The Namibian Hake Value Chain Analysis

Greining á virðiskeðju lýsings í Namibíu

Etuna Twahafifwa KT Haimbili

Final Thesis for MS-Degree in Environment and Natural Resources

Supervisors: Professor Sveinn Agnarsson
Dr. Vilhjálmur Wiium

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60-credit thesis submitted in partial fulfilment of a Master of Science degree in Environment and Natural Resources

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February 2022

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This is a 60-credit thesis to obtain an MS degree in Environment and Natural Resources linked to the School of Business Administration, from the School of Social Sciences at the University of Iceland.

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Printed by: Prentsmiðja

Reykjavik, Iceland, 2022

Preface

This thesis is submitted for the degree of Master's in Science at the University of Iceland. The focus of the thesis is on the Namibian hake value chain. The research was conducted by Etuna Twahafifwa KT Haimbili under the supervision of Professor Sveinn Agnarsson in the Department of Business Administration and Dr. Vilhjálmur Wiium, Ministry of Foreign Affairs for Iceland. This thesis is a 60 ECTS and the graduation date is February 2022.

This thesis was funded by the GRO Fisheries Training Programme (GRO-FTP). With the support of the Ministry and Fisheries and Marine Resources of Namibia. My sincere gratitude to the management of the GRO Fisheries Training Programme for providing me with the opportunity to complete my master's studies and for your generous support throughout my stay in Iceland.

A very special appreciation to my supervisors, I would not have done it without your guidance and academic support, thank you.

I would also like to thank my colleagues at the Ministry of Fisheries and Marine Resources, Namibia for not getting tired of my data requests.

Finally, I would like to express my gratitude to my family and friends for their moral support and encouragement throughout my time in Iceland.

God bless you all!

ABSTRACT

The Namibian fishing industry is dependent on export markets as ~75% of the fish products are exported, making the sector undeniably significant to the nation's economy. Hake is the country's most valuable commercial fishery, accounting for over 70% of total fishing employment. One of Namibia's national policies targets for the processing industries is to increase value-added exports of overall export values from 40% in 2013 to 70% by 2030, which could be achieved through enhancing value chains. As a result, the hake value chain activities, governance, value-adding functions, and the trade and marketing structures, were mapped and analysed. In addition, analyses were conducted to assess whether regulatory frameworks influenced policy objectives for further value addition, employment creation, and investments. Primary data was collected via questionnaires from nine hake processing firms, encompassing quantitative and qualitative data. The findings suggest that competence exists in the activities of the hake value chain. It also recognizes the value addition potential for secondary processed products and the challenges that may be encountered, such as distance from markets, costs, and prospective mechanization and automation, that may impact employment. While government policies appear to promote industry value addition and investment, they have also generated overcapitalization and resource access uncertainty. Furthermore, the findings reveal contradictory policy objectives, such as enhancing value addition at the expense of employment or increasing the TAC to put more pressure on hake stocks. As a result, the government must address these issues to prevent jeopardizing hake stocks which, are critical to the value chain.

Sjávarútvegur í Namibíu er mjög háður erlendum mörkuðum, en um 75% af sjávarafurðum er flutt út. Því er óhætt að segja að sjávarútvegur sé þýðingarmikill þáttur þjóðarbúsins. Veiðar á lýsing er mikilvægustu fiskveiðar Namibíu, en um 70% af vinnuafli í atvinnugreininni tengist fiskveiðum og -vinnslu á þeirri fisktegund. Meðal þeirra markmiða sem stjórnvöld í landinu hafa sett fiskvinnslu fyrir árið 2030 er að auka hlut unnins afla úr 40% af útflutningsverðmæti í 70%. Þessu markmiði á m.a. að ná með því að efla virðiskeðju í sjávarútvegi. Í þessari ritgerð er sjónum beint að virðiskeðju í veiðum og vinnslu á lýsing. Fjallað er um virðskeðjuna, stöðu og styrks fyrirtækja innan hennar,

aðgerðir til að auka virði framleiðslunnar og skipulag á viðskiptum og mörkuðum. Sérstaklega er fjallað um hvernig stjórnkerfi veiðanna ýtir undir þau markmið stjórnvalda að bæta virðisauka og auka atvinnu og fjárfestingu. Gögnum var safnað með því að leggja spurningakönnun fyrir níu sjávarútvegsfyrirtæki. Niðurstöður gefa til kynna að innan virðiskeðjunnar sé til staðar góð kunnátta og þekking. Ljóst er að möguleikar eru fyrir hendi til að auka vinnslu afla, þótt svo hár kostnaður og fjarlægð frá erlendum mörkuðum geti orðið iðnaðinum fjötur um fót. Aukin vélvæðing og sjálfvirkni getur einnig haft neikvæð áhrif á fjölda starfa. Þótt svo stjórnvöld í Namibíu stefni að því að ýta undir fjárfestingu og bæta virðisauka í greininni hafa þau markmið einnig orðið til þess að skapa of mikla vinnslugetu og auka óvissu um stöðu auðlindarinnar. Í ritgerðinni er einnig sýnt fram á að ákveðin mótsögn er í stefnu stjórnvalda. Þau markmið að auka virðisauka í greininni geta þannig gengið gegn frekari atvinnusköpun og hærra heildaraflamark fyrir lýsing getur stefnt stofni lýsings í voða. Því er mikilvægt að stjórnvöld að leiti leiða til að ná betur fram þeim markmiðum sem að er stefnt, án þess að álag á stofn lýsings aukist, en sterkur stofn er forsenda verðmætasköpunar í veiðum og vinnslu á lýsing.

Table of contents

List of figures

List of tables

1 Introduction

The Namibian fishing sector is vital, as it is the country's third-largest foreign currency earner, behind mining and agriculture, accounting for 3.5 percent of Gross Domestic Product (GDP) on average (Namibia Statistics Agency, 2020). It significantly contributes to sustainable livelihood and income generation, which helps to alleviate poverty. The sector provides direct employment to about 25,000 people (Erasmus *et al*., 2020). It also contributes to the source of food security for the country (Ministry of Fisheries and Marine Resources [MFMR], 2017; Chiripanhura & Teweldemedhin, 2016). Namibia ranks third in Africa, after Morocco and South Africa, and 30th globally, with annual marine landings of about 550,000 Metric Tons (MT) valued at an average of NAD 10 billion (800 million USD) between 2012 and 2016 (National Planning Commission [NPC], 2017). The Namibian fishery sector is dependent on export markets as about 75% of the fish products are exported (Erasmus *et al*., 2020).

Hake is the country's main commercial fishery, in terms of value, worth about NAD 3.6 billion, (USD 233 million) and it is responsible for about 70% of the total employment generated by the fishing sector (MFMR, 2018; Marine Stewardship Council [MSC], 2020). Namibians received virtually few benefits from the hake resource before the country's independence in 1990. Foreigners owned the majority of fishing vessels, almost all staff were foreigners, and no hake processing took place in Namibia. Since then, the industry has made great strides (MFMR, 2018).

One of Namibia's Growth at Home Industrial policy features is to promote local value addition (Ministry of Trade and Industry [MTI], 2015). The policy demands that sectors with existing comparative advantages such as fisheries should ensure local value addition occurs before exports as this limits the opportunities for job creation, value addition, reduction of inequalities, and accelerated economic growth. Increasing value addition requires developing and strengthening the value chain, with forward and backward linkages to the raw material and economy. The policy targets to increase the value-added products exports value to 70% of overall export values by 2030. The value-added exports value accounted for 40% of overall exports in 2013.

Furthermore, the desired goal for the fishery sector is to diversify the Namibian economic base to minimize its reliance on a limited variety of products and their vulnerabilities as well as to improve firms' competitiveness and government revenue.

1.1 Research objectives

Given the importance of the hake fishery to the country's economic growth and the expected regulatory obligation for value addition, understanding the value chain activities is essential. Also, it is critical to recognize and comprehend the regulatory institutional mandates and obligations of national policies that impact the hake value chain. Analysis of the hake value chain can assess whether the policy intentions for further value addition, employment creation, and investments were influenced by the regulatory frameworks and if not, what is the reason.

Accordingly, the research questions to be analysed in this thesis are as follows:

(i) What are the value-adding functions and trade and marketing structures in the hake value chain?

(ii) How have the regulatory frameworks influenced the hake value chain?

(iii) How is the governance among actors in the hake value chain?

1.2 Thesis structure

There are seven chapters in this thesis. The introduction, objectives, and research questions are all in the first chapter. The second chapter provides an overview of the Namibian fisheries, looking at fisheries background, industry structure and processing, resource exploitation management, and the hake fishery as well as its value chain. The theory of value chains is presented in chapter three and introduces the concepts and definitions, as well as Porter's and GVC value chain frameworks, value chain governance models, and their implementation. The methodology used in the research is covered in chapter four. The survey's results analysis are presented in chapter five. Chapter six contains the discussion of the survey results and conclusion followed by chapter seven that outlines the policy recommendations.

2 Overview of the Namibian fisheries

2.1 Background

2.1.1 Geographical location

Namibia has a population of about 2.5 million people and is situated on the southwestern coast of Africa (Namibia Statistics Agency, 2014). It is bordered on the west by the Atlantic Ocean, on the north by Angola and Zambia, on the east by Botswana, and on the south by South Africa (Potts *et al*., 2015). Namibia is the third world‘s most sparsely populated country, with approximately 3.13 inhabitants per square kilometere (World Population Review, 2021). Since much of Namibia‘s coastline is covered in desert, there are few urban communities and because the shoreline is lightly populated, ocean contamination is limited, signalling a clean and healthy ecosystem. This is an advantage in terms of the environment that the Namibian fishing sector may exploit to market and promote its fish products (Chiripanhura & Teweldemedhin, 2016).

Namibia's marine environment is sustained by the Benguela Current Large Marine Ecosystem (BCLME), an upwelling system rich in demersal and pelagic species populations as well as productive fishing areas (Shannon & Pillar, 1986). It features an Exclusive Economic Zone (EEZ) of 200 nautical miles and a coastline approximately 1,500 km long (figure 1). The two largest ports, Walvis Bay and Lüderitz handle about 96 percent of the country's docking, offloading, and seafood processing activities (figure 1) (Erasmus *et al*., 2020).

Despite the rich marine resources, Namibia has one of the lowest fish consumption rates in Africa, with an annual average of 12 kilograms per capita (Erasmus et al., 2021). Fish has traditionally not been a major source of protein in many Namibian diets, which explains the low intake. This is because meat is preferred by the vast majority of Namibians (Musaba & Namukwambi, 2011). However, after realizing the importance of fish consumption, the Namibia Fish Consumption Promotion Trust (NFCPT) was founded in 2001 as part of MFMR's efforts to address national food security and encourage local fish consumption as a source of affordable protein. NFCPT now operates fish shops around the country (NFCPT, 2019).

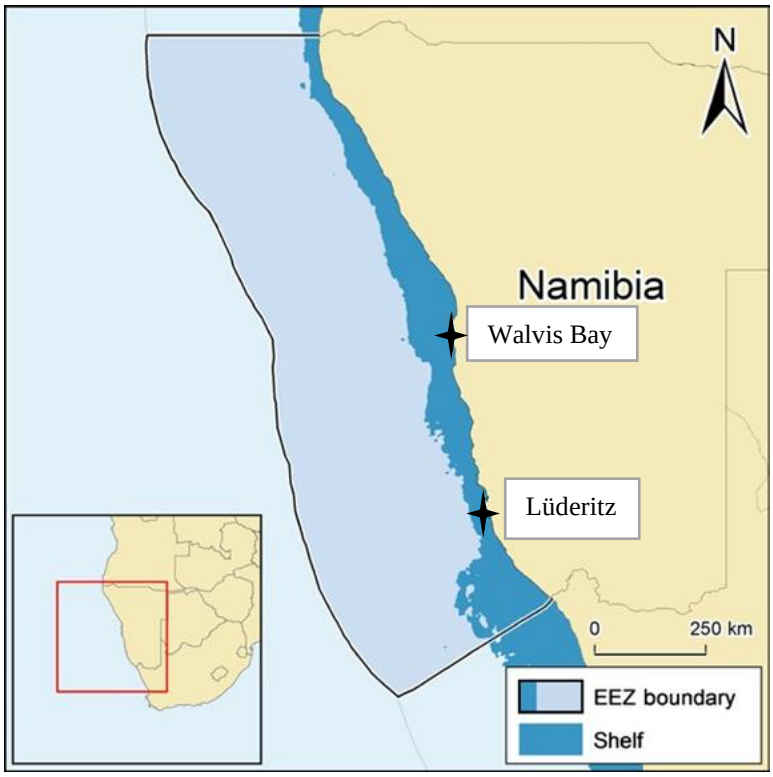

Figure 1: Namibia's EEZ and ports (Belhabib et al., 2015)

2.1.2 The fisheries sector production

The marine sector is entirely industrial and has practically no artisanal fishing (Belhabib et al., 2015). The marine capture fisheries and aquaculture subsectors make up Namibia's fishing sector. The former is controlled by private firms and is internationally competitive. The capture fisheries sub-sector is entirely industrial, with primary and secondary sub-sectors engaged in catching and processing for both domestic and foreign markets. The aquaculture subsector, on the other hand, is extensively funded and encouraged by the government as it is a source of food security and employment in the country (Chiripanhura & Teweldemedhin, 2016; MFMR, 2017). Figure 2 depicts Namibia's total production for the aquaculture and marine capture fisheries since 1990. Over the recent decade (2008-2018), total marine capture production decreased, with an annual average of roughly 450,000 tons, down from an average of about 550,000 tons over the previous two decades (1990-2007). The decrease and variations in the majority of the fishery stocks are largely due to the instability of the biological and oceanic settings, as well as climate change. While aquaculture production has surged over the last decade, from an annual average of around 150 tons in the preceding two decades (1990-2007) to around 7000 tons in the most recent decade (2008-2013). Aquaculture production has been declining since then, due to

various factors, including a lack of investment capital, limited natural potential, and other challenging environmental risk concerns (MFMR, 2013).

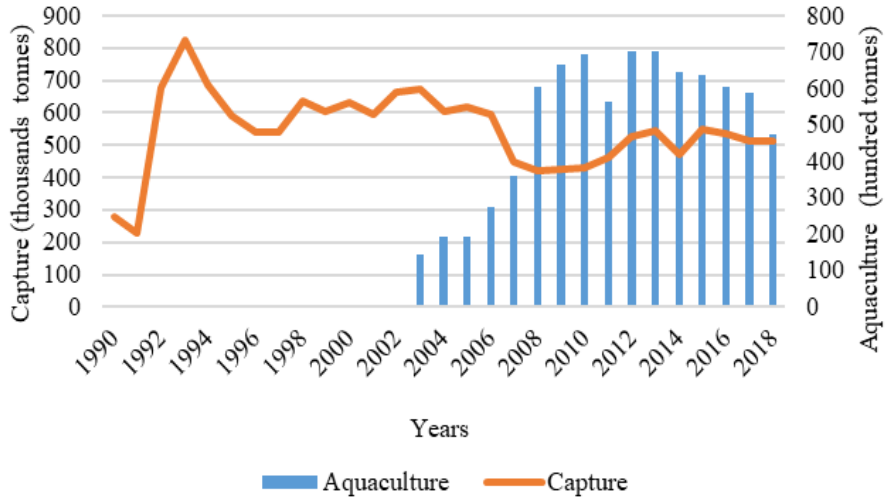

Figure 2: Namibian capture fisheries and aquaculture production in 1990-2018. (FAO FisStat)

2.1.2.1 The marine capture production

The marine capture fisheries in Namibia are centred around seven commercially fished species; hake, monk, horse mackerel, large pelagic species, deep-sea red crab, and rock lobster, as well as Cape fur seals (MFMR, 2017). The orange roughy and pilchard were part of the commercially fished species, however, the stocks have been overexploited, and a fishing moratorium has been imposed. The large pelagic fishery targets tuna, mainly albacore, big eye, yellowfin, snoek, and swordfish. Hake is the most valuable species in terms of export earnings, while the horse mackerel is significant in terms of the catch volumes, with average landings of 150,000 tonnes and 300,000 tonnes per year, respectively (FAO, 2015).

Figure 3 shows the trend of the demersal and pelagic species during 1990-2018. The most important demersal species is hake, but there are significant catches of monkfish. Large catches of orange roughy were also registered at the beginning of the period, but the stock is now overfished. Kingklip and sole are the most common bycatch in the demersal fishery. Horse mackerel and pilchard are the major pelagic species. By the time the country gained independence in 1990, both pelagic and demersal stocks had been heavily fished by foreign vessels (figure 3). Following independence, the government set out to rebuild the depleted stocks. In 1992 the pelagic stocks increased up to 600,000 tonnes, however after 2005, the stocks mainly pilchards dropped drastically, owing to the detrimental

environmental effects of the Benguela Niño (Boyer and Hampton, 2006). Since then, the pelagic has fluctuated until the pilchard stock was severely low in 2007 and a moratorium was implemented.

