DISCLAIMER

The views expressed herein are those of the author and do not necessary reflect the views of the government of the Kingdom of Morocco, the United Nations, the Nippon Foundation of Japan, or Max Planck Foundation for International Peace and the Rule of Law

ABSTRACT

The transboundary nature of Illegal, Unreported and Unregulated (IUU) fishing brought to light a number of legal challenges for States, particularly with regard to the question of sovereignty and the scope of jurisdictions exercise. Combating IUU fishing and overcoming its challenges, hence, needed cooperation at a regional and international level to revive a pragmatic debate and include the exercise of jurisdictions in a logic of collegial construction

SUPERVISORS

Dr Arron N. Honniball
Senior Research Fellow
Max Planck Foundation for International Peace and the Rule of Law

Valentina Germani
Legal Officer, Programme Advisor
Division for Ocean Affairs and the Law of the Sea -DOALOS
Office of Legal Affairs of the United Nations
New York, United States of America

Vanessa Arellano Rodríguez
Associate Legal Officer
Division for Ocean Affairs and the Law of the Sea -DOALOSS

OECD	The Organization for Economic Cooperation and Development
ONP	National Office of Fisheries
ONSSA	National Food Safety Office
PSMA	Port State Measures Agreement
RFID	Radio Frequency Identification
RFMO	Regional Fisheries Management Organizations
SAMAC	Certification of Catches and Computerization System
SAR	Synthetic Aperture Radar
SGG	General Secretariat of the Government
SMM	Sense Making Methodology
UN	United Nations
UNCED	The1992 United Nations Conference on Environment and Development
UNCLOS	United Nations Convention on the Law of the Sea
UNFSA	The 1995 United Nations Fish Stocks Agreement
VHF	Very High Frequency
VMS	Vessel Monitoring System

AKNOWLEDGMENT

I would like to express my deepest gratitude to those who have played a pivotal role in my journey as a United Nations fellow. This incredible experience has been a culmination of support, mentorship, and collaborative efforts that have shaped my understanding and commitment to making a positive impact.

First and foremost, I extend my sincere appreciation to my supervisor Honniball Arron Nicholas, Senior Research Fellow at Max Planck Foundation for International Peace and the Rule of Law whose unwavering guidance, expertise, and encouragement have been invaluable throughout this research endeavor. Your commitment to excellence and passion for advancing knowledge have been a constant source of inspiration.

I would like to express my sincere thanks to Valentina Germani and Vanessa Rodriguez for their valuable assistance and guidance. It wouldn't have been possible without your understanding and support.

I am profoundly thankful to the United Nations-Nippon Foundation Fellowship Program for providing me with the opportunity to participate to this program. Being a United Nations fellow has not only broadened my perspectives but has also allowed me to engage with diverse cultures, ideas, and solutions on an international stage. I wish to extend my sincere gratitude to Krusemark-Camin Johannes, managing Director at Max Planck Foundation for International Peace and the Rule of Law for encouraging my research.

I am indebted to my colleagues and fellow researchers who have shared insights, provided constructive feedback, and offered support throughout this program. The sense of camaraderie within our group has made the pursuit of knowledge a truly enriching experience. Lastly, I want to express my deepest gratitude to my late father NATIFY ABDELKEBIR for his constant support, encouragement and untold number of sacrifices for me. Thank you, MAMA, for your support, you are a great inspiration to me. Big thank you my loving husband, Badr

Table of Contents

Aknowledgment

Abract

List of Abbreviations

List of Figures

Introduction

Part 1- Moroccan coastal state efforts to combat IUU fishing from the perspective of alignment with international instruments.

Chapter 1- The international framework defining the roadmap for governance policies in the fight against IUU fishing

Section A- International legal framework to combat IUU fishing

Subsection A.1 – UNCLOS and cmplementary instruments and agreements

Subsection A.2 – Challenges within the UNCLOS legal framework

Section B - Legal and organizational framework for Combating IUU fishing in Morocco

Subsection B.1 – Morocco's legal framework and enforcement policy against IUU fishing

Subsection B.2- Combatting IUU fishing throught surveillance, cooperation and awarness

Chapter 2- Evaluation of the level of implementation of measures to address the IUU fishing and alignment with international recommendations in Morocco

Section A- Administrative and legal levels

Subsection A.1- Administrative level

Subsection A.2- Legal level

Section B: Technical and technological levels

Subsection B.1: Technical level

Subsection B.2: Technological level

Methodology- Qualitative Ethnomethodological approach

Part 2- Analysis of the governance policy to combat IUU fishing in Morocco: gaps and opportunities

Chapter 1- Constraints on efforts to combat IUU fishing in Morocco

Section A- Governance policies and territorial integrity

Subsection A.1- Moroccan sovereignty a

Chapter 2- Morocco's Opportunities and Obligations to strengthen its Fight against IUU Fishing

Section A- Data processing techniques and proactivity

Subsection A.1- Data processing and exchange as pillars of decision making

Subsection A.2- Data mining and anticipation of risks and fraud with irreversible effects in the context of IUU fishing

Section B- The Needs for

LIST OF FIGURES

Figure 1: Morrocan Department of Fesheries organigram

Figure 2: The Moroccan-Spanish marine border

Figure 3: The Moroccan-Canary Islands maritime border

Figure 4: The Morocco-Mauritania maritime border

Introduction

the 2021, the 24th Session of the FAO Committee on Fisheries (COFI) unanimously endorsed the COFI Declaration for Sustainable Fisheries and Aquaculture[1]. This Declaration recognized the fisheries as an important sector for their important contribution in combating poverty and hunger since the endorsement of the 1995 Code of Conduct for Responsible Fisheries[2]. However, marine resources are limited and, for that reason, they have to be managed in an effective and proper way for future generation[3]. According to the FAO's assessment, the percentage of stocks fished at biologically unsustainable levels has been increasing since the late 1970s, from 10 percent in 1974 to 35.4 percent in 2019[4]. This situation is threatening environment, food security, and economies worldwide if not settled seriously. According to FAO report, global marine captures were 78,8 million tonn 0 1 2418871 0 59571 0 020.000008871 0 595.32 8

In 2022, the Financial Transparency Coalition published a report estimating the economic loss in this region at approximately 9,4 billion dollars annually due to IUU fishing[8].

Morocco has a coastline of 3500 km that is one of the richest in the world in terms of fisheries. The country's fishing sector faces several challenges, despite the fact that the sector has grown in recent years. Illegal, Unreported and Unregulated (IUU) fishing is one of the major challenges faced by Moroccan fisheries sector. Since 1994, the country has been collecting national data for IUU fishing and the most infringements concern inter alia unauthorized fishing, unauthorized or undeclared catches and fishing in prohibited areas or during the prohibited season. It is worth noting that a national study has been carried out to estimate revenue of these practices but limited information available in particular regarding data on by catch and ghost fishing constrained this study.

In another context, the international framework plays a crucial role in directing governance policies in the ongoing fight against Illegal, Unreported, and Unregulated (IUU) fishing. The 1982 United Nations Convention on the Law of the Sea (UNCLOS), provides the general legal framework for the regulation of all activities in the seas, including fishing activities even if it did not manage to prevent the overexploitation of some fish stocks and other issue such as IUU fishing. The reason why the need for the development of further instruments resulting in the 1995 United Nations Fish Stocks Agreement (UNFSA) and other instruments developed under the auspices of the Food Agriculture Organization of the United Nations (FAO), such as the 1993 FAO Compliance Agreement and the Port State Mea

countries and coastal states to ensure sustainability of fishing stocks and hence reduce IUU fishing.

In this regard, Morocco has made considerable efforts to combat IUU fishing through the implementation of the international instruments mentioned above such as ratifying the United Nations Convention on the Law of the Sea in 2007, becoming Party to the 1995 United Nations Fish Stocks Agreement (UNFSA) and Party to the international binding Agreement on Port State Measures (PSMA) to prevent, deter, and eliminate Illegal, Unreported and Unregulated fishing in 2022.

At regional level, Morocco collaborates closely with RFMOs in the Mediterranean region as well as in Atlantic region and commits to their standards by adopting their decisions and regular measures into Morocco's national law to fight against IUU fishing. Among the main measures, Morocco agreed within the General Fisheries Commission for the Mediterranean (GFCM) to launch new tools to track all fishing vessels activities in the Mediterranean Sea. Adopting new catch documentation schemes to help to identify the origin of fish products, implementing GFCM IUU vessel list as well as the exchange of information on access agreement and joint inspections procedures in the Mediterranean region to facilitate monitoring, control and surveillance (MCS) are other measures adopted by Morocco, within GFCM to fight against IUU fishing.

From above, it can be stated that Moroccan authorities have committed to successfully implement the international instruments to fight against IUU fishing. However, despite the notorious progress, the effectiveness and proper implementation of these instruments and measures remain dependent on effective institutional and informational governance, in one hand, and improvement of capacity building, in the other.

This thesis attempts to expose the IUU fishing threats and its negative worldwide impacts and the response of the international community in tackling it, while giving consideration to national implications, that necessarily arise from implementing international instruments to combat IUU fishing and examines and explore the Moroccan governance and building capacity problems along with the regional machinery as a facilitator for full and effective implementation of international conventions and instruments in the fight against IUU fishing.

Thus, this thesis is divided into two parts. The first part discusses Moroccan coastal efforts to combat IUU fishing from the perspective of alignment with international instruments and the second part provides an analysis of the governance policy to combat IUU fishing in Morocco and identifies gaps and opportunities in this context. For this purpose, this thesis will address the following points:

ensure two levels of analysis of the international regulatory corpus. The first concerns the recommendations and requirements for the processes related to the management and governance of public action against IUU fishing. The second level deals with the legal framework: legal qualification of acts related to IUU fishing, mediation bodies, modalities of conflict resolution at the national and international levels.

tackle recommendations and requirements related to technical devices (VMS, field control tools, modalities for the exercise of certain techniques and practices to combat IUU fishing) and recommendations and technological requirements related to standards, norms, protocols and formats for the repatriation of data, their processing and exchange, while respecting the principles of integrity and interoperability.

ensure two levels of analysis of the Moroccan regulatory and procedural corpus, with respect to international regulations and recommendations. At the first level, analyze and evaluate the processes and procedures related to the management and governance of public action against IUU fishing. At a second level, analyze the Moroccan legal and regulatory corpus dealing with the legal qualification of acts related to IUU fishing, modalities of penalization, mediation and penalization instances, modalities of conflict resolution at the national and international levels, articulation of Moroccan jurisdiction, on the one hand, and international fishing law, on the other.

identify and evaluate the Moroccan advances in the techniques of the fight against IUU fishing (VMS, field control tools, modalities of exercise of certain techniques and practices of the fight against IUU fishing) and analysis of the standards, norms, protocols and formats of data repatriation, processing and exchange, at the national and international level, in the respect of the principle of integrity and in the concern of interoperability.

highlight the particularity of the plural legal regime that concerns Moroccan territorial waters and that constrains Moroccan public action as well as the less-than-optimal articulation of the different actors in the fight against IUU fishing: administrative, associative, professional and military actors.

highlight the differences regarding, first, the levels of technological penetration, integration and production in Morocco, related to the fight against IUU fishing and s

- *Habit.* A habit that attaches itself to changes in the environment and conditions;
- *Hegemony*. A power relationship that develops during the interview and pushes the interviewer to exert pressure in the direction of his or her interests. The awareness of this power relationship calls for more discipline so as not to go beyond the scientific framework of the method,
- *Habitus*. Touches on the analytical aspects related to the powers observable by the communicative mechanisms.

