SOCIO-ECONOMIC IMPORTANCE OF THE ARTISANAL FISHERY FOR STAKEHOLDERS IN BENGUELA PROVINCE, ANGOLA

THESIS TO BE SUBMITTED TO THE UNIVERSITY OF STIRLING FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

By

ARSENIO BOAVENTURA HILINGANYE

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INSTITUTE OF AQUACULTURE, SCHOOL OF NATURAL SCIENCES, UNIVERSITY OF STIRLING, STIRLING, SCOTLAND, UK

DECLARATION

This thesis has been composed in it's entirely by the candidate. The work described in this thesis has been conducted independently and has not been submitted for any other degree.

Name: Arsenio B. Hilinganye

Sign:

Date:

Name: David C. Little

Sign:

Date:

Name: Amaya Albalat

Sign:

Date:

To Vanda and to my dear and beloved daughters WEZA and TERESA for the time I was not able to be by your side during such long journey. To my parents ELIAS (in memory) and EVA HILINGANYE for all the support from the beginning.

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Abstract

Angola, an African country situated adjacent to the prolific Benguela Large Marine Ecosystem faces challenges linked to the poor management of the fishery sector and its low contribution to the national GDP, exacerbated by data scarcity due to lack of studies of the artisanal fishery sector in the region. This study aims to describe the socio-economic profile of small-scale fishery stakeholders and to highlight the importance of artisanal fishing in reducing poverty and sustaining livelihoods in Benguela province. Primary data was obtained through a field survey in Angola with structured questionnaires applied among small-scale fishery stakeholders; interviews with leaders of fishers' cooperatives and government representatives in Benguela province were also performed. The data were analysed thematically through qualitative and quantitative methods. The study reveals that direct fisheries employment comprises 0.5% of the province's population, with 8% of families directly benefiting from this sector. Although women do not go out to fish, they dominate the trading market in terms of numbers, cooperative work, and mobility. The local markets trade crustaceans and bony fish differently due to high demand and low availability, influenced by lack of fishing knowledge and suitable gear, weak preservation infrastructure and poor road accessibility. Therefore, artisanal non-bony fish are primarily consumed in urban restaurants, with 90% featuring crustaceans, at prices nearly triple that of finfish. However, artisanal fishery stakeholders face challenges in terms of investment, catches, and revenues due to a general lack of financial education, environmental knowledge, and collective action. Financial support, fuel subsidies, appropriate fishing gear, and financial and environmental management training are all needed. This study provides crucial policy insights supporting the economic growth of the artisanal fishery sector in the area, offering potential for future qualitative and quantitative studies on the socioeconomic importance of seafood at regional and national levels.

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List of Abbreviations

AAPIB – Associação de Armadores da Pesca Industrial de Benguela (Benguela Industrial Fisheries Shipowners Association)

ADCC – Associação para o Desenvolvimento da Comuna do Cuio (Association for the Development of the Community of Cuio)

AFAP - Artisanal Fisheries and Aquaculture Project

ANASO - Angolan Network of AIDS Services Organization

AOA – Angolan Kwanza (currency)

ASCOFA – Associação de Apoio aos Combatentes da Ex-F.A.P.L.A (Association for the Support of Ex-F.A.P.L.A Combatants)

BCC - Benguela Current Commission

BCLME - Benguela Large Marine Ecosystem

BNA – Banco Nacional de Angola (National Bank of Angola)

CAADP - Comprehensive Africa Agriculture Development Programme

CAPAs – Centros de Apoio a Pesca Artesanal (Support Centres for the Artisanal Fishing),

Cb – Commercial boat

CI – Confidence Interval

CIA - Central Intelligence Agency

CIP – Centro de Investigação Pesqueira (Fisheries Research Center)

COPREB - Cooperativa de Pescadores da Praia Bebé (Cooperative of Fishers of Praia Bebé)

EEZs - Economic Exclusive Zones

FADEPA - Fundo de Apoio ao Desenvolvimento da Indústria Pesqueira e da Agricultura (Support Fund for the Development of Fisheries and Agriculture)

FAO – United Nations Food and Agriculture Organization

FAPLA – Forças Armadas Populares de Libertação de Angola (Popular Armed Forces of the Liberation of Angola)

GCLME - Guinea Current Large Marine Ecosystem

GDP – Gross Domestic Product

GIS – Geographic Information Systems

GPB – Governo da Provícia de Benguela (Goverment of Benguela Province)

GPS - Global Positioning System

GR – Governmental representative

ID – Identification
ILO - International Law Organization
IMF - International Monetary Fund
IMNE- Instituto Normal de Educação (Normal Intermediate Institute for Education
IMR - Institute of Marine Research
INAC - Instituto Nacional da Criança (Child´s National Institute of Angola
INE – Instituto Nacional de Estatísticas (National Institute for Statistics
INIP – Instituto Nacional de Investigação Pesqueira e Marinha (National Institute of Fishery and Marine Investigation)
IPA - Instituto de Desenvonvimento da Pesca Artisanal e da Aquicultura Comunal (Institute for the Development of Artisanal Fisheries and Communal Aquaculture)
LMIC – Low and Medium Income Countries
MCA – Multiple Component Analysis
MINAGRI – Ministério da Agricultura (Ministry of Agriculture);
Minhotur, Ministério da Hotelaria e Turismo (Ministry of Hotels and Tourism)
MINPESCAS – Ministério das Pescas (Minsitry of Fisheries)
MINPESMAR - (Ministério das Pescas e do Mar (Ministry of Fishery and the Sea)
MINUA - Ministério do urbanismo e Ambiente (Ministry of Urbanism and Environment)
MPLA – Movimento Popular de Libertação de Angola (Popular Movement for the Liberation of Angola)
N/A – Not available

NEPAD´s - New Partnership for Africa´s Development
NF – not found
NGOs – Non-Governmental Organizations
NORAD - Norwegian Agency for Development

OEC - The Observatory of Economic Complexity
PCA – Principal Component Analysis

PRODESI - Programa de Apoio à Produção, Diversificação das Exportações e Substituição das Importações (Support Program for Production, Exports Diversification and Imports Substitution)

PUNIV – Ensino Pré-Universitário (Pre-University Studies)
RV - Research Vessel
SADC - Southern African Development Community
SD – Standard Deviation
spp. - Several species
ST - Secured Territory

TLm – Mean Trophic Level
UK – United Kingdom
UN – United Nations
UNDP – United Nations Development programme)
UNESCO – United Nations Educational, Scientific and Cultural Organization
UNITA – União Nacional para a Independência Total de Angola (National Union for the Total Independence of Angola)
USD – United states Dollar

Glossary of Local Terms

Banda-banda – Beach Seine

Cacimbo – dry season (from May to October), opposite to the raining season (November to April).

Chalandras – Semi-industrial vessels

Rapa - boats using seine nets,

Kaleluya – Motor-tricycle

List of species registered in this study and exploited by artisanal stakeholders.

Species local name	English common name (from FAO)	Scientific name
Arrancador/roncador	Atlantic spotted grunter	*Pomadasys jubeleni*
Atum (kimbumbu)	Yellowfin tuna	*Thunnus albacares*
Azeite	Yellow tail amberjack/king fish	*Seriola lalandi*
Barbudo	African threadfin	*Galeoides decadactylus*
Cachuchu	Large-eye-dentex	*Dentex or Sparus spp.*
Cacolocolo / colo - colo	Grunt spp.	*Pomadsysidae*
Camarão	Shrimps	*Aristeus varidensis;*
Gamba	Prawns	*Parapenaeus longirostris*
Camuchili / camuchilo	Pompano	*Trachinotus ovatus*
Canjili (Cangira)	Balao halfbeak	*Hemiramphus balao*
Caranguejo	Kingfish	*Carangid spp.*
Carapau	Horse mackerel	*Trachurus trecae.; t.t. Capensis*
Cavala	Mackarel	*Scomber japonicus*
Choco	Cuttlefish	*Sepia officinalis*
Chova/enchova/anchova	Shad	*Pomatomus saltatrix*
Coa	Jackcrevalle	*Caranx hippos*
Corvina	Canary drum	*Umbrina canarienses*
Dourada	Dorado	*Coruphaena equiselios*
Espada	Hair tail/ribbonfish/snakefish	*Lepidopus caudatus*
Espadarte	Swordfish	*Xiphias gladius*
Ferreira	Sand steenbras	*Lithognathus mormyrus*
Galucha	Bonga shad	*Ethmalosa fimbriata*
Garoupa	Rockcodes	*Various spp. Grouper*
Judeu	Frigate mackerel	*Auxis thazard*
Lagosta	Lobsters	*Panulirus regius; reptantia*
Liro	Blue butterfish	*Stromateus fiatola*
Lula	Good hope squid	*Loligo reynaudii*
Mandongo	Thin sardine	*Sardinella aurita*
Merma	Little tunny	*Euthynnus alletteratus*
Pargo	Large sparids	*Sparus spp.*
Peixe agulha	Flat needlefish	*Belonidae albumes hians*
Peixe -porco	Grey trigger fish	*Balistes capriscus*
Pescada	Hake	*Merlucius spp.*
Pungo (= v. Big corvina)	Southern meagre/kob	*Argyrosomus hololepidotus*
Raia	Ray spp.	*Raiidae*
Sardinha palheta	Sardine	*Sardinella madarensis*
Savelha	Sardine	*Sardinops sagax*
Serra	West African Spanish mackerel	*Scomberomorus tritor*
Serreijão (serrajão)	Blue bonito; katonkel; Atlantic bonito	*Sarda sarda*
Taco - taco	Blotched picarel	*Spicara spp.*
Tico-tico	Red pandora	*Pagellius bellottii*
Viola	Southern guitar fish	*Rhinobatos percelleus*

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Chapter 1 – General introduction

1.1 Introduction

Small-scale fisheries (SSF) are crucial for millions of people worldwide, who rely upon them for a living (Tapia-Lewin et al., 2017). They have crucial importance in many coastal developing countries in acting as a guarantor of food and nutrition security (Asiedu et al., 2022).

Employment in fisheries in many countries worldwide includes many females, challenging traditional male gender roles (Weeratunge et al., 2010). It is estimated that more than 90% of the women employed in the fishing sector work in the post-harvesting subsector, and nearly 100% of those in the retailing sub-sector are women, both in Angola and in other countries of the Southern African region (de Graaf & Garibaldi, 2014). Processing activities include salting, smoking, and sun-drying fish of all sizes, and fish of second-grade quality (FAO, 2018).

Women are less involved in direct fishing activities but hold significant control over artisanal seafood retailing and processing in many African regions for cultural reasons (Sowman and Raemaerks, 2018; Wamukota et al., 2015; Nzatuzola, 2005; Williams et al., 2006; Hauzer et al., 2013). However, single women are the heads of the families in many households, which rely almost totally on them for their livelihoods (FAO, 2023a).

In many African countries, SSF play a vital role for revenues and livelihood, especially in Angola, Namibia and South Africa, which are covered by the Benguela Current Large Marine Ecosystem (BCLME) which is known to play an important role in marine food production and is among the most fruitful of the great marine environments worldwide (Shannon, 2006; Sowman & Cardoso, 2010; FAO, 2018; Duarte et al., 2005).

With an annual fish production estimated at approximately 7665 tonnes, it is suggested that around 600,000 people in Angola depend directly on artisanal fishing activity (FAO, 2023). However, decades of civil war in Angola caused general destruction leading Angola into extreme poverty, poor literacy, and a general deficit of good governance, which also affected its marine and fisheries environment (FAO, 2018).

1.2 Motivation

1.2.1 Research problem and gap

Although existing data acknowledges the significance of the fishery sector in Angola to many people's livelihood in the country, specific information on its actual socio-economic importance in certain zones, such as Benguela province, is lacking. This data could include the number of fishing communities, the fleets and fishers, and estimates of the total number of people involved in the fishery sector by province as well as specific socio-demographic data on fishers and the economic benefits they bring (FAO, 2018; PRODESI, 2021). Furthermore, most

information on Angola's artisanal fishery sector is out-of-date and/or inaccurate. For example, while PRODESI (2021) and MEP (2021) estimate that around 150,000 people engage in fishing activities in Angola, FAO (2023) put the number at 60,000 people.

Benguela and Lobito municipalities (both in Benguela province) along with Luanda (the country´s capital city) and Lubango (the capital of the inland province of Huíla) have the biggest fish markets due to their high population densities and buyer capacity (INE, 2016). Reports from FAO (2018) and Aguilar-Manjarrez et al. (2021) indicate that fish are transported by car, bicycle or motorcycle to the market, with ice usage depending on distance – however, from Benguela province it is externally traded mostly dried and smoked (FAO, 2018). Little is known about prices, the most valuable species, and consumption within urban zones, especially in restaurants. Sowman and Cardoso (2010) emphasised the lack of specific information on the socioeconomic importance of SSF for many coastal countries in Southern Africa.

Hence, this study identifies a need for more information on aspects of this system, from its characterisation to descriptions of how individuals participate. Another problem is that although many people are known to rely on small-scale marine fisheries for their livelihood, the contribution of this sector to the national GDP appears insignificant. Currently, according to PRODESI (2021), MEP (2021) and FAO (2023), most people involved in artisanal seafood in Angola are fishermen, but the number and social profile of women engaged in retail and fish processing and their exact role and contribution to the local economy is still poorly described. It is also known that many fishers in Angola rely on close relatives for processing and retailing fish, but the numbers of family members involved are not estimated (Faria et al., 2021).

Angola is located alongside the BCLME, which is home to many marine species including crustaceans (Yemane et al., 2014). Crustaceans are globally exploited through different methods of cultivation and extraction due to their broad distribution and concentration not only in marine but also in fresh and brackish waters; adaptation and farming possibilities; their economic value, and their importance in the animal food chain (Koch & Ďuriš, 2016; Zacarias et al., 2019; Judkins, 2014; Fransen, 2014; George et al., 2014).Crustaceans are also vastly marketed, are amongst the most lucrative species worldwide; and constitute sources of income and food security for many families in coastal zones as well as contributing significantly to the national GDP of many countries (Bondad-Reantaso et al., 2012). Furthermore, countries in the Southern African region which import seafood from Angola are also potential destinations for artisanal seafood from Angola, including crustaceans (OEC, 2021). However, the only method through which they are exploited in Angola is the direct extraction from the sea of four species, namely crabs, shrimps, prawns, and lobsters (Decree nº 13/18). Therefore, this study attempts

to address the reasons why artisanal small-scale fisheries do not explore crustaceans more industrially or effectively.

This study presents new primary data on the value of artisanal fishing to people living along the coastal zone of Benguela province, as well as updated information addressing the sector's data gap.

1.2.2 The research questions addressed in the thesis are as follows:

1. How does the Benguela fishery sector fit the FAO guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication?
2. What are the main social and economic characteristics of the artisanal fishery sector in Benguela province?
3. What benefits does the artisanal fishing sector provide to stakeholders and people in the coastal zones of Benguela province?
4. Can fishers´ cooperatives accelerate participation and stimulate improvement in SSF-related economic growth?
5. Why do artisanal stakeholders in Benguela province not exploit crustaceans effectively?
6. What are the main barriers and opportunities faced by SSF stakeholders in Benguela province?

1.3 Key argument

In Angola, the fishery industry is vital for subsistence, however socioeconomic statistics for certain regions such as the province of Benguela are lacking. The available data does not provide precise socio-demographic information; it merely estimates fishing communities, fleets, and fishers. Estimates of the numbers involved in artisanal fishing are also erroneous and out of date. There are few statistics on costs, species, and consumption in cities, especially in restaurants. There is also limited available data on the financial, economic, and livelihood advantages for those who work in trade markets at the provincial level, especially women and children. The Angolan coastline is rich in marine demersal and pelagic species, including crustaceans and sardines which are widely exploited and distributed globally for their economic value. They are highly marketed and contribute significantly to national GDP and the incomes of many coastal families, but the reasons artisanal fisheries fail to exploit them more effectively are unknown, and therefore explored in this thesis.

1.4 Research aim and objectives

1.4.1 General aims

This study aims to assess the socioeconomic importance that the SSF sector has for people living in the coastal area of Benguela province in Angola, through the following main objectives:

- To describe the structure, the main actors, the dynamics, and the policies (governance and management) of the artisanal fishery sector in Benguela province.
- To describe the impact of the artisanal fishery sector on small-scale stakeholders´ lives in Benguela province.
- To estimate the number of people who directly rely on artisanal fishing activity, thus resolving the issue of the lack of existing data on the artisanal fishing sector as a means to reduce poverty and unemployment among people living in the coastal zone of Benguela province.

1.4.2 Specific aims

- Identify the stakeholders, value-chain structures, ruling institutions, and dynamics (relationships) of the artisanal fish market in Benguela province.
- Analyse the contribution of artisanal seafood as a source of food, employment, income and revenues for SSF stakeholders in Benguela province.
- Describe the roles that women and young people have within the artisanal seafood value chain in Benguela province.
- Identify the involvement of child labour within this market.
- Identify the main barriers that artisanal stakeholders face while engaging in seafood capture, trading, and processing.
- Explore the reasons why artisanal stakeholders do not significantly exploit crustaceans.

Overall, this thesis aims to identify and describe the main actors and dynamics of the artisanal fishing sector in Benguela province, Angola, and to assess its importance as a means to reduce poverty, hunger, and unemployment for the coastal population there. This thesis also attempts to augment and improve the data on the artisanal fishing sector in Angola and to produce results which may facilitate future quantitative studies in the study area or elsewhere in the country.

1.5 An Overview of Angola´s fishery sector

Angola is a Southwestern African country comprising a geographic area of approximately 1.25 million km^2, with an estimated population of around 32 million people, the majority of whom are women, with more than 60% living within the coastal zone (INE, 2016). Figure 1.2 details the geographic situation of Angola.

With a diverse geography, Angola's climate is tropical, with two main seasons: "Cacimbo" (dry, cold) from May to October, and "Wet" (rainy, hot) from November to April, affecting artisanal fishing and agriculture (Ministério da Agricultura [MINAGRI], 2016).

The Exclusive Economic Zone (EEZ) of Angola, as Figure 1.2 shows, is within the BCLME and stretches 1650km from Cabinda to Namibe coastline. It is less than 200m deep, the coast is mainly sandy with very few rocky outcrops, and there are 33 estuaries (MINUA, 2006).

Angola experienced a long civil war that started in 1975 following its independence from Portugal, and ended in 2002 having caused significant negative impacts on the country's economy (Figure 1.1). The effects were felt in the fishery sector, which experienced growth during the civil war until 1990, when peace agreements were reached; the war returned in 1992, and employment declined until 2000. After 2002, the sector regained growth, reaching over 100,000 people in 2012 (FAO, 2014).

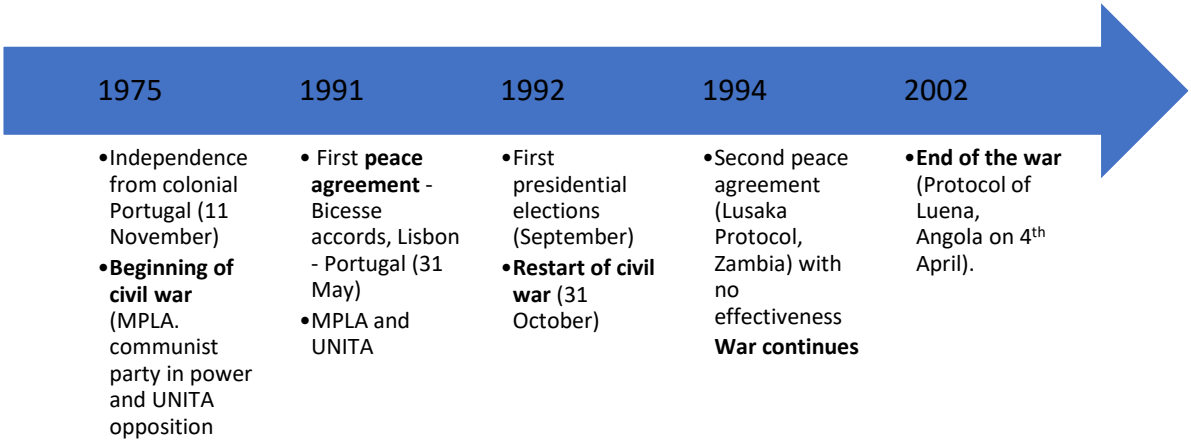

Figure 1.1. Brief timeline of Angola´s civil war (Source: Pearce, 2012).

The Angolan industrial sector lacks production of fishing gear and equipment, meaning that the importation of gear from regional and international markets is crucial for government and fishery stakeholders (FAO, 2018).

The contribution of the Angolan fishery sector to the national GDP, including the offshore industrial subsector, is low (3%); the country´s economy relies most heavily on oil exportation

followed by diamond mining, agriculture and fishery (MINAGRI, 2016; FAO, 2018). The agriculture sector, which contributes 6% to the national GDP, remains largely undeveloped since only 10% of the estimated 58 million hectares of Angola's arable land is currently cultivated and 90% of farms are small to medium size; the main crops are corn, millet, sorghum, maize, cassava, beans, soybean, potatoes, and vegetables (MINAGRI, 2016; CIA world factbook, 2021).

Angola's artisanal fishing communities, once 102 with 190 landing sites, as shown in **Figure *1.2***, have grown to 184 from 2005-2018, but the number of current landing sites is unknown (Duarte et al., 2005; IPA, 2017; FAO, 2018). There is a single landing site for semi-industrial vessels in the port of Nzeto, province of Zaire (Duarte et al., 2005; FAO, 2011; MINPESMAR, 2018). As in many countries worldwide, women mostly engage in the retail and processing parts of the sector, but their benefits and contributions are poorly researched globally (Tilley et al., 2021; Murphy et al., 2020).

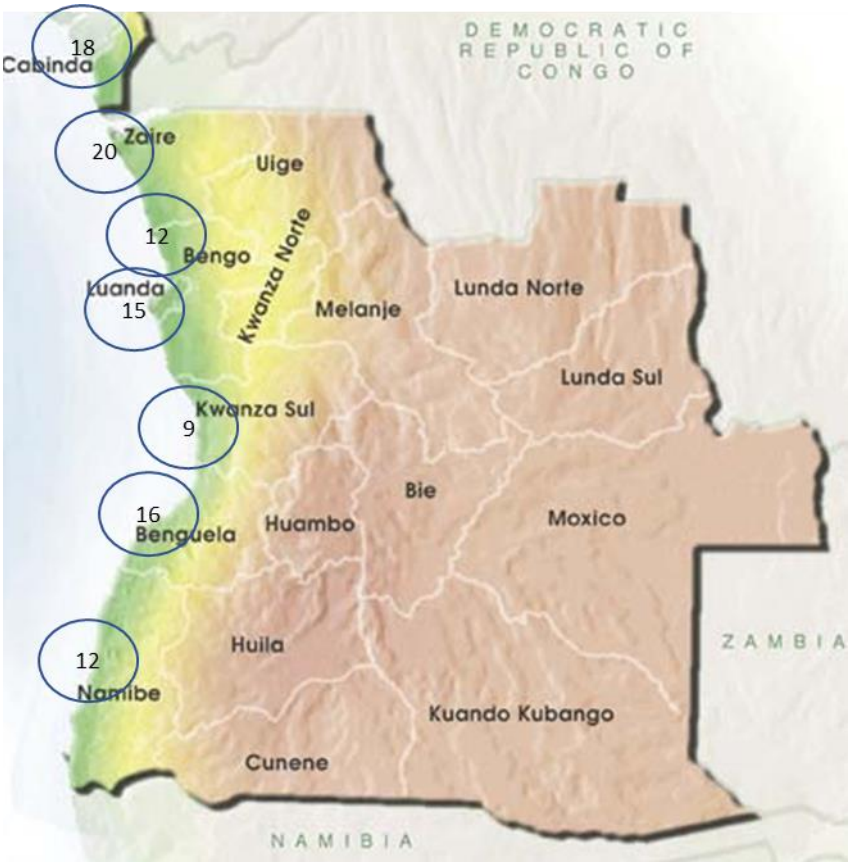

Figure 1.2. Location of marine artisanal fishing communities along the coastal zone of Angola. (sources: FAO, 2018; FAO, 2014; MEP, 2021; MINPESCAS, 2014; Duarte et al., 2005; bp.blogspot.com).

In Angola, many different marine species of demersal fish and pelagic fish, including crustaceans, are industrially harvested by around 150 boats, while the SSF sector currently

comprises close to 31,000 fishers operating in 9000 boats, and production is nearly 113,000 Tonnes a year (Ministério das Pescas [MINPESCAS] 2014; FAO, 2018; MEP, 2021). It is also estimated that nearly 50% percent of the catch is exported, generating around USD12 million in 2012 (FAO, 2018). Unknown quantities of fish are informally traded to the Democratic Republic of Congo (DRC), Zambia and Namibia, mainly by artisanal fishers and small-scale traders (Sowman & Cardoso, 2010; FAO, 2018).

Table 1.1. Characterisation of the marine fishing subsector in Angola from 2014-2021 (Sources: MINPESCAS, 2014; MEP, 2021).

Province	Number of artisanal fishing communities	Number of artisanal fishers	Number of artisanal boats	Capture in tonnes	Industrial capture	Semi industrial capture	Artisanal capture
Cabinda	18	2 882	611	8 265	0	4 549	3 103
Zaire	20	1 852	677	32 673	0	0	31 678
Bengo	12	1 175	227	13 468	0	0	8 972
Luanda	15	9 951	2 578	206 333	126 856	42 364	35 497
Cuanza Sul	9	2 484	861	43 175	12 162	7 220	17 352
Benguela	16	8 401	2 044	94 452	40 736	36 195	16 601
Namibe	12	3 346	862	39 820	11 467	22 616	5 584
Total	102	30 091	7 860	437 186	191 221	112 944	118 787

1.6 Layout of the thesis

The purpose of the narrative literature review in Chapter 2 is to provide background context to the topic, and to review several approaches that have been utilised to explain the socioeconomic value of small-scale fishing based on the current literature, mainly in developing countries. To achieve relevant information on the sector, most of the articles were selected from scientific and academic databases such as the Web of Science by searching for specific topics using the “snowball” method (Lecy and Beatty, 2012; Naderifar et al., 2017; Thomas, 2021).

Chapter 3 discusses the justification for the mixed method design utilised in this thesis. The method of primary data collection utilised in this thesis was a systematic survey of stakeholders conducted in fishing locations along the coast of Benguela province. Chapter 3 details the study's field methodology, including site identification, recruitment, stakeholder surveys, document collection, observations, and a description of the study area.

Chapter 4 describes the qualitative data analysis and present the findings of the interviews, observation, and document analysis. The chapter discusses the codification of the interview

data for thematic analysis to answer the research questions and address the hypotheses, reflecting the respondents' perspectives, and contributing to the understanding built by the research. It highlights the importance of marine resource governance in Benguela province for food security, poverty reduction, and economic growth. It analyses value-chain, post-harvest, and national/international trade, focusing on crustaceans and women's roles. The final section of this chapter sets out the main barriers to economic growth in the study area. Chapter 5 analyses the quantitative data and presents the main findings, similarly to Chapter 4, based on the same research questions and objectives, using statistical and descriptive techniques. It describes fishing boats, equipment, operations, species, catches, and landings. Chapter 6 discuss the main findings from the literature review, the qualitative and quantitative results.

Chapter 7 summarises the previous chapters, presents the main conclusions, offers some recommendations for improvements in key areas, and suggests avenues for future studies.

Chapter 2. Literature review

2.1 Introduction

The aim of this literature review is to present what is known about artisanal fishery and to identify knowledge gaps in the current literature regarding the socio-economic importance of marine artisanal seafood to the people living in coastal areas. Since the scope of this thesis is the marine artisanal fishing sector in Benguela province, Angola, for structural reasons, this narrative review follows the FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (the Small-Scale Fisheries Guidelines) (FAO, 2015). The Small-Scale Fisheries (SSF) guidelines supplement the UN Convention on the Law of the Sea's fishing regulations and the Code of Conduct for Responsible Fisheries, forming the most widely recognised international fisheries instrument (Vincent-Akpu et al., 2015). They are closely related to *Principles for Responsible Investment in Agriculture and Food Systems, Voluntary Guidelines on Tenure of Land, Fisheries, and Forestry, and Voluntary Guidelines for Progressive Realization of the Right to Adequate Food* (Xiong et al., 2022). The FAO SSF guidelines are also aligned with the United Nations 2030 Agenda for Sustainable Development, SDG14, and the 2022 International Year of Artisanal Fisheries and Aquaculture, which aimed to highlight the importance of small-scale fishers, farmers, and workers in food security, nutrition, and poverty eradication (Xiong et al., 2022).

The text reviews prior work on Angola's small-scale fisheries and the Sub-Saharan regional context, comparing its fishery integration to that of neighbouring countries. It compares Angola to developing and low-income countries, focusing on the marine SSF sector in Benguela province. Therefore, this chapter presents a general overview of the importance of fish as a food source; the definition of the existing fishery categories in the country; and the role of the artisanal fishery sector in food security and nutrition as well as in achieving economic growth. Emphasis is given to the importance of crustaceans for exports, revenues, and livelihood.

The following section explores women´s participation in the SSF and the existing frameworks for the governance and management of SSF, focusing on the role of cooperatives. This section is closely linked to the review of the main barriers and challenges to the sustainable development of SSF. It includes topics such as overexploitation, poor infrastructure, lack of investment, low literacy levels, conflict over fishing grounds and resources, lack of data on SSF for decision-making, and child labour in the fishery sector. The final section of this chapter emphasises the most relevant results of the narrative literature review.

2.2 Importance of seafood as a source of food and nutrients

Aquatic foods are a great source of the essential nutrients required for human health across the world, and are consumed in developed, developing and Low- and Medium-Income Countries (LMIC) (Garaway & Arthur, 2019). Fish provides a high proportion of animal protein

and ensures global food and nutrition security for more than half of the world´s population (Cohen et al., 2019). Seafood includes bioavailable vitamins and important fatty acids, and accounts for 17% of global edible meat production, coming from both wild fisheries and ocean-farmed species (Costello et al., 2020).

Fish is frequently supplied by fishermen for direct consumption within their own homes or communities in many developing nations (FAO, 2015). Although there have been significant advances in technology to exploit fish stocks, some of the more ancient and traditional seafood harvesting techniques still take place in LMIC (Lozano et al., 2018). In these developing nations, small-pelagic fish are frequently the most important marine resource consumed by low-income households (Allison & Ellis, 2001). FAO (2023b) emphasise that the most nutrient-dense species from both inland and marine fisheries are highly nutritious even though nutrient values vary widely among different species. FAO (2023b) also found in their more recent study that the nutrients in fish species gathered by large-scale fisheries can contain around 1/4 more of omega-3 fatty acids than from fish harvested by small-scale fisheries, possibly due to differences in habitats and latitudes. Currently, as the world population grows, and the health benefits associated with fish consumption become better known, the demand for animal protein from fish also increases in some of the most world´s populous countries, such as Nigeria (Lawal et al., 2016).

According to Hicks et al. (2019), the lack of fish for some nations can lead to significant negative impacts on their GDPs; therefore, countries should prioritise fish quality in terms of nutrients for food security rather than just quantity. Furthermore, production should really reach the poorest who most need the nutritional qualities of fish (Cohen et al., 2019).

Béné et al. (2015) argue that fish is an ecologically sustainable protein source due to its biological properties with a higher food conversion efficiency of 30%, compared to chickens and pigs; 18% and 13%, respectively. However, despite the evident ecological importance of fish, some authors argue that its farming as a food system, which is seen as the main means to meet current global demand, can threaten the environment (Cohen et al., 2019; Willett et al., 2019). Therefore, it is imperative to continue to improve the harvest of marine fish in order to meet global demand in a sustainable, low-impact way (Lozano et al., 2018).

Like most African countries and many other coastal low-income countries fish is the major source of animal protein (25%) for Angola as well as a great contributor to food security (Sowman & Cardoso, 2010; Ababouch, 2000; Heileman & Toole, 2007; FAO, 2018). Fish in Angola is therefore rated among five of the top 10 most popular foods eaten there (TasteAtlas, 2021; Omenka, 2018; Bastos, 2021).

Figures from FAO (2018) show a relatively high consumption rate of fish that may not be sustainable given population growth trends, as Angola is estimated to reach nearly 78 million citizens by 2050 (world population review [WPR] 2022). Compared to other countries in the Southern African Development Community (SADC) region, especially Namibia and South Africa (14 kg and 8 kg, respectively), Angola's per capita consumption of fish in Angola of 20 kg/year is relatively high; the median consumption level in the region is no more than 8 kg per year/person (FAO, 2018), partly due the existence of many inland countries.

Therefore, BCLME marine catches, especially in the SADC zone, have the potential to contribute significantly towards animal protein sources and food security, not only in coastal but also in non-coastal countries (Sowman & Cardoso, 2010; Brugère, 2015). Moxness Reksten et al. (2020) argues that although Angolans citizens mostly consume food based on vegetables and cereals rather than meat, fish still provide much of their nutritional needs.

2.3 Characteristics and definition of small-scale (marine) fisheries

Many criteria have been used to describe and define small-scale fisheries ranging from the use of a boat (or not), boat size, fishing gear, motion and motion power, local geographic location, and national legislation (FAO, 2023b). These criteria can extend to fishing trip duration, species and quantity caught, the destination of the fish captured, financial requirements, crew size, navigation equipment, socio-economic importance of the fisheries, and management strategies which all, amongst other factors, make it very difficult to form a universal concept and definition of small-scale fisheries, (Lozano et al., 2018; Vincent-Akpu et al., 2015). Furthermore, disagreements, conflicts, discontent, and a failure to abide by fishing regulations can be observed when lawful small-scale fishermen are disqualified or larger vessels are counted as part of the small-scale fleet (Lozano et al., 2018). However, the most accepted and used characteristics to define small-scale fisheries are based on several legislations and mechanisms elaborated by the Food and Agriculture Organization of the United Nations (FAO) and approved with the consent of many UN member nations (FAO, 2023b). Lozano et al. (2018) find that 70% of countries define SSF, with boat length being the most common defining characteristic.

(FAO, 2023a), Angola's definitions for marine small-scale fisheries, amongst other categories, are based on boat type, size, fishing purpose (commercial or subsistence), motion, the presence of motor and engine power, and fishing gear, and can be found in two governmental documents: (1) Decree No. 41/05 which outlines General Regulation on Fisheries, including documentation, registration, inspections, local partner committees, and protective measures for artisanal vessels; and (2) Decree No. 159/2006 which defines Angola's legal and illegal fishing techniques, nets, and gear. These documents distinguish small-scale fisheries by their

characteristics, but blurry areas like boat size and engine presence are difficult to disentangle. Clarification is needed on subsistence in Angolan fisheries, where captures are for family consumption and occasional sales are made. The definitions of SSF in Angola follow the FAO guidelines, with boats being the most common factor, followed by motorisation as it is many countries in Sub-Saharan Africa (Lozano et al., 2018). Fishers' nationality is limited to Angolan citizens (FAO, 2018).

In Angola, the characteristics of SSF are not based on other adopted global and regional definitions, such as ethnicity, social class, religion, ecology, working hours, value chain, or time commitment, as in other regions (FAO, 2023a). In other Benguela Current Commission (BCC) countries, the criteria used to define SSF differ quite significantly - Namibia's coastal communities and arid climate mean that its marine fishing industry has been fully industrialised, resulting in no artisanal fisheries and only one angling community, while subsistence, artisanal, and small-scale commercial fisheries in South Africa are characterised based on resource use, income level, needs met, harvest site, harvesting, gear, origin, and resource value (FAO, 2023b). Despite the different definitions and classifications in use, SSF worldwide face similar challenges related to exploitation, environmental changes, and management principles (Vincent-Akpu et al., 2015).

