

**AN ADAPTIVE APPROACH TO DETERMINE LANDED VALUE FOR CAPE HORSE MACKEREL (*TRACHURUS CAPENSIS*) FISHERY IN NAMIBIA**

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**ABSTRACT**

This study evaluates the need to review the landed value of Cape horse mackerel while considering the approach and factors that inform it. A literature review highlighted the need for a mixed research method. Quantitative data on fish market value and quota volume were obtained from the Namibia Revenue Agency and FAO, whereas data from the Ministry of Fisheries and industry stakeholders documented the valuation process and perceptions of fairness in the resource rent system. The study found that landed value is determined using local and export market prices, with TRIMMEAN techniques applied to remove outliers before calculating the weighted average price. The final landed value is obtained by subtracting the operating and marketing costs from the average price. While 63% of industry participants viewed the resource rent system as fair for supporting Namibianisation, some called for lower rates on wet landings. Since 2017, rising market prices for Cape horse mackerel have necessitated a revision of the landed value. A collaborative approach, fair methodology, economic considerations, sustainable fishing practices, improved data collection, and regulatory compliance can enhance the valuation process. Additionally, a comprehensive price study and audited income expenditure data can provide reliable insights for reviewing the landed value.

**Keywords:** Cape horse mackerel, resource rent system, landed value, fishery valuation, Namibia.

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## 1. INTRODUCTION

This section provides background information on fisheries management, with a focus on Namibian fisheries management. It outlines the research problem, objectives, and significance of the study.

### 1.1 Background

The Namibian fishing industry is a good example of a national sustainable natural resource being exploited within the 200-mile Exclusive Economic Zone (EEZ). Namibia has a diverse marine ecology that is well-nourished by the Benguela current system, which stretches 1,500 km along the coastline (Chiripanhura & Teweldemedhin, 2016). This current is inhabited by an array of pelagic (deep-sea) and demersal fish, mainly Cape horse mackerel and hake, and is also a source of abundant plankton owing to the region's intense coastal upwelling. The sector, which has two landing sites in Walvis Bay and Luderitz, licences approximately 207 vessels annually (MFMR 2022). Also, the sector lands close to 442,000.00 MT of commercial species on annual average, with Cape horse mackerel being the largest and contributing more than 60% to the landing. Furthermore, the fishing industry in Namibia is the second largest export commodity after diamonds, accounting for 8.8 per cent of the total exports, in particular, the commercial fishing of horse mackerel and hake (NSA, 2022). Contributing approximately 4.5 per cent to Gross Domestic Product (GDP), Namibia's Government through its "Vision 2030" identifies fisheries as one of the industries with potential for growth (Chiripanhura & Teweldemedhin, 2016) through sustainable strategies.

Fisheries management in Namibia, similar to that in Iceland and a number of other fishing nations, is regulated by a quota system and a valid fisheries resource rent system. However, unlike Iceland, which uses a transferable quota system, the Namibian quota system is a non-transferable quota (Arnason, 2009). The quota system involves the determination of TACs based on the best available scientific evidence, given thorough discussions of the biological status of the stock and economic performance by the sector. Furthermore, advice from the Marine Resources Advisory Council is considered before the presentation to the cabinet (MFMR, 2000). In terms of resource rent, these fees form an important part of Namibian fisheries management. Their role is twofold: first, to earn revenue for the government, and second, to create incentives that work towards the goals of the management system, both conservation and Namibianisation (MFMR, 2007). Namibianisation is an innovative policy in Namibia that provides fishery stakeholders with economic incentives to encourage them to expand Namibian involvement in fisheries by increasing both the ownership and employment of previously disadvantaged population groups. (Sumaila, 2004).

Fisheries resource rent ranges from quota fees, marine resource fund levies, and by-catch fees which are payable in accordance with the volume of allocated quotas and by-catches, to vessel ownership (MFMR, 2000). Under Sections 44(1) and (3) of the Namibian Marine Resources Act of 2000 (Act No. 27 of 2000), the fees and levies are based on the landed values of commercial species (MFMR, 2000b). Cape horse mackerel (*Trachurus capensis*) is the second most valuable fishery in Namibia and the largest in terms of catch net weight. This project will

develop an adaptive approach to determine the landed value for cape horse mackerel, as it is essential for fishery resource rent reviews and updates.

## **1.2 Problem Statement**

In accordance with Sections 44(1) and (3) of the Namibian Marine Resources Act, 2000 (Act No. 27 of 2000), the Minister may determine the fees payable with respect to the harvesting of marine resources and impose levies for the harvesting of marine resources, to be paid into the Marine Resources Fund referred to in Section 45 for the purposes of the fund. This is done in consultation with the Advisory Council and with the approval of the minister responsible for finance. In line with the above provision, the Namibian government on 26 June 2017 determined the new quota fees and marine resources levy to benefit the Marine Resource Fund that repeal Government Notices, No. 253 of 14 October 2016 and 80 of 01 June 2002.

The historical levies were calculated using a fixed rate per species up to 2017; however, as of that year, the levies were proportioned to landed values of the species. The landed value notion in the Namibian fishery management system is the cost of a fish species per kilogram in the form it is brought to shore with a discounted cost of operation. At present, the ministry has not yet developed a dependable documented system to direct the process of determining the landed values of fish species. Given that this is public information and that the government and stakeholders must both be involved in reviewing and updating the landed value, it is essential to establish a well-defined technique for calculating landed value. Furthermore, updates to species landed values are also necessary, considering economic progression and market dynamics over the intervening period. During the ministry's annual consultations with the fishing industry, it was claimed that the previous exercise that determined the landed value that is utilised now was not inclusive in terms of participants in the process. Additionally, the size and type of fish products were overlooked during the establishment of the average fish price. As a result, the currently enforced landed value is challenged, as it may be inaccurate, resulting in an unfair management system. Thus, considering the landed value of N\$9.50 for Cape horse mackerel, the possibility of unfair charges on resource rent to quota holders is noted.

## **1.3 Research Objectives**

The Cape horse mackerel fishery was used as an example in this study to develop a reliable approach for determining the value of landed fish species. Consequently, the sub-objectives of this study are as follows:

1. Identify the factors that determine landed value for Cape horse mackerel.
2. Formulate a standard approach to determine the landed value of Cape horse mackerel.
3. Assess the current market value of Cape horse mackerel.

## **1.4 Significance of the study**

- This study may assist the Ministry of Fisheries and Marine Resources (MFMR) to have a standard approach for determining landed value for commercial fisheries, particularly for Cape horse mackerel.

- This study may benefit the government and stakeholders by providing a documented report on how landed value is determined for resource rent.
- This study will be a guiding document for determining the landed value of Cape horse mackerel.
- In addition, the study will benefit scholars who find interest in advancing knowledge fisheries in resource rent and determining resource value for the benefit of the national economy.

## 2. METHODOLOGY

This chapter explains and provides justification for the study's chosen research design, study area, sampling technique, questionnaire design, and data processing and analysis methods.

### 2.1 Research Design

Over the past 30 years, mixed-methods research has gained popularity in the social sciences. A variety of perspectives and degrees of complexity can be captured through mixed-methods research, which is sometimes not achievable with the use of a single methodological technique (Doyle, Edwards, & Haddow, 2022). Mixed method designs include at least one quantitative method (designed to collect numbers) and one qualitative method (designed to collect non-numerical data), in which neither type of method is inherently linked to any particular enquiry paradigm (Creswell & Clark, 2013). The same author argues that mixed-method studies outweigh the drawbacks of both qualitative and quantitative research. Furthermore, compared to either quantitative or qualitative research alone, the technique offers additional support for investigating a research problem. Instead, other than being limited to the types of data traditionally collected for either quantitative or qualitative research, researchers are allowed to employ all accessible data gathering technologies. Generally, mixed-method research assists in providing answers to queries that cannot be addressed solely by quantitative or qualitative methods. Therefore, this study used a hybrid strategy to gather both primary and secondary data to fulfil its goals. As illustrated in **Error! Reference source not found.**, the study accumulated information in three ways.

- i. Detailed information was gathered from relevant published and unpublished literature from journal articles, reports, and government documents.
- ii. Interviews were conducted with focus groups actively involved in fisheries administration and operations.
- iii. Statistical data were collected from secondary data sources in the study area.

This study applied a systematic literature review. This type of system includes structured execution of the review and a high degree of transparency in the review methods applied. These measures enable readers and reviewers of such studies to trace and better understand the review results compared with more traditional approaches to literature reviews (Booth, 2016; Jesson, Matheson, & Lacey, 2011; Tranfield, Denyer, & Smart, 2003). This instrument was used to understand the ideology and methods of determining fishing fees and levies for Namibia and other fishing nations to develop a research design that was used for this study, as illustrated in **Error! Reference source not found.** below.

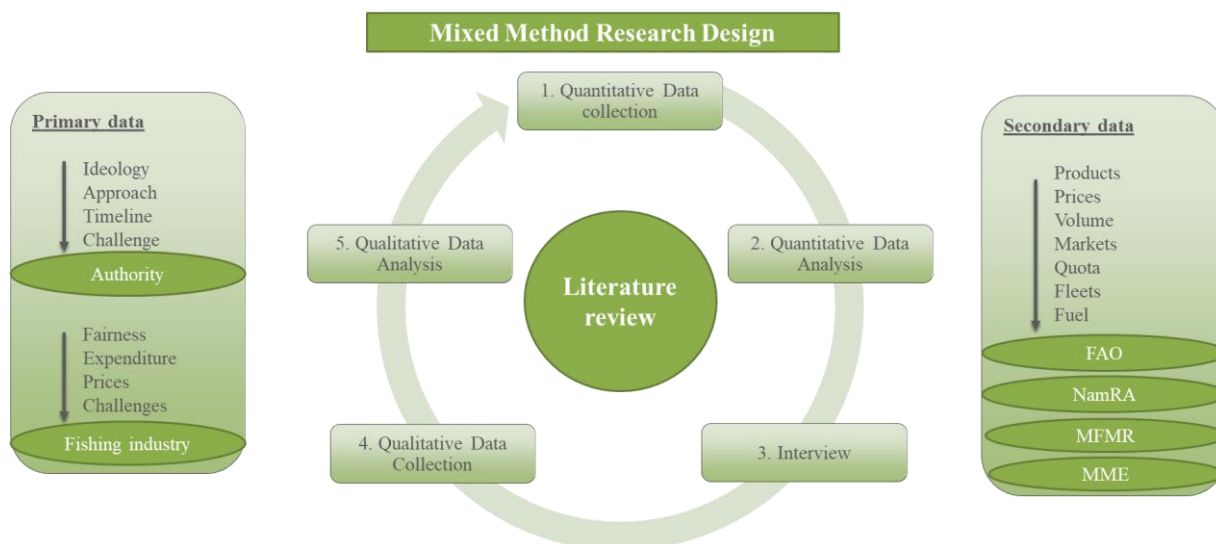


Figure 1 Research design of the study. Source: Author's own.

## 2.1. Study Area

The study focused on obtaining data from government fisheries administrators and fishery operators in the cape horse mackerel subsector from Windhoek and Walvis Bay, respectively. Walvis Bay is a major investment hub in Cape horse mackerel operation and its subsidiary service industries because the fish are landed and mainly processed in Walvis Bay (Belhabib et al., 2019). The head office of the Ministry of Fisheries and Marine Resources is based in Windhoek, where administrators are stationed.

## 2.2. Sampling Strategy

The sampling strategy refers to the different ways in which study participants can be selected from the study population (Mosweu & Mosweu, 2020). Since the study considered both the qualitative and quantitative collection of information, the sampling was as follows.

### *Quantitative Data*

The study employed available data from the Food and Agriculture Organization (FAO), Namibian Revenue Agency (NamRA), Ministry of Fisheries and Marine Resources, and Ministry of Mines and Energy. The institutional database provided time series cape horse mackerel export and import data, TACs and landing, and fuel prices that cover the period from 2017 to 2022 since the set landed value. The focus group also provided additional quantitative information such as market prices for cape horse mackerel and quota usage charges. The purpose of gathering this information was to estimate the market value of landed Cape horse mackerel.

### *Qualitative data*

Purposive sampling and convenience sampling are the most common sampling strategies used in qualitative research. These techniques allow the researcher to select objectives and specifically qualified respondents or participants to collect the requisite data from (Etikan,



2016). Since the study did not aim to generate results that would be used to create generalisations pertaining to the entire population, it used non-probability sampling techniques. The interviews followed a set of specific questions that were systematically developed. This type of interview was employed to acquire primary qualitative and quantitative information, and the responses were directly comparable. Therefore, this study interviewed the Namibian Ministry of Fisheries and Marine Resources and Cape horse mackerel fishing industry quota operators.

### **2.3. Interview sample size and procedures**

Owing to the short study duration, 12 participants were interviewed by the researcher. The interviews were separated into two groups, with 67% of the participants coming from the fishing industry and 33% of the participants being government personnel from the Ministry of Fisheries and Marine Resources.

All interviews were facilitated using the Zoom application. For effective data collection and verification, participants were informed that the interviews would be recorded. In addition, they were assured that their personal information would be kept in strict confidence and that their contribution would remain anonymous. The information was validated by the participants via email after the transcription of the discussion was shared.

### **2.4. Interview questions outline**

The literature review revealed information gaps pertinent to the research topic. Consequently, the study created a focus group of willing participants who were purposefully selected and relevant in responding to the questions. The interviews were divided into two groups that focused on participants from the Ministry of Fisheries and Marine Resources and the fishing industry. The Ministry of Fisheries and Marine Resources participants were asked to provide insights into the ideology and approach used to determine landed value. Given that landed value is an independent variable for calculating quota fees, marine resource funds, and by-catch rates, they were also asked to indicate the length of time it took for the regulation to be developed and put into effect. Lastly, the interview sought for any challenges encountered, interventions, or solutions before and after using landed value as a factor in resource rent determination.

