR

# DATA ANALYSIS

## 4.1 Introduction

The literature review has noted that illegal, unreported, and unregulated (IUU) fishing has devastating social, economic and environmental impacts on the society. This study aims to investigate the impact of IUU fishing on the food security, local enterprises, and lifestyles of communities residing along the north-central coast of Somalia. The data is analyzed and interpreted in order to identify recurring patterns, significant themes, and the intricate interconnections that influence the studied communities.

## 4.2 Methodology

This research investigated the impacts of illegal, unreported, and unregulated fishing on the coastal villages of Garacad and Eyl District in Somali through the utilization of qualitative research methodologies. The study relies on Qualitative research approaches which enable a comprehensive exploration and understanding of individual experiences, perceptions, and issues concerning the research question.

Participants were able to convey their experiences in their own voices thanks to interview flexibility. To ensure a varied spectrum of opinions, a purposive sample was employed, which included individuals from various demographics. A systematic approach was employed to derive semantic significance from the extensive qualitative data sets. The process of coding in NVIVO allowed for the classification of unstructured data, hence facilitating the identification of trends and recurrent themes.

Thematic analysis is a widely utilized qualitative research approach that involves the identification, analysis, and reporting of patterns within collected data. In order to effectively capture the

fundamental experiences of the participants, the themes, which are essentially the repeated ideas and patterns, were carefully delineated. This methodology facilitated a comprehensive examination of the ramifications associated with the practice of illegal, unreported, and unregulated fishing on aspects such as food security, economic dynamics, livelihoods, and other significant community issues.

### 4.3 Summary of the interviews

The first respondent emphasized the significant ramifications of unauthorized fishing on the principal food supply of the native population. The decline in the fish population has prompted individuals to abandon their reliance on marine resources as a food source and instead transition towards the use of animal meat. The Chemballi fish, formerly a significant nutritional staple, has witnessed a significant decline or even complete eradication due to the prevalence of illegal fishing methods. Similar to the first respondent, the second respondent emphasized the economic consequences linked to the phenomenon of illegal fishing. The fisherman noted that the decline in fish catches has led to a significant decrease in the economic profits of indigenous fishermen, prompting a considerable number of them to seek alternative career opportunities.

The third respondent, identified as a local fisherman, offers a primary source testimony regarding the significant ramifications of illicit fishing activities on the port of Garada. The illicit fishing vessels have significantly diminished the fish populations, hence posing a threat to the community's sustenance and economic well-being. The current circumstances are characterized by a sense of urgency, as individuals are compelled to resort to alternate sustenance options such as rice, sorghum, and animal protein in order to ensure their survival.

Respondent 4, the Chairman of the local fishermen' union in Garaad, has similar concerns to those articulated by preceding interviewees. The act of engaging in illegal fishing practices has resulted

in a decline in the fish population, hence posing a significant risk to the community's ability to obtain their essential dietary source. There has been a decline in the presence of numerous fish species that were previously abundant within the region. The economic ramifications are substantial because the fishing community has lost more than half of its earnings to foreign IUU fishing vessels.

Respondent Five, a local fisherman residing in the Eyl district, provides insights into the distinct obstacles encountered by fishermen within their locality. The respondent made an alarming claim "*We have lost half the quantity of fish we used to get from the sea.*" Foreign fisherman engaging in illegal activities not only deplete marine resources through overfishing but also engage in the theft of equipment utilized by local fishermen, so depriving them of the means to sustain their livelihoods. Despite being alerted about the issue, the authorities have demonstrated a lack of effectiveness in providing sufficient help or taking appropriate action. Local fishermen are frequently stigmatized as pirates when they endeavor to protect themselves.

Respondent Six, an elderly fisherman in the Eyl district, offers a more comprehensive outlook on the enduring consequences of illicit fishing practices. The reduction in the population of individuals engaged in fishing activities and the quantity of fish harvested has led to a diminished dependence on fishing as a source of sustenance. The adoption of alternative food sources has been observed among individuals, resulting in the disappearance or decline of some fish species as a consequence of illicit fishing activities. The economic ramifications have been substantial, as evidenced by a notable decline of 90% in the income of individuals reliant on fishing activities.

Respondent Seven: A fisherman from Eyl shared that illegal fishing has drastically reduced fish populations, with certain species now almost extinct locally. This scarcity has forced the community to depend more on meat, impacting their diet and income. *"Many fish are simply gone from the sea now."*

Respondent Eight: A fisherman from Gara'ad reported that due to fish scarcity, around 50-80% of the community no longer relies on fish as a main food source, affecting both food security and economic stability. *"Nearly half the community has turned away from fish."*

Respondent Nine: Another fisherman from Eyl noted that local fishers must now travel further for minimal catches, leading many to leave fishing altogether due to financial strain. *"We travel farther now, but it's hardly worth it."*

Respondent Ten: A fisherman from Gara'ad observed that foreign vessels have reduced local fish stocks by over 80%, leading to severe economic hardship. *"Fish stocks have been wiped out by foreign vessels."*

Respondent Eleven: This fisherman from Eyl described the risks posed by encounters with foreign vessels, which threaten both their safety and livelihoods. *"Our boats and lives are at risk every time."*

Respondent Twelve: A community member from Gara'ad mentioned that many people have left fishing for urban jobs due to the reduction in fish stocks. *"Fishing just can't support families anymore."*

Respondent Thirteen: A fisherman from Eyl highlighted that foreign vessels frequently take their equipment, making it difficult for locals to continue fishing. *"They take our equipment, leaving us with nothing."*