The characteristics of artisanal, subsistence, and recreational fisheries that make up the small-scale sector are very different from those of industrial fisheries (Pauly, 2018). However, similarly to definitions of SSF, the distinction between this sector and industrial fishery also varies across countries based on socio-political, cultural and environmental aspects (Xiong et al., 2022). According to Pauly (2018), distinct characteristics between sectors include geographic location, catch destination, socio-economic importance, and ecological impact due to different gear and fuel usage. All these differences between the two sectors, as stressed by Xiong et al. (2022), have caused conflicts between fishers in the two sectors.

Furthermore, the pathways through which industrial and artisanal fishery benefit people differ significantly. For example, while around 2400 people catch approximately 1000 tonnes of fish in the artisanal sector, industrial fisheries require only 200 people and a few boats to do so (Lem et al., 2012), meaning artisanal fisheries typically directly benefit a larger number of people relative to catch quantities, as shown previously by Cohen et al. (2019), and may be more environmentally friendly than industrial methods due to lower fish discarding rates, carbon emissions, and subsidies. According to Nataniel et al. (2021), industrial fisheries' direct advantages require extraordinary measures, while small-scale fisheries generate higher employment opportunities as well as significant economic benefits for people in coastal regions.

2.3.1 Recreational fisheries' importance for tourism and economic development

Research suggests that local commercial fishing boosts tourism, as fresh seafood supplies restaurants catering to tourists, while fishing boats can offer trips as a tourist attraction (Pascoe et al., 2023). Although the tourism industry can highlight the socio-economic importance of SSF, its contribution to coastal areas remains unclear. That said, recreational fishing, as part of tourism, has been acknowledged as a major contributor to the economies of many countries across the globe (Butler et al., 2020; Sean Pascoe et al., 2023). For instance, tourist fishers catch fish that are worth seven times as much in a commercial fishery as they would be in a recreational fishery, which is especially true in West Africa (Pauly, 2018).

It has already been argued that both the Angolan economy and people´s livelihoods can benefit greatly from the tourism sector (MINHOTUR 2013; Loureiro & Ferreira, 2014). Furthermore, Ferreira et al. (2015) highlight Angola's unique natural resources as a possible tourism development opportunity by stimulating entrepreneurship, which could help in alleviating poverty.

Tourism can significantly impact Benguela's regional development, with Angola attracting two million international tourists annually, mainly from Portugal, China, the UK, Brazil, and France (MINHOTUR, 2013) who seek attractions such as seafood with an emphasis on local menus – often featuring high-value crustacean species, since "*tourism is viewed as a combination of resources and services*" (Ferreira et al., 2015, p.161). MINHOTUR (2013) reports suggest that this sector contributed AOA156 billion (equivalent to USD15 billion) to Angola's economy in 2014 and maintained 202,766 jobs throughout the country. Furthermore, consumption can be linked to tourism because many marine species in Angola, especially crustaceans, can be included among so-called "*leisure tourism products*" as they are found on "*restaurant menus*" with an emphasis on local food. These are combined with home stays on such properties and "*the 'beach product*' (*the 'sun and sand' product*)" in attracting foreign tourists to Angola (Ferreira et al., 2015, p.159-161).

According to Beckensteiner et al. (2016) and Potts et al. (2009), although there is a lack of available data for recreational fishing in the southern Africa region, its development could considerably improve GDP contributions, as has happened elsewhere globally. In addition to the economic value of oil and diamonds, Angola is also among the African countries offering the best conditions to develop recreational fishing (Belhabid & Davivoch, 2015); indeed, according to Beckensteiner et al. (2016), "*recreational fisheries in particular have the potential to substantially contribute to the local economy of the southern Angolan region*" (p.3).

Linking leisure tourism to the boosting of the artisanal seafood sector, like many other examples all over the world, can be achieved by integrating people from the fishing

communities into the process so that they sustainably benefit as much as possible from the socio-economic achievements (Belhabib et al., 2016). This approach could enable an evolution to ecotourism, which by definition "*can involve both cultural and environmental tourism and, in addition, benefits to the local population should be an integral part of the activity*" (Scheyvens, 1999, p.245).

Recreational fishing could significantly contribute to the Angolan economy , with studies showing incomes of USD1,007 per fish and USD243 per kg captured and traded by tourists in some coastal zones of the country (Beckensteiner et al., 2016). Belhabib et al. (2016) report that recreational fishery can contribute to economic growth in Western Africa, attract foreign tourists, and generate high incomes. Angola's participation in the *Luanda Sailfish Classic Tournament* and the *2015 World Tournament* showcased its potential (Weir & Nicolson, 2014). Furthermore, recreational fisheries have other benefits such as to the mental health and economic safety and resilience of many anglers and fishing communities during the COVID-19 restrictions (Howarth et al., 2020; Midway et al., 2021; Paradis et al., 2021). Tourism in harmony with SSF, under solid management policies, can also have a significant impact on fish stocks, enabling fishermen with a vested interest in the survival of the coastal stock to take advantage of it (Pauly, 2018).

Figure *2.1* illustrates the above discussion of the linkages between fisheries, consumption, recreation, and tourism.

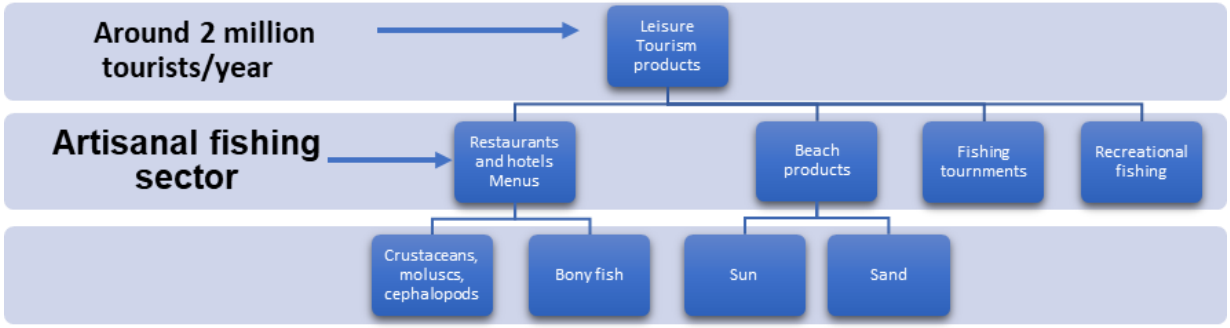

Figure 2.1. Artisanal fishing in the tourism context in Angola (source: Author´s own design based on Ferreira et al, 2015; MINHITOUR, 2015; FAO, 2018).

A lack of management and policies for recreational fishery in Angola results in excessive catches of targeted species, unlike Namibia's specific regulations limiting fishing locations and specimens (Belhabib & Divovich, 2015). Therefore, investment in recreational tourism would have to evaluate issues such as pollution, lack of coastal management, overpopulation, and unregulated human activity, which can cause rapid depletion of stocks (Belhabib & Divovich, 2015). This occurs because enormous quantities of fish can be eliminated by foreign recreational anglers (Potts et al., 2009); fisheries become unsustainable if they lack rules, as has occurred in Namibia and South Africa (Beckensteiner et al., 2016); foreign tourism arrivals and financial profits have been decreasing due to concerns about fraud, violence, and insecurity; and the Angolan capital city has become known as "*the most expensive in the world*" (Ferreira et al., 2015, p.159), so overall, the early detection of recreational fisheries trends is crucial to support sustainable coastal communities (Belhabib et al., 2016).

2.3.2 Small-scale fisheries production: global and regional BCLME region figures

It is argued that about half of all fish caught globally come from small-scale fisheries, with up to two-thirds going directly to human consumption (Xiong et al., 2022). The same trend is observed for developing countries in relation to the percentage of fish harvested but the destination is different, as almost 100% of small-scale fishery catches are consumed by local people (Asiedu et al., 2022).

However, global figures on fish production by artisanal fisheries, including those presented by FAO in 2008, have seen it fall to almost half of the total. Currently, small-scale marine fisheries account for about 28 percent of the total world production, based on a recent update to the Sea Around Us database (FAO, 2023a). Yet, according to FAO (2023a), total marine SSF catches significantly vary across the world´s geographical regions as well as between different countries according to their economic development status, as Table 2.1 shows.

Table 2.1. Global estimates of marine small-scale fisheries (SSF) catch by geographic region and by national economic classification (average annual values, 2013-2017). Source FAO (2023b).

Region	SSF catch (million tonnes)	Total catch (million tonnes)	% SSF
Africa	3.14	6.27	50.%
Americas	5.02	16.91	30%
Asia	15.69	42.22	37%
Europe	0.86	13.60	6%
Oceania	0.39	1.33	29%
Economic classification	**SSF catch (million tonnes)**	**Total catch (million tonnes)**	**% SSF**
Least developed countries	3.29	4.93	67%
Other developing countries/ areas	18.69	51.55	36%
Developed countries or areas	3.12	23.86	13%

The FAO (2023b) data indicates that Africa has the second-largest SSF production with equivalent catch levels between marine and inland small-scale fisheries as well as the highest proportion of small-scale fisheries when comparing small-scale and large-scale fisheries, with the highest values being observed in the maritime fisheries of Western (84 percent of the total) and Eastern Africa (72 percent of the total).

This information demonstrates the significant value that marine SSFs have in more restrictive regions. For example, the SADC, brings 15 countries together in exclusive agreements and aims, including a Free Trade Area, to liberalise trade, improve the investment climate, and enhance economic development, diversification, and industrialisation (Southern African Development Community [SADC], 2009). Landlocked SADC countries are crucial strategic destinations for Angola's seafood, as they have low fish production levels (OEC, 2021). Countries such as Namibia, South Africa, and Mozambique can also help to address declining fish stocks and increasing fish intake needs in the region (Hara, 2001).

Angola, Namibia, and South Africa share the BCC coastal marine area, but their methods of exploitation and economic contribution differ significantly (FAO, 2018), as **Table 2.2** shows.

Table 2.2. Characteristics of the fishery sectors of the Benguela Current Commission countries (source: FAO, 2018).

Characteristics		Angola	Namibia	S. Africa
Mean consumption of fish per capita / year		19 kg increasing	14 kg increasing	8 kg Decreasing
Fish contribution to total animal protein		25%	14%	No data on FAO
Legal recognition of artisanal and subsistence fishery sectors		Totally recognised and supported	Not Recognised but supported	Partially Recognised but not supported
Employment	Industrial fishing sub-sector	10,000	15,000	17,000
	Artisanal fishing sub-sector	50,000 (Including traders)	200 (In "part time" regime)	11,000 recreational
Fleet	Industrial fishing sub-sector	150 vessels	20,000	1500
	Artisanal fishing sub-sector	5500 boats	No data	No data, Thousands recreational
Fish exports		5% of the catch (USD12 million)	90% (USD787 million)	USD538 million
Fish Imports		USD252 million	USD46 million	USD234 million
Crustacean exploitation		Low (4 species)	Low (2 species)	High (more than 6 species)

2.4 Contribution of small-scale fisheries to food security and nutrition

It is widely acknowledged that many people in coastal zones around the world, especially in low-income nations, depend on small-scale fishing for their food security (Asiedu et al., 2022, Lawal et al., 2016, Cañete et al., 2022, Xiong et al., 2022).

However, it is argued that small-scale fisheries are often overlooked in management and policy despite their role as a guarantor of essential nutrients for human immune system performance, infant development, normal cognitive function, and successful reproduction being well known (Harper et al., 2012). It is also argued that a prerequisite to guaranteeing and preserving food security through small-scale fisheries is the capacity to respond and adapt to environmental changes directly linked to the food production chain (McClanahan et al., 2015).

In Sub-Saharan Africa, especially in the SADC zone, the BCLME marine catches have the potential to make a significant contribution towards food security, both in coastal and non-coastal countries (Sowman & Cardoso, 2010; Brugère, 2015). In Angola, the southern coastal provinces of Namibe and Benguela, which are directly influenced by the Benguela current, account for most of the catches, predominantly composed of pelagic fish. These catches are crucial to Angola's domestic food security, and significant quantities are also used to feed

neighbouring landlocked nations (FAO, 2020). Most of the fish consumed in Angola comes from the industrial fishing sector (MEP, 2021; FAO, 2018).

Conversely to what happens in Angola, marine SSF catches in Namibia have no potential to provide domestic food security due to unfavourable climate conditions; therefore, this role is assumed by its aquaculture sector (FAO, 2020a). Similarly, in South Africa, fish does not significantly contribute to food security; however, several coastal populations are dependent on subsistence fishing (FAO, 2020b). Furthermore, many West African nations and neighbouring Mozambique greatly benefit from the supply of South African horse mackerel, which helps to ensure food security. SSF catches in Angola struggle to offset food shortages due to poor road accessibility, impacting domestic demand and affecting rural food security in households (Silva, 2020).

2.5 Importance of artisanal fisheries for economic growth and sustaining livelihoods

2.5.1 Economic value of small-scale fisheries production

Small-scale fisheries provide livelihoods for many people around the world, from developed to low-income nations, providing coastal areas opportunities for development, especially in isolated areas (Gaines et al., 2018; Vasilakopoulos et al., 2018; Xiong et al., 2022; Cohen et al., 2019). The number of people living near coastal zones globally who depend on marine resources is close to half of the global population (Kaiser et al., 2005). Fisheries are a crucial source of income and employment, especially in developing countries where more than 75% of fishers worldwide work in the SSF sector (Cohen et al., 2019, p.5).

FAO (2023b) states that SFF accounts for 44% of the economic value of global fish catches, equivalent to USD77.2 billion, adding that inland SSF in Africa contributed more landed economic value (USD5.6 billion) than marine small-scale fisheries, with Asia accounting for the vast majority of this value. Miscellaneous marine species, prawns, and aquatic invertebrates are caught in marine small-scale fisheries, with diverse marine species accounting for 20% of global landed economic value.

Fishing is the third most important economic sector in Angola, after oil and diamond mining (Sumaila et al., 2005; Heileman & Toole, 2007; Sowman & Cardoso, 2010; FAO, 2018). Considered the motor of the economy of most of the country's coastal provinces (MINAGRI, 2016), it involves subsistence, artisanal, commercial, and industrial fishery. However, the specific contribution of SSF to the gross domestic product (GDP) of the Angolan economy is unknown (FAO, 2018; PRODESI, 2021).

Small-scale marine fisheries include the harvesting of a variety of pelagic and demersal species, while inland fisheries focus on harvesting catfish and aquaculture is limited to the culture of Nile Tilapia (*Oreochromis niloticus*) (Sumaila et al., 2005; Heileman & Toole, 2007). Currently, artisanal fishers have between 3000-5500 boats, which include a mixture of vessels with no engines, as well as those with in-board and out-board engines, and the species harvested varies greatly: "*groupers, snappers, seabreams, croakers, spiny lobster and lower-value species*" (FAO, 2011, p.9) but also "*small pelagic fish (sardinella, horse mackerel, sardine) and many other species (e.g., deep-sea red crab)*" (Brugère, 2015, p.16). However, more recent data from the Ministry of Fishery and the Ministry of the Economy pointed out that by 2019, overfishing had led to significant production issues affecting industrial, semi-industrial, and artisanal marine sectors with reductions of 12%, 36%, and 17% respectively from 2000 to 2019 (PRODESI, 2021).

As most cities in Angola have poor housing and unsuitable water sources, as well as a lack of sanitation, and public grid electricity access (Governo da Província de Benguela [GPB], 2016) it is suggested that fisheries in developing countries such as Nigeria and Angola contribute to the economy through value chains, but have minimal economic impact on communities (Lawal et al., 2016).

2.5.2 Contribution of SSF to sustaining livelihoods: employment and revenues

Millions of people work in small-scale fisheries around the world which they depend on for their livelihoods (Lawal et al., 2016; Asiedu et al., 2022; Cañete et al., 2022), SSF actually involves most of the people involved in capture fisheries (Xiong et al., 2022) – it employs more people than industrial fishing, oil and gas, shipping, and tourism put together, making it by far the greatest employer in the oceans (Lozano et al., 2018). Furthermore, indirect jobs are also offered through the SSF value chain, which extends from the pre- to post-harvest stage; all together, it provides around 120 million jobs (Lawal et al., 2016, Asiedu et al., 2022). Due to the scarcity of work prospects in many countries in Asia and Africa, these two world regions host the majority of global fishery jobs, predominantly in SSF (Harper et al., 2012).

It is difficult to quantify how many people work in Angola's small-scale fisheries due to lack of specific data, especially in the post-harvest value chain, due to the lack of stability it has, but based on an assumed ratio of anticipated post-harvest employment to actual harvest employment, multipliers have been utilised to conclude that up to three people are employed in post-harvest operations, including part-time, for every fisher employed (FAO, 2023b).

People engaged in marine captures tend not to depend solely on this activity for their complete livelihood and incomes. According to Kadfak (2019), fishers and young people who reside close to the city have more options to diversify their incomes due to the alternative job options

within the extensive SSF value chain, the service industry, and elsewhere. Furthermore, fish are among the most traded food products in the world after being landed and converted into a variety of products, expanding the possibilities in terms of SSF stakeholders´ earnings (Lozano et al., 2018).

Sowman & Cardoso (2010) report that in the BCLME region as well as in many developing countries, a huge number of people are directly or indirectly employed in small-scale fisheries. These authors point to figures indicating that the delivery of food, general employment and local economies are supported by these small-scale fisheries. Taken together, they are a source of livelihood for about 85 percent of these countries´ populations (Aguilar-Manjarrez et al., 2021). More recent data indicate that small-scale fisheries and aquaculture (SSFA) "*produce more than half of the global fish catch and two-thirds of aquatic foods for human consumption, and associated value chains support over 100 million full- and part-time jobs*" (Short et al., 2021, p.733). These authors argue that SSF are a crucial source of livelihood for many people living in coastal areas of the BCLME, and probably for many others in inland regions too.

It is claimed that SSF has played a significant role for many Angolan families ever since the country gained independence in 1975 (FAO, 2018). Currently, Angola has around 50,000 fishers, which corresponds to about 0.2% of the estimated Angolan population but also constitutes 50% of the total people involved in the fishery sector (FAO, 2018). These artisanal fisheries are crucial to rural development and are the main provider of livelihoods for more than 100,000 people, from which about 40,000 are involved in small-scale fish processing and selling (FAO, 2018; FAO, 2023a).

In Benguela province, fishery-related work is among the most common alongside agriculture and hunting with an employment rate of 47.8%, followed by transportation, communication, commerce, finances and administrative services (27%), while other not declared forms of work have an employment rate of 20.1%; and industry, construction, energy and water services employ only 5.1% of the province's working force (INE, 2016). However, data on the contribution of SSF is not provided separately.

In terms of revenues in many African nations, *"fish traders had a relatively high[er] income than fishers"* (Wamukota et al., 2015, p.2) since fishermen spend most money overall on their fishing operations, while traders and processors spend the least, but it has also been observed that fish traders made the least money whereas fishermen make more money from SSF (Asiedu et al., 2022).

In Angola, although other studies provide estimates of the daily earnings of SSF fishers (Faria et al., 2021), there is no specific available data relating to retailers and processors.

2.5.3 Contribution of small-scale fisheries in exports of fish and fish products and to national economies

A value chain is defined as a framework through which a product is described and characterised from its conception, design, and trading through to consumption, including the actors and influencers of the entire process (Gereffi & Fernandez-Stark, 2011; Grace et al., 2015). Therefore, identifying fisheries' profitability using value-chain analysis is crucial for restructuring fisheries, improving livelihoods, ensuring resource sustainability, and understanding financial performance among different actors (Asiedu et al., 2022).

The most traded food items both in local coastal areas and worldwide are fish-derived products (Crona et al., 2015, Asiedu et al., 2022). Over the last three decades, the international trade of fish and fisheries products has increased by from 8-58 million tonnes per year and its value has increased dramatically from USD62-USD129 billion in less than a decade (Crona et al., 2015). Capture fisheries in particular are a greater contributor to national economies, GDP, foreign currency, and government revenues through international trade and cooperation (de Graaf & Garibaldi, 2014).

However, although fish, especially small pelagic species from SSF, are crucial to the GDPs of low-income coastal countries, there are still difficulties across the entire value chain that limit trading opportunities and international market value (Asiedu et al., 2022, Gardner et al., 2017).

Tietze (2016) asserts that many African and Asian countries are increasing exports of high-demand species to wealthier Asian countries and the European Union, while the domestic marketing and utilisation of fish is decreasing. Exports benefit the producer countries but not the fishing communities due to competition and market diversification. Gardner et al. (2017) argues that the increase in exports is due to the introduction of new export markets in developing countries which has led to many fisheries changings in recent decades from being subsistence to market-oriented.

In Angola, exports of high-quality seafood products such as prawn, shrimp, and crab are directed mainly to Europe (and Portugal and Spain in particular) (FAO, 2018). However, the volume of exports is still very low, creating an imbalance in transactions. For example, as **Figure *2.2*** shows, from 1990 to 2012 the investments made to import low-quality fish and fish

products have risen from USD50 million to 250 million, while the revenues from exports have remained almost the same at around just USD12 million a year (FAO, 2018).

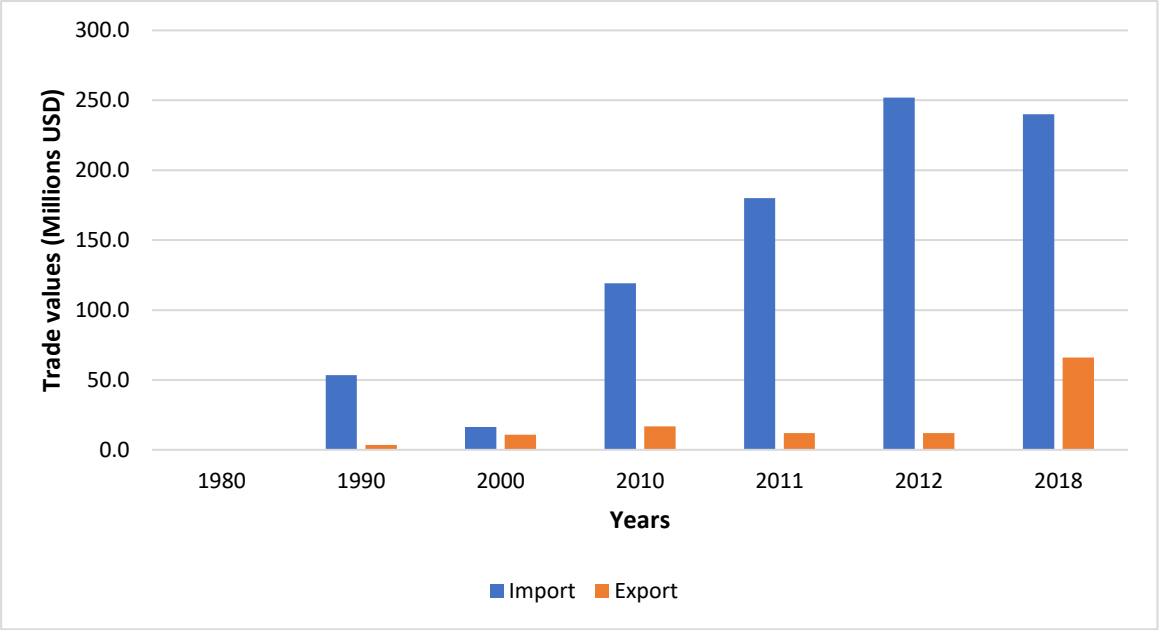

Figure 2.2. Angola's fish importation and exportation (source: FAO, 2018; PRODESI, 2021; MEP, 2021).

The current data in **Figure *2.2*** shows that while imports investment has also increased, except for a small drop from 2012-18, exports have significantly increased.

According to FAO (2014), small-scale fishers have not been sufficiently incorporated into regional and national trade by governmental institutions, which provide most support and economic opportunities to the industrial sector, despite all the efforts made by the artisanal fishery stakeholders to maximise the economic benefits from catches of high commercial value species. Furthermore, while the contribution and proportion of the industrial fishery in Angola are well known, the participation of SSF and the aid provided to this sector is still unclear (FAO, 2023a). Therefore, it is recommended that through ethical fishing, post-harvest practices and legislation, small-scale fisheries and value chain stakeholders can try to ensure the equitable distribution of the advantages of international commerce (FAO, 2015).

2.5.3.1 Exploitation of crustaceans and its importance for exports and national revenues

Crustaceans constitute an important source of revenues and therefore livelihoods, and are a great contributor to economic development in many developed and developing countries worldwide as they are among the most valuable seafood exports (Bondad-Reantaso et al., 2012). Crustaceans can be caught using a variety of types of fishing gear (Gardner et al., 2020), however otter trawl on commercial vessels and traps on artisanal boats are the most

widely used (Penn et al., 2019). Some of the most highly valued species in the market are demersal crustaceans, with lobsters and prawns being the most prized wild fishery products, and these are heavily exploited by towed gears throughout the world due to their high protein content, meaning they need active management (Vasilakopoulos et al., 2018, Penn et al., 2019).

However, Penn et al. (2019) argues that although from 2010 to 2016, the number of catches reported by the FAO only marginally increased, reaching nearly seven million metric tonnes, crustaceans caught in shallow waters have low economic value due to their immature growth. Meanwhile, crustacean farming and international trading have surged, with tiger prawns and Pacific whiteleg prawns dominating 75% of trade as aquaculture production reached nine million tonnes in 2018, with whiteleg accounting for over half (Albalat et al., 2022).

Crabs constitute a regular source of food and are farmed around the world, including in Asia (Vietnam, China, Thailand, Indonesia, Malaysia, Taiwan, and the Philippines) (Niswar et al., 2018; Shelley, 2008) and Africa (Churchill, 2003; Moksnes et al., 2015); however, wild catch by trapping is simple and labour efficient, with low injury risk, and is used with other methods including trawling, tangle netting, dredges, trotlines, and drop/ring nets (Penn et al., 2019).

In Angola, the industrial sector targets shrimps, lobster, crab, and prawn, while artisanal fishers mainly exploit spiny lobster (Sumaila et al., 2005; FAO, 2018). Currently, crustaceans, together with frozen fish, also constitute one of the major marine products being widely exported to Europe with considerable amounts of high-quality shrimp, prawn, and crab accounting for 78% and 75% of total global fish import value in 2014 and 2015, respectively (MINPESMAR, 2018).

As **Figure *2.4*** shows (OEC, 2021), importers also include Southern African countries. Furthermore, Jonico (2004) states that some crustacean species presented in **Figure *2.3***, including deepwater rose shrimp have been exploited in fishing communities, mainly by industrial vessels; indeed, this species contributes around 50% of the Angolan Fishing Ministry's annual budget through export taxes.

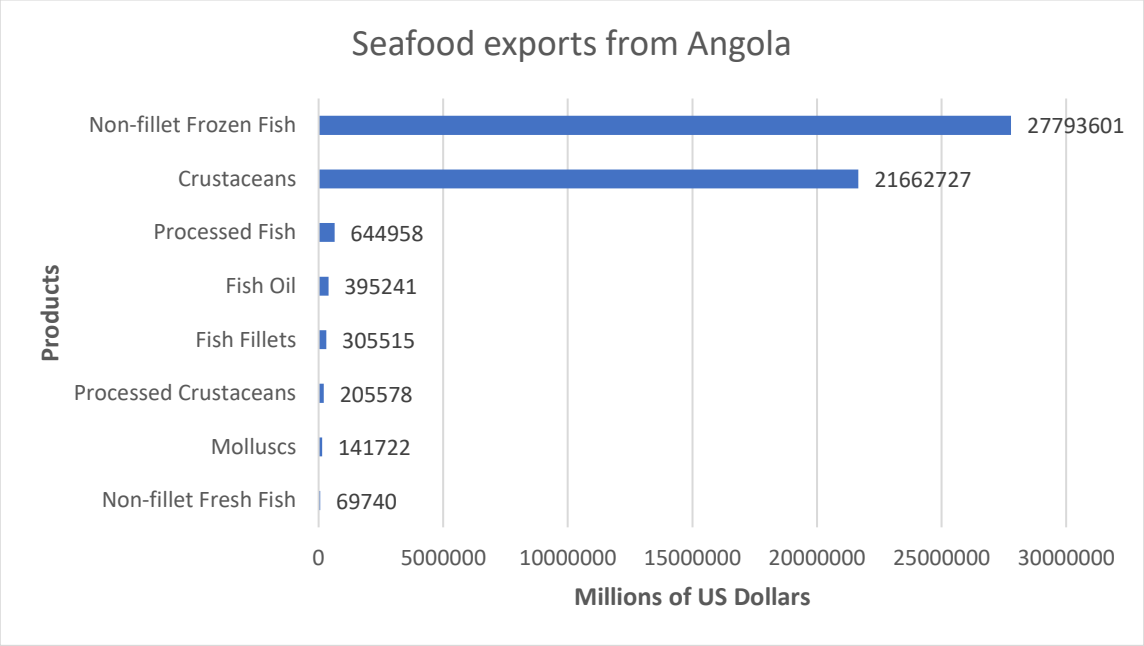

Figure 2.3. Export values of seafood in USD from Angola to countries worldwide (Source: OEC, 2021).

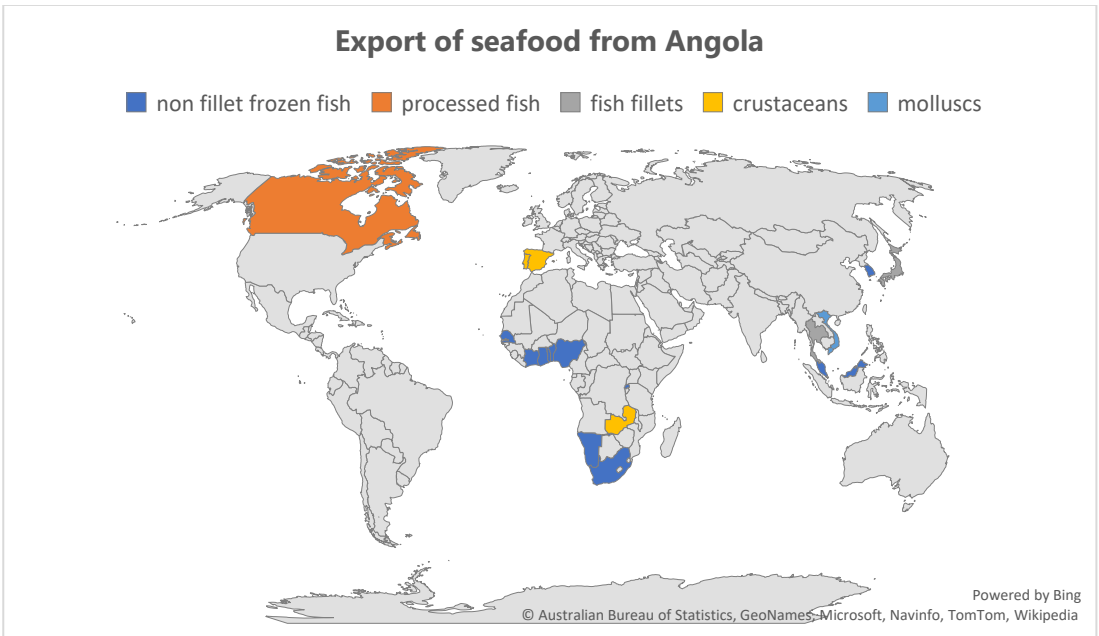

Figure 2.4. Map of importers of seafood products from Angola (Source: (OEC, 2021).

As well as being widely consumed in Angola, crustaceans including shrimps, lobsters, and crabs are served in different ways throughout the country (Reksten et al., 2020). Most Angolan restaurant menus include crustacean species from the Decapoda order such as the deep water rose shrimp (Ferreira et al., 2015). One reason why shrimps are a good food source and widely commercialised is that their size combined with their anatomy allows them to be easily processed (Provenzano Jr, 1985). However, although deep shrimp fishing remains very important in Angola, there are few studies about this category of seafood (Jonico, 2004).

2.6 Women´s participation in small-scale fisheries value chains

Women's labour is often obscured in studies because a large portion of the literature on fisheries focuses on fishers rather than onshore processing (where women are largely employed) (Belton et al., 2022). Many studies, however, evidence that women dominate the processing and selling, while the fishing process is widely dominated by men. Harper et al. (2012) asserts that women are often in charge of the financial aspects of fishing, including record-keeping and negotiating prices while registering increases in the value of products, with good net returns. However, although even in wealthy nations women own far fewer boats than men do, including in other sectors where they are more prevalent, many boats are owned by women fishers alone, and many are co-owners, often with husbands or partners (Gerrard & Kleiber, 2019).

Worldwide, the number of women involved in seafood markets is close to 45 million, representing nearly 40% of the total in this industry (Lozano et al., 2018; FAO, 2023b). The global post-harvest sector employs more than 20 million people, and is predominantly female (Lozano et al., 2018; Asiedu et al., 2022).

Women play a crucial role in West African fisheries, providing monetary credit and maintaining patron-client ties. They contribute to household income and food security by distributing fish and performing supporting tasks like supply and equipment maintenance (Harper et al., 2012). In Angola, similar to other parts of the world (and especially other developing countries) the fish trading market is dominated by women, who tend to be less involved in actual fishing and more in aquaculture, processing, and retailing (Weeratunge et al., 2010; Asiedu et al., 2022). It is estimated that more than 90% of the women employed in the fishing sector work in the post-harvesting subsector, and nearly the retailing sub-sector is almost exclusively made up of women, as is the case in other Southern African countries (de Graaf & Garibaldi, 2014) such as the Republic of Congo, where women represent around 90% of fish traders (Harper et al., 2012). Processing activities include salting, smoking, and sun-drying fish of all sizes, and processing fish of second-grade quality (FAO, 2018).

In Angola, women are not directly involved in fishing activities, but as explained above, they dominate the retailing and processing segments of the artisanal seafood sector not only in Benguela province but also elsewhere in the country (Sowman and Raemaerks, 2018). Women retailers also contribute to the household economy since many fishers depend on their spouses to transport fish to the market and generate income and revenues. Furthermore, many households are headed by single women retailers and rely almost totally on them for their livelihood (FAO, 2018).

These women´s roles, however, are frequently ignored in management and policy formulation due to misconceptions based on traditional gender roles in societies and the definitions attributed to fisheries, and although women are gaining more space in fisheries science and management, men still hold the majority of high-level posts (Harper et al., 2012). Indeed, de la Torre-Castro et al. (2017, p.1) found that "*management was found to be strongly androcentric, revealing a deep gender inequality*" in some east African countries. Most of the neglected women within the SSF sector are single, divorced, widowed, or mothers who are separated – these women are numerous in African countries (Medard et al., 2002).

It is claimed that similar to other regions of the country, the reasons why women do not go fishing seem to be linked to cultural behaviours. According to Nzatuzola (2005), in Angola women are not allowed to participate in many activities and "*women working in the informal sector are concentrated overwhelmingly in retail trading*" (p.110). This statement is in accordance with other researchers' findings regarding women elsewhere in Africa, such as in Kenya, where fishing "*is primarily a male activity, where women's low participation in fishing activities is in part influenced by the dominance of the Muslim faith*" (Wamukota et al., 2015, p.3).

Due to these cultural values through which women seem to be playing a secondary role by helping men in domestic affairs, even in countries such as the Comoros where women are dedicated to fishing, their role and contribution to the sector is still minimised or neglected by local governments and authorities, and by researchers (Williams et al., 2006; Hauzer et al., 2013).

Wamukota (2020) argues that the interaction between fishers and traders, as well as socioeconomic conditions and resources, are among the various elements influencing the prices that fishers and traders charge. Therefore, it can be concluded that retailers (many of whom are women) act as intermediate negotiators, thus playing a central and crucial role in influencing prices (Mignot et al., 2012). In Angola, fishers rely greatly on them and on other family members to sell the landings, similarly to other markets (Faria et al., 2021) but also in some African countries fishers "*are unable to generate wealth from fisheries due to limited*

market access and exploitative relationships with trading actors" (Wamukota et al., 2015, p.2), specifically women who dominate this process.