In this sense, the interview by the Dervin method is based on the metaphors space-time, action or movement, discontinuity and outcome or result, which follow one another to put the actor's action in a single line, taking into consideration the element of the gap in the context (space and time) to create meaning. Also, three main questions must form the background of the interview based on the Dervin method:

- A first question prompting the interviewee to describe a situation or information gap detected during the performance of his or her business activities;
- A second question focusing on attempts to solve the problem expressed following the first question,
- A third question seeking to identify the interviewee's expectations.

The interviewer is expected to be flexible and have a clear strategy when conducting interviews and must be able to arrange and combine the elements and concepts of the sense-making process.

The advantage of this technique is that, via the answers, the movements of our interviewees can be traced, as verbs can translate the movement, unlike nouns, freezing the action and tearing it away from its context (space-time).

1- Identification of interviewees

Due to access rights considerations, just three decision-makers from the Department of Fisheries were allowed to be interviewed. One (1) of the interviewees is a woman. Two of the decision-makers are over the age of 45 while the third decision-maker is under the age of 45. It should be noted that the targeted responsible are directly involved in fisheries control and surveillance at the central level and having expertise and sound knowledge of MCS matters and which combatting IUU fishing is top priority in their daily work within the Ministry of Fisheries.

3- Classification of situations identified at the Moroccan FMC in applying technological solutions in fisheries control

Based on the interviews conducted, three categories of situations are identified, namely:

Punctual situations

These are time-limited situations or problems related to specific problems at medium frequencies. Two main specific situations have been identified:

a) To make a decision regarding fishing vessels present outside Moroccan EEZ without an EEZ fishing license;

b)

Drawing up a *verbing* table was found to be inappropriate since the number of interviewees is small. However, three categories of situations were identified and prioritized. It is therefore based on these three interviews, rich in information, that the following parts, particularly the second part, will bring a deep understanding of how things are conducted in the Moroccan reality.

Part 1- Moroccan coastal state efforts to combat IUU fishing from the perspective of alignment with international instruments.

Chapter 1- The international framework defining the roadmap for governance policies in the fight against IUU fishing

The Part 1 of this thesis gives an overview of the key provisions of the major global treaties which are relevant to IUU fishing activities. It then reviews the efforts made by global and regional bodies to combat IUU fishing and then examine the Moroccan efforts to fight against IUU fishing. To achieve this goal, this work intends to answer the following questions:

1-What is the international legal framework relevant to States regulation in combating IUU fishing?

2-What is Morocco law against IUU fishing?

Section A- International legal framework to combat IUU fishing

Subsection A.1 –

while the International Plan of Action (IPOA) to Prevent, Deter and Eliminate IUU fishing, and the 1995 FAO Code of Conduct for Responsible Fisheries (Code of conduct) are non-legally binding instruments. All these international instruments are recognized for contributing to combat IUU fishing. However, it should be noted that the UNCLOS provisions particularly those relating to fisheries have a universal acceptance, with 169 parties including Morocco, as reflecting general international law. The same for Port State Measure Agreement (PSMA) which has 78 signatory countries including Morocco and has a binding character. While the United Nations Fish Stock Agreement (UNFSA) and the Food and Agriculture Organization (FAO) Compliance Agreement have a limited number of parties, 92 and 45 respectively.

In the following an examination of States duties and responsibilities relating to IUU fishing based on an analysis of the provisions and requirements of each international instrument. Starting by the first relevant global international instrument governing fisheries: the United Nations Conventions on the Law of the Sea (UNCLOS) which has three basic regimes: coastal State sovereignty, coastal sovereignty rights and flag State jurisdiction.

In relation to coastal State rights and duties, Articles 56 and 62 of the UNCLOS provide that coastal States have sovereignty over their territorial seas and the sovereign right to explore, exploit, conserve and manage the living marine resources in their exclusive economic zone (EEZ) and their continental shelf as well as the responsibility to adopt and effectively implement appropriate measures to conserve and manage the resources within such marine areas. However, in the territorial sea this sovereignty is subjected to the right of innocent passage. Nonetheless, coastal States have complete authority to control fishing activities in its territorial sea. The Article 19 paragraph 2(i) of UNCLOS defines the right of innocent passage and states that one of non-innocent activities in the territorial sea is to conduct any fishing activities. Thus, Article 21(e) of the Convention permits the coastal State to adopt certain laws and regulations relating to innocent passage in respect of *inter alia* "the prevention of infringement of the fisheries laws and regulations of the coastal State". More importantly, the existence of a right of innocent passage, even for fishing vessels, imposes certain limitations on what can be done by the coastal State to such vessels where they are not engaged in fishing. Where a vessel is engaged in any fishing activities within the territorial sea without a valid authorization, it can be dealt with in accordance with the extensive powers of the coastal State.

In territorial seas, that Morocco requested its extension to 12 nautical miles in 1973[13], fishing activities fall under the exclusive jurisdiction of the coastal State. Nevertheless, the Convention does not provide coastal State detailed guidance on exercising their law-making jurisdiction over the management and conservation of living resources in this zone[14]. Foreign vessels exercising the right of innocent passage in the territorial sea are not allowed to engage in fishing activities. Additionally, foreign vessels exercising

Article 94 states further that the flag state must take the necessary administrative measures to ensure that the vessels flying the flag are not involved in activities that interfere with the conservation and management of living marine resources. But if such violations occur and reported by another country, the flag state is obliged to carry out an investigation and, if necessary, take whatever action is necessary to improve the situation.

Based on Article 192 the flag state is obliged to ensure that vessels flying their flag comply with the biological resource conservation measures imposed by coastal states in their EEZ.

Article 58 paragraph 3 and Article 62 indicate that the flag state has the obligation to take the steps necessary to ensure compliance of ships flying their country's flag against the rules adopted by coastal countries in WKH UHV

responsible fishing however, their responsibility in case of failure as a result of IUU fishing is not addressed adequately[23].

With the objective to fill the void of the Convention, the FAO started to take up the question of IUU fishing and have attempted to address this issue and find a common solution to it. Among the main outcome of FAO's efforts was the 1993 Compliance Agreement and the 1995 UN Fish Stocks Agreement (UNFSA)[24].

The FAO Compliance Agreement, entered into force in 2003, promotes compliance with international fisheries conservation and management measurers and deals with the flag State responsibility to take such measures as may be necessary 'to ensure that fishing vessels entitled to fly its flag do not engage in any activity that undermines the effectiveness of international conservation and management measures[25].

The flag state responsibility in the authorization to fish on the high seas as well as increased transparency through exchange of information is addressed in article III of the FAO Compliance Agreement. This later is the most important provision of this instrument, especially in the context of IUU fishing activities, since it sets out the responsibility of the flag State in respect of fishing vessels operating on the high seas [26]and elaborates several obligations for parties whose fishing vessels operate on the high seas.

Under article III of the FAO Compliance Agreement flag States, whether or not a member of a RFMO that has adopted international conservation and management measures, have to take measures as may be necessary to ensure that fishing vessels entitled to fly their flags do not engage in any activity that undermines the effectiveness of international conservation and management measures. Also, according to article III of the FAO Compliance Agreement, no Party shall allow any fishing vessel entitled to fly its flag to be used for fishing on the high seas unless it has been authorized to be so used by the appropriate authority or authorities of that Party. A fishing vessel so authorized shall fish in accordance with the conditions of the

---

[23] Gianni, Matthew (2004). *IUU Fishing and the Cost of Flag of Convenience Countries*. In, OECD Fish Piracy Combating Illegal, Unreported and Unregulated Fishing, OECD.

[24] Jean-Jacques Maguire and others, *FAO Technical Paper : the State of World Highly Migratory, Straddling and Other High Seas Fishery Ressources and Associated Species* (Rome : Information Division of FAO, 2006),p.2.

[25] See report of the FAO World Conference on Fisheries Management and Development, FAO, Rome, 1984

[26] Balton, David A. and Holly R. Koehler (2006). Reviewing the United Nations Fish Stocks Treaty. *Sustainable Development Law & Policy*, (Fall), pp. 5-9.

authorization. Moreover, no Party to the Agreement shall authorize any fishing vessel entitled to fly its flag to be used for fishing on the high seas unless the Party is satisfied that it is able, taking into account the links that exist between it and the fishing vessel concerned, to exercise effectively its responsibilities in respect of the vessel.

Under Article IV of the FAO Compliance Agreement, flag States are required to maintain a record of fishing vessels which have been duly authorized for fishing on the high seas and to take such measures as are necessary to ensure that all such vessels are entered on that record. On the other hand, pursuant to Article VI, such information has to be made available to FAO on a real time basis by the flag State.

The Agreement calls also for collective actions and amongst the matters referred to are the exchange of information, including evidentiary material, relating to activities of fishing vessels in order to assist the flag State in identifying those vessels flying its flag reluding evideiIh12 84 0

nt s authorizatiounlitsevideiIh12 84 0 595.32 841.92 reW* nBT/F3 12 Tf1 0 0 1 70.86 504.16 Tm0 g0 G[yess)-2(els)1 3 46

flag states including those related to fishing vessel registration, fishing authorization, and fishery control, monitoring and surveillance. The latter extends its member states obligations to include, *inter alia*, the duty to" apply the precautionary approach" and the duty to" take measures to prevent or eliminate overfishing and excess fishing capacity" (Article 5 of UNFSA). Additionally, coastal States may abide to non-binding instruments, such as the FAO Code of Conduct for Responsible Fisheries.

With respect to flag State responsibility, Article 18 (3) (a) (b) (iv) of the UNFSA provides that it is the responsibility of flag States to exercise effective jurisdiction and control over vessels flying their flag wherever the vessels operate in area under and/or beyond national jurisdiction and to ensure the vessels flying their flag do not engage unauthorized fishing within areas under jurisdiction of other countries.

Furthermore, the UN Fish Stocks Agreement has introduced two new tools for enforcing

2001 and the Agreement on Port State Measures to Prevent, Deter and Eliminate IUU fishing in 2009[28].

The IPOA-IUU, being the first international instrument targeting IUU fishing (Article 2(d) of the Code of Conduct)[29], provides full range of measures that can be incorporated into national legislation by states addressing IUU fishing[30] and aims at the implementation of measures to prevent, deter and eliminate IUU fishing by focusing on all State responsibilities, flag State responsibilities, coastal State measures, port state measures, internationally agreed market-related measures, research and regional fisheries management organizations. The implementation of this instrument focuses on the elaboration of national plans of action on seven types of measures such as coastal State measures, port State measures, and market related measures[31].

The IPOA-IUU fishing, further, recognizes the increasing importance of Monitoring, Control and Surveillance (MCS) operations in fisheries and marine conservation. Thus, paragraph 24 and other relevant provisions of the IPOA-IUU give a wide variety of MCS tools to curb IUU fishing, including vessel monitoring systems (VMS), observer programs, catch documentation schemes, inspections of vessels in port and at sea, denial of port access and/or privileges to suspected IUU vessels, maintenance of “black” and “white” lists[32], and the creation of presumptions against the legitimacy of catches by non-party Fishing vessels in areas regulated by Regional Fisheries Management Organizations (RFMOs). Additionally, the IPOA-IUU, under Paragraphs 28-31, provides ways in which States should cooperate to prevent, deter and eliminate IUU fishing, including through their participation in RFMOs.

Regarding coastal States responsibilities under the IPOA-

competencies to carry out coordinated and cost-effective MCS operations to combat IUU fishing through port State measures and complementary measures, developing national, regional and global information systems and knowledge management systems to support the implementation of the PSMA and complementary international instruments, regional mechanisms and market measures[35].

[35] M. Camilleri. Taking action to prevent, deter and eliminate Illegal, Unreported and Unregulated fishing, 2017

Section B - Legal and organizational framework for Combating IUU fishing in Morocco

Subsection B.1 – Morocco's legal framework and enforcement policy against IUU fishing

IUU fishing is a serious threat to marine resources and the sustainability of marine ecosystems in Morocco. To meet this challenge, the country has put in place a solid legal framework to regulate and combat illegal fishing activities. This chapter examines Moroccan laws, regulations and initiatives aimed at eradicating IUU fishing in its waters. As a coastal State, Morocco has also taken steps to achieve this goal. These measures focus on six main areas, that will be clarified in turn.