Respondent Fourteen: Another fisherman from Gara'ad shared that the community now relies on foods like rice and sorghum due to the scarcity of fish, which disrupts traditional diets. *"Fish is so rare now that we rely on rice and beans."*

Respondent Fifteen: A local administrator pointed out that a lack of enforcement allows illegal fishing to continue, exacerbating economic issues for the community. *"These illegal fishers are free to exploit our resources."*

### 4.4 Theme 1: Economic Struggles and Livelihood Decline

The dominant theme in the interviews was economic hardship. The economic structure, previously reliant on the abundant resources of the ocean, is currently experiencing the adverse effects of a significant decline of 70% in fish harvests. For example, respondent one notes *"We have lost half the quantity of fish we used to get from the sea. For example, if we used to catch 100 kg of fish weekly, today we only catch around 18-20 kg. That means that more than ¾ of the fish population has decreased."* In the interview with a Local Fisherman in Eyl District the respondent notes *"The money we used to make has gone down a lot, almost to nothing. It's not bringing in much cash, and you can see how it's hurting the local economy. It's a big problem."*

The chairman of the Chairman of the Local Fishers' Union in Gar'ad notes "*Many people have left this profession, some have migrated, some have moved to other cities, and everyone has sought a better place where he can live.*" Throughout multiple generations, the inhabitants residing in the coastal regions of Garacad and Eyl District in Somalia have relied on fishing as their primary means of sustenance. In recent times, the phenomenon of IUU fishing has resulted in the depletion of fish stocks within certain specific regions. The economic downturn has had a profound impact on the local economy, resulting in a significant number of individuals seeking alternative employment opportunities.

The analysis of livelihood transitions in Garacad and Eyl District encompasses economic, social, and environmental dimensions, revealing a complex interplay among these factors. The decline in fish stocks has resulted in a significant decrease in the revenue of local fishermen. Numerous individuals have been compelled to transition to alternative occupations in order to achieve financial stability. A portion of the population choose to engage in agricultural activities, whereas

another segment relocated to urban areas in pursuit of employment opportunities. The Government Official in Puntland notes *"The perception that being a fisherman is considered a low-status occupation has been passed down through generations."*

The depletion of fish stocks has resulted in significant challenges for fishermen in maintaining the livelihoods of their families. Consequently, alternative sources of income must be sought. A number of individuals in the interviews wanted the implementation of more security on the waters to reduce IUU cases and protect the fishermen. Employment in maritime environments entails several hazards, such as the potential for accidents and the occurrence of injuries. Additionally, the respondents underscored the considerable time commitment and physical exertion associated with the practice of fishing and this had prompted some of them to switch careers in order to facilitate personal and professional growth. Understanding the patterns of livelihood shifts in Garacad and Eyl District is crucial for formulating targeted interventions that address the root causes of livelihood decline. These interventions should focus on promoting sustainable fishing practices to protect marine resources and ensure the long-term viability of the fishing industry, investing in alternative livelihood options, such as agriculture, tourism, and vocational training, providing support services, such as microcredit and business training, to help individuals establish new livelihoods, and strengthening social safety nets to protect vulnerable populations from the economic impact of livelihood decline.

### 4.5 Theme 2: Food Insecurity Dynamics

The issue of illegal, unreported, and unregulated fishing has significantly affected the food security of coastal populations residing in the Garacad and Eyl District of Somalia. The depletion of fish stocks, which serve as a fundamental source of sustenance, has compelled people and families to modify their dietary patterns and implement novel approaches to ensure their nutritional needs are

met. One of the respondents noted *"Our lives mostly depended on the fish we catch in the ocean as consuming or making a profit for selling, but now all of this seems gone. No income can manage our lives, and you can feel it in the impact in the village if you look closely."*

The dietary patterns of the local population have undergone modifications as a consequence of the scarcity of fish. The increasing shift in dietary demands and preferences has led to a rise in the consumption of imported packaged meals, indigenous staples such as beans, as well as varied meats and poultry. One respondent argues *"In the past, people were very dependent on fish. It has now been replaced by imported processed foods such as rice, pasta, etc. It has also replaced indigenous foods such as beans that grow in the country. People also switched to eating meat and chicken."* The aforementioned alterations have had an impact on their dietary patterns and overall nutritional well-being.

In spite of several obstacles, communities have successfully devised inventive strategies to address the issue of food insecurity. In order to augment their income from fishing, the individuals have contemplated engaging in agricultural pursuits and establishing small enterprises. One respondent argues "*Yes, they have. The locals have shifted to consuming animal meat, which was already a dominant food source in the region, as Somali people are pastoralists."* In addition, they have enhanced social support networks through the dissemination of resources and provision of assistance to community members who are particularly susceptible to adverse circumstances.

Glaser, Roberts, & Hurlburt, (2019) argue that all foreign fishing in Somali waters is unregulated, most goes unreported to Somali authorities, and this has severely impacted the food security of communities in Somali who relied on fish as the primary source of protein. IUU fishing activities lead to overfishing, reducing fish populations and threatening the sustainability of marine ecosystems (Glaser, Roberts, & Hurlburt, 2019). IUU fishing creates an uneven playing field, disadvantaging legitimate fishers who adhere to regulations and incur the costs of sustainable

fishing practices. Addressing IUU fishing requires a concerted global effort involving governments, international organizations, the seafood industry, and consumers.