To answer questions on the operation of the Cape horse mackerel from the perspective of a quota holder without a vessel, a quota holder with a vessel, and a vessel owner with a vessel, the researcher purposefully chose qualified participants from the fishing industry. In this way, a series of questions were posed after the researcher sought to determine whether the resource rent system was fair by utilising landed value as the basis for the calculation. The identification and justification of the main implications for fishing expenses and fish market prices were among these issues. Table 1 presents the questions asked during the interviews.

Table 1. Questions to government administrators and fishing industry. Source: Author's own.

<b>Interview questions to the government administrators</b>
<ol style="list-style-type: none"> <li>1. <i>According to Namibian law, the MFMR is authorized to impose levies on marine resources for the benefit of the Marine Resources Fund. Could you please explain the ideology and the current resource rent system?</i></li> <li>2. <i>How were the rates for the fund levy, by-catch fees, and quota fees established?</i></li> <li>3. <i>How was the value of each species in the form in which it is landed decided?</i></li> <li>4. <i>Can you give an estimate of how long it will take to determine the landed value of each species, in the case of cape horse mackerel?</i></li> <li>5. <i>How was resource rent calculated prior 2017?</i></li> <li>6. <i>What led the ministry to adopt the 2017 method for calculating resource rent?</i></li> <li>7. <i>Does the Ministry face any challenges with the current system to determine resource rent?</i></li> <li>8. <i>In your opinion, how can the ministry make system improvements to address the challenges identified?</i></li> </ol>
<b>Interview questions to the fishing industry</b>
<ol style="list-style-type: none"> <li>1. <i>The Ministry of Fisheries and Marine Resources charges resource rent on the allocated quota to right holders. Depending on the landed value of the fish, a proportion of the landed value is paid to the government as quota fee, by-catch fee, or fund levy. Consequently, the quota fee charges take into consideration the ownership of the vessel utilized and whether the fish is processed on board or processed on land. Do you find this system fair or unfair?</i></li> <li>2. <i>Why do you think it is fair/unfair?</i></li> <li>3. <i>Is N\$9.50 as horse mackerel landed value fair enough?</i></li> <li>4. <i>What are the main offshore operation expenses?</i></li> <li>5. <i>What is the reason for high expenses?</i></li> <li>6. <i>What is the wage structure for the crew?</i></li> <li>7. <i>How much is the usage fee and what is the implication as an expense?</i></li> <li>8. <i>Does the fish size affect the price per kg?</i></li> <li>9. <i>What is the average price of horse mackerel per kg?</i></li> <li>10. <i>What is your advice on the determination of landed value?</i></li> </ol>

## 2.5. Data processing and analysis

The collected data were cleaned to remove all errors and address any omissions and inconsistencies to ensure accurate and complete information. Data collected from the field were recorded and checked against codes for verification. Quantitative data were combined and analysed using Microsoft Excel, whereby descriptive statistics were generated as frequencies, means, minimum, maximum, and percentages and presented in tabular forms and charts. For the Key Informant Interviews (KIIs), content analysis method was employed to analyse qualitative information. Content analysis is suitable for qualitative data because it consists of direct quotations from respondents about their experiences, opinions, feelings, and knowledge. The presentation from the interviews after analysis is illustrated in tables and figures to demonstrate the approach and ideology behind determination of landed value and to examine resource rent fairness, operational cost implication, value of fish, and potential solutions in case of conflicts between the industry and regulators. Descriptive statistics, such as frequencies and percentages, were used to analyse the quantitative results for the determination of the current landed value for cape horse mackerel.

### 3. LITERATURE REVIEW

This chapter will outline the background and theories of fisheries management in a hierarchical order, starting with fisheries management in general, then moving on to Namibian fisheries management, and finally to cape horse mackerel fisheries management.

#### **3.1 Fisheries Management**

Fisheries governance has been moving from open access to management systems. To counter this, rights-based and effort control systems have been widely practiced and extensively discussed in fisheries literature over the last two decades (Arnason, 2005, 2009; Charles, 2002; Oelofsen, 1999; Pearse & Lockhart, 2004; Sutinen, 1999). Rights-based fisheries consist of two types of rights: use rights, which determine who is allowed to fish, and management rights, which determine who is allowed to manage the fishery. Effective use rights can aid better management and conservation efforts. Management rights are effective when the government, fishermen, and local communities co-manage. There are various types of use rights, such as territorial use rights, limited entry, effort, and harvest rights (Charles, 2002). A limited entry right is a tool for regulating fishery access, capacity, and safeguarding fishery stability (Oelofsen, 1999).

##### *Rights, TAC and Quotas*

TAC is an output control measure that is divided into quotas and distributed to authorised fishing operators, such as firms, individuals, or units, with each share representing individual or collective harvesting use rights. These allocations can be given for one year, longer durations, or indefinitely (Copes, 1986). Harvest rights, which are predetermined shares of the annual TAC, are divided into two categories: IQ and ITQ. IQs are non-transferable harvesting rights, whereas ITQs can be permanently transferred among fishers. IQs and ITQs as property rights have been successful in global fisheries (Arnason, 2009). Property rights vary in terms of security, permanence, exclusivity, and transferability, and their quality is considered excellent if they hold all features (Arnason, 2005). As IQs are neither transferable nor permanent, they provide limited control over resources and have fewer incentives to maximise profitability. On the other hand, individual transferable quotas (ITQs) have all four features and can bring substantial economic benefits (Arnason, 2009; Gunnlaugsson, Kristofersson, & Agnarsson, 2018a; Gunnlaugsson & Saevaldsson, 2016). With IQ harvesting rights, there is certainty that fishing firms, individuals, or communities will not have to compete for their share of TAC. They also allow operators to fish in their own time and carefully distribute their efforts and costs throughout the season, eliminating the need for fishing in inclement weather or other potentially hazardous conditions. In addition, excess harvests can be avoided, and sales value can be maximised by meeting the demand trends of both fresh product processors and customers throughout the year (Copes, 1986). Fishing inputs, such as the number of fishers and size of the fleet, are lowered because of these incentives (Charles, 2002). IQ harvest rights may have potential benefits but may also have some social and environmental drawbacks. Owing to the complexity of enforcement in fisheries, IQs often cause fishermen to participate in “quota busting”, meaning catching more than their allotted individual quota. IQs are also linked to “data fouling”, which occurs when operators underreport excess catch to avoid detection. In

addition, IQs are associated with high grading which occurs when a quota is only filled with high-quality fish, while lower-quality fish are discarded (Charles, 2002; Copes, 1986).

### *Fisheries resource rent*

As quota systems are being adopted by more countries worldwide and the financial performance of fisheries is improving, there has been an increase in demand for the sharing of fisheries resource rent (Gunnlaugsson, Kristofersson, & Agnarsson, 2018b). Generally, economic rent estimation is difficult for a variety of reasons, including its elusive character and widespread misunderstanding among academics about how to recognise and quantify various kinds of economic rent. Furthermore, correct rent predictions necessitate estimating inframarginal profits alongside rent, rather than disregarding them. Overestimating economic rents by ignoring inframarginal earnings can be significant in particular industries and could be an issue (Misund & Tveterås, 2020).

### *Resource rent - Iceland*

Using Icelandic fishing as an example, their resource rent is arguably the largest experiment in the world, where the fishing industry pays licence fees and resource rent taxes for access to fishing resources. Taxation of fishing is not yet widespread in other nations, and significant levies or true resource rent taxes are not typical in international fisheries. Most countries charge minor licence fees to the fishing sector, barely covering the costs of administration and research (Gunnlaugsson et al., 2018b). According to Gunnlaugsson et al. (2018b), four distinct phases with distinct characteristics and fee structures constitute the introduction of the Icelandic fishing fee. The first phase, which ran from 1990 to 2003, included licence fees meant to offset some of the expenses of managing fishing resources. The fishing fee was first implemented in 2004, and then increased annually from 2009 to 2011. Finally, the charge dramatically increased in 2012, elevating it to the status of key expense. However, the introduction and implementation of fishing fees has several issues. These include establishing the base of the fee, varying profitability, shifting revenue from fishing to processing, having a heavy debt load, and having trouble gathering reliable data (Barnett et al. 2017; Gunnlaugsson et al., 2018b). Studies have shown that a quota tax is preferred over a comparable profit tax by fishers who earn the highest average net returns on quotas owned. A quota tax also has the potential to allow fishers to capture the full benefits of efficiency improvement (Grafton, 1992).

### *Resource rent - Norway*

The Norwegian salmon aquaculture sector has recently produced substantial exceptional profits and the market value of farming licences has increased, indicating that the sector is creating sizable economic rents. However, the nature of the economic rent generated by salmon aquaculture is largely unknown. Norway's resource rent taxation takes the form of payments for aquaculture licences. The rent includes a royalty tax that went into effect in 2022, payments for aquaculture licences (with a fixed fee starting in 2002) and auctions (starting in 2018) (Misund & Tveterås, 2020).

*Resource rent - Morocco*

According to El Ayoubi (2003), there are about 30 deductions in the Moroccan maritime fishing industry, which might be fiscal, parafiscal, or social for services paid. Access and resource exploitation deductions, which include supplementary fishing licence taxes and a fishery research tax, refer to the issuance and renewal of fishing licences, use of tuna traps, or concessions for fish farms. Cephalopod and shrimp trawlers pay an extra tax on top of these charges. The three main forms of deductions that constitute the system are investment deduction, resource exploitation deduction, and deduction for fishing activities. It was further argued that the way that current fiscal and parafiscal deductions are structured, they are more geared towards meeting immediate financial requirements than they are towards resource management. The proceeds from these deductions have helped finance the fishing industry, particularly infrastructure, fishing villages, and scientific research, directly or indirectly. Unfortunately, the tax system has some shortcomings that make it less effective as a tool for fishery policy, leading to under-declaration and sales outside authorised channels. These flaws include, among others, the profusion of deductions, rates used, taxing base, and quality of the services provided.

*Resource rent - Madagascar*

The total treasury revenue for the Republic of Madagascar from European fishing consists of three components, each of which contributes to the "financial compensation" outlined in each agreement: (1) access fees for the exploitation of fishery resources within the EEZ; (2) financial support for management activities (such as monitoring, gear improvement, and scientific research); and (3) fishing fees paid on a quota basis. In contrast to fishing fees, which consist of fees paid by vessel owners, access fees for exploitation and financial support for management activities are both directly funded by the EU (i.e. they are taxpayer subsidies) (Le Manach et al., 2013). It was further argued that, notwithstanding the fact that the Malagasy government currently receives 13,300 tons of tuna in return for 1.7 million euros per year, the current deal is far less advantageous for Madagascar than it was in the past. This reduction can be attributed to Madagascar's significant currency depreciation as well as the fact that Europe's inflation rate has been significantly lower during the past 20 years. In addition, despite the EU's assertion that fishing costs climbed from 70 euros per ton in 1986 to 100 euros per ton in 2010, these expenses decreased from 137 euros per ton to 100 euros per ton by that year.

*Determination of resource rent*

Gunnlaugsson et al. (2018b) suggested issues related to determining fishing fees. The first issue, which has dominated fishing fees, is to determine the base on which the fee should be levied. In the examples of Icelandic and Namibia, the fishing industry pays for the right to catch fish in the respective countries. Second, different Icelandic fishing enterprises have different levels of profitability. The composition of quotas among various species is one factor that contributes to this difference. Profitability varies between vertically integrated businesses and those that participate solely in harvesting. Third, in recent years, the processing portion of the fishing sector, such as the Icelandic sector, has received a larger percentage of earnings than the fishing

portion. Most of Iceland's largest and most significant fishing firms are vertically integrated, which means they engage in both fishing and processing, as well as the sale of their own goods. For these businesses, landed catch is an intermediary product and its pricing is somewhat arbitrary. The fourth and most significant problem is the challenging financial condition, which includes a heavy debt load and wide variances in the financial standing of enterprises involved in the fishing industry. Finally, the basis for the fee had to be calculated, which was a very challenging undertaking. The fee should ideally be determined by actual existing rents. However, doing so would require current data on the earnings and costs of all species, including capital expenses. This is challenging. First, it is challenging to estimate and divide costs by species, especially in vertically integrated organisations, where fixed costs are divided and intermediary revenue is a major difficulty. Second, if the fishing charge is to be applied generally, rentals can only be estimated after all businesses have submitted their tax returns. Furthermore, Misund and Tveterås (2020) revealed that utilising information from the 2018 and 2020 salmon production capacity auctions predicted that a significant portion of the market value of salmon farming licences would come from infrastructure earnings. It was also discovered that less efficient businesses are more prepared to pay for marginal production capacity than larger salmon farming businesses, which suggests that incremental revenues play a significant role in explaining the diversity in this willingness to pay.

#### *Fish size and fish market value*

According to Zimmermann and Heino (2013), fish body weight plays a significant role in determining the market value of landed catch, which affects the best harvesting method. However, there is no systematic research on the prevalence of size-dependent pricing, and body size is frequently ignored as an economic feature in the analyses of management strategies and bioeconomic modelling. The results show a significant positive relationship between weight class and price for seven of the eight fish stocks examined. In addition, ex-vessel prices typically vary significantly among fish species because they represent the interaction between the supply and demand dynamics for a particular species at a particular moment. Consumers typically bid up the market price to stimulate the production of extra supply if they need more of a product than is currently available (U. Rashid Sumaila, Marsden, Watson, & Pauly, 2007).