1- Strengthening laws and regulations: indeed, Morocco has introduced laws and regulations to control and monitor fishing in its waters. These laws define fishing rules and quotas, as well as authorized fishing methods. Thus, fishing vessels operating in Moroccan waters must comply with these regulations. For example, fishing without license is considered illegal fishing, while fishing activities carried out by vessels not

Article 2: Definition of IUU fishing

This Article define

In other words, the law 15-12 to prevent and fight against IUU fishing aims mainly to determine the rules to be respected by foreign fishing vessels to land and/or transship fishery products in Moroccan ports, set measures to ensure that fish products marketed in Morocco are not from IUU fishing and integrate several provisions of the 2009 PSMA.

Further, this law allows to prohibit the marketing of undeclared catches, regulate fishing outside the Moroccan EEZ by vessels flying the Moroccan flag and establish the register of vessels engaged in IUU fishing.

Subsection B-2-2 - Strengthening surveillance

Morocco has invested in strengthening surveillance of its waters to detect and prevent IUU fishing. Maritime authorities use modern technologies such as satellite surveillance, vessel tracking systems and aerial patrols to monitor the activity of fishing boats.
Satellite surveillance is indeed an effective approach to combating IUU fishing in Morocco, as in many other parts of the world. Satellites can be used to monitor maritime activities and detect fishing boats operating illegally, enabling the relevant authorities to take appropriate action to enforce fishing regulations.

With this in mind, here's how satellite surveillance is being used to combat IUU fishing in Morocco:

1- Real-time monitoring (not applied at procedural level): Satellites are equipped with cameras and sensors that enable real-time monitoring of maritime activities along the Moroccan coast. This enables the authorities to spot boats that are not complying with fishing

and identity of vessels. This helps to differentiate legal fishing vessels from those involved in IUU fishing. Nonetheless, even though the considerable benefits of AIS in identifying illegal fishing activities remain limited especially relating to the quality of the received records and data.

3. Monitoring protected areas: Satellites monitor marine protected areas and fishing reserves, where fishing is restricted or prohibited. Such as the shellfish fishing zone which is governed by Order No. 4201-14 of November 25, 2014. Any fishing vessel entering these areas can be detected, enabling appropriate action to be taken.

4. Data analysis: The data collected by the satellites is analyzed to identify patterns in the

objective is to ensure a planned and effective execution of control through a powerful, perfectible and auditable system.

The plan prioritizes and defines the objectives to be achieved in inspection and control, gives tools for an harmonization inspection and control procedures and methodologies, defines the execution and monitoring means for assessment, consequent evaluation and improvement.

The implementation of this plan is ensured by 18 maritime fishing delegations that Department of Fisheries has across the national coast as regional representations. These regional administrative entities dedicate services in their structures to the mission of controlling fishing activities and implement the control policy established by the Department of Fisheries, Thes ensure an assiduous control presence at landing points for catches and fist sale auctions. They also ensure control at the level of premises on land such as processing and packaging establishment[38].

In another context, the entry into force in 2016 of the Port State Measures Agreement to prevent, deter and eliminate illegal, unreported and unregulated fishing marked the culmination of global efforts to combat IUU fishing by setting harmonized minimum standards for measures to be taken in port. Morocco, like many countries, has been actively preparing for entry into force of this Agreement and implementing it in domestic law.

Being part of this Agreement, also meant for Morocco being able to benefit from a comprehensive assistance program for the implementation of instruments to combat IUU fishing. In this regard, it should be emphasized that Article 21 of the PSMA recognizes the needs of developing States. Thus, Morocco has joined the global effort to prevent, deter, and eliminate illegal, unreported and unregulated (IUU) fishing by signing this Agreement in 2022, after depositing its instruments of accession with the FAO.

With regard to regional cooperation, the International Commission for the Conservation of Atlantic Tunas (ICCAT) is an intergovernmental fisheries organization responsible for the conservation of tunas and tuna

the event of non-application or non-compliance with these recommendations, restrictive and

Moroccan legislation provides severe penalties for those who contravene fishing regulations. Financial penalties can be combined with prison sentences, and vessels involved in IUU fishing can be seized and confiscated. These deterrent measures are designed to discourage illegal activities at sea.

Moroccan legislation on sanctions and penalties against IUU fishing is mainly governed by law no. 15-12 on preventing and combating IUU fishing. This law provides for strict measures to combat IUU fishing, including financial penalties as stipulated in Article 34 of this law, confiscation of vessels and fishing gear as stated in Article 47, and prison sentences for offenders. These measures are applied in all of Moroccan's fisheries management zones that includes Moroccan's internal waters, territorial sea, contiguous zone, and exclusive economic zone. Even though, illegal activities still occur in all those zones. The measures stipulated by law 15-12 are effective to a certain degree, since the number of infringements regarding some IUU fishing violations has diminished such as using prohibited fishing gear. However, these measures are not sufficient, especially in terms of penalties which are not proportionate to the infringements committed, given the massive profits brought about by IUU fishing. Furthermore, the amount of the fine is decided by the Moroccan authorities on a case by case and issue by issue basis. Thus, more severe s

Subsection B-2-5 - Awareness-raising and training

Morocco recognizes the importance of raising awareness among fishermen, local communities and stakeholders of the consequences of IUU fishing. Training programs are regularly organized to inform those involved in the fishing industry about current regulations, sustainable practices and the risks associated with IUU fishing. One of these workshops has been organized in 2021 at Oualidia in close collaboration with the United Nations to raise awareness of the protection and sustainable and equitable management of fisheries resources.

Chapter 2- Evaluation of the level of implementation of measures to address the IUU fishing and alignment with international recommendations in Morocco

The control system in Morocco utilizes an integrated method to verify traceability and conduct spot inspections, with the objective of enhancing the national SCS system. Operators and inspectors have the instant chance to verify, regardless of the specific link in the chain, that the fish does not originate from Illegal, Unreported, and Unregulated (IUU) fishing.

The primary goals of the control system are as follows: - To tackle the issue of Illegal, Unreported, and Unregulated (IUU) fishing, specifically by combating the informal circuit related to access, species, size, areas, and gear, as well as addressing the origin and marketing of IUU products. -To support the implementation of development plans by implementing effective ctna e ulaotas3(,)-1969e5(leeri4(o)5(l d)-20Tmd)-15Tmzss

Figure 1: Morrocan Fisheries Control Directorate organigram

Source : http://www.mpm.gov.ma/

In its capacity as the overseer of fishery resources, the Fisheries Control Directorate is responsible for implementing all essential actions to coordinate the MCS system. This includes organizing and managing its structure and operations, as well as planning controls and analyzing and managing relevant information.

Control Methodologies and Procedures

The implementation of methodological guidelines for external services has greatly enhanced control processes. These guidelines have been introduced to provide standardized control and inspection methods for fishing operations and onshore premises. The objective is to achieve consistency in control procedures at the fisheries delegations level.

These approaches implement standards in the execution of partial or full inspections. In addition, they provide the creation of internal inspection reports inside the fisheries delegation, which ensures the capacity to track inspection operations and develop a system that can be audited and verified. Each fisheries delegation establishes an internal inspection system based on the standards of its marine region.

The operational platform designed for monitoring and surveillance purposes follows a process that includes implementing control measures at various locations (such as ships, docks, halls, premises, and export areas). This platform is governed by specific procedures, particularly those related to sensitive fisheries. The following items are included:

Department

Fisheries

The technique governing the oversight and examination of

particular thing, such as gear, size, species, quota, or stock carried. This method lowers inspection time by just focusing on the item considered a priority for examination.

The catch certification is a regulatory mechanism implemented by statute 15-12 to combat

of decree no. 2-09-674, dated March 17, 2010, and has been modified and supplemented by decree no. 2-18-104, dated December 10, 2018.

The vessel must regularly communicate its latest position, speed, and course to the fisheries department every 4 hours. This communication should be done using any method that can provide proof of receipt. This requirement is stated in Article 10 of Decree No. 2-09-674 dated March 17, 2010, as amended and supplemented by Decree No. 2-18-104 dated December 10, 2018, and Article 9 of Order No. 574-19 dated March 7, 2019.

In this scenario, the fisheries delegation is required to collaborate with the Royal Navy to oversee the examination of the ship while it is at sea, specifically to identify any instances of fishing in restricted areas. After the ship comes back to the port, and before fixing or replacing the broken DPL, the fisheries delegate will carry out an investigation to determine the details of the technical failure or non-operation of the satellite tracking device incident. This investigation will follow the rules stated in Article 14 of Decree No. 2-09-674 from March 17, 2010. If necessary, the investigation will assign responsibility and impose penalties, as stated in Article 35 (4) of the Dahir from November 23, 1973.

Upon concluding the conflicting investigation, the fisheries delegate prepares a comprehensive report. If the violation is proven, an infringement report is prepared and the procedures outlined in the aforementioned Dahir (Article 15 of decree no. 2-09-674 of March 17, 2010) are implemented.

The monitoring technique involves tracking fishing vessels that stay at Moroccan ports for over 72 hours and seek the temporary deactivation of their positioning and locating systems. This technique pertains to the use of satellite surveillance to monitor national fishing vessels operating within the national Exclusive Economic Zone (EEZ) as a measure to combat illegal, unreported, and unregulated (IUU) fishing. The captain, skipper, shipowner, or their representative must formally request permission from the fisheries delegation of the port where the vessel intends to temporarily remain. This request should include a detailed explanation of the length and reasons for the longer stay in port, as well as the submission of the crew registration to the fisheries delegation.

Upon receiving the request, the fisheries delegation must confirm the physical presence of the specific vessel at the port. After reviewing the request (including the reason for the extended period of inactivity and verifying the vessel's actual presence at the port), the delegate or the

authorized individual appointed by the delegate grants the temporary authorization for the lay-up to the applicant. The applicant must not shut off the vessel's DPL until the authorization has been provided. The fisheries delegation is responsible for maintaining a specialized register that tracks received applications and issued authorizations. The register must be signed and initialed, and prepared in electronic format using an Excel spreadsheet, to be promptly sent to the Moroccan FMC.

At the conclusion of each day, the fisheries delegation is required to send an email including a list of vessels that have been granted permission to temporarily halt their operations, and whose authorizations are still valid. This list should be in an electronic format, namely an Excel spreadsheet, following a similar structure as the previously described ad-hoc register.

Every day, the fisheries delegation must verify that the fishing vessels that have been given permission to temporarily suspend their operations are physically present at the port. Upon detecting the fishing vessel's absence from port, the fisheries delegation promptly initiates an investigation and implements necessary measures in compliance with existing regulations. The fishing vessel may only depart from the port if its DPL is fully operational again. The fisheries delegation also verifies the functioning of the DPL on the department's VMS site, and in case of any issue, consults with the Moroccan FMC. The fisheries delegation will only give over the fishing vessel's crew register to the captain/skipper and update the tracking record if the DPL is functioning correctly.

Examination of onshore premises

Furthermore, when it comes to onshore premises, the inspection team's physical presence in the field should be focused and directed based on the specific requirements outlined in the planning phase: Preliminary verification is conducted before validating a catch certificate or processing plant declaration. A posteriori control is carried out over a specific time period to validate catch certificates or processing plant declarations. Additionally, verification can be conducted upon special request or demand for a posteriori control of validation. Other controls include quota control and monitoring of stock holdings.

* The Royal Armed Forces exercise control over the water

The Royal Armed Forces enforce the cooperation outlined in the protocol for managing and regulating fishing operations at sea.