Despite the impressive resilience exhibited by the communities, they have not been impervious to the problems presented by illegal, unreported, and unregulated fishing. Certain individuals and families have encountered difficulties in adjusting to their circumstances, which have manifested in challenges such as malnutrition and heightened levels of poverty. By employing a qualitative approach, we are able to discern narratives that shed light on the personal experiences of individuals residing within various communities. These narratives offer a comprehensive viewpoint on the significant influence of illegal, unreported, and unregulated fishing on the issue of food security, as well as the following adaptations implemented in response.

The results obtained from the theme analysis highlight the imperative to tackle the underlying factors contributing to food insecurity in the districts of Garacad and Eyl. Addressing this issue necessitates implementing specific interventions that prioritize the reduction of illegal, unreported, and unregulated fishing through the implementation of efficient monitoring, control, and surveillance mechanisms. Additionally, it involves advocating for sustainable fishing practices to safeguard marine resources and guarantee the sustained availability of essential food sources. Moreover, it entails investing in alternative livelihood opportunities to decrease dependence on fishing and establish diverse income streams.

### 4.5 Theme 3: Youth Migration

A significant number of young individuals have departed from their place of origin in search of employment opportunities, primarily driven by the decline of fish populations, which traditionally served as their primary source of income. A qualitative study has identified multiple characteristics that exert an influence on juvenile mobility in the Garacad and Eyl Districts. A comprehensive

analysis uncovers a multitude of causes, ranging from economic imperatives to the pursuit of knowledge.

For instance, the Local Fisherman in Gar'ad District notes that *"The disillusionment among our younger generation has prompted migration from towns like Eyl or Garad to larger urban centers."* This is an indication that young people are slowly abandoning local fishing communities and migrating to larger towns. The fisherman also notes *"On the other hand, there are those among us who have chosen to venture into urban centers, seeking better opportunities and a different lifestyle."* The migration is also caused by lack of education opportunities in small fishing villages. Gilmer (2016) also notes that due to illegal fishing, youth are migrating from fishing villages into towns that are renowned for piracy. This has prompted the introduction of the Somali fishermen registration programme which has successfully registered over 5000 fishermen. The Somali fishermen registration programme is a complex and controversial program that seeks to register all fishermen in Somali waters because pirates also pose as fishermen making it difficult for law enforcement to distinguish between genuine fishermen and criminals. However, the registration programme has been a valuable tool in the fight against piracy. It has helped to decriminalize Somali fishermen and made them less likely to engage in piracy.

As the youth residing in the Garacad and Eyl Districts continue to face the plight of loss of opportunities, this has made them relocate to urban areas and some have even emigrated to neighboring countries. Youth migration affects the local fishing communities by reducing the number of people available to engage in fishing activities. This pattern not only reduces the social capital of these coastal areas but also makes it more difficult for young people to complete their education because they are frequently compelled to drop out in pursuit of employment. Fishing is a labour-intensive venture and the youth emigration threatens the collapse of the native fishing

industry in Somalia. Youth emigration also put population pressure on big Somali towns such as Mogadishu

Gaining insight into the obstacles faced in achieving educational achievement is crucial in order to devise interventions that effectively target the underlying factors. The proposed solutions should prioritize the enhancement of infrastructure and allocation of resources towards the augmentation of education, provision of financial assistance, and implementation of measures to enhance resilience. The enhancement of Garacad and Eyl District's prospects can be achieved through the implementation of measures aimed at addressing educational challenges and providing support to the youth population.

### 4.6. Theme 4: Insecurity

The coastal villages of Garacad and Eyl District have experienced significant consequences as a result of illicit, unreported, and unregulated fishing. This study utilizes qualitative data collected from semi-structured interviews to examine the complex array of problems experienced by local fishermen. Specifically, we investigate the tangible interactions with foreign vessels as well as the intangible risks that have been ingrained in their everyday existence.

One of the respondents notes *"Not long ago, they took off my equipment and left me with no tools. We really couldn't handle it, and the quantity we caught was reduced."* This insecurity occurs when local fishermen are harassed by both large fishing vessels and security personnel that patrol Somali waters. This insecurity not only affects the economic wellbeing of the fishermen but also their mental and physical health. The fisherman added *"If they took your equipment, then the quantity (of fish caught) would reduce. They are overexploiting in the sea and don't leave us anything when we are in the sea for hours without getting any fish."* an indication of the desolation that the fishermen have to endure due to IUU.

The experiences shared by the participants provide a dramatic depiction of the difficulties arising from interactions with foreign vessels involved in unlawful fishing practices. The participants provide detailed accounts of situations involving intimidation, interference, and occasional direct encounters with these vessels. The qualitative data encompasses the experiential accounts of indigenous fishermen, offering a personal perspective on the challenges presented by illicit fishing activities.

In addition to physical interactions, our analysis encompasses an examination of the safety concerns expressed by participants. The local fisherman provides accounts of the daily hazards they encounter, encompassing confrontations and the challenges associated with traversing waterways beside unregistered fishing ships.

A study by Belhabib, Sumaila, & Le Billon, (2019) noted that IUU had profound impacts on maritime security in Somali. The authors note that although African waters are home to an abundance of fishery resources, IUU has severely affected the security of maritime waters which has made it hard for fishermen to obtain fish from the ocean. This insecurity also contributes to piracy and terrorism in the region (Belhabib, Sumaila, & Le Billon, 2019).

The study demonstrates the significance of the emotional burden experienced by local fisherman. The participants exhibit emotions of anxiety and profound concern for their food security. The thematic study investigates the emotional repercussions stemming from the persistent practice of illicit fishing. Comprehending these impacts is crucial in formulating comprehensive solutions that effectively tackle the tangible and intangible expenses faced by coastal towns.