### **3.2 Namibia Fisheries Management**

#### *Namibian Exclusive Economic Zone*

Fisheries resources belong to and are regulated by the state government because Article 100 of the Namibian Constitution grants sovereign power over all natural resources on land, below and above the surface, on the continental shelf, and inside territorial waters (EEZ) (MFMR, 2004a). Cape horse mackerel and other marine species, including hake, were found in the 1950s and the 1960s by far-off trawler fleets from other countries. Namibia implemented a rights and quota management system after gaining independence in 1990 to address the issue of unrestricted access to common property and to increase Namibians' economic gains from fishing (MFMR, 2004a). The authority has been successful in conserving marine resources and securing maximum yields from fish populations and income since the implementation of the rights and

quota management system (MFMR, 2004b). To regulate the use of marine resources inside the territorial maritime seas, Namibia produced the Marine Resources Act, No. 27 of 2000, regulations relating to the use of Marine Resources in 2001, and the Marine Resources Policy in 2004. A law enacting a policy of "Namibianization" in the fisheries sector was also passed simultaneously, with the goal of enhancing and empowering Namibian participation in fisheries operations (MFMR, 2004).

#### *Monitoring, Control and Surveillance*

An efficient monitoring, control, and surveillance system has been established by the Namibian government to combat illegal, unreported, and unregulated (IUU) fishing in Namibian waters (MCS). The entire coastline is covered by MCS in all four directions: sea, air, land, and remote sensing. The Fisheries Observer Agency, which deploys a fisheries observer on board each licenced fishing vessel to oversee fishing operations, supplements the MCS. The movement and fishing activities of vessels are also tracked and observed using a Vessel Monitoring System (VMS). Additionally, MFMR regulates the fishing industry by limiting fishing activities to those with fishing rights and quotas, ensuring that fishing activities are carried out properly and administratively, and by obtaining revenue from landings (MFMR, 2004a).

#### *Fishing rights*

The Namibian hake fishery employs limited entry rights, which are solely given to legal entities, and IQ harvest rights. IQs are portions of the hake TAC that are issued to hake rights holders annually to ensure the industry's economic viability. These quotas are allocated for longer periods, ranging from seven to a maximum of twenty years, depending on the term of fishing rights. Individual quota allocations are performed on a pro-rata basis based on past year allocations, and the size of allocations varies depending on how well right holders perform against predetermined criteria, as well as the annual TAC level. The criteria consider right holders' investments, value addition, employment, and socioeconomic factors. Individual quotas cannot be permanently transferred, except with permission from the minister. The restrictive non-transferability of quotas and rights is intended to ensure that Namibianisation policy efforts are not compromised (MFMR, 2018). Right holders are expected to relinquish any unused quota to MFMR before the end of the fishing season to allow them to be redistributed. Unused quotas that are not returned on time have penalties or may impact future quota allocations (MFMR, 2020).

#### *Operational Agreements*

Horizontal clustering, wherein new or smaller rights holders enter into joint venture agreements with much larger fully integrated hake rights holders or operators, is a frequent practice in hake fisheries (Cooper et al., 2014). Both parties benefit from these arrangements. Such an arrangement permits the right holder to have access to vessels and processing facilities for the capturing and processing of that specific right holder's quota for new or smaller current rights holders. The fact that some of the smaller right holders have quotas that are insufficient to justify investment in either vessels or onshore processing facilities makes this necessary. These

right holders have no other investment options outside purchasing shares of larger companies' ships and onshore processing facilities. As they have sufficient catching and processing capacities, larger right holders can make better use of their factory and vessel fleets by engaging in these types of arrangements. Larger companies with high levels of vertical integration increase profitability and long-term viability by lowering risk and boosting earnings through economies of scale (Cooper et al. 2014).

Namibia's post-independence management practices, while focusing on individual quotas, have always conflicted with the state's commitment to efficiency (Kirchner & Leiman, 2014). The fragmentation of quota shares and inconsistent rights allocation laws, which have diminished right-holders' sense of ownership over the resource, have added to the industry's inefficiencies (Paterson, Kirchner, & Ommer, 2013).

#### *Marine Resources Fund Levy*

In the early 1970s, only pilchard, anchovy, horse mackerel, kingklip, monk, sole, and rock lobster were subject to research charges. All fish species for which harvesting rights have been given have been subject to a Marine Resources Fund levy since 1992 and the introduction of new fishing rights in 1994 (MFMR, 2004). Under the same policy, the minister was guided to change these fund levies to improve their efficacy. The costs of research, development, and training pertaining to marine resources are covered by the Marine Resources Fund. Fund levies are managed and administered after consulting the minister in charge of finances. A person to whom a quota is allocated under section 39(3) of the Act must, with respect to any of the species of marine resources allocated, pay on every kilogram of the species so landed, a 2% levy for the benefit of the Marine Resources Fund of the landed value of cape horse mackerel.

#### *By-catch*

A person to whom a quota is allocated under section 39(3) of the Act must, with respect to any bycatch of any species of marine resources, pay on every kilogram of the species so landed, a 15% levy for the benefit of the Marine Resources Fund of the landed value Cape horse mackerel (MFMR, 2004). In addition to the costs listed above, fishing firms must pay 32% corporate tax, 15% value-added tax on net profits, and several other fees and duties for services provided to them. The Namibian system levies quota fees, fund levies, observer fees based on harvest and quota allocation, and deterrence fees for bycatch (MFMR, 2017a).

#### *Quota Fees*

According to MFMR (2004), a quota levy was applied only to hake and horse mackerel at the time of independence. Land processing will clearly specify the levels of processing for rebates, with the aim of boosting employment in Namibia. As there is no practical alternative to land processing for small pelagic fish (pilchards and anchovies), this rebate is mostly applicable to hake and other wet fish (canning and reduction). Whether or not this is land-based, it may be more crucial in the future to encourage the full freezing of horse mackerel because it yields a more valuable product than reduction to fish meal and oil. Furthermore, the degree of processing required to qualify for rebates will be made clear. The fundamental level of quota levies, which may be changed annually, and the system of surcharges and rebates, which should be more permanent but may occasionally be changed, are the two decisions that must be made



when determining quota levies. "Namibian vessel, Namibian-based vessel, and foreign vessel" are the three categories of vessels recognised for the rebate system. Using this mechanism, exploiters are compelled to request more quotas than they anticipate catching them, which also reduces the incentive to underreport catches (MFMR, 2004).

The marine resource policy of 2004 stated that the fundamental amount of the quota levy will be decided by considering the worth of the fish, as well as catch rates, cost structures, and the profitability of fishing operations. The basic level often ranges from 5 to 15% of the value at first hand. Every fish subject to quota regulation ought, in theory, to be subject to a quota levy.

### 3.3 Cape Horse Mackerel Fisheries

#### *Biology*

Cape horse mackerel (*Trachurus capensis*), a member of the Carangidae family, has a long lifespan and can live for up to 30 years at a time (Abaunza et al., 2003). As shown in Figure 2, Cape horse mackerel has a typical length range of 15–40 cm and can grow to a length of approximately 60 cm. When they are young, they develop quickly, but beyond the age of three, they grow much more slowly, reaching their full length, which ranges from 20 cm to 33 cm (FishBase, 2016). Cape Horse Mackerel has a continuous distribution from Port Alfred on the southeastern coast of South Africa to the Northern border of Benguela and Tombwa in Southern Angola (Axelsen et al., 2004). In the past, it was assumed that the western and southern coastal horse mackerel populations were separate stocks; however, these populations are genetically identical, and hence, they are believed to be a single stock (Axelsen et al., 2004).

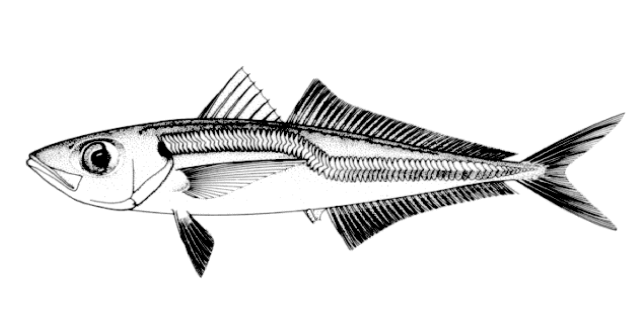


Figure 2: Cape horse mackerel (*Trachurus capensis*). Source: FishBase, 2016

The South African and Namibian stocks are separated by a strong Lüderitz upwelling cell. The two stocks are assessed and managed separately. The distribution and migration patterns of Cape horse mackerel in Namibia are highly concentrated in the northern part of the country, between 17°00 S–20°00 S. The species are highly migratory, and often the distribution of stocks overlaps; however, they have distinct areas for spawning, feeding, and over-wintering. Their migration is driven by water temperature and food availability. In winter, horse mackerel forms dense schools in deep waters, while in summer, they become dispersed and migrate northward with increasing temperatures (Abaunza et al., 2003). In the Namibian waters, horse mackerel spawn continuously from October to March/April, with spawning in spring being isolated and patchy, whereas spawning in summer and early autumn is intense and widespread (Kreiner,

Yemane, & Stenevik, 2015). The Namibian Cape horse mackerel is mainly pelagic, but as fish age, they are seen in demersal waters. Adults form monospecific schools, but juveniles can be found in mixed schools with sardines (*Sardinops sagax*), anchovies (*Engraulis capensis*), and round herring (*Etrumeus whiteheadii*) (Axelsen et al., 2004). Adult and juvenile horse mackerel mainly feed in the pelagic zone, and their diets vary according to their size. The juvenile diet consists mainly of small zooplankton, such as copepods, and the adult diet consists of euphasids, copepods, lantern fish, gobies, and polychaetes. The most active feeding period of horse mackerel is daytime, mainly at dusk (Axelsen et al., 2004).

#### *TAC and fishing rights*

Cape horse mackerel TACs are set by considering the biological status of the stock as determined by the assessment and economic performance of the subsector. The determination of TACs in Namibia, like other commercial fisheries, is based on scientific findings and after considering the Marine Resources Advisory Council's advice (MFMR, 2000a). Furthermore, the MRAC advises the Minister, who subsequently makes a proposal and lobbies the cabinet for approval, considering the evaluated level of TAC and performance. The TAC is distributed to the owners of the fishing season rights, which runs from 1 January to 31 December upon approval.

#### *Landing*

According to MFMR (2018), Namibia marine-captured fish are landed only at two harbours: the port of Walvis Bay in the western coastal area and the port of Luderitz in the southwestern coastal area. Cape horse mackerel is exclusively landed at the port of Walvis Bay because of the lower cost of doing business for fisheries companies. All catches, including bycatches, must be recorded upon landing. The regulations have a strong harvest rule against discards and encourage fishing companies to declare bycatch. On average, less than 1,000MT of Cape horse mackerel catches are landed by hake fleet trawlers as bycatch per year. Cape horse mackerel is landed in the form of whole round fish, and broken fish for fishmeal has a conversion factor of 1:4.25. Since 1990, catches increased sharply until 1994, and in the succeeding years declined with minimum fluctuations owing to poor fishing conditions and reduction in TAC.

### **3.4 Fees and Levies**

Several levies and fees must be paid to the Cape horse mackerel fishing sector. The various charges related to the Cape horse mackerel quota include quota fees, bycatch fees, vessel licence fees, and fund levies (Wium and Uulenga, 2003). The fees and levies are the sources of income utilised by the government to pay for the administrative costs involved in sustaining resources and the fishing industry. They are due to the quota allocated to each quota holder, regardless of whether it is harvested, and if it is not returned, they are paid. The fees are paid depending on whether the fish was landed fresh, frozen, or processed on land or at sea as a percentage of the landing value. Additionally, costs are divided into three categories based on the type of vessel used for harvesting: foreign, Namibian, and Namibian-based (MFMR, 2017a). According to government notice No. 6342 on 26 June 2017 the fees associated with the Cape horse mackerel

quota include quota fees, as indicated in **Error! Reference source not found.**, bycatch fees at 15%, and fund levies at 2%, which are calculated based on N\$9.50 landed value for Cape horse mackerel. The quota fees of the Cape horse mackerel, excluding those caught by the purse seine method, are determined based on the landed value rates, as indicated in **Error! Reference source not found.** below.

Table 2: Cape horse mackerel quota fee rates. Source: Namibian Gov. Notice No.159, 2017

<b>Processed at sea</b>	
Vessel Categories	Rate
Allocated to Namibian vessels	5%
Allocated to Namibian-based vessels	10%
Allocated to foreign flag vessels	15%
<b>Processed on land</b>	
Vessel Categories	Rate
Allocated to Namibian vessels	3.10%
Allocated to Namibian-based vessels	6.20%
Allocated to foreign flag vessels	10%
processing fish meal in Namibia	2%

## 4. RESULTS

The results are presented in two sections. Section 1 presents statistical data from the Namibia Revenue Agency, FAO, and Ministries of Fisheries, Marine Resources, and Mines and Energy. Section 2 includes the interview results, split into two sub-sections: the Ministry of Fisheries and Marine Resources and the Cape horse mackerel fishing industry.

### 4.1 Statistical Data

The study collected secondary data on Cape horse mackerel fleet capacity, TACs, landings, export and import fish prices, fees and levies, and fuel prices between 2017 and 2022.

#### *Fleet catch capacity*

The sub-sector licences approximately 18 vessels per fishing season, including four refrigerated seawater (RSW) vessels, two ice vessels, and 12 freezer vessels. Wet trawlers store fish on ice or in refrigerated seawater tanks before shipping them onshore for processing, whereas freezer trawlers process and freeze horse mackerel at sea within hours. Fish frozen at sea are packed in 30 kg master cartons, each containing three 10 kg blocks, wrapped in plastic and stored at a minimum of -15 °C.

Freezer trawlers have a total annual catching capacity of 320,000MT and 131,000MT for wet. This translates into a 451,000MT catching capacity, as indicated in **Error! Reference source not found.** Nevertheless, as shown in **Error! Reference source not found.**, the actual catching capacity remains below the set TAC.