Furthermore, it is very difficult to identify specific, exclusive difficulties that women and youth face within the SSF sector because many of these problems arise due to common issues affecting societies in general (Arulingam et al., 2019). However, discrimination and lack of empowerment have been cited as amongst the most common problems faced by women and youth within the artisanal fisheries sector (Sowman & Raemaekers, 2018). Thus, it is necessary to empower both women and young people in this sector.

Currently across Angola, the number of people involved in SSF sector is known to be around 150,000 (PRODESI, 2021; MEP; 2021) most of whom are fishermen. However, the number and social profile of women engaged in retail and fish processing, and their exact roles and the contribution to the local economy is still poorly described. Recent data points out that "*around 60,000 persons were estimated to be engaged in fisheries activities in 2019. In the inland sector, with approximately 20,000 people engaged, women, made up 8 percent of the total*" (FAO, 2020, p 2). These facts support Harper´s (2012) assertion that even though women depend on fishing for a living and a means of life, they are still excluded from fishers' financial and training organisations and key decision hubs, perpetuating their socio-economic situation.

2.7 Management and governance of small-scale fisheries

2.7.1 Governance of small-scale fisheries

It is argued that "*governing fisheries for sustainability is a challenge the world over*" (Preez, 2009, p. 19). Therefore, it is suggested that the Departmental Cooperation-Based Model of SSF Governance is essential for achieving output goals which can improve coordination, predict challenges, reduce costs, and address concerns (Xiong et al., 2022). In addition, several fisheries policy frameworks are currently being adopted for the governance and management of small-scale fisheries worldwide, and to improve food security, reduce poverty, and contribute to sustainable development goals especially in developing countries. For example, the *FAO Voluntary Guidelines for Sustainable Small-Scale Fisheries in the Context of Security and Poverty Alleviation* are aligned with the *United Nations 2030 Agenda for Sustainable Development*, *SDG14*, and the *2022 International Year of Artisanal Fisheries and Aquaculture* which aims to highlight the importance of small-scale fishers, farmers, and workers in food security, nutrition, and poverty eradication (Xiong et al., 2022). McClanahan et al. (2015) suggests that the Conflict, Food Security, and Vulnerability Framework can be used to assess the current condition of the world's marine fisheries by focusing on three key components: exposure, sensitivity, and adaptive capacity. The degree of stress on sensitivity, and social adaptability of the fisheries system all impact on vulnerability; sensitivity refers to

how dependent humans are on marine resources for sustenance, income, and other needs; exposure describes the size, frequency, duration, and spatial extent of climatic and human disturbances; and vulnerability is influenced by adaptive capacity. Therefore, according to this author´s ideas, a vulnerability framework can be used to assess food insecurity to manage fisheries from a food security perspective.

For the preservation of biodiversity, marine protected areas (MPAs) have increasingly been implemented around the world as part of an ecological approach (EA) because they involve spatial-temporal fishing closures (FAO, 2011). MPAs are used to safeguard maritime ecosystems and stop habitat loss, and the Code of Conduct for Responsible Fisheries suggests some concrete management procedures to reduce waste, discards, bycatch, and adverse effects on non-target species, especially endangered species. The ability of MPAs to achieve sustainable fishing is acknowledged by the FAO's technical standards (FAO, 2011).

All the frameworks mentioned above are appropriate to the Angolan context and MPAs are already in place, although the extent to which the SSF guidelines and the vulnerability framework are applied is unclear.

Angola, Namibia and South Africa, which control the majority of the marine fisheries potential among the SADC region, are parties to both international and regional protocols, such as the New Partnership for Africa´s Development (NEPAD) Comprehensive Africa Agriculture Development Programme (CAADP) and the SADC´s Food Security Strategy Framework, in which the achievement of food security is one of the key features; "*fisheries are also included in both NEPAD and SADC´s food security objectives*" (Sowman & Cardoso, 2010, p.1163). However, the countries apply these protocols slightly differently; for example, small-scale commercial line fish operations are supported in Namibia, Angola recognises both subsistence and artisanal fishers, and South Africa has legal protections for subsistence fishers under tight conditions.

Another existing sub-Saharan organisation is the BCC, which provides a legal framework to support integrated administration, promote sustainable growth, and safeguard the ecosystem and environment of the three countries comprising the Benguela Current Large Marine Ecosystem (BCLME), namely Angola, Namibia, and South Africa (Cochrane et al., 2009; Hutchings et al., 2009; Harris et al., 2012). Despite all this, the fact that artisanal fisheries in Angola were until recently largely informal presents a significant governance problem (Preez, 2009).

2.7.2 Management objectives and strategies for the sustainable development of SSF

Well managed fishery policies can drive the rebuilding of overfished stocks and boost long-term wild fisheries food output. Governments need to implement reforms for maximum sustainable yield (MSY) and quotas or adopt enhanced management for fisheries with high costs (Costello et al., 2020). Additionally, the management of wild fisheries needs to be improved, mariculture policy needs reform, feed technology advancements need to be made, and demand needs to change (Costello et al., 2020). Furthermore, in achieving food security and sustainability, and tackling poverty some proactive and adaptive fishery management strategies can also reportedly boost worldwide revenues, harvest, and biomass by 154%, 34%, and 60%, respectively, as well as gaining advantages from addressing range shift and productivity adjustments (Gaines et al., 2018). It is important to note, though, that controversy in defining SSF may impede its effective management (Xiong et al., 2022).

Amongst the most common pro-active management measures is the "spawn-at-least-once" approach, according to which fish can only be caught with commercial gear after spawning, which ensures sustainability (Myers and Mertz, 1998). Not all fish species need to be conserved for sustainability (Vasilakopoulos et al., 2011). Traditional fisheries management is based on patterns of overfishing and the use of gears that keep large fish while ensuring that sufficient numbers of juveniles are left to breed long-term. In addition to various existing management policies and strategies worldwide, the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication recommend that: (1) to ensure ecological food production, states and fisheries management should adopt long-term conservation measures; (2) balance rights and obligations, and involve local communities in management decisions; (3) monitoring, control, and surveillance mechanisms should be implemented, along with participatory techniques like co-management; (4) promoting ethical fishing and safeguarding small-scale fishing communities' tenure rights is crucial; and (5) states should cooperate to prevent resource overuse and overcapacity (FAO, 2015).

From these FAO recommendations, it is worth highlighting co-management defined as "*the control and organization of something by two or more people or organizations together*" (Cambridge English dictionary, 2023: online). A general definition of co-management is that it is an agreement between fishing communities and the government, involving organizational and institutional arrangements to share management responsibilities. (Nielsen, 2004)**.** Co-management methods in SSFs can facilitate collaboration between stakeholders if supported by institutional assistance and funding and by integrating labour, capital, and equipment for fishing that can improve fishers' feelings of community and social responsibility, while lowering operational costs and allocating resources effectively (Xiong et al., 2022). Co-management

can also empower women by involving them in policy decisions – and having women as decision-makers is crucial for environmental policies and fisheries programs (Harper et al., 2012) promoting poverty reduction and food security. This author also states that rural African women tend to excel in organising, collaborative training, and monitoring climate change impacts, contributing to policy development and achieving MDGs and poverty reduction.

Nonetheless, many small-scale fisheries worldwide are still managed through non-participatory, centralised management systems which negatively impact traditional fishing techniques (FAO, 2023b). Modern/top-down fisheries management strategy prioritises conservation and resource biology, with little participation from fishing communities themselves, having resulted in an overexploitation of fish resources, with many stocks collapsing due to obstacles between administrations and communities (Nielsen et al., 2004).

2.7.3 Development and support programs - *the role of* cooperatives

Fishery cooperatives are common examples of cooperative strategies and are essential for the sustainable management of small-scale marine fisheries as well as to eradicate poverty and increase wealth (Unal and Yercan, 2006, Basurto et al., 2013, Finkbeiner, 2015). Fishery cooperatives emerged because the low involvement of fishers in decision-making had resulted in poor fishing management, and thus, slow progress in marine resource conservation (Garza-Gil et al., 2020). Furthermore, fishery cooperatives are a common self-governance strategy for small-scale fisheries worldwide which are more likely to emerge in isolated communities requiring collective action (Basurto et al., 2013). Therefore, many strategic programs are described as having the potential to enhance the sustainable development of small-scale fisheries, especially in developing countries. According to Garza-Gil et al. (2020), in fisheries with a tradition of collective action, as is typically the case in SSF, it should be simpler to implement co-management strategies because it involves local governance, enabling efficient and equitable resource management. Examples in different parts of the world show that institutional support has led to the successful evolution of effective fishers' cooperatives; for example, Sapovadia (2004) declares that cooperatives, which were created in the 1800s, serve both deprived and wealthy people worldwide, with fishery cooperatives playing an important part in socioeconomic growth. In some Latin American and African nations "*state initiatives have also promoted cooperatives' productivity through subsidies and infrastructure investments*" (Lozano, 2018 p 78), and IFAD (2021) reports that participatory methods and cooperatives have enabled aquaculture and fisheries communities' legalisation and training, as well as meeting goals for business skills, climate change, and cooperation - although its final outcomes are still awaited.

There are many advantages for stakeholders to be part of fishery cooperatives in which, according to Basurto et al. (2013), individuals work together to organise and allocate the expenses related to capturing or marketing, to formalise agreements between active members, and facilitate access to fishing assets. Fishing cooperatives also increase the participation of women in SSF (Harper et al., 2012). Furthermore, other studies have reported that cooperative work gives fishers many advantages such as experience exchange, motivation, financial support, generational inheritance, fishing quality (Freudenberg & Arlinghaus., 2008) as well as positive results in fighting illegal fishing in co-managed fisheries (Romero et al., 2022).

These and other advantages have led to the identification of cooperatives as a viable management strategy for Angolan artisanal fisheries through the strengthening of bottom-up policies; however, given Angola's rocky governance history, it is difficult to realise the promise of these management frameworks (Preez, 2009). Nonetheless, studies show that uncertainty can be relieved by diversification, via inner enforcement, supervising, and contest solution schemes within small-scale fishing cooperatives (Finkbeiner, 2015).

Angolan law determines that fishers must legally be organised in cooperatives and/or associations for them to receive financial and technical support from government institutions and their partners (FAO, 2018; du Preez, 2009). Similar situations are observed in other countries worldwide, where a cooperative must be formed to support small-scale stakeholders in the agriculture and fishing industries (Hanh et al., 2016). For these reasons, thousands of artisanal fishers are members of hundreds of cooperatives and associations around the country, benefitting not only fishers but also processors and retailers, especially women. Women have been assisted by a number of fish cooperatives and associations in establishing mutual-aid cooperative thrift organisations which can safeguard their income and offer loans when necessary (Pryck, 2013).

2.8 Barriers to artisanal fishery's sustainable development

2.8.1 Overexploitation

Despite the benefits that marine small-scale fisheries can provide to thousands of millions of individuals worldwide (Lawal et al., 2016; Asiedu et al., 2022; FAO, 2023), numerous obstacles and challenges undermine sustainability and expansion, including excessive exploitation (FAO, 2015, Cañete et al., 2022). In fact, fishing industry expansion in the past four decades has resulted in the overexploitation of resources and damage to habitats and ecosystems (FAO, 2015). Among other species, overfishing threatens Greenland halibut, Atlantic bluefin tuna, cod stocks, and the common skate from the Irish Sea (Myers and Mertz, 1998).

Overexploitation is also fueled by the use of aggressive fishing gear like beach seine, which has been controversial due to its small catch (Asiedu et al., 2022; Kraan, 2009). Despite being prohibited in many countries, beach seining still accounts for 30% of fish landings globally due to climatic variations like falling water levels (Cetra & Petrere Jr, 2001). While some argue that, for the conservation of inshore and demersal biodiversity, beach seines must be banned (Stergiou, 1996), others, such as Hutchings et al. (2002), support their continued use subject to some conditions. These include a requirement for information on the demographics and economic situation of the current permit-holders, their attitudes towards management regulations, and their perception of the resource base be in place prior to any new net permits are distributed. Therefore, more recently it has been argued that measures to allow beach seines to be used effectively could be expensive, requiring vessel upgrades and increased costs, including fuel (Silas et al., 2020) which is linked to the use of more aggressive and less passive gear (Pauly, 2018).

In connection with fuel and inappropriate fishing gear, overexploitation can also be provoked by high market demand, which can endanger the long-term viability of fisheries assets, food security, and nutrition; overexploitation can also occur through advances in equipment and technology to problems in fisheries (e.g., by-catch) but which also have adverse repercussions (Cañete et al., 2022). Thus, according to FAO (2015), it is recommended that adequate fisheries management procedures are in place, and to steer clear of financial and policy initiatives that could encourage overfishing and resource overexploitation, both of which would be detrimental to small-scale fisheries. Despite the efforts of many academic, governmental and non-governmental institutions to tackle overexploitation, in-depth research is still required on how to encourage the sustainable utilisation of important fishery populations worldwide (Vasilakopoulos et al., 2018), with research highlighting the benefits of increasing awareness and support for diversity in SSF systems, which play crucial roles in families, communities, and nations, in contrast to industrial fisheries that can undermine cultural integrity, equity, nutritional security, and livelihoods (Short et al., 2021). Therefore, because current fisheries policy prioritises profit or productivity, reorienting consumption towards efficient, fair distribution could be a way of eliminating nutrient gaps in critical locations such as West and Sub-Saharan Africa (Hicks et al., 2019). Therefore, longer-term action to address power inequalities, constrain monopolies, and support diverse SSFA capacities are essential along with scaling approaches and policy understanding (Short et al., 2021; Hicks et al., 2019).

Despite Angola's location alongside the BCLME, the socio-economic importance that artisanal fisheries have for its population, and its government's efforts to tackle poverty through fishing activity, overexploitation can still undermine current programs and projects (Sowman & Cardoso, 2012; FAO, 2020a).

2.8.2 Poor infrastructure and lack of investment

Small-scale fishers, especially those in developing countries, face economic challenges, limited market chain infrastructure, food safety and processing issues, post-harvest losses, challenges in fishing due to distances and road accessibility, and a lack of equipment, ice, post-harvest protection, capital, and loan collateral, all of which hinder their success (Onyango, 2011; Olaoye et al., 2017; FAO, 2023b).

Therefore, infrastructural improvements can impact fishing operations globally, leading to competition or cooperation between small-scale and large-scale industries, such as tourism, aquaculture, agriculture, energy, mining, and other industry, which often hold greater political or economic significance (FAO, 2015). Hence, in order to assist the small-scale fisheries post-harvest subsector to generate superior and secure fish and fishery products, for both export and domestic consumption, in an environmentally conscious and sustainable way, states should promote, facilitate, and supply investment in suitable infrastructures, organisational structures, and capacity growth. (FAO, 2015).

Due to the long civil war, Angola's economy declined, infrastructure was destroyed, government systems were weakened, society was polarised, four million people were displaced, poverty increased, and a precarious political system led to the commercialisation of SSF marine harvests in poor local markets (FAO, 2023a).

Limited fish handling knowledge and poor processing undermine small-scale fisheries benefits, causing massive significant losses, insanitary treatment, and low-quality fish for local sale (PRODESI, 2021). The Angolan government's 2003 micro-credit system, involving 10 Centres for Support to Artisanal Fisheries, has proved ineffective, potentially leading to unsustainable fishing overloading and overproduction in seven provinces (Pauly et al., 2003; Sowman & Cardoso, 2010). Each centre is provided with landing facilities, docks, and fish processing and cooling areas (FAO, 2018). More recently, the country benefited from foreign investment in the development of a fisheries educational and technical school in the Namibe province to promote the growth of the fishing industries, enhance community participation, and achieve sustainable fish production, market infrastructure and organisational capacity at provincial and local levels as well as extension services (FAO, 2023a).

Fishers, retailers, and processors are also exposed to hazards highlighted by Olaoye et al. (2017) including extreme weather, poor tools, primitive processing methods, physical and psychological violence, and poor body posture (FAO, 2018). Even though they pay daily fees which should be enough for the authorities to provide basic work conditions, similar to other developing countries in Angola this does not result in appropriate and safe work conditions (Williams et al., 2006).

Financial support is considered a key determinant for the acquisition of many inputs in fishing and related activities, but the lack of investment in this segment is evident not only in Angola but also in other parts of the world (Rahman, 2006). This absence of financial programs for the artisanal sector has led to low profitability and the conclusion that any improvement in the situation requires "*credit and loan facilities be provided with no collateral and at very low interest rates*" (Olaoye et al., 2017, p.1).

According to Pauly (2018), artisanal fishers, especially those exploiting crustaceans, require financial support for their environmentally friendly practices as they provide more animal protein and micronutrients for local markets in rural areas using less fuel than industrial fishers.

Research indicates that **fuel support** is among the largest forms of support to fisheries due to its importance and influence in fishing operations costs globally (Cheilari et al., 2013; Moerenhout, 2019). Therefore, it is crucial that this sector benefits from subsidies for fuel acquisition, and in Angola the government should urgently define, approve, and implement fuel subsidies for artisanal fisheries having announced the intention some time ago (Africa Press, 2023). To reduce the costs of fishing, different models could be adopted to the Angolan reality considering that the country is one of the biggest crude oil producers worldwide (Silva, 2020). Therefore, it seems that the best model would be "*fuel subsidies (with different degrees of scope), while others propose to exclude some forms of support, like "fuel de-taxation schemes""* (Moerenhout, 2019, p.2).

However, over the past decade Angola's fuel prices have increased four-fold due to government subsidies to cover inflation and currency devaluation (BNA, 2020) with more predicted price increases coming soon (Africa Press, 2023). The necessary implementation of fuel subsidies in the fishery sector must therefore be preceded by cautious analysis to prevent environmental and ecological issues (Pauly et al., 2003). Furthermore, investing in subsidies for fuel also implies investment in innovation, which is argued to be crucial to tackling climate change (Lebel et al., 2021), but this can be difficult to achieve in developing countries.

2.8.3 Literacy levels

Many studies have discussed whether literacy is a barrier to participation in artisanal fishing activity. Pollnac et al. (2001) argues that low literacy levels among small-scale fisheries can have consequences linked to limited job opportunities within non-fishing sectors, lack of management skills, and difficulties in learning new activities. However, Maddox (2007) indicates that subsistence through fishing is not dependent on an individual's education but rather requires the ability to learn and adapt.

Because of their poverty, fishermen may have lower literacy rates than the broader population, but in comparison to their agricultural counterparts, some fisher communities in Africa and South Asia have greater literacy rates as poor school enrolment is sometimes offset by long-standing literacy practices (Maddox, 2009). However, low literacy, alongside poverty, cultural and religious beliefs, and poor governance, may hinder understanding of the links underlying human activity and asset conditions, undermining management programmes that limit or regulate resources (McClanahan et al., 2015). One factor that exacerbates low levels of literacy within fishing communities is that, due to the cost of education and lack of materials, young people in remote coastal communities may not enroll in school or complete their education (Maddox, 2009).

The United Nations Educational, Scientific and Cultural Organization (UNESCO) defines a literate person as anyone aged 15 years old or above who can read and write, and the rate of illiteracy in Angola is approximately 40% (UNESCO, 2014; INE, 2016). In Benguela 77.2% of men, and 44% of women are literate (INE, 2016). However, there is no available data for the SSF, and because they lack access to education, most people who work in the small-scale agriculture sector in Angola are illiterate (Vinevala, 2022).

2.8.4 Conflicts over fishing grounds and resources

Conflicts involving small- and large-scale fisheries are a problem in many coastal regions globally (Pauly, 2018). Disputes also occur in other industries, typically with more powerful political or economic influence, such as tourism, aquaculture, farming, power generation, extraction, industry, and infrastructure (FAO, 2015). Moreover, due to the cumulative impact of social, economic, and environmental factors, such as globalisation, population increase, trade, global warming, and loss of resources, SSF's disputes with large-scale fisheries and related sectors have worsened in recent years (Xiong et al., 2022). Additionally, small-scale fishing communities frequently experience disparate relationships of power in several regions of the world (FAO, 2015, Xiong et al., 2022).

Diedhiou et al. (2019) adds that the competition between SSF and industrial fishing reaches beyond fishing grounds and species, extending to other components of the value chain, including access to capital and conflicts between international partners. For example, there have been huge funding differences between the large- and small-scale sectors, with the former receiving USD25–27 billion and the latter just USD5–7 billion in recent years (FAO, 2023b).

The struggle between artisanal and industrial fisheries for marine resources can lead to overexploitation (Nataniel et al., 2021), and consequently, in both industrialised and low-income countries, overexploitation negatively impacts either industrial or small-scale fisheries'

entire value chains, resulting in significant losses (Anderson et al., 2015, Diedhiou et al., 2019). It has been argued that 90% of all fishers worldwide work in the small-scale sector, which provides most of the fish consumed in poor nations and 50% of the world's seafood, and that when compared to large-scale fisheries, small-scale fisheries contribute significantly more in terms of livelihoods and environmental value (Lem et al., 2012). In Angola, the reality is close to most of these global statistics but slightly different from the other BCLME countries, as the artisanal fishery sector appears to employ more people than industrial sector as shown in Table 2.2, but these statistics may not reflect the reality due to SFF data gaps in Angola.

Conflicts within the fishery sector can be classified into five types:(1) who controls the fishery; (2) how the fishery is controlled; (3) relations between fishery users; (4) relations between fishers and other coastal/riparian zone users; (5) relations between fishers and non-fishery issues (McClanahan et al., 2015).

Small-scale fisheries compete with large fisheries for catches as well as for development aid, as their existence is frequently overlooked, resulting in exponential overfishing due to disorganisation, resource degradation, and habitat loss (Pauly, 2018).

Conflicts between small-scale and industrial fisheries have been observed in many countries (DuBois & Zografos, 2012). In some African countries such as Senegal and Kenya which also have conflicts within the fishing sector, various approaches are taken. For example, while in Kenya there are conflicts between artisanal and recreational fishers (Kadagi et al., 2020), in Senegal artisanal fishers have conflict with industrial fishers in four areas (DuBois & Zografos, 2012, p. 1214), namely "*destruction of artisanal fishing equipment; gunwale-to gunwale violence; on-board non-violent conflict; and on-board violent conflict*".

In Angola only one type of direct conflict has been reported: collisions involving industrial vessels leading to the destruction of artisanal fishing gears and artisanal boats sinking (ANGOP, 2019). DuBois & Zografos (2012) explain that two methods to mitigate conflicts are used in Senegal - informal (direct negotiations between the two parts), and formal (both in court and by mitigation) while in Angola there is only one approach led by the Ministry of Fishery (ANGOP, 2019).

2.8.5 Lack of data on small-scale fisheries sector for decision-making and management

Xiong et al. (2022) argues that "*the data serve as the foundation for science-based fisheries management*" (p. 10). Other authors claim that in many countries of the world, including both developed and low-income ones, the collection and reporting of data in almost entire value chain of small-scale fisheries has been an issue affecting decision-making in policies aiming at food security and poverty eradication (Harper et al., 2012; Pauly, 2018; FAO, 2023b).

Data scarcity impedes the management and conservation of small fisheries around the world, and the paucity of data collection can lead to a knowledge vacuum, making science-based fisheries decision-making more difficult (Xiong et al., 2022). Previous work (Harper et al., 2012) declares that due to lack of quality data and managers' lack of expertise, social scientists' conclusions are frequently not taken into consideration when making policies and decisions.

In fact, as Pauly (2018) declares, most FAO member countries don't record catch data, as artisanal fisheries often receive little consideration during fisheries decision-making, an argument reinforced by Xiong et al. (2022), who states that SSFs in China have not received enough attention, and the general public's ignorance of them has marginalised them. This issue is made worse given that once artisanal, subsistence, discarding, and illegal catches were taken into consideration, Pauly (2018) found that the total yield of maritime fisheries grew by 50%.

It is also worth noting that, despite the importance of marine resources for food safety and enhanced nutritional outcomes, many countries are still unable to supply data regarding local food safety risks in relation to small-scale fisheries (FAO, 2023b).This lack of reported data, particularly from subsistence fisheries, is not limited to low-income countries, as with the exception of Finland, recreational fisheries are also not reported to the FAO (Pauly, 2018). However, Asia and Africa seem to be the regions of the world with the poorest level of data for most areas of small-scale fisheries, especially regarding gender; as a consequence, the absence of sufficient information regarding women's participation in SSF and the low presentation of small-scale fisheries in catch statistics make gender equality in fisheries difficult to ascertain, particularly in Africa and the Asia-Pacific area (Harper et al., 2012).

In Angola, like most low-income countries, the direct economic importance of the small-scale fishing sector for poor people has not been subjected to high quality studies (Béné et al., 2016). For this region, Sowman & Cardoso, (2010, p.1164) note that "*there is very little specific information on the small-scale and subsistence fisheries sector operating in the SADC* [Southern African Development Community] *coastal environment, nor its contribution to food and livelihoods of hundreds of coastal communities*". Online databases and articles consist of out-of-date, poor-quality data, usually from third sources. Furthermore, access to information from the Angolan governmental institutions in general, and local government in Benguela specifically, requires very formal procedures to be navigated, and the complex and often uncooperative bureaucracy makes the information, specifically for the artisanal sector in Angola, hard to find (Sumaila et al., 2005). Moreover, MEP (2021) states that the real status of Angolan marine fisheries cannot be thoroughly understood due the absence of statistical information on this sector, especially SSF.

2.8.6 Child labour within the fishery sector

The complex topic of child labour is a developmental issue worth investigating, and concerns exist that children are being exploited and coerced into labour while not obtaining critical development schooling (Abdul Hai, 2010).

Child labour is one of many violations of human rights prevalent within the SSF-sector in many developing countries and a factor undermining global efforts to eradicate poverty (Ratner et al., 2014). The number of children involved in labour globally is alarming, with an estimated 112 million children working in fishery and agriculture (Tindall et al., 2022). Even more alarming is that nearly 1.8 million children work in dangerous conditions, including trafficking and possibly slavery, especially in the private sector (Srivastava, 2011; Tindall et al., 2022). However, in many developing countries child labour has been subject to much discussion, partly due the importance of the contribution that younger members of poor families often make to the household economy (Bellwood-Howard & Abubakari, 2020), as some argue that "*child work is considered to be normal if the family does not have the means to provide the minimum dietary intake*" (Pinilla-Roncancio & Silva, 2018, p.981). It is estimated that about 30% of children in coastal areas worldwide engage in fishing, primarily due to low education, poor job opportunities, and development issues, rather than poverty (Abdul Hai, 2010).

Child labour in Angola is common, and is a clear consequence of the long civil war that led to high levels of poverty and unemployment (Allais , 2007). Coastal provinces such as Luanda, Namibe, and Benguela were considered safer than the inland provinces and the fishing sector constituted the easiest source of work and revenues for people fleeing war zones, including children (ANGOP, 2018).

According to the Children´s National Institute of Angola (Instituto Nacional da Criança-INAC) until 2016 nearly 1,200 child victims of coerced labour were reported (ANGOP, 2018). For example, in Luanda itself, the capital of the country, more than 25,000 children were found to be working daily for their survival, mainly in informal commerce (street and market vending), agriculture, car washing, fishing, shoe polishing, housekeeping, mechanics, and construction. This situation is common in big cities around the developing world where criminality is high, and children are exposed to violence (ANGOP, 2018). Furthermore, children involved in the fishery and aquaculture sectors globally are subject to discrimination and marginalisation and are greatly affected by rural migration, lack of funds, technical skills, and knowledge (Arulingam et al., 2019).

2.9 Key findings from the literature review

This chapter has analysed the literature on the socioeconomic importance of the small-scale marine fishing sector, focusing on developing countries like Angola. Marine seafood is vital for

human health, food security, and livelihood in developed, low- and medium-income countries. SSF seafood offers livelihood and employment for millions, particularly in isolated areas of low-income coastal Southern African countries. The main characteristics of SSF and their global variations were covered, including disputes over fishing grounds and management principles. Angolan legislation defines marine SSF, but lack of clarity in areas like boat size and engine presence hinder effective management.

Fish-derived products are the most-traded food items in coastal areas and worldwide. However, value chain issues limit opportunities for trading and international market value. In Angola, industrial fishery contributes to GDP via crustaceans' exportation, but the participation of the SSF sector in this is unclear.

The chapter found that quantifying post-harvest employment is challenging due to organisational solidification leading to poor descriptions of women's roles in retail and fish processing, their difficult socio-economic situations, and their exclusion from fishers, financial organisations, and decision-making hubs.

This chapter also reported that the sustainable governance of fisheries is a global challenge, with various policy frameworks being adopted to support small-scale fisheries, food security, gender equality, and poverty reduction. Proactive measures like "spawn-at-least-once" ensure sustainability, but non-participatory and centralised systems negatively impact traditional fishing techniques in small-scale fisheries worldwide. Fishery cooperatives are crucial to the sustainable management of small-scale marine fisheries, poverty eradication, and economic growth.

Many factors impede the sustainable development of SSF, particularly in Angola. Major barriers include overexploitation that can result from high market demand, technological advances, and environmental shifts. The lack of infrastructure improvement in Angola directly impacts fishing operations and has led to competition between SSF and industrial fisheries. Conflicts between the two sectors are common in coastal regions worldwide, with SSF often overlooked for catches and development aid. Greatly improved data collection and reporting in the SSF value chain is crucial for food security and poverty eradication. However, low literacy and management skills can hinder the availability of statistical data on marine fisheries in developing countries. Child labour is also a significant issue in SSF, as it violates human rights and undermines global efforts to eradicate poverty.

Chapter 3 – General field methods and materials

3.1 Introduction

This chapter describes the field survey performed to gather both qualitative and quantitative data, which was conducted between January and July 2018 in Benguela province, Angola, in order to answer the main research questions.

The field survey included natural and direct unstructured observations, questionnaires, and interviews to collect primary data, and grey literature. The field survey was initiated after situating the study area within Benguela province, according to the aims of the study, before planning specific activities to assess the fishing communities, fish trading and processing markets, as well as the restaurants and hotels serving seafood. As a requirement for mixed methods research (Creswell and Clark, 2017), both qualitative and quantitative data have been analysed and are presented separately through qualitative and quantitative methods, in Chapters 4 and 5 respectively.

The research methodology for this study followed the model shown in **Figure *3.1***, described by Saunders (2019) as the "research onion". The criteria selected for this study can be summarised as follows:

- Research philosophy – pragmatism
- Research approach – induction
- Methodological choice – mixed method
- Research strategy – in depth inquiry survey
- Time horizon – cross-sectional
- Data collection technique (research methods) – interview and questionnaire.

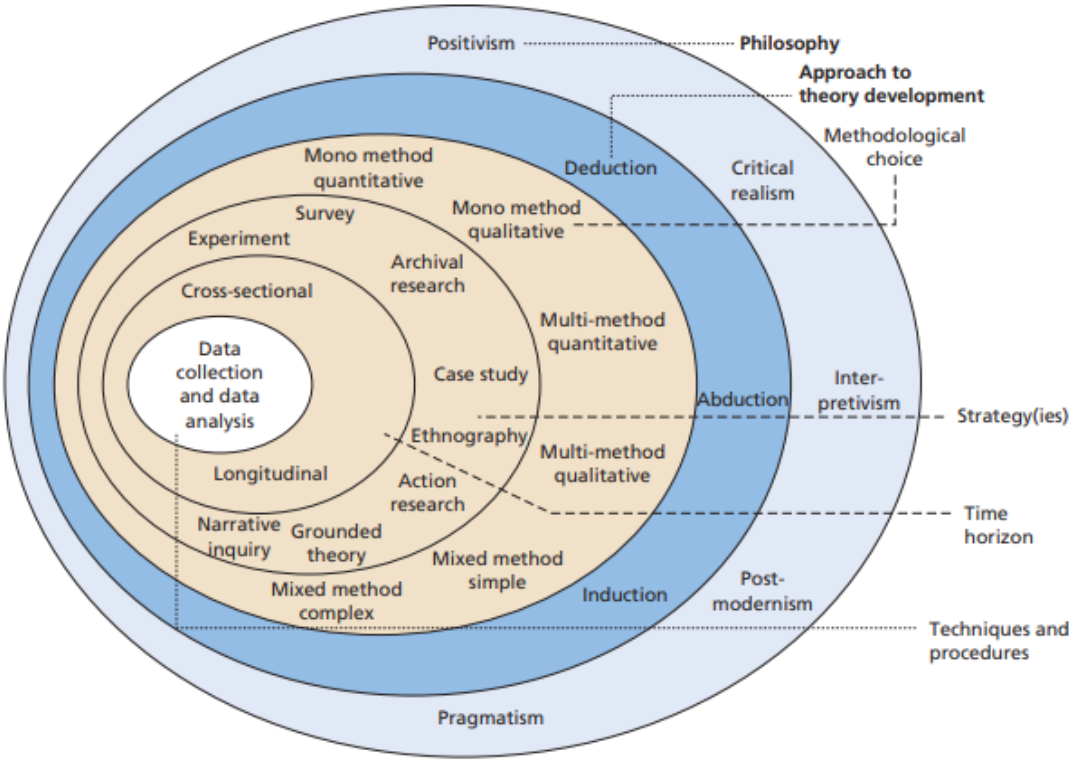

Figure 3.1. Model of the research methodology ("Research onion") adopted for this study. Source: Saunders (2019).

3.1.1 Research philosophy and approach

Due to logistical and financial constraints while planning the field survey, and the need to collect data from multiple sites, it was necessary to choose the most suitable methods and techniques to achieve useful primary data and scientific results. Thus, for an optimal research design and implementation, it was selected a research approach based on adaptation and pragmatism, as Creswell (2014) states that in social sciences, the philosophical basis for mixed methods studies emphasises focusing on the research problem before using pluralistic

approaches to learn more about the problem; therefore, I employed all methodologies available to understand the problem rather than concentrating on methods, using exploratory, inductive, purposive, and interactive mixed qualitative methods. Aiming to contribute practical solutions that inform future practice, a pragmatist starts research with a problem (Saunders, 2019). Therefore, the chosen research approach for this study is induction.

3.1.2 Methodological choice

Semi-structured interview guides and structured survey questionnaires were used in this study as a part of a mixed-method research strategy for the collection of both qualitative and quantitative information. The guiding methodology for this survey was the use of an inductive and pragmatic philosophy in order to develop a new or change an existing theory, which can then be verified using additional information. Therefore, new data were gathered to investigate and describe the dynamics of the artisanal fishing sector in Benguela province. As has been recommended, by following a pragmatist approach (Saunders, 2019), this research started with the identification of a problem, and sought to provide useful solutions that can influence current practise within the entire artisanal fishery sector values chain in Benguela province.

3.1.3 Research strategy

According to Denscombe (2010), a strategy is the outline of a plan to act in order that a designed purpose is reached. Therefore, we can define a research strategy as the plan for the application of research methods to answer the research questions.

Due to the lack of prior studies undertaken for Angola and the scarcity of scientific information on this country, I elected to use both archival and documentary research (grey literature) and survey research, which are often linked to a quantitative research design, but also ethnography and narrative inquiry research strategies which are associated with qualitative study. All these choices were made because this study applies both qualitative and quantitative data collection by employing mixed research methods.

3.1.4 Description of the study area (setting)

Benguela province in Angola covers a total area of 39,827 km^2 which is equivalent to about 3.19% of the country's territory. Its population is approximately 2.3 million people (55% women) (Instituto Nacional de Estatísticas [INE], 2016), corresponding to approximately 9% of the country's population. Composed of ten municipalities which include 31 communes (GPB, 2016), it is estimated that close to 70% of the population of the province is concentrated in the four coastal municipalities, namely Baía-Farta (South), Benguela and Catumbela (Centre) and Lobito (North) as shown in **Figure 3.2**. They are situated for 250 km along the Southeast Atlantic coast, from the Tapado River mouth in the north to the Catara River in the south, forming borders with Cuanza-sul and Namibe provinces, respectively. Around 37% of this

population live rurally, while 63% are in urban areas. The most populous municipality is Lobito, with about 845,000 citizens, followed by Benguela with about 747,000 people, as **Figure 3.2** shows.