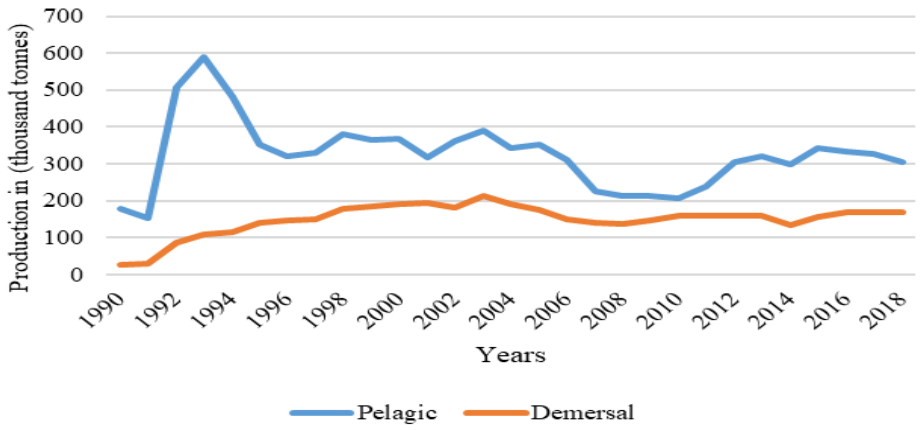

Figure 3: Namibia's catches of demersal (hake, monk, orange roughy, kingklip, and sole) and pelagic (horse mackerel, pilchard) species (FAO FisStat)

2.1.2.2 Aquaculture production

The freshwater/inland and mariculture sub-sectors make up the aquaculture sub-sector, which is quite minor. Oysters, abalone, and mussels are farmed in the mariculture sub-sector, whereas tilapia and catfish are farmed in the freshwater/inland sub-sector. Aquaculture is primarily practiced in Namibia's northern and southern regions (FAO, 2015; MFMR, 2017).

2.1.3 Status of Namibia's fishery export and import

Namibia exports about 75 % of its fish products in different forms, generating significant foreign earnings for the country (Erasmus *et al.*, 2020). Figure 4 shows the exports and imports of Namibia, the highest export revenues generated were in 2013, around USD 784 million. Frozen horse mackerel products were marketed to African markets, hake and monk products were sold to European Union markets, and crab, as well as lobster products, were sold to China, Japan, and the United States (MFMR, 2020; FAO, 2015).

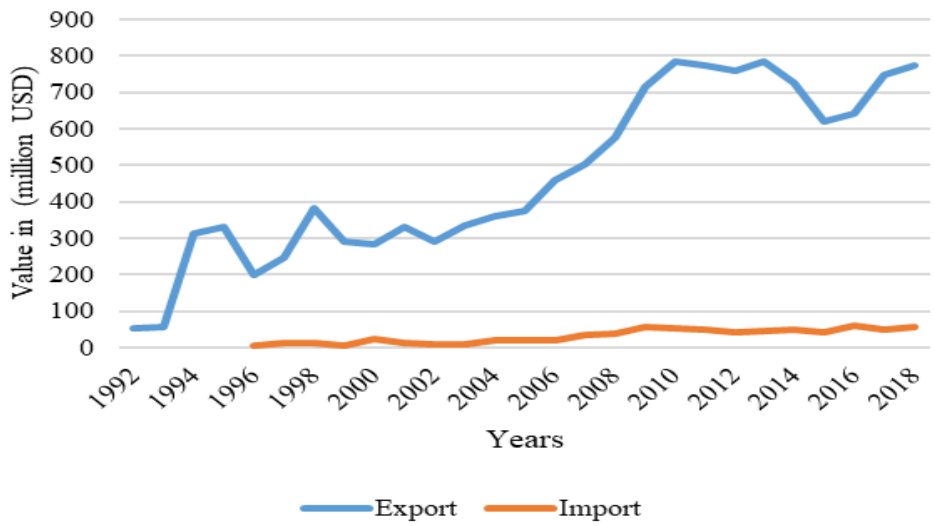

Figure 4: Namibian seafood imports and exports in 1990-2018. (FAO, 2015)

2.2 Resource exploitation and management

Authors like Oelofsen (1999); IJG (2009); Lange (2003), and Paterson *et al*., (2013) give a comprehensive historical overview of the Namibian fishing activity prior to independence in 1990, spanning back to the 18th century. At the time, there was no legislation governing Namibian waters, and the fisheries resource was merely open access, leading to invasions by foreign vessels, resulting in the collapse of commercial fish stocks and little benefits to Namibians. The collapse of many commercial fisheries worldwide over the past three decades (1970-1999) has changed the perception that fisheries resources are unlimited (Oelofsen, 1999). These changes resulted in the rapid emergence of exclusive fishing rights for fishermen in the mid-1970s, which eventually led to the establishment of EEZ following the ratification of the United Nations Convention on the Law of the Sea (UNCLOS) in 1982.

Following Namibia's independence in 1990, the new government declared a 200 nautical mile exclusive economic zone (EEZ) along the coast in accordance with the UNCLOS to gain complete control over the marine resources. Alongside that, a fisheries management system and policy were established to restore the over-harvested fish stocks, construct effective monitoring, surveillance, and control system, and develop a fisheries sector that adds value and benefits Namibians (MFMR, 2017; Chiripanhura & Teweldemedhin, 2016).

With the assistance of donors as well as influence from regional and international bodies, significant developments have since been made in the Namibian fishing industry.

A management regime supplemented by competent scientific experts now monitors, assesses, and controls the fisheries' resources (Van Zyl, 2001). Fishing rights and property rights in form of individual non-transferable quotas are the foundations of Namibia's fisheries management system. Fishing vessels require licenses to operate in Namibian waters, this is done for the purposes of monitoring and statistics. Only Namibian-controlled entities are granted exploitation rights and quotas under the established criteria in sections 32 and 33 of Marine Resource Act No. 27 of 2000. Foreign participation in the exploitation, processing, and marketing of marine resources is promoted through mutually beneficial joint ventures, vessel chartering, and contractual agreements (MFMR, 2004; MFMR, 2018). According to Oelofsen, (1999) this strategy stimulated investment and increased Namibian ownership of the industry.

2.2.1 Involved organizations and fisheries legislations

The Ministry of Fisheries and Marine Resources is the designated authority in charge of managing the living aquatic resources by applying appropriate management techniques to maintain sustainability and improve social and economic benefits. To maintain seamless operations and long-term resource management, MFMR works with a variety of fishing industry stakeholders, including right holders, factory & vessel owners, unions, employees, fishing communities, fishing associations, financial institutions, Ministry of Trade, Ministry of Environment, and Ministry of Finance among others. The MFMR is guided by the Marine Resource (Act 27 of 2000), Marine Resources Policy (2004), Marine Resources Regulations (2001), Aquaculture Act, Policy Statement on granting of the rights of exploration, and other legal frameworks. MFMR also collaborates with several international regulatory agencies and organizations, which are all integrated into the fisheries management regime. Some of the international organizations include the Southeast Atlantic Fisheries Organization (SEAFO), which deals with matters concerning high seas fishing activities beyond the EEZ of the Benguela Current Convention (BCC) member states. Also, a member of the International Commission for the Conservation of Atlantic Tunas (ICCAT), which oversees the management of the region's large pelagic species (MFMR, 2017;(Tall & Failler, 2012).

2.2.2 National Plan for the Fisheries Sector

The development and potential growth of the fishery sector, together with other sectors such as mining, agriculture, and tourism, has been ingrained in the 5th National

Development Program (NDP5), Namibian Industrial policy, and the Vision 2030 (NPC, 2017; MTI, 2015). With the aim of manufacturing and industrialization, by building synergies among sectors via primary processing of raw material and employment generation in manufacturing sectors (MTI, 2015). These goals have been emphasized in the fishery sector, whereby, the government encourages the industry to enhance value addition, resulting in greater export earnings and increased employment levels.

2.2.3 The monitoring control, and surveillance system

In preventing illegal, unreported, and unregulated (IUU) fishing in Namibian water, the Namibian government has implemented an effective monitoring, control, and surveillance system (MSC). The MCS encompasses the entire coastline in all four dimensions: sea, air, land, and remote sensing. The MCS is complemented by the Fisheries Observer Agency, which places a fisheries observer on board each licensed fishing vessel to monitor fishing activity. A vessel monitoring system (VMS) is also used to track vessels and monitor their movement and fishing activity. In addition, MFMR supervises the fishing sector by restricting fishing activities to those with fishing rights and quotas, ensuring that fishing activities are conducted legally and administratively, and collecting income from landings (MFMR, 2004).

2.3 The hake fishery

2.3.1 Global importance and production of hake

Large-scale hake harvesting only began after global cod supplies could no longer fulfill the demand for whitefish, following a major decline in cod stocks in the 1960s (Alheit and Pitcher, 1995). There are 15 hake species under the genus (*Merluccius* and *Macruronus*) which are members of the subfamilies (*Merlucciinae* and *Macruroninae*) that, belong to the (*Merluccidae)* family. The hake is distributed widely along the Southeastern and Western Atlantic coasts (South Africa, Namibia, Uruguay, and Argentina) as well as the Western and Eastern Pacific (New Zealand, Peru, and Chile). They are also found around the European coast, south of the Black Sea and the Mediterranean Sea. Hake is a first-class fisheries product, although the quality and consequent commercial value of each species vary greatly (Lloris et al., 2005).

Hake is the most significant demersal species and has great economic importance in several nations such as Namibia, South Africa, Argentina, Spain, Peru among others. Hakes play a smaller role elsewhere, but they are still extensively fished. The hake has a

comparatively high economic value in Europe when compared to other parts of the world. In addition to their economic significance, hake also play important role in their ecosystems (Alheit & Pitcher, 1995).

Global hake production surged in the 1960s peaking at 2.1 million tonnes in 1972, according to FAO statistics. During the first half of the 1980s, it dropped to almost 1.2 million tonnes and peaked between 1987 and 1989 (Figure 5). It subsequently declined to 1.2 million in the early 1990s before reaching a new high of 1.7 million tonnes in 1996. Production decreased to 1.2 million tonnes in the early 2000s and has been relatively stable since then (Figure 5). Hake catches have been declining rapidly in several locations than others during the last ten years (Alheit & Pitcher, 1995). The hake declines can be observed in the South Pacific, Europe, and other parts of the world (Figure 5). Over one-third of the world's hake biomass is found in Namibia and South Africa's combined stocks (Kathena *et al*., 2016).

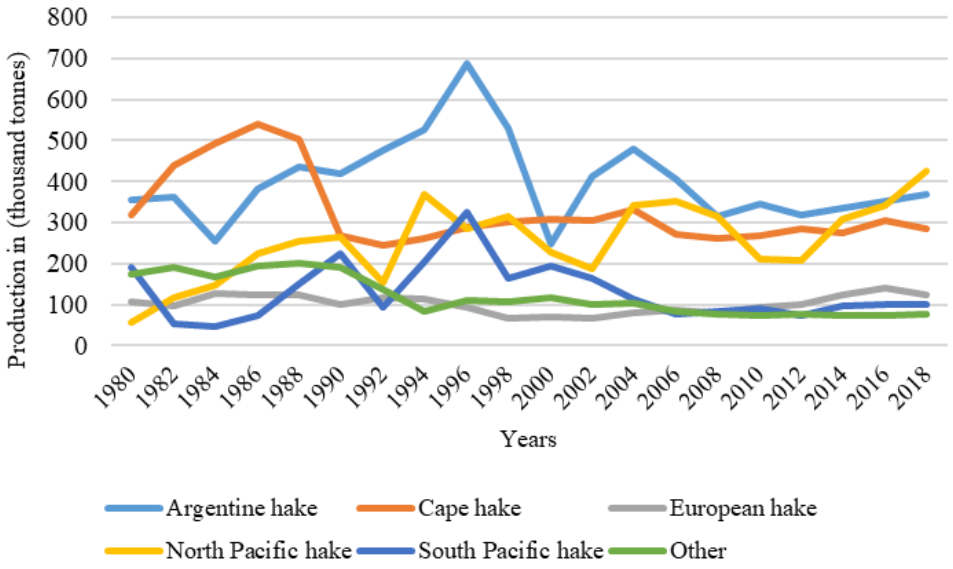

Figure 5: Global hake production by species in 1980-2018 (FAO FisStat)

Hake is traded worldwide, with Spain being the major world hake importer, bringing in up to 700,000 tons annually (Muñoz-Colmenero *et al.*, 2015). Spain is also the largest market for Namibian hake products taking up about 70% of the overall exports (MFMR, 2020). The Namibian hake fishery contributes more than 50% to the total fisheries export value. The export volumes, the values, and the share of contribution to the overall fishing sector exports over the last five years are shown in table 1.

Table 1: Total hake export volume (MT), in 2016-2020. Thousand (USD). (ITC, 2021)

Years	***Hake export volume (MT)***	***Hake export value in thousand USD***	***Total export values in thousand USD***	***Share of hake in total fisheries export***
2016	73,744	273,769	603,381	45%
2017	80,605	329,161	674,305	49%
2018	84,843	384,605	731,086	53%
2019	90,484	360,432	695,215	52%
2020	329,676	323,645	596,806	54%

Table 2 shows the Namibian hake frozen fillets export markets, values, and share of total hake export markets. Spain is the largest importer of the Namibian hake frozen fillets accounting for about 58%, followed by Italy, South Africa, and Germany. The volume of frozen fillets has increased over time, and it accounts for the majority of the value and volume of all hake products.

Table 2: Namibian exports of hake frozen fillets to the world in 2016-2020. Thousand USD. (International Trade Center [ITC], 2021).

Importers	***2016***	***2017***	***2018***	***2019***	***2020***	***Share of total export markets***
Spain	107,336	140,505	189,686	183,870	174,728	58%
Italy	20,755	25,618	27,854	27,212	32,171	10%
South Africa	10,404	19,653	26,666	27,845	16,131	7%
France	12,585	19,844	24,073	19,762	15,628	7%
Germany	11,444	12,511	25,312	13,515	7,404	5%
Portugal	7,740	19,279	16,847	11,817	11,441	5%
Netherlands	8,750	14,765	11,729	14,857	11,377	5%
Australia	5,400	4,373	4,199	4,231	3,520	2%
Others	5,543	3,433	4,043	4,668	3,570	2%

Table 3 illustrates the export markets for Namibian hake fresh or chilled products, as well as their values and share of overall hake export markets. The only markets for these products are Spain and South Africa, with the former accounting for 90% of total sales. Since 2019, the Spanish export market for fresh or chilled hake has been shrinking, possibly due to the COVID-19 pandemic.

Table 3: *Namibian exports of fresh or chilled hake to the world in 2016-2020. Thousand USD. (ITC, 2021).*

Importers	***2016***	***2017***	***2018***	***2019***	***2020***	***Share of total export markets***
Spain	12,808	7,232	7,856	8,400	3,873	90%
South Africa	352	773	660	1,161	1,262	9%

Table 4 shows the Namibian frozen hake products export markets, values, and share of overall hake export markets. Spain is still the top market for this product, accounting for about 45 %, followed by South Africa, accounting for 35%.

Table 4: Namibian exports of frozen hake to the world in 2016-2020. Thousand USD. (ITC, 2021)

Importers	***2016***	***2017***	***2018***	***2019***	***2020***	***Share of total export markets***
Spain	25,451	11,381	13,578	12,520	13,162	45%
South Africa	12,971	11,719	13,845	12,220	8,030	35%
Portugal	5,660	2,892	1,455	650	378	7%
France	5,625	2,684	275	306	181	5%
Italy	2,176	1,337	124	242	225	2%
Others	1,719	1,432	1,739	1,517	2,516	5%

The origin, gear used, and fish size are the most important factors in hake pricing on global markets. Asche and Guillen (2012) claim that hake from Namibia attracts a rather fair price because it is harvested with the desired fishing gear. Given that Spain is the world‘s top hake importer and consumer, import market prices are compared, to determine which hake market fetches the best value (EUMOFA, 2015). Table 5 shows the pricing of hake frozen fillets imported by Spain. Germany commands the highest average price per kilogram of hake frozen fillets imported by Spain, around 7.17 USD, followed by Chile at 6.20 USD, then Netherlands, Namibia, South Africa, and Portugal with an average of 4.50 USD, and Argentina as well as the United States at 3.10 USD. It is worth noting that, Germany, Chile, and the Netherlands volumes are far lower compared to Namibia, South Africa, Argentina, and the United States.

Table 5: Price of frozen hake fillets imported by Spain in 2016-2020. USD per kg (ITC, 2021).

Exporters	***2016***	***2017***	***2018***	***2019***	***2020***	***Average***
Germany	4.26	7.41	7.87	7.59	8.71	7.17
Chile	6.14	5.94	6.28	6.31	6.62	6.26
Netherlands	2.81	5.73	6.39	5.55	3.69	4.84
Namibia	4.25	4.53	4.83	4.58	4.68	4.57
South Africa	3.98	4.45	4.69	4.42	4.26	4.36
Portugal	3.62	3.61	4.89	4.64	4.45	4.24
Argentina	3.17	3.03	3.10	3.26	3.05	3.12
U S A	3.05	3.11	2.91	3.09	3.43	3.12
Peru	2.55	2.36	2.21	2.72	3.08	2.59
China	2.01	2.33	2.49	2.60	3.21	2.53

Table 6 shows the pricing of fresh or chilled hake imported by Spain. Germany, Chile, and United Kingdom commands the highest average price per unit around 6.00 USD, followed by Denmark at 5.00 USD and Namibia and South Africa at around 4.80 USD.

Table 6: Price of fresh or chilled hake imported by Spain in 2016-2020. USD per kg (ITC, 2021).