Table 3: Annual catching capacity of midwater trawlers (MT). Source: MFMR, 2023

Vessel name	Flag	Yr built	Vessel type	Annual catch capacity
<b>Wet vessel</b>				
Krossfjord	Namibia	1997	Wet - RSW	26,000
Zephyr	Namibia	1996	Wet - RSW	30,000
Steinsund	Namibia	2001	Wet - RSW	25,000
Nordervon	Namibia	1998	Wet - RSW	25,000
Omake	Namibia	1985	Wet - ICE	15,000
Katima 1	Namibia	1988	Wet - ICE	10,000
<b>Total wet vessel capacity</b>				<b>131,000</b>
<b>Freezer vessels</b>				
Carapau 1	Namibian	1991	Freezer	27,000
Cavema Star	Namibian	1986	Freezer	37,000
Venus 1	Namibian	1988	Freezer	26,000
Mediva Star	Namibian	1982	Freezer	24,000
Komesho	Namibian	1988	Freezer	35,000
Desert Jewel	Namibian	1983	Freezer	25,000
Desert Ruby	Namibian	1984	Freezer	25,000
Tutungeni	Namibian	1990	Freezer	30,000
Jupiter 1	Namibian	1990	Freezer	40,000
ERNIR	Russia	1987	Freezer	n/a
Saga	Belize	1988	Freezer	25,000
Geysir	Belize	1985	Freezer	26,000
<b>Total freezer vessel capacity</b>				<b>320,000</b>

<b>Total vessel capacity</b>	<b>451,000</b>
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#### *Total Allowable Catches and Landings*

The TAC for Cape horse mackerel has consistently been set at or above 300,000MT, as shown in Figure 3. This indicates an increase over the previous six years, from 340,000MT in 2017 and 2018 to 349,000MT in 2019. TAC was cut by 19,000MT in 2020, bringing it down to 330,000MT, and the amount was held constant until 2022. Landings for the Cape horse mackerel during the past six years have been below the set TAC, and there has been a decline in the catches over the period, with a slight improvement in catches by 7 in 2021. In terms of wet landing, the proportion of wet allocation is based on the information provided in Table 4.

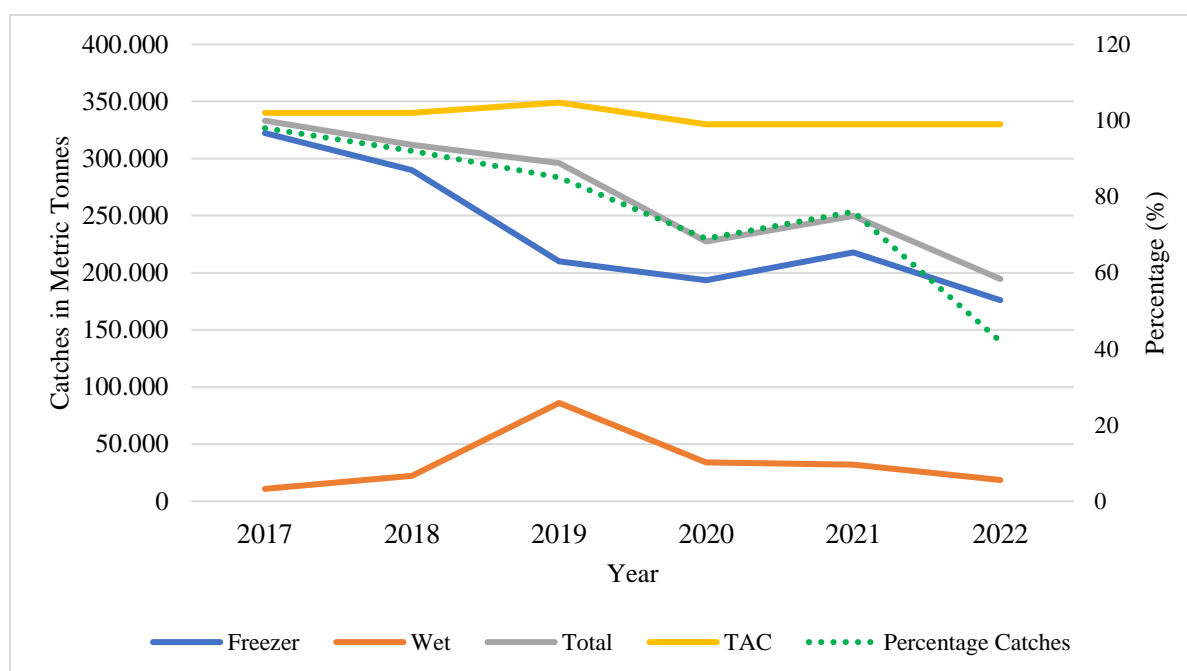


Figure 3: Trend of TAC and catches (freezer and wet) over the study period. Source: MFMR, 2022.

Table 4: Wet quota allocation. Source: MFMR, 2022

	2017/18	2018/19	2019/20	2020/21	2021/22
<b>Value addition allocation actuals</b>	5%	10%	20%	30%	40%

### *Export markets and prices*

According to Hara (2001), when compared to species such as hake or pilchard, horse mackerel has always been seen as an inferior product with little value. However, especially at the lowest end of the consumer market, horse mackerel is increasingly viewed as a food fit for human consumption. Considering Africa's rapid population growth, horse mackerel has enormous potential as a source of protein. Currently, the majority of Namibia's whole-round frozen Cape horse mackerel production is shipped to the DRC, Zambia, South Africa, and Mozambique (Figure 4)**Error! Reference source not found..**

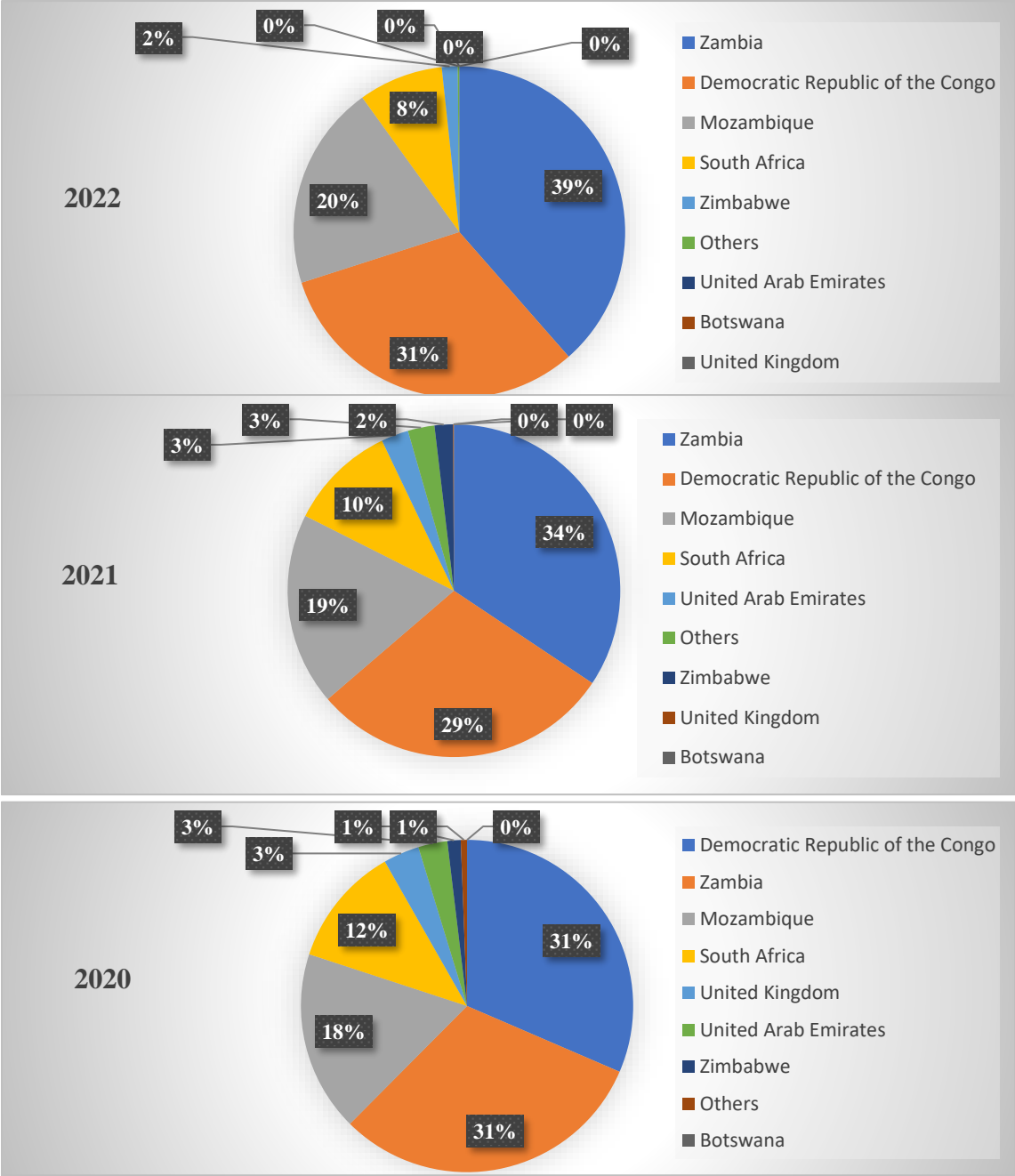


Figure 4: Cape horse mackerel export market share by nation from 2020 to 2022. Source: NamRA, 2023.

The data below show that Zambia imports the most fish from Namibia; however, a fishing industry respondent explained that Namibia has two corridors for shipping fish products to the DRC: by road through Zambia to southern DRC (Lubumbashi), and (ii) by sea through Matadi to northern DRC. As a result, it is possible that some of the fish products listed as exported to Zambia are en route to the DRC. Namibia’s largest export market over the past three years has been to Zambia, the Democratic Republic of Congo, South Africa, and Mozambique. Overall, Zambia and the DRC have the largest market shares, accounting for over 29% for each country. This is illustrated in **Error! Reference source not found.**

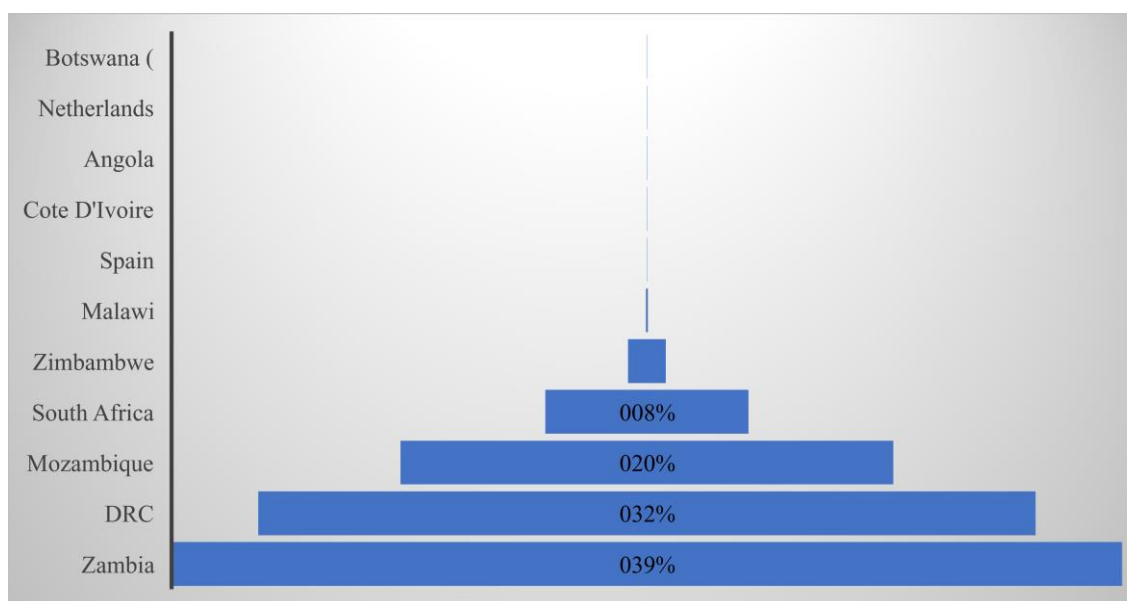


Figure 5: Percentage of whole round Cape horse mackerel weight export during 2022  
Source: NamRA, 2023.

Based on export data, the study summarised the frozen whole round cape horse mackerel average price per kg as traded to different countries over a period of the past eight years. As Figure 6 illustrates, **Error! Reference source not found.**the average price increased slightly in 2017. The median of the prices is not far from the calculated average prices, as further explained by the minimum and maximum prices.