*Dockside, disembarkation, and post-disembarkation inspections

Regional control services should implement internal protocols for monitoring and oversight at various stages, including landing, market, quay, land, and export. These protocols should be based on the established methodology for inspecting and controlling fishing activities both on land and at sea.

From a different perspective, within the department, a risk is defined as a violation of regulations or a departure from established processes. Identifying IUU fishing operations is crucial since they are directly associated with non-compliance with current rules and procedures. Certain dangers are shared across several fishing methods, while others are unique to each method. However, it is important to emphasize that the primary sources of information for determining risk are:

1- Inspectors' knowledge and expertise;
2- Proficiency and examination of current regulations;
3- General information received;
4- History of infringements;
5- Data obtained via monitoring operations (contents of inspection reports)

Subsection A.2- Legal level

In order to make the control of fishing activities more effective, certain provisions of the above-mentioned Dahir were amended and supplemented by Law 15-12 on preventing and combating Illegal, Unreported and Unregulated fishing, and amending and supplementing Dahir No. 1-73-255 of 27 Chaoual 1393 (November 23, 1973) regulating maritime fishing. This law makes it possible to:

Dakes

The Code of Maritime Commerce[41] deals, among other things,

Surveillance is conducted routinely on all restricted areas using two complementing methods: real-time monitoring and database documentation. Seamless coordination is also guaranteed by the immediate transmission of VMS data to the Royal Armed Forces Control Centers. It should be noted that fisheries delegation has access to real-time data on the functioning of on-board positioning and tracking systems, which is recorded and sent for each vessel. Similarly, Daily, fisheries delegations receive notifications from FMC on any disruptions in VMS data transfer. Upon the arrival of a vessel experiencing VMS transmission interruptions, the fisheries delegations promptly conduct the necessary investigation as mandated by existing standards. This inquiry is conducted to ascertain the causes behind the observed interruptions, and in the case of a violation, a violation report is prepared by the marine fisheries representative. The findings of any conflicting inquiry must be submitted to the Moroccan FMC in the format of a comprehensive report.

Subsection B.1: Technical level

If the evaluated hazards associated with the things to be inspected have the same level of priority, they can be inspected together in a single visit. Additionally, these inspections can be distributed and arranged among many trips, contingent upon the level of importance assigned to the aforementioned concerns. The objective is to enhance the efficiency of the inspection process by minimizing the number of inspection visits required. This may be achieved by strategically arranging the items to be examined during each visit, during which a certain number of operations are conducted and relevant information is gathered.

At quay level

1- Inspection

- Ship's identity (registration number, name) / Captain's identity (crew list, logbook)
- Date of departure from sea and date of entry into port / License and specifications carried
- Fishing gear on board / Fishing log if applicable
- Catch declaration and cross-check with fishing logbook data and other documents where applicable (packing list, on-board process and storage documents).
- Verification of quota compliance, if applicable: this requires regular and rigorous monitoring of catches, so that the inspector has all the relevant data to carry out an inspection of compliance with the allocated quota.

-

settlementprocedure within the regulatory timeframe

- Archiving of inspection reports and infringement notices, and use of ledgers and Excel files
- Monthly report

- Using the species reference adopted and to respect the information given bythe declarant;
- Checking the identity of the declarant;
- Keeping an ad-hoc register for the follow-up of acts of rectification and cancellation of validated declarations, mentioning in particular:

  × The reference of the catch declaration subject to rectification/cancellation;
  × Reason and purpose of rectification/cancellation;
  × The agreement of the delegate or the person authorized by the delegate
  × The vessel and the skipper concerned.

- Complying with this mandatory traceability of rectification/cancellation in the automated system (de-validation followed by possible validation of a new declaration).

In the same vein, the essential objective of using risk analysis

indicators;

2- For a fishing fleet group, multiply indicators 1, 2 and 3 by 6, 3 and 1 respectively;

3- For each individual, add up the results of the multiplications, then divide the sum by 10 to obtain the individual's score.

Step

auditing and reporting capabilities that enable them to conduct inspections in a prompt and efficient manner. In addition, effectively overseeing the multitude of operators engaged in the value chain and related entities (such as shipowners, fishmongers, processing companies, exporters, government users, etc.).

Monitoring and reporting

The Department of Fisheries is presently in the process of building an application specifically designed for the input and analysis of inspection reports. This system will not only generate inspection reports but also facilitate their monitoring and management.

- Fishing vessel inspection report
- Inspection report for fishery product establishments
- Post-landing inspection report
- Inspection report on the fish markets

Besides, the Vessel Monitoring System (VMS)

has been receiving data from foreign-flagged vessels operating in Moroccan waters under fishing agreements.

The Electronic reporting System (ERS) allows users in the Department of Fisheries to:

1- Receive fishing data automatically in order to:

- Manual queries to retrieve fishing information
- View a boat's activities (tide, tide details)
- Generate fishing reports
- Fishing

Part 1- Partial Summary

Thus, the First part of this work provides a comprehensive overview of the international and national legal framework and instruments relevant to combatting Illegal, Unreported, and Unregulated (IUU) fishing. It discusses key global treaties such as the United Nations Convention on the Law of the Sea (UNCLOS) and complementary agreements like the United Nations Fish Stocks Agreement (UNFSA) and the Port State Measures Agreement (PSMA). These instruments establish the duties and responsibilities of states in ensuring sustainable fishing practices.

This work highlights Morocco's efforts in combating IUU fishing, noting that the country is a party to UNCLOS and has extended its territorial seas to 12 nautical miles. Morocco has the

Overall, the importance of international cooperation and the need for effective enforcement measures to combat IUU fishing was emphasized. This first part highlights the role of various stakeholders, including coastal states, flag states, port states, and regional fisheries management organizations (RFMOs), in addressing IUU fishing. Indeed, it concludes that while the international legal framework and instruments provide a roadmap for states to combat IUU fishing, challenges remain in effectively enforcing laws and regulations and ensuring compliance with conservation and management measures.

Morocco has implemented Law 15-12 to prevent and combat illegal, unreported, and unregulated (IUU) fishing. The law includes provisions from the Port State Measures Agreement (PSMA) and aims to ensure that fish products marketed in Morocco are not from IUU fishing. Morocco has invested in strengthening surveillance of its waters through the use of satellite surveillance, vessel tracking systems, and aerial patrols. The country collaborates internationally by sharing satellite data with other countries and regional organizations for broader monitoring of maritime activities.

Morocco has adopted a National Plan of Action (NPA) to prevent, deter, and eliminate IUU fishing. The plan prioritizes inspection and control objectives and provides tools for harmonization of procedures. Impleme

monitoring of specific fisheries. The system also addresses cases of technical failure or non-operation of positioning and locating devices on fishing vessels.

Morocco has implemented a comprehensive control system to address IUU fishing, with a focus on coordination, standardization, and effective monitoring and inspection procedures. The country has also implemented technological advancements in its fisheries management system, such as the Certification of Catches and Computerization System (SAMAC), Vessel Monitoring System (VMS), Electronic Reporting System (ERS), and Electronic Surveillance System (EMS), to improve control and monitoring. Overall, Morocco has taken significant steps to prevent and combat IUU fishing through the implementation of laws, international collaborations, surveillance technologies, and comprehensive control systems. However, there is still a need for more severe penalties and increased awareness and training to effectively

Part 2- Analysis of the governance policy to combat IUU fishing in Morocco: gaps and opportunities

Chapter 1- Constraints on efforts to combat IUU fishing in Morocco

In order to attain sustainable fisheries, IUU fishing jeopardizes national, regional, and international efforts. It affects fishing vessels from both domestic and foreign countries and happens in all marine zones. The identification and classification of IUU fishing operations is subject to an operational method with several and occasionally conflicting legal and administrative spectrums given the expanse of territorial sea, especially in Morocco, and the variety of institutions participating in their control.

Because of this, the Moroccan government is taking a number of steps to address the issue, including fortifying the country's legal and administrative system. But some limitations still exist, most notably those that come with exercising sovereign public authority in a way that is directly related to the question of Morocco's territorial integrity. Because everything in these circumstances is political and politics invests everything, this remark is even more crucial because it helps us see that, occasional

In this context, the 2009 launch of the "*Halieutis*"[42] national policy brings together ecological imperatives and sustainable fishery management. Enhancing the sector's competitiveness, protecting the maritime environment, and maintaining sustainability while keeping a watchful eye on Illegal, Unreported, and Unregulated fishing are the main objectives of the plan.

The Department of Fisheries, which is expressly tasked with managing fisheries resources, has been given the authority to implement fisheries policies in this case, monitoring and control within the parameters of this vision. In order to prevent illicit fishing, Morocco employs marine patrols, on-board inspections, and surveillance technology (such Vessel Monitoring Systems, or VMS) to keep an eye on fishing activity in its maritime zones.

The boundaries of Morocco's marine zones are not as well defined, though. After the implementation of UNCLOS, Morocco and its neighbors have only signed shaky agreements that are at most loosely negotiated over a number of overlapping maritime claims. However, it is not possible to completely rule out this finding in that these accords lack the legal weight of bilateral agreements between States.

The matter of maritime boundaries and the Moroccan strategy for monitoring and controlling fishing can only be seen from a strictly legal perspective once the political problem has been settled. Only then can the strategy's application and evaluation be evaluated impartially.

These three physical zones the North Moroccan zone, the Middle Moroccan zone, and the South Moroccan zone shared with other bordering nations serve as examples of this predicament.

Northern Morocco (Moroccan-Spanish maritime border)

Figure 2: Map showing the Moroccan-Spanish marine border

Source: https://www.marinetraffic.com/en/ais/

Per the United Nations Convention on the Law of the Sea (UNCLOS), Morocco and Spain both claim territorial waters that extend up to 12 nautical miles from their respective baselines. Additionally, both nations assert that they are the only ones with the right to exploit natural resources inside Exclusive Economic Zones that stretch up to 200 nautical miles from their baselines. In this case, Melilla and Ceuta are two of Spain's enclaves on the coast of North Africa. This makes determining marine rights and limits in these areas more difficult because Morocco also claims control over certain territories. The waterways surrounding these enclaves are particularly tense due to the ongoing sovereignty issue. This makes keeping an eye on and controlling the fishing in this region more challenging. In fact, there hasn't been a complete agreement that precisely defines Morocco's and Spain's maritime boundaries in the Mediterranean, and this has resulted in regions where claims overlap, particularly when it comes to the EEZs.

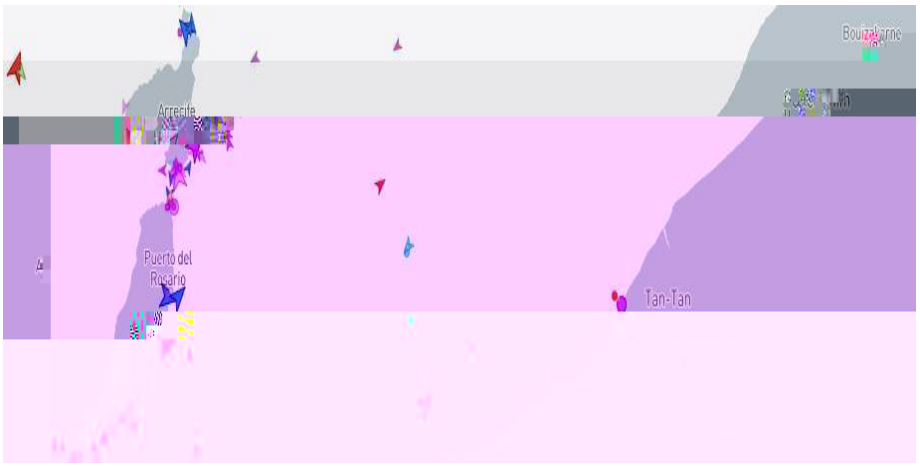
To address these problems, there have been several rounds of discussions. They had not, however, produced a final, widely accepted delineation of the whole maritime boundary. There have been numerous, intricate efforts at both political and judicial resolution of the maritime border disputes in the Mediterranean between Morocco and Spain. These endeavors encompass a blend of bilateral discussions, legal structures furnished by global legislation, and occasionally, the engagement of more extensive international organizations such as the European Union. Here's a thorough examination of a few of these attempts:

• Historical Agreements and understandings: Morocco and Spain have signed a number of historical agreements and understandings throughout the years, mostly pertaining to matters such as fishing rights, which have an indirect bearing on talks about maritime boundaries. Managing resource utilization in disputed or overlapping marine regions is a common goal of these accords. Periodic debates pertaining to the delimitation of maritime boundaries have been place, but they have not yielded a complete and widely agreed-upon understanding of maritime boundaries in the Mediterranean.