Exporters	***2016***	***2017***	***2018***	***2019***	***2020***	***Average***
Chile	5.78	5.78	6.04	5.99	6.64	6.05
United Kingdom	4.91	5.94	6.35	6.45	6.48	6.03
Denmark	4.05	4.82	5.52	6.50	6.01	5.38
South Africa	3.96	4.46	5.04	5.26	5.71	4.89
Namibia	4.33	4.61	4.93	4.78	5.61	4.85
France	3.63	3.91	4.44	4.46	3.88	4.06

Namibia imports frozen hake mainly from South Africa and other countries including New Zealand, Canada, Argentina, Spain, and Norway (see Table 7). The average price in South Africa is 2.14 USD, whereas the average price in the rest of the world is 2.09 USD.

Table 7: Namibian imports of frozen hake from the world. USD per kg (ITC, 2021)

Exporters	***2016***	***2017***	***2018***	***2019***	***2020***	***Share of total import markets***
South Africa	2.18	2.14	1.99	2.33	2.05	2.14
Others	2.07	2.21	1.99	2.19	2.00	2.09

2.3.2 Biology and distribution

The shallow water hake *Merluccius capensis* and deep-water hake *Merluccius paradoxus* are the two Cape hake species that occur in the BCLME (Figure 6) (Wilhelm *et al*., 2015). The two species are referred to as *M. Capensis and M. Paradoxus* herein. The morphology of the two species is difficult to differentiate and their distribution overlaps, hence, they are treated as a single stock species, and so are the catches recorded (Kathena *et al.*, 2016; Kirchner, *et al.,* 2012). The same species are also found in South African waters and similar procedures are employed. According to Henriques *et al*., (2016) and Jansen *et al*., (2017) one of the stocks, the deep-water hake *M. paradoxus* is shared between Namibia and South Africa, nevertheless, the two countries' fisheries are managed independently. This is because the two countries have always assumed the stocks were different, though its distribution extends from South Africa, into Namibia, and further in Angola (figure 7) (Jones *et al*., 2020).

Figure 6: Cape hake M. capensis and M. paradoxus (MFMR, 2007)

The *M. Capensis* lives in shallower water above 450 meters, while the *M. Paradoxus* prefers deeper water up to 600 meters (Wilhelm *et al*., 2015; Burmeister, 2001). The two species feed on crustaceans, krill, and other tiny fish, but their diet varies depending on the season because they are opportunistic eaters (Roux and Shannon, 2004; Mecenero *et al*., 2006). Hakes are eaten by a variety of demersal and big pelagic prey species (Wilhelm *et al*., 2015). The *M. Capensis* has a shorter length, grows faster, and matures quicker than *M. paradoxus* (Jones *et al*., 2020; Wilhelm *et al*. 2015). Table 8 summarizes the biological features of the two species.

Table 8: Biological features of the (M. Capensis) and (M. paradoxus). (Jones et al., 2020)

Biological parameters	*M. capensis*	*M. paradoxus*
Growth parameters (1999-2018):		
L_∞	113	102
K	0.094	0.106
t_0	-1.327	-1.556
Natural Mortality:	M – 0.35 to 0.4 (literature)	
Length-weight relationships ($a*L^b$) (1991-2018):	$W = 0.0088L^{2.94}$	$W = 0.0067L^{3.04}$
Age at 50 % maturity (1999-2018)	1.3	2.6
Length at 50 % maturity (L50) (1994-2018):	23.3 cm	32.3 cm

Figure 7 shows the distribution of the two species along the BCLME were, North of (~27°S), the *M. Capensis* is more common, whereas south of (~27°S) the *M. Paradoxus* is more common (Johnsen and Kathena, 2012). According to Hutchings *et al.*, 2006 and Jansen *et al.*, 2015 spawning occurs all year round, but the main spawning period is between winter and spring (July – October), hence hake fishing is prohibited throughout October to reduce the impact on hake that are spawning or have already spawned *(Jones et al*., 2020). Spawning happens in the mesopelagic and demersal zones, peaking between 100 and 400 meters offshore, depending on environmental conditions. The season for hake fishing extends from November through September of the following year.

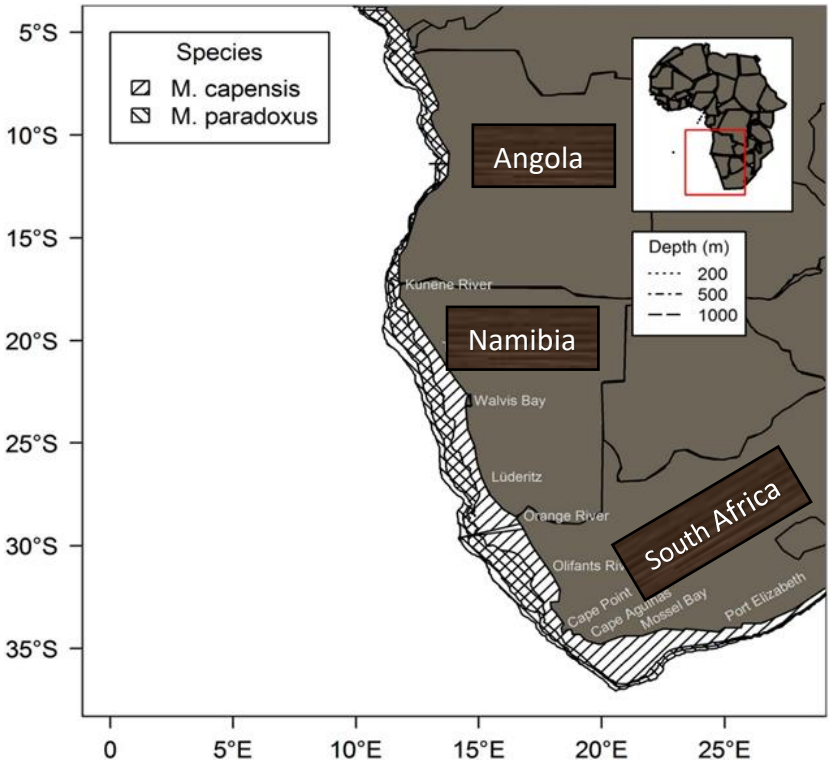

Figure 7: The BCLME hake species distribution along the Southern African Atlantic Coast. (Kathena et al., 2016)

The Benguela Current Commission (BCC), an intergovernmental body that facilitates transboundary research, has been established as part of the BCLME Program's collaborative management efforts. Given the importance of the hake fishery in both Namibia and South Africa, centralized management and protection of shared stock is important to minimize economic, environmental, and social losses. According to Arnason (2009), over-exploitation of resources is generally due to a lack of management, mismanagement, or inappropriate systems. In fisheries, this is most common in the transboundary or artisanal fisheries, where it is challenging to implement a comprehensive fishery management system or as a result of the political will of a nation (Field, 2016). Fisheries are typically a common-pool resource, which makes it hard to exclude users from the resource. Hardin (1968) argues that common-pool resources are often associated with a situation known as "the tragedy of commons", which is when individuals overexploit or degrade natural resources at the expense of others. The members in the commons problem are usually stuck on an invertible path in which they are unable to pull themselves out. Therefore, outside authorities are often needed to enforce rules and regulations for users, as they are unable to do it on their own (Ostrom, 1999). A similar situation might arise between two countries and if all participants have their way, the incentive will be to catch as much of the resource as possible before others do, with no control, resulting in an overharvesting tragedy.

2.3.3 Brief history of the hake catches

Hake fishing in Namibian waters only began in the 1960s, and as a result of open access, over 100 foreign vessels from Russia, Spain, Italy, Portugal, Israel, South Africa, Japan, and Cuba participated. Freezer trawlers with processing factories on board had just been developed at the time, allowing vessels to travel great distances in search of fish (Paterson *et al*., 2013). By 1972 the Spanish and Soviet vessels were capturing up to 90% of the total hake caught by foreign vessels, with catches reaching over 800,000 tons, significantly reducing the hake stock (Figure 8).

The International Commission for Southeast Atlantic Fisheries (ICSEAF) had the task of providing scientific recommendations for fisheries management and established TAC and minimum mesh sizes from 1976-1989, however, it failed. Hake catches declined sharply, and around the 1980s the harvest had drastically reduced to 170,000 tonnes with the stock size reduced by less than half of what it had been. During the years 1981 to 1989, the catches varied around 300,000 to 400,000 tonnes (Figure 8). The hake resource was

open access up until the establishment of the EEZ and independence in 1990 (Wilhelm *et al*. 2015; Paterson *et al*., 2013). Annual hake catches have ranged between 87,000 to 190,000 tonnes since 1992 (figure 8). The (*M. Paradoxus)* is responsible for 52% to 71% of overall yearly landings (Johnsen and Kathena, 2012).

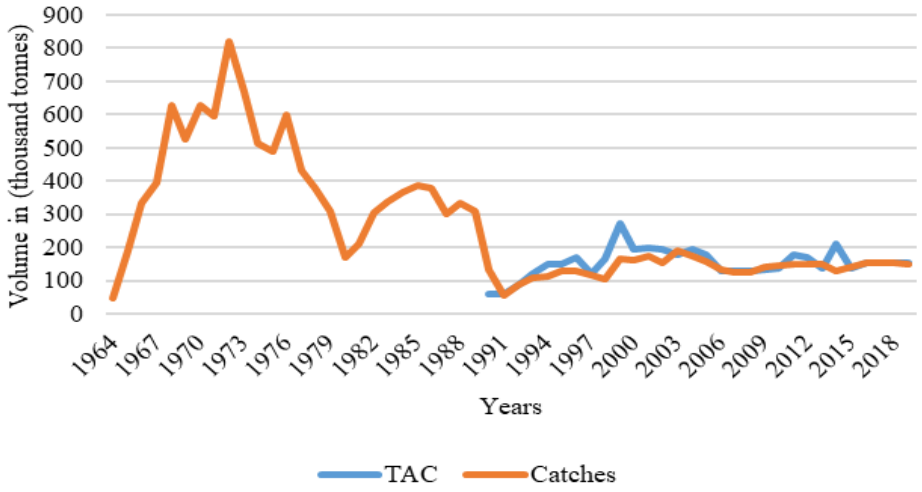

Figure 8: Hake catches in 1964-2019 and annual TAC for the years 1990-2019. Thousand tonnes. (MFMR, 2018).

2.3.4 The current hake management regime

After Namibia‘s independence in 1990, MFMR assumed control and management of the severely exploited fishery (Payne and Punt, 1995). To conserve and recover the hake stocks, immediate efforts were implemented, such as the declaration of a 200-mile exclusive economic zone and a prohibition of foreign fishing vessels. The goal of the hake management regime was to restore stocks and localize the industry. The management measures included entry license restrictions, October closures, no trawling inside 200 meters of water and no mesh sizes smaller than 110mm, by-catch limits, and no discarding of quota species (Wilhelm *et al*., 2015).

Total Allowable Quotas (TAC) are set once a year to ensure the long-term viability of the fishery. In 1990 and 1991, the TACs were lowered from over 300,000 to 60,000 tonnes but have steadily increased since then, as shown in Figure 8. Annual swept-area biomass surveys were utilized to provide scientific assessments between 1992 and 1997. These surveys were considered to determine the actual population of Namibian hake and proposed a TAC accommodating 20 percent of fishable biomass. Between 1990 and 1996, the TAC increased from 60, 000 to 170,000 tonnes as a result (Figure 8). Annual TACs have since been based on a rigorous scientific assessment using of stock status using

statistical catch-at-age analysis (SCAA) since 1998 (Wilhelm *et al*., 2015). Input data includes maturity-at-age, selectivity-at-age, weight-at-age, landings, biomass estimation from surveys, and catch at age matrices from biomass surveys. Following this, the scientific and socio-economic recommendations are presented to the Marine Resource Advisory Council, which advises the Minister, who then makes recommendations to Cabinet, which eventually sets the TAC based on all proposals. In addition, there is a 10% restriction on TAC inter-annual changes to ensure security for the fishing industry (Wilhelm *et al*., 2015). In 1999 the TAC was increased from 160, 000 to about 270,000 tonnes due to a shift in the fishing season from January-December to May-April, and in 2014 the TAC was increased from 140,000 to 210,000 tonnes as the fishing season was changed from May-April to November-September (MFMR, 2018).

At the time of independence in 1990, none of the fish was landed wet, as all demersal fish processing took place offshore. This was partly due to the dominance of foreign vessels in the industry. A TAC wet apportionment policy was formed in response to government pressure to localize and develop the industry. The apportionment plan was intended to raise the industry‘s jobs by progressively transferring catch effort away from freezer vessels toward wet-fish vessels. In 1992, only about 5% of (87,000 tonnes) total hake landed was wet (Sumaila, 2000). A TAC apportionment policy was declared for the wet-fish vessels, with allocations of 20, 40, and 60%, in 1993, 1994, and 1995, respectively (Kirchner and Leiman, 2014). However, because there were no increases in TACs from 1995 to 1998, the 60 percent target was not attained (Sumaila, 2000). Currently, the TAC apportionment policy is 70% for wet-fish vessels and 30% for freezer vessels (MFMR, 2018).

Despite the efforts to restore the hake stocks, Paterson and Kainge (2014) argue that it has not fully recovered since the government regained sovereignty over the resource in 1990. The ecology deterioration owing to the relatively low quantity of tiny pelagic species prevalent in the Northern Benguela habitant since the mid-1970s could be the cause (Wilhelm *et al*., 2015). Furthermore, Kirchner and Leiman (2014) believe that the failure to recover the biomass is due to a complex balancing of various social, economic, and political commitments. The current biomass as of 2019, is estimated to be about 30% below the maximum sustainable yield (MSY). Although the biomass appears to be below MSY, the range of uncertainty suggests that the stock may already be at MSY (Jones *et al*., 2020).

2.3.4.1 Right-based fisheries management

Fisheries governance has been moving away from open access and toward management. To counter this, rights-based and effort control systems have been widely practiced and extensively discussed in the fisheries literature over the last two decades (Pearse, 1994; Oelofsen, 1999; Sutinen, 1999; Charles, 2002; Arnason 2005; Arnason, 2009). Right-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 in better management and conservation efforts. Management rights are effective when the government, fishers, and local community co-manage. There are various types of use rights, such as territorial uses rights, limited entry, effort rights, and harvest rights (Charles, 2002). A limited entry right is a tool for regulating fishery access, capacity and safeguarding the fishery's stability (Oelofsen, 1999).

TAC is an output control measure that is divided into quotas and distributed to authorized fishing operators such as firms, individuals, or units, with each share representing individual or collective harvesting use rights. These allocations can be given for a year, longer durations, or indefinitely (Copes, 1986). Harvest rights, which are predetermined shares of the yearly TAC, are divided into two categories: IQ and ITQ. IQs are non-transferable harvesting rights, whereas ITQs are rights that can be permanently transferred among fishers. The IQs and ITQs as property rights have shown to be quite successful in global fisheries (Arnason, 2009). Property rights vary in terms of security, permanence, exclusivity, and transferability, and their quality is considered excellent if it holds all features (Arnason, 2005). Since IQs are neither transferable nor permanent, they give limited control over resources and have fewer incentives to maximize profitability. Individual transferable quotas (ITQs), on the other hand, hold all four features and can bring very substantial economic benefits (Gunnlaugsson and Saevaldsson 2016; Gunnlaugsson *et al*., 2018; Arnason, 2009).

With the IQ harvesting rights, there is the certainty that fishing firms, individuals, or communities will not have to compete for their share of the TAC. They also allow operators to fish at their own time and carefully distribute their efforts and costs throughout the season, eliminating the need to fish in inclement weather or other potentially hazardous conditions. Also, excess harvests can be avoided, and sales value maximized 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 the size of the fleet are

lowered as a result of the mentioned incentives (Charles, 2002). The IQ harvest rights may have potential benefits, but they may also have some social and environmental drawbacks. Due 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 catches to avoid detection. In addition, IQs are associated with high grading which is when a quota is only filled with the high-quality fish while the lower quality fish is discarded (Copes, 1986; Charles, 2002).

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 right 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 the fishing right. Individual quota allocations are done on a pro-rata basis based on past years' 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 the right holders' investments, value addition, employment, and socio-economic factors. Individual quotas cannot be transferred permanently, except with the Minister's permission. 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 quotas to MFMR before the end of the fishing season so that they can be redistributed. The unused quota that is not returned on time has penalties or may have an impact on future quota allocations (MFMR, 2020).

2.3.4.2 The hake fishing rights system following independence

The hake fishing rights are issued based on the criteria stipulated in Article 33 section 4, of the Marine Resource Act of 27, 2000 which states that "the *Minister may announce by a notice in the Gazette, a period during which applications for rights to harvest may be made"*. The Minister may take into account the following criteria when considering rights applications:

- If the applicant is a Namibian national or not;
- In the case of a firm, the extent to which Namibian citizens hold beneficial control of the firm;
- The applicant's beneficial ownership of any vessel that will be utilized;
- The applicant's ability to exercise the right satisfactorily;

- Promoting the advancement of Namibians who have been disadvantaged socially, economically, or educationally as a result of discriminatory laws or policies established or practiced prior to Namibia's independence;
- Development of Namibia's regions
- Economic and social concerns;

The structure of fishing rights terms has shown to be a useful management instrument and has been utilized as a vital benchmark for the fishing industry's future development (MFMR, 2009). The term of fishing rights was formerly divided into three categories, four, seven, and ten years respectively, this was in effect from January 1994 to May 2001. However, as the hake fishing industry‘s dynamics evolved and gotten more sophisticated in recent years, the periods of the fishing rights changed to seven, ten, fifteen, and twenty years respectively (MFMR, 2009).