### 4.7 Theme 5: Community Resilience

In spite of the issue of illegal, unreported, and unregulated fishing, the coastal villages of Garacad and Eyl District in Somalia have demonstrated remarkable resilience. Notwithstanding the decline

in fish stocks, which constitute their primary source of revenue, these indigenous communities have demonstrated resilience and perseverance.

One of the respondents noted *"We can help the government by providing information about illegal fishing activities and their Somali mercenaries in our area. We have submitted reports to the government several times, but nothing has been done yet."* an indication that the community was more than willing to help in the fight against IUU on the waters. Communities aspire to attain sustainable livelihoods that effectively fulfill their requirements and foster growth. The organization expresses a desire to diversify its operations outside the fishing industry, with a particular interest in venturing into sectors such as agriculture, tourism, and other related industries.

Communities have a profound relationship with their ancestral lands and rivers. The user's priorities encompass environmental sustainability, cultural identity, and generational heritage. One of the respondents noted *"Many of us have felt the impact of illegal fishing on our livelihoods. In response, some in our community are returning to the simplicity and familiarity of traditional rural life, finding solace and sustainability in our roots."* The recognition of the necessity for a coordinated endeavor is evident in their acknowledgment of the imperative nature of addressing the issues of illegal, unreported, and unregulated fishing. The emphasis is placed on fostering collaboration, facilitating the exchange of knowledge, and providing support.

Numerous individuals in the community express a desire for an improved quality of life for their offspring. For instance, another respondent noted *"We are planning to provide renewable fishing nets in all coastal districts, as well as solar or green energy devices to provide cheap electricity that they can use for fishing. This will help the people to get locally produced, cheaper proteins and will also encourage fishing skills among the youth and women to reduce poverty levels."* Their objective is to interrupt the perpetuation of poverty and offer individuals the chance to attain

success. There is a desire to preserve culture and communities acknowledge the intrinsic connection between their culture, environment, and customary practices.

The districts of Garacad and Eyl exemplify resilience, since they possess a steadfast belief in their ability to surmount challenges and construct a more promising future. The respondent's affiliation with their place of origin, dedication to collaborative endeavors, and optimism for an improved future serve as the impetus behind their aspirations for sustainable development.

### 4.8. Theme 6: Loss of species and biodiversity

The theme of loss of fish species was also prevalent in the interviews. Illegal, unreported, and unregulated (IUU) fishing is a serious global problem that is causing significant harm to marine ecosystems and the species that depend on them. IUU fishing can lead to the overfishing of target species, which can push them to the brink of extinction. IUU fishing often involves the use of destructive fishing gear, such as dynamite and bottom trawls, which can kill large numbers of non-target species, including dolphins, sea turtles, and seabirds.

One of the respondents noted *"In fact, many fish have disappeared such as Qardaha, Asibiha, chemballi fish and mackerel tuna."* The disappearance of native fish species could have been caused by introduction of invasive species or simple overfishing. The fishermen also added "*The fish that we used to get in the sea have all been caught today. The fish have been taken away by illegal fishers' trawlers and the remaining they moved because their habitats were destroyed by these unlawful fishing vessels."*

Another prevalent issue was habitat destruction and the loss of biodiversity. One of the respondents noted, *"Endangerment of the sea turtle, the Chamballi fish, shark fish, and the lobster has increased due to illegal fishing by some vessels that have destroyed their habitats."* The reduction

in the number of sea turtles is mostly due to habitat destruction from IUU activities. The picture below shows some of the fish species that have disappeared due to IUU activities in Somali waters.

***Figure 1: Chamballi fish***

The loss of fish species and biodiversity due to IUU fishing is a pressing global challenge (Samy-Kamal, 2022). By taking decisive action to combat this illicit activity, it will be possible to protect marine ecosystems, safeguard fish species, and preserve the rich biodiversity of the ocean for future generations.

**4.8 Synthesis of Findings**

The economic issues faced by local communities are a result of the depletion of fish supplies, which serve as a vital sustenance for these populations. As a consequence of unemployment and economic adversity, a significant number of individuals and households have been compelled to adopt alternative means of subsistence. The problem of illegal, unreported, and unregulated fishing has further compounded these challenges, posing a significant threat to the long-term viability of fishing as a means of livelihood and the marine ecosystem that sustains these communities.

The population of Garacad and Eyl District have demonstrated remarkable resilience in the face of numerous problems posed by illegal, unreported, and unregulated fishing activities. The aforementioned individuals have effectively utilized their collective resources and demonstrated ingenuity in order to adjust to evolving circumstances. They have proactively pursued alternative avenues of sustenance and ecologically conscious approaches to combat environmental degradation. The individual's aspirations for a sustainable future are rooted in a profound allegiance to their place of origin, a steadfast commitment to collaboration, and an enduring sense of optimism for the prospect of improvement.

The findings of the study align with the stated research objectives, as evidenced by a critical analysis. This study elucidated the intricate interplay of food poverty, declining livelihoods, and youth migration resulting from the practice of illicit, unreported, and unregulated fishing within local communities. Additionally, it unveiled measures employed by the community to enhance resilience and achieve sustainability objectives.

### 4.9 Limitations of the Study

The clandestine nature of illegal, unreported, and unregulated fishing poses a substantial challenge to data collection. The complex research landscape is shaped by the clandestine operations carried out by foreign warships and the probable hesitancy of community members to provide confidential information. Therefore, it is possible that the study may not comprehensively encompass the complete range of illegal, unreported, and unregulated fishing activities.