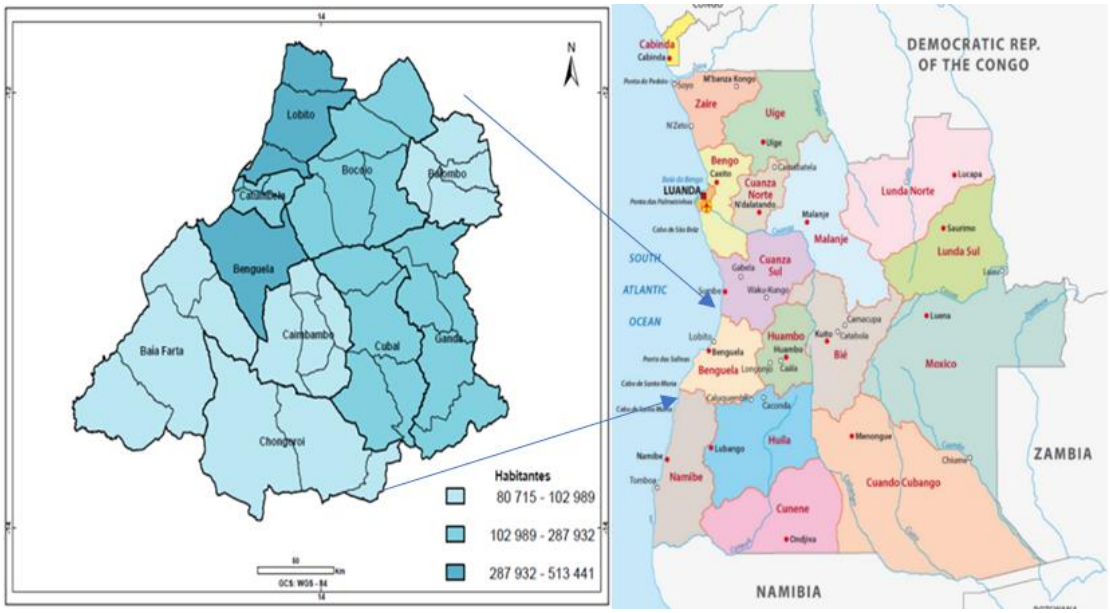

Figure 3.2. Maps of Benguela province (left), and Angola (right) (Source: INE, 2016; angolaprovinces.png (worldatlas.com)).

Benguela province is drained by watercourses that are confined to four hydrographic basins, namely Cubal, Hanha, Catumbela, and Coporolo, as **Figure *3.3*** shows, which support a vast biodiversity and flow through valleys important for agricultural activity on the coastal strip; Canjala, Hanha, Cavaco and Dombe-Grande (Henriques et al., 2012; GPB, 2016). As has been observed, "*these rivers are also an important source of nutrients and suspended matter to the coastal and marine environment*" (Ukwe et al., 2006, p.388). Examples are in the regions of Benguela municipality and Egipto Praia commune, where the Cavaco and Balombo rivers flow.

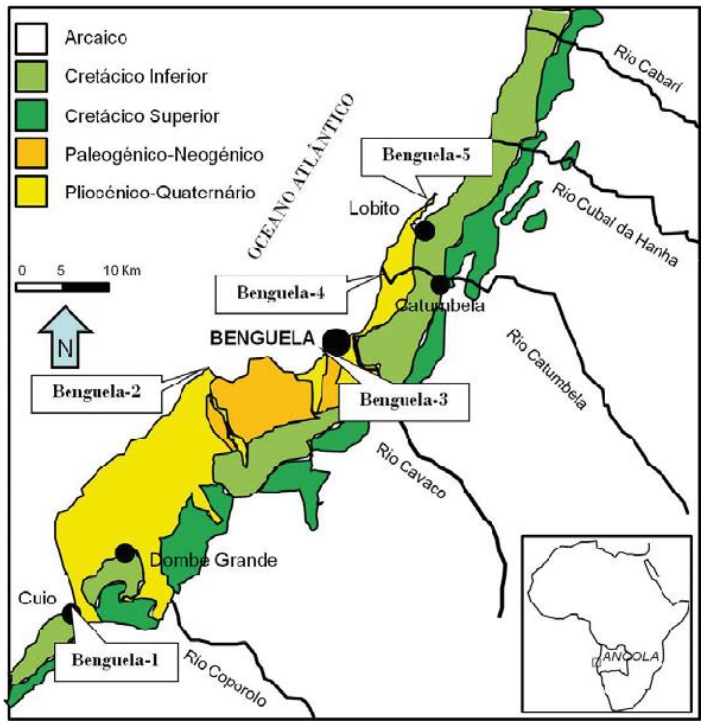

Figure 3.3. Map of the four hydrographic basins in Benguela province. Source: Henriques et al. (2012).

Benguela province, along with Namibe, is situated in the most productive fishing zone of Angola, also referred to as the Southern Fishing Zone (Konda, 2008), that ranges from Lobito Benguela province) to the Cunene River´s mouth (located at the border between Angola and Namibia), as **Figure *3.4*** shows. In the zone, horse mackerel, sardines, tuna, and demersal species are abundant (FAO, 2018; Chilamba, 2016; GPB, 2016). This province also has industrial and touristic diversity which allows large economic contributions to the national GDP, especially through the fishery sector. Together with Luanda province, Benguela has the greatest concentration of artisanal fishing boats in Angola (MEP, 2021).

Figure 3.4. Map of Angola showing the location of Benguela province alongside the Southern Fishing Zone of the country. Source: angolaprovinces.png (1200×1200) (worldatlas.com).

Available data shows that in Benguela province there were approximately 6000 artisanal fishers operating around 2000 boats until 2012 (Duarte et al., 2005; IPA, 2017), based in 16 fishing communities. A recent data update indicated an expansion to 34 localities, involving nearly 2044 boats and 16000 fishers, with a maximum annual fish production estimated at

25100 tonnes (MINPESMAR, 2021). These fishers are organised in 59 cooperatives, and it is suggested that nearly 60000-80,000 people in Benguela province depend directly on artisanal fishing activity; around 10% of families in the province (IPA, 2017).

From Sowman & Cardoso´s (2010) point of view, the growth in the number of artisanal fishers in the Benguela region was, among many other factors, a consequence of the post-colonial period of civil war in Angola from 1975 to 2002. During this period there was widespread migration from inland and rural areas to urban and coastal zones where people could find a secure livelihood in fishing; indeed, "*small-scale fisheries have been conceptualized as a "safety valve" – the last reliable livelihood when no other exists for fishers, who are considered poor*" (Onyango, 2011, p.97).

Benguela's socio-economic status is similar to other Angolan provinces. With a poverty rate of around 51%, the average family size in Benguela province is 4.6 people (INE, 2016), and it is supposed that 3.4% engage in fishing related activities while 48% do agriculture; however, there is no data on the number of people living on the coast in Benguela province who rely directly on fishing activity for their primary source of livelihood. The general employment rate is also higher (49% in general, and 44% for women) than the national rate, estimated at 40% in general, and 34.1% for women.

A natural setting was established for the data collection for this study because according to Croswell (2014), a key feature of qualitative research is the thorough knowledge gained through the direct contact the researcher can have with interviewees in relevant locations. Therefore, all primary qualitative and quantitative data were collected in the four coastal municipalities of Benguela province, namely Baía Farta, Benguela, Catumbela, and Lobito.

3.1.5 Sampling and sampling techniques

According to Thomas (2021), sampling examines a subset of the population, the sample, and draws conclusions about the situation from observations in order to represent the entire population. The sampling method for this study is exploratory sampling, which was chosen over representative sampling.

Denscombe (2010) describes seven types of surveys: postal surveys, internet surveys, telephone surveys, group-administered surveys, face-to-face surveys, observational surveys, and surveys of documents. All of these can use a wide range of sampling approaches and data collection methods that will depend on the researcher´s selection of those best suited to fulfill the aims of the study as well as the availability of resources for this purpose. Therefore, two types of samples are proposed by Denscombe (2010): representative samples for

quantitative research, allowing generalisation, and exploratory samples for qualitative research, utilising small-scale data.

Of the above mentioned types of survey, the most suitable in terms of the time and logistic conditions of this study were deemed to be face-to-face surveys, observational surveys, and surveys of documents were, therefore, used.

This study has been grounded on exploratory sampling, in detriment of representative sample, due to the suitability of this technique to be applied in small-scale research involving qualitative data collection and analysis. Denscombe (2010, p. 24) declares that "*an exploratory sample is used as a way of probing relatively unexplored topics and as a route to the discovery of new ideas or theories*", thus matching one of the purposes of this study. However, for data collection to be successful it is necessary that the researcher chooses the best sampling approach for the study´s aims. Thomas (2021) classifies sampling methods into two categories of approaches:

(1) In the first approach there is a known probability for each element of the population to be included in the study. Simple random sampling, systematic random sampling, and stratified random sampling are the most common methods. This approach is called probability sampling.

(2) The other approach is called non-probability sampling, and is generally used in qualitative studies. Convenience sampling, quota sampling, judgment sampling, and snowball sampling are the sampling methods. In this approach the selection of the participants in the study does not follow random sampling methods. According to Thomas (2021, p. 137) "*a major disadvantage of non-probability sampling is that the extent to which the sample differs from the population remains unknown, and therefore, it is very difficult to estimate sampling error*".

For this study in the setting of Benguela province purposive sampling (Etikan et al., 2016) or judgement sampling (Thomas, 2021) was selected, using a non-probabilistic sampling approach. This is firstly because of the area's potential to represent other coastal regions of Angola in terms of the characteristics of their artisanal fishing sectors. Secondly, this province is home to one of the most productive sectors of Angola, fisheries. Finally, Benguela province has clear importance and relevance due to its geographic location within the BCLME. For Thomas (2021), purposive or judgement sampling is extremely useful in cases like the present survey where access to the entire country or province population would be impossible due to logistical and time constraints. However, because the choice of the method depends on the researcher's perception of the study area's reality, bias can occur (Thomas, 2021).

3.1.5.1 Criteria for the selection of fishing communities; landing, processing, and trading sites.

The qualitative data were collected in the coastal region of the province incorporating four municipalities from south to north, namely Baía Farta, Benguela (the capital), Catumbela, and Lobito, as **Figure *3.5*** shows.

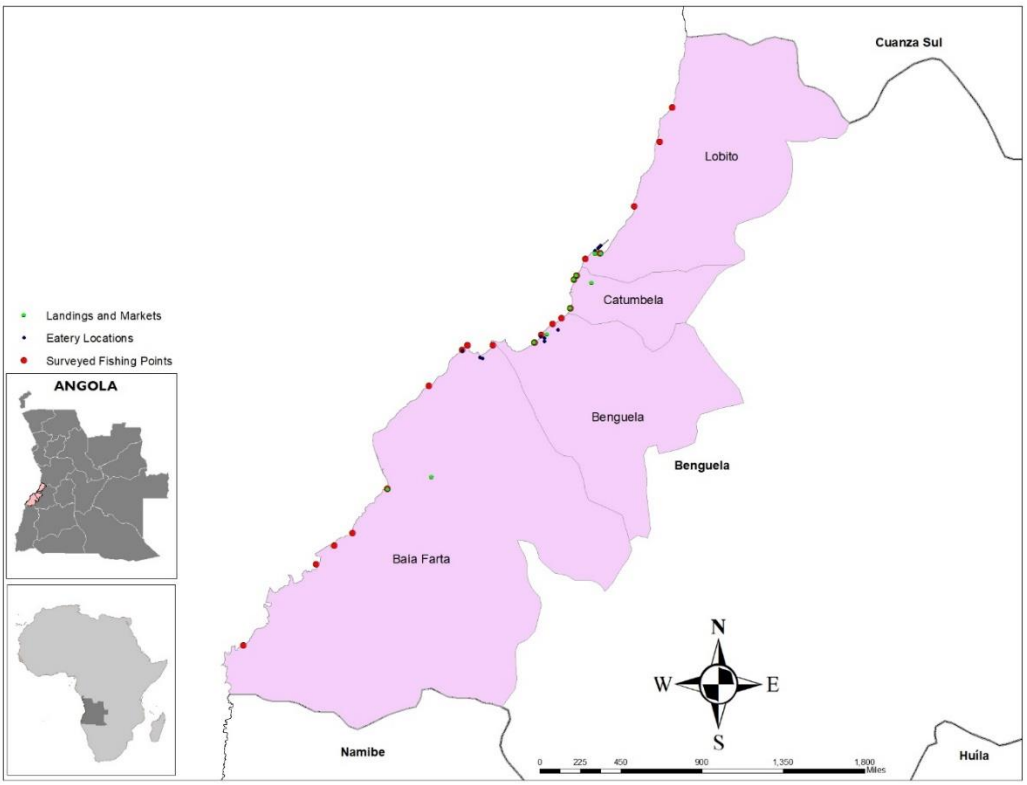

Figure 3.5. Map of the study area (Source: IPA, 2017; Field survey, Jan-July 2018).

According to the most recent update by the Instituto de Pesca Artesanal (IPA) (2016 -2017), there are 34 sites of concentrated fishing activity located in 12 communities across the Benguela province.

The selected and surveyed sites are highlighted in **Table 3.1**, **Table 3.2**, and **Table 3.3**, and in **Figure 3.5**, **Figure 4.2** and **Figure 4.3**. A total of 12 fishing sites located in 10 communities were chosen, ranging across the four coastal municipalities of Benguela province, according to the following criteria:

- **Equal coverage of the four municipalities:** through the quota sampling method (Yang and Banamah, 2014): three fishing points were selected per municipality, to obtain information on each location in a cost-effective way, and to observe the similarities and differences between artisanal fishing practises in each municipality. To reach this aim, following Thomas´ (2021) recommendations, initially ratios representing

the population were selected, from previous established strata. After the stratum choice, using the convenience or judgement sampling approach, samples were taken from each division.

- **Road accessibility**: access to fishing communities in the province depends more on road conditions than distance. For example, Egito Praia are situated in the extreme North, and Cuio in the extreme South of the province, although being approximately 90 and 70 km respectively, from the capital of the province, have good road accessibility; around 80% of the road is asphalted and accessible during all seasons of the year. In contrast, fishing communities such as Chamume and Chiome, although being in less than 35-40 km from the centre of the city are connected by non-asphalted roads making the access problematic. Other fishing communities such as Hanha do Norte (Lobito), Equimina (Baía-Farta) are both distant and difficult to access; located at more than 40 and 80 km, respectively with non-asphalted roads. These impediments to reach some fishing communities have limited data access that could be crucial for this study since many of the sites may differ by lacking access to markets, fishery regulation, or access to other facilities.
- **Potential for artisanal fishing activity**: some localities in Benguela province are well known for their fishing production, especially in terms of the diversity of species exploited. These facts were cross-checked using supplemental information provided by governmental institutions, fishers' associations, and other independent fishers identified during earlier contacts with key informants.

Table 3.1 shows the fishing locations registered by the fishing authorities across the province as well as the points selected as sampling sites.

Table 3.1. List of the fishing communities in Benguela Province and places surveyed/sampled, in red (Source: IPA, 2017).

Municipality	Community	Fishing community	Latitude	Longitude	Fish purchase	Accessibility by road	Distance from the capital	Surveyed?	Number of fishers interviewed	Number of boats surveyed
Lobito	**Canata**	**Cabaia**	12.366 S	13.522 E	Market	Yes	32 km	Yes		
	Zona 9	**Lobito Velho**	-12.351 S	13.561 E	Market	Yes	33km	Yes	6	5
	Hanha do Norte	Hanha do Norte	12.226 S	13.655 E	Direct from boat	No	Not found	No		
		Bingi	Not found	Not found	Direct from boat	No	Not found	No		
		Praia Grande	Not found	Not found	Direct from boat	No	Not found	No		
		Cuhula	12.053 S	13.725 E	Direct from boat	No	114 km	No		
	Egito Praia	Mur	Not found	Not found	Direct from boat	No	Not found	No		
		Egito Praia	-11.960 S	13.760 E	Direct from boat	Yes	Not found	Yes	7	7
		Chimbala	Not found	Not found	Direct from boat	No	Not found	No		
		Cangalma	Not found	Not found	Direct from boat	No	Not found	No		
Catumbela	**Gama**	**Catumbela Praia**	-12.499 S	13.480 E	Direct from boat	Yes	13.5 km	Yes	11	5
		Cachiva	-12.422 S	13.490 E	Direct from boat	Yes	28 km	Yes	6	1
	Catumbela	**Praia Bebé**	-12.411 S	13.497 E	Direct from boat	Yes	30 km	Yes	10	7
Benguela Municipality	**Zona B**	**Caota**	-12.598 S	13.267 E	Market	Yes	18 km	Yes	5	4
		Kasseque	-12.590 S	13.382 E	Market	Yes	0 km	Yes	15	8
	Zona E	**Quioche**	12.570 S	13.400 E	Roadside	Yes	0 km	No		
	Zona F	**Kawango**	12.541 S	13.431 E	Roadside	Yes	0 km	Yes	3	2
		Damba Maria	-12.525 S	13.456 E	Roadside	Yes	0 km	Yes	2	2
		Baía dos Passaros	Not found	Not found	Direct from boat	No	Not found	No		
		Meva	-13.400 S	12.583 E	Direct from boat	No	Not found	No		
	Equimina	**Iquimina- Sede**	-13.183 S	12.783 E	Market	4 x 4 vehicles	102 km	Yes	1	1
		Praia da Lua	-13.133 S	12.833 E	Direct from boat	No	97 km	No		
		Nhime	-13.100 S	12.883 E	Market	4 x 4 vehicles	Not found	No		
Baía Farta	**Dombe Grande**	**Cuio**	-12.982 S	12.978 E	Market	Yes	69 km	Yes	7	5
		Farol	Not found	Not found	Direct from boat	4 x 4 vehicles	Not found	No		
		Saco	Not found	Not found	Direct from boat	4 x 4 vehicles	Not found	No		
		Tenda Grande	Not found	Not found	Direct from boat	No	Not found	No		
	Chamume	Gengo	Not found	Not found	Direct from boat	No	Not found	No		
		Chiome	Not found	Not found	Direct from boat	No	51 km	No		
		Chamume	12.706 S	13.092 E	Direct from boat	4 x 4 vehicles	45 km	No		
		Macaca	Not found	Not found	Direct from boat	No	Not found	No		
		Senga	Not found	Not found	Direct from boat	No	Not found	No		
	Baía Farta	**Vitula**	-12.610 S	13.183 E	Direct from boat	Yes	25 km	Yes	1	1
		Baía Farta	12.598 S	13.198 E	Market	Yes	15 km	Yes		

Although in Benguela province many of the fishing points also operate as landing sites and retailing markets, there are other places where people also trade fish. I interviewed fish retailers and processors from nine different fish trading points, listed in **Table 3.2**, selected based on their presence and accessibility by road.

Out of the12 locations visited and listed in **Table 3.2**, some work only as trading markets, while others are also processing centers and general informal markets where other products such as food and clothes are traded too. Some fish trading markets serve as landing sites for small-scale artisanal and subsistence boats due to their location close to the sea. Some people sell fish at the side of the road far from the landing sites. **Figure 3.5** (Map of the study area) shows the geographic distribution of these sites. Kasseque market, located in Benguela municipality, is the only place where artisanal processors operate.

Table 3.2. List of places surveyed where fish is processed and sold, and number of people interviewed.

Name of the market	Type of site	Close to the sea	Fish retailers	processors	Leaders of fisher co-ops	Municipality	Community	Location	Accessibility by road	Distance from the centre of the capital
Dombe Grande market	General market	No	6	0	0	Baía Farta	Dombe Grande	Vila Centre	Yes	52 km
Gama market	General market	No	2	0	0	Catumbela	Gama quarter	Quarter centre	Yes	14 km
km 27 market	General market	Yes	2	0	0	Catumbela	Gama quarter	Roadside	Yes	27 km
Catumbela Market[2]	General market	No	11	0	0	Catumbela	Catumbela	Catumbela city	yes	13.5 km
Baía Farta Tombas	Landing site and general market	Yes	4	5	1	Baía Farta	Baía Farta	Vila Centre	Yes[2]	15 km
Kasseque Tombas Market	Landing site and general market	Yes	10	0	0	Benguela	Zona B	Kasseque	Yes	1 km
Cuio Tombas	Landing site and fish market	Yes	3	22	1	Baía Farta	Dombe Grande	Cuio	Yes	69 km
Lobito Velho	Landing site and fish market	Yes	2	0	0	Lobito	Zona 9	Lobito Velho	Yes	33 km
Cachiva	*Landing site*	Yes	0	0	0	Catumbela	Gama	Cachiva	Yes	28 km
Praia Bebé	*Landing site*	Yes	0	0	1	Catumbela	Catumbela	Praia Bebé	Yes	30 km
Vitula	*Landing site*	Yes	0	0	0	Baía Farta	Sede	Vitula	Yes	25 km
Cotel Roundabout	Roadside	No	4	0	0	Benguela	Zona E	Roadside	Yes	0.5 km

3.1.5.2 Criteria for selection and characteristics of food service in Benguela province

The method for the selection of these places was convenience sampling (Etikan et al., 2016; Thomas, 2021), as the criteria was the type of food available, i.e., only establishments where seafood is served were selected. Few differences exist between these restaurants and hotels surveyed in terms of size or the socioeconomic status of the targeted customers, except for location, as **Table 3.3** shows.

According to Thomas (2021), convenience sampling or accidental sampling is widely applied in descriptive research because of its suitability early in many cross-sectional studies, by allowing the low-cost estimate of facts, making the research easier and less costly. According to Denscombe, 2010), convenience is the main factor considered while choosing samples for convenience sampling, as it offers rapid, affordable, and simple item selection.

Table 3.3 lists the surveyed restaurants and hotels that serve seafood in Benguela Province. All hotels and restaurants are located in places with good road accessibility. **Figure *4.3*** also shows these restaurants and hotels on a map.

Table 3.3. Surveyed restaurants and hotels serving seafood in Benguela Province

No	Type of Unity	Municipality	Specific Location	Latitude	Longitude	Distance from the capital
1	Restaurant	Lobito	Next to the sea	S 12º 34.384´	E 013º 23.952´	27 km
2	Restaurant	Lobito	Next to the sea	S12º1957´´	É13º33´37´´	25 km
3	Restaurant	Lobito	City Centre	S12º20´38´´	E13º32´51´´	23 km
4	Restaurant	Benguela	Next to the sea	S 12º 35.168´	E 013º 24.528´	0 km
5	Restaurant	Benguela	City Centre	S 12º 20.187´	E 013º 33.386´	0 km
6	Restaurant	Benguela	City Centre	S 12º 34.681´	E 013º 24.568´	0 km
7	Restaurant	Baía Farta	Next to the sea	S12º37´54´´	E13º14´21´´	18 km
8	Hotel	Lobito	Next to the sea	S 12º 36.660´	E 013º 11.034´	22 km
9	Hotel	Benguela	City Centre	S 12º 33.341´	E 013º 26.770´	0 km
10	Hotel	Baía Farta	Next to the sea	S 12º 3744´	E 13º 13´56´	18 km

3.2 Time horizon

Cross-sectional and longitudinal are two possible types of non-experimental designs depending on the timing of the data gathering (Creswell, 2014). In a cross-sectional study, the reality of a certain group of people at a single moment in time can be illustrated from the collected information (Thomas, 2021). This study uses a cross-sectional method, as it is inexpensive and quick to apply, as it uses a single group and requires no follow-up, so is suitable for the present study.

Since one of the objectives of this thesis is to gather information for further accurate quantitative studies in the future, it made sense to perform a cross-sectional study because, as Thomas (2021) suggests, such studies are better at determining and discovering phenomena, while in contrast, cohort studies offer thorough analysis, despite challenges in distinguishing cause and effect. It is also argued that studying a cross-section of a population ensures a variety of ingredients and a selection process that takes into account pertinent variables and amounts, enabling reliable inferences about the research population as a whole (Denscombe, 2010).

3.3 Safety, language, and cultural considerations

For safety reasons, wherever possible all the interviews with the representatives of the fishers´ cooperatives were conducted by the researcher in outdoor spaces, near the boats, in the markets where they land, process, and retail their fish catches. For the representatives of industrial fishing and processing companies, restaurants, governmental institutions and fishers´ associations, the interviews occurred in the indoor spaces where they worked.

To reach the fishing communities the researcher always drove his own car at a safe speed, and prior to any travel to all places, secured information about weather and safety. The researcher avoided sleeping in these communities, returning home the same day, and also avoided working in isolated geographical areas and consuming non potable water, and took anti-malarial precautions. All these measures were taken in accordance with the risk assessment procedures under the University of Stirling GUEP.

Since Portuguese is the official and most spoken language (idiom) in Angola, it was the idiom used to conduct all the interviews. These interviews were then analysed in Portuguese before being translated into English, which reduced the amount of time needed to translate the large amount of data generated, as well as helping to maintain the meaning of the material (Vinevala, 2022).

One aspect of Angolan culture is that young people are expected to treat elders with decency and respect. This premise was carefully taken into consideration, as many elderly people who play

the role of traditional authorities had to be contacted before any interview with participants from the fishing communities. It also made the participants feel at ease and promoted open communication.

3.4 Ethical considerations

All invitations to participate in the research were preceded by the delivery of information sheets to the participants, and by the collection of informed consent forms, written or recorded, according to their level of literacy. It should be noted that many of the fishers, fish retailers, and processors in Benguela province are under 18 years old. These younger people were not interviewed because they are not considered adults in Angola and are also not permitted to participate in survey studies without the written consent of their parents or guardians, in accordance with the ethical guidelines of the University of Stirling General University Ethics Panel (GUEP).

3.5 Data collection technique (research methods)

3.5.1 Qualitative data collection

The choice of interview methods tends to influence the types of responses. Semi-structured and unstructured interviews produce data that is not pre-coded, and which can have a relatively open format. (Denscombe, 2010)

This study's qualitative data collection in Benguela province, Angola, involved semi-structured interviews with people from governmental institutions, fishers' associations, industrial fishing companies, and restaurant and hotel managers. The semi-structured interview guides (Appendices K, L, M and N) contained questions designed to collect information related to the level of their engagement in cooperative work, as well as to better understand the structures, administration, regulation, and governance of the fishery sector in Benguela province.

3.5.2 Interview process

Participants were interviewed in offices, governmental sites, fishers' associations, or restaurants, as appropriate. **Table 3.4** illustrates the total number of participants interviewed.

Table 3.4. Number of stakeholders selected for the field survey.

Participants	Male	Female	Total
Governmental institution representatives	4	1	5
Fishers´ association and cooperative representatives	4	0	4
Restaurant and hotel managers	9	0	9
Managers of industrial fishing companies	5	0	5
Total	22	1	23

People from fishery organisations were recruited through the heads of these institutions, who were approached in writing requesting access to key employees legally authorised and able to give the required information. Some heads of organisations made themselves available for the interviews, and all these were performed observing the principle of confidentiality, mainly in their offices.

The semi structured interview guides (Appendix K) encompassed topics, by sections, as it follows:

(A) Information about the governmental institutions, and fishers´ cooperatives such as their aims, representations, and statistics.

(B) Governmental institutions and cooperatives main means of work.

(C) Information on the work developed by the governmental institutions and cooperatives.

(D) Information related to wild crustacean harvest.

(E) Information related to the practice of aquaculture.

The questions from these topics aimed to collect information related to the level of their engagement in cooperative work, as well as to better understand the structures, administration, regulation and the governance of the fishery sector in Benguela province.

3.5.3 Surveys of documents

In addition to using methods such as observation and interview, qualitative research also uses document analysis (Yilmaz, 2013). This is a way to ensure that the data are reliable and can be obtained from different sources, and can therefore be classified as primary or secondary material (Creswell, 2014).

This study implemented a document survey, including online newspapers, due the difficulty of accessing information on the artisanal fishery sector in Angola as well as the financial and logistic limitations of the project. As stated by Denscombe (2010), existing documentary data offers convenient online surveys without travel costs, making them accessible and cost-effective for document analysis. Therefore, during the interviews, which were conducted individually and lasted between 1-2 hours each, different documents related to the governance and management of the fishery sector such as as reports, maps, tables, and statistics were requested from the participants to help the researcher to gather and better understand qualitative and meaningful data related to statistics on, and the management and regulation of, the entire artisanal seafood value chain in Benguela province.

Most of the documents collected and analysed for this study are grey literature. Grey literature, according to Mahood et al. (2014) is defined as any document that deals with the creation, dissemination, and distribution of numerous document kinds in electronic and print formats.

The present grey literature analysis revealed limited information on national and local fishery institutions, a common issue in Angola due to its lengthy civil war and top-down governance models. This lack of information is not specific to the fishery sector and also affects other sectors in the country (Nielsen et al., 2021).

Texts were analysed to help to establish the following: the hierarchy of the institutions that manage and regulate the fishery sector from the national to the provincial level (see also MINPESMAR´s organic statute in Appendix E for further details); the categories of the fishery sector adopted by the government of Angola due to its global complexity; the composition of the artisanal fleet and the size of the artisanal fisher population; and the main existing policy and regulation framework of the fishery sector in Benguela province.

3.5.4 Unstructured interviews

Unstructured interviews, also called open-ended or in-depth interviews (Thomas, 2021) aim to collect information based on how the problem is perceived by the interviewee; therefore, the questions asked in an unstructured interview do not follow a set order. Unstructured interviews allow interviewees to explore important themes and provide an account of their experiences, and enable researchers to focus in on some responses and ask follow-up questions to ensure an accurate comprehension of the interviewee's perspective (Denscombe, 2010).

3.6 Quantitative phase

3.6.1 Quantitative design

This study collected data from fishers, retailers, and processors using structured questionnaires and direct unstructured observations in order to understand artisanal fishery dynamics in Benguela province. It aimed to generalise findings, estimate causes and effects, and address research problems (Yilmaz, 2013).

These questionnaires were designed for the collection of information on the participants' social and economic status, and focused on the most important aspects of the fishing and trading process, including acquisition, preservation, transportation, processing, and selling of fish in seafood markets in Benguela province.

3.6.2 Sampling techniques

3.6.3 Identification and recruitment of participants

The key informants for this study were stakeholders introduced by representatives of the Institute of Artisanal Fishery (IPA), and comprised fishers, retailers and processors who were well-known within the fishing community and trading markets. Then, some of the participants were introduced by representatives of the main markets and fishing communities allowing the researcher to establish contact with other participants through convenience sampling. As a non-probability sampling technique for small-scale studies, this sampling method seeks to make the survey easier and less expensive by generating an exploratory sample, even though the possibility of sample bias growth exists (Denscombe, 2010; Thomas, 2021).

However, whenever possible, the researcher contacted additional retailers, processors, and fishermen to ask them to complete the survey. Explanations of the study's objectives were provided in accordance with the University of Stirling's ethical requirements. Some fishers and retailers did not show any interest in participating in this activity, for reasons still to be understood. **Table 3.5** shows the number of fishers, retailers and processors who were surveyed.

Data from most of artisanal boats in this survey which belong to some participants were provided in the same questionnaires utilised for the collection of personal and working information.

Table 3.5. Number of participants in the quantitative survey.

Participants	Male	Female	Total	Number of boats
Commercial fishers	58	0	58	33
Subsistence fishers	16	0	16	15
Retailers	4	40	44	----
Processors	22	5	27	----
Total	100	45	145	----

3.6.4 Survey data collection methods

Structured questionnaire has been suggested as one of the most effective methods for the collection of information, especially primary data, but like any other technique it has its own benefits and drawbacks (Yilmaz, 2013; Creswell, 2014). Although questionnaires offer advantages such as being cheap and easy to administer and analyse, brief, and potentially low in bias, they may still cause bias, have limitations due to poor literacy, and cause potential confusion (Kothari, 2004). Furthermore, when selecting and designing data collection methods to carry out in accordance with the study's objectives and logistic capacity, researchers should be aware both of their suitability and risks (Kothari, 2004; Thomas, 2021).

Therefore, a quantitative survey developed and conducted face-to-face by the researcher in Benguela province, targeting fishers, retailers, and processors. A structured questionnaire was used to collect information on social and economic status, fishing, trading, and processing processes. Small-scale commercial boats and subsistence rafts owners were also analysed.

3.6.4.1 Questionnaires for fishers, boat owners, retailers, and processors

The questionnaires (see Appendices G and H) for personal interviews with artisanal, commercial, and subsistence fishers were created based on the literature review, specifically Duarte et al. (2005), i.e., *Appendix 1 of "Angola – Questionnaire conducted by IPA – year 2000, Aimed at fishers and masters of fisheries*"). A total of 74 of these questionnaires were delivered to artisanal and subsistence fishers directly by the researcher in the four coastal municipalities of Benguela province selected for this survey, namely Baía-Farta, Benguela, Catumbela, and Lobito which included each three different sections:

(I) Personal features (Age, social status, number of children, literacy), work characteristics, financial issues, and revenues and benefits achieved from the fishing activity.

(II) Data for a current regular trip about the boat's characteristics, crew composition, fishing methods and periods, fishing zone characteristics, costs for exploitation, preservation, commercialization as well as revenues.

(III) Information for the last trip they had before the survey about the boat's characteristics, crew composition, fishing methods and periods, fishing zone characteristics, costs for exploitation, preservation, commercialization as well as revenues.

Data from subsistence, artisanal, and commercial boats were collected and analysed separately because according to the Angolan Fisheries Law there are different segments of the artisanal sub-sector where subsistence boats do not have engines, are a maximum of 7m of length, are used to fish for family consumption, and are exempt from paying any fees (Appendix O, Table O.6).

A total of 44 structured questionnaires (Appendix I) were completed with fish retailers (both women and men) at the working marketplaces to collect data on social and economic status. Only people who chose to make themselves available for the survey received and answered the questionnaires. Therefore, although there was a considerable number of refusals, the survey did not register any “no responses” to the questionnaires, and these instruments of data collection gathered information about the characteristics of the trading process, including fish acquisition, preservation, transportation, and selling, the status of the infrastructure, and road accessibility.

The structured questionnaires (see Appendix J) were directed to 27 artisanal fish processors (22 men and five women) from a single market where they could be found. The questionnaires were designed to collect data on social and economic status, and the characteristics of the trading process as above.

3.6.4.2 Unstructured observations

Observations are useful for qualitative data collection and quantitative research, as they focus on individuals' descriptions of behaviours, events, surroundings, and the frequency, location, time, and duration of events (Denscombe, 2010). Mulhall (2013) observed that to understand cultural behaviour, researchers can employ unstructured observation, context recognition, and co-construction.

Therefore, observation was implemented in this study to boost the robustness and thoroughness of the survey as part of a combination of different research methods including interview and document analysis (Creswell, 2014), which according to Yilmaz (2013) comprises methodological triangulation. Observations took place in all 12 fishing communities selected in the four coastal municipalities and added complementary information and robustness to the data collected through the interviews.

The researcher conducted parallel inquiries with artisanal fishery experts to verify the accuracy of information received from interviewees, to gain a more holistic understanding of the value chain in Benguela province's artisanal fishery sector. The quantitative survey method assessed market dynamics, enabled visual estimations, and addressed uncertainties in the literature and reports from fishery institutions in the province. It provided insights into fish volumes, trading, processing, gear, market infrastructure, and financial transactions. However, because of their time-consuming nature, non-standard responses, interviewer impact, and context, unstructured interviews can be difficult to analyse (Denscombe, 2020). Accordingly, consistency and neutrality are difficult to achieve, and in-person interviews can also be costly and complex due to audio and video recording, privacy concerns, and travel expenses. Researchers must make cautious observations, and be careful to avoid emotions, biases, and interference with daily phenomena. Passive observations were therefore made without affecting the participants' lives or activities, and precautions were taken to avoid incorrect conclusions (Thomas, 2021).