Extensions of fishing rights in various terms are contingent on an assessment of the right holder's performance with consideration of the criteria of longer period rights, as well as adherence to fisheries policies, regulations, and conditions linked to the right. There are differences in these conditions depending on the size of the firm, innovations, and the number of Namibian jobs created. A right holder with a seven-year term must meet the standards mentioned under seven years (table 9) before a right can be reviewed and extended for a longer term beyond seven years. The same is applicable for all ten and fifteen years. Likewise, if a right holder ceases to fulfill the conditions for which the right was awarded, the right may be cancelled or downgraded. Fishing rights are not extended beyond the 20-year term often right holders are advised to reapply for a new fishing right (Fergus, *et al*., 2005; MFMR, 2009).

These conditions were imposed in 2000 when MFMR recognized the industry‘s substantial contribution to the country‘s socio-economic development (Elago, 2004). Certain right holders, on the other hand, were not following through on their original commitments and appeared to be more concerned with earning quick money by selling their quotas rather than creating more employment (Elago, 2004). The criteria considered in the extension of hake fishing rights durations are shown in Table 9.

Table 9: Fishing rights terms and conditions (Elago, 2004)

Rights period	***Conditions on the right***

7 Years	a) Right holders owning at least 50% in onshore processing facilities or vessels. b) Right holders with less than 51% Namibian shareholding ownership, with onshore investment. c) Rights may be granted for shorter terms in particular circumstances, such as early-stage development.
10 Years	a) Right holders that have a minimum of 50% Namibian ownership in onshore processing facilities or vessels. b) Firms with onshore investments with less than 51% Namibian ownership.
15 Years	a) Right holder with a minimum of 90% Namibian ownership and more than 50% investment in onshore processing facility or vessel. b) Right holders that own shares in bigger firms. c) Right holders that create a minimum of 500 onshore jobs for Namibians. d) Right holders that can contribute innovatively to the industry‘s development, through product development and establishing export markets.
20 Years	a) Right holder that creates a minimum of 5000 permanent jobs on land or sea. b) Right holder value adding up to 75% of allocated quota c) Right holder that has a minimum of 80% Namibian ownership and owns 60% or more shares in a vessel or factory. d) Right holder that is 100% Namibian owned and has 25% shares in bigger firms.

The hake industry consisted of 38 fishing rights-holding firms between 1994 and 2011 (Table 10), these rights were divided into the following categories 10 rights under the seven-year term, six under the ten-year term, and 22 under the 15-year term (Nichols, 2004). The majority of these fishing rights were owned by Namibians with past fishing experience, with only a few foreign owners in the mix (Elago, 2004). In 2011, 62 new fishing rights were granted, bringing the total number of hake fishing rights to 100 (Table 10). The 62 rights were all under the seven-year term, while four of them were extended to ten years and 34 to fifteen years terms. In 2020, 38 fishing rights that had reached the end of their 20-years term (had to apply for new ones) were renewed, and 80 new rights were issued, bringing the total number of new rights to 118, all of which fall under the seven-year term. While, 62 fishing rights are under 10-years (MFMR, 2020).

Table 10: Number and duration of fishing rights in 2003-2019. (Elago, 2004; MFMR, 2021)

Year	***Duration of Rights***				
	7-years	**10-years**	**15-years**	**20-years**	**Total**
2003-2011	10	6	22		38

2011-2019	62	4	34	100
2020	118	62		180

Some of the successful new right holders were organized into joint ventures, commonly referred to as "forced marriages" to collaborate with existing fishing enterprises. The forced marriages referred to situations where the minister granted a single fishing right to a number of applicants, forcing companies to form joint ventures. According to Melber (2003), this setup was to increase the bargaining power of new entrants and help them to diversify their operations and make investments. However, there have been other joint ventures in which companies chose to pool their resources and collaborate on their initiative, and these are not considered forced marriages.

2.3.4.3 Present state of hake fishing rights

In 2018, an application for new fishing rights was made, published in the Government Gazette, notice No. 92 of May 24. In 2020, a total of 80 new hake fishing rights were issued, together with the renewal of 38 expired rights, which were added to the 62 active rights, bringing the total number of fishing rights to 180 (Table 10) (MFMR, 2021). The number of hake fishing rights increased over the years, from 38 in 1994 to 180 in 2021 (Elago, 2004; MFMR, 2021). Currently, over 90% of 180 hake rights are exclusively owned by Namibians, while the remaining have less than 50% foreign ownership. Furthermore, 62 fishing rights are set to expire on December 31, 2021, (reaching the 10-year term) and will be evaluated and assessed for a possible extension beyond ten years. The 180 hake right holders are grouped into 29 joint ventures (JVs) (each JV has five right holders) and 35 individual right holders.

2.3.4.4 Fees and levies

There are various types of levies and fees payable in the hake fishing industry. The different fees associated with the hake quota include quota fees, bycatch fees, vessel licenses fees, and fund levies (Wiium and Uulenga, 2003). The fees and levies are the sources of government revenue that are used to fund administrative costs associated with maintaining the resource and the fishery sector. They are payable for the quota allocated to each quota holder and are paid irrespective of whether the quota is harvested or not if it is not returned. This is designed to encourage the utilization of quotas and by-catch cost is imposed to deter right holders from pursuing species for which they do not have a quota. The fees are designed so that quota holders who use Namibian vessels pay less than those

who use foreign vessels. In addition, quota fees for fish landing for onshore processing are lower than for fish processed at sea (Wiium and Uulenga, 2003; MFMR, 2018).

2.3.5 Operational arrangements

Horizontal clustering is a common practice in the hake fishery, whereby, new or smaller existing right holders enter into joint venture agreements with much larger fully integrated hake right holders/operators (Cooper *et al*., 2014). These agreements are beneficial for both parties. For the new or smaller existing right holders, such an agreement enables the right holder to have access to vessels and processing facilities for the catching and processing of that particular right holder's quota. This is necessitated by the fact that some of the smaller right holders have quotas that are too small to warrant an investment in either vessels or onshore processing facilities. The only investment option for these right holders is through buying shares in vessels and onshore processing facilities belonging to the larger firms. For the larger right holders, entering into these types of agreements allows them to utilize their vessel fleets and factories more efficiently since they have enough catching and processing capacities. Larger firms with high levels of vertical integration are believed to boost profitability and long-term viability by reducing risk and increasing profits via economies of scale (Cooper *et al*., 2014).

2.3.6 Harvesting

Harvesting activities are the initial step in the hake value chain (figure16). Vessel owners, the majority of which are right holders and some non-right holders, are the direct actors at this stage. Other indirect actors involved at this stage of the chain are the enablers and service providers. The government (MFMR) is the enabler in this instance, as it makes quotas accessible and distributes them once a TAC has been established. Quotas are distributed on a 70/30 wet basis to eligible right holders, and these serve as the chain‘s inputs. Many larger firms are vertically integrated, completely dominating the entire value chain. While smaller firms/right holders with no catching capacity merge horizontally through contractual arrangements with other firms, to catch on their behalf (MFMR, 2019).

The hake fleet is made up of longline vessels (19-55m length) and wet and freezer trawlers (19-77m length) and they must be licensed before engaging in any fishing activities. A common hake longline consists of a double line set up, with the mainline of roughly 30 km long and 20,000 baited hooks on branch lines, while trawlers employ bottom trawls. An average of 44 wet trawlers, 11 long lines, and 12 freezer trawlers are

employed. The majority of these vessels are owned by right holders, while some are leased to right holders by non-right holders through the mentioned arrangements (Jones *et al.*, 2020).

The wet fish trawl trip usually takes about eight to nine days, and wet fish vessels carry roughly 80-90 tonnes of crushed ice on board, as well as an average of 3,500 empty fish tubs per trip. After the catch is removed from the fishing gear, it is sorted by species on board the wet fish trawler and then headed and gutted (H&G), with the guts and head dumped overboard. The headless and gutless fish are then placed in fish tubs with crushed ice layers, which stay in place until they are landed onshore (figure 9). While the freezer trawl duration varies between four to seven weeks, on freezer trawlers, once the fish is removed from the fishing gear, it is instantly filleted on board. Filleting depends on the size of the fish, smaller fish are generally processed into skinless fillets, whereas broken or damaged fish are processed into sausage, blocks, and individually quick-frozen fillets, (IQF). Bigger fish are processed into H&G, and some are cut into steaks. Finished products are packaged and kept in cold storage until landed onshore (Jones *et al.*, 2020).

Catches are landed in Walvis Bay and Lüderitz, Namibia's two harbours, where processing factories are located, with the former accounting for the majority of the activities. The catches are recorded and discharged straight into processing factories when the vessel returns from a fishing trip. At the end of every fishing trip, logbooks containing information such as projected catch volume for each species, catch coordinates, gear, and vessel name are signed off (Jones *et al.*, 2020).

Figure 9: Hake vessel offloading the H&G fish in tubs covered with ice (Haimbili, 2021)

2.3.7 Processing

The hake fishing industry is mainly structured around onshore processing facilities. It commands the highest number of onshore processing facilities in the entire Namibian fishing sector (Chiripanhura & Teweldemedhin, 2016). The hake processing firms are

located at the two Namibian coastal towns, namely Walvis Bay and Lüderitz, and have a total processing capacity of 1,200 tons per day. This means the subsector can process more than 400,000 tons hake quota onshore per year (MFMR, 2021). Given that the hake Total Allowable Catch has been set at 154,000 tons per season for the past four seasons, the sub-sector can catch and process nearly three times the TAC. It is clear when looking at the annual processing capacities of the factories in the hake fishery why joint ventures are so crucial.

Fish processing has been prioritized in efforts to develop the fishing sector (MFMR, 2007). This was facilitated by the development of joint ventures, particularly with Spanish firms, from advanced fishing sectors with international marketing connections. The Namibia Standards Institution (NSI) is in charge of overseeing and ensuring that the industry meets the minimal standards mandated by trade and export markets (NSI, 2005). Food safety is also ensured by a quality assurance technique known as Hazard Analysis Critical Control Point (HACCP) (FAO, 1994). This approach enables firms to locate and assess the likelihood of hazards involved with various phases of food production that could jeopardize the value chain. It also enables comprehensive fish product traceability and employs corrective steps in an event of contamination (MITSMED, 2013; Chiripanhura & Teweldemedhin, 2016; FAO 2015).

Processing is the second step in the hake value chain (figure 16). The processors, who are mostly large vertically integrated firms, are the direct actors at this stage. The indirect actors at this stage include labour unions, financial service providers, Namibian ports authority, Team Namibia, and other government institutions such as MFMR, MITSMED, and Namibia Standards Institution (NSI). Horizontal and vertical inter-firm linkages also exist at the processing stage (Hempel, 2010). Where horizontally, a few firms that exclusively specialize in catching establish contractual arrangements with processing firms to process and market their catch.

Over 60% of the firms are fully integrated, with cold storage and processing facilities on their premises. Upon landing, catches are stored in a cold store while, being sorted and weighed. Imported hake, primarily from South Africa, enters the value chain at this stage. The wet fish is then unloaded and size-graded before being dispatched to processing lines to be filleted, portioned, trimmed, skinned, shaped, coated, frozen, cooked, seasoned, packaged, and sent to cold storage (Figure 10). Some of the products processed onboard freezer vessels are transferred straight to cold storage, while others are repackaged and

processed further. Processing of hake takes place in larger quantities because of the scale efficiency. There may be competition among hake firms that produce frozen fillets as this is the main product in the value chain. There are very few firms that specialize in fresh products (PQ) implying low rivalry.

Traceability is extended to processing facilities, allowing for identification of the fishing vessel that delivered the product. This way processors ensure that product/raw material is obtained from a certified vessel in the fishery and keep the chain of custody intact.

Figure 10: Various processing of hake products and packaging. (Haimbili, 2021)

2.3.8 Value addition

On-shore value addition in the hake fishery is encouraged through the 70:30 wet split policy, which aims to sustain jobs and investment. This implies that 70% of the TAC is to be landed as wet for on-shone processing and 30% as freezer for off-shore processing (MFMR, 2018). The value-added product mix for hake is depicted in Figure 11. The wet fish is caught by longline and wet trawlers for onshore processing. The longline vessels land fresh prime quality hake, that is directly exported and fetches high prices. It also adds value through large crew numbers on vessels, due to the labour-intensive work of catching and handling the product. While the fish landed by wet trawlers is processed into various fresh, frozen retail and foodservice catering packs, aimed directly at consumers through major distributors. As for the hake landed by freezer trawlers, value addition takes place at sea, where fish is processed, packaged, and frozen onboard vessels. These and other products can be further processed and/or re-packed ashore to enhance the consistency and quality of the packing required for retail (MFMR, 2020). The hake by-products such as tongues, and roes have markets, however, other by-products such as heads, frames, backbones, fins, tails, and skin are used for fish meal (Erasmus *et al.*, 2020).

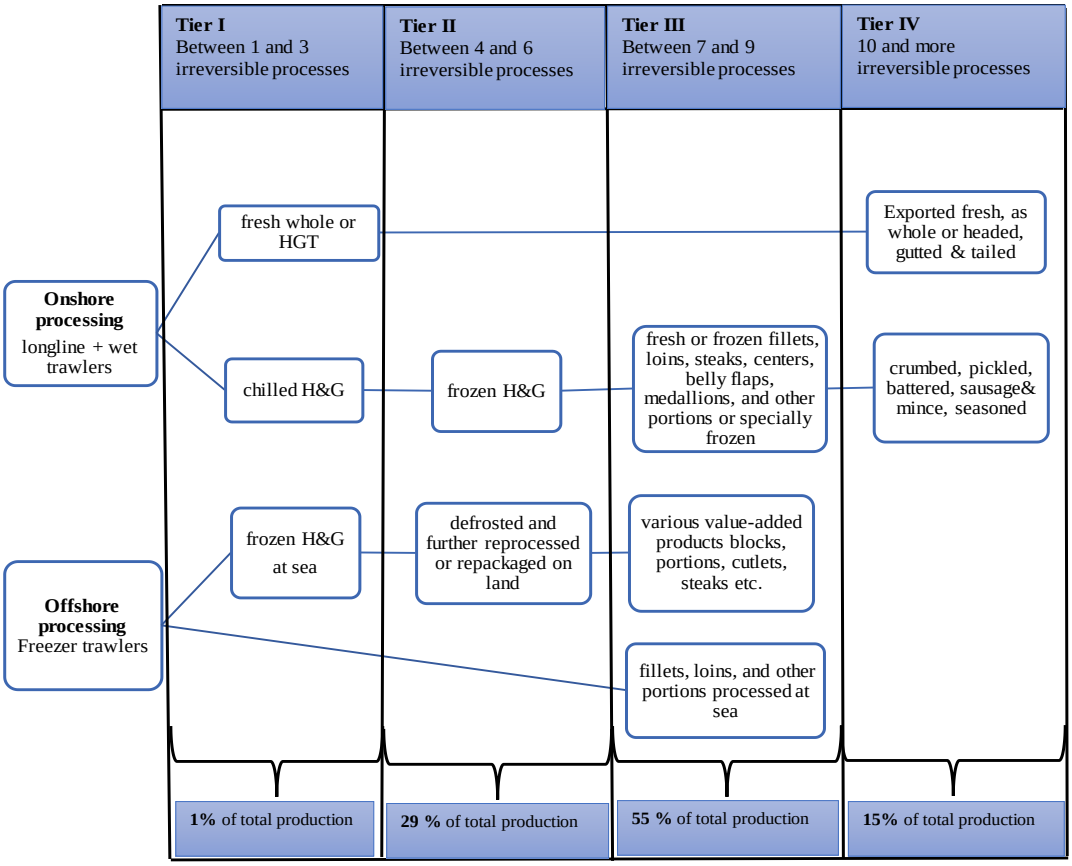

Figure 11: Hake Onshore and offshore products mix (MFMR, 2020)

Figure 11 also shows the classification of the hake value-added product mix for both offshore and onshore processing using a process-based method. Where each product type is analysed and categorized based on the number of irreversible processing steps, that the raw material has gone through before being deemed an end product (MITSMED, 2013). A fish is irreversibly changed when its head or tail is chopped off and cannot be returned to its original state. The hake product mix is categorized into four (I-IV) tiers using this method (figure 11). The different tiers I-IV indicates the number of irreversible processing steps that the various hake value-added products went through, as well as the share of the total production in each tier. The hake value-addition production for the 2018/19 fishing season is used to estimate the proportion of each tier. These tiers are not in any particular order or step in the production process: they are merely a set of possibilities. Tier I- includes all hake products that have gone through one to three irreversible processing steps, such as head, gutted, and tailed (H, G&T). This tier comprises very little value-added

product mix, less than 1% of the total value-added product mix. Tier II- includes all hake products that have gone through four to six irreversible processing steps, such as frozen hake (H, G &T). Products in this tier accounts for 29% of the total value-added mix. Tier III- includes all hake products that have gone through seven to nine irreversible processing steps, such as fillet, loin, steak, etc. This tier contains the majority of the hake value-added product mix, accounting for around 55%. Tier IV- includes all hake products that have gone through more than ten irreversible processing steps, such as sausage, crumbed, pickled, and other ready-to-eat meals. These products account for about 15% of the total value-added product mix (see figure 11) (MITSMED, 2013).