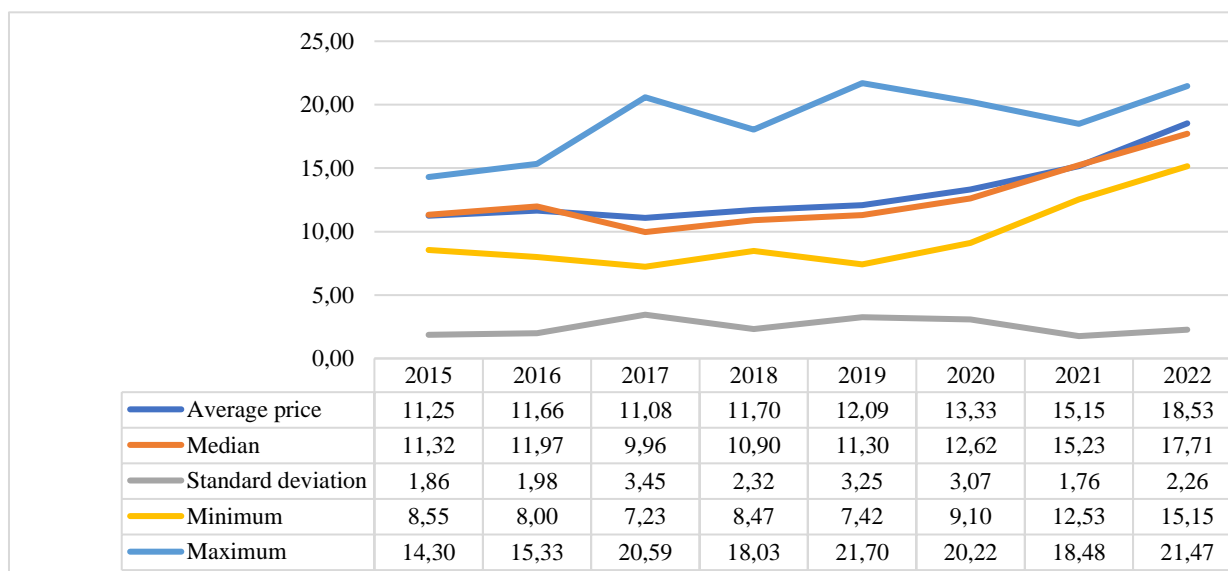
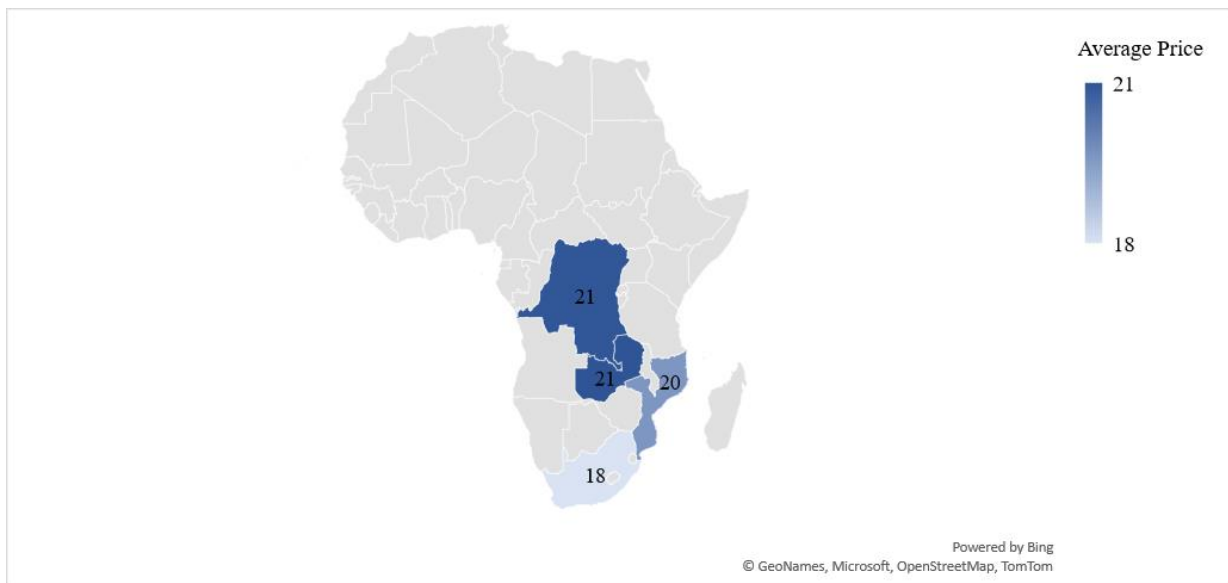


Figure 6: Descriptive Statistics for Cape Horse Mackerel Export Value per kilogram. Source: NamRA, 2023





shows a comparison of Cape horse mackerel whole-round frozen aggregated average prices in Namibian dollars from the four main markets in 2022. The Democratic Republic of Congo and Zambia fetch the highest price at N\$21 followed by Mozambique at N\$20, and South Africa at N\$18.

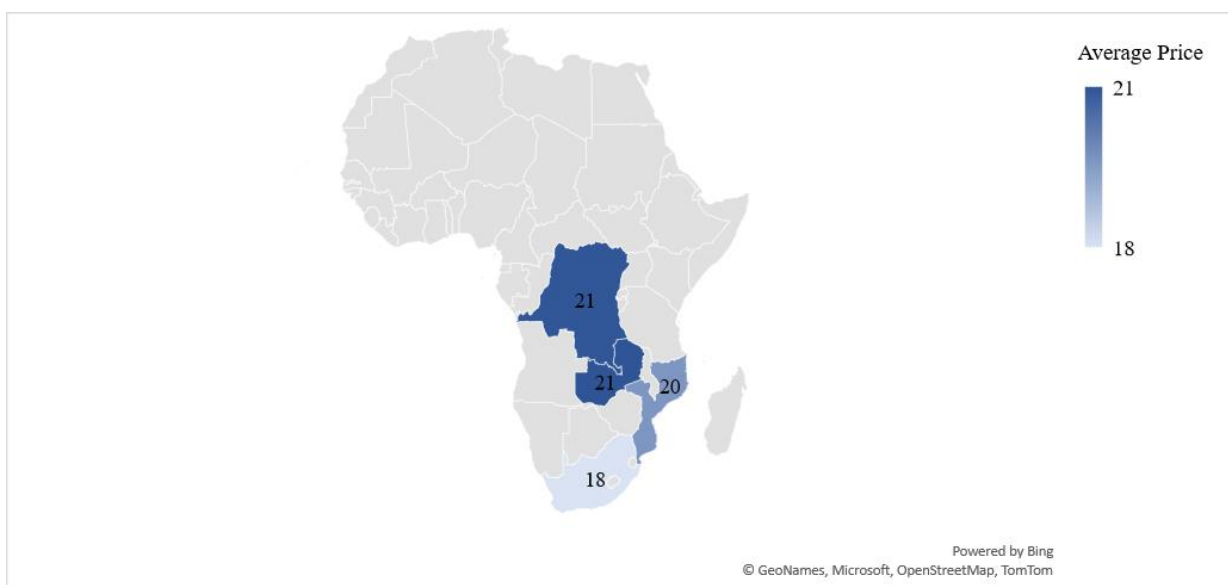


Figure 7: Cape horse mackerel main market average prices (N\$) in 2022. Source: NamRA, 2023.

The study compared the average pricing (N\$) for whole frozen Cape horse mackerel from the four major markets with landed value for the years 2017 to 2020 in detail. The figure below shows that prices have been rising since 2017, despite Zambia being the top export destination in terms of prices.

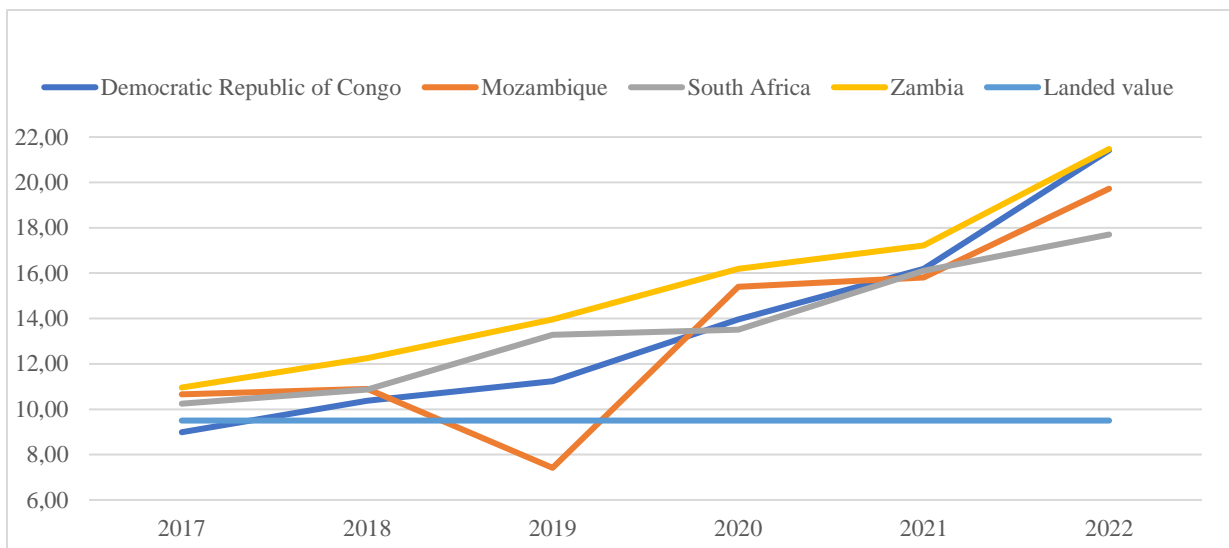


Figure 8: Cape horse mackerel average main export prices and landed value from during 2017 to 2022. Source: NamRA, 2023.

The average price of frozen Cape horse mackerel imported into Namibia's top export market from 2015 to 2019 was also examined. **Error! Reference source not found.** demonstrates that before South Africa, imports from the Democratic Republic of Congo had the lowest average price. Zambia imports fish at varying prices, although Mozambique has the highest import price relative to other markets.

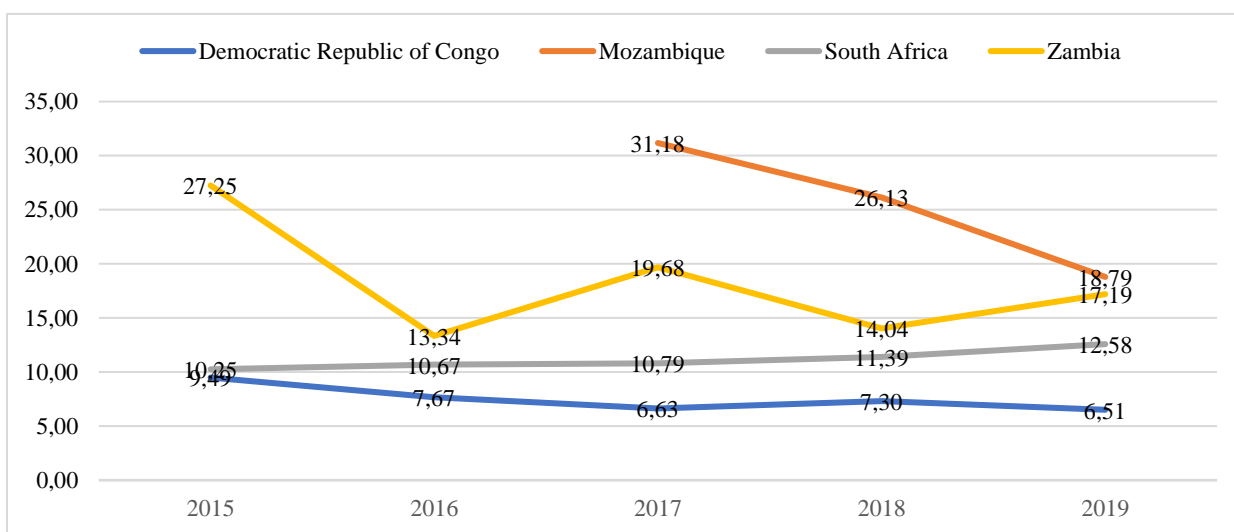


Figure 9: Cape horse mackerel average import prices from the main market over period 2015 to 2019. Source: FAO, 2023.

*Fees and Levies*

**Error! Reference source not found.** shows the resource rent in terms of quota fees, fund levies, and by-catch fees paid by NAD in millions to the Ministry of Marine Resources over the period of this study. Depending on the catch during the fishing season, quota fees are the most common form of payment to collect the highest government revenue, followed by the fund levy, rather than the by-catch fee.

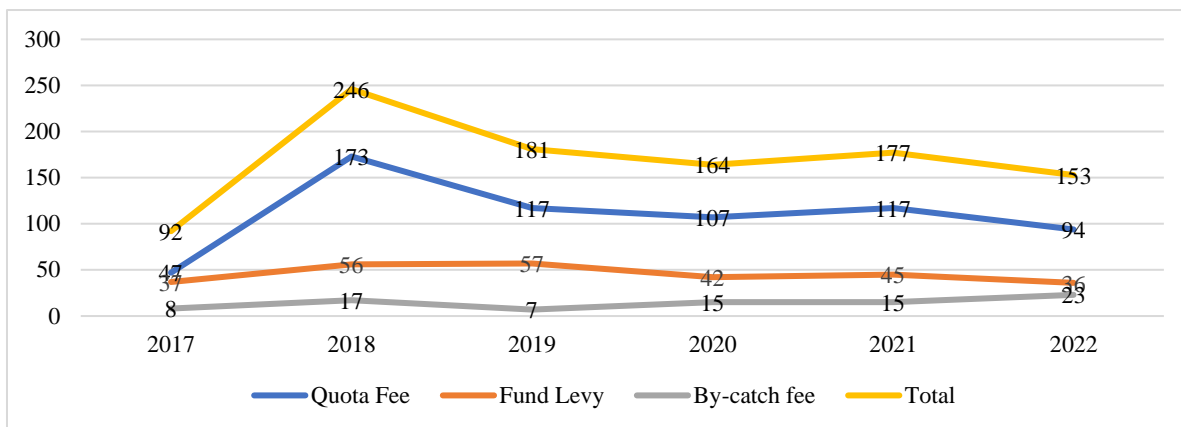


Figure 10: Cape horse mackerel resource rent (N\$) from 2017 to 2022. Source: MFMR, 2023.

### Fuel prices

The supply and demand dynamics in international markets have an impact on Namibia's diesel price, similar to other fuel prices. The coastal fuel costs in Namibian dollars per litre from 2017 to 2022 are shown in Figure 11. The cost of diesel has been increasing since 2017, with prices dropping significantly in 2020. In addition, compared with all other years, 2022 displays the highest peak.