The primary focus of this study is directed at the coastal communities located in the Garacad and Eyl Districts of Somalia. Although the insights provided are significant in terms of localized viewpoints, it is important to note that the findings may not possess complete generalizability to

other places that possess diverse socio-economic and environmental circumstances. The restricted scope of the study region restricts the generalizability of certain findings.

Due to the delicate nature of illegal, unreported, and unregulated fishing activities and the potential consequences associated with divulging pertinent information, certain interviewees may have exhibited reluctance in openly discussing their personal experiences. The potential for bias in the data arises from the possibility that certain characteristics of the phenomenon under investigation may not be fully reported.

The researcher's perception of findings may be influenced by the cultural nuances present in the research context. Despite conscientious attempts to maintain cultural sensitivity, the presence of an outsider-insider dynamic may have implications for the extent of comprehension, perhaps resulting in the occurrence of misinterpretations.

The research was conducted under the constraints of limited resources, which had an impact on the extent and scope of data gathering. The comprehensive examination of all aspects of illegal, unreported, and unregulated fishing and its effects on communities could be hindered by limitations in terms of time and financial resources.

### 4.10 Implications for Policy and Practice

The findings from the data analysis demonstrate the extensive influence of illicit, unreported, and unregulated fishing on indigenous populations. There is a strong call for policymakers to implement and enforce rigorous legislation in order to mitigate these unlawful acts. The protection of coastal populations' livelihoods and well-being can be ensured by the enhancement of maritime monitoring, cooperation with international organizations, and the implementation of deterrent strategies.

The results highlight the necessity of implementing comprehensive plans for the management of fisheries. It is advisable for policymakers to take into account the adoption of sustainable fishing

practices, the establishment of unambiguous catch limits, and the promotion of community involvement in the preservation of resources. The utilization of technology for the purpose of efficient monitoring and control has the potential to enhance endeavors aimed at addressing the issues of overfishing and habitat damage.

In order to mitigate the economic challenges experienced by local fisherman, it is recommended that authorities allocate resources towards the development of contemporary fishing infrastructure. The provision of access to innovative fishing equipment and technology has the potential to augment the efficiency and production of local fisheries, thereby making a significant contribution to the rehabilitation of the economy.

The implementation of education and vocational training programs plays a pivotal role in the empowerment of coastal communities. It is imperative for policymakers to give precedence to efforts that focus on equipping local communities with the requisite skills to engage in a wide range of livelihoods, thereby diminishing their reliance on a vulnerable fishing industry. The process of diversification has the potential to strengthen the ability to withstand economic downturns that arise as a result of illegal, unreported, and unregulated fishing activities.

Local communities have the potential to actively engage in the effort to eliminate illegal, unreported, and unregulated fishing through taking the lead in raising awareness through campaigns. The dissemination of knowledge regarding the potential hazards and repercussions associated with illicit practices among fishers, coupled with the cultivation of a shared commitment to accountability, has the potential to enable local communities to take the lead in the fight against IUU fishing on Somali waters.

In light of the susceptibility of livelihoods to variations in fishing activities, community members are advised to actively pursue alternative avenues for generating revenue. The mitigation of the

economic impact of IUU fishing can be achieved through the diversification of livelihoods into sectors such as agriculture, tourism, or small-scale industries.

It is imperative that stakeholders, encompassing international organizations, non-governmental organizations (NGOs), and bordering countries, engage in collaborative efforts pertaining to maritime security measures. Collaborative endeavors in the realms of intelligence sharing, capacity development, and synchronized patrols have the potential to bolster the efficacy of activities aimed at countering illegal, unreported, and unregulated fishing within the region.

The allocation of resources towards sustainable development endeavors has the potential to foster economic expansion and enhance societal adaptability. Stakeholders are advised to provide their support to community-driven initiatives that facilitate job creation, enhance infrastructure, and cultivate self-reliance in response to external challenges.

### 4.11 Conclusion

This chapter delves into the effects of illegal, unreported, and unregulated fishing on the coastal communities of Garacad and Eyl District. Through this exploration, a rich tapestry of insights emerges that aligns with the firsthand experiences of the participants. The interviews and observations conducted provide a comprehensive portrayal of the difficulties encountered by individuals engaged in fishing at the local level. These problems encompass economic hardships experienced by these communities, as well as the complex interplay between food security, livelihoods, and the aftermath of illegal, unreported, and unregulated fishing practices.

The interview participants provided detailed accounts of their distressing encounters with foreign vessels involved in the illicit practice of illegal, unreported, and unregulated fishing in the interviews. These narratives such as “The perception that being a fisherman is considered a low-status occupation" emphasize the numerous hazards encountered by fishermen in the local

community. The recurring patterns observed in these occurrences underscore the urgency of implementing timely interventions aimed at safeguarding individuals who rely on maritime resources.

The research findings have significant implications for both Garacad and Eyl Districts, extending beyond their unique characteristics. The results are applicable to coastal communities worldwide that are experiencing the negative impacts of illicit, unreported, and unregulated fishing.

# CHAPTER FIVE

# RESULTS AND CONCLUSIONS

## 5.1 Results of the interviews

The study employs a qualitative research approach to analyze narratives shared by victims of illegal, unreported, and unregulated fishing activities. The utilization of in-depth interviews provides a comprehensive understanding of how IUU fishing has affected the livelihoods of local fishing communities in Somali.