3.6.5 Non-response bias

According to Denscombe (2010), non-response is one of the causes of bias in research and can either be the result of refusal to participate when invited, or non-contact with target participants.

Many fishers and retailers did not agree to participate in this survey, and among those who did participate, many refused to give important information and/or refused permission for photography of their working fishing gear, boats, and other equipment. However, this study did not register any non-response from the target group as all the people contacted who were available for the interviews were interviewed. Furthermore, the questionnaires collected qualitative data from respondents, avoiding restricting data collection to only one group. All groups, including fishermen and retailers, were contacted independently of age, gender, activity, or working time. (Denscombe, 2010).

Chapter 4 - Qualitative data analysis and findings

4.1 Introduction

Through inductive and deductive thinking (Croswell, 2014) based on the literature review, a comprehensive set of themes has been established based on the information provided through the interviews. The analysis of these themes is discussed in the present chapter in order to present the interviewees' understandings of issues involving the SSF sector in Benguela. This analysis, supported by documents provided during the interviews, helps to build knowledge patterns and to answer some of the research questions, gaining insights on the components of the SSF value chain in Benguela province, their interaction and dynamics, and the current benefits and difficulties.

However, since this is a mixed methods research, without a hypothesis to be tested but with research questions to answer, the main approach to generate themes and identify patterns from the collected information, and to better explore the artisanal fishery sector in Benguela province, is a **mixed methods abduction analysis** adopting a "*bottom-up approach to data analysis with open coding strategies*" (Yilmaz, 2013; Creswell, 2014; Creswell and Clark, 2017).

4.2 Qualitative data analysis

The testimonials from each research participant were recorded using a Digital Voice Recorder, in Portuguese. Therefore, the data gathered required codification for thematic analysis before its translation into English for better comprehension.

This information was transcribed into verbatim (word-for-word) word processing files for analysis. As recommended by Creswell and Clark (2017), this process comprises making brief notes in the margins of transcripts or field notes to capture early impressions and developing codes or themes from input sources such as observational field notes, journals, conference minutes, pictures, and interview transcripts. The accuracy of the transcriptions was checked to facilitate the coding and analysis operations.

4.2.1 Coding data

Analysis of the present data consisted of examining the database to address the research questions through thematic analysis. Coding of the information involved grouping evidence and labeling participants´ ideas to reflect broader dimensions by dividing text into small units, assigning labels, and grouping codes into themes (Creswell and Clark, 2017). According to Creswell and Clark (2017) *in vivo* coding occurs when the precise words spoken by participants are utilised as the coding label; however, phrases created by the researcher or terms from the social or human sciences can also be employed to create codes and themes. This process can also be denominated 1st order analysis; when participants exact words are examined; and 2nd order analysis; when researcher´s ideas and knowledge are examined (Gioia et al., 2012). After that, a wider narrative can be created from a combination of dimensions or views previously generated from the combined themes.

The coding of the data for the present survey used hand codification in *Microsoft Word* format, allowing the researcher to become immersed in the database collected and to gain a deep comprehension of the information. Afterwards, these codes were grouped into themes which, consequently, generated the four broader dimensions (aggregate dimensions) namely governance, food security, exploitation of crustaceans and fisheries economic growth; which are aligned with the wider literature of SSF, mainly those highlighted in the FAO's voluntary guidelines for securing sustainable SSF in the context of food security and poverty eradication (FAO, 2015). Therefore, in the present thematic analysis, both some of the exact words and phrases used by the interviewees as well as phrases created by the researcher based on the wider SFF literature were used to codify the data and to expand it to the themes and, consequently, to the main broader (aggregate) dimensions.

In order to comply with the University of Stirling's ethical requirements relating to confidentiality, the participants were assigned with pseudonyms such as RM1 (Restaurant manager 1), RM2, GR1 (government Representative), GR2, etc. to protect their identities.

As has been recommended (Braun & Clarke 2012; Denscombe, 2010), the data analysis included the steps in **Figure *4.1***, starting with organising all the data collected during the field survey (interviews transcripts and documents):

Steps	Purpose	Input	Details of the process used	Output	Use of the output
Organizing and preparing data for analysis	Familiarising with data	Transcripts of interviews, documents and observations notes	To get a general overview of the data collected/becoming immersed in the data set by reading and rereading transcripts and starting to make notes	Potential segment of interest highlighted in notes taken	Reflection for step 2
Reading through all data	Generating initial codes	A word or phrase said in the interviews that is relevant to the research aim and objectives	Identifying an extract of data to code, writing down the code, and highlighting the text associated with it	List of codes based on the type of question	Serves as input for the next step
Coding the data (hand or computer)	Searching for themes	List of codes generated	Organising and grouping codes that seem to share some characteristics into categories of emerging themes that belong to specific questions	Categorising the raw data	Input for the next step
Defining the Themes	Defining themes	Set of themes and categories which emerged in the previous phase	Constantly comparing emerging codes and categories to data, and cross-referencing the codes with updated data specifically collected for the purpose	Generate categories or themes for analysis	Input for the next step
Interpreting the Themes	Reviewing themes	Set of themes and categories reviewed in the previous phase	Generating concepts and theories that are thoroughly grounded in the data based on type of questions	Listing overall themes and categories	Input for the next step
Interpreting the meaning of Themes	Producing the report	Listing overall themes and categories	Making an interpretation in qualitative research of the findings	Chapter 5: Data analysis and findings	General conclusions of the study

Figure 4.1. Illustration of the data analysis process. Source: Author, 2023, adapted from Braun & Clarke (2012), Creswell (2014), Descombes (2010), Vinevala (2022).

After organising (Step 1) the interviewees' answers and document findings in *Word* transcripts, each participant's answers were organised by topic, according to the questions in the questionnaires, on the same data sheet, to allow immersive and comprehensive reading and rereading of all the information. Then, a colour-coding phase for words and phrases (Step 2) was performed which, according to Creswell (2014), helps to look for patterns, differences and similarities within the data and allows a general overview of the data collected.

As recommended by Denscombe (2010), Step 3 started after colour-coding all the data by searching for themes according to the patterns found during the codification phase.

In Step 4 the researcher used the coding process to generate themes for analysis, which is also described as categorising the raw data (Creswell 2014; Denscombe, 2010). Additionally, it involved constantly comparing the emerging codes and themes with the data and checking the codes against new data specifically collected for the purpose (Denscombe, 2010). Step 5 advances how themes will be represented in the qualitative narrative (Creswell 2014). It does so by generating dimensions; concepts and theories; that are thoroughly grounded in the data (Denscombe, 2010). Finally, in Step 6 an interpretation of the findings is made (Creswell 2014).

The researcher was able to classify the developing data into a variety of themes from which four aggregate dimensions emerged: *governance*, *food security*, *exploitation of crustaceans* and *fisheries economic growth*, as shown in **Table *4.1***. For example, words and phrases such as "*government*", "*support from the government*", "*marine environment protection*", constituted codes which originated the dimension "*governance*"; and words and expressions such as "*employment*", "*revenues*" and "*lack of technical knowledge*", originated the dimension "*fisheries economic growth*".

According to Creswell (2014), themes and the generated aggregate dimensions presenting numerous views, which are supported by a variety of quotations and evidence, are among the main findings in qualitative studies.

Table 4.1. Thematic table final evaluation and reporting on general themes and categories.

Codes	Themes	Aggregate Dimensions
Policy coherence, institutional coordination and collaboration Information, research and communication Capacity development Implementation support and monitoring	Policy ensuring an enabling environment and supporting implementation	Governance
Modified water flows and coastal habitats Conflicts over fishable areas and resources. Unsafe fishing conditions and loss of life at sea	Disaster risks and climate change (potential human and biophysical changes)	
Community-based fisheries management Sustainable resource management Responsible governance of tenure	Governance of tenure and resource management	
Livelihood diversification Resource dependency Increased fish consumption	Poverty alleviation	Food security
Contribution to tourism promotion Livelihood diversification Income generating opportunities	Markets, value chains, post-harvest, and trade multipliers	Exploitation of crustaceans
International trade and income generating opportunities	Contribution to national economy	Fisheries economic growth
Employment and revenue generation	Contribution to livelihoods	
Enterprise and funding programs Implementation support and monitoring	Role of cooperatives	
domestic trade	Women's involvement in SSF	
Limited funding, investment, and support Lack of technical knowledge and decision-making capacity Lack of law enforcement Lack of cooperation	Barriers to fishery growth and development	

4.3 Qualitative Findings

The themes and subthemes arising from the participants' responses are discussed in this section, with topics grouped based on the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication designed and approved by the Food and Agriculture Organization of the United Nations in Rome, 2015 (FAO, 2015).

4.3.1 Governance

4.3.1.1 Policy ensuring an enabling environment and supporting implementation.

Here, the participants´ answers emphasised the importance of the government as a central and hierarchical hub for the development of the fishery sector in Benguela. The Ministry of Fisheries (MINPESCAS) manages the fishery sector using a top-down model, overseeing policies, programs, and dynamics. As the main governmental institution responsible for scientific research and marine and fishery information in Angola, MINPESCAS has collaborated with various national and international institutions for decades. However, this institution depends on its provincial departments for the management of marine resources.

A representative of the provincial department of MINPESCAS (GR3) explained that:

> *"We only supervise the rules established for the exercise of the fishing activity. Management is not our responsibility. Once the management policies are defined, we receive the document and, based on this, we exercise control throughout the year. We report everything that is anomaly, send them to the Ministry of Fisheries, so that the people in violation are penalised"*.

MINPESCAS also promotes cooperation and collaboration between governmental, private companies, and non-governmental organisations. One representative of these organisations commented that:

> *"We have a provincial multi-sectoral operating group made up of many structures, such as fisheries, the navy, the tax police, the captaincy, criminal investigation services, secret services, firefighters, and the environment, so that all work done along Benguela's coastline is carried out within the framework of this group and, in most cases, even sensitising the fishermen"* (GR3).

Although the MINPESCAS representatives and some from the fishers´ associations gave evidence that the government is the main promotor of collaboration between different institutions, the effects do not have a visible and positive impact on their daily activities, as R1 stated:

> *"I have received no stimulus from either MINPESCAS, the Ministry of Tourism and the Environment or the Ministry of the Hotel Industry. As a result, things have come to a halt. All of this requires an interconnection between sectors and ministries for us to put our hand in here, to work, to guide it in the sense that soon, in addition to our own consumption, we will also export to neighbouring countries, even to Europe"*.

The lack of collaboration between public and private institutions is reinforced by statements made by another participant (R2) who calls for stronger links between the various sectors of society:

> "*To promote sustainable development in fishing activity, it is crucial to address impassable roads in national territory. Universities and the government should collaborate on transportation methods. Attracting foreign investment in the capture and consumption of crustaceans and fish can strengthen the fishing industry and potentially boost hotel tourism*".

The FAO SSF guidelines state that "*all stakeholders and small-scale fisheries communities should recognize the importance of communication and information, which are necessary for effective decision-making, including bioecological, social, cultural and economic data*" (FAO, 2015, p. 15). The MINPESCAS´ Fishery Research Centre collates annual marine wildlife data for the government to produce laws and directives regulating the fishery sector, from marine to terrestrial fishing resources. The aims of these institutions were reflected in the statements of many participants of this study, such as GR1:

> "*The Centro de Investigação Pesqueira de Benguela (CIP Benguela) is a public scientific research institution whose mission is to gain knowledge about marine resources and fisheries and to provide managers with recommendations on optimal levels of exploitation while protecting the marine environment; investigate the platform's hydrological conditions and the factors that influence species distribution; and develop and improve methods for preserving and processing fish."*

Many SSF stakeholders in Benguela have access to MINPESCAS biological data of fishable marine resources, mainly through annual documents regulating fishing each year. A governmental representative (R4) declared that *"Management measures are approved every year and determine in which period a certain species should or not be captured. So, they have already been approved for 2018, but we haven't received them yet*".

Many managers of fishery companies acknowledged this information concerning managed marine resources produced by MINPESCAS:

> "*There are areas in which the MINPESCAS itself directs the prohibition. For example, now, on the 15th of May, we are going to enter the winter season for horse mackerel and it is in addition to those that will be prohibited from capturing for three or four months, depending on the studies they did last year, they will say if it is for two months, if it is for one, if it is for three and find out if it increased or decreased*" (FR4).

Communication between government and fishers takes different forms. The most common is delivering information, plans, intentions, needs, suggestions, complaints, and projects through cooperatives and associations, as CR4 stated: "*The aim of this organization is to organize industrial shipowners to serve as intermediaries between them and the state institutions*."

Although it only applies to industrial and semi-industrial vessels, information is also managed through statistically controlling and monitoring biomass levels, as GR3 pointed out:

> "*Normally we control through the statistics that the fishermen provide. For the vessels, the control is during the unloading of the fish first, with the boarding of inspectors… to control the areas where the vessels carry out their activity and, when they arrive back, we also have an inspector there to monitor the unloading, in the sense that we know the quality and quantity of fish landed*".

However, communication and information access in many cases do not work as intended, which is almost always due to the lack of governance transparency found in many African countries, particularly Angola (Transparency International, 2021). When asked to provide statistical information on the fishery sector, one government representative said:

> *Unfortunately, I lack these specifics, and we are not the most appropriate body or structure to provide them. You could go to the provincial Fisheries Directorate and contact the head of the Fisheries Department; he will be able to give you an answer on this matter, which we could also have, but we are not prepared to do so at this time*".

MINPESCAS also has an institute promoting the development of artisanal fishery in Angola. In Benguela province this institution has an office in the capital and is responsible for all artisanal fishing activity in the region, including aquaculture. One participant (GR4) explained the main aims of this organisation as being: "*to organize and execute social campaigns for the creation and development of artisanal fishing and communal aquaculture communities*".

This institution has incentivised the creation of many fishers´ cooperatives, aiming at the development of coastal communities. CR1 explained that:

> "*When we created the cooperative, it covered not only fisheries, but also the field of agriculture and livestock. At first, they were created by members, just fishing, shipowners, barge owners. But, after defining the nature of the cooperative, we saw that livestock was also included, which means that we can also expand the business to livestock and agriculture. Now we are only fishing*".

Financial and technical assistance must be addressed by governments aiming at the sustainable development of the SSF sector. Therefore, this topic was discussed with the participants, who confirmed that their financial capacity is mostly dependent on MINPESCAS and its partners. Many governmental and fishers´ associations representatives gave evidence; for example:

> "*Aid has been provided. If we remember six or seven years ago, MINPESCAS supplied semi-industrial and industrial fishing vessels to fishing operators. The artisanal fishing stakeholders have also been given boats. Along our coastline, SSF white vessels and some semi-industrial ones with names like "Benguela 1", "Benguela 2" can be found. These vessels were funded by MINPESCAS, of course to be refunded*" (GR5).

The government adopts different implementation and monitoring mechanisms for its policies and programs in different provincial locations. These task forces and control posts, as shown in **Figure 4.2**, work using three large, medium, and small boats, and two speedboats to control the waters in the province of Benguela and beyond, often up to Cuanza Sul and Namibe provinces, covering around 200 km in coast and extending to up to 4 nautical miles offshore within Angola´s EEZ.

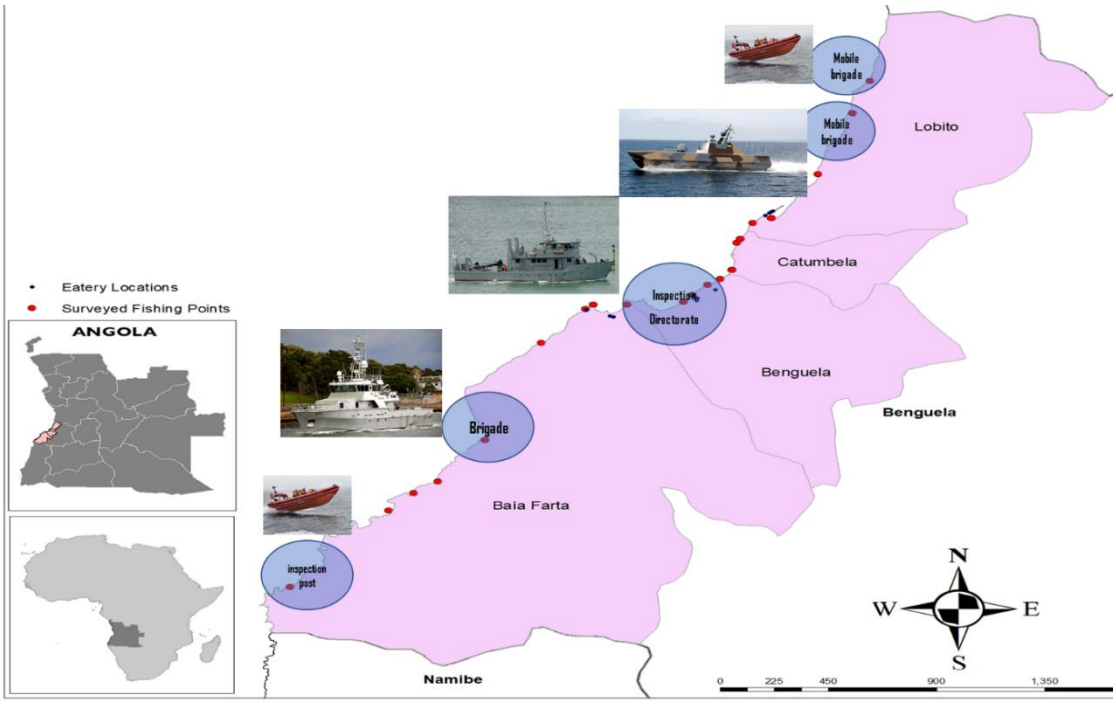

Figure 4.2. Map of locations of maritime brigades (task forces) and inspection posts in Benguela province fishery sector (source: the author, 2018).

Further information on the types of government support given to fishers, especially members of cooperatives and associations was given:

> "*The support we can provide is perhaps in terms of sensitization. Making known the legislation that regulates the activity of fishing, guiding people who must have a license, must have navigation documents, and must bring safety equipment when they go to the sea"* (GR3).

Another government representative (GR1) explained how their institution collaborated in the implementation and monitoring of the fishery sector in Benguela province: "*This institution controls fishing activities by sampling the length of the line, biological sampling, three times a week and a monthly survey of catches in existing fishing companies in the province*".

The department responsible for the implementation of supporting policies, plans, and projects for the sustainable development of SSF is the IPA, as CR4 explained in detail:

> *"The main objective of the IPA is to support the development of artisanal fishing in all its aspects, in raising the awareness of fishermen of sustainable fishing. It includes organising and carrying out social campaigns for the creation and development of artisanal fishing and communal aquaculture communities. Another aim is the elaboration of technical assistance programs for artisanal and subsistence fishing, in maritime and continental water"*.

4.3.1.2 Disaster risks and climate change (potential human and biophysical changes)

Both human and physical changes occur within fishery communities across the world, raising risks ranging from conflicts involving fishing areas and resources to natural disasters resulting in food shortages and loss of life (Brugère, 2015). States must therefore assure the prevention and reduction of these risks (FAO, 2015).

Climate change is a huge problem facing humanity and the subject of many debates and measures by governments and institutions/NGOs worldwide. FAO guidelines particularly urge states to act to avoid the consequences of global warming, such as droughts, excessive rainfall, leading to disaster risks including food shortages (FAO, 2015). Therefore, the present interviews discussed the incidence of these phenomena, to identify the possible consequences of climate change, such as marine biomass level reductions that can directly affect SSF, and the mechanisms to tackle them.

The MINPESCAS publishes annual legislation regulating species and closed seasons. This study uses the 2018 Management Measures for Marine Fisheries, Inland Fishing, and Aquaculture document as a reference (Decree nº 13/18) (Appendix D). **Table 4.2** shows some of the main restrictions in the document. Preliminary studies assess species biomass, fleet capacity, and animal protein requirements for the Angolan population (FAO, 2018).

Table 4.2. Species catch prohibitions in 2018 in Angola. Source: Decree nº 13/18.

Species	Period of Prohibition
Bottom shrimps (*Parapenaeus longirostris* and *Aristeus varidens*)	January and February
Coastal prawn (*Penaeus notialis* and *Penaeus kerathurus*)	January, February, and September
Crabs (*Geryon maritae*)	From 15th of June to 15th of August
Lobster (*Panulirus regius*)	January, February, and March
Demersal species	April, May, and June
Horse mackerel	June, July, and August

Participants such as CR1, a representative of a fishers´ cooperative, affirmed that the reduced fish availability is visible: "*We are really noticing, the product that is disappearing even on our coastline is in the case of grouper; horse mackerel is also disappearing, sofio, exactly, are disappearing*".

Another representative of a fishers´ cooperative (CR2) corroborated CR1, adding that some species' low biomass levels are particularly noticeable, and subject to catch restriction, but some others draw attention because they are not supposed to be in shortage:

> "*What has been disappearing is horse mackerel. In all these years that we've worked, there has been a ban on the capture of horse mackerel. But, since the end of 2017, until 2018, even sardines are different, they are scarce here on the coast of Benguela*".

He further added that the consequences include higher fishing costs since they need to travel to more distant fishing grounds for catches:

> "*And we spend a lot of fuel because now we have to go a long way to catch fish. For those who are here in Benguela, they'll have to go there to Sumbe or here to the south, over there in Namibe, because if not, here on this coast the fish is really scarce*".

Horse mackerel has been by far the most endangered species on Benguela's coastline and on this, even industrial associations are in line with SSF stakeholders. When asked about fish availability in recent years, FR3 affirmed that: "*The horse mackerel, in recent times, has disappeared but it… varies a lot; there are days when there are many losses [of catch] and others with no catch at all*".

The participants consider that seafood on Benguela's coastline is irregularly available, possibly due to climate change, as FR4 declared that: "*Now it's more complicated because things are reversed; in a good capture phase there are failures. In a failure phase, it gives fish, but I believe that this failure has to do with environmental problems*".

The reduction in horse mackerel biomass was confirmed by MINPESCAS representatives, who explained that this issue has been addressed by implementing responsible measures to guarantee the sustainable exploitation of this species along with other marine and inland live resources:

> "*At first sight, there is a certain decrease in the biomass of the horse mackerel species, which is why the executive, through MINPESCAS, has been establishing periods of prohibition to allow the reproduction of these species. There have been indications of falling biomass of horse mackerel in relation to the past. So, for its recovery, normally, three or four months, in some cases, are established so that fishing for this species cannot be carried out. But in recent days we have been noticing that things are improving little by little*" (GR3).

Another governmental representative (GR5) gave more details about the policy aiming to tackle these risks, pointing out some species that face critical biomass reduction:

> "*The law 6-A/2004 also refers to rare species and endangered species. In fact, turtles are currently among the species that are rare and endangered, and some crustaceans are protected by law but there are those species that are much more fished, and considering that their reproduction, is long term, the ministry has had some programs to protect these species. This is done by not giving authorisation for fishing these species. There are many species endangered, but here in Benguela it hasn't been much, because our activity is limited to pelagic fishing. I mean, fishing for horse mackerel, sardines, and mackerel. We have few demersal trawls*".

Restaurant owners are also noticing the effects of falling biomass levels as it greatly affects their business by causing low availability in the market. R7 stated that: "*Everything disappears from our province, and we can't have the product regularly, and we don't know where it goes; they say it's the Chinese, they say it's going to Luanda… I don't know… and there's not much left here*".

Because of overfishing, biomass levels are plummeting in the areas some artisanal fishers are authorised to operate, forcing them to go past the four-mile fishing limit. Participants in the study declared that, consequently, many fishers face unsafe fishing conditions that could lead to loss of life at sea, aggravated by the lack of navigation equipment:

> "*In our patrolling missions, we have already encountered, for example, artisanal fishers at 20 miles, at 30 miles which is an authentic suicide. But they go because they don't have navigation equipment, not even a lamp*" (GR3).

This study also found that most of the risks small-scale fishers face are linked to disputed fishing grounds. One of the fishers´ association representatives (CR1) emphasised how often this situation occurs, and the reasons for it:

> "*We come across this type of conflict every day; even now, at this very moment, we are solving this problem because of the problem of drags, which are caused by large vessels. These industrial boats that carry the nets, they are spoiling the catches. The species that we mentioned are really disappearing*".

CR2 also highlighted that the substantial fishing capacity difference between artisanal and industrial stakeholders causes the conflict over resources exploitation on the Benguela coastline:

> "*The fish capture is difficult, and usually those who can capture in greater quantities are the larger vessels and industries. They drag in large numbers and soon the fish flee further, and only they have this ability to fish*".

A fishers´ cooperative representative (CR3) argued that physical accidents between vessels happen but those are mostly caused by semi-industrial vessels: "*It hasn't been that constant because there have been times when semi-industrial fishing vessels have violated the artisanal fishing space. There have been some situations involving some trawlers, and artisanal fishermen always make complaints about it*".

Even managers of fishery companies, which mostly own industrial vessels but also have some semi-industrial boats, confirmed the existence of such conflicts with artisanal fishers: "*It has*

already happened one or two times, but the crews have been advised to avoid such situations, but they are very sporadic" (FC5).

However, governmental institution representatives stated that the occurrence of accidents over fishing grounds at the sea are frequent and pointed to both artisanal and industrial fishers as having shared responsibility. According to GR4, conflicts are due to many factors, including lack of navigation equipment and awareness:

> "*This is constant, to the extent that, sometimes, [they] exceed or violate the boundary area of the others. By law, artisanal fishing is only up to four miles, and there are moments, those looking for fishing and because few artisanal fishermen, use equipment - GPS, etc., to see where they are, sometimes they exceed. But sometimes some industrial and semi-industrial shipowners fish beyond, even within the limits of the artisanal fishing area, in the four miles, even half a mile, especially when the biomass approaches these areas; they violate and this always leads to conflicts, resulting in that sometimes, industrial vessels capture the materials of artisanal fishermen, mainly meshes, and gill nets* ".

Another representative of a governmental institution (GR3) said:

> "*We have a somewhat complex problem with artisanal fishermen. For example, sometimes, certainly industrial boats come to the areas of artisanal fishing and may not notice the net in the water because sometimes the nets are not properly signalled, it is very likely that accidents occur. But, sometimes artisanal fishermen do not comply with the areas established by law, the four miles. Therefore, they go into the six, seven, eight miles reserved for semi-industrial or industrial fishing vessels. As I said, the problem is not that the industrial vessels come to meet the artisanal fishermen, the artisanal fishermen, sometimes go to areas where large vessels normally must circulate and this causes accidents and conflicts*".

4.3.1.3 Governance of tenure and resource management

The Angolan authorities have promoted and implemented appropriate measures, in line with FAO guidelines, to ensure an ecological foundation for food production and the long-term conservation and sustainable use of fisheries resources (FAO, 2014). The participants here discussed how these measures have been promoted and applied, such as GR4, who explained in detail that:

> "*For 2017, fishing for deep-sea shrimp was prohibited in January and February. The months of January, February and September were also closed to prawn fishing. From the*

15th of June to the 15th of August there was, for example, a ban on crab fishing. In the months of January, February and March, lobster fishing was prohibited, which is another crustacean, and the months of August and September, molluscs and bivalves. So, fishing in closed bays was also prohibited, for example, in Luanda, Lobito and Tômbwa and so on. In other words, according to marine research, measures are taken every year, management measures are approved for the prohibition of a given species, within a given period".

Another participant (GR5) confirmed the achievement of the sustainable use of fisheries resources and long-term conservation through the adoption of regular measures by the government. He argued that the current levels of exploitation are sustainable under the current management policies and frameworks:

"*It is sustainable, also considering the number of vessels we have, it is sustainable but one of the great species, for example, that we have been monitoring, which has been in the containment phase, is horse mackerel. There are restrictions on horse mackerel in the months of June, July, and August. And we have the case of crustaceans, shrimp, in January and February*".

GR4 also made clear that his government department have responsibility over all biological resources, especially crustaceans, within the coastal fishable areas of Benguela province:

"*…we control all the species captured by the artisanal stakeholders, which are captured by line, gill, and even some fish cages. So, it means we don't have a specific species to control; all kinds of fish, especially crustaceans are really from our artisanal area, because crustacean exploitation is only via artisanal fishing*".

The Angolan authorities have thus been providing a responsible governance of resources. The participants in this study who represent the government affirmed that adequate legislation to protect different forms of legitimate tenure rights is guaranteed.

Other state representatives (GR5 and GR3) affirmed that the authorities currently also enough equipment to ensure a responsible governance of the fishery sector in the study area:

"*First, the means are many and sufficient, especially for covering our coast in the province of Benguela, although there may be one or another problem, it is normal, but we have been able to provide prompt responses to all situations that may arise, operational situations, of course*".

Some participants confirmed that they had received financial or material support from the government through MINPESCAS, which is made possible by joining fishers' cooperatives, as previously noted by CR2. However, other participants claimed that government support is insufficient or interrupted abruptly, as CR1 stated, citing unclear reasons for these issues:

> "*There were ten of us, out of the ten we were financed once, that, if I'm not mistaken, it was in 2007. We stopped being financed in 2007, on June 27*th.

One governmental participant (GR4) claimed that many cooperatives have benefited from the support it is meant to provide and gave details on why this financial and material aid stopped. The issue seems to be linked both to management problems in the funding institutions and the beneficiaries:

> "*The Fundo de Apoio à Pesca Artesanal, the fund that supports intersectoral artisanal fishing, was created precisely for that. As soon as this fund was created, it began to support artisanal fishing. But, at a certain point, the return was taking a very long time, in a way that prevented the continuation of the constant and permanent support that was periodically necessary according to some programs, which the IPA itself elaborates*".

Due to the discontinuation of the government funding, some cooperatives created their own measures to facilitate aid. One participant (CR2) mentioned self-funding and described how it works:

> "*The cooperative was created because each one of us formed the fund, because of income financing, an internal income. The fund is really made by us. So, the one that was funded, as soon as you make your refund, then another person is financed, and so on Now, as for credit, no, we need it, we didn't go there, we didn't risk asking for it*".

In many cases, MINESCAS does not directly support fishery stakeholders, instead acting as an intermediary between financial institutions and fishery stakeholders, as GR5 explained: "*The MINPESCAS supports with materials only… It already did in the past. But it has made it much easier for fishing shipowners to receive support from "Angola Investe", it finances some areas of fishing, companies*".

One of the managers of a fishery company confirmed this statement about the intermediation that MINPESCAS offers between fishery stakeholders and financial institutions. The financial support provided by the government is also extended to empowering women's involvement in the fishery sector: "*The vessels we have, here we have one that is not owned by the company; it was a*

FADEPA´s financing and this financing was done in the FDES program that was there, and we were covered with a vessel" (FR4).

In addition, GR4 outlined the other types of support the government provide and the requirements that stakeholders must meet to access financial support:

> *These supports have been given, in addition to artisanal fishermen, the MINPESCAS has also been supporting artisanal fishing processors through commercial banks, serving only as guarantors, but is only as a sponsor who makes contact with the banks to support some processors. In this case, we have Banco BCI and MINPESCAS, specifically the IPA, to support fish processors*. *But, to have access to this credit, first, they need to be part of an association created by them… and for both fishermen and women to be part, sometimes, of cooperatives*".

The support that governmental institutions give to fishery stakeholders in Benguela do not limit to financial and material support. It also extends to the resolution of conflicts which are mostly linked to the dispute of fishing grounds and marine resources, resulting in clashes between industrial and artisanal actors.

The literature shows that many measures to prevent and end disputes regarding fishing grounds and marine resources have been implemented across the world; however, the methodology for their implementation depends on specific regional characteristics, governance frameworks, and the origins of these conflicts (DuBois & Zografos, 2012; Kadagi et al., 2020).The present research discusses how conflicts are resolved with different Angolan fishery stakeholders who gave their opinions.

However, even cooperative fishers have very limited capacity to resolve conflicts, mostly ending in their disfavour, especially when in accidents with industrial vessels, as evidenced by CR1 and CR3:

> "*We have already reported this situation to the superior institutions of the MINPESCAS, which is the inspection area and the IPA, but according to what they tell us, it is ´the rope that breaks on the side where it is weaker [the one who has less influence or power in society may even be right, but against a powerful person, he will always be considered wrong]. So, until now, we never had any kind of measures against these types of shipowners*".

As the main institutions responsible for resolving these conflicts, government representatives have more balanced opinions, characterising the process of resolving a conflict complex which requires care and responsibility to avoid rushing to judgement. However, they did not refer to a specific framework to resolve conflicts over fishing grounds and aquatic resources which any third party may experience. GR3 firstly declared that:

> "*This case is a bit complex; we have, in fact, received complaints in this regard at certain times of the year. But these are subjects that sometimes oblige us to do investigative work, because they do not always correspond to the truth. Or rather, even if these cases do occur, the important thing is to know under what circumstances*".

Another governmental representative (GR4) confirmed what GR3 explained, adding that sometimes conflicts are resolved without the involvement of third parties by the people directly involved in the accidents:

> "*Sometimes, when accidents occur the fishermen manage to take note of the registration plate of the vessel that has dragged their material, there have been peaceful and extra-judicial resolutions so that they peacefully return the material lost by actually buying the fishing gear or compensating the cost of the material in question*".

Participants explained that MINPESCAS's operational boards are the main bodies responsible for the prevention and resolution of conflicts between fishery stakeholders, but fishers and fishing companies, under MINPESCAS guidance, have also been putting forward initiatives with this aim, representing an attempt to achieve community-based fisheries management. One of the government representatives (GR5) declared that:

> "*We started to create a community inspection. I mean, there are those who stay along the coast, the artisanal fishermen themselves, when they see a boat fishing along the coast or in an unregulated area not reserved for this type of boat, they take note of the registration, the name, if possible, the company´s name and send them here. And here we notify the shipowner or the company where this vessel belongs*".

The evidence in this section show that Angolan authorities implement FAO principles to ensure ecological food production and sustainable fisheries use, preserving tenure rights and promoting collaboration among governmental, business, and non-governmental organizations, but many programmes depend on financial sector third parties.

4.3.2 Food security

The participants believe that fisheries can contribute to minimising food insecurity and hunger through the improvement of fish exploitation and thus reduce poverty, which remains among the many concerns among small-scale fishers. CR3 clarified that: *"I am a member of a cooperative which aims to increase the level of catches and quality and to combat hunger and poverty in the communities"*.

R2, a restaurant owner, also declared the importance of fish for the nutrition and health of people in Benguela province: "*The restaurant obtains from fishing a qualitative benefit in the acquisition of fish and crustaceans for rich and healthy dishes to the satisfaction of our customers, employers and employees*".

Fisheries resources also offer income-generating opportunities for coastal communities worldwide, as was discussed in literature review. This study discusses opportunities for revenue generation and the increased consumption of abundant species like sardinellas, yellowtail, red-eye-dentex, and valuable demersal. Stakeholders, including government representatives and fishers, shared their views on exploited species and their potential. According to CR1 and GR3:

> "*What is more exploited is sardines.... The sardine appears practically throughout the year and so, we believe that it is the most abundant species that we have in our waters, not underestimating the others because we still have many and we are talking about the pelagic species, but we have the demersal species which are the corvinas, the groupers, the pungos, in short and not only*..."

More evidence came from restaurant managers, who highlighted the direct benefits that fishing activity has for owners, managers, and employees. R7 confirmed that:

> "*Fishing contributes significantly to the restaurant's income. I've only had this activity so far and it's what I live on, and I've been making my life quietly and so have the employees. There are many employees who have been with me since I opened. So, it's a benefit*".