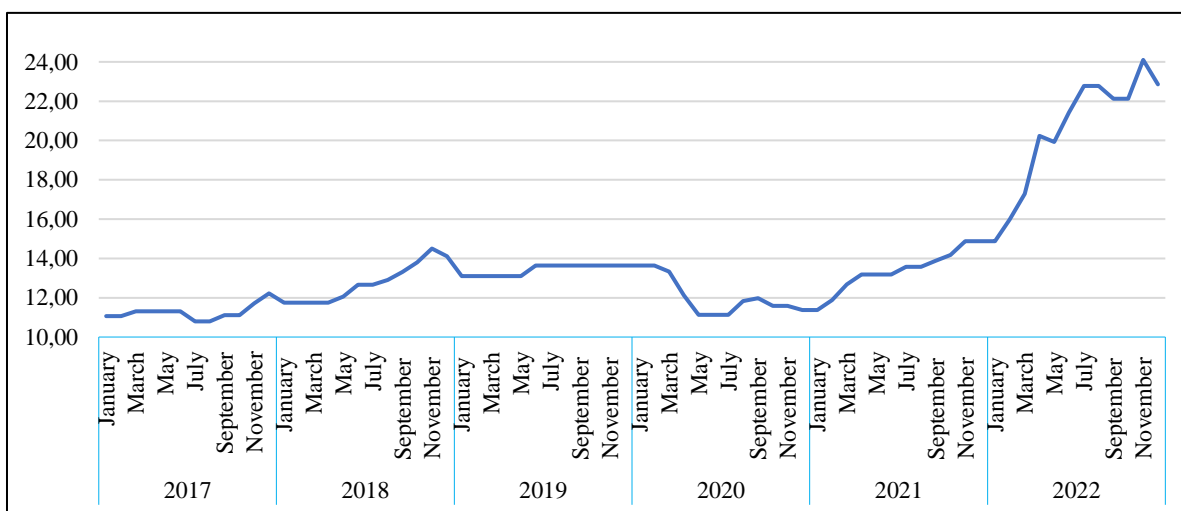


Figure 11: Coastal diesel price per litre in NAD from 2017 to 2022. Source: Ministry of Mines and Energy, 2023.

## 4.2 Interviews

The results from the interviews were divided into responses from the authorities and fishing industry. Detailed information on the results is provided in Appendices 1 and 2.

### Authority

The Ministry of Fisheries and Marine Resources participants gave an overview of the ideology and the approach used to determine landed value in the project timeline, challenges encountered, and the interventions or solutions before and after using landed value as a factor

in resource rent determination (see Appendix 1). The diagram below presents the process of determining the landed value by the Ministry of Fisheries and Marine Resources.

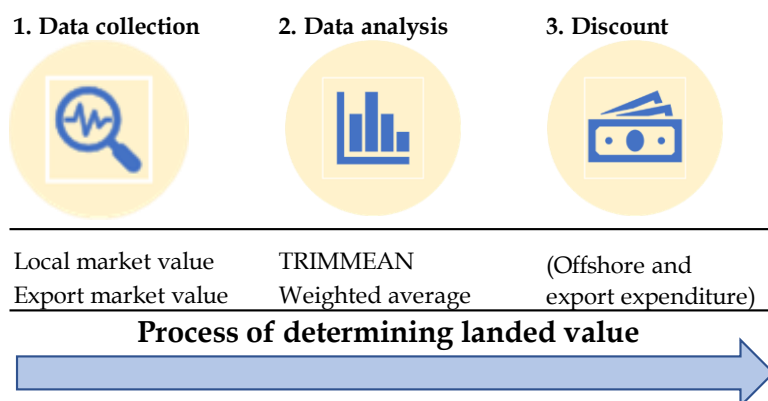


Figure 12: Process for determining land value. Source: Author’s own.

*Industry*

The Ministry of Fisheries and Marine Resources charges resource rent on the allocated quota to right holders. Depending on the landed value of the fish, a proportion of the landed value is paid to the government as quota fee, by-catch fee, or fund levy. Consequently, the quota fee charges consider the ownership of the vessel utilised and whether the fish is processed on board or processed on land. Do you find this system fair or unfair?

Overall, 62.5% of the participants indicated that the system was fair, whereas 37.5% indicated that the system was unfair. In terms of the categories, all quota holders without vessels indicated that the system was fair. As for the quota holders with vessels, two respondents found the system unfair, while one respondent found it fair. In the category of vessel owners without quotas, they equally split on whether the system was fair or unfair, as shown in Figure 13.

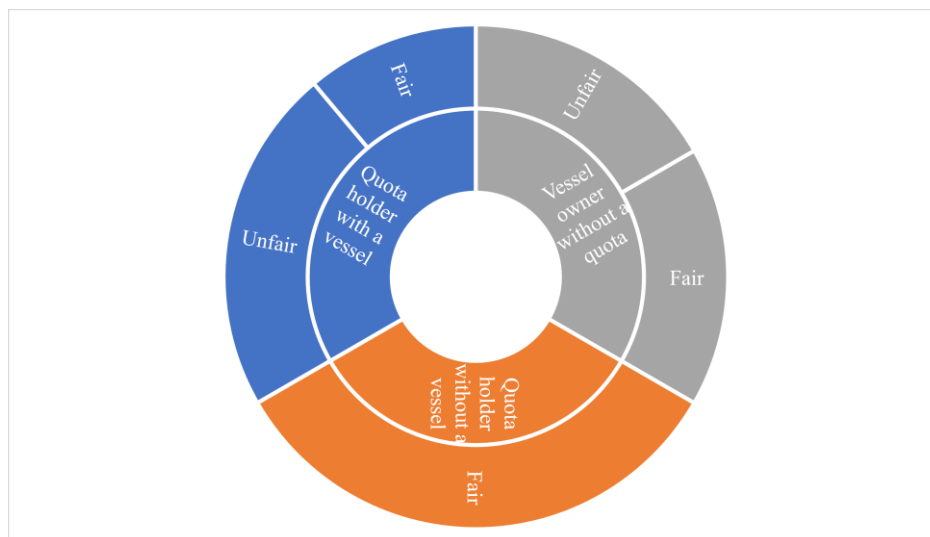


Figure 13: Participant responses regarding the fairness of resource rent system. Source: Author's own.

## 5. DISCUSSION

The discussion in this study contains explanations and interpretations of the findings in the previous chapter. The study's findings are also presented in relation to the research question and literature review, where implications and limitations are highlighted and acknowledged before recommendations are suggested.

The study sought to use the Cape horse mackerel fisheries subsector as an example of how to determine the value of landed fish species because it is crucial for the rental of fishery resources. Defining the methodology and identifying the elements that impact landed value are necessary steps in this process, along with determining the horse mackerel's estimated current landed value. The results of this study are therefore used to determine whether the Cape horse mackerel resource rent charged using N\$9.50 landed value is justifiable.

## 5.1 Fisheries management system

Arnason (2005, 2009), Charles (2002), Oelofsen (1999), Pearse and Lockhart (2004), and Sutinen (1999) have suggested that fisheries management is gradually moving away from traditional ways that allow open access which has no major control over who has the right to catch and who authorises the catching of fish. While it appears that right-based compliment management and conservation efforts also require co-management from the authority, fishermen, and the community at large. According to Charles (2002), different types of rights are used by different fishing nations, such as territorial rights, limited entry, effort rights, and harvest rights. Therefore, there may be challenges in identifying the best system that puts in co-management effort from the government and fishers. In addition, Arnason (2009) indicated that there are two categories of the share of quota in the rights system, one being the non-transferable Individual Quota (IQ) system and the other being individual transferable quotas (ITQs) that have been shown to be successful globally. These oppose the benefits from IQ to ITQ, as they provide limited control over resources, have fewer incentives to maximise profitability, and often cause fishermen to catch more than their allotted individual quota (Arnason, 2009; Gunnlaugsson, Kristofersson, & Agnarsson, 2018a; Gunnlaugsson & Saevaldsson, 2016). This suggests that the ITQ system has greater benefits over the IQ system for nations that are not vested into expanding national participants, such as Namibia, as stated in an interview with the Ministry of Fisheries and Marine Resources administrators.

### *Resource rent*

Research has revealed that there is a wide range of fisheries resource rents among different fishing nations (Gunnlaugsson et al., 2018b; Misund & Tveterås, 2020; El Ayoubi, (2003); Le Manach et al., 2013). Governments levies for fishing in different ways; for instance, Iceland charges fishing fees and quota taxes to access fisheries resources, Norway's resource rent taxation takes the form of payment for aquaculture licences, and Morocco has over 30 deductions related to getting access to and using resources, including additional fishing licence taxes, a fishery research tax, and using tuna traps. Whereas, nations like Madagascar and Mauritania enter bilateral agreements with the EU, including financial compensation such as access fees for the exploitation of fisheries resources within the EEZ, financial support for management activities, and fishing fees paid on a quota basis. Resource rent is levied in all these fishing nations to fund the exploration and exploitation of marine resources.

According to Misund and Tveterås (2020), one of the main reasons governments have been reluctant to pass resource rent taxation in fisheries and aquaculture is the difficulty in assessing economic rent. Profits may not be a good predictor of economic rent in the aquaculture and fishing industries. Nonetheless, inframarginal profits play a significant role in defining market value, and the industry concurred. It was suggested that the ministry hire an auditing firm to provide it with revenue realized.

## 5.2 Namibia fisheries management system

### *Resource rent*

The literature revealed that the resource rent system came into place shortly after Namibia gained its independence to guarantee that all Namibians benefited, not just those who acquired fishing rights (MFMR, 2004). The results from the administrator's ideology behind resource

rent with respect to the landed value notion came into practice with the aim of managing the resources in a way that revenue is collected by the government. Because fishery resources are said to belong to Namibians, the state grants authority to Namibians to harvest resources; the state does not have the capacity to harvest resources. This is backed by the Marine Resources Policy that encourages Namibianisation while collecting revenue from quota fees and research levies intended to boost government income from the exploitation of the country's natural resources.

It was further found that levying resource rent is necessitated by the need to recover the cost of management of natural resources, as there is a cost implication when managing resources. This is one of the reasons that the industry found the system to be fair by the majority. The system extracts resource rent by levying a quota, which is a fee charged on the amount of fish allocated to a quota holder. Meanwhile, when harvesting the target species, incidental catches of other species may be landed owing to the nature of habitats within the sea. To regulate and control this activity, a fee is paid for those resources landed, and the fee is referred to as catch fees. Another fee charged is the fund levy which is paid for every fish that is landed, whether it is a target or by-catch. This refers to the fund levy that serves the purpose of funding research and the development of marine resources. Resource rent fees were supported by the Namibia Marine Resources Act.

The respondents provided a chronological development of the Marine Resources Policy of 2004 that guides the setting of levels of levies which involved two different decisions. The basic level of the quota levies, which may be adjusted annually, and a system of rebates and set charges. The study suggested that for the purpose of rebate systems, there are three categories of vessels recognised: Namibian vessels, Namibian base vessels, and foreign vessels. It also states that the basic level of the quota levy will be established, considering the value of the fees, but also factoring in other factors such as catch rates, cost structure, and the profitability of the fishing operations. In most cases, the basic level varies between 5 and 50% of the firsthand value. In principle, it says that all quota-related species should be covered by a quota levy. Therefore, through the rights allocation system, the fisheries sector pays resource rent in the form of quota levies. The Marine Resource Act provided provisions for quota fees, Marine Resource funds, and other fees charged for rent. Among these, the landed value-based system came into implementation in 2017 to cater to factors that change on an annual basis. It was further suggested that the change could be based on factors such as market demand and supply (either locally or externally), inflation, and general market conditions.

The determination of the proportion charged on land value as quota fee, bycatches, or fund levies was further investigated in this study. According to the respondents, it became known that a study on the cost of doing business was conducted years ago. The same study intended to investigate the cost implications of operating as a fisher, as a rights holder, or as an operator in Luderitz. Other elements of the study were quota fees and fund levies, which informed the rates for the fund levy as well as quota fees. However, 50% of the respondents said that the marine resource policy of 2004 had set out a basic level that could be charged between 5% and 50% on the landed value of the resource, and those figures were reviewed. However, no factors

were considered at the time of rate determination. As a result, it is not clear how the fixed rates charged for quota fees, bycatches, and fund levies were determined.

The interviews explained the historical charges for resource rent. The respondent informed the study that before the Marine Resources Regulation of 2017, there was a constant system with predetermined rates used to charge resource rent in accordance with the quota allocated per rights holder. However, it is observed that the previous system had limitations which brought to light a variance between the historical charge and the current which is beneficial. The system could not be improved because of institutional labour incapacity. However, it caused technical challenges, such as that of the Fishery Observer Agency, which could not collect fees to support the execution of their strategic objectives.

#### *Landed value approach*

In terms of determining the landed value as implemented in 2017, the study suggested that the Ministry of Fisheries and Marine Resources conduct a study that involves consulting fishing industry stakeholders for an understanding or collective decision on the determined landed value. Respondents further explained that a comparative analysis between the statistical export data from the Ministry of Finance and the species landed value from the industry was executed. Both datasets comprise the market values of the species and the products that have been sold. The ministry analysed value, and to convert the market value to the price of fish before it was processed, major costs such as marketing and freight costs were removed. Thereafter, the main costs of operating at sea were removed to derive the landed value. However, it was not revealed which expenditures and what method was used to remove the cost operation. It was also indicated that, to justify the specific amount realised, industry consultation took place to present the findings and discuss the way forward. It was agreed that completing this exercise may depend on the availability of data, and for one fish species, it may require one to three months. This is because the process involves gathering international and local fish market prices, data analysis and validation, and industry consultations. In addition, it was assumed that by law, the process requires seeking approval from the minister in charge of state finance to agree to the final landed values before the legal process for gazettelement.