2.3.9 Sales and marketing

Namibian hake products are marketed both locally and internationally under some of the brands shown in figure 12. The Namibian brands are identifiable as they are associated with the Team Namibia brand, which aims to enhance consumption and promote excellent Namibian products and services both domestically and internationally (Team Namibia, 2003). Over 80% of hake products are exported, with Spain accounting for over 60% of hake processed products (Erasmus *et al*., 2020). This represents a risk in the sense that one has most of the eggs in one basket. More market diversification would be preferable, not only to reduce potential risk but also to provide incentives for value enhancement. However, given that the Spanish appreciate Namibian hake and have one of Europe's highest per capita fish consumption levels, this market should be targeted if optimal product prices can be obtained. The majority of hake products are sold to wholesalers, retailers, food catering services, and branded seafood firms (Hempel, 2010).

Furthermore, many hake firms are in partnerships or joint ventures with Spanish partners who have well-known existing brands and access to different distribution channels in Spain and throughout Europe. Hake products are marketed in Spain through these partnerships. When Namibian firms sell products directly to retailers or supermarkets, products are sold under Spanish brands because Namibian brands are not recognized. Also, Namibian firms selling under their brands are unable to fulfill the retailer's demands. This is because supermarkets often seek out suppliers with well-known brands that can fulfill their needs, and Namibian firms may not be capable of guaranteeing the required volumes. Hence to reach the required quantity, Spanish distributors obtain products from several sources other than Namibian (Chiripanhura & Teweldemedhin, 2016; MFMR, 2007). For

years, these obstacles have prevented the Namibian hake from gaining direct access and competing in European markets.

Figure 12: Some brands under which Namibian hake products are marketed (MFMR, 2019)

The above factors together with the demand for eco-label products prompted the hake industry to acquire in November 2020 one of the world's recognized seafood certifications, the Marine Stewardship Council (MSC). The MSC certification promotes ocean protection and safeguards the future supply of seafood. It is identified by a blue label which is preferred in many markets as it assures consumers that the fish product is sustainably sourced (MSC, 2020). This certification presents opportunities to reach markets that require eco-labelled products, diversifying the industry's markets (Jones et al., 2020).

Trade and distribution are the third step in the Namibian hake value chain (figure 16). At this stage, processors are still the direct actors. Indirect actors include the NSI, EU Standards, Team Namibia, and NFCPT. Hake products are distributed through wholesalers and retailers to reach consumers. Over 80% of hake products are exported to international markets, mostly Spain and South Africa, and less than 10% is consumed locally. Fresh products are transported by air, while frozen products are shipped in containers to destination markets, primarily in the EU. Locally, distribution to wholesalers and retailers are transported in cooler trucks via road, and the firms also fish shops situated on their premises. The industry has reliable support services such as net-making, stevedoring, packaging, logistics, cold storage, dry docking, and oil bunkering, which are all accessible to the port and do not require long travel. (MFMR, 2019).

Consumers

The fourth and final step in the Namibian hake value chain is the consumers. Only local consumption is known at this stage, as foreign importers of Namibian hake are not always the end consumers. Even though only about 10% of hake is consumed locally, Erasmus *et al*., (2021) found that hake is the most preferred fish in Namibia. The low consumption is due to its price and accessibility, although the NFCPT is striving to address these issues.

3 Theory

3.1 Value chain concepts and definitions

Over nearly three decades, the value chain concept has been employed as a valuable analytical framework for industries' decision-making and planning (Silva, 2011). The term "value chain" refers to the structure and coordination of the various participants in the chain, as well as their strategies and power dynamics. Value chain analysis can also reveal the challenges facing the industry, due to drivers of changes like market access or weak governance (Rosales *et al*., 2017). Hence, value chain analysis should consider the institutional structure of the participation sector.

The value chain concepts have evolved since Porter (1985) with vital advances on value chain governance. Porter (1985, p. 33), defined value chains as a "*systematic way of studying all of a firm's activities and how they connect is important for analysing the sources of competitive advantage*". Porter highlights that firms can gain a competitive edge by applying a strategy in performing major activities at a lower cost and higher quality than their competitors.

Kaplinsky & Morris (2000, p. 5) described value chain as "*the full range of activities which are required to bring a product or service from conception, through the various phases of production, delivery to final consumers, and final disposal after use*''. It is a method helpful in investigating a firm's competitive advantage sources. According to Kaplinsky and Morris (2000), the intention is to separate the firm's key strategic activities and gain a better understanding of how value is added in production. In studying the main components and applying the value chain notion to map operations, overall value chain earnings may be split into benefits gained by various value chain participants. This could aid in comprehending every value chain participant earnings (Thordarson, 2008). Value chains are commonly simplified for easy understanding, however, in reality, they can be rather complex. It is critical to keep the value chain paths as straightforward as possible (Kaplinsky and Morris, 2000).

The whole spectrum of interconnected value addition activities transforming raw material into finished products, thereby contributing to end result and ultimately obtaining a competitive advantage, in commercial fisheries are referred to as "fisheries value chains" (Silva, 2011). In addition, fisheries value chains include the overall activities of all actors from catching, processing, marketing until it reaches the final consumers, whether in local or international markets. These activities can be contained inside a single firm or

distributed across multiple firms (Gereffi and Fernandez-Stark, 2011). Fisheries value chain reveals the stream of products and raw material supplies, capital, and information showing the value of activities, the income, and costs made in an industry (Gestsson et al., 2010).

3.2 Value chain structures, activities, and key actors.

3.2.1 Porter's value chain framework

Porter (1985) claimed that looking at the company as a whole does not reveal the source of competitive advantage. Instead, the company's activities should be split apart to see which one has a competitive advantage (DFID, 2008). Porter urged that a firm's competitive advantage is derived from a variety of activities from designing, production, advertising, distribution, and servicing its product (Peterson, 2019). He classified these activities into two groups; primary and secondary activities and utilized the value chain notion to portray them (Figure13). Production processes are the core primary activities, which consist of five aspects of primary activities, all of which contribute toward generating value and gaining a competitive advantage. While secondary activities include things such as infrastructure, human resources, technology, research, raw material, and others that make basic production processes more efficient. It is important to note that these activities can vary per industry (Peterson, 2019). Each activity's strength, as well as its connection to all other activities, allows firms to assess how much value they create or maintain (Caribbean Natural Resource Institute (CANARI), 2021).

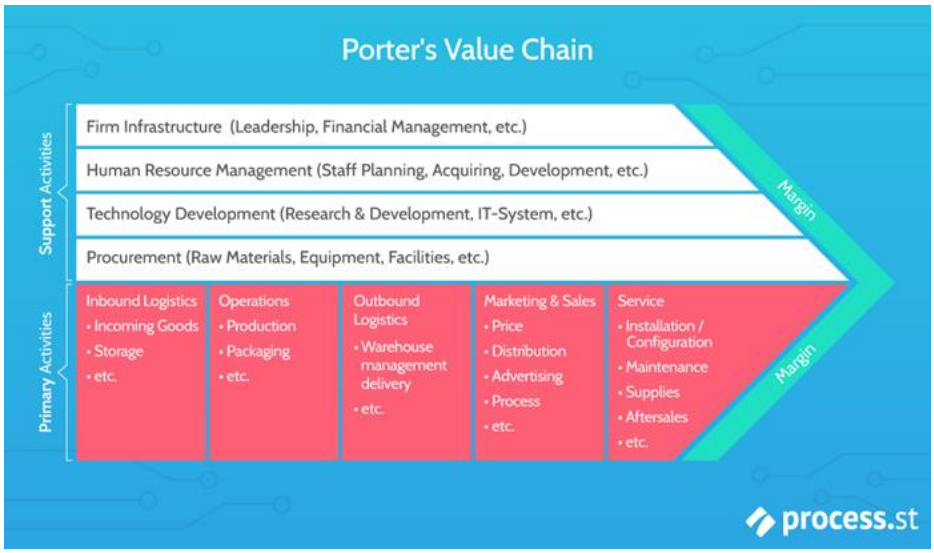

Figure 13: Porters Value Chain (Peterson, 2019)

3.2.2 Global value chains

Gereffi and Korzeniewicz, (1994) coined the phrase “global value chain” (GVC), which has since become a significant tool for analysis of product distribution and marketing. The increased integration of global markets through trade has created an advantage of outsourcing, which has resulted in international trade growth (Gereffi *et al.,* 2005). In a global context, GVC plays a significant role in global trade, they connect consumers and firms, and workers worldwide. Therefore, GVC presents possibilities for developing countries' firms, and consumers to incorporate themselves into the world economy, as this is essential for their economic development (Gereffi and Fernandez-Stark, 2011). GVC concentrates on the series of value addition activities in the industry, from conception to different stages of production and final use, giving a comprehensive approach to world industries, from both the bottom-up and top-down (Somasekharan *et al*., 2015).

3.2.3 Value chain actors

Value chain activities are reliant on cooperation and collaboration among the actors, no single actor can complete a chain. A typical value chain includes a raw material provider, who supplies to a processor who then produces products and distributes them to wholesalers/retailers who eventually deliver to consumers. However, depending on the complexity of the value chain, selling between producers or even between customers may be necessary (Thordarson, 2008). Value chains comprise downstream, and upstream activities and actors exist on both sides. Downstream actors are the raw material providers, who add value by reducing the cost of raw material through product standardization and homogeneity (Ssebisubi, 2010). Upstream actors, on the other hand, are near the final consumer and place greater focus on finding markets (Nguyen and Jolly, 2020).

3.3 Implications of vertically integrated value chains

A flexible value chain is quick to adapt and respond to the changes in consumer demand and preferences as long as the product quality remains. A consistent flow of raw materials and effective technology is essential to develop a flexible value chain. (Næss & Haneczko, 2013). Furthermore, global sustainable value chains actors are focused on more than just the optimum harvesting rate, but also consider traceability techniques to identify catches as well as their source, thereby safeguarding supply chains and maintaining sustainability. These value chains have a high level of vertical coordination, which Porter (1980) defined as "the combination of technologically distinct production, distribution, selling, and/or

other economic processes within the confines of a single firm" (Haneczko and Næss, 2013). This coordination permits information flow from consumers to producers, allowing products with the proper attributes to be delivered to the correct market (Knútsson, *et al.*, 2008; Knútsson et al. 2016; Haneczko and Næss 2013).

Authors like Knútsson et al., (2016) Knútsson *et al*., (2008); and Knútsson *et al*., (2010) explained how vertical integration has changed the Icelandic fishing industry value chain. They claim vertical integration has enabled actors to control all stages of the value chain. As a result of this control, the industry has become more concentrated, limiting the number of actors that control the value chain. The tight control of the value chain from catching to marketing allows for long-term planning and gives reliable knowledge regarding supply as well as an understanding of what, when, and where to catch. Furthermore, the interrelationships and information flow from consumers to producers create a market-driven chain that adapts to changes and thrives in coordination and cooperation, with a focus on sustainable partnerships and trust. Additional value has been created as a result of these relationships with global value chains. Likewise, the introduction of domestic wet fish auction markets has allowed for specialization, resulting in enhanced value addition, efficiency, and stability throughout the value chain. As a result, there has been a greater emphasis on producing fresh products rather than frozen, as well as an increase in value chain sales revenues. Significant technological investment has also aided this effort.

3.4 Value chain governance and relationships

Value chain governance as defined by Gereffi & Fernandez-Stark, (2011, p. 4) refers to "the authority and power relationships that govern the allocation and flow of financial, material, and human resources within a chain". Governance of the value chain is also described as the coordination and interaction among actors, characterized as "buyer-driven chains", which are larger firms that play pivotal roles in establishing dispersed manufacturing networks, usually labour-intensive and "producer-driven chains", are large firms, and play central roles in manufacturing networks and are vertically integrated (*Gereffi et al.,* 2005). Insight into a firm's chain governance is crucial for the development and entry into global chains. The notion of governance is crucial in fisheries, and it is linked to the value chain concept since value chains are largely dependent on the usage of natural resources (Rosales *et al*., 2017).

There are five types of governance models, defined by Gereffi *et al*., (2005), market, modular, captive, hierarchy, and relational (figure14). They are centred around the

following three variables; the intricacy of the knowledge among actors, capacity to codify and transmit information amongst actors, and competence level of actual and potential suppliers. Figure 14 depicts the various governance models outlined above, which are categorized according to their degree of "power asymmetry and explicit coordination." The smaller arrows reflect price-based trade, whereas the bigger arrows reflect greater information and control streams that are coordinated explicitly. The type of value chain governance model changes based on the firm's development and can be characterized by several and interacting models. Furthermore, numerous value chains have varied and intertwined governance arrangements, which influence the prospects and constraints for social and economic development (Jueseah *et al.*, 2020; Somasekharan *et al.*, 2015; Gereffi et al. 2005; Gereffi and Fernandez-Stark, 2011).

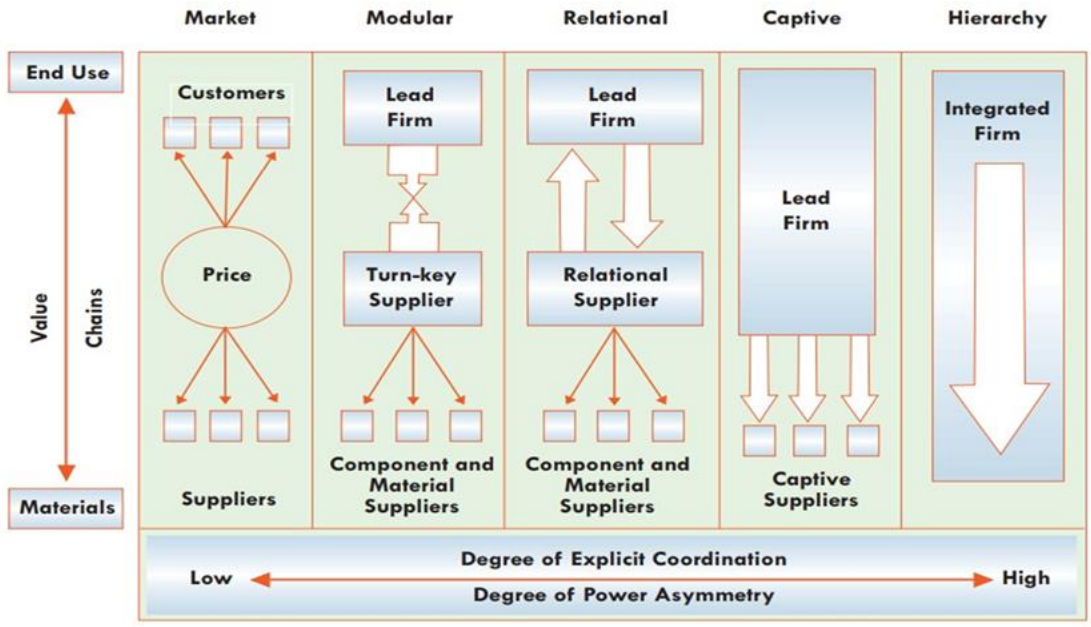

Figure 14: Types of governance models in the global value chain (Gary Gereffi et al., 2005)

- Market model- in this set up there is a modest amount of power asymmetry amongst consumers and producers, whereby no player has authority over others. The key governing tool is price instead of a dominant lead firm.
- Modular model- producers usually create products based on a client's requirements, which can be vague or comprehensive. When supplying turn-key services, producers assume full responsibility for process technical capabilities, utilize generic equipment to limit transaction-specific inputs, and make capital outlays on behalf of clients for components and materials. Due to the abundance

of information traveling over the inter-firm link, relations are much more significant. Easy connection or disconnection between customers and producers, allowing for more flexible networking arrangement. Both information exchange protocols and information technology are key functions.

- Relational model- there are intricate interactions between sellers and buyers in this setup, as a result, players become dependent on one another. Lead firms typically determine whatever is required, hence having authority over suppliers. Because establishing relationships requires time, switching partners can sometimes be challenging and expensive.
- Captive models- emerge when small producers rely on much bigger customers for transactional support. Producers are unable to change customers because switching costs are prohibitively high and lead firms maintain a high level of control and supervision.
- Hierarchy model- vertical integration characterizes the ultimate form of power, which is cantered with one main producer who actively controls and governs other players.

Firms make strategic decisions about the type of relationship they want to have with their customers and suppliers in effort to gain the most competitive advantage. According to Gummerson, (2002) cited in Thordarson, 2008 consumers, retailers, and suppliers cooperate as partners to optimize their mutual gains, commonly known as the "plus-sum game," which necessitates careful coordination among value chain participants Certain companies, on the other hand, may seek success at the expense of others and utilize their negotiating position to obtain significant benefits for themselves, resulting in a "zero-sum game" Gummerson, (2002) cited in Thordarson, 2008. It may be more appropriate to use the value chain to analyse a firm‘s competitive advantage rather than focusing on value addition of rival companies in the chain. Because value addition primarily focuses on procuring low-cost raw materials and selling them at greater prices, overlooking the significance of better margins resulting from consumer-supplier cooperation and collaborations. Additionally, value addition excludes activities that occur far upstream, prior to inputs reaching the processing plant, as well as activities that occur far downstream during the transportation route, resulting in a loss of potential cost savings at these phases of the value chain (Thordarson, 2008).