From the analysis of the interviews, it has emerged that communities residing in the Garacad and Eyl Districts of Somalia have been adversely affected by illegal, unreported, and unregulated fishing. The fall in fish stocks, which serves as their primary source of income, has had a significant impact on their way of life.

The analysis has observed that local communities are actively pursuing alternative sources of livelihood as a consequence of the diminishing income derived from fishing activities. The individuals engage in the cultivation of sorghum and maize crops, as well as the operation of carpentry and handicraft enterprises. The implementation of diversification strategies has proven to be vital in generating essential revenue and enhancing the ability to withstand economic hardships. Communities have also established their social support networks via enduring challenging circumstances. Community-based organizations and cooperatives are established with the purpose of collectively sharing resources, providing mutual assistance, and engaging in collaborative action. These networks have proven beneficial for individuals within vulnerable communities, particularly those who are confronted with challenges related to food insecurity and economic adversity.

Illegal, unreported, and unregulated fishing has a significant impact on various communities; nonetheless, despite these challenges, some people continue to maintain a sense of optimism. The individuals in question aspire to achieve economic prosperity, promote social welfare, and prioritize environmental stewardship. The stakeholders express a desire to expand their economic activities outside the fishing industry, establish sustainable means of livelihood, and ensure the conservation of marine resources for the benefit of future generations.

The people of Garacad and Eyl District have been subjected to the challenges posed by illegal, unreported, and unregulated fishing, but have managed to endure. Individuals have made alterations to their means of subsistence, enhanced their interpersonal connections, and maintained a positive outlook on forthcoming circumstances. The individuals have the belief that through diligent efforts, unwavering determination, and cooperative endeavors, they can effectively address the issue of illegal, unreported, and unregulated fishing and establish a sustainable trajectory for the well-being of their families and communities.

### 5.2 Implications for Coastal Communities

It is imperative to establish a thorough understanding of the dynamics underlying illicit, unreported, and unregulated fishing before recommending guidelines to address the problems it poses in the coastal towns of Garacad and Eyl District, Somalia. A succinct summary of the main conclusions about interactions with foreign vessels, dangers for local fishermen, economic hardships, declines in livelihood, food shortages, difficulties in schooling, and youth migration offers a background against which well-informed and focused recommendations can be made. For indigenous fishermen, the existence of foreign fishing vessels in Somali waters has always presented a challenge. These boats frequently invade customary fishing areas, reducing fish populations and endangering the security of nearby fisherman. There have been reports of acts of

aggression, intimidation, and harassment, which raises questions about the safety and means of subsistence for individuals who depend on fishing. The local economy has suffered greatly as a result of the loss in fish stocks brought on by IUU fishing. Numerous families are experiencing severe financial difficulties as a result of losing their main source of income. As a result, families are finding it more difficult to pay for needs like food and water, which has increased food insecurity.

### 5.3 Recommendations for Addressing IUU Fishing

From the analysis, it has emerged that IUU fishing has had devastating consequences on the local fishing communities in Somali. It is therefore imperative that concerted efforts are undertaken by stakeholders to not only curb illegal fishing activities but also improve the wellbeing of local fishing communities. The following are the recommendation based on the analysis.

- Strengthen Marine Security and Discourage Illegal Fishing: To improve marine security, discourage illegal fishing, and guarantee the safety of local fishermen, cooperation with regional and global partners is crucial. Joint patrols, intelligence sharing, and enhancing the capabilities of regional marine law enforcement organizations could all be part of this.
- Use Community-Based Monitoring and Surveillance Technologies: Unauthorized fishing vessels can be found and tracked using surveillance technologies like drones and satellite monitoring systems. Furthermore, local communities can be empowered to report suspicious activity and give authorities up-to-date information by setting up community-based monitoring systems.
- Encourage Economic Diversification and Support Alternative Livelihoods: The fishing industry's downturn should be addressed by encouraging economic diversification and providing alternative income streams. This could include tourist, agricultural, and other

industry programs, skills development, and vocational training to give community residents the tools to explore new financial stability alternatives.

- Support community-led education: Community-led educational programs tailored to coastal issues are necessary to ensure high-quality education and prevent youth migration. These programs should emphasize cultural sensitivity, flexible learning, and relevant skills to suit fishing community needs.
- Encourage Sustainable Fishing and Protect Marine Ecosystems: Regulations that promote sustainable fishing are crucial. This includes creating fishing seasons, limiting fish catch, and using environmentally friendly gear and procedures. Incentives should also encourage sustainable practices to ensure resource availability and marine environment protection.
- Encourage Advocacy Efforts and Empower Local Communities: Local communities should be given the freedom to take part in advocacy campaigns, bringing attention to the effects of IUU fishing and influencing local, state, and federal policy decisions. This could entail working with area groups, taking part in policy discussions, and launching initiatives led by the community.
- Invest in Necessary Infrastructure to Promote Effective Transport and Marketing: To promote the effective transportation and marketing of fish, investments in necessary infrastructure such as better roads and storage facilities are crucial. This will raise local fishermen's income, decrease post-harvest losses, and improve the fishing industry's overall competitiveness.
- Identify the Distinctive Features of Every Coastal Community: Customizing interventions to the particular difficulties and possibilities encountered by each community makes it more likely that the advice provided is meaningful and contextually appropriate. A more

sophisticated and successful strategy for combating IUU fishing in Somalia is made possible by acknowledging the distinctive characteristics of each coastal town.

These ideas offer a framework for resolving the issues the coastal communities of Garacad and Eyl District are facing. They are based on a thorough study of the dynamics surrounding IUU fishing. We can strive toward a future in which these communities may prosper sustainably and reap the rewards of their abundant marine resources by putting into practice focused initiatives, encouraging cooperation, and empowering local communities.