Although the International Court of Justice (ICJ) and other international arbitration organizations provide a means of settling disputes of this kind, Morocco and Spain have not used these channels to settle their maritime boundaries in the Mediterranean. The political climate between Morocco and Spain as a whole obviously affects maritime border discussions, in the end. Discussions on maritime boundaries frequently touch on topics like migration, cooperation in security, and economic relations. Furthermore, there are numerous and continuous legal and political initiatives to settle the Fw[illegible]

Middle of Morocco (Morocco-Canary Islands maritime border)

Figure 3: The Moroccan-Canary Islands maritime border



Source: https://www.marinetraffic.com/en/ais/

After the Spanish invasion in the late 15th century, the Canary Islands came under Spanish rule. There have always been issues because of the Canary Islands' closeness to Morocco. This being the case, a complicated interaction of past occurrences, international law, and bilateral talks has defined the maritime boundary between Morocco and the Canary Islands (Spain). The Canary Islands' strategic location and the abundance of resources in the nearby oceans make this boundary important.

UNCLOS has an impact on the specific agreements that Spain and Morocco have respecting their maritime borders. However, because there are no definitive signed agreements, there aren't many comprehensive and publicly accessible records of these arrangements, including precise dates and clauses. These understandings of marine boundaries are the product of protracted talks that took into account a variety of political and economic reasons, including fishing rights and mineral resources. Morocco has increased its offshore resource exploration and exploitation in recent years, which has occasionally prompted resentment from EU members and Spain as well as reignited debates about maritime borders. Furthermore, in a climate of tension and international criticism, the Moroccan parliament unanimously passed the laws Bill 37.17 and Bill 38.17 in 2017 to close the legislative gap that characterizes the country's legal arsenal governing maritime areas and to strengthen Morocco's sovereignty over its territorial waters. Morocco is able to draw a boundary along the Atlantic Ocean

between Tangiers in the north and Laguira in the south thanks to the first legislation. The second statute establishes an Exclusive Economy Zone (EEZ) spanning 200 nautical miles.

These regulations, in Morocco's opinion, are consistent with the Kingdom exerting total sovereignty over its boundaries, including land and sea. The international law limits the territorial sea of a coastal state up to 12 nautical miles, the contiguous zone up to 24 nautical miles, and the exclusive economic zone (EEZ) up to 200 nautical miles. These represent the uppermost permitted boundaries, and in the event that overlapping claims occur, they may be subject to delimitation with surrounding states. Due to agreed-upon delimitation, the Moroccan EEZ will consequently seldom extend to the whole 200 nm in actuality.

The maritime border that separates Morocco from the Canary Islands is a complicated matter with political, legal, technical, and economic facets. There have been continuous negotiations, shaped by a number of variables such as historical links, resource rights, and regional security. According to Article 75 of UNCLOS, negotiations are private, and if an agreement is achieved, it must be publicized appropriately and deposited with the UN Secretary General.

Southern Morocco (Morocco-Mauritania maritime border)

Figure 4: The Morocco-Mauritania maritime border

Source: https://www.marinetraffic.com/en/ais/

Because of its complex history and strategic location between Mauritania and Morocco, the

defined, which might lead to significant difficulties with monitoring and regulation as well as exacerbate tensions between Morocco and Mauritania. The area is a hotspot for fishing rights and access to marine resources since it is, in fact, rich in fisheries resources. Additionally, the potential existence of energy resources (such gas and oil) in nearby seas raises additional complexity and national security concerns.

Intimate ties exist between regional maritime boundary efforts and more general political discussions about the Moroccan Sahara's status. Nevertheless, commerc5(olion/yN871 0 gst194h3(tica)4

Moreover, there are differences in the decision-making process. Deliberation and consensus are common methods of decision-making at the Department of Fisheries. The execution of decisions is often flexible and tailored to the local and global environment. The procedures are participatory, including a variety of actors and stakeholders. Naturally, civil laws, public regulations, controls, and audits centered on financial responsibility and transparency govern this.

However, in the military, making prompt choices based on orders is frequently required. According to this reasoning, in times of crisis, the military often follows instructions strictly and promptly, leaving no opportunity for consideration. Naturally, laws pertaining to defense and military regul

The organizational issues raised will undoubtedly contribute to the failure of the institutional communication campaigns that the Moroccan Department of Fisheries is waging against IUU fishing. It is also true that there are well-established channels of communication between the various public actors military and civilian but it is still difficult, for example, to talk about centralizing enforcement at the departmental level and to limit the role of the Royal Armed Forces to logistics and technical support. At this level, communication amongst the institution's representatives is another issue. Indeed, the command culture of military does not allow to question the Department of Fisheries dominance in combating IUU fishing.

Similarly, it should go without saying that communication issues still exist both inside the Department of Fisheries an

analyzes the rate and standard of development of Moroccan skills, training, and resources, namely human resources, in relation to the advancement of fraudulent fishing methods.

Section B.1- Progression of technology and standards in Morocco

Located in the heart of North Africa, Morocco is at the forefront of incorporating technology into its fishing operations. This integration acts as a strong

Also, the National Fishing Monitoring Centre (FMC) has included the Automatic Identification System (AIS) as an additional monitoring tool. This system establishes a network of transparency, discouraging fishing vessels from engaging in illicit activities by preventing them from disappearing and engaging in unauthorized fishing activities. This technology offers worldwide coverage of vessels equipped with AIS transponders through a network of Low Earth Orbit (LEO) satellites and ground stations. Additionally, it offers a web

1-Financial Constraints: The procurement of technology solutions necessitates substantial financial resources, which are sometimes difficult to obtain for many education and/or growing nations, such as Morocco. In addition, all information technology solution providers in this industry utilize proprietary technology and ultimately enforce ongoing expenses, either via the initial purchase price or through maintenance and updates. The financial burden becomes more onerous when it takes into account the rapid pace at which standards are changing, and the unwillingness of regional and international communities in the north African region to participate in any collaborative effort to distribute the expenses of acquiring

criminal offense. However, it is crucial to highlight that legislation 09-08 specifically mandates the need for interoperability with the systems of other nations and collaborating entities, in order to enhance transparency and traceability.

5-Regulatory Evolution: The legal and governance framework must be as adaptable as the technology it aims to include, developing to guarantee responsible management. Ultimately, digitalization is just the process of formally converting real-world legal structures into algorithms. The challenge is in the disparity between these two realms, which hinders the smooth transition into the digital and technological era. Multiple nations are experiencing, to different extents, the consequences of this disparity. Despite Morocco's evident dedication to a substantial digitalization initiative, this issue persists. Law 43-20 and Law 53-05 have been enacted to regulate the legal consequences of electronic signatures, online contracts, and the exchange of legal data. However, the penal code, civil code, and labor code have not been extensively modified to recognize electronic evidence as valid and fully legal, except for certain sectors like banks and insurance companies that are covered by the digital trust index. Consequently, courts often do not attribute evidentiary weight to electronic evidence, viewing it only as a tool for organizing the case being examined. This elucidates the challenge of

Currently, Morocco is exploring the feasibility of outfitting artisanal fishing vessels with the aforementioned technical monitoring capabilities. However, in order to do this, it is crucial to implement a well-thought-out change management strategy, while also considering the socio-economic implications that are now relevant.

Also, there are two main benefits of stock management. Data, with its capacity to forecast and safeguard, plays a crucial role in ensuring sustainable harvests and maintaining the stability of marine resources. Data inside the Moroccan Department of Fisheries undergo processing and consolidation to discern trends in fishing activity, namely within the control department. This data is quite valuable for making informed decisions, particularly in this situation to save goods. An example that illustrates this is the Octopus stock. The organization in charge of monitoring catches has observed a decrease in this particular fish population. As a result, they have used this information to redefine the areas where fishing is allowed, based on the behaviors of the fish and continuously making necessary adjustments. Furthermore, it is important to acknowledge that while the existing framework for data processing and transmission is effective, it still has the drawback of dispersing data across several organizations involved in fisheries management. Greater centralization of data to prevent IUU fishing would be a necessary in the future.

In the same direction of ideas, utilizing the internet and social media platforms, the market's influence extends beyond conventional physical locations. This has the potential to significantly enhance transparency and traceability in terms of monitoring catches, visibility of stocks, and control of illegal, unreported, and unregulated (IUU) fishing products. However, the successful implementation of this technology relies on the degree of digital literacy and the conduct of fishermen, notwithstanding the strength of government regulations. The Moroccan authorities may have launched an endeavor to clarify these statements. The Moroccan fishing department has ruled to centralize the sale of catches by port in a designated chamber, through which the problems of traceability and transparency can be fulfilled, and data can be collected with a high degree of dependability. Nevertheless, the fishermen' response was vehement, resulting in the premises largely remaining unoccupied. Therefore, it is evident that evaluating the effectiveness of control operations in a nation such as Morocco should first focus on analyzing alterations in fishing behavior, and secondly on the extent of technology adoption. It should be mentioned that the rate of technology use and acceptance is now the most crucial. Given this circumstance, the

Moroccan fishing department is cognizant of the situation and is actively engaged in implementing a management strategy to modify fishing practices, in collaboration with groups that represent fishermen.

Capacity building

Harmonizing Morocco's regulatory framework with international standards for combating illegal, unreported, and unregulated (IUU) fishing necessitates cooperation across several authorities and organizations. These institutions collaborate to create, execute, and enforce the requisite rules and laws to guarantee efficient measures against illegal, unreported, and unregulated fishing. The key entities and actors engaged in this process in Morocco are as follows.

The Ministry of Fisheries has a primary responsibility in formulating and implementing policies pertaining to the management of fisheries, which includes combating illegal, unreported, and unregulated (IUU) fishing activities. It exercises supervision over the Fisheries Department and assumes the responsibility of formulating and executing the legal structure for fisheries. The Fisheries Department plays a significant role in the daily oversight of the fisheries industry, encompassing activities such as formulating policies, enforcing regulations, and managing resources. Aside from overseeing training and skills enhancement initiatives, this Department also oversees training and research institutions such as the Institut Supérieur des Pêches Maritimes, Institute des Technologies des Pêches Maritimes, and the Centres de Qualification Professionnelle Maritime.

The Moroccan Parliament serves as the legislative arm of the government, with its primary responsibility being the enactment of legislation and regulations pertaining to fisheries management and the establishment of training and research facilities, especially for the education of inspectors. This agency is essential for ensuring that national laws are in line with international standards and for allocating the necessary financial resources through the Finance Act.

Moroccan Fishing Industry Associations: Numerous fishing industry associations and trade groups advocate for the interests of the fishing community. They play a crucial role as stakeholders in the policy-making process, namely in enhancing maritime monitoring and surveillance. These groups contribute to the creation of training and awareness programs by identifying their specific requirements and offering insights from their experiences in the

field. They also indicate any deficiencies in the technical abilities of inspectors or the need for improvement in terms of interpersonal skills.