The term “value addition” can indicate many different things depending on whom you ask. Value addition is not just about chopping the fish, adding breadcrumbs, or packing fish into a retail pack. Value addition is about enhancing the product value with regard to the money paid for it (MFMR, 2007). Value addition can be delivering high-quality fresh fish to the market to get a better price. Not doing anything to the fish physically, but focusing on the environment surrounding it, such as packaging, temperature, logistics shipping, and organization to ensure that products arrive in excellent condition and fetch premium prices (Hempel, 2010). Knútsson et al. (2016) suggest that the processing technique used to cut fillets adds significant value, also the primary focus of value addition is ensuring freshness, and this is achieved when the correct fish attributes are applied.

Trust has consistently been considered one of the major drivers for effective partnerships in a strategic relationship among firms (Knutsson and Gestsson 2001; Thordarson 2008). One of the most damaging aspects of a company's relationships is a lack of trust. According to Knútsson et al., (2010) and Ssebisubi (2010) relationship trust in value chains can generate value that is shared across firms influencing the relationship effectiveness and long-term "plus-sum game". However, trust cannot be purchased or established only on formal contracts; it must be formed on strong principles such as a willingness to collaborate or cooperate. Power and how it is distributed are also essential factors in inter-firm collaboration, as they affect the level of trust (Thordarson, 2008).

4 Methodology

This chapter will go into the reasons for choosing the methodology, as well as how the firms were selected, and the approach taken.

4.1 Study area and sample size

There are 14 onshore/offshore processing firms' "operators'' in the hake industry, that control more than 90% of the hake quota and are in charge of all the harvesting, processing, and marketing activities (Erasmus et al., 2021). These firms are involved in the hake value chain activities and are located in the two main ports of Namibia, Walvis Bay (ten firms) on the central coast while Lüderitz (four firms) is in the south, the former being the main commercial port due to its strategic location. A total of 9 out of 14 (64%) hake onshore/offshore processing firms were surveyed using questionnaires for this study. The nine firms are all located in Walvis Bay and operate about 78% of the total hake quota allocated to right holders, (see table 11). Three firms (out of 14) did not respond to the survey as it was not mandatory. Two firms were unable to participate in the survey due to covid-19 limitations. As a result, the value chain study is limited to onshore/offshore hake processing firms that participated, all of which are located in Walvis Bay. The survey's willingness to participate is linked to Walvis Bay's convenient location, the country was on lockdown at the time, and movements between regions were restricted.

Table 11: The 14 hake processing firms, locations, and quota size

Processing Firms	***Location of operation***	***Hake Quota size MT***	
Firm 1	Walvis Bay	11500	
Firm 2	Walvis Bay	22300	
Firm 3	Walvis Bay	19000	
Firm 4	Walvis Bay	16700	78% of total hake
Firm 5	Walvis Bay	15200	quota allocated
Firm 6	Walvis Bay	3800	
Firm 7	Walvis Bay	1300	
Firm 8	Walvis Bay	15600	
Firm 9	Walvis Bay	4600	
Firm 10	Lüderitz	10200	
Firm 11	Lüderitz	11000	
Firm 12	Lüderitz	4000	
Firm 13	Walvis Bay	4500	
Firm 14	Lüderitz	1300	

4.2 Data collection

To achieve the objectives, the study used qualitative and quantitative research methodologies to collect primary and secondary data from the main hake value chain actors, the Namibian Ministry of Fisheries and Marine Resources, and literature. The survey tool was a semi-structured questionnaire derived from a Norwegian cod value chain study (Næss & Haneczko, 2013) and the EU's Horizon 2020 Research and Innovation Programme's FarFish project. The goal of the FarFish project is to improve the understanding and management of European Union fisheries beyond the European EEZ. The project helps strengthen European food security, promote long-term profitability, and create jobs by improving sustainable management, efficiency, and resilience in seafood value chains (FarFish, 2017). Prior to sending out the questionnaires, official letters were written to the hake firms, and phone calls were made to explain the study's goal, objectives, the type of information that would be collected, and to nominate a firm representative to participate in the survey. Following that, questionnaires were sent out via email, and personal factory visits were made to conceptualize the theory. Only six of the nine firms authorized visits, the rest declined due to covid-19 protocols. To supplement the analysis, secondary data was gathered from available literature of related studies, lectures, and publications.

4.3 Data analysis

Excel was used to analyse and code the data. The data was coded according to the questionnaire topics as well as the theoretical frameworks of Porter's (1985); Kaplinsky and Morris's (2000) and Gereffi *et al*., (2005) presented in the theory chapter. The coding process consisted of a variety of questionnaire topic areas, such as value chain structure and actors, value addition, marketing and sales, competitiveness, and governance, as well as fishery management. To better understand the marketing and trading structures in the hake value chain, actors, their activities, and trade and marketing arrangements were tracked and analysed using diagrams, graphs, and tables. The study looked at the relationships and bargaining power among the actors, product compositions, and the value-added focus area to help understand value-adding roles and governance. Furthermore, the hake management regime was explored to determine the influence of institutional mandates and regulatory frameworks on the value chain.

There may be varied perceptions in this kind of study, making it appear as a jumbled story, but when properly organized and analysed, it can provide a meaningful linkage that

accurately reflects how the industry operates. It should be noted, however, that the conclusions were confined to the perspectives of the represented actors due to the study's limited sample, which may be a misrepresentation of the full value chain.

4.4 Questionnaire outline

The questionnaire was semi-structured and included open-ended questions, (see appendix 1). It was divided into seven sections covering the following subjects: general information about the firm, value chain structure, sales and marketing, value addition, fishery policies and marketing system, support services, and competitiveness and governance. In the event that the questions were not clear, or the respondents were unsure how to respond, the questionnaire contained suggestions. The suggestions were developed by attempting to predict the responses to specific questions based on literature viewpoints on various subjects.

5 Results – thoughts of respondents

The opinions of the respondents are analysed according to the questionnaire layout which is provided in appendix 1. The layout consists of six themes, each with its own set of questions linked to the theme of the issue. Key themes of the analysis were established based on the information gathered in each section. The themes are examined in the following format, value chain structure, value addition, sales and marketing, competitiveness and governance, and fisheries policies and marketing system. Under each of the themes, specific questions will be indicated, and the responses analysed.

5.1 Responders‘ personal information

Question 1: Position and years of experience in the industry?

All respondents indicated that are in managerial positions in their firms and have years of experience in the sector ranging between 3.5 years to 30 years (Figure 15). This implies that they are well-versed in the operations.

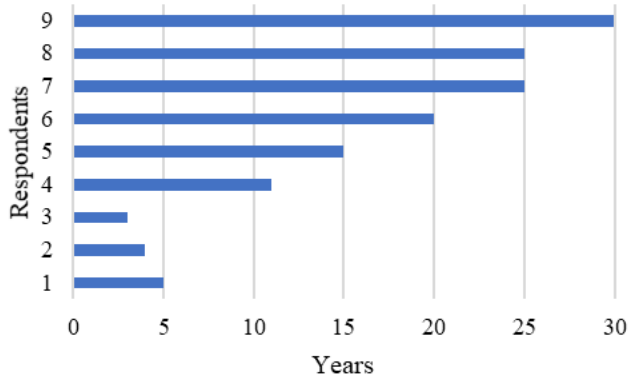

Figure 15: Respondents‘ years of experience in the fishery sector.

5.2 Operators in the hake fishery

Question 2: Describe the firm’s actors and activities at each stage, as well as the level of vertical integration?

The major actors, according to the respondents, are all the hake firms, including (workers, shareholders, and customers) involved in catching, processing, marketing, and distribution. Furthermore, they identified MFMR as their most important stakeholder because they are the custodian regulator and raw material provider. Stevedoring, logistics, maintenance, financial institutions, and fuel suppliers are among the other stakeholders identified.

Approximately 78% (7 firms) of the hake respondents indicated that their firms are involved in the harvesting, processing, and marketing of their products. About 11% (1 firm) is exclusively involved in the processing and marketing part of the value chain, while the remaining 11% (1 firm) is only involved in the harvesting. The respondents of firms that cover the full value chain indicated that they are vertically integrated, and have complete control over the catching, processing, packaging, and export of goods. While the respondents of firms involved in the processing and marketing parts of the value chain indicated that they lease vessels to catch and land their quota. The respondents of firms only involved in the harvesting indicated that they enter into processing and marketing agreements with factory operators. Although some firms in the hake industry may not specialize in the full value chain, their activities are linked as a result of the catching and processing agreements, therefore, they are nonetheless considered vertically integrated.

Figure16 illustrates the hake value chain and activities as described by the respondents. The hake value chain nodes include harvest/fisherman - processor - distributor - consumers. The Namibian hake value chain ends when products are exported to wholesalers/retailers who sell to final consumers.

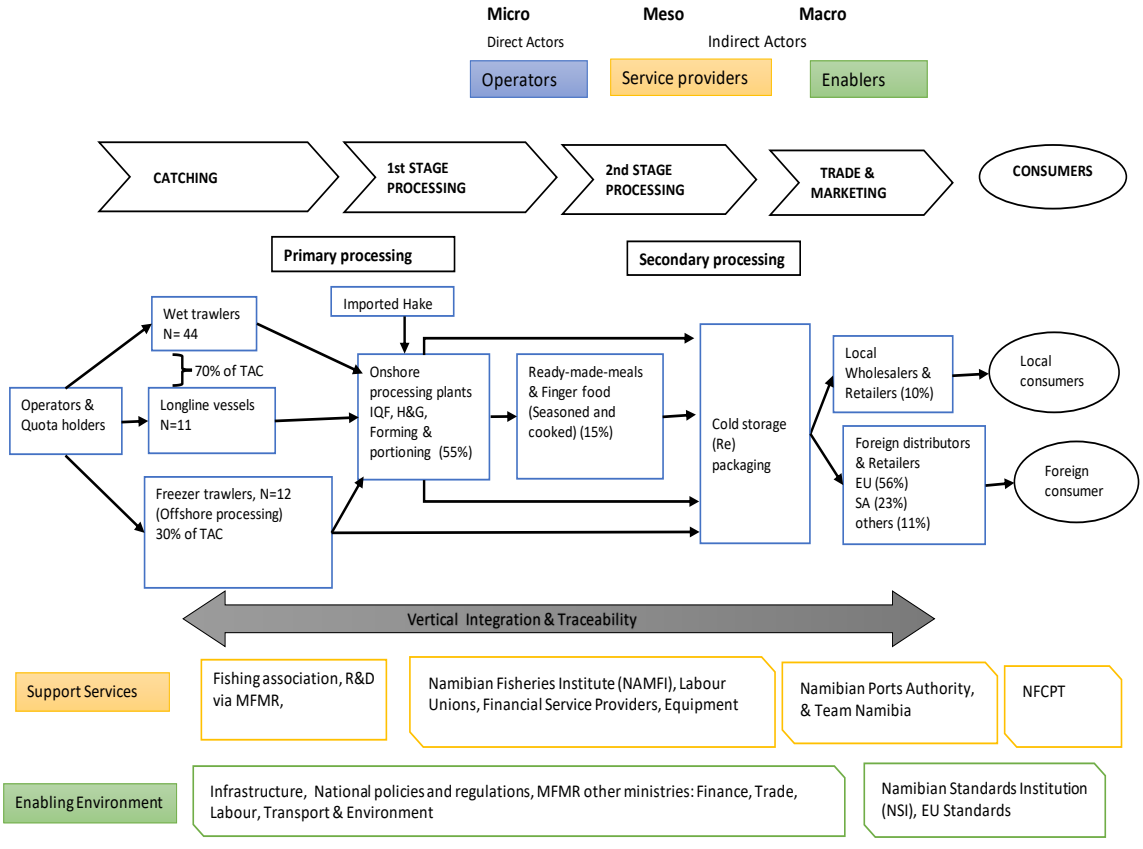

Figure 16: A typical Namibian hake value chain.

Trade and Marketing

Trade and distribution is the third step in the Namibian hake value chain. At this stage, processors are still the direct actors. Indirect actors include the NSI, EU Standards, Team Namibia, and NFCPT. Hake products are distributed through wholesalers and retailers to reach consumers. Over 80% of hake products are exported to international markets, mostly Spain and South Africa, and less than 10% is consumed locally. Fresh products are transported by air, while frozen products are shipped in containers to destination markets, primarily in the EU. Locally, distribution to wholesalers and retailers are transported in cooler trucks via road, and the firms also fish shops situated on their premises. The industry has reliable support services such as net-making, stevedoring, packaging, logistics, cold storage, dry docking, and oil bunkering, which are all accessible to the port and do not require long travel. (MFMR, 2019).

Consumers

The fourth and final step in the Namibian hake value chain is the consumers. Only local consumption is known at this stage, as foreign importers of Namibian hake are not always the end consumers. Even though only about 10% of hake is consumed locally, Erasmus *et al*., (2021) found that hake is the most preferred fish in Namibia. The low consumption is due to its price and accessibility, although the NFCPT is striving to address these issues.

5.3 Value chain structure

Question 3: How do actors cooperate, and are any of the products further processed elsewhere?

Respondents noted that firms cooperate at all levels of the value chain, examples of different areas of cooperation are highlighted below;

- Input production- firms with excess capacity can purchase fresh or frozen raw material from other firms. Also, firms cooperate with others when experiencing vessel breakdowns to catch on their behalf.
- Processing- when a firm is experiencing cold storage breakdown, they liaise with other firms to obtain ice or store their products.
- Transport- firms liaise with third-party contractors, road, air, and sea.
- Marketing- often firms cooperate to develop markets and attain the required volumes.

More than half of those polled said that exported products are sometimes re-processed or re-packaged at locations closer to their final destination. The type of further processing taking place is mainly the high-end retail products such as freshly cooked ready-to-eat meals. Many of the firms that have their products processed elsewhere have expressed interest in processing them in Namibia, albeit this would entail a considerable investment in processing infrastructure. Because these high-end retail products are subject to stringent requirements that the firms currently do not meet. Other firms responded that their products are not further processed since they process according to the specifications and needs of their retail customers.

Respondents were asked to rate how capable the hake value chain is at adjusting to changes, as shown in figure 17, with 1 suggesting incompetence and 5 indicating exceptional competence. About five of the respondents claimed extremely capable because their quality control personnel are quick to respond to flaws and implement the corrective procedures in place. They also claimed that having good contact with their partners and markets allows them to respond to change efficiently.

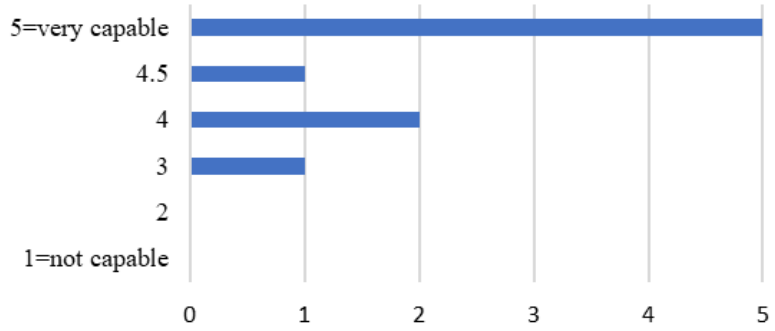

Figure 17: The capability of the hake value chain response to change.

5.4 Sales and marketing

Question 4: How is marketing organized, and to which countries and trade industries do you sell?

The majority of the respondents stated that the firms have in-house marketing expertise and have strategically established marketing associates and subsidiaries abroad, to gain easy access to target markets. These marketing associates and subsidiaries are located in Spain, Germany, and South Africa. Furthermore, they indicated that most exported hake products are marketed under foreign brands.

As illustrated in figure 18, all firm respondents indicated Europe as the primary market for hake products, followed by South Africa and Australia. The specific countries in Europe include Spain, Italy, Germany, Holland, Portugal, France, and the Netherlands.

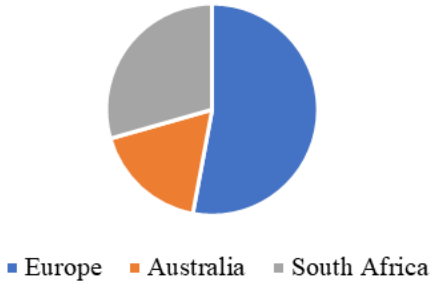

Figure 18: The main markets of hake products.

According to respondents, the majority of their products are sold to distributors, retailers, restaurants, and processors, who then disseminate them across Europe (figure19). The common end buyers of hake products include catering, hotels, supermarkets, restaurants, schools, hospitals, and households.

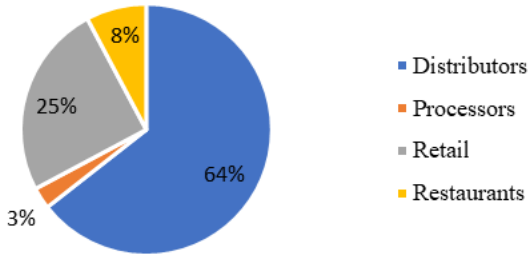

Figure 19: *The type of industry where hake products are exported to.*

Question 5: What are the biggest changes experienced in product marketing in the last 5-7 years?