Regarding revenue generation and empowerment, participants explained the importance of seafood on local menus, which are highly preferred by customers. R6, a restaurant manager in Lobito municipality, pointed out that: "*In hotels seafood represents an important source of revenue*".

R5 said that the revenues from the restaurant he manages (where seafood is one of the main commodities), contribute greatly to the empowerment of the employees, by allowing many of them to pay for their university studies alongside other daily needs, including food:

> "*Most of the employees are university students, but almost none of them have a degree in hospitality. The only thing they have in hospitality is the will to win and continue to pay for university. Therefore, as I have an idea of how much it costs to study, I had to defend the payment of the tuition fee and the minimum to meet their personal costs. Hence, we have an average salary of a minimum of AOA60,000. Then, we have others who earn much more, but with AOA60,000 you can pay for your studies, and you can eat [with this amount of money, the employees can pay for education and food security]*".

Participants have emphasised the potential of fisheries as a means of reducing food insecurity and hunger due the abundance of many valuable fish species alongside the Benguela coastline particularly among small-scale fishers. They also see fishery as sustainable source of employment and revenue for coastal communities.

4.3.3 Exploitation of Crustaceans

The literature review emphasised the importance that crustaceans have in their contribution to revenues for MINPESCAS through exports. Therefore, this topic was discussed with the participants to assess the extent to which artisanal fishers exploit this commodity. Here, crustaceans will be compared to bony fish in aspects such as costs of exploitation, market demand and offer, consumption, and income generation.

4.3.3.1 Income generating opportunity.

Although the varied food diet in Angola is largely dominated by plant-derived food (Reksten et al., 2020), bony fish and crustaceans play a crucial role in livelihoods and income generation. The interviews with managers of restaurants in Benguela province showed that 90% include crustaceans on their menus.

In Benguela, crustaceans are generally perceived as an expensive and profitable product which is only affordable for wealthy people. The first assumption was prompted by GR1, a fishery expert, when asked about the economic importance of crustaceans: "*Yes, crustaceans are very important both for the MINPESCAS and fishers because crustacean fishing is one of the most profitable*".

A representative of a fishers´ cooperative (CR3) referred to crustaceans as good sources of revenues for both artisanal fishers and traders:

> "*Yes, mainly prawns, prawns are caught more here in the fishing commune of Catumbela-Praia and Cachiva… and the capture of these crustaceans has better yields. The women usually sell a small bowl for AOA15,000 to AOA16,000 [around USD15-USD16], and the catch is sometimes up to five bowls. But it doesn't always get caught, there are phases*".

Many participants trade fish not only in coastal and inland areas of Benguela province but also in neighbouring provinces and even in bordering countries. Evidence of this domestic seafood trade was provided by CR3, who pointed out the potential that these transactions have for the **diversification** and boosting of their income and revenues:

> "*The cooperative aims to supply fish, not only locally, but also in the interior of the country, particularly in the provinces. We already took, we already had this type of experience on the anniversary of the 50 years of the municipality of Cubal: we took the product, including crustaceans, and the people liked it. Maybe with more material, more quality of capture, we can manage to, maybe, supply the other municipalities*."

Regarding international trading, another participant (FR4) stated that fish captured by stakeholders in Benguela province have already reached places outside the country:

> "*I mean, I can already say the foreign market because they are already going to other countries, the Congos, Tanzania, Zambia… the fish and crustaceans have already reached there*".

An expert from MINPESCAS confirmed the emphasis on the direct exportation of crustaceans exclusively by industrial fishing companies:

> "*Here in Angola, especially here in Benguela, the partner, the companies that fish the most for crustaceans are the Spanish… and then, they export these products*. *Now, we only have four vessels that do direct fishing for crustaceans and export this product to the European Union, I'm talking about shrimp, crab*" (GR3).

These statements were corroborated by one manager of an industrial fishing company (FC2):

> "*Our product (crustaceans) is all for export, it is captured, processed, packaged, and preserved on the ship... Then, we moor the boat, unload the ship, and put the product in refrigerated containers, which remain here in the Port of Lobito until export*".

4.3.3.2 Contribution to tourism promotion

Artisanal seafood is widely consumed in restaurants in both coastal and inland regions of Benguela province having been delivered by artisanal traders. It is widely consumed in poor households and luxury restaurants alike. In Benguela province many of these restaurants and hotels are along the coast as **Figure *4.3*** shows, alongside very attractive tourist features such as beaches and reefs.

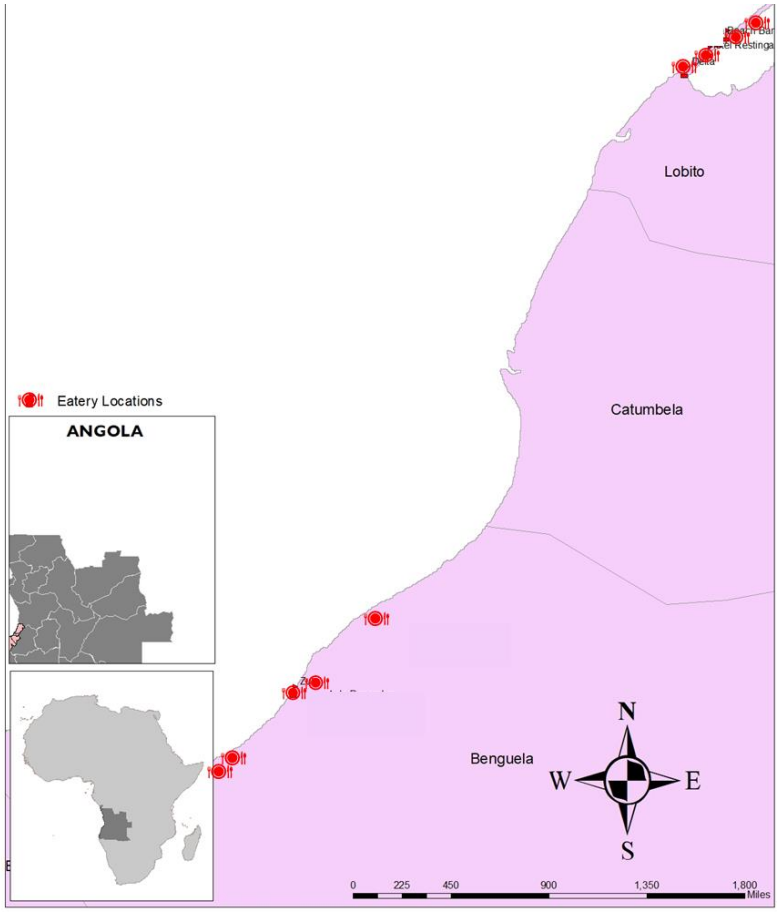

Figure 4.3. Map of restaurants and hotels that serve food in Benguela province surveyed for this study. In Lobito, all the restaurants surveyed are in Restinga bay.

The study analysed the significance of artisanal seafood in restaurants and hotels in Benguela province, finding it the most consumed food. At the same time, the artisanal fishery sector's economic growth is being significantly impacted by the widespread exploitation and trading of seafood products. Around 90% of participants said they serve seafood daily in their restaurants, with only one serving it at customer request, while other participants such as R5 stated that:

> "*Every day, out of every 10 dishes we sell, seven or eight are fish, shellfish and crustaceans*: *lots of fish every day. In fact, it's what sells the most*. *The restaurant sells fish and crustaceans every day*".

Most of the interviewees affirmed that seafood, consumed daily in the restaurants and hotels frequented by both national and foreigner tourists, is mainly delivered by artisanal stakeholders. R1 pointed out that:

> "*This unit serves as a tourist attraction in Benguela, offering excellent conditions and excellent sea food, including lobster and crab. It offers a sun and sea package, making it a popular destination for tourists. Shrimp is rare on the coast due to limited production. Fresh, live crabs, lobsters, mussels, oysters, and other seafood are sourced directly from fishermen's hands to the unit, where they are processed and handled.*".

This participant added that: "*The fish for consumption appear practically day-to-day... we have a partnership relationship with a fisherman who we work with. We have a boat that we part-own halfway with a fisher*".

The nationalities of the main consumers in restaurants in Benguela province include Europeans (Portugal, Italy, Russia) Asians (Chinese, Indians), Americans, Cubans, and Africans (South Africa), according to restaurant managers such as R9. Another restaurant manager provided more customers´ details and a third explained the reasons why foreigner customers choose seafood restaurants, especially to eat crustaceans:

> "*Customers are variable, predominantly European bathers, people from oil companies: Indians, Americans, but also national consumers, from all ages, children, young people, and adults. In the age group it is more 30-50*" (R1).

A manager (R3) of a hotel that hosts a restaurant gave a more precise statistic on the people looking for their hotel services by pointing out that: "*Customers are subdivided, where foreigners are the majority corresponding to 65%, and 35% nationals*".

Prices in restaurants vary depending on location, category, and cooking method. Crustaceans are typically more expensive than bony fish due to their higher catching difficulty. Hotels typically only serve breakfasts and snacks, with crustaceans being on the menus in 50% of surveyed hotels. Another question to restaurants managers was who consumes more crustaceans, nationals or foreigners. According to the managers of restaurants and hotels, around 57% of

consumers of crustaceans are Europeans, mostly Portuguese, and 29% are Angolans. Asians represent 14% of these consumers.

Accordingly, foreign citizens, either as tourists or residents, consume more crustaceans, as R6 stated: "*The Portuguese are the customers that consume most crustaceans*".

Other restaurant managers (R1 and R3) added that:

> "*Crustaceans are more consumed by foreigners. Nationals go more for local dishes, more prepared food. There are a few other foreigners who come for shellfish. In this case, the clients who ask most for crustaceans are the Chinese"*.

R5, who owns and manages a restaurant in the coastal zone of Benguela, described what foreign tourists most appreciate in crustaceans:

> "*Obviously, it's definitely the tourist. They appreciate the lobster too much and when they look at the size of the lobster, they go crazy. They are immediately taking pictures; they consume even more. Portuguese, Americans, and Indians consume a lot of lobster*".

Angolan lobster such as royal spiny lobster (*Panulirus regius*) can reach sizes of up to 35cm, with an average size of 25 cm (Bianchi, 1986).

The number of Angolans tourists from inland provinces looking for crustaceans in coastal restaurants is also considerable, as they make up around 29% of crustacean consumers. Some participants confirmed this: "*The biggest consumers of crustaceans are national clients*. *Mostly Angolan, born in Lobito and Luanda and, occasionally, foreigners passing through*" (R8 and R2).

One participant (R4), however, declared that: "*It is difficult to calculate who consumes more crustaceans, between Angolans and foreigner citizens*".

Although crustaceans are more expensive than bony fish, this does not mean that they are automatically more profitable, because according to Forbes (2022), there is no direct correlation between the price of a product and its profitability. Therefore, participants were asked to compare bony fish and crustaceans regarding sales volumes and profits to assess whether crustaceans are both more expensive and potentially more profitable than bony fish.

Some managers declared that although bony fish sell more, this is because they are more available than crustaceans, and both are lucrative. Since crustaceans' offer is more restricted, they are very expensive and must be cooked mixed with other foods such as rice, bony fish, and pasta as **Figure *4.4*** shows. The participants thus argued that bony fish and crustaceans are both

lucrative, but their success depends on preparation and serving. However, when crustaceans can be sold well or if waste is minimised, they can generate profits of up to 30-35% more than bony fish, as R6 declared: "*Fish slices, as well as crustaceans, turn out to be profitable if you value waste*" (R6).

Figure 4.4. Two dishes from restaurants menus in Benguela province featuring crustaceans combined with pasta, rice, and other ingredients.

Similarly, R1 considered that crustaceans and bony fish are equally profitable under specific conditions:

> "*They are all profitable because we have a massive policy of selling numbers. So, we always lower our profit margins. Instead of doing like the others that earn 50% or 60%, we earn 15%, but we sell 200 times more than them. So, let's win 400%. I'm going to invest AOA1,000,000, they're going to invest AOA1,000,000 and they're going to earn AOA600,000 in profit, we're going to earn AOA150,000 in profit, but while they're making AOA600,000 in two weeks, I'm going to make AOA2,000,000 in one day*.

Another participant (R3) presented the difference in prices for dishes prepared with crustaceans and bony fish, showing that crustaceans are more expensive than bony fish:

> "*Between fish and crustaceans, we consume a lot of fish, crustaceans are for wealthy people. Well, at this stage there is greater demand for fish, given its value, than crustaceans, which are much more expensive. Fish dishes range from AOA3,900 to AOA5,000, and crustaceans range from AOA1,000 to AOA12,500*".

Other participants (R8 and R4) stated that although both crustaceans and bony fish are equally expensive, some factors boost the value of the food - but crustaceans always have a considerably higher average price:

> "*Both for fish and crustaceans, it varies, it can go from AOA2,200 per serving, and AOA12,000, in the case of Seafood Rice or Seafood Cataplana but crustaceans will always be around 60 to 80% of the value of the dish*".

Although crustaceans are more expensive to purchase, some stakeholders consider it as more profitable than bony fish. R8, who manages a restaurant in Lobito, explained why he thinks crustaceans are more profitable than bony fish:

> "*Crustaceans are the most profitable at around 30% to 35%, as they usually do not have a garnish, or the garnish is in smaller quantities, in addition to the drinks that are normally consumed to accompany the dish. For example, a garnished fish dish costs the house the value x which is equal to 100%, while the lobster dish costs the same x, but without about 30 to 35% of the garnish that is normally dispensed by customers in this type of dish, hence it is more profitable by about 30 to 35%*".

Other participants attempted to explain why they consider either crustaceans or bony fish more profitable. R7 explained that the profitability of crustaceans comes from the low cost of preparation:

> "*It's because, you don't add anything, it's practically water and salt... Maybe if it's shrimp with garlic, you use more oil, you use more garlic, but usually the shrimp, the seafood is cooked and that it's water and salt. Let's just say, if you have a sauce to go with the lobster, you use mayonnaise and ketchup but, well done, the really high cost is in the raw material*".

R8, who also considers that the cost of cooking crustaceans is lower than bony fish, added:

> "*The value of the amount invested to cook fish or crustaceans is around 55 to 60% of the total value of the dish, although in crustaceans the value can sometimes be only around 50%. I can base these numbers as follows: for every AOA1,000 of fish, between acquisition and sale, we have to consider the following expenses (called invisible expenses, which go unnoticed by the customer but are high): Freezer storage (light), plus cutting and preparation of the fish; more seasoning; more garnish of the dish; more spent on gas and flatware; more expenses at the table and decoration of the table (napkins, salt, pepper, toothpicks, etc.); more dishwashing; more staff work; more profit from the dish*".

However, R7, expressed a totally opposite opinion, that bony fish generate more profits:

> "*I, honestly, at this stage, with the accommodation of expenses and… fish is more profitable… because seafood, sometimes, you buy then you don't sell it and then you have to cook that with seafood rice, which is not enough for a daily dish, which is not more profitable than maybe selling a red-eye-dentex, every day, a lot of red-eye-dentex. Because with the sales we have, we must opt for cheaper dishes*".

Overall, the data from the study shows that, as well as being more expensive than bony fish, crustaceans are more profitable, as **Table 4.3** shows.

Table 4.3. Price comparison between crustaceans and bony fish in the restaurants and hotels surveyed for this study in Benguela province.

Type of dish	Lowest price (AOA)	Highest price (AOA)	Maximum % of profits	1st Source of acquisition	2nd Source of acquisition	3rd Source of acquisition
Crustaceans	2,000	12,500	300%	Importers	Outside province	Local artisanal stakeholders
Bony fish	1,200	6,000	100%	Local Artisanal stakeholders	Outside province	Importers

Although some crustacean species are very expensive and unaffordable for poor people, especially in restaurants, crabs such as West African geryon (*Geryon maritae*) can be bought in the street, as **Figure *4.5*** shows, at a low price. Some retailers suggested that crabs caught by artisanal fishermen are consumed at home cooked with rice or pasta.

Figure 4.5. Crab (West African geryon) boiled with salt sold in the street market next to Cotel Roundabout in Benguela province, ready to eat.

4.3.3.3 Difficulties in exploitation of crustaceans

Although fish consumption in restaurants, especially that of crustaceans, is crucial for livelihoods and revenues as well for the promotion of tourism, there are still some drawbacks that can undermine this potential. According to the participants in this study, the main reasons for the low availability and high prices of crustaceans within the fishery market in Benguela province are linked to the lack of appropriate gear and equipment for crustacean capture by artisanal fishers.

Another key reason is that only industrial companies are exclusively dedicated to crustacean fishing; however, this is only for exportation purposes. This was confirmed by the statements of many stakeholders such as representatives of artisanal fishers´ cooperatives, who acknowledge the lack of fishing gear as the main reason for their low exploitation of crustaceans:

> "*Perhaps crustaceans and shellfish, because there are few areas where they are found. There are few people who have explored these areas. It's not really my area, because I'm just more into fish, but I believe, in my opinion, that it's really due to lack of means. The means are kind of archaic, there's little... Normally I use more imported things*". (CR1)

CR2 noted the same difficulties:

> "*The products that are not being exploited are lobster, shrimp, and crab, due to lack of means*. *We have sardines, yellowtail, goldfish, sharks, manta rays, swordfish, tuna fish, camuchiri, horse mackerel; there are no crustaceans, we don't have that kind of art… not the lobster. Shrimp we have, in banda-banda art (beach-seine). Shrimp and prawns come, but crab not*".

Another participant (CR3) pointed out that access to fishing communities is very difficult:

> "*It is really necessary to pave the way to give access, not only for merchandise but other situations, even tourists could show up there and who knows, have the pleasure of investing in something. We don't have, we never had a visit from some tourists because… the road is in terrible condition*".

Experts from MINPESCAS also added their thoughts on this issue. The first (GR3) stated:

> "*As I said, we don't have people who capture this species with large vessels. Lobster, for example, are more artisanal fishermen, because it is also a very expensive species, it is not for everyone. As with horse mackerel, there are also periods when this species is not captured. If I am not in doubt, in January, February and March of each year, fishing for this type of species is prohibited*".

This expert statement clearly demonstrates that the small-scale fishers operating in this coastal zone do not have the required capacity to sustainably capture this product for local consumption. His statements are in line with another governmental fisheries representative (GR4) who also blames the lack of fishing gear. He argued that the number of fishers dedicated to crustaceans´ exploitation in Benguela province is difficult to calculate since fishers use the same gear for different types of seafood:

> "*At this point we have no idea why, what happens because there are many licensed gills craft which use this art also to capture crustaceans, especially lobster. But, fishermen in Egypt Praia, located at great distances, vary in their number of lobster fishermen based on their ability to acquire materials for their craft. Occasionally, there is a lack of precise number of fishermen exclusively targeting crustaceans, as they have specific capture periods. Why? For crustaceans, especially lobster, it is a mixed catch, as nets are launched in areas where lobster and fish are present, involving both species*".

Meanwhile, some fishing companies have tried to exploit crustaceans but, from their point of view, doing so is costly and faces many impediments, even from institutions that should promote the activity, as GR5 from MINPESCAS pointed out:

> "*Nowadays it is not easy to carry out an activity on the high seas. And usually, the shrimp and prawns come from the high seas, they are a type of fishing that is very expensive*".

FC4, a manager of a fishery company, gave further details on this issue:

> "*Exploiting crustaceans is difficult due to the inadequate measures implemented by the Ministry of Fisheries, excluding those capable of fishing them. I even believe they do this to divert us from fishing*. *Older methods involved caged crabs, but [these are] risky and vulnerable, requiring dropping, spending days, and raising them for protection. And licenses are expensive. it's a product that we find expensive in a restaurant, but to be captured, nobody appreciates it. In the province of Namibe it's already different because they've always had this. Here, nothing is done to take that type of activity as an art, or to do business*".

These allegations by FC4 should be seriously considered since crustacean exploitation is considered by MINPESCAS experts, fishers, and restaurants owners alike as among the most profitable but expensive seafood in the coastal zone of Benguela.

Crustacean acquisition is not regular due to the low availability from artisanal fishers and the high prices of imported products in supermarkets. Restaurants and hotels typically purchase crustaceans from local sources like Caota, Vinte-e-sete, Lobito Velho, Compão, and Restinga, and from retailers, and fishers who deliver directly to them. Distant locations like Cuio and Egito Praia may also be used. Prawns and shrimps are purchased in local supermarkets and in neighbouring provinces, also due to low availability from local artisanal providers; as R4 observed: *"Local fishers and retailers use to fail when required to provide crustaceans".*

Although the Angolan coastline is abundant in marine wildlife, including crustaceans, due to its location within the BCLME, and MINPESCAS experts also confirm sustainable biomass levels, some participants in the study argue that the periods officially closed to crustacean fishing last too long, posing questions about productivity and decreasing biomass levels.

One manager of a fishery company (FC3) declared that the availability of crustaceans in the ocean is not satisfactory:

> "*We do not explore crustaceans much more because of doubts about their economic viability. We have only one small vessel that is dedicated sporadically to catching crabs, but this has no or low output. Lobster and shrimp are most sought after but are located far from our fishing zone which is not very favourable, and these species are not very abundant there*".

Another expert, however, thinks that the biological levels of crustaceans is sufficient for exploitation by foreign companies aiming to export, but he did not acknowledge the needs of domestic consumption:

> "*Yes, the biological level of crustaceans is satisfactory for exploitation. You know that if foreign companies are not satisfied, they go bankrupt, they give up soon. When the following year arrives, they no longer renew contracts*".

The difficulties that participants presented in their statements led the researcher to discuss with the participants if the availability of crustaceans was sufficient to meet the current market demand or not.

Therefore, many stakeholders, including MINPESCAS experts, stated that there is more demand than supply, due to the low production by fishers who direct their catches to the local market, as CR4 explained: "*The offer of crustaceans, I mean the amount delivered by fishermen is insufficient, there has been more demand than production of crustaceans"*.

Most of the participants stated that in their opinion, the demand for crustaceans in the market is greater than the amount on offer from local stakeholders. Restaurant owners such as R1 stressed the irregular crustacean availability because of the absence of a specialised value chain for this product:

> "*There are no specialized suppliers in crustaceans in this area, only curious people, mainly from Cuanza Sul province. Maybe there are places here that might have more, but we're not really specialised in selling that kind of stuff. So, we buy it, on the coast… we usually*

have shrimp and lobster, but we are not strong sellers because there is no regular supply… Well, monthly, maybe we don't even sell 10kg of lobster".

Other restaurant managers had similar opinions; R2 declared that:

"*Sometimes, but not frequently, the offer can be satisfactory but most of the time there are always periods of total lack of crustaceans, and I think it would be solved if someone could produce it regularly oriented to the market´s needs… overall, current production is not enough for market demand… we cook more fish every day than crustaceans because of difficulties in acquisition*" (R2).

One restaurant manager stated that due to the current low offer of crustaceans in the market, they mostly have to go to places outside Benguela, and on many occasions imports from European countries are available in supermarkets, at far more expensive prices:

"*We buy crustaceans from Lucira (in a neighbouring province of Namibe) and Cuanza Sul, with greater predominance in these two provinces than in Benguela. The reason, I don't know if it is because they don't have the art here or they don't develop it. We spend, weekly, AOA400,000 on prawns and shrimp to buy from the supplier who orders from abroad*" (R1).

Another restaurant manager added:

"*Current production is not enough for the market, because we still have to purchase at a very high price and sometimes from foreign supermarkets such as Shoprite… we usually buy imported shrimp. It has more quality. It comes balanced, it comes clean… and here is a bit mixed up–with sand, not balanced, coming with big and small ones all together although now the ladies are working a little better due to our advice*…" (R7).

Another restaurant manager (R1) declared that they mostly acquire crustaceans from inside Benguela province, but must also request a supply from people bringing the product from the neighbouring province of Namibe:

"*We have a group of fishmongers that have been working with us for 10, 15 years. They are from Kasseque roundabout and from 27 Market, but we also have one or two ladies from Baía Farta for crab. Lobster, we have it from Egypt Praia, now we are working with a gentleman from the south who brings it from the Lucira area*".

The causes behind the limited availability of crustaceans were identified by one restaurant manager (R1) as due to lack of knowledge and appropriate fishing gear and equipment:

> "*In Benguela we have one supplier who provides us with crab, but mainly lobster. The Prawns are 100% imported; shrimp appears very little; there is no one to produce specifically here in Benguela and dedicate himself to the art of shrimp and such in an industrial way. If I had that, I would make a lot of money*".

R1 thinks that the lack of specific producers and traders of crustaceans in the region causes the irregularities in availability, and he points out some eventual solutions:

> "*There are periods of surplus and there are periods we want and don't have. Because, by nature, capture is not oriented: when you have too much, you have [it]; when you don't have it, you don't have it. Something that could be guided with farms, with aquariums, as is done abroad*".

Only one restaurant manager (R6) had an opposite opinion to most of the participants, saying: "*[the] production of crustaceans is proportional to market demand*".

MINPESCAS experts also confirmed that the crustacean production by small-scale stakeholders is insufficient to meet current demand, as was respectively stated by GR1 and GR3:

> "*At the provincial level, there is no directed fishing for crustaceans, what exists is artisanal fishing, or we can even call it subsistence fishing*... w*e have some cases of lobster fishing in Egipto Praia and Lobito too, but they are not large quantities*".

However, some representatives of government institutions considered that it is difficult to establish if the offer has been enough for local demand. This idea was expressed by GR4:

> "*We can say that it's quite possible that there might not be a balance between demand and supply. Why? Sometimes there is capture and there are not many buyers, sometimes there is demand and the product has not yet been captured because, sometimes, it is the closed period, and it cannot be captured*".

He further explained some extra factors that make difficult to understand the crustacean value chain:

> "*As I said, the marketing of this product is multichannel; the shipowner depends on how he acquired the product and, because we have in this chain some traders of crustacean products who are not fishermen. Sometimes they go to the high seas, and buy*

crustaceans, lobster from fishermen and come to sell here on land. They have some reserves, as we would say, nurseries to keep that lobster and sell later."

The low availability of crustaceans in the market makes the product more expensive throughout the entire value-chain. When asked to compare fish and crustaceans selling, some participants pointed out that the relatively lower price of bony fish made it more available and more widely consumed than crustaceans:

"*Fish is cooked every day, crustaceans are less frequently sought after also because a plate of good fish is AOA3,000- AOA4,000, a lobster dish is AOA6,000; it's very high, it's our most expensive part of the restaurant, that's it, it's very high. Unfortunately, it costs too much*" (R1).

Another restaurant manager expressed his views on the cost of crustaceans in the market, especially for final consumers within restaurants, pointing out some interesting statistics:

"*It's also true that we don't have much [of a] crustacean consumption habit, but also the price scares a bit, because if you already buy it for AOA3,000, put the garnish, put the profit margin, put the finance margin (taxes), add other additional taxes, the product reaches the customer at 120%... very, very expensive*" (R8).

4.3.4 Fisheries contribution to economic growth

The study participants were also asked about the employment opportunities that marine resources can create for people living in coastal area of Benguela province. Representatives of the government presented statistical data indicating that this sector is a great contributor to job opportunities, as GR5 stated:

"*As far as artisanal fishing is concerned, we have control of 1,700 vessels, some with outboard and inboard motors and others with oars. We have approximately 14,000 employees, 14,000 jobs, including fisheries, salt flats and much more. Some in the fishing activity and others in the salt industry*".

Restaurants, although indirectly, also create job opportunities due to the volume of seafood they trade. These assumptions come from the statements of the restaurant managers interviewed for this study, which indicated that the number of employees varies between 10-68. In total, the nine restaurants surveyed had 291 job posts, with an average of 32.3. R5 gave some details about his employees:

”*We have 54 direct employees. Then, on weekends, we have another 12 temporary employees who work only on weekends, then we have as many indirect employees who are our suppliers, from vegetables to fish*… [they are] *between 18 and 35 years old more or less, most of them have this as their first job*”.

Another restaurant manager (R1) shared his opinions and expectations regarding the contribution that SSF can provide to the country´s economic growth:

“…*the country needs to know that we do not invest, we do not create conditions. Today we could be calm with a good alternative to oil, creating revenue, contributing to the national GDP and we have not been giving, and wasting potentialities that only God knows what he can and what he has given us*…”.

The researcher interviewed fishers' cooperative leaders, associations, and governmental representatives to discuss the role of cooperatives in Benguela province in promoting socio-economic growth in marine fishing communities. Some mentioned that the support from governmental institutions is exclusively directed to stakeholders, including women, associated in fishers ´cooperatives and associations. Indeed, CR2 declared that, in fact, many cooperatives were only constituted for this intention: “*The cooperative was created, first, to have government assistance, because the government only supports cooperatives”*.

Another participant (CR4) showed that, through the cooperative to which he belongs, MINPESCAS can deliver technical and methodological support to associated fishers:

“We have been contributing to the organisation of associated companies, correcting them and guiding them methodologically in accordance with the directives of the governing body, with a view to improving the quality of the fishing activity”.

Furthermore, CR3 gave further evidence of the role of cooperatives in securing support from the government in terms of collaboration, technical, and financial achievements:

“… *the ten vessels belong to the cooperative, in the number of associated personnel; one vessel corresponds to four members. It was support given by the Provincial Government, through the Municipal Administration of Catumbela*”.

Women's involvement in SSF was not discussed during the interviews with stakeholders but was mentioned by some participants. It was noted that women do not directly participate in fishing activity but are very influential in the processing and trading processes, which confirms the literature review´s findings.

Women´s role in the trading process was evidenced by one of the restaurant managers (R7) who stated that they are the most regular and reliable sources of seafood for their daily activity:

> "…*the fish is equal; we have two or three people who call us every day at 6am, they already work with us, ladies who are right and bring the fish. They are always the ones to bring it, because the fisheries fail, they prefer to sell far away to those who pay more, and when they bring it is frozen and we don't like it. We want the fish every day as it comes out of the sea, comes in their basket, covered by ice, they deliver, and we take care of it right away and sell it on the same day. We want on the same day, little and to sell every day... this fresh fish, because the grouper, we buy big groupers, and we freeze it whole and then we cook and sell it*".

4.3.4.1 Barriers to fisheries' economic growth

Although the participants highlighted the importance of SSF in achieving economic growth, many factors impede this potential. The main factors addressed by the participants were the lack of financial support, technical knowledge, and decision-making capacity due to top-down governance, lack of stakeholders´ cooperative work, and law enforcement.

Lack of funds is perceived as being among, or even the main, obstacle impeding improvements in the economic growth of the SSF sector in Angola.

The first signal of lack of funding comes from the IPA [Instituto de Pesca Artesanal (Institute of Artisanal Fishery)]. The IPA lacks the terrestrial and maritime means to do their job according to GR4:

> *"The institution had means of transportation, but these means become obsolete, they are already worn out and some have been decommissioned, within the scope of their use and, at that moment, we are still without transport*.

Some stakeholders pointed out that some initiatives were launched years ago as the government provided some financial and material aid to fishers and processors in cooperatives. Fishers in some cooperatives have also had their own initiatives and implemented self-funding systems, but without successful continuation. One participant (CR1) stated that these initiatives have since stopped due the low fishing capacity:

> "*The association had possibilities, and has already financed some members of the association, but due to the lack of capture, this contribution that the association made stopped*. *The poor capture is due to lack of means that we have here*".

The previously mentioned **low fishing capacity** refers to the **lack of fishing gear** that most of the fishers currently face. Another representative of a fishers´ cooperative (CR3) stated that:

> "*The difficulties are at the very base of support, in material means, in this case I am talking about vessels, outboard motors, and fishing materials. The cooperative cannot provide these to members because we really lack fishing means*".

However, due to the lack of domestic production of almost all types of goods required for fishing activity, these are imported into the country, especially from China, Namibia, and Portugal. The survey confirmed Angola's high dependency on the importation of fishing gear, navigation, and preservation equipment. Managers of fishery companies, FC5, FC2, and FC3, stated that they use gear and equipment from foreign sources:

> "*Fishing gear is imported. It's been easy since everything comes from China*".

> "*The material the company acquires abroad, in Spain, is not available here*".

> "*The company acquires the material in both the domestic and foreign markets*".

Even stakeholders operating semi-industrial and industrial companies struggle with similar problems to small-scale fishers, as CR4 outlined:

> "*The difficulties are related to spare parts, spare parts and accessories, lack of currency to import materials, and packaging for fish, although there is a local Lebanese production company in Luongo -Lobito*".

Additionally, government representatives provided more evidence of the lack of fishing gear as an impeding factor for the economic growth of the fishery sector in Benguela province, as GR4 observed:

> "*The acquisition of fishing gear and vessels are the difficulties that fishers present the most. We don't have any factory in Benguela province. I don't know if the other factories that existed in the country can still give us that, because all material has been imported. This, then, is the greatest difficulty*".

GR5 added that the problem of fishing gear is linked to Angola's difficulties in obtaining foreign exchange considering that most fishing gear comes from abroad:

> "*It's mostly spare parts that we have difficulties in acquiring because of lack of foreign exchange. Many times, shipowners and businessmen are forced to go outside, and when there is no currency, instead of closing, they must resort to the parallel market*".

This high dependency on foreign exchange and the importation of fishing gear was confirmed by other participants in this study. FR4, a manager of a fishing company, explained the situation in the following terms:

> "*Without fear of being wrong, we are the company with the largest ATM [stock of spare parts and equipment] nationwide but everything is imported because we don't have anything in our market*; *nothing at all, it's a shame. For example, when there was the worst financial crisis between 2014 to 2017, we even bought currency on the street to be able to import. The banks cut us off entirely and, in order not to stop investing, we were forced to take risks"*.

In addition, CR2, a representative of a fisher´s cooperative, stated:

> "*The acquisition of fishing gear was already difficult, but it got even more complicated with these import problems. There are only a few stores that sell fishing equipment. In Lobito we only know one, here in Benguela we only know one, in Baía Farta there is also only one. At Egito Praia I never got there; [they] probably haven't [got one]*".

However, some strategies have been adopted to overcome the lack of fishing gear caused by foreign exchange, as GR5 stated:

> "*We have some support that MINPESCAS has given, consisting of a company importing its own nets and then selling directly to shipowners with the exemption of some customs duties, in order to try to have an acceptable price on the market*".

The reality is that currently, most cooperatives lack the capacity to self-finance their members, which leaves them totally dependent on the state. However, the government also stopped providing aid some time ago, as CR3 declared:

> "*The cooperative, normally, has not given any support. In principle, we don't have our own institution, the structures are not our own, so we don't have financial support to provide to fishers*".

This stakeholder emphasised the **absence of facilities**, from support centres including ice industries, to accessible roads that could help to improve fishing activities, from fishing to post-harvest and trade. He pointed out that:

> "*First, I have to say that we don't have facilities*. *We need a support centre for the cooperative to work with dignity and also for the processors to start working well, to create the trays for fish within the institution. In this case, what we really lack is the support centre, and material means*" (CR3).

When asked about whether the fishing community the cooperative represents had ice industries, CR3 answered that:

> "*No, we don't. This is also one of the concerns, because with ice, the fish, instead of coming too early, the fishermen, come a little late, confident that they will put it, they will deposit the fish on ice so that later tomorrow, the ladies will make the sale*".

CR3 also commented on road accessibility to the beach in the fishing community:

> "*Access to the beach itself is another problem, as much as it is during this rainy season. Our road is in terrible condition*".

In a further addition to justify the importance that a support centre would have especially for processors, CR3 stated that:

> "*We have 560 female associates, of which 420 are fish processors and 140 are fresh fish sellers. Some fish species, for example, are for local sale, but dorado and sharks, are processed by the ladies and then taken to the Baia Farta market where they are sold. The other ladies sell fresh fish at the market in the municipality of Catumbela, the Kalumba market, even in Chapanguelo. They lament the lack of financial support for promoting and expanding their businesses*".