### 5.4 Comparative Analysis with Existing Literature

Our research explores the effects of illegal fishing on specific fishermen and their communities, providing in-depth understanding of the feelings and experiences that arise from coming into contact with foreign vessels. The study provides practical advice for boosting community resilience in addition to identifying obstacles. The suggestions are grounded in qualitative depth, resulting in a workable framework for resolving the intricate effects of IUU fishing.

Our work adds to the body of literature by examining the psychological costs incurred by local fishermen, even as it recognizes the safety problems related to IUU fishing. This convergence draws attention to the common problems encountered, but it also shows the necessity of specialized solutions that deal with mental health. The relationship between IUU fishing and youth migration has been acknowledged in the literature, but our qualitative investigation offers new insights into the obstacles to schooling and a more complex picture of the difficulties young people in coastal communities confront.

It is critical that we consider the information gaps that still exist in the literature as we contextualize our findings. Future research efforts can be directed towards the areas where our analysis sheds light on previously undiscovered features or offers fresh views. The dynamic character of the IUU

fishing environment is highlighted by this analysis, which also highlights the necessity for ongoing scholarly research to address changing issues facing coastal communities.

### 5.5 Recommendations for Future Research

This study has delved into the intricacies of IUU fishing on Somali waters. Further, the study is far from perfect and further research is needed to identify how the different interventions have helped local communities fight the challenge of illegal fishing activities. The following are the recommendations for future research.

- Perform longitudinal research to monitor changes over time and evaluate how long-lasting the interventions that have been put in place are. This strategy would offer insightful information about how well laws and community-led programs work to mitigate the effects of IUU fishing.
- Promote interdisciplinary cooperation between policymakers, marine biologists, and social scientists. Through such partnerships, IUU fishing's ecological and socioeconomic aspects can be better understood, leading to more integrated solutions.
- Examine the efficacy of various policy initiatives in the fight against illegal fishing in the United States and other countries. To lessen the negative consequences on coastal communities, this could involve comparing regulatory systems, international partnerships, and community-driven projects.
- Examine how technology and environmentally friendly fishing methods might work together as possible remedies. Examine the ways that fisheries management innovations, such as blockchain technology and satellite monitoring, can help to discourage IUU fishing and encourage ethical behavior.

- Analyze how IUU fishing and climate change interact. Given the interdependence of environmental and human factors, examine the effects of climate-induced changes in marine ecosystems on the frequency and trends of illicit fishing.

Research gaps highlight the need for continued scholarly exploration into the dynamic nature of IUU fishing. These suggestions are meant to serve as a guide for future investigations that go further into the intricacies of this problem, promoting a more comprehensive understanding and aiding in the creation of successful tactics for the resilience of coastal communities.

### 5.6 Conclusion

The qualitative research looked into the lived experiences and narratives of individuals directly affected by IUU fishing. Through in-depth interviews, we explored the human dimensions of this dilemma, exposing the intricate stories of interactions with foreign vessels and the hazards faced by local fisherman. The emotional nuances and contextual complexity included in these tales provided more in-depth knowledge of the issues encountered by coastal communities.

Understanding the consequences of IUU fishing demands a holistic approach that embraces qualitative depth. The detailed insights gathered from this study provide a platform for informed decision-making and focused actions. As we reflect on the holistic understanding acquired from this research, the pathways forward become clearer: Based on the analysis in the previous chapter, the following strategies would help curb IUU fishing in Somali waters and improve the wellbeing of local fishing communities.

- Develop and implement integrated policies that address both the ecological and socio-economic components of IUU fishing. Which would involve the collaboration between policymakers, scholars, and local communities to guarantee a holistic and sustainable strategy.

- Empower coastal communities through community-led projects. Recognize the resilience and agency of these communities, promoting collaborations that highlight local perspectives and encourage sustainable practices.
- Explore technological options to tackle IUU fishing, such as satellite surveillance and blockchain technology. Leveraging these advances can boost monitoring capabilities and facilitate traceability in the fishing supply chain.
- Integrate climate change adaptation measures into fisheries management. Recognize the connection between climate-induced shifts in marine ecosystems and the frequency of IUU fishing, addressing both concerns collectively.
- Advocate for worldwide coordination to stop IUU fishing. Recognize the transboundary nature of this issue and support cooperation across countries to increase enforcement and promote sustainable fishing practices.

As we close this chapter, the holistic understanding acquired through the synthesis of qualitative dimensions acts as a compass, leading future endeavours toward successful ways of tackling the complex difficulties created by IUU fishing in coastal communities

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**APPENDIX (A)**

UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA · UNIVERSITEIT VAN KAAPSTAD

**2023/09/02**

**COM/00405/2023**

**RE: Research Ethics Committee Project Approval Letter**

**Dear Luqman Jama,**

Your application for ethics review of your project titled

Analyzing the socio-economic impact of illegal, unreported, and unregulated fishing on Somalia's coastal communities

has been reviewed and evaluated by the Commerce Research Ethics Committee.

You may proceed with your research project titled:

Analyzing the socio-economic impact of illegal, unreported, and unregulated fishing on Somalia's coastal communities

Please note that should:

i. any serious or adverse effects to participants occur and/or,
ii. aspect(s) of your current project change and/or
iii. any unforeseen events that might affect continued ethical acceptability of the project occur then you should immediately report this to the approving REC. You may be required to submit an amendment to this application, in order to determine whether the changed aspects increase the ethical risks of your project.