According to the respondents, firms have witnessed positive and negative changes in the marketing of their products over time as a result of Covid-19 and quota reductions. Due to Covid-19 laws and restrictions, firms saw a change in market share from hotel, restaurant, and catering to more retail-oriented clients. As a result of the quota reductions, firms are more focused on increasing value addition and product quality. Some firms are also working to expand the global market for hake products. Respondents also noted that

the quota restriction hinders marketing because a good value chain requires a steady supply to gain access to markets. Others have pointed out that present markets are still not saturated due to limited quotas, thus there is no need to look for new ones.

Question 6: Are there any new methods introduced regarding marketing?

Respondents highlighted that firms introduced marketing strategies of packaging directly into European supermarket brands, which is assisting in the expansion of the hake product share in international retail sectors. According to the respondents‘ marketing information is now the determining factor in their daily operations, as clients inform production. This is made feasible, they said, by vertical coordination, which allows data to flow from consumers to producers along the value chain.

Question 7: How important is marketing information to the value chain?

The importance of marketing information in a value chain was acknowledged by most firm respondents: ‘‘*It is only after one has figured out how to promote a product, that you can plan to meet the demand. Markets cannot be coerced to accept products; instead, find out what the market wants and then mold products to match those needs. Only by comprehending the market can you attain informed production, processing, and planning*’’.

One firm respondent said, “*we do not have a marketing brand, hence we do not focus on marketing*”. These firms are not market-driven, because they do not have their own marketing brands hence, they are not involved in the marketing of the products. Instead, they focus and rely on the feedback from their associates and subsidiaries that does the marketing.

Question 8: Regarding your products, what factors are the most important to price variation?

Respondents were asked to rate (1= less important and 5= very important) from the list of factors, the most important factor to price variation of their products. The factors to be considered included season, quota size, quality of product, supply from other countries, demand for fish, overall uncertainty, and any other factors not stated. According to the respondents, the most important factors in determining the price of hake products are the demand for fish and the product's quality (Figure 20). An additional factor identified was the exchange rate.

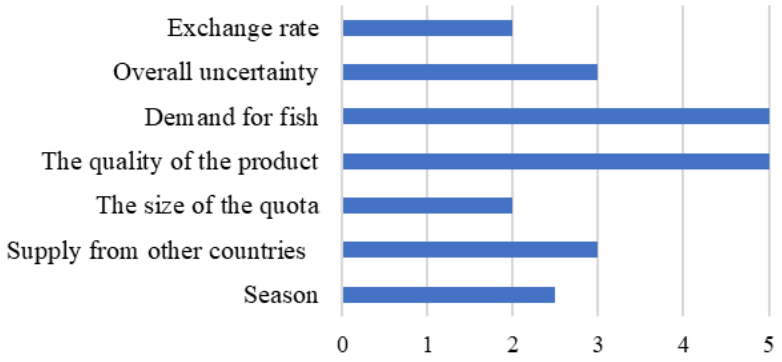

Figure 20: Important factors to the price variation of hake products.

5.5 Value addition

Question 9: What changes occurred in production and value-addition in the last 5-7 years?

Respondents noted that there have been various developments in the production and value addition of hake products. They indicated that firms focus more on generating high-value and retail products, which requires efficient use of raw material and use of better technology. The growing demand for high-quality products has led to the development of new processing methods as well as an increase in labor and production costs. Some firms stated that they resorted to 100% hand filleting to reduce raw material loss, resulting in decreased efficiency but a higher yield.

Question 10: What is the company's main products composition?

All respondents indicated that their firms; primary products are frozen products (fillets, portions, lions, etc.). Three firms also stated that fresh products are a part of their product mix (H&G and fillets).

Question 11: Focus areas of the company to increase the value-added (profit) in the last 5-7 years?

The respondents were asked to indicate areas where the firms target their efforts to boost value-added profits. Figure 21 shows a list of target areas, and all of the respondents claimed that their firms have been working hard to improve and increase product quality. Other target areas identified by the majority of the firms include investments in production facilities, investments in manufacturing processes, increasing revenue, and lowering cost as well as the usage of labour and raw materials per hour (see figure 21). According to the

respondents, firms increase revenue by adding value, and they can produce high-quality products by investing in more efficient processing equipment and using a competent workforce that is trained on a variety of product specifications. Outsourcing raw materials ensure that the firms have continuous throughput and can meet consumer demand.

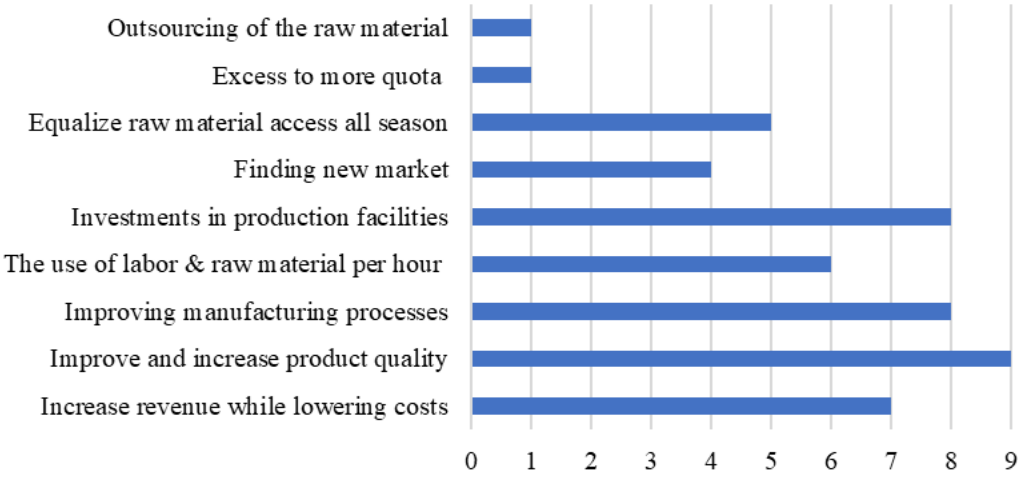

Figure 21: Firms' priority areas in increasing value-added profit.

Question 12: What influence has fisheries policy had on value addition?

According to the respondent's government policies as well the rise in demand for high-quality products led firms to focus on value addition.

One firm respondent remarked, "*The only way to be competitive and increase profits with finite raw material is to maximize value addition. Furthermore, the covid19 pandemic has taught us to be vigilant innovative and at the forefront of our product marketing.*"

Another stated, "*Our company's goal is to be internationally competitive, while still being socially responsible. We believe that by adding value to our products, we can make them more competitive in our markets*."

Government policies, according to the firms, aided in increasing value addition by encouraging the fishing industry to focus on value addition before exporting. The management system in place ensures the sustainability of the resource, which is critical to the entire value chain. As a result, the hake industry obtained the Marine Stewardship Council Certification, which has opened up many doors in international retail markets. Policy adherence leads to industrialization, which means more jobs, investments, and education are created because everything is value-added locally, bringing in more foreign revenues and eventually economic prosperity to the country.

5.6 Fisheries policies and marketing system

Question 13: Did fisheries policies have any effects on the development of the firms' value chain in the last 5-7 years?

The respondents responded that having value addition as one of the criteria of the MFMR scoring method for allocating fishing rights and quotas had improved their firm value chains. The scorecard system determines how much quota each right holder receives each season based on whether or not they match the scorecard criteria. As a result, right holders with good scorecards are more likely to receive an additional quota or an extension of the fishing right term. The following are some other fisheries policies that firms believe aided the growth of their value chains:

- *The Namibianisation policy*- Many previously foreign-owned firms became Namibian as a result of this legislation, resulting in increased job opportunities and higher income benefits.
- *The 70:30 policy*- Namibia has become a fishery processing country as a result of this policy, as it emphasizes processing at home. Initially, the hake value chain consisted primarily of catching, freezing, and exporting fish. It has also contributed to the expansion of the sector's workforce as well as the adoption of technology, resulting in increased processing efficiency.
- *October Closure*- As a result, productivity increased, and the long-term viability of hake resources is improving.
- *Exclusive Economic Zone (200 nautical miles)*- Foreign vessels severely destroyed Namibian fish stocks before the formation of the 200-mile EEZ. However, after the EEZ was formed in 1990, no unlicensed vessels were allowed to fish in the area, and fish stocks began to recover slowly. This is reflected in the industry's annual catch per unit effort.
- *Industrial Development*- Government creates a viable economic environment for the industry to expand in all socio-economic areas.
- *The Marine Stewardship Council Certification*- prompted the firms to improve their fishing techniques to safeguard endangered species, fish stocks, and marine life. As a result, the industry can compete in global markets and offer high-quality products for the best prices.
- *Illegal Unregulated and Unreported (IUU) Compliance Control* - the national satellite-based Vessel Monitoring System (VMS) and fisheries patrol, monitor

all illicit fishing activities and hazardous actions, both inside and beyond the EEZ. In addition, fishing licenses specify the fishing gear that vessels are permitted to use. Vessels are boarded at sea to ensure that the correct equipment and limitations are in place, all of which are critical to the value chain's operation.

A firm respondent also highlighted that "*the system has created uncertainty around resource access, with the new fishing rights entrants, in 2020 and it has contributed to the non-transparent manner in which fishing rights have been awarded.*"

Question 14: How can the fisheries policies be improved or changed to aid the value chain?

Existing fisheries policies, according to respondents, can improve value chain competitiveness by allocating the full quota to right holders at the beginning of the season, as segmented quota allocations hinder production planning and product marketing. Furthermore, the rights allocation policy should consider all the applicants who participate in the industry, as allocating quota to right holders without catching or processing capacity does not enhance industry profitability.

Question 15: Is the fisheries management system supporting or hindering the effectiveness of your company?

Respondents were asked to identify which aspects of the fisheries management system are supporting or hindering the effectiveness of the industry. The features of fisheries management that were provided were transferability of rights or quotas, landing fees, gear restrictions, and any other that is not listed. According to more than half of respondents' quota non-transferability is a barrier to the industry, as smaller firms sell their quotas at non-market related prices, making it difficult for larger firms to obtain extra quota to keep their vessels and factories operational. In addition, the majority of respondents identified landing fees and gear restrictions as aspects supporting the industry's effectiveness, (see figure 22).

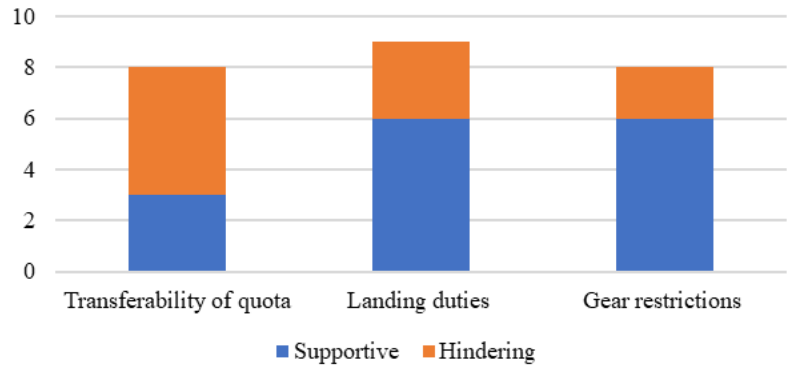

Figure 22: Aspects of fisheries management supporting or hindering the hake industry effectiveness.

5.7 Competitiveness and governance of the value chain

Question 16: How competitive is the value chain in comparison to other local and international competitors?

The firm respondents believe that the hake value chain is competitive in terms of the quality and prices of hake products. Some respondents highlighted that there is not much competition in the specialized product development that they focus on, therefore, they try to maximize the value that hake can generate on a global scale.

When asked who their competitors are, the respondents said anyone that produces and sells white fish products both locally and internationally. Other competitors include the meat and poultry industries, which produce and sell substitute protein products.

Respondents were asked about the main difference between their competitors. "*There is not much difference between us and our competitors",* one respondent said*, "However, firms with partners abroad may have a stronger advantage because they can sell their products with a transfer price to their mother nations, and that's where the real profits are made.*"

Other respondents said, "*the quota volume, processing technology, and efficiency is often the difference between us and our competitors.*"

The respondents were asked to rate the competitiveness among the major suppliers, on a scale of one to five, one indicating highly ineffective competition and five indicating highly effective competition. Figure 23 shows how respondents ranked the competitiveness of the major hake suppliers' competitiveness. The majority of respondents

gave the suppliers a score ranging from three to one in terms of competitiveness, implying that they are effective to ineffective.

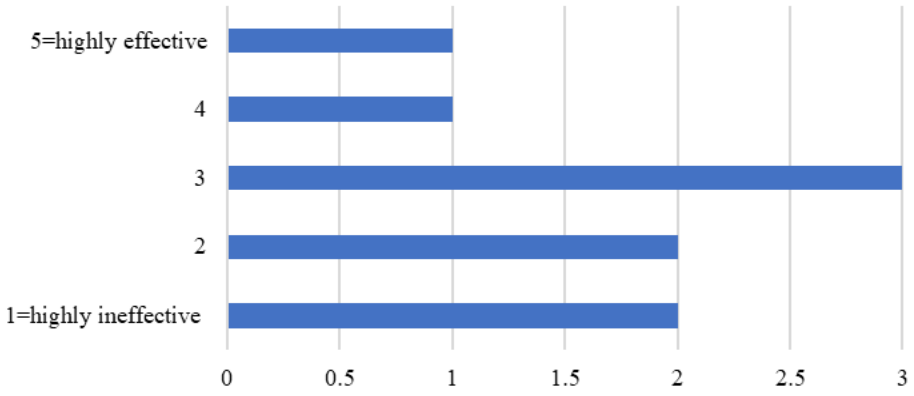

Figure 23: Competitiveness among hake suppliers.

Question 17: Are there leading firms in the value chain?

More than half of the firms polled agreed that there are leading companies in the value chain. Due to varying levels of vertical integration among actors, firms with a marketing presence or engaged in more than one component of the chain are in the lead. Furthermore, firms that use the most up-to-date technologies are more efficient and hence lead. Also, in terms of quota volume, certain companies receive more than others, allowing them to add more value and access to more markets.

Question 18: How is the distribution of power in the value chain?

Some respondents indicated that there is a balance of power between suppliers and buyers because they are in control of their chain. Some argue that there is an extreme imbalance of power between larger and smaller firms. Others say that quota holders (suppliers) have more power as they have the access to the raw materials (inputs). Many have stated that consumers have a great deal of power since they determine what should be produced.

When asked how these power relations occurred, respondents said it was due to a better understanding of global markets and supply and demand. These power dynamics have also been established by firms' access to jetty space, financing, and international ownership of local firms. Others claim that due to their extra production capacity, quota holders receive massive demands from non-quota holding processors.

6 Discussion

The findings of this study suggest that government policies and institutional mandates have influenced the hake value chain to some extent. While it appears that government policies promote industry value addition, the analysis suggests that they have also created resource access uncertainty. The analysis identifies the rights and quota allocations as well as the 70/30 wet split as government policies that impede the value chain's effectiveness. Government policies such as October closure, EEZ, MSC certification, and Industrial development, were also identified as contributing to the value chain's progress. The analysis also indicates that the hake value chain may have a competitive advantage in terms of its quality and pricing. This is mainly the case for the firms with subsidiaries or partners in other countries, as they commonly sell products at transfer rates to their parent companies. In addition, firms with higher quota volumes, processing technologies, and efficiency also have a competitive advantage. The balance and imbalance of power among value chain actors is assumed to be influenced by capital availability, international ownership of local firms, quota volumes, cutting-edge technologies, and marketing experience.

Hake value chain operators and structure

The hake horizontal and vertical inter-firm linkages allow new or smaller firms that have a lesser share of the total quota and limited operational capacity to pool resources together with the larger established through joint ventures and agreements firms. Although there are 180 hake fishing rights, that are grouped into 64 quota holders, joint ventures and agreements have consolidated these into about 14 active vertically integrated operators (MFMR,2021). These integration arrangements give firms more price power and allow them to gain economies of scale as well as strengthen oligopolistic connections with local suppliers. Thordarson (2008); Knútsson *et al*., (2010), and Ssebisubi (2010) noted the importance of such relationships and cooperation among value chain actors. Implying that the strategic horizontal and vertical inter-firm linkages can aid the firms in attaining "plus-sum gains" when the interests of firms are mutual (Thordarson, 2008). However, they can result in the opposite "zero-sum gain" when one firm pursues its interests at the expense of others.

Vertical integration, on the other hand, tends to hold smaller firms at the bottom of the value chain. As pointed by Nielsen and Hara, (2006) that fully integrated firms often make it difficult for new firms to thrive, hence the majority of them are compelled to form joint

ventures and agreements. This is because smaller firms or new entrants‘ quotas are often too small to afford investments in processing operations. These arrangements also influence the power imbalances between larger and smaller firms, whereby larger firms retain higher profits (Kirchner and Leiman, 2014). These are just some of the highlight difficulties that new or small firms confront when attempting to break into these vertically firm structures.

Given the vertical integration setup of the hake industry, information flow can be guaranteed throughout the value chain. Modern technology is used in the industry to a certain degree, which ensures traceability and aids in maintaining a cold chain from harvesting to retailing, as detailed in the various stages of the value chain (Figure 16). Due to the need to create jobs, the industry has made limited investments in high-tech processing equipment (such as water-jet cutters) and relies heavily on manpower to execute various processing tasks. Although it affects overall efficiency, operators prefer it, particularly manual filleting, because it yields more than the present filleting technology. Namibia has good logistical abilities, involving cautious handling at sea and in onshore processing plants, efficient roadways, and air and sea freight delivery. This logistical capability allows for the delivery of products with the right attributes that demand competitive prices in target markets (MFMR, 2007).