2 hours, in contrast to the Moroccan FMC standard of 30 minutes. An additional illustration is the case of DNFA (Deficiency and Malfunctioning of the VMS). This offense involves the failure to automatically penalize the interruption of transmission of a vessel that is suspected of being prohibited. The confirmation of the intentional element is determined based on the inspection report conducted under the supervision of the fisheries department delegation. Drafting new legislation involves the government structure responsible for initiating negotiations to determine the wording of the new text or amendments with the government's general secretariat, once the aforementioned stages have been completed. After receiving approval from the SGG, the text undergoes deliberation by the Government Council. Subsequently, it is forwarded to the Representatives chamber for thorough examination, which includes both plenary and intra-committee sessions conducted twice. After being adopted by this chamber, the text undergoes a similar process, but this time it is reviewed by the Chamber of Councilors. If approved, it is then sent to His Majesty the King for ratification and promulgation, marking the point at which it becomes a law. To educate the public and fishing communities about the new regulations and the significance of sustainable fishing practices, as well as the obligation to refrain from engaging in illegal, unreported, and unregulated (IUU) fishing, the Department of Fisheries employs various communication channels such as its website, a dedicated electronic journal, and a mailing list. Nevertheless, because of the exclusive character of the fishing community, the primary focus is on targeting the representatives of the latter group, and typically they are responsible for disseminating information

international collaboration plays a crucial role in facilitating capacity building and providing technical help by several means, such as

1- Identifying capacity deficiencies: The first stage is to perform a comprehensive investigation to identify deficiencies in Morocco's ability to combat IUU fishing. This encompasses deficiencies in personnel, organizational structures, legal frameworks, technological capabilities, and physical infrastructure. International collaborators contribute to this evaluation process, and Morocco is progressively more receptive to disclosing its limitations and requirements, facilitating the identification of deficiencies.

2-Utilizing Global Expertise: nations with sophisticated sustainable fisheries management systems provide important knowledge and experience. Moroccan authorities and fishery managers get instruction through training programs, workshops, and seminars conducted by foreign specialists. These sessions aim to educate them on the most effective methods for promoting sustainable fisheries and combating illegal, unreported, and unregulated (IUU) fishing. An example of this is the General fishermen Commission for the Mediterranean (GFCM) providing technical support to equip Moroccan small-scale fishermen with Vessel Monitoring Systems (VMS).

3- Enhancing the legal and regulatory framework: Morocco might seek the support of foreign legal specialists to revise or create new legislation that conforms to global laws and norms, such as the FAO Code of Conduct for Responsible Fisheries and the United Nations Fish Stocks Agreement. However, it is important to note that the Department of Fisheries has a team of national specialists available to strengthen and revise this legal framework. These experts are responsible for negotiating and writing modifications and legislation. The collaboration between international and national knowledge should be regarded as mutually reinforcing in the process of formulating domestic legislation, rather than contradictory. Both possess crucial components to contribute to the process of legislative reform.

4- Strengthening monitoring and surveillance capabilities: Collaborating with foreign research institutes and agencies, Morocco engages in cooperative research endeavors to create advanced programs aimed at enhancing effectiveness in marine surveillance and control. These programs incorporate training. An illustrative example is the training program conducted by the European Fisheries Control Agency for inspectors from the Department of Fisheries. The program focuses on practical exercises aimed at enhancing knowledge and

developing capacity in relation to international, regional, and national laws pertaining to combating illegal, unreported, and unregulated (IUU) fishing.

5- Developing Human Resources: The advancement of Morocco's fisheries sector goes beyond simple investments in infrastructure and regulatory laws; it heavily relies on nurturing human capital. International partnership can accelerate several activities focused on fostering the development of the country's fisheries experts. These options encompass scholarship programs, exchange trips, and internships, all of which provide Moroccan specialists significant chances to gain international experience and competence.

Developing a robust legislative framework for promoting sustainable fishing practices in Morocco is an intricate and multifaceted endeavor that necessitates the dedication of the nation and cooperation with other countries. It includes changes in laws, improving skills and knowledge, advancements in technology, and involving all relevant parties in decision-making. Morocco safeguards its marine resources against illicit activities and simultaneously capitalizes on the economic advantages of a morally sound fishing sector by embracing and implementing global benchmarks.

In fact, governance policy to combat IUU fishing in Morocco faces constraints related to legal and administrative complexities, governance policies, technology limits, and capacity building. The unresolved maritime boundaries with neighboring countries, particularly Spain, further complicate efforts to effectively monitor and control fishing activities in Moroccan waters.

Also, Morocco is implementing technological solutions, such as Vessel Monitoring Systems and Automatic Identification Systems, to combat IUU fishing, but faces challenges in financial constraints, digital literacy, technological maintenance, data guardianship, and regulatory evolution. The country is also focusing on improving fishing equipment, implementing stock management strategies, and centralizing data to prevent IUU fishing.

Besides, cooperation among various entities and stakeholders, including the Ministry of Fisheries, Moroccan Parliament, fishing industry associations, environmental NGOs, research institutions, and international organizations, is crucial in aligning Morocco's regulatory framework with international standards. The Moroccan Department of Fisheries is actively working towards sustainable and responsible fishing practices but faces challenges in gaining

acceptance and cooperation from fishermen. Enforcement issues in Morocco's legislative system, limited resources, corruption, and non-compliance are also concerns.

To address these challenges, Morocco engages in international collaboration to enhance its capacity and technical support in managing sustainable fisheries. Also, developing a robust

Fishing Monitoring Center, with its two structures for satellite monitoring of fishing vessels and satellite data processing, plays a central role.

Surveillance Synergies and Cross-Border Data Diplomacy

surveillance technologies, and encouraging collaborative data hubs, the global community fortifies its collective capacity to police the oceans and uphold the rule of maritime law.

Data processing and exchange are not merely tools but are foundational elements in the global campaign against IUU fishing. In Morocco, they amplify the capabilities of monitoring systems, reinforce regulatory adherence, catalyze cross-border enforcement cooperation, and inform sustainable management practices. Transparency and accountability benefit from open data initiatives, just as environmental conservation strategies gain precision from data insights. The economic and social health of coastal communities, too, is bolstered by fair and data-informed fisheries governance. Also, if Morocco continue to fight IUU fishing, its success will be deeply intertwined with its ability to leverage the transformative power of data to foster a sustainable and just future for oceans.

However, this exchange of crucial data encounters a series of complex constraints and limitations that impede the effective addressing of IUU fishing. For example, nations exercise rights over their EEZ, leading to reservations about sharing detailed data that could compromise control or reveal sensitive information regarding fishing activities and resources. Furthermore, discrepancies in national laws related to fishing, data protection, and maritime surveillance create significant obstacles to data sharing. Some countries may have stringent laws governing the dissemination of information they consider proprietary or security sensitive. In this respect, Morocco's specific territorial and security features mean that it cannot envisage data exchange and open data in the broadest and most absolute terms.

Different countries and regions often employ varying standards and formats for collecting and reporting fishing data. This lack of standardization makes it challenging to aggregate and compare data across borde and

Other constraints to highlight include: 1- Effective monitoring of fishing activities and enforcement of regulations require substantial resources 2- The potential for data breaches and cybersecurity threats may discourage participation in data exchange, fearing that sensitive information may be compromised 3- Concerns may arise over the accuracy and reliability of data provided. Data may be intentionally distorted or inaccurately recorded, leading to mistrust of the data exchange process. 4-Efficient data exchange requires coordination between multiple agencies within countries and across borders, which can be logistically and bureaucratically complex.

To overcome these constraints and limitations, there is a need to emphasize international treaties and agreements that prioritize data sharing. The development of standardized protocols and technologies is essential to facilitate secure and efficient data exchange. Additionally, capacity-building efforts in less developed nations can ensure that all states can contribute to and benefit from shared data in the fight against IUU fishing effectively. In the specific context of Morocco's approach to processing data related to IUU fishing, except the absence of a national center data several measures have been implemented, as already seen before.

Also, to effectively combat transnational IUU fishing, collaboration with neighboring countries and international partners remains pivotal to Morocco. This includes engagement in various channels and frameworks for data exchange, first including active participation within Regional Fisheries Management Organization (RFMOs). Morocco’s membership of the International Commission for the Conservation of Atlantic Tunas (ICCAT) provides a good example because it provides a platform for Morocco to exchange critical data on catch statistics, fishing efforts, and other pertinent information with other Members, fostering cooperation in combatting IUU fishing.

Second, bilaterally agreements provision for the sharing of maritime and fisheries data between Morroco and the other Party, including data on fishing activities, vessel tracking, and IUU fishing. Morocco and Mauritania signed such an agreement on 11 March 2022.[44] This agreement include collaboration in the fight against IUU fishing by strengthening cooperation in the field of training and capacity-building; setting up a common, standardizing training program for fisheries inspectors; information sharing and exchange on suspected IUU fishing

[44] http://www.mpm.gov.ma/wps/portal/PortaII

vessels; joint fisheries inspection programs; and the possibility for Morocco to share VMS data for fishing vessels operating in the Mauritanian EEZ at the request of Mauritania.

In this perspective, Morocco collaborates with RFMOs in joint surveillance and patrol operations. Data collected during these operations is shared among participating nations and organizations to coordinate enforcement actions against IUU fishing. As an example, the joint inspection program with GFCM in the Mediterranean Sea. Also, the diplomatic channels play a pivotal role in facilitating the exchange of information. Moroccan embassies, consulates, and foreign diplomatic missions in Morocco serve as conduits for communicating issues related to IUU fishing.

In Morocco, it's crucial to recognize that data exchange on IUU fishing is governed by an array of legal instruments, treaties, and national regulations designed to safeguard sensitive information while promoting transparency and cooperation. There are a number of criticisms and challenges associated with its data exchange policies concering the fight against IUU fishing. First, critics point to a lack of transparency. Despite Morocco’s participation in numerous international agreements, the completeness, accuracy, and timeliness of the data provided under such frameworks has been questioned. Second, critics note a lack of detail in the data shared. This undermines effective monitoring and enforcement, particularly regarding vessel movements, transshipment, and catch reports. Any discrepancies in the data will further undermine international responses, including if there is underreporting or misreporting of fishing activities by Morocco or other Parties.

Criticisms may center on technological gaps between international expectations for monitoring and what Morocco has implemented, potentially leaving the nation vulnerable to IUU fishing activities. Also, the enforcement of data-sharing agreements can be inconsistent, with critics arguing that Morocco, like many nations, may not always fulfill its obligations to share data or might prioritize national interests over international agreements. In the same sens, independent researchers and non-governmental organizations may find it challenging to access data on IUU fishing activities due to restrictive policies, which can be a point of contention even though Morocco has adopted law 31.13, allowing Moroccan citizens and foreign residents access to information held by public or private institutions charged with public service.

Besides, the exchange of information between countries is very important for effective fight against IUU fishing at a regional level. Making this information available would act as a cost-efficient way of preventing IUU fishing in this region. Morocco engages in regional efforts against IUU fishing activities, but the level of cooperation and data exchange within the region may not be sufficient to address the transboundary nature of IUU fishing effectively, meanly for the following reasons.

1- Political and economic consideration: there can be instances where political and economic considerations take precedence over environmental and sustainability concerns, potentially affecting the willingness to share data that could have negative economic or political repercussions for Morocco.
2- Standardization of data: the lack of standardization in data collection and reporting processes can lead to criticism regarding the ability to compare and integrate data from Morocco with that from other countries.
3- Resource allocation: limited resources allocated for monitoring and data management may also be a point of critique, with calls for greater investment to ensure comprehensive surveillance and data analysis capabilities. However, it’s important to emphasize that Morocco has made great strides in sea control and surveillance, given the resources at its disposal.
Thus, addressing these criticisms involves a concerted effort to enhance technology, transparency, and international collaboration. While these critiques are not unique to Morocco and are common challenges faced by many countries in the fight against IUU fishing, the government of Morocco, along with international organizations and stakeholders, continually work to improve their approach.