The study found factors that led the ministry to change its ways of calculating resource rent with respect to landed value. One of the respondents indicated that the Marine Resource Act, together with the Marine Resource Policy, provided the ministry with fees in line with first-hand and landed values, respectively. For the same reason, the landed value concept enabled the Fishery Observer Agency to commence revenue collection, as outlined in the Marine Resource Act. The Act stipulates that these charges should not be lower than 5% and should not exceed 15%. In addition, the respondents agreed that the fees and levies charged prior to 2017 were low in comparison to the advancement of the industry and profits. Moreover, the current system still faces challenges that include the one-off determination of the landed value which makes it difficult to determine the actual value from the right value. Other challenges include the justification of the percentages for determining the landed value, difficulties in determining the real landed value, and lack of an aggregate market landing site which would be crucial in confirming the actual landed value as the minimal collection of revenue in relation to



what the industry is making in terms of the revenue that they are receiving from exploiting the resources. Overall, the ministry is not able to establish whether the current landed value system addresses the objective of collecting revenue, since it is not updated accordingly.

In conclusion, respondents agreed that there is a need for regular reviews subject to the prevailing economic situation and industry needs. In support of the landed value review, respondents from the fishing industry suggested that the ministry needs to appoint an audit firm that will be tasked with contacting each auditor of those seven operators to provide information on cost and income, as it will be easier and more effective because of their specialisation. Furthermore, it was pointed out that it would be helpful if Namibia established a harbour market, where operators sell their fish first hand as it lands, and the ministry should put in effort to collect market fish prices at Walvis Bay regularly. However, it was argued that in coming up with a market, the main obstacle is implementing the value-adding policy upstream and downstream in all instances in the value chain (Knútsson, Klemensson, & Gestsson, 2010). Fish harvesting and sourcing are the first steps in this process, and effective fish markets or auctions are essential components of this mechanism. Furthermore, fish markets play a unique dual role in the value chain by gathering downstream market signals and responding to them (downstream) by providing the appropriate quantity, species, quality, and qualitative qualities at the appropriate time. In addition to the recommendation, the interviews suggested that landed reviews should consider the maximisation of resource rent. However, these reviews do not undermine the sector's profitability.

### **5.3 Cape horse mackerel fishery**

#### *Operation*

According to the study, midwater trawling techniques are used to catch cape horse mackerel, a mesopelagic species that lives in coastal depths of 200 to 1,000 meters (MFMR, 2018). It was noted that Namibian fleets have changed from conventional freezer vessels to RSW vessels, which are designed to board wet fish for processing on land. Despite government efforts to encourage employment, fierce competition has been noted at sea when trawling because the two operations are based on the same ground. It was suggested by the industry interview that wet operators are at a disadvantage because they must preserve the fish on land while operating in the same waters with freezer vessels that have a capacity equal to the designated TAC and considering that they have shorter excursions.

The industry was said to be struggling with underharvesting the allotted quota because of poor catches brought on by the bad weather that was in place at the time, the Covid-19 pandemic and containment measures, and the mid-season disbursement quota due to the granting of rights that were granted during the harvesting season. Regarding wet landing, which is suggested to be continuously declining in contrast to the NDP5 targets, if wet operators' concerns are not addressed, the performance is likely to remain the same, which will have a negative effect on the government's goals for the NDP5 target in the subsector. Consequently, all in one sector might have trouble maintaining fleet investments and the related operating costs.

#### *Landed value*

The industry recommended either reviewing or maintaining Cape horse mackerel's N\$9.50 landing value. It was suggested that since it was last set, economic growth had an impact on the value, but this also depended on the entity's production efficiency and the propriety of the study into wet and freezer landings. Several respondents recommended that the value be maintained at N\$9.50, since it is now closer to its true value than it was in 2017 when it was set. On the other hand, the Ministry respondent concurred that a review of landed value is necessary, considering the evolving economic climate. Additionally, it was suggested that the landed value be considered as being driven by the market, which determines whether the value needs to be adjusted. Namibia's fundamental problem is that there is no market on which the calculation of landed value can be based. Consequently, it is recommended that the nation create a market.

#### *Fees and levies*

The data in **Error! Reference source not found.** support the quota fee rates in **Error! Reference source not found.**, the fund levies, and the by-catch fee rates in Section 3.2. According to this study, fund levies are the second-largest source of government revenue after quota fees. The fact that by-catch generates only a small amount of cash suggests that fishermen try to avoid unintentional catches. Of the respondents, 62.5% agreed with the levied fees; however, the majority said that there should have been more differentiation between wet and frozen fish. It was proposed that because the rate for the landed value for wet catches is currently fixed at the same rate as the freezer, it needs to be revised. Wet catches are less expensive than freezer catches, with 1.9% for Namibian vessels, 3.8% for Namibian-based vessels, and 5% for foreign vessels, depending on the rate of the quota fees levied. By-catch fees, which are determined to be expensive given that the fish captured as by-catches are not of good quality to be valued equally with those caught by the vessel targeting the species, have also been criticised as being unfair under the system. Owing to the difficulty in selling by-catches at the same standard market price, the fees are high.

#### *Operational costs*

According to the study, the primary costs incurred in Namibia's offshore operations include fuel, salaries, repairs, and maintenance, as well as usage and harbour fees. **Error! Reference source not found.** depicts diesel costs from 2017 to 2022, which supports the industry's claim that prices have increased because of the global financial crisis and inflation. The industry also cites the fact that there is only one cold storage near the port, forcing freezer operators to use the pricy harbour because of high operational costs.

#### *Market prices and destination*

The industry has been supported by Hara (2001) in defending the low value of cape horse mackerel as a protein source in underprivileged areas. The main export markets for Cape horse mackerel, according to the export data, are the Zambia and the Republic Democratic of Congo. Zambia was claimed to be one of the shipment channels that traders use to import goods into the DRC, which is how the industry disputes the claim that Zambia is the main export destination. Consequently, the average export prices in Zambia and the DRC, as shown in **Error! Reference source not found.** and **Error! Reference source not found.**, are quite close to one another. The data in **Error! Reference source not found.** also suggest that the export shipment routes, which are via sea and road, have established two markets in the DRC, explaining why Zambian pricing differs from that in the DRC.

Notwithstanding the destinations, export prices from Namibia have shown that prices have been rising since 2017. This study suggests that the current average export price for Cape horse mackerel is N\$20 per kilogram. However, the average import prices from other nations into Namibia's key export markets, as shown in **Error! Reference source not found.**, revealed that the prices have been regulated by other markets, which is why stagnant patterns and low prices were seen from the respective countries; hence, prices ranged between N\$7 to N\$19 per kilogram. This suggests that Namibian export prices are higher than those of their international competitors.

The study concluded that the landing value of Cape horse mackerel should be reconsidered, considering that export market prices have increased since the initial landing value was established in 2017. Despite the fuel price that the study revealed, other factors such as the time series of salaries, repair and maintenance, and other significant industrial expenses were not included in this study, which is why the rationale for the percentage increase warrants further research.

## 6. CONCLUSION

The Namibian government has implemented various policies and measures to ensure the sustainability of the marine fishery industry. These include the implementation of a quota system, closed seasons, and establishment of Marine Protected Areas. The industry primarily harvests demersal and pelagic (hake and horse mackerel) fisheries which are important commercial species because they contribute significantly to the country's economy, mainly by providing employment opportunities and generating revenue through exports. In addition, active fisheries resource rent by the Namibian government plays a major role in contributing to national revenue and acts as a control measure for effective fisheries management.

Namibia, in relation to other countries, shares similarities in the collection of resource rent which includes levying quota fees, a marine fund levy for research and development, and by-catch fees to discourage catching untargeted species. Despite these similarities, Namibia resource rent requires the determination of the species landed value. The process can be complex, as it involves considering a variety of factors, such as commercial species market prices, market demand, production costs, profit margins, and government regulations.

In the case of the Namibian Cape horse mackerel fishery, there may be different perspectives on how landed value should be determined. On the one hand, the Namibian government may be interested in reviewing the landed value to increase revenues in line with ensuring that Namibian citizens benefit from the country's fishery resources. On the other hand, the industry may feel that value needs to reflect prevailing economic times, which could involve considering factors such as market demand and production costs. This could mean that the landed value would be set based on what the government and industry believe is a fair value for fish, considering factors from both parties.

The systems in Iceland and Norway can be used as examples to identify key factors that should be considered in the determination of landed value. These were market demand, production costs, profits, government regulations, and currency exchange rates. The landed value of fish in Iceland and Norway is largely determined by market demand for their products. Factors, such as species, size, quality, and sustainability certification, can affect the market price of fish. For example, salmon from Norway commands a premium price because of its reputation for high quality and sustainability. The governments of Iceland and Norway use a system of dynamic fishing fees that adjust based on changes in industry profits. Fees are typically set on an annual basis, and the government monitors the profitability of fishing companies throughout the year. If fishing companies earn higher profits than expected, the government may increase fishing fees for the following year to capture a larger share of the economic rent generated by the fishery. The cost of producing fish can vary depending on factors such as labour costs, fuel prices, equipment costs, and maintenance expenses. These costs can impact the profitability of fishing operations and the landed value of the fish. This study also shows that governments play an active role in regulating fishery resources for sustainability and economic benefits. The government sets quotas for the number of fish that can be caught each year, which can affect the supply of fish and the landed value. Additionally, the government may impose taxes and fees on fishing companies to support their management and development.

Ultimately, it has been suggested that landed value be reassessed, subject to the current economic climate in Namibia, which shows an increase in Cape horse mackerel product export prices. Furthermore, to accommodate value to both the government and industry, aspects such as operating costs and resource rent objectives should not be overlooked. The Ministry may investigate alternatives to resolve problems with the lack of an auction market as a point to collect market value by conducting market pricing research. For trustworthy revenue and expenditure data from the industry, it is wise to suggest hiring an audit firm to provide precise income and expenditure for calculating landed value.

## 7. RECOMMENDATIONS

Determining the landed value of Cape horse mackerel in Namibia can be complex and contentious because of the divergent interests of the government and fishing industry. While the government seeks to increase revenue, the industry aims to reduce expenses and increase profitability. To address this challenge, there needs to be a balanced and transparent approach to determine the landed value that considers the interests of all stakeholders. The following recommendations are made:

1. Adopt a collaborative approach: The government and fishing industry should work together to determine the landed value of Cape horse mackerel. This collaborative approach can help ensure that the interests of both parties are considered and facilitate the development of mutually beneficial solutions.
2. Use a fair and transparent methodology: The methodology used to determine the landed value should be fair and transparent. This can help build trust between the government and the fishing industry and ensure that the process is perceived as equitable.
3. Consider the economic realities: The determination of the landed value should consider the prevailing economic conditions and the realities of the fishing industry. This can help ensure that the value is realistic and reflective of market conditions.
4. Promote sustainable fishing practices: Sustainable fishing practices can help maintain the productivity and quality of fish stocks, which is essential for the long-term profitability of the industry. The determination of landed value should encourage sustainable fishing practices that prioritise the health of fish stocks while promoting the efficient use of resources.
5. Invest in data collection and analysis: The determination of landed value should be based on reliable and timely market information. The government should invest in data collection and analysis systems that can provide accurate information on market conditions.
6. Ensure compliance with regulations: The determination of landed value should be based on compliance with regulations, including sustainable fishing practices and quality

standards. The government should enforce regulations and impose penalties for non-compliance to ensure sustainability of the fishery sector.

7. Market price research: The Ministry of Fisheries and Marine Resources should consider conducting a fish and fish product market price depth analysis as an input to the process of determining landed value to consistently obtain credible commercial species market prices. As an alternative, it would be beneficial if Namibia established a harbour market where business owners could sell their catch as soon as it arrived, and the Ministry should try to regularly gather market fish prices in Walvis Bay.
8. Profit in the fishing industry: The Ministry of Fisheries and Marine Resources should consider hiring an audit company responsible for contacting each auditor of those seven operators to request information on costs and revenues, as it will be simpler and more efficient given their area of expertise.
9. Landed value review: Although it is possible that the cost of production for horse mackerel has surged, the market price has improved since 2017, necessitating a hypothetical update of the landed value.

In conclusion, a collaborative and transparent approach, fair methodology, consideration of economic realities, promotion of sustainable fishing practices, investment in data collection, and compliance with regulations can help address the challenge of determining the landed value of Cape horse mackerel in Namibia. In addition, considering a thorough fish and fish product price study, income and expenditure by auditor firms can eventually provide reliable data to be considered when reviewing the landed value.