Based on the information supplied your application has been successful and is approved. Please note the following additional conditions associated with this approval:

i. Informed consent document must include a statement on how data will be stored; who will have access to that data

(In general, a data management plan should be formulated)

Regards,

Commerce Research Ethics Committee.

# APPENDIX (B)

Date: 14. September.2023

Sharmake Yasin Ali
Director General
Ministry of Fisheries and Marine Resources
Puntland State of Somalia
Garowe, Puntland, Somalia
Dg.mofmr@plstate.so

Mr. Luqman Jama
8, Hornsey Road, Mowbray, Cape town ,
South Africa

**Subject:** Approval for Research on the Socio-Economic Impact of Illegal, Unreported, and Unregulated Fishing in Eyl and Gara'ad Districts, Somalia

I am hereby giving to you approval and support for your research project, which aims to analyze the socio-economic impact of illegal, unreported, and unregulated (IUU) fishing in the Eyl and Gara'ad districts of Somalia. Your research aligns with our commitment to addressing the challenges posed by IUU fishing and its impact on our coastal communities.

You will have access to relevant data, field visit permissions, collaboration opportunities with experts, feedback support from our ministry. Your findings will be instrumental in shaping future policies and strategies to combat IUU fishing and promote sustainable economic development along our coasts.

Thank you for your dedication to this important cause.

Sincerely,

**Sharmake Yasin Ali**
**Director General**
**Ministry of Fisheries and Marine Resources**
**Puntland State of Somalia**

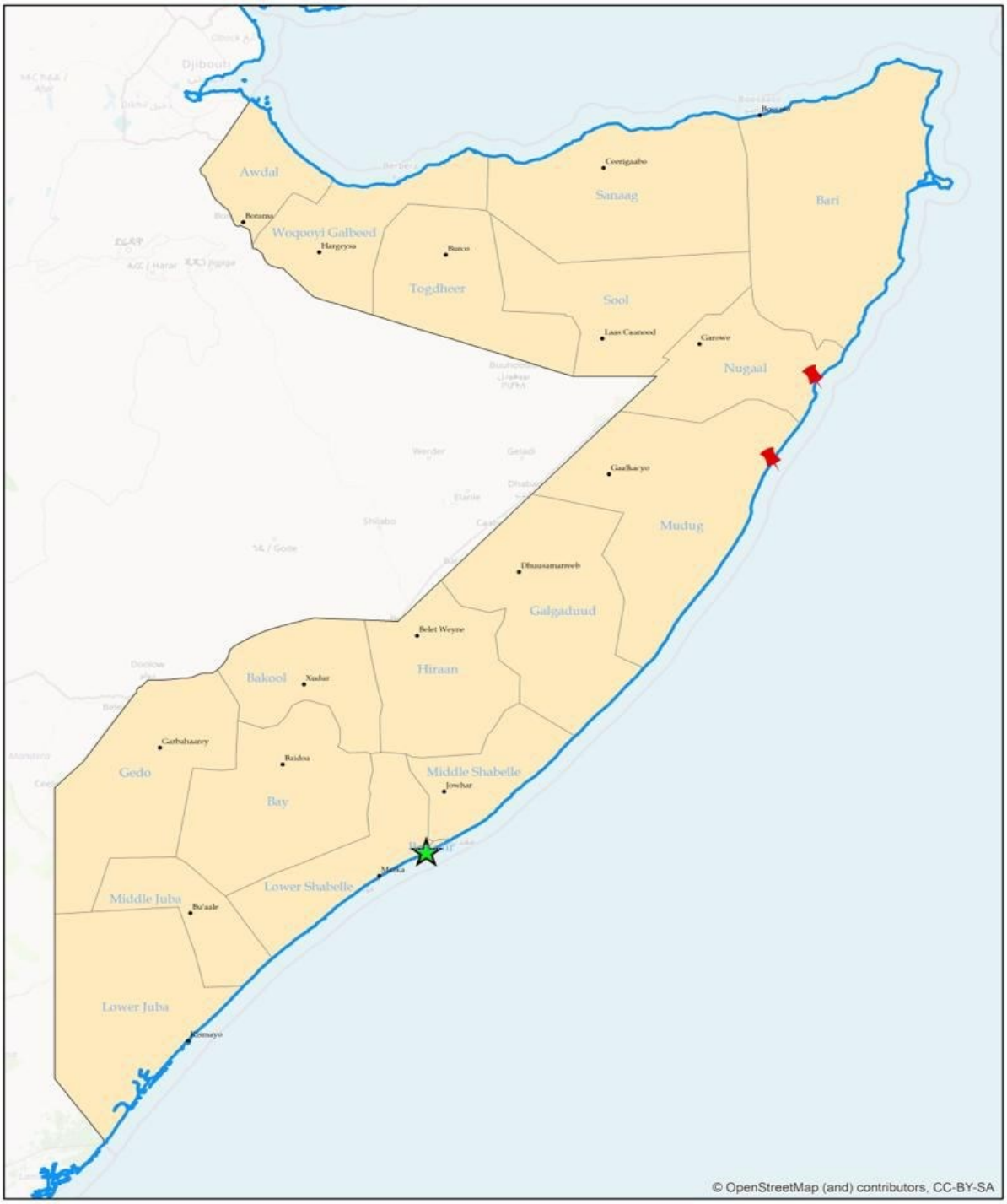
Signed by candidate

# APPENDIX (C)

# APPENDIX (D)

# APPENDIX (E)

# APPENDIX (F)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