Other problems that aggravate the low fishing capacity, limited fish availability, and price rises in Benguela province, especially for small-scale fishers, are the high prices of fuel and the absence of policies to protect or give privileges to stakeholders, as CR2 identified:

> "*There should be more support from the government because things are getting harder. For example, since fuel went up, we also had to go up in fish sales. We saw good news on the state media, but so far no one comes knocking on our door and there is no fuel subsidy. They promised that there would be a fuel subsidy for the fisheries area, we heard,*

but so far, we have been buying expensive fuel. *We only have a partnership with the municipal administration, we pose some needs to the administration and the administration takes the issue to a higher level. We depend on these little things"*.

Lack of knowledge of matters such as fishing techniques, fisheries and business management, policies, and other technical areas has also been highlighted, across governmental institutions, private fishing companies, and overall stakeholders, as factors hindering the growth of the fishery economy in Benguela province. FR4, one of the participants who manages a fishery company, detailed the main difficulties they experienced, and the strategies adopted by their company to overcome them:

"*In our company, in past years, we had difficulties among technicians with the ability to resolve certain malfunctions. There was one freelancer technician working for 20 companies. So, he would answer whoever was faster or gave more. Now, after expanding the company, there was a need to have one technician for certain key sectors such as electricity, refrigeration, mechanics, hydraulics, and naval carpentry, but all six are expatriates, and are really key people who don't doubt their ability. So, at this moment, we can respond to any type of problem*".

More evidence was provided by a representative of MINPESCAS:

"*In 2008 MINPESCAS supported cooperatives with boats, fishing materials, etc., aiming to help the development of artisanal fishery. However, this was canceled because the return on this support stayed stagnant because some of the fishermen did not have the domain to be able to work with them, but MINPESCAS still provided training to the masters, the owners of these vessels to be able to manage the acquired means. However, because the training was over a short period of time, sometimes the domain and assimilation of many were not always equal, and some vessels and fishing gear disappeared or were sunk*" (GR4).

Many participants´ declarations led the researcher to conclude that the well-known characteristic of central governance in Angola conditions the general and economic growth of its fishery sector.

Statements on the deep centralisation of the governance of the fishery sector, including decisions on financial support, were provided by some participants. GR4 commented:

"*At the level of Benguela, the institute has only one representation, which is the provincial representation, and this is what controls the activity of artisanal fishing itself along the*

entire coast of Benguela, that is, from the Tapado river – bordering the division with Kuanza South, to Catara, which is the limit with Namibe. Therefore, this whole area is controlled by artisanal fishing; only one representation, which does not have municipal representation, does not yet contain an organigram, it has only sections, even within the scope of the Provincial Directorate which, with means of transport, move to control all fishing communities".

Another MINPESCAS expert (GR5) added that:

"*First, yes. The decision on who receives funding is made in Luanda (at the central government) level. First, it must be a reputable company, here at provincial level, with a good production image. And then, not only that, but these companies are also all registered, they are registered by the Ministry*".

Although in Angola, associations and cooperatives are seen as the best way that fishery stakeholders can benefit from governmental and their own support, participants in this study, such as GR4, declared that a lack of cooperation is still highly visible amongst many fishers:

"*The associative spirit is still not very strong among our Angolan fishermen, despite much awareness that has been raised, regarding the need to really associate and create cooperatives and associations. But the spirit is of individual work in such a way that they are still not able to work together. Some are trying, but in small numbers*".

Another participant (GR5) added that the lack of cooperation amongst fishers leads to management disputes over the cooperative or association's common property, causing failure:

"*These cooperatives or associations, they exist. We have several associations in Benguela. But there has been some disagreement between the members. For example, the Ministry of Fishery financed each cooperative with one vessel, but there is no union within the cooperative. For example, when the boat produces, everything is fine, and when there is a problem, the cooperative no longer has money and then disagreement begins, then they do not repair the vessel, and the vessel ends up being abandoned*."

Finally, although Angolan law is very clear regarding the policies adopted to support the sustainable management of the country's marine resources, many aspects are ignored or violated by stakeholders. The first example comes from a representative of a fisher´s cooperative who stated that due to the lack of appropriate fishing gear, many fishers still adopt a technique forbidden by law a long time ago:

"*In this case, we have the restriction on the basis of Law 6-A/2004 of October 8th, the ban on dragging on land, the art of banda banda (**beach seine**). Naturally, the law forbids it, but that's it, we can't replace this art with another*" (CR3).

Another clear **violation of the law** is the continuing existence of the capture of marine turtles, which are an endangered and protected species, as shown in **Figure 4.6**.

Figure 4.6. Image of a turtle´s head, supposedly harvested by small-scale fishers using beach seine, in the fishing community of Praia Bebé, municipality of Catumbela.

The chapter discusses the fishery sector stakeholders' perspectives in Benguela province, highlighting the government's role in overseeing policies, programs, and dynamics. The Ministry of Fisheries collaborates with national and international institutions for scientific research and marine information, aiming to ensure ecological foundation for food production, sustainable fisheries resource use, responsible resource governance, and protection of tenure rights. The government collects and manages marine wildlife data for regulation. However, programs supporting fishery development rely on third-party financial sector involvement. Participants stressed that fisheries promote food security and reduce hunger and poverty, by improving fish exploitation particularly among small-scale fishers increasing consumption of abundant species. Fisheries also provide income-generating opportunities for coastal communities. Participants also highlight the importance of artisanal seafood in Benguela province's restaurants and hotels, as it is the most consumed food and a significant contributor to job opportunities, and empowering youth to pay for education.

From many stakeholders´ points of view, in Benguela province, crustaceans are seen as expensive but profitable commodity, attracting wealthy individuals and tourists with 50% of surveyed hotels and restaurants featuring crustaceans on their menus. Women´s significant influence in trading process was evidenced by restaurant managers who rely on them as reliable sources of seafood for daily activities. However, low fishing capacity and the irregular availability

of seafood and climate change-related biomass issues pose risks to small-scale fishers. Other significant issues reported by participant's include (1) the lack of collaboration between public and private institutions, communication issues; (2) low financial capacity in Angola's fisheries sector, and large dependency in third-party institutions and programs, often insufficient or interrupted; (4) absence of facilities and knowledge in areas such as fishing techniques, business management, and technical areas; (5) cooperatives management disputes; (6) conflicts due to violation of law and fishing ground also contribute to the failure of the sector.

Participants in the study highlights the need for improved navigation equipment, fishing and post-harvest facilities as well as management of marine resources.

Chapter 5. Quantitative data analysis and findings

5.1 Introduction

This chapter aims to describe and analyses the socio-economic profiles of the SSF stakeholders and also the nature of the fishing sector in terms of vessel size, fishing frequency, and trading relationships. It addresses the lack of existing data for the artisanal fishing sector as a way to reduce poverty and unemployment among the people living in the coastal zone of Benguela province.

SSF plays a vital role for the people living in Angola's coastal zones as a source of food security, revenues, and livelihood (FAO, 2018; Duarte et al., 2005) but the information regarding this sector in Angola remains very limited, this chapter also aims to produce results that can be used as a basis for future quantitative studies.

To determine the associations between the respondents' socioeconomic characteristics and their views, data were evaluated using statistical and descriptive analysis. To make it easier to combine the key conclusions from assessments of both results chapters, the quantitative analytical results are presented in the same way as the qualitative results are displayed, under the four themes (Governance, Food security, Exploitation of Crustaceans, and Fisheries Economic Growth) which emerged from the thematic analysis of the interviews based on the FAO SSF guidelines, as the main theoretical framework.

5.2 Methods

The data analysis methodology employed in this study combined both descriptive statistics and exploratory multivariate analyses to interpret information gathered from small-scale fisheries (SSF) stakeholders. Descriptive statistics were used to explore network characteristics and relationships between variables, focusing on key metrics such as link density and node properties. For qualitative data, percentages, means, and relative frequencies were calculated, while for quantitative data, averages, standard deviations, and coefficients of variation were used. This approach aligned with previous studies like Lindkvist et al. (2022) and Zacarkim et al. (2017).

Principal Component Analysis (PCA) was applied to simplify the data by identifying clusters of numerical variables with loadings greater than 0.3. Similarly to other studies (Asnawi et al., 2012), five to six key components were extracted from boats and each of the stakeholders´ groups datasets (fishers, retailers, and processors). These principal components, ranked by their contribution to total variance, were crucial in understanding relationships between variables.

Multiple Correspondence Analysis (MCA) was then utilized to visualize associations between categorical and numerical variables, producing maps that helped in interpreting the dataset.

The analyses were conducted using R Studio (v4.3.2) and SPSS software, with statistical significance tests including chi-square tests, Fisher's Exact tests, Kruskal - Wallis rank sum tests and Welch t-tests applied to explore relationships between socioeconomic characteristics and fishing-related responses. PCA was performed using the `FactoMineR` package in R, and as a common practice of scaling data, scaled PCA was chosen since the variables have different measurement units and dimensions. Missing data were handled by omitting incomplete rows, particularly for continuous variables such as boat size, number of crew, total investment or payment of taxes.

PCA was conducted separately for four datasets—boats, fishers, retailers, and processors—each containing one data point per surveyed entity. For the **boat's dataset**, PCA was applied to the variables: number of trips per week, boat size, total daily investment, and daily expenditures on fuel, oil, food, bait, and ice. In the **fisher's dataset**, the analysis included the number of crew members, fisher's age, years of experience in fishing, number of children, and daily investment in food. For the **retailer's dataset**, PCA was performed on retailer age, number of children, number of family members working together, years of experience as a retailer, and total monthly revenue. Lastly, in the **processor's dataset**, the variables analyzed included processor age, number of children, number of family members working together, years of experience as a processor, daily income, total monthly revenue, tax payments, total daily investment, and daily expenditures on salt and transportation.

The results, detailed in the next sections, also show the interpretation of MCA maps in the main text, focusing on statistically significant variables ($p < 0.05$), while considering some over this threshold that were critical for addressing the research questions.

Additionally, a Likert scale was used to assess the difficulty of accessing fishing gear and navigation equipment such as nets, traps, anchors, GPS, compass, sounders, floats, ropes, fishing line, hooks, life jackets. However, the data, in some cases, have been analysed as interval rather than ordinal.

This comprehensive methodology allowed for a robust analysis, identifying key patterns and associations within SSF stakeholder data.

5.3 Quantitative results

In both PCA and MCA plots of all stakeholders' datasets, Dimension 1 (X axis) highlights contrasting characteristics with positive values (to the right side of the graph, characterized by a strongly positive coordinate on the axis) and negative values (to the left of the graph, characterized by a strongly negative coordinate on the axis). Similarly, Dimension 2 (Y axis) reveals distinctions along another dimension, with positive values (to the top of the graph, characterized by a strongly positive coordinate on the axis) and negative values (to the bottom of the graph, characterized by a strongly negative coordinate on the axis). In addition, the PCA plots reveal the correlations between the quantitative variables of all datasets. Prior to conducting the PCA, correlation matrices were generated for all datasets, as presented in **Figure *5.1***. These matrices serve as a reference point for the PCA results and will be revisited during the discussion, particularly to examine the strength and direction of correlations (strong, weak, positive or negative) among the variables. Consequently, more specific Pearson chi-square tests, Fisher's Exact tests, Kruskal - Wallis rank sum tests and Welch t-tests, will be done following the outcomes of the PCAs and MCAs, within the specific sections according to the themes defined and described in Chapter 4 (Qualitative data analysis and findings).

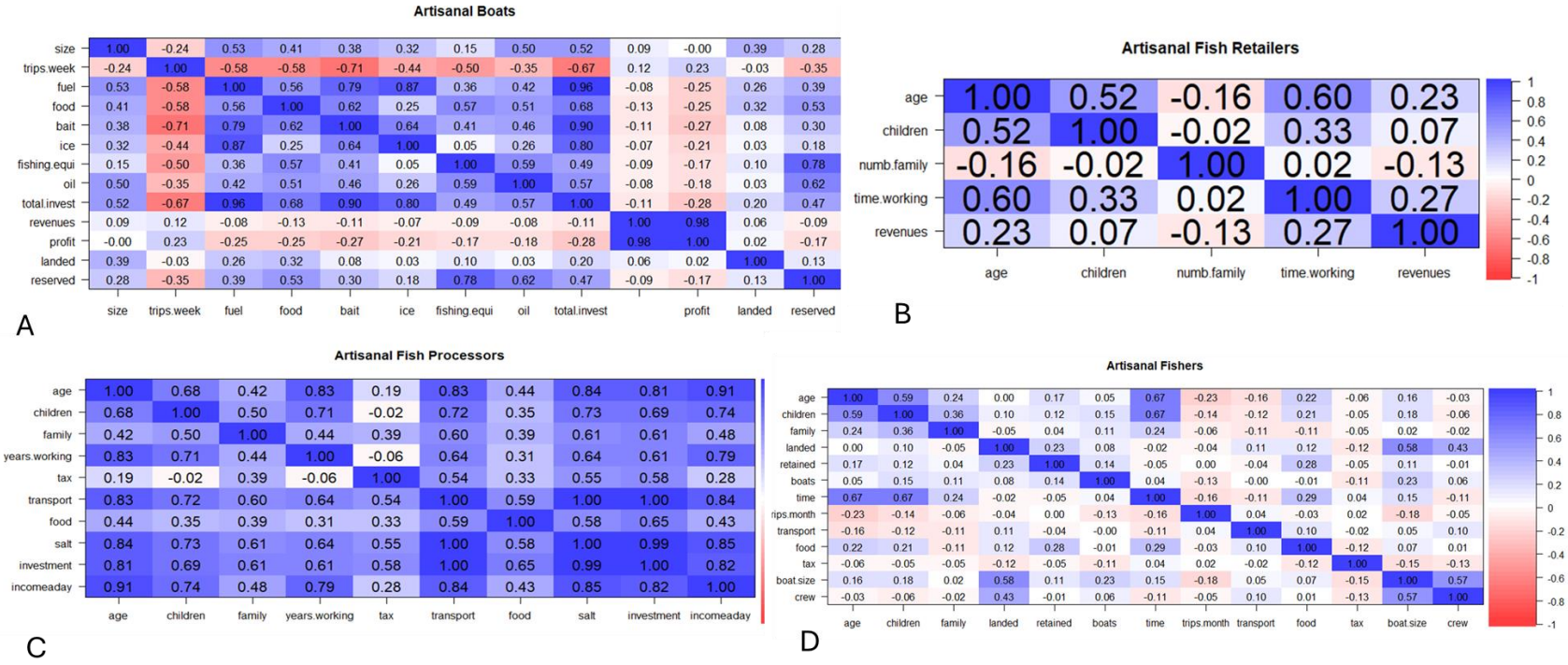

Figure 5.1. Correlation matrices of numerical variables for boats (A), retailers (B), processors (C) and fishers (D) in the study dataset.

5.3.1 Principal Component Analysis (PCA) and Multiple Correspondence Analysis (MCA) of the boats and stakeholder's dataset.

5.3.1.1 Boats´ dataset PCA and MCA

Figure *5.2* shows, on the left side, the Principal Component Analysis (PCA) plot representing the relationships between the quantitative variables related to small-scale boats surveyed for this study across two main dimensions: Dimension 1 (Dim 1), explaining 20.42% of the variance and Dimension 2 (Dim 2), explaining 10.52%. Together, these dimensions capture key trends in the dataset and explain 30.94% of the total variability, which is an intermediate percentage.

This circle of correlations represents the maximum possible correlation between each variable and the principal components, with variables closer to the edge having stronger correlations. The arrows represent the direction and strength of each variable's contribution to the respective dimensions.

The variable representation (blue arrows) shows that trips per week (trips.week) is oriented leftward along Dim 1, suggesting a negative correlation with the other variables in the plot such as "fuel" indicating that these boats do a small number of long trips per week. The variables 'total.invest', 'fuel', 'food', 'oil','size', 'bait', and 'ice' are grouped together on the right side of Dim 1, indicating positive correlations with Dim 1 and a possible interrelationship among them.

The cluster of 'total investment' and other resource-related variables points to a dimension where higher investment and resource use are directly proportional, likely reflecting a higher intensity or scale of fishing operations.

In addition to the boats´ variables correlation circle the individuals factor map from the MCA, on the right and bottom of **Figure *5.2***, helps to explain how the individuals and variables are intercorrelated.

The best qualitative variable to illustrate the distance between individuals on this plane is: "loc" (boat location) which indicates the fishing community from where the boat operates. This variable has a $p < 0.0001$**,** suggesting that it significantly separates the groups or individuals. It indicates that location is a meaningful variable for explaining the distances between individuals. Observations are labelled with notable categorical attributes, such as "cage_TRUE", "gps_TRUE", and "easier.catch_TRUE", to illustrate their association with the principal

components. The labeled individuals are those with the higher contribution to the plane construction and are coloured after their category for the variable “location”.

Data from surveyed boats were analysed along two dimensions encompassing four groups: Group 1 (to the right of the graph) is characterized by a high frequency of plank boats, with an outboard motor and frequent use of navigational equipment. They operate in areas with abundant fish species, and distant from fishers´ homes. They use cages as fishing gear, target easy-to-catch species, and crews use vests for navigation and safety. They operate mostly within Lobito Velho fishing communities. This group relies on advanced equipment within areas with abundant resources, indicating a specific fishing practice profile.

Group 2 (to the left of the graph) is defined by certain distinct characteristics and equipment preferences. This group shows a high frequency of paddle-powered plank boats and is typically engaged in fishing close to fishers´ home. Additionally, they tend not to use navigational equipment and commonly employ beach seine nets as the main fishing gear.

In summary, this group's profile indicates a traditional, close-to-home fishing approach, favoring paddle-powered vessels and minimal equipment, reflecting a low-resource environment and reliance on simpler tools and techniques.

Group 3 (to the top of the graph) displays a distinct set of shared characteristics related to their fishing practices and location. This group of boats exhibits a high frequency of using fishing cages, which suggests a reliance on this specific method of trapping or containing fish, especially crustaceans. They also report fishing conditions in which catching fish is relatively easier, perhaps due to the specific resources or environmental factors in their area. Additionally, individuals in these boats commonly wear life vests, indicating a focus on safety measures.

Group 4 (to the bottom of the graph) encompasses boats which crews show a preference for traditional handlines, targeting profitable fish species, and relying on resource-abundant areas for profitability. They rarely use navigational equipment, suggesting they rely on local knowledge for navigation. Their fishing practices are influenced by the specific environmental conditions and culture of Cuio - Tombas, highlighting a fishing profile adapted to local environmental resources and practices. Their location in this region may contribute to their success.

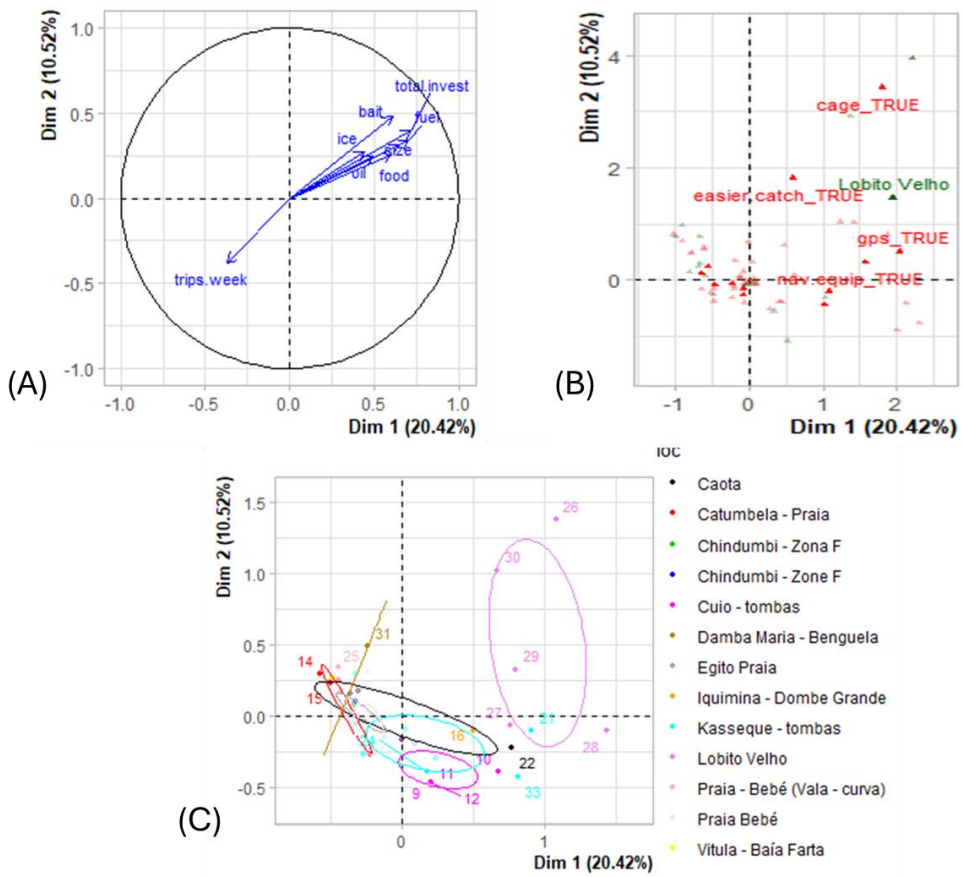

Figure 5.2. PCA and MCA results for the dataset of boats surveyed for this study. (A) Correlation circle displaying the contribution and relationships of continuous variables to Dimensions 1 and 2. (B) MCA plot representing categorical variables and their associations with the PCA dimensions. (C) Individuals map showing the distribution of observations grouped by location, with ellipses representing confidence intervals for each fishing site.

5.3.1.2 Fishers´ dataset PCA and MCA

The PCA model (correlation circle), on the top side of **Figure *5.3***, reveals the relationships between quantitative variables in a fishers' multivariate dataset, projected onto the first two principal components. The variable arrows represent each variable's contribution to the dimensions, where longer arrows signify a stronger association with Dimension 1.

Variable "crew number" shows a negative correlation with "food" (food purchase), indicating that larger crews are associated with lower food purchases. In contrast, "fisher age", "time fishing", and "food" are tightly clustered, suggesting a strong interrelationship among these variables.

Variable “food”, on the other hand, although aligns more closely with Dimension 1, it is also slightly aligned with Dim 2, indicating a stronger and unique association with these dimensions compared to other variables. Conversely, “crew number” has weaker associations with both dimensions, suggesting these factors are less influential within the current data structure. Variables such as “fisher age” and “time fishing”, with arrows extending to the circle’s edge, are well-represented by the model, capturing strong associations within the dataset across these principal components.

In addition to the PCA plot, the MCA maps, [B) and (C)] in the bottom side of **Figure *5.3***, illustrate the relationships between individuals and categories based on two dimensions:

The fishers' profile is divided into four groups. Group 1 (right of the graph) is associated with cooperatives and a resource-intensive approach, based on owned equipment and retaining crustaceans. They are associated with specific fishing locations, particularly Lobito Velho and Cuio Tombas. They tend to be older, consequently fishing for longer time periods and usually make longer trips and invest more in food due the time they spend on the sea . Group 2 (left of the graph) is more traditional, using less mechanized methods like beach seines and paddle-powered boats. They face financial and tax challenges, often not being part of associations and less active in fishing operations decision-making.

Fishers in Group 3 (top of the graph) have high frequencies for factors such as preferences for handlines as fishing method, reporting taxes benefits, and challenges related to credit access. On the other hand, Group 4 (bottom of the graph) shares high frequencies in areas such as engaging in beach seine fishing and using paddle-powered boats, reporting access to credit, and holding negative views towards fair taxes.

In conclusion, the groups differ significantly in socio-economic factors, fishing methods, tax perceptions, and credit access, indicating distinct profiles that could inform targeted interventions or policy decisions.

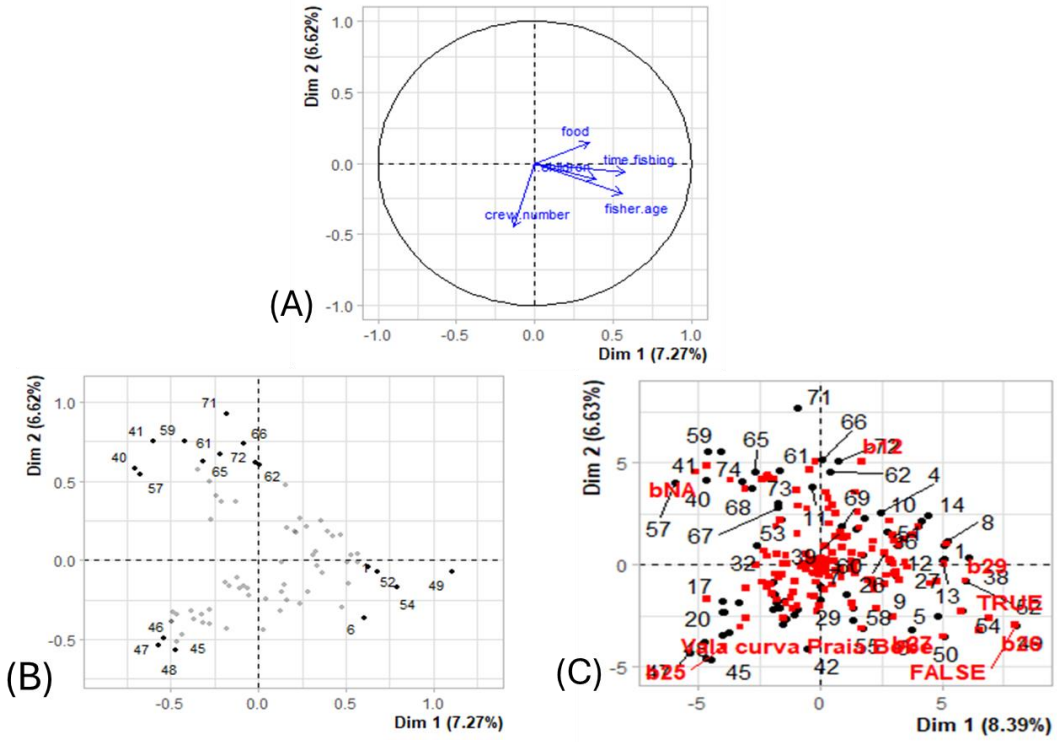

Figure 5.3. PCA and MCA results for the fishers' dataset. (A) Correlation circle showing the contribution and relationships of continuous variables to Dimensions 1 and 2. (B) Individuals plot displaying the distribution of observations, with numbered data points representing individual fishers. (C) MCA plot illustrating the distribution of categorical variables and their associations with the PCA dimensions. The red points, numbers and letters indicate key categorical variables such as locations and binary variables in the dataset while numbers and points in black represent the individuals.

5.3.1.3 Retailers´ dataset PCA and MCA

Figure *5.4* illustrates how different quantitative variables from the retailer's dataset are projected onto the first two dimensions (Dimension 1 and Dimension 2) of the PCA plot, on top, and on the MCA plots, on the bottom of the figure.

The PCA plot shows that "time. working" and "age", seem to have a positive relationship, as they are pointing in similar directions along Dimension 2 while. The variables "age" and "children" (Number of Children) are positioned close to each other, indicating some degree of correlation between them, but they are negatively correlated with "numb,family". Meanwhile, "time working", "revenues", and "numb.family" are positively correlated with Dimension 1 and Dimension 2 while age" and "children" appear less strongly correlated with these components.

In addition to the PCA plot, the MCA maps, [B) and (C)] in the bottom side of **Figure *5.4***, illustrate the relationships between individuals and categories based on two dimensions. The red squares and labels represent categorical factors such as locations and binary variables, while black dots indicate individual observations. Categories such as "COPEB," "instit.support," and "Baía Farta" are positioned in specific regions of the plot, highlighting their associations with the principal components.

The variability in retailers´ number of children" seems to be more associated with Dimension 2, whereas age, revenues, time working, and number of family members working with are associated with Dimension 1. **Figure *5.4*** shows, on the right, that Group 1 (top right) includes individuals such as 12, 22 and 35 who have completed secondary education, prefer to sell crustaceans in the most favourable places, and retail both bony fish and crustaceans directly to customers. They often report to have no credit providers. Group 2 (top left), in contrast, includes members of COPEBE cooperative with access to credit, and support from governmental institutions. They consider that selling both fish and crustaceans is optimal, are located at the Baía Farta market, tend to be illiterate and perceive taxes as unfair.

In summary, PC1 has "numb.family" in the oppositive direction from all other variables which indicates that the main variation is between people with high (score high on PC1) and people with low number of family working with and high other values (score negative on PC1). However, the main contributors of PC2 are "numb.family" and "time.working" which demonstrates how people differ from the typical pattern, by having both a high number of family working with and a high time working as retailers.

Group 3 (bottom left) includes individuals such as 2, 3, and 24 who also are associated with the COPEBE cooperative, are credit-accessible, often illiterate, perceive taxes as unfair, and operate in the Baía Farta market. In contrast, individuals such as 4, 30 and 39, in Group 4 (bottom right), prefer favourable purchase conditions and have unspecified reasons for preferring crustacean sales. They also prefer selling crustaceans directly to consumers in the most favourable places, and retail both fish and crustaceans. This group generally shows high frequencies for economic motivations related to fish sales

In essence, the dimension contrasts market involvement, educational levels, and economic priorities, with Group 3 emphasizing cooperative benefits and Group 4 focusing on independent economic preferences.

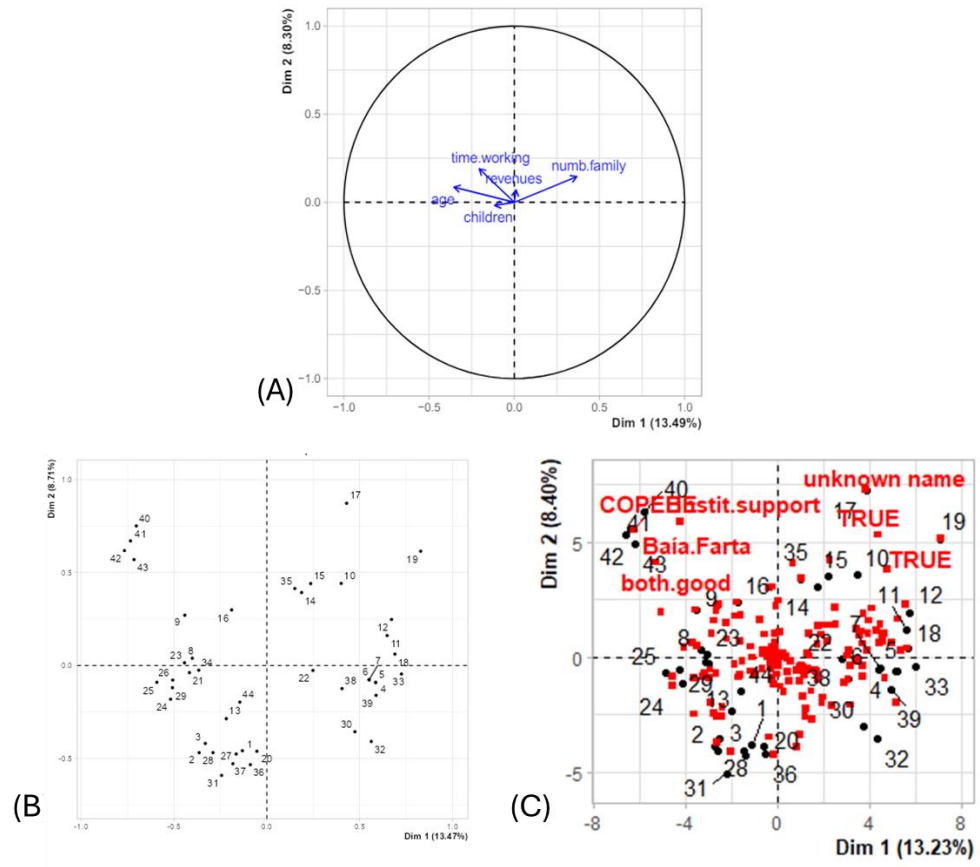

Figure 5.4. PCA and MCA results for the retailers' dataset. (A) Correlation circle showing the contribution and relationships of continuous variables to Dimensions 1 and 2. (B) Individuals plot displaying the distribution of observations, with numbered data points representing individual retailers. (C) MCA plot illustrating the distribution of categorical variables and their associations with the PCA dimensions, with red labels representing key categorical variables such as locations and support institutions.

5.3.1.4 Processors´ dataset PCA and MCA

Figure *5.5* illustrates, on the top (A), the Principal Component Analysis (PCA) performed on the processors dataset to assess the associations between the quantitative variables.

Numerical variables labelled as “revenues”, “years working”, and “children” (number of children) are closely correlated, forming a cluster, while the variables “tax” (payment of tax) and “Nofamily” (number of family members working with) show a different set of relationships. The plot suggests that Dimension 1 captures most of the variation related to economic and demographic factors,

while Dimension 2 might relate to family and tax-related variables. The variables close to the boundary of the circle have a stronger contribution to the dimensions.

In addition to the PCA the MCA plots, on the bottom of the picture [(B) and (C)], also explain the dataset. Individuals are represented by black dots and variables with red dots and text labels.: Group 1 (bottom right) includes mostly female members of the COPEBE cooperative in Praia Bebé. They show a high frequency of cooperative-related factors, such as mutual aid, association, and participation, while rarely working directly for buyers or restaurants. They tend to have lower levels of formal education. Group 2 (top left) contrasts by being predominantly male, less cooperative, and more likely to work for customers' houses or for other processors. They have higher levels of secondary education, are not associated with a cooperative, and prefer to work in the most favourable places.

Group 3 (top right) includes individuals with a high frequency of factors indicating an absence of tax benefits and neutral or undefined views on fair taxes. They also do not pay taxes, with a low frequency for any affirmative tax payments. Group 4 (bottom left) encompasses individuals who have joined the profession as the best job they have found and does not work for customer houses and are not able to provide their household for complete food supply alone for fish processing. Therefore, they also do not rely on fish processing as their only job.

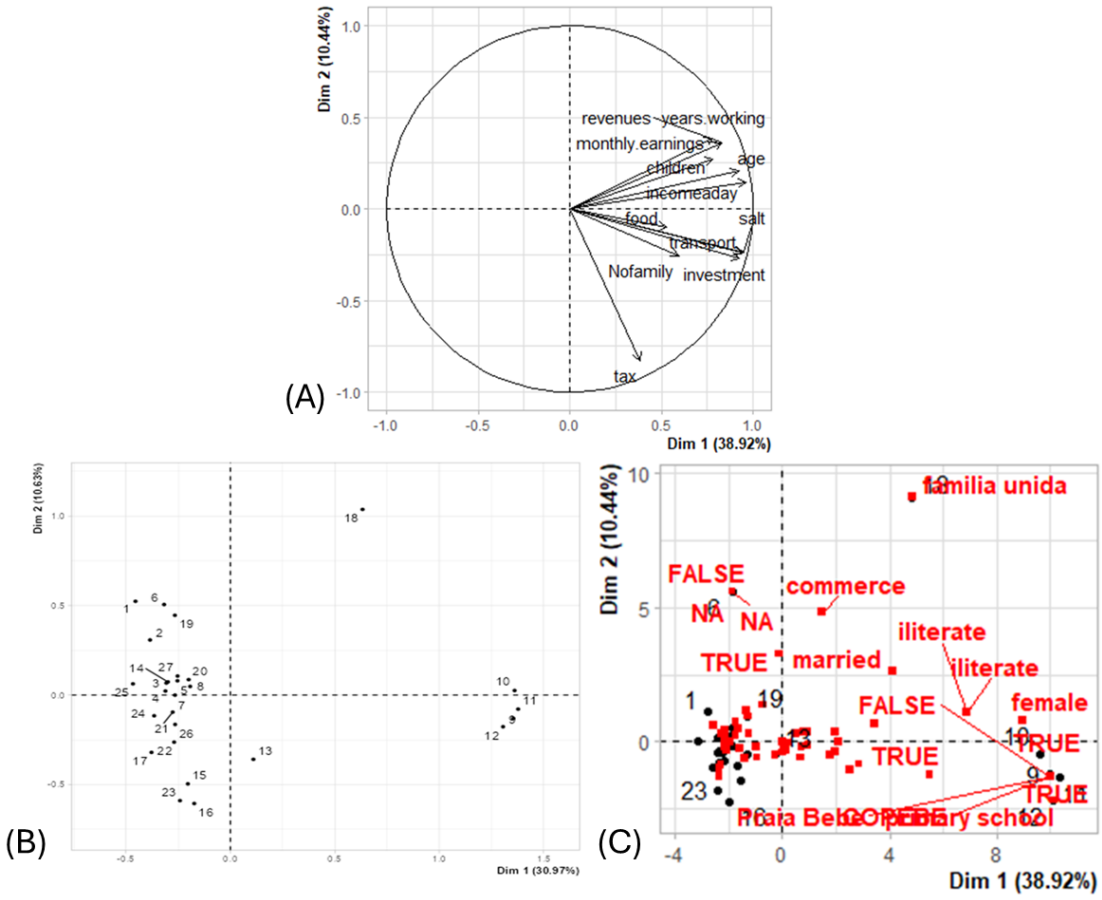

Figure 5.5. PCA results for the artisanal fish processors' dataset. (A) Correlation circle showing the relationships among continuous variables and their contributions to Dimensions 1 and 2. (B) MCA plot representing individual observations in the PCA space. (C) MCA plot illustrating the distribution of categorical variables and their associations with the PCA dimensions, with key categories such as education level, gender, and occupation highlighted in red.