Subsection A.2-

Similarly, the AIS serves as a valuable tool in maritime navigation safety and vessel tracking. AIS data can reveal potential illegal activities, particularly when vessels disable their AIS transponders, presumably to avoid detection while engaging in unauthorized activities. The analytical challenge here lies in distinguishing between innocent malfunctions and deliberate subterfuge. Data mining must, therefore, be complemented by contextual analysis and corroborated by on-the-ground intelligence to ascertain the intent behind AIS anomalies.

Data mining can also be applied to catch documentation systems to verify the legitimacy of the seafood supply chain generally. By identifying inconsistencies indicative of fraudulent behavior, such as discrepancies in catch volume or species mislabeling, data mining helps enforce legal compliance by identifying repeat offenders or areas of weakness and vulnerability for exploitation by IUU fishers. For example, particular fisheries, ports, or fleets may demonstrate weaknesses to IUU fishing when catch documents are analyzed collectively.

Alternatively, the analysis of satellite imagery through data mining techniques has become increasingly instrumental in identifying unauthorized fishing activities, particularly for protected zones or areas where fishing is strictly regulated. The imagery can reveal the presence of vessels and fishing gear, which, in restricted areas, are clear indicators of illegal fishing. The interpretative challenge, however, is significant, requiring advanced algorithms capable of differentiating between legal and illegal activities from mere visual data.

Synthetic Aperture Radar (SAR) is invaluable for vessel detection, especially under conditions where optical sensors are compromised, such as during bad weather or night-time operations. The automatic processing of SAR data through data mining algorithms can detect potential IUU activities, providing a critical layer of enforcement through technological means. This technological advance, however, requires significant investment in satellite infrastructure and analytical expertise, which may be a barrier for resource-constrained nations, such as Morocco.

Finally, the integration of various data streams including environmental factors, market prices, catch reports, and vessel behavior creates a holistic view of maritime activities. Deviations from established norms could indicate potential IUU activities or fraud. This, however, requires robust data-sharing frameworks and multi-agency collaboration, which can

be challenging to implement in Morocco. It also requires a clear lead agency responsible for integration and analysis.

Machine learning algorithms have the capacity to identify complex patterns and correlations beyond human capability. They can be trained on historical data where IUU fishing has been confirmed to enhance predictive capabilities. Nonetheless, the quality of the outcomes is heavily dependent on the quantity and quality of input data, which necessitates a considerable data accumulation effort.

Morocco's potential use of data mining in combating IUU fishing can be considered a paradigm of how t

to global efforts while addressing local needs, by playing a strategic role in negotiating internal and external forces, ensuring that globalization benefits rather than exploits local sector. In fact, choosing to set up a national agency for fisheries control in Morocco is the right choice. It is not just a bureaucratic or administrative measure, it is a strategic and multifaceted approach to addressing historical, economic, technological, and social challenges. This agency can serve as catalyst for sustainable fisheries development, helping to transform and uplift this critical sector.

Thus, the creation of a national agency for the control and monitoring of fishing activities will enable Morocco better understanding of IUU fishing and related activities, effective control and monitoring of it and assessment on a regular basis the extent and impacts of these illegal activities and the effects of regulatory measures to address this phenomenon. Furthermore, and since Morocco is signatory to international agreements on combatting IUU fishing, management of oceans and fisheries resources, the agency will help to meet these commitments.

In Morocco, fishing is an environment with interdependent components: fisheries to manage (access, species, periods, zones...), vessels to identify (registration, flag, authorization...) and post landing activities to identify and monitor (authorizations, operators, import, export). This environment includes operators to be identified, authorized, made accountable and authorized activity to be regulated, catches to be identified and tracked, and authorities with whom to coordinate exchange and collaborate[45].

To this end, the fight against IUU fishing requires integrated actions across this entire environment. These integrated actions must focus on the introduction of regulatory mechanisms such as texts and procedures, the introduction of verification and control mechanisms such as traceability, declarations and electronic tools, the organization of control in terms of structure, methodologies, and training, and finally the introduction of cooperation mechanisms[46].

Since 2016, Morocco has had a control structure, the Directorate for the control of maritime fishing activities, which is responsible for coordinating control and acts as a single point of contact on issues relating to the fight against IUU fishing. Before that, control and

[45] Document interne, Département de Pêche Maritime, Direction de Contrôle des Activité de la Pêche Maritime, 2017.

[46] Plan « Halieutis » pour les années 2010-2016. Rapport annuel de la Cour des Comptes, 2018.

surveillance were ensured by a coordination unit which had no hierarchical power over the other structures involved in the fight against IUU fishing, at least not over the decentralized structures of the department of fisheries, but not over the military. Also, the creation of this Directorate has certainly had several beneficial effects, notably compliance with fishing zones and periods, thanks to VMS, and the pressure exerted on the informal circuit by the catch certification process.

However, despite the progress made by this Directorate since its creation, several questions remain, notably the extent and determinants of fraud in specific fisheries, for reasons of information availability and data integrity and exploitability. Another question, as serious as those mentioned above, concerns the specific issue of the Octopus fishery in southern Morocco, which is at the top of the list of economically important fisheries because of its fragility and instability as a resource[47], but which is managed solely by ministerial

A few key elements might characterize such an agency. These foctors would include:

1. Command and Control Center: A high-tech center with screens showing nautical charts and ship positions and equipped with sophisticated communications systems for communicating with ships at sea.
2. Patrol boats: Vessels affected to maritime surveillance can be equipped with radar, sonar and other detection technologies.
3. Surveillance drones and aircraft: Use of aerial and maritime drones to extend surveillance capability. Aircraft can be equipped for long-range reconnaissance and surveillance missions.
4. Qualified personnel: Officers trained in maritime surveillance operations, including navigation experts, lawyers.
5. International collaboration: Links and agreements with other international agencies for the management of marine resources and the fight against illegal fishing.
6. Training and education programs: Initiatives to train staff and raise public awareness of maritime issues, IUU fishing damage and environmental protection.
7. National fisheries control data center: advanced systems for data processing, marine mapping and real-time monitoring of activities at sea. At this center that advanced data processing, collected nationwide, is carried out to develop decision-making tools and forecasts, and to evaluate the effectiveness of control, surveillance and penalization measures.
8. Monitoring and Innovation: This structure should be responsible for monitoring the national and international legal environment, on the one hand, and the technological and technical environment, on the other, so that the agency can keep abreast of the latest developments in the sector in operational and regulatory terms.
9. National coordinating committee for fisheries control: This committee should bring together all the players (civil/military, public/private) closely or remotely involved in fisheries control in Morocco. The chairmanship of this council must be imperatively and expressly attributed to the director of the agency who assumes the role of leader in matters of fisheries control. Meetings of this council should be as un-bureaucratic as possible, to ensure a high level of responsiveness to emergencies and unforeseen events. The board's prerogatives should extend to regulatory and financial matters, and it should be subject to strict posteriori control by the supervisory body, the Department of Maritime Fishing.
10.

Port state inspections

• Verification of the legality of the catch

• Application of penalties in case of infringements

5. International Cooperation Service

Manages relations with international partners, participates in joint projects, and shares information and best practices.

• Collaboration with foreign agencies and international organizations

• Participation in international fisheries agreements

• Exchange of data and expertise

6. Legal & Regulatory Department

Provides legal support, drafts regulations, and manages the legal aspects of fishing activities.

• Legal advice on fisheries matters

• Drafting and updating of regulations

• Handling of disputes and litigation

7. Training & Awareness Service

Organizes trainings for staff and fishers and conducts awareness campaigns on sustainable fishing.

• Training of supervisory staff

• Outreach programs for fishers

• Public education on sustainable fisheries

8. National Fisheries Control Data Centre

The centre for the in-depth processing of data, collected on a national and international scale (within the framework of exchanges:

• Data recovery and formatting

• Data processing and preparation of dashboards (in push/automatically and pull/on demand modes)

• National and international data exchange

• Preparation of forecasts and risk and opportunity assessment reports

9. Monitoring and Innovation Department

The monitoring service is central to the Agency's structure. At the same time, it is a means of monitoring the technological and legal environment, at the national and international level, and at the same time, it makes it possible to disseminate news and innovations to a large number of actors, whether through a selective dissemination of information, a generalized dissemination or in response to a specific request.

10. Administrative & Financial Department

Ensures the smooth running of the agency, manages finances, and provides administrative support to the various depanF2(,)-1h

8- Operations and Surveillance: Patrol Coverage and Effectiveness : Extensive and effective maritime surveillance is essential to control fishing activities and respond quickly.

Assessment: Assess the geographic scope of surveillance, the frequency of patrols, and the ability to respond.

9- Operations and Surveillance: Risk Prevention and Management: The ability to prevent and manage incidents (overfishing, etc.) is vital for the protection of marine ecosystems.

Assessment: Analyze prevention strategies, contingency plans, and crisis response.

Part 2- Partial summary

The governance policy to combat IUU fishing in Morocco faces various constraints and challenges. These include legal and administrative complexities, unresolved maritime boundaries with neighboring countries, technology limitations, and capacity building. The articulation of various actors involved in the fight against IUU fishing is suboptimal, and political considerations often hinder effective fisheries monitoring and control.

The unresolved maritime boundaries with Spain and the Canary Islands further complicate efforts to effectively monitor and control fishing activities in Moroccan waters. Thus, Morocco has implemented technological solutions such as Vessel Monitoring Systems and Automatic Identification Systems to combat IUU fishing, but there are challenges in terms of financial constraints, digital literacy, and technological maintenance. The country is also focusing on improving fishing equipment, implementing stock management strategies, and centralizing data to prevent IUU fishing. Cooperation among various entities and stakeholders is crucial in aligning Morocco's regulatory framework with international standards for combating illegal fishing. Besides, the involvement of fishing professionals in decision-making can sometimes lack oversight and accountability. Morocco faces enforcement issues in its legislative system, including limited resources, corruption, and non-compliance.

To address these challenges, Morocco engages in international collaboration to enhance its capacity and technical suppo

comp

criticisms and challenges is essential for ensuring the success of Morocco's data exchange policies in combating IUU fishing.

In the perspective, data mining emerges as a crucial tool in combating IUU fishing, offering predictive analytics and real-time monitoring capabilities. By analyzing historical trends and real-time data, data mining can identify patterns indicative of fraudulent fishing activities and illegal exploitation. It can also enhance maritime practices, such as optimizing fishing routes to reduce bycatch and prevent overfishing. However, the successful implementation of data mining requires robust data-sharing frameworks, multi-agency collaboration, investment in technological capabilities, and international cooperation.

Morocco has the potential to leverage data mining to enhance its maritime surveillance capabilities and ensure the sustainability of its fisheries. By adopting data-driven strategies and investing in technology and training, Morocco can strengthen its efforts to combat IUU fishing and comply with international conservation efforts. Ongoing collaboration with international bodies and adaptive use of data mining tools will be crucial in addressing the evolving tactics of IUU fishing.

Also, the creation of a national agency to combat IUU fishing in Morocco is necessary due to various factors. The country's historical legacies, including colonialism and socio-political upheaval, have resulted in un-articulated institutions and underinvestment in this critical sector. A national agency can address these challenges by fostering inclusive growth, promoting local industries, and strengthening capacity building in the fisheries sector. It can also facilitate public-private partnerships to bridge funding gaps and enhance the efficiency of public services, particularly in combating IUU fishing where specialized skills and knowledge are essential. Additionally, a national agency can align Morocco's objectives with global agendas and international agreements, ensuring the sustainability of fishery resources and meeting commitments.