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## APPENDICES

## Appendix 1. Summary of responses from the government administrators

<b>Summary of Ministry of Fisheries and Marine Resources Administrator responses</b>			
<b>Respondent 1</b>	<b>Respondent 2</b>	<b>Respondent 3</b>	<b>Respondent 4</b>
<b><i>1. According Namibian law, the MFMR is authorised to impose levies on marine resources for the benefit of government revenue. Could you please explain the ideology and the current resource rent system with respect to landed value?</i></b>			
<p>The ideology behind the landed value concept is for the ministry to manage the resources in such a way that it generates revenue from quota fees and marine resources levies on behalf of the Government of Namibia so that it can contribute to the GDP of the country.</p>	<p>Levying resource rent is to recover the cost of management for natural resources and for both Namibians with and without fishing rights to benefit.</p> <p>The system basically extracts resource rent through levying of quota fees, by-catch fees, and fund levy. The resource rent that is extracted is based on the Marine Resources Act. It directs how these fees are being set and rated based on landed value.</p>	<p>Ideology and the system are explained in the marine resources policy, the fisheries marine resources policy of 2004, which talks about responsible development and management of the marine resources sector. It is also narrated by section 44 of the Marine Resources Act of 2000 that gives the Minister the authority to impose a levy and is said it should be based on landed values. species. So those are the basis.</p>	<p>The landed value-based system was just recently implemented, that was 2017. But before there was a constant system. A fee that was introduced that people would basically just calculate based on whatever quota you got for the year. The Marine Resource Act made provision on how the quota fees and Marine Resource fund and other fees charge for rent based on the landed value.</p>

<b>2. How were the rates charged against fund levy, by-catch fees, and quota fees determined?</b>			
<p>The ratio of the landed value was basically established considering the cost of doing business. The price market, both national and international.</p>	<p>The cost of doing business study was conducted which made recommendation. The study was looking at what is the cost that goes into operating as a fisher or as a right holder or as an operator. It also looked at the cost implication and one of those elements was quota fees and fund levies. So those were fees that goes into the cost of doing business in your trades so that studies the one that has informed the rates for fund levy as well as the quota fees.</p>	<p>The Marine Resources Policy of 2004 sets out how you should charge between 5% and 15%.</p>	<p>They were just constant figures that have been reviewed and I don't really know what factors were considered at the time of determining those. I don't know what factors were considered.</p>

<b>3. How was the landed value of each species determined?</b>			
<p>This was a collective decision made between the Ministry of Fisheries and Marine Resources and the fishing industry where the consultative meetings took place, so an understanding or collective decision can be taken with the contribution from both from both sides.</p>	<p>Another study was conducted by the Ministry of Fisheries and Marine Resources. The study collected data from customs and these values obtained were analyzed, major costs were removed, to determine a landed value. The industry was consulted they were requested to provide landed values of the respective species for a comparative analysis. Results from the study were agreed between the parties.</p>	<p>There was a process that the ministry had to do with its stakeholders, the fishing industry since it was felt that the sector has so much developed the industry is profitable. Therefore, consultations with the sector were done and data that we used was not from the official data which is from ministry finance under the customs.</p>	<p>The Ministry undertook an exercise that collected export data from custom and requested the fishing industry since Namibia does not have a firsthand market. These figure where than used to determine the landed value.</p>
<b>4. Can you give an estimate of how long it will take to determine the landed value of each species, in this case Cape horse mackerel?</b>			
<p>The time depends on the amount of work required, since the process involves industry consultation and gathering of international and local market prices, which may require travelling to different location. Therefore, the work may up to three to six months.</p>	<p>The first trial was quite lengthy because all the species had to be assessed at that time and there's quite a bulk of information that was received. So, on average the exercise will take up to three months.</p>	<p>Given the staff complement and the amount of work, the task is likely to go beyond a year or two.</p>	<p>The time will depend on the availability of information and stakeholder consultations. But based on the experience, determination of landed value for one species can be completed within a month.</p>

<b>5. How was resource rent calculated prior to 2017?</b>			
I have no idea how the fixed rate was established. However, there were fixed rates for charging fees published upon joining the Ministry.	I don't have the insight in terms of the exact details, but I know that it was a predetermined rate.	It is not known to me how the fees were determined; however, the calculations were based on a quota allocated.	The calculation of collecting revenue was based on a predetermined rate that was already there and it's not clear how they were determined.
<b>6. What led the ministry to adopt the 2017 method for calculating resource rent?</b>			
The ministry adopted the landed value system because it was realized that the fees and levies that were being charged on or imposed on the quotas in the marine resources were too low.	The current system of extracting resource rent with respect to landed values does not only have a bearing on the direct revenue that the ministry is receiving, but also the Fisheries Observer Agency. The Agency needed determined landed value for their fees to be affected as per the Marine Resources Act.	Calculating resource rent with the use of landed value has been all along indicated in the policy and the Act. I think it was only a matter of implementing the concept.	The Ministry needed to introduce the charges that are based on landed value that is reviewed on a yearly basis because of the market dynamics.

<b>7. Does the Ministry face any challenges with the current system to determine resource rent?</b>			
<p>The ministry is not able to establish whether the current landed value system is really addressing the objective of collecting the revenue. This is caused by the fact that the landed value is not up to date and there is a need for the value to be reviewed at least on a yearly basis.</p>	<p>Prior to the landed value, one of the major challenges is the minimal collection of revenue in relation to what the industry is making. Whether those rates were justifiable or not is another challenge. Another technical challenge was with the fishery Observer Agency with not collecting fees that they can use to make sure that they execute their strategic objective of the Agency. The current major challenge is that we have the real landed value and how to determine the real landed value and it because we do not have a landing market.</p>	<p>Prior to the landed value we did not have the capacity to implement the current system. There are no challenges now.</p>	<p>The current challenge is the one of determining the landed value because the rates I would say are there and there is really nothing technical about them.</p>

<b>8. In your opinion, how can the ministry make system improvements to address the challenges identified?</b>			
<p>The ministries need to review the landed value on a yearly basis so that it can determine whether there is a change in the market price. This will inform the ministry if it needs to change the rates and landed value for a far charge of resource rent fees.</p>	<p>I think the landed value should be market driven. The landed value should change as often as the economic situation changes. So, it will be led by what is happening within the economy within the operations of the fishing sector that is going to determine whether the senate for it to be revised without saying, let's change it after three years. What if there's a major change within the first or second year? So, I would leave it up to market forces to. Determine whether there's a need for it to be revised.</p>	<p>The ministry conducts regular interval reviews. When the sector is not making good profits, we should be able to reduce the landed value in line with the market price data. But it also should be done in such a fashion that it takes into consideration what is needed for the government to maximize resource rent. However, it should not undermine the profitability of the sector. So, we would be able, but you can only do this after maybe 2-3 years, but not on an annual basis because of the volume of work that is involved in giving a proper work in the end of the whatever the values would be.</p>	<p>It's a challenge that we don't have a market in Namibia to determine the landed value. Since landed value is market force, my advice to the Ministry to come up with a market, a point was operator sell the fish at first hand as it lands, and the ministry should put in effort in collecting market fish prices at Walvis Bay monthly. The prices can be collected from fish shop since I believe it will a closer figure to landed value as compared to how the Ministry is currently doing it.</p>

## Appendix 2: Summary of responses from the Fishing industry

Summary of the fishing industry actors responses							
Respondent 5	Respondent 6	Respondent 7	Respondent 8	Respondent 9	Respondent 10	Respondent 11	Respondent 12
<p><i>1. The Ministry of Fisheries and Marine Resources charges resource rent on the allocated quota to right holders. Depending on the landed value of the fish, a proportion of the landed value is paid to the government as quota fee, by-catch fee, or fund levy. Consequently, the quota fee charges consider the ownership of the vessel utilised and whether the fish is processed on board or processed on land. Do you find this system fair or unfair?</i></p>							
Fair	Fair	Unfair	Unfair	Fair	Fair	Unfair	Fair
<p><i>2. Why do you think it is fair/unfair</i></p>							
The system is fair and well-structured. The resource rent levies force the operators to "Namibianize" the industry by charging less for vessels with Namibian ownership than for those with foreign ownership.	The distinction made between freezer vessel and wet vessel charges make the system fair.	The landed value of horse mackerel is based on the cost of freezer horse mackerel operations and not wet, therefore there was no distinction.	There was no consultation on the fixed rate that are levied on landed value for Fund Levy, quota fee and by-catch fees. By-catch are too high, and the quality of the by-catch don't fetch market prices.	The system is fair to the freezer operation because fish is processed and packed on board. No major further cost is incurred onshore.	The government need to charge a fee that is put into resource control and cost recovery on research for the natural resources.	The percentage charged on landed value is very expensive because cape horse mackerel is a very low-income commodity.	Considering the market factor such as inflation, the system is fair since landed value require review.



3. Is N\$9.50 as horse mackerel landed value fair enough?							
Given the economic progression the current N\$9.50 is fair enough because it was not the same some years back. However, due to different production efficiencies opinions may differ.	The current landed value needs to be reviewed seem the price of horse mackerel has as well increased over the past 6 years.	The landed value at N\$9.50 is not fair.	The landed value needs to be reviewed to get the real value of as per the ministry's definition.	With this current market, I the landed value should be kept at N\$9.50.	The N\$9.50 as it is right now it is fine. I suggest it should be kept at that value for the next two years. A few years ago, it found too high, and I think we reached the point of equilibrium.	The landed value is too high for the wet horse mackerel operators. This result in an increase of cost operation which already high for the operators.	The landed value is fine, with proper research and findings the differentiation between wet and freezer charges can be observed.
4. What are the main offshore operation expenses?							
Fuel Crew salaries & Repairs & maintenance.  Usage fee	Not involve in offshore operation.	Fuel  Crew salaries	Fuel  Crew salaries  Repairs & maintenance  Usage fee  Harbor fee	Fuel  Crew salaries  Repairs & maintenance	Fuel  Oil and lubricants  Crew salaries	Fuel  Crew salaries  Repairs & maintenance	Not involved in offshore operation.

5. What is the reason for high expenses?							
Inflation	No response	Inflation	There is only one cold storage around the port and freezer operator are forced to use the harbor which is costly.	Inflation and vessels, there will always be a need for continuous repair and maintenance.	The global economy has made it very tough for the industry remain profitable because of the inflation.	Inflation and the repair and maintenance for vessels in Namibian waters is costly due to the salt content.	Global economic crisis that drives inflation.
6. What is the wage structure for the crew							
Different operators will have their own private employment contracts with the workers. It is most likely to be market related because workers interchange within the same operating companies. In the horse mackerel industry, the foreign crew has a quite big percent in percentage that amounts to 40%. However, as a percentage of total cost, will differ from company to company.	The current set of contracts differs from operators to operators. Some companies have a no work, no pay policy and there's some operators that have got a 50% guarantee should there be no work. There is a big gap between Namibian and foreign salaries.	RSW vessel employ about 12 people on the vessel, and they are all specialized where else on a freezer trawler, there's maybe like 24 specialized foreign crew and then there is a huge number of sorts of just skilled - unskilled Namibian labor on a freezer trawler. The salaries are market related because these people can work interchangeably on any vessel. This the same case as the general workers.	The professional salaries are market related salaries while general fishers, they are paid in line with what they have negotiated through their respective union. They are paid a basic salary and a commission.	The salaries are much market related; they are all almost the same level across the sector.	Fisherman gets what they call a basic salary which is their monthly salary and on top of that they are paid was called fish commission, which is basically based on the number of fish that they processed or that they if they part of the team. Salaries range somewhere between N\$18,000 to N\$25,000 a month.	No information provided.	Specialized workers on the vessel are paid fixed salaries. The seasonal workers there is a minimum wage that has been prescribed which are supposed to be followed but not sure if it is followed. There are agreements signed with the unions on behalf of the workers in terms of salaries and benefits to be paid.

7. How much are the usage fees and what are the implication as an expense?							
Freezer usage fees for the past 5 to 6 years have been between N\$2000 and N\$3000 per ton and that translates into N\$2 to N\$3 per kilogram.	The usage fee for wet quota N\$750 - 850 per MT and for freezer is N\$3000 per MT	The usage fee for wet quota on the market is about N\$750 - 850 per MT.	Not provided	Not provided	Operators are offering for the wet quota is in the range of N\$750 to N\$900 per ton. While the freezer operators are offering a ton between N\$2500 to N\$3,500.	Not Provided	Not Provided
8. Does the fish size affect the price per kg?							
The size of fish absolutely affects the prices. The bigger the fish, the higher the price per kg. However, it also depends on what the market demand.	Yes, the grading and the packing net weight has an effect.	Yes, the bigger the size the better the selling price per kg.	Yes, the smaller sizes, the less price pay package.	Yes, fish size does affect the price. Most currently what is being catch are more of the smaller size fish, therefore, the value is little.	Yes, The bigger the fish the high the price per kg. I think this is driven by the flesh to bone ratio, the bigger fish has more flesh as compared to the smaller fish, hence the bigger fish fetch a better price on the market. Average fish size is 16(-) and 16(+)	Yes, 14(-) fish size is lower cost fish as compared to size such as 16(-) ,16(+), 20(+) and 25(+) fish that fetch high prices.	Yes, the smaller has less price compared to the bigger fish.

<b>9. What is the average price of horse mackerel per kg?</b>							
Average price is around N\$14 to N\$18.	14(-) N\$17.74 16(-) N\$24.98 16(+) N\$25.88 18(+) N\$26.79 20(+) N\$27.69	14(-) N\$17.50 16(-) N\$19.50 16(+) N\$22.50 18(+) N\$25.50 20(+) N\$27 25(+) N\$28.50 The average price N\$15.50 to N\$16.50	Not provided	Not provided	14(-) N\$10 16(-) N\$ 16 16(+) N\$18	14 (-) N\$17 16(-) N\$18 Average price N\$20	Average price N\$30
<b>10. What is your advice on the determination of landed value?</b>							
Landed value needs to be reviewed after three to four years. To determine landed value, the ministry can audit firms that will be tasked to contact each auditor of those 7 operators to provide information on cost and income for the determination of landed value.	No information was provided.	The ministry needs to investigate the real cost of the land value for wet horse mackerel. In my opinion, the landed value is N\$5,80. Job creation need to be factored in during decision making on landed value.	No information was provided.	To give a clear indication of what economic value is being created by fishing industry within Namibia, the Ministry need to improve data collection methodologies. Activities executed by non-operators should be treated separately from that of the operator though it's their quota being utilized.	Landed value should not be confused with market price because of those are two different values. In addition, N\$9.50 as horse mackerel landed value is fair value for now and should stay like that for at least the next 2 years, because of the increased fuel prices, post- COVID 19 effects, and the instability in the global economy related to the war in Ukraine.	The Ministry needs to treat the wet horse mackerel industry as a sector owned. It important that the industry is for the job creation motive, and they are not supposed to compete with freeze vessel operators.	The Ministry needs to continuously verify the information provided during the determination of landed value. It important the landed value is determined with accurate figures for informed decision making.