5.3.2 Socio-demographic characteristics of respondents (fishers, processors, and traders)

Understanding the demographics of the participants is crucial to achieving the research aim and objectives and answering the research questions. Therefore, the demographic profiles of the stakeholders, comprising their gender, age, marital status, number of children, and level of education, are shown in this subsection, having been obtained through a series of descriptive statistics including frequency, cross tabulations, and chi-square, as used in other studies (Zacarkim et al., 2017), to better understand how SSF can contribute to livelihoods, food security, and poverty reduction in the study area.

5.3.2.1 Gender, age, marital status, number of children, and education.

As **Table *5.1*** shows, 100% of fishers are male while 91% of retailers are female, and nearly 82% of processors are male. Regarding marital status, most fishers and retailers are married, representing 62.2% and 75% respectively, while 81.5% of processors in this study are single.

Table 5.1. Gender and marital status of respondents.

	Fishers		Retailers		Processors	
Gender	Frequency	Percent	Frequency	Percent	Frequency	Percent
Male	74	100%	4	9.1%	22	81.5%
Female	0	0%	40	90.9%	5	18.5%
Marital status						
Single	28	37.8%	11	25%	22	81.5%
Married	46	62.2%	33	75%	5	18.5%

Fishers´ ages range between 18-78 (Mean: 36.7±12.9SD), retailers between 18-60 (Mean: 34.50±9.380SD) and processors between 18-60 (Mean: 25.74±11.7SD). The artisanal fishing population in this region is young**;** ages in this study vary between 18-78, and individuals in the group aged 21-30 are predominant in both categories, as shown in **Table *5.2***

Table 5.2. Age of participants in the study.

Age	Fishers		Retailers		Processors	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Up to 20	3	4.1%	2	4.5%	14	51.9%
21-30	26	35.1%	18	40.9%	8	29.6%
31-40	18	24.3%	12	27.3%	1	3.7%
41-50	16	21.6%	10	22.7%	2	7.4%
50+	11	14.9%	2	4.5%	2	7.4%

In terms of number of children, fishers range between 0-16 (Mean: 4.74±3.889SD), retailers 0-11 (Mean: 4.25±2.403SD), and processors 0-11 (Mean: 1.56±2.750SD).

The number of children that fishers have varies greatly. As **Table *5.3*** shows, the average is four while some fishers have up to 16 children (the average of number of family members for Benguela and Angola is 4.6); fishers usually work with no more than one member of their family in the same crew (INE, 2016).

Table 5.3. Number of children of the participants.

Number of children	Fishers		Retailers		Processors	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
0	10	13.5%	2	4.5%	17	63.0%
1-4	29	39.2%	24	54.5%	5	18.5%
5-8	27	36.5%	15	34.1%	4	14.8%
9-12	3	4.1%	3	6.8%	1	3.7%
13-16	5	6.8%	0	0.0%	0	0.0%

Results of this study also show that fish retailing and processing in Benguela province is not a family-based activity; most retailers and processors in the study area do not work with relatives. While half of all retailers work with 1-3 of their relatives; usually, mothers and daughters, most processors do not work with any relatives (only 9%); only two processors work with one brother each. None of these individuals from the fish retailing and processing samples entered the sector for heritage reasons. When comparing retailers to fishers there are no significant differences in these variables. However, due to their relatively lower age and number of children, the differences are significant between fishers and retailers compared to artisanal processors.

The data shows that the number of family members working together, especially daughters, sons and brothers, varies between 0-5 (Mean:0.70±0.77SD) for fishers, 0-2 (Mean:0.57±0.66SD) for retailers, and 0-1(Mean:0.19±0.39SD) for processors.

The literacy level amongst fish retailers is slightly higher than in the country overall. However, the percentage of illiterate retailers, as shown in **Table *5.4***, is higher than for fish processors. The literacy level within participants in the study must be gender-based, since the general statistics for Benguela indicate levels of 77.2% for men, and 44% for women (INE, 2016).

Table 5.4. Literacy level of participants.

Educational level	Fishers		Retailers		Processors	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Illiterate	8	10.8%	10	22.7%	5	18.5%
literate	66	89.2%	34	77.3%	22	81.5%

Note: illiterate stakeholders are considered all those who have no formal education and simultaneously cannot read and wright whereas literate/educated)is all those who declared to have any formal education, from primary to college education (the study did not find any stakeholder with university degree) and could sign their name in the consent forms.

5.3.3 Governance

Data was analysed to assess whether the boats operating in the study area comply with the following FAO guidelines recommendations which have the ultimate goal is to ensure policy coherence in various areas, including national and international laws and instruments, economic development, energy, education, health, environmental protection, food security, labour, employment and trade policies. In order to promote comprehensive development in small-scale fishing communities, the FAO guidelines also assess other initiatives such disaster risk management, climate change adaptation and fisheries sector access agreements.

5.3.3.1 Policy ensuring an enabling environment and supporting implementation.

The main physical characteristics of boats, such as type (boat-building and propulsion), size of boats (length), crew composition, fishing gear, navigation and safety equipment, targeted species, and other relevant variables shown in The PCA and MCA of boats´ dataset and in Table O.6 (Appendix O) were analysed to assess whether they comply with Angolan fisheries legislation and the FAO guidelines. Boat size (in length) along with propulsion method, deck, horsepower, purpose of fishing and taxes due are the main characteristics that define the fishery sector and make the distinction between commercial, and subsistence aims of fishing.

The results show that boat's dimensions and gear usually define the size of the crews. Boats with 3-4 crew members are in the majority. For larger boats, with sizes ranging from 7-12m, the average crew composition is 4 (quartiles = 3, 5; median=4).

Therefore, based on the correlation matrix (**Figure *5.1***, plot (A)), and the PCA, a set of Pearson's product-moment correlation tests were performed between boat size and daily investments for the boats to operate as well as between boat size and trips made by boats in a week, to assess whether there is a correlation between them. Results show that all p-values are less than the significance level of 0.05, the **boat's size** having a large-positive correlation with daily **total** investments, $r(46) = 0.52$, $p = < .001$, daily investments in **fuel**; $r(46) = 0.53$, $p = < 0.001$, **and oil**, $r(46) = 0.49$, $p = < 0.001$; a medium positive correlation with daily investments in **bait,** $r(46) = 0.37$, $p = 0.007$; **food**, $r(46) = 0.41$, $p = 0.003$, and **ice**, $r(46) = 0.31$, $p = 0.028$. However, **boat size is** negatively correlated with the boats´ **trips in a week,** $r(46) = -0.24$, $p = < 0.009$ because, and not surprisingly, bigger boats tend to make fewer, longer distance trips in a week, and further from the coast.

Characteristics of boats such as built material and propulsion were compared to size, as shown in Figure T.2 in Appendix T1; size was also compared the different type of fishing gear used in the boats in the study area with their size, with both analysis intending to assess boats´ legality and compliance with the Angolan legislation as shown in Table O.6 of Appendix O.

The data shows that most of the boats are outboard engine plank boats.in which hand lines are the main fishing gear (hand lines are marked as an active factor in factor map of the MCA). From the study sample only one onboard engine trawler (used exclusively for crab cages) and six canoes made from tree trunks do not use hand lines as fishing gear. The Fishers´ Exact test showed a highly statistically significant association between the boat-building type and surface gillnets, $p = 0.001$ as well as with handlines (two tailed $p = 0.010$). The data show that surface gillnets are only used in five outboard engine plank boats, representing 45.5% of the proportion of boats with this gear ($p = 0.001$), and in six canoes built from tree trunks that represent 54.5% of this proportion ($p = 0.010$). These results show how specific fishing gears are related to different types of boat, according to the type of material from which they are built and method of propulsion.

Another criterion to assess if the boats comply with the Angolan fisheries legislation is the payment of taxes to give the boats the authorization to operate, according to their size. Therefore, the data was analysed and showed that larger boats pay the highest taxes while a proportion of

smaller boats do not pay this tax, as **Figure *5.6*** shows. A further Pearson's product-moment correlation test indicated a medium positive correlation between the size of the boats and the payment of the tax for boats licensing, $r(46) = 0.32$, $p = 0.023$. This data also shows that the payment of taxes for boats to operate is in accordance with the Angolan law that determine bigger taxes for bigger and exceptions for some of the smaller boats according to the categories shown in Table O.6 (Appendix O).

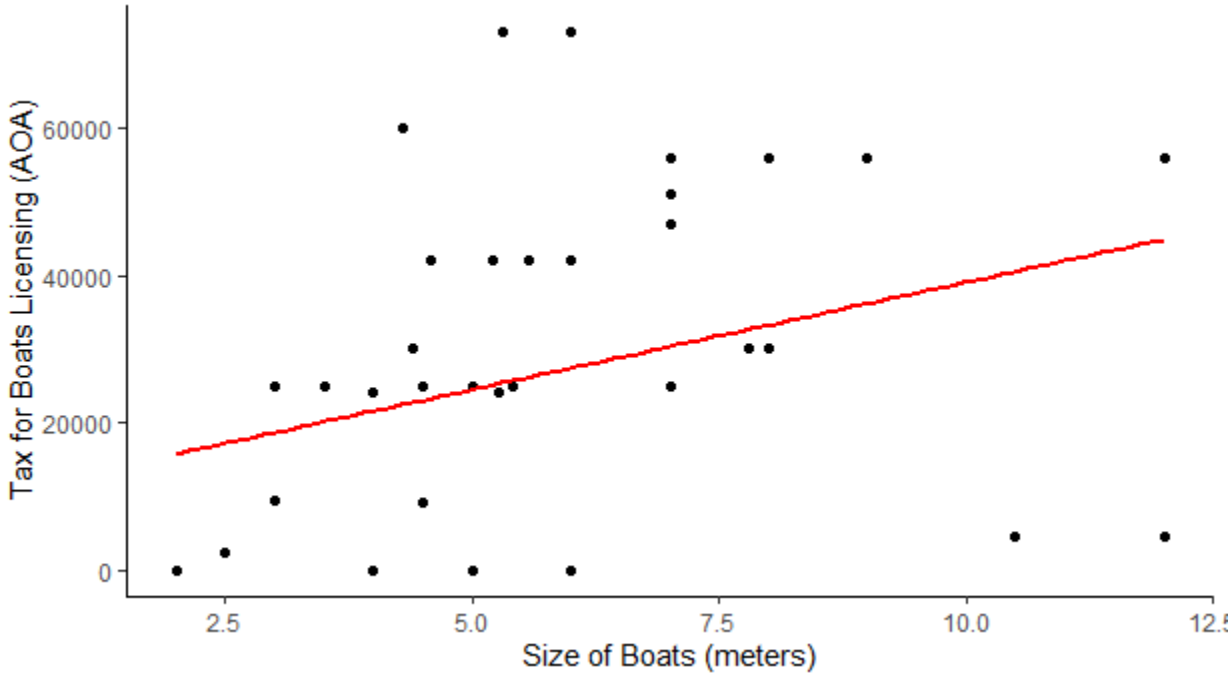

Figure 5.6. Relationship between boat size (length) and the payment of taxes in Angolan currency (AOA) for boat licensing. This figure illustrates how the size of the boats correlates with the amount paid as taxes to obtain operational licenses, providing insights into whether larger boats are subject to higher or lower licensing fees compared to smaller vessels.Small-scale commercial boats operating in Benguela province use up to eight different types of fishing gear, the main ones being hand lines, and bottom and surface gillnets - all permitted by law – along with beach seines, which are forbidden. More than a quarter of the boats in this study used hand lines as fishing gear. Less frequently used are traps or cages, normally used for crustacean capture – only two boats in the present survey use this type of fishing gear.

5.3.3.2 Disaster risks (potential human and biophysical changes)

The data indicate that 33 of the 48 artisanal boats (75%) surveyed for this study have been involved in accidents with bigger vessels, especially semi-industrial ones. Of those artisanal vessels, only 10.5% are equipped with safety navigation equipment. Table O.8 in Appendix O shows more details.

The proportion of paddle-powered boats which are involved in accidents with industrial vessels is almost the same as the proportion of outboard engine- powered boats involved in the same type of issue. Therefore, a Fishers´ exact test for count data was performed to assess whether there was an association between the presence of safety and navigation equipment, in the boats, and the occurrence of accidents between these small-scall fishing boats and the industrial vessels operating in the region. Results show that there was a statistically significant association between the two variables (two tailed, $p = 0.022$) which indicate that the presence of safety and navigation affects the occurrence of accidents in the study area.

Fishers´ exact tests for count data were also performed to assess whether there is a relationship between the use of navigation equipment and engine or paddle- powered boats. Results show that most of the boats with safety and navigation equipment are those with engines and indicated a highly significant association between the two variables ($p < 0.001$). In opposition to the presence of an engine, the results show that most paddle-powered boats are unequipped with safety and navigation equipment. Therefore, there is very high negative association between the two variables ($p = < 0.001$) which indicate that many paddle-powered boats in this study do not comply with the Angolan legislation regarding the use of navigation equipment.

Table 5.5. Relationship between the use of safety and navigation equipment and engine or paddle-powered.

Boats´ motion		Presence of navigation equipment	
		No	Yes
Outboard engine	No	29	8
	Yes	2	9
Paddles	No	8	29
	Yes	10	1

The data also shows that of the 11 boats in which this equipment is used, life vests exist only in six (12.5%); lanterns in three (6.3%); compasses in three (6.3%); GPS in five (10.4%); anchor in

one (2.1%); and floats in two boats (4.2%). The Angolan Fishery Law, in its article *n)* of the Decree 13/18, sates that it is compulsory to have GPS on board of all commercial vessels.

Therefore, through a Fishers´ Exact test it was assessed whether there is a significant association between the presence of safety and navigation equipment and the different types of these equipment; GPS, sounder, compass, floats, exclusively those highlighted in the variables factor map (PCA) as *"active factors"* and labelled as *"variables the best shown on the plane".* The results show a highly statistically significant association between the presence of navigation equipment and the use of GPS (p = < 0.001); the use of lantern (p = 0.009); and compass (p = 0.009).

Appendix D states that, under Angolan law, commercial boats, usually bigger, must be more equipped with safety and navigation equipment than smaller ones, it was assessed whether there is an association between the use of safety and navigation equipment and the size of the boats. As **Figure *5.7*** shows, the mean size of boats without navigation equipment was 4.66 meters, whereas the mean in boats with navigation equipment 7.93 meters. Therefore, a Welch two-samples t-test was performed to assess whether there is an association between the size of the boats and the presence of navigation and safety equipment; the test showed that the difference was statistically significant (p = 0.003).

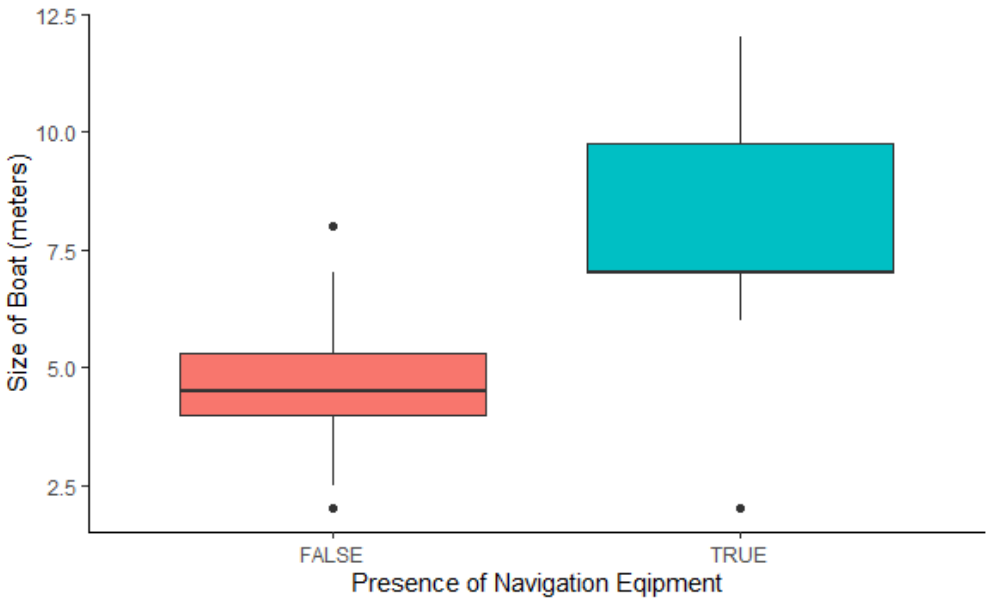

Figure 5.7. Relationship between the size of the boats in the study and the presence of safety and navigation equipment. Visually inspecting the figure, it shows an apparent cut-off at 7.5 m where boats adopt navigation.

Data analysis suggests that the presence of navigation equipment influences the decision of the crews in relation to the fishing zone and targeted species. To assess whether there is a statistically significant association between the presence of navigation equipment and the choice of the fishing zones and the targeted species, a Fishers´ exact test for count data was performed.

The results showed that the association between the presence of navigation equipment on boats and the choice of targeting species easier to catch was not statistically significant (p = 0.123). However, the results showed that there was a statistically significant association between the presence of navigation equipment on the boats and the choice of targeting species more profitable (p = 0.027); species more abundant (p = 0.032); fishing near home (p = 0.015) as well as the choice of using cages as fishing gear (p = 0.048).

5.3.4 Food security

As well as earning a livelihood, another advantage of being in the fish retailing market is that part of the product obtained at a cheap price can be used for household consumption. Almost all the participants of the study reserve up to 30% (retailers), 10% (fishers) of fish for family nutrition, which makes this activity a great contributor to food security for many families in Benguela.

The data show that the average daily amount of fish captured and landed by the surveyed small-scale commercial boats is 78 kg. Most of the fish is sold, while a small amount is reserved for family consumption (Mean:11±18SD).

A Pearson´s product-moment correlation test was performed to assess whether the size of the boats have any influence on the quantity of fish caught. The results showed a small correlation coefficient between the two variables (p = 0.034). The analysis also indicated that the size of the boats influences the quantity of fish landed; the bigger the boats, relatively the higher/larger the amount of fish captured. A Pearson's product-moment correlation test also showed a significant medium correlation coefficient between the size of the boats and the quantity of fish landed (p = 0.005).

From the fish landed, some is reserved by fishers for household consumption, supporting food security. **Figure *5.8*** shows, on the left plot, the amount of fish retained (in kilograms) for both the commercial and subsistence fishing classes of boats. On the right plot, the figure shows the proportion of fish retained relative to the total fish caught by the commercial and subsistence fishing classes Subsistence fishers tend to reserve larger proportions of their landings compared to commercial fishers, who sell most of their landings.

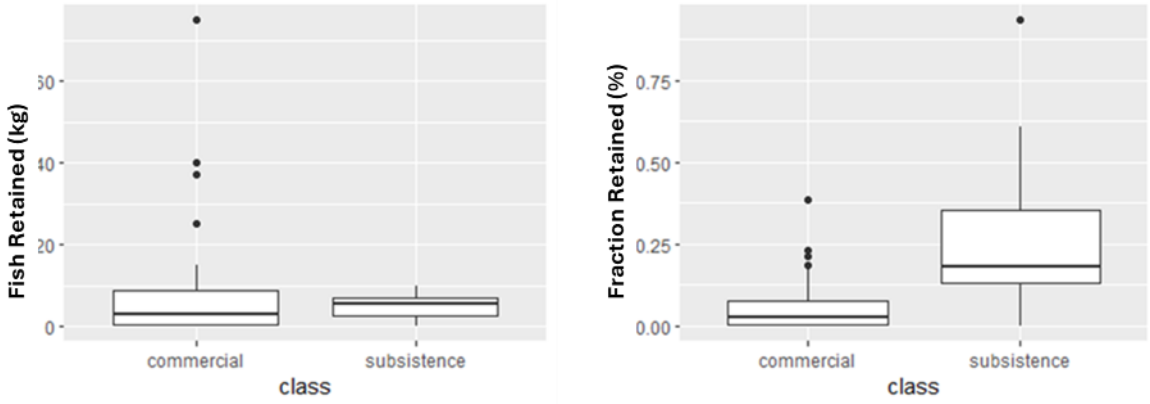

Figure 5.8. Fish utilisation (kg) by small-scale boats from the present study.

Other results of the study show that food supply is associated with other variables such as **fishers´** age. As shown in **Figure *5.9***, these results indicate that older fishers can afford to retain more fish for their own use than younger in both categories. A further Welch Two Sample t-test showed a higher statistical significant association between the two variables (p = 0.005).

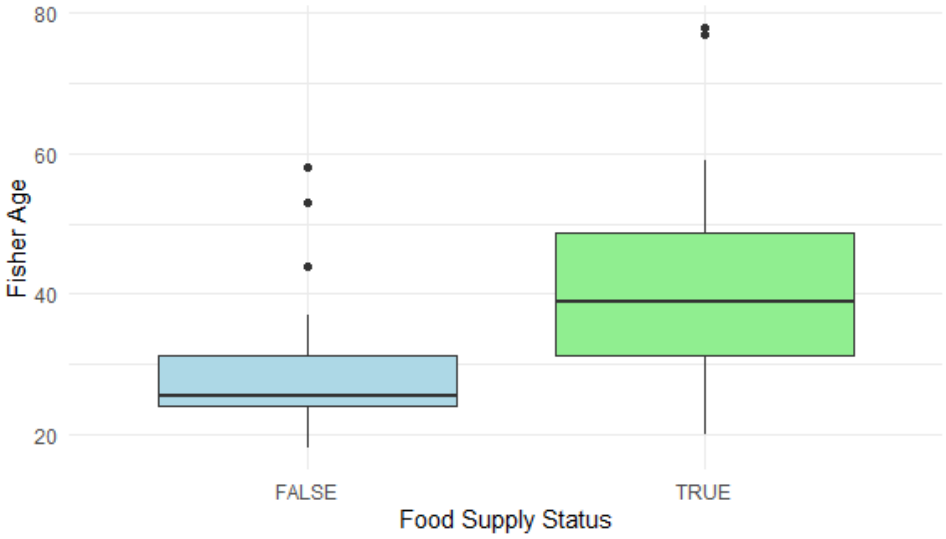

Figure 5.9. Distribution of fishers age by food supply status affordability to their household.

Regarding **retailers**, the analysis of data shows that all participants retain fish for household consumption. However, Table O.9 in Appendix O shows that most of the retailers (52.3%) who do this are those with 4-6 children. This assumption was confirmed by a Pearson's product-moment correlation test which showed that the difference was statistically significant between the two variables; $r(46) = -8.97$, $p = < 0.001$.

The data show that 26 out of 44 retailers (59%) who can afford to retain fish for home consumption can also afford the payment of school fees, However, a Pearson's Chi-squared test with Yates' continuity correction data showed that the difference was no statistically significant between the two variables ($p = 0.135$)

The data also show that the proportion of retailers who have less than 15 years' experience is greater than the proportion of those who have worked for longer time, as shown in Figure T.3 in Appendix T. A Chi-squared test for given probabilities showed that the difference was not statistically significant between the two variables($p = 0.330$)

The analysis above reveals a correlation between retention of fish for home consumption and other socioeconomic factors; retailers with larger families are more likely to afford food, and financial stability in one area is linked to other household expenses. These findings suggest that family size and economic stability are interconnected factors influencing fish retailers' financial well-being.

For **processors**, retention of product for home consumption has no statistically significant association with other variables. For example, as **Figure *5.10*** shows, although the data indicated that the proportion of fish processors that invest between AOA200 – AOA500 is slightly greater than the proportion of fish processors that invest AOA200 or less per day, a further Welch Two Sample t-test showed a $p = 0.066$.

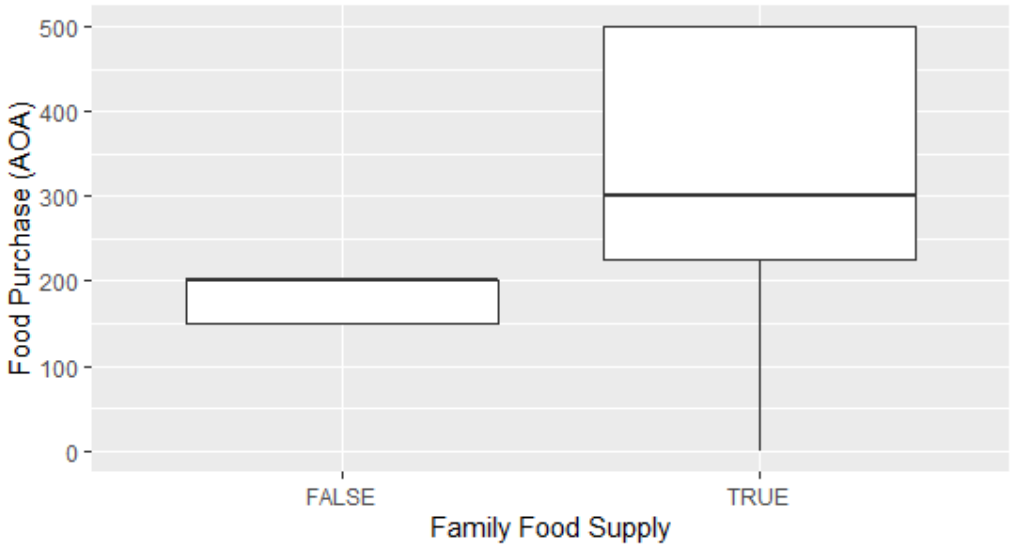

Figure 5.10. Investments in daily food made by fish processors who can afford food supply to their households.

Overall, in the three stakeholders´ categories, as **Table 5.6** shows, the proportions of participants that can only afford a family food supply from fish related activities and cannot make savings is greater than the proportion of participants who can also afford for savings and other benefits.

Table 5.6. Relationship between stakeholders´ affordability of family food supply and savings and other benefits .

Affordability of family food supply	Affordability of savings and other benefits					
	Fishers		Retailers		Processors	
	Yes	No	Yes	No	Yes	No
Yes	1(1.3%)	35(47.3%)	4(9.1%)	40(90.9%)	8(29.6%)	11(40.7%)
No	5(6.7%)	33(44.6%)	0(0%)	0(0%)	2(7.4%)	6(22.2%)

Fishers´ exact tests for count data showed no statistically significant association between family food supply and savings for all stakeholders´ categories, p = 0.200 for fishers; p = 0.107 for retailers; and p = 0.665 for processors.

5.3.5 **Exploitation of Crustaceans**

The study reveals that artisanal fishers struggle to effectively exploit highly valued crustaceans due to several limitations. Most do not focus exclusively on specific species, lack engines, and essential navigation and preservation equipment.

The study reveals that 69% of 48 artisanal vessels are not dedicated to crustacean capture, with 31% targeting crustaceans but not specific species like lobster, shrimp, prawn, or crab. Only one boat is exclusively dedicated to crustaceans, located in Lobito. The boats operate in various fishing communities, including Egito Praia with six (6) boats representing 42% of the study sampling, Kasseque (2), Lobito Velho (2), Chindumbi (1), Catumbela Praia (2), and Praia do Bebé (1).

Crustaceans, specifically lobster, are amongst the most exploited species of seafood, along with sardines, little tunny, large-eye-dentex, striped mullet, and Atlantic spotted grunter; the scientific names of these species are in the "***List of species registered in this study and exploited by artisanal stakeholders*****.**"

List of species registered in this study and exploited by artisanal stakeholders., in the introductory section. The most favourable months to catch these species, as shown in **Figure 5.11**, are March, April, July, August, and September, all in the non-rainy season, also known as "*cacimbo*" or dry season, thus indicating that the rain conditions affect fishing.

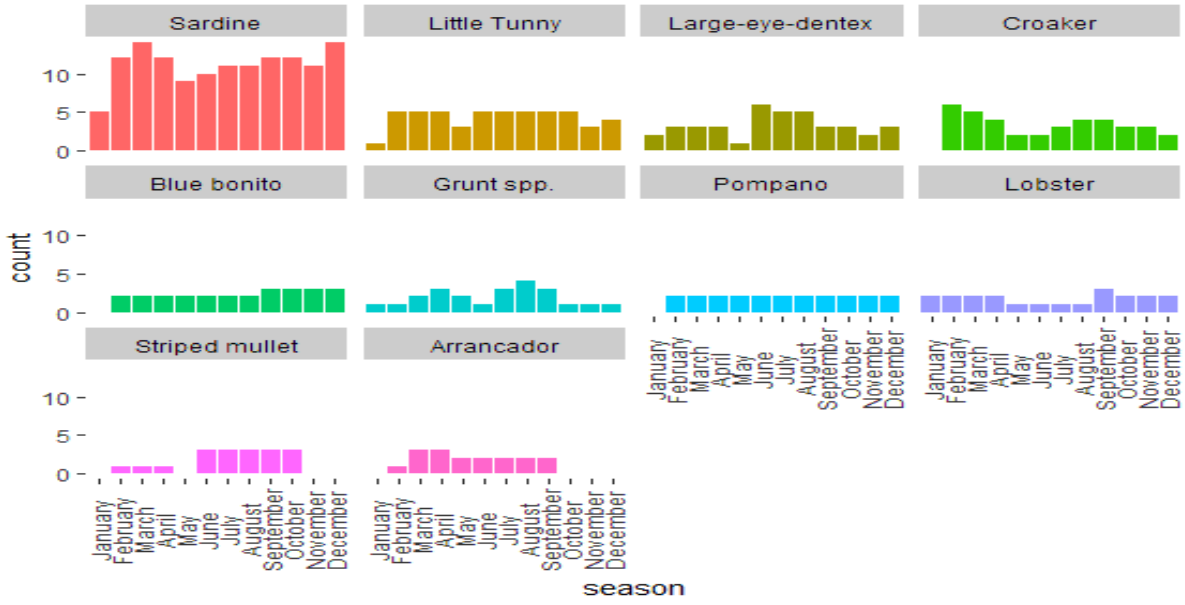

Figure 5.11. Descriptions of the species caught by season by commercial and subsistence boats, and seasonality. This data was obtained through questionnaires, based on fishers' self-declarations of catches of species obtained by boat on a regular fishing day. The count represents the number of boats catching each species.

Boats targeting crustaceans have nearly the same characteristics as those not doing so. In both segments, most boats have the same size range, are not equipped with safety navigation equipment, and lack means to preserve fish. However, they differ in terms of engine; most boats with an engine do not target crustaceans, while most boats targeting crustaceans are paddle-powered. The data also shows that a greater proportion of boats with navigation equipment are plank-built with outboard engines (81.8%). A further Fishers´ exact test for count data indicated a highly statistically significant association between boat propulsion and the use of navigation equipment (two-tailed $p < 0.001$).

Of those 15 artisanal boats which dedicate to crustaceans' capture, only one, classified as a semi-industrial vessel, is exclusively target and captures crustaceans. However, only one species, specifically West African geryon, is caught using traps (cages) by this vessel.

The other boats, as **Figure *5.12***. shows, target and capture different species of both finfish and crustaceans such as lobsters, prawns, shrimps, and other species of crabs, mostly marbled swim crab (*Callinectes marginatus*), using a variety of fishing gear, including beach seine and surface gillnet. Beach seine, although not authorised by law, is one of the main fishing gears used to capture not only in crustaceans but also bony fish and cephalopods.

Figure 5.12. On the left, a net used for beach seine with a variety of seafood, mostly juveniles. On the right: seafood from the net used for beach seine; bony fish and crustaceans caught together. Photos: the author, Jan - July. 2018.

Prawns, crabs, and shrimps can be caught all over the region using beach seine, mainly by boats without engines, as Table O.16 (Appendix O) shows. A considerable number of boats target and capture lobster using traps and net fishing gear, but they only operate in a single region of the province.

The most common fishing gear, as Table O.11 (Appendix O) shows, are pelagic mid-water bottom trawling (3), and beach seine (3) which simultaneously capture other non-crustacean species.

The data also indicates that the proportion of boats using cages as fishing gear which have navigation equipment (GPS and sounder) is greater than the proportion of boats using cages without navigation equipment. Therefore, whether the presence or absence of navigation equipment could influence the use of different fishing gear was considered. A Fisher´s exact test for count data indicated a significant association between navigation equipment and the use of cages as fishing gear in boats in this sample (p = 0.05).

Crustaceans are not the most traded seafood by the participants in this study. Most **retailers** in this study (50%) trade bony fish, followed by those simultaneously selling crustaceans and bony

fish (38%). Those dedicated exclusively to crustaceans retailing (5%) and crustaceans associated to other species than bony fish represent minorities (2%).

The most traded species are sardines, shrimps, ribbonfish, jackcrevalle, lobster, grunt sp., cuttlefish, horse mackerel, red-eye-dentex, balao halfbeak, dorado, and rockcodes. The most expensive species are grouper, prawn, and lobster, with prices around AOA2,000-4,500 per kg while the cheapest are mackerel, sardines, and blotched picarel, selling for around AOA500-1000 per kg, as shown in Table O.12 (Appendix O).

When asked to compare crustaceans and bony fish, the survey participants declared that they engaged more in the bony fish trading process because fish is easier (75%) and more economically viable to sell (55%) as well as easier to preserve (40%) than crustaceans. However, when it comes to profitability (40% for both) and to market demand (40% and 35%, for fish and crustaceans, respectively), both species are similar.

Crustaceans and bony fish retailers were then asked to give the reasons why they would prefer to trade different species if there was good customer demand for both products. Most bony fish retailers (94%) responded that they would stick to the product they already trade. A set of Kruskal-Wallis rank sum test were performed to look for an association between fish retailers trading preferences and reasons of trading preference which showed a high level of statistical significance since $p < 0.0001$ in all categories (easier to sell; more economic viable to sell; easier to preserve; more profitable; and more demanded).

The qualitative data analysis showed that crustacean exploitation, mainly in restaurants, contributes to revenue generation and tourism promotion since most consumers are foreign residents and tourists. However, when artisanal fish retailers were asked about the nationality of their customers in relation to crustacean and bony fish preferences, they declared that the main customers for crustaceans are national residents (66.7%), followed by national tourists (13.3%), foreign residents (13.3%) and foreign tourists (6.7%). This result contradicts the qualitative, results where restaurant managers declared that foreign residents and tourists consume more crustaceans than Angolans. Most of these retailers´ customers are likely to be restaurant owners and managers who buy raw products while customers in restaurants and hotels are likely to be foreigner visitors who buy and consume