Currently, the control of fishing activities in Morocco is managed by the Directorate for the Control of Maritime Fishing Activities under the Ministry of Agriculture and Fisheries. However, there are limitations and questions regarding the extent of fraud and the management of specific fisheries, such as the Octopus fishery. The complexity of the system and the multiplicity of players involved in the fight against IUU fishing hinder effective control and evaluation of the implemented infringement system. Therefore, the establishment

of a national agency would provide a more comprehensive and specialized approach to understanding and addressing IUU fishing, implementing regulatory mechanisms, introducing verification and control mechanisms, organizing control structures, and promoting

and networking, the investment in development and innovation, the impact of awareness and education programs, and the evaluation of outreach programs.

Overall, the proposed organization chart and evaluation elements aim to ensure that the National Fisheries Control Agency effectively carries out its mission of preserving marine resources and monitoring sustainable and responsible fisheries.

Conclusion

This study extensively analyzes Morocco's endeavors to address the issue of Illegal, Unreported, and Unregulated (IUU) fishing, with a specific focus on its adherence to international legal frameworks and treaties. This investigation highlights the essential need of global collaboration and the commitment to worldwide norms in tackling the widespread problem of illegal, unreported, and unregulated (IUU) fishing.

The paper outlines Morocco's strategy for addressing IUU fishing, which demonstrates a thorough comprehension of the complex legal regulations that regulate marine operations. The United Nations Convention on the Law of the Sea (UNCLOS), in conjunction with other significant accords such as the United Nations Fish Stocks Agreement (UNFSA) and the Port State Measures Agreement (PSMA), is the fundamental framework of this legal system. These agreements jointly create obligations and roles for governments, with a focus on promoting sustainable fishing methods and the effective management of maritime resources. Morocco's proactive involvement in these international endeavors is highlighted. Morocco's adherence to international accords through the alignment of its national legislation and policies displays its dedication to sustainable fishing techniques and the preservation of marine biodiversity. Furthermore, this alignment demonstrates Morocco's readiness to collaborate with international and regional organizations in order to successfully tackle the difficulties posed by IUU fishing. Furthermore, the Moroccan instance exemplifies the intricacies involved in implementing international principles within a national context. It highlights the importance of aligning domestic legislation with international commitments, to prevent local actions from undermining worldwide conservation initiatives. The maintenance of this equilibrium is crucial for the effectiveness of international agreements in reducing illegal, unreported, and unregulated fishing.

Clearly, Morocco has made substantial progress in strengthening its legislative framework to protect its maritime ecosystems and guarantee the long-term viability of its marine resources. The emphasis on six primary domains, namely bolstering legislation and regulations, augmenting monitoring and oversight, participating in global cooperation, implementing penalties and fines, promoting consciousness and education, and developing capabilities,

exemplifies a multifaceted and all-encompassing strategy. This exemplifies Morocco's dedication to solving the multifaceted issues of IUU fishing, acknowledging that a unique strategy may not be enough in addressing this intricate problem. This approach emphasizes the social and economic incentives driving IUU fishing, highlighting the need of understanding and addressing the underlying causes of this phenomenon. This include addressing poverty, limited economic prospects, governance challenges, and the necessity for enhanced awareness and education in coastal areas.

The legislative framework of Morocco, namely Law No. 15-12, demonstrates the country's proactive approach in addressing illegal, unreported, and unregulated (IUU) fishing. The legislation encompasses administrative and criminal sanctions, control and surveillance measures, international collaboration, preservation of marine resources, and awareness-raising. It is in accordance with international standards and represents a substantial advancement in the management of sustainable fisheries.

Morocco has implemented improved surveillance techniques and has been actively collaborating with international and regional partners to address the issue of Illegal, Unreported, and Unregulated (IUU) fishing. These efforts have been supported by the use of advanced technology and technical advancements. These projects are vital for ensuring the sustainable stewardship of marine resources and preserving natural equilibrium. The utilization of new technology such as satellite surveillance, vessel tracking systems, and aerial patrols by Morocco showcases a contemporary and proactive strategy in overseeing and managing marine activity. The incorporation of this technology not only assists in monitoring and identifying vessels in real-time, but also guarantees the safeguarding of marine protected areas and enables the analysis of data for the purpose of strategic planning against illegal, unreported, and unregulated fishing. Indeed, Morocco has made notable progress in implementing technologies such as the Vessel Monitoring System (VMS) and the Automatic Identification System (AIS), which are crucial for monitoring the operations of fishing vessels and guaranteeing adherence to national legislation. Nevertheless, the incorporation of various systems does not provide a comprehensive integrated strategy. Improvements are needed in the non-centralized structure of the VMS and the absence of procedural digitalization in detecting and processing ship offenders. The necessity for a more unified and centralized system is apparent, as is the need to incorporate these technologies into a wider digital framework. Furthermore, the Electronic Recording/Reporting System (ERS) is now only in

use for vessels operating under the Morocco-EU agreement, and has not yet been implemented for all domestic vessels. This expansion is essential for guaranteeing thorough surveillance and documentation of fishing operations over the entirety of Morocco's fleet. In order to stay up-to-date with advancing technology and emerging fraudulent fishing strategies, it is essential to engage in continuous training and skill development.

Furthermore, the prioritization of international collaboration is a crucial element of Morocco's strategy. The adoption of the National Control Plan (NCP) in 2017 is in accordance with the principles outlined in the International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU). This strategy demonstrates a dedication to implementing a structured, efficient, and verifiable system of oversight. The inclusion of Morocco in the Port State Measures Agreement (PSMA) in 2022 marks a noteworthy achievement. This agreement represents the collective worldwide endeavor to address Illegal, Unreported, and U

fishing. However, it i

of inspection efforts and efficient resource management. By simultaneously considering collective and individual goals, Morocco may efficiently deploy inspection resources to

Nevertheless, the ever-changing character of these talks, shaped by wider political alliances and economic connections, underscores the continuous and complex nature of these endeavors. The governance strategy aimed at addressing IUU fishing in Morocco has several obstacles, particularly due to the intricate nature of national maritime boundaries and the complicated geopolitical dynamics at play. Although Morocco has made significant progress in implementing laws and strategies to combat illegal, unreported, and unregulated (IUU) fishing, it is imperative to maintain ongoing negotiations and collaboration with surrounding nations. To properly tackle these issues, a well-rounded strategy is necessary, taking into account both the legal and political aspects. This approach should ensure that the tactics for monitoring and m

Furthermore, the efforts to address the issue are further undermined by communication issues within the fisheries department, the fishermen's confederation, and the fishing community, which are frequently marked by the withholding of information or the delayed spread of information.

Improving the skills and knowledge of workers engaged in fisheries monitoring and management is crucial in order to maximize the advantages of technological improvements. Indeed, digital literacy becomes a prominent concern, particularly when taking into account the socio-economic status of the majority of Moroccan seafarers. The crucial significance of ship captains in enabling on-the-job digital learning underscores the necessity of practical, experiential training in the technological shift.

An additional limitation is introduced to the aforementioned. Morocco faces substantial financial challenges in obtaining and maintaining innovative technical solutions to prevent IUU fishing. The exorbitant expenses associated with these technologies, together with the swift rate at which standards are emerging and the absence of a consortium to allocate expenditures, provide a significant obstacle. The financial component emphasizes the necessity of making strategic investments and fostering international collaboration to enhance the feasibility of technology acquisition in Morocco. Technological sustenance, or the upkeep of advanced equipment, poses an additional barrier. Problems like equipment breakdowns might hinder efforts to combat IUU fishing, requiring strong maintenance practices and technical assistance. Data guardianship and privacy are significant concerns, particularly in relation to Law 09-08, which requires the safeguarding of personal data and the implementation of interoperability criteria to enhance transparency.

To tackle these problems, it is necessary to adopt a comprehensive approach that includes making strategic investments in technology, enhancing digital literacy through capacity training, implementing ongoing maintenance and data security policies, and undertaking regulatory changes to fully embrace the digital transformation. Through addressing these c

The Ministry of Fisheries has a crucial role in formulating and implementing policies pertaining to the management of fisheries. The collaboration between the organization and training and research organizations, such as the Institut Supérieur des Pêches Maritimes, is crucial for enhancing expertise and understanding in the field. This partnership is crucial in guaranteeing that the legislative structure and enforcement methods conform to international norms.

The Moroccan Parliament guarantees the alignment of national legislation with international best practic

(VMS), stringent licensing and registration prerequisites for fishing vessels, and meticulous catch reporting. Moreover, Morocco's involvement in bilateral, regional, and international agreements enables the interchange of data and collaboration in the fight against illegal, unreported, and unregulated (IUU) fishing.

This study also demonstrates the difficulties associated with establishing uniform data standards, the possibility of unauthorized access to data, and the necessity of allocating resources to adequately oversee and implement legislation. In order to address these difficulties, it is proposed to place a strong emphasis on international agreements that give priority to the exchange of data, establishing uniform procedures, and enhancing the capabilities of underdeveloped countries, such as Morocco.

Given Morocco's history characterized by colonialism, socio-political turmoil, and systemic problems like weak institutions and lack of investment, the establishment of a national agency specifically focused on addressing illegal, unreported, and unregulated (IUU) fishing appears to be more than just an administrative change. It is a strategic measure aimed at addressing historical disparities, promoting inclusive economic development, and improving oversight and monitoring of fishing operations. The successful implementation of Public-Private Partnerships (PPPs), specifically in infrastructure projects like as the Tanger-Med port, is emphasized as a model that may be duplicated in the effort to combat Illegal, Unreported, and Unregulated (IUU) fishing. The proposed agency might promote these collaborations, merging public objectives with the efficiency and creativity of the private sector, thereby tackling the substantial investment requirements and hazards linked to the fight against illegal, unreported, and unregulated (IUU) fishing. Undoubtedly, this institution has the capacity to act as a catalyst for the advancement of sustainable fisheries. To mitigate the sector's shortage of competent human resources and institutional experience, the agency might implement training programs, develop knowledge centers, and facilitate technology transfer. This

frequently results in inadequately defined roles and duties, which poses challenges to coordination and occasionally results in the failure of certain management initiatives. Therefore, establishing the National Agency is considered an essential measure to tackle these coordination difficulties and achieve more efficient control over activities and decisions aimed at combating IUU fishing. The institution would function as a centralized hub at the national level, guaranteeing streamlined oversight and traceability across the whole value chain. This entails augmenting the number of persons in charge of control, expanding the satellite control system to encompass artisanal fishing sectors, and establishing a more robust legal structure for imposing fines in relation to fishing violations.al structure for impos

1. Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (opened for signature 22 November 2009 until 21 November 2010, entered into force 5 July 2016)
2. Azaguagh, Ismail and Driouchi, Ahmed (2019). Management of fisheries resources in Morocco and access modes : The anticommons model for the Octopus fishery *in Revue Marocaine des Sciences Agronomiques et Vétérinaires*, ISSN 2550-4401, Institut Agronomique et Vétérinaire Hassan II, Rabat, Vol. 7, Iss. 1, pp. 5-17.

11. Food and Agriculture Organization (FAO), the State of World Fisheries and Aquaculture 2022, Rome, United Nations publications, 2022, p. 12.
12. Food and Agriculture Organization (FAO), the State of World Fisheries and Aquaculture 2022, Rome, United Nations publications, 2022, p. 129.
13. Gianni, Matthew (2004). IUU Fishing and the Cost of Flag of Convenience

26. Oystein Jensen. *The Development of the Law of the Sea Convention : The Role of International Courts and Tribunals.* Fridtjof Nansen Institute, Norway, and the University of Souh Eastern Norway. Edwar Elgar Publishing limited, 2020.
27. Palma, Mary Ann, Martin Tsamenyi and William Edeson. *Promoting Sustainable Fisheries : The International Legal and Policy Framework to Combat Illegal, Unreprted and Unregulated Fishing*. Leide0 593o Combat