Furthermore, Draper (2015) and Kirchner & Leiman (2014), claim that these arrangements have turned the hake IQs into de facto ITQs because quotas are transferred indirectly through these joint ventures and agreements. The hake IQs become more like an ITQs, but with less positive efficiency effects. This is because the industry uses an average of 67 vessels and has a processing capacity of almost 400,000 tonnes to land and process an average hake TAC of 154, 000 tonnes, indicating a nearly three-fold excess capacity. In addition, new quota holders, who do not participate in operations can now profit without lifting a finger, just by leasing their quota, through these joint ventures and agreements. According to Arnason (2008) and Knútsson, *et al*., (2016), IQs tend to retain industry overcapacity and inefficiency whereas ITQs generally prioritize economic efficiency, over environmental stewardship, or equity (Sumaila, 2010). However, ITQs are unlikely to provide a guarantee of sustainable management if quota holders are not the one‘s fishing. This is because the ITQ owners' incentive for sustainable management is not necessarily shared by the fishermen, as they will not reap all of the benefits of sustainable management (Sumaila, 2010).

Value addition, sales, and marketing

The value-adding functions, trade, and marketing structures in the hake value chain are discussed in this section. When compared to other Namibian fisheries subsectors, the hake subsector comes on top in terms of adding value, resulting in higher quality fish products and more jobs. However, if the hake industry wants to add more value, it could consider moving up to the four processing tiers (figure 9). These tiers classify the processing processes of hake value-added products, from the most basic products in tier I, to the most processed products in tier IV. The products in tier I are what would be expected from an industry focused solely on exporting raw materials. Based on the analysis, the majority of the hake value-added products are in tiers II and III, accounting for about 29% and 55%, respectively. Tier II products include frozen H&G and whole round, whilst tier III products include fresh or frozen fillets, loins, stakes, and other portions (figure 9). So, if the hake industry wants to increase value addition it should move towards tier IV, which mainly consists of ready-to-eat meals. Chiripanhura and Teweldemedhin, (2016) highlighted that the hake industry has significant value-adding potential, notably in the secondary manufacture of ready-to-eat meals, but little effort has been made in this direction. The majority of ready-to-eat meals consumed in Namibia are sourced from South Africa.

Tier IV products, on the other hand, are typically processed closer to markets, which may be difficult given Namibia's distance from its markets. Though Namibian firms may have formed partnerships and joint ventures with Spanish firms to reach tier IV, the value-added gains do not benefit Namibia; instead, they benefit the Spanish. This is because price reductions in agricultural products value chains are more significant at the supplier level than at the retail level (EUMOFA, 2015). This could explain why Namibia is still not benefiting from the actual value addition. Therefore, achieving tier IV value addition may necessitate Namibian firms establishing processing facilities in Spain to process these products closer to their consumers.

Nonetheless, upgrading from tier III to IV (figure 9) may not be feasible due to constraints such as costs involved or market availability. For example, international exports of secondary processed food should adhere to stringent EU sanitary standards and regulations, which many smaller firms cannot meet or afford. As a result, firms focus on producing commodity products, that are vulnerable to price volatility as a result of global market forces (Chiripanhura and Teweldemedhin, 2016; MFMR, 2007). Today's seafood value chains are market-driven, and not product-driven, and real profits are made in

product development and marketing (MFMR, 2007). Therefore, hake value addition is confronted by various challenges both internal and external. Locally value-added hake products are more expensive as compared to the unprocessed fish, hence demand is likely to be minimal (Erasmus *et al*., 2021). The hake industry is also faced with the challenge of being unable to effectively participate in the international marketing of its products. This is because many of the Namibian hake products are marketed under the brands of international (European) firms and building a Namibian brand could lead to a loss of market share in that area. Therefore, many exported hake products are tailored to the specifications of their already existing markets, leaving firms with little motivation to try out new value-added products.

The hake MSC certification can help address some of these challenges and help increase value addition while also strengthening the overall value chain. Learning from the South African hake experience, which has a similar species and operating setup and was MSC certified in 2004. Lallemand *et al*., (2016) indicate that market diversification of South African hake products was only possible after the certification. Furthermore, the MSC certification is linked to greater quality, competitive advantage as well as premium price. The MSC can demand a price premium and competitive advantage for Namibian hake because it is South Africa's major competitor in South European markets, where Namibia already has the largest market share (Lallemand *et al*., 2016).

Furthermore, increasing value addition to tier IV (Figure 9) may affect the government job creation efforts. Value-added activities in tier II and III are labour-intensive, upgrading to tier IV as well as an increasing value addition from a limited stock may mean increased mechanization and automation, which will then reduce the demand for labour. Given the stock's limited supply, making the most of the landed catch in terms of processing and utilization is critical. However, the hake industry has resorted to labour because it is cheap, and if it needs to go a step further, it may resort to mechanization. As a result, the government faces a dilemma because its goals are to maintain or increase employment while also increasing value addition. As a result, the optimal point would most likely lie somewhere between tiers I and III (Figure 9), but it may lack the value addition required.

Fisheries policies

The impact of the regulatory framework on the hake value chain is discussed in this section. Even though the hake 70/30 quota split policy has boosted employment, improved value-addition, and increased investments, the analysis indicates that it has resulted in an

overcapitalization problem in the subsector. According to Chiripanhura & Teweldemedhin (2016) and Paterson *et al*., (2013), pushing the industry to invest in value addition capacity has created excess capacity, which is utilized to advocate for larger quotas and TACs, putting the hake stock sustainability in jeopardy. Kirchner and Leiman (2014) also pointed out that the hake fishery gives quota incentives to right holders who make greater investments and more value addition, posing a risk to the stock's long-term viability and company profits. The hake stock is estimated to be below MSY, meaning that the stock is insufficient to support increased TACs and quotas. So, if fishing from a stock that has not fully recovered or possibly overexploited persist, the stock will decline further, severely affecting the value chain.

The terms and conditions of fishing rights underline the need for right holders to invest in vessels and processing facilities (Table 9). Currently, the hake industry has 180 fishing rights, uses an average of 67 vessels, and has almost three times excess processing capacity, implying overinvestment. With such a large number of right holders with a set investment requirement and evidence of overinvestment, acquisition of shares in vessels or processing facilities and joint ventures, as well as agreements, will be the outcome. These features suggest that no new investments are taking place in the industry. For example, when a new right holder acquires shares in a larger firm's vessel or processing plant, the revenue generated is merely increased profit for them. Another example is that, because new or smaller firms do not have much money, larger firms with vessels or processing plants would allow them to buy shares in exchange for quota for a defined period, resulting in increased revenue for the larger firms.

The system is designed to ensure long-term sustainability and to improve the value chain for increased socio-economic advantages. However, some incentives based on the analysis created uncertainty over resource accessibility. To begin with, the number of hake fishing rights has expanded dramatically from 38 in 2004 to around 180 in 2020 (Table 10). The increment of the fishing rights is driven by the Namibianisation policy, which aims for broader participation and empowerment of Namibians (MFMR, 2004). Yet, it is incomprehensible that the number of fishing rights keeps increasing while the TACs are decreasing (Figure 8) and doing little to generate new investments or employment in the industry. Taking from the earnings of right holders who invest in processing or harvesting dilutes their profits and boosts the profits of new right holders who don't participate but instead lease out their quotas, which does not promote anything. None of these are being

promoted sustainability, employment, value addition, Namibianisation, and investment. Kirchner and Leiman (2014) explain that each new right holder added weakens the property rights of others and reduces the motivation to fish responsibly. When the resource is not exploited sensibly, it can have negative consequences for the entire value chain. According to Haneczko and Næss (2013), value chains require a continuous flow of raw materials, which can be maintained by ensuring resource sustainability. In terms of price transfers, the excessive number of right holders may ensure that more of the resource rent is retained in Namibia. Although not the most efficient way, it does work to a certain extent.

Competitive advantage and GVC in the context of the hake value chain

Porter (1985) and Kaplinsky and Morris (2000) emphasize that a firm's competitive advantage may come from a single activity. This stands to reason because fish competitiveness is determined by supply reliability, quality, and price (Hempel, 2010). The significance of the mentioned characteristics varies based on the target market. Like in the Namibian hake value chain, price is the most significant consideration in the domestic market, while quality and supply consistency are vital in export markets. The Namibian hake value chain is similar in that its competitive advantage is tightly linked to the fish stock abundance its long-term management, which will ensure that value chain actors have constant access to raw material (MITSMED, 2013). The Namibian hake may have a competitive advantage in terms of quality because it is already well-known on international markets, implying that it is participating in GVC, albeit under foreign brands. The Namibian ports from which the wet vessels operate are relatively located near the fishing grounds, assuring efficiency and productivity at the harvesting level. Hake products also compete well in export markets in terms of price and quality (table 4 and 5) (Chiripanhura &Teweldemedhin 2016; Lallemand et al., 2016).

Governance and Relationships in context of the hake value chain

The research question on the governance of the hake value chain actors is discussed in this section. In both local and international markets, hake is distributed to customers via two major channels: wholesalers and retailers (Figure 14). Frozen hake dominates in both these channels (wholesale and retail). Furthermore, the analysis indicates that imported hake is primarily used for domestic channels, whilst local hake is largely used for international channels. The hake value chain coordination with the foreign distribution channels is based on the captive-based governance model (Figure 12), as defined by Gereffi *et al.*, (2005). Where foreign channels, particularly retailers, serve as lead firms,

setting product specifications, quality standards, procedures, delivery options, and prices that producers must comply with and adhere to. Foreign distribution channels have more power over Namibian hake producers, reflecting a buyer-driven value chain in this market.

In the domestic market channels, market-based governance predominates (Figure 12). Producers make educated guesses on product type and quantities to produce, with less formality and paperwork. Furthermore, supermarkets market products on their behalf, and as a result, actors benefit from a power balance because no single firm dominates. While governance and coordination across catching and processing actors are based on a more hierarchical governance model. This is because of smaller firms' contractual arrangements, with larger vertically integrated firms for catching and processing their quotas. These vertically integrated firms decide on what and how to produce, thereby controlling and governing other firms.

In conclusion, the value addition activities in Namibia's hake value chain show that the competence is present and operational. It also recognizes the potential for additional value addition, particularly concerning secondary processed products. In addition, the industry can benefit from MSC certification, which can aid in market diversification, premium pricing, and overall value chain competitiveness. The analysis does, however, point out that the quest for increased value addition may come at the expense of employment, and vice versa.

The findings found that while government policies supported the growth of the value chain, they also created incentives that are having a negative influence on the value chain. According to the analysis, the 70/30 quota split policy, as well as the rights and quota allocation criteria, have resulted in overinvestments in the industry, putting the hake stock and value chain profitability at risk. It also, highlights that the increased number of fishing rights reduces the quota share of right holders, which provides fewer incentives for sustainable stock exploitation. Moreover, the quota system has generated power asymmetries between smaller and larger value chain actors. Therefore, enhancing the hake value chain will require consistent policies that strike a balance between participants, value addition, employment, investment, and raw material availability.

The government‘s drive for more value addition, investment, and employment, as well as increasing the number of fishing rights, while TACs are decreasing, demonstrates conflicting goals and misaligned incentives. The findings suggest that value addition can occur without the need for employment. So, if the industry wants to create more jobs, it

might have to do things by hand or increase the TAC to put more pressure on the stock. Certain aims are well aligned and others are more contradictory. These incentives have an impact on the actors as they will want to maintain their profits, but declining quotas may reduce revenues and at the same time the government will continue to demand higher taxes, putting more pressure on the stock. Also, the rights allocation criteria do not appear to consider raw material availability, as fishing rights have increased dramatically over the years, while resources appear to be declining. Furthermore, as value addition and market diversification increase, the government will be required to maintain an obligation to safeguard the MSC certification.

7 Policy recommendations

The government policies for the hake subsector have the following objectives: job creation, industrial investment, increased value addition, increased exports through value chain upgrades, and Namibian empowerment. Some of these objectives are intertwined, such as Namibian empowerment and value chain improvement. While some of these may appear to be contradictory, such as employment creation, investment, and increased value addition. There is a trade-off among the objectives, it is necessary to figure out what the optimal mix is, more jobs, value addition, or investments. The hake stock's long-term viability must take precedence over all other considerations, without it, the industry dies. As a result, the government may be compelled to decide at some point which conditions should be met and which must be reduced to avoid risking the hake stock's long-term sustainability, which is the top priority. As a result, the following are suggested:

(i) Government to ensure that the stock is not deteriorating, to maintain and keep the MSC certification.

(ii) Government to rebuild the hake stock to make it more sustainable

(iii) The overinvestment in the hake industry calls for the government to thoroughly examine the rights and quota allocation criteria and incentives for investments to see if they have accomplished their objectives and if they should be re-directed or amended.

(iv) Government to assess whether the investments such as the acquisition of shares in vessels or processing plants of existing right holders are appropriate and adequate and whether right holders would be penalized if they do not meet the investment requirements.

(v) Government to examine the value addition and employment drive as they have conflicting aims, whereby the pursuit of one will be at the expense of the other.

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Appendix

The Research Questionnaire

Appendix 1: This is the list of all the questions that were asked during the survey.

Personal information	**Question 1** What is your position in the company and your responsibilities? How long have you been working in the industry?
General information about the company	**Question 2** Describe the company's production! • *Initial activities in the company (fishing/processing/marketing and sales)?* • *Describe what is done at each of the stages of the value, type of firm, and level of vertical integration?*
The value chain structure	**Question 3** How does the company cooperate with other actors in the value chain? • *Nature (and flow) of the cooperation/Information* • *Who are the main (or largest) partners in the value chain,* • *and in what parts of the chain are they?* • *Do you cooperate with competitors?* Where do you place the company in the value chain? • *What is the main focus of the business?* • *Are any of your products further processed elsewhere?* • *If yes, who is responsible for this?* • *Are you planning on doing this yourself in the future, or did you use to do this process yourself?* How capable is your value chain of responding to changes/marketing information? (*1=not capable; 5=very capable*)
Sales and Marketing	**Question 4** How is the marketing organized?

	Who are the largest purchasers from the company in percentages of all sales? • *Distributors,* • *processing,* • *retail,* • *restaurants, etc.* To which countries do you sell the most? • If the largest purchasers are *not* end buyers, who are the final buyers of the products? *Retail, restaurants, catering, etc.* **Question 5** • What are the biggest changes you have experienced within marketing of the company's products in the last 5-7 years? **Question 6** • Have you introduced any new methods regarding marketing within the last 5-7 years? What is your goal in achieving new customers? How do you plan to achieve that? • Have your company created or are you in the planning of establishing subsidiaries abroad? **Question 7** How important is marketing information for your operation today? **Question 8** Regarding your products, what factors are the most important to price variation? • Season *(1= less important; 5 = very important)* • Supply from other countries *(1= less important; 5 = very important)* • The size of the Norwegian quota (*1= less important; 5 = very important)* • Demand for fish *(1= less important; 5 = very important)* • The quality of the product *(1= less important; 5 = very important)* • Overall uncertainty *(1= less important; 5 = very important)* • Other *(1= less important; 5 = very important)*
Value Addition	**Question 9** What changes have occurred in the production and value-added in the last 5-7 years?

	• *The use of labor, raw material per hour (efficiency), and/or sold quantity/value per employee* **Question 10** The production of main products (roughly) • *Frozen on land* • *Frozen on trawlers* • *Fresh fillets* • *Others (s)* **Question 11** What have been the focus areas of the company to increase the value-added (profit) in the last 5-7 years*?* • *Reduce costs and/or increase revenues* • *Providing more and/or better raw materials* • *Outsource parts of the production* • *Investment in equipment and/or production facilities* • *Increase and/or improve the quality of products* • *Finding new markets* • *Improving manufacturing processes* • *Equalize raw materials access during the year* • *Other - what?* **Question 12** What effect has the Fisheries Management had on corporate value? • Have the Fisheries policies helped to increase value? added? If yes - How?
The fisheries policies and marketing system	**Question 13** Do the current fisheries policies have any effect on the development of the company's value chain in the last 5-7 years? If yes, which ones? • What has the system changed? • What factors in the system have promoted or led to any? changes? Which effects have the Fisheries policies had on the marketing of your products? • Have the fisheries policies changed anything in the marketing of your products? If yes, what has changed? • If it has affected, what factors have contributed to the change or supported the changes? **Question 14**

	Is there anything in the current fishery that you think should be changed to improve the conditions of competition for your business? **Question 15** Is the fisheries management system supporting or hindering the effectiveness of your company? • *Transferability of harvesting rights* • *Landing duties* • *Gear restrictions*
Competitiveness and governance of value chain	**Question 16** How competitive would you say that the value chain is compared with your competitors (other countries)? • *Who are the competitors?* • *What is the main difference?* • *Why is it different?* The competition among major suppliers is (1=highly ineffective; 5=highly effective) **Question 17** Are there leading companies in the value chain? • *Why are they leading?* • **Question 18** What do you think about the distribution of power in the value chain? • *How would you consider the balance of power between the different actors in the value chain?* • *How have these power relations occurred?* • *Have the owners of quotas greater (market) power than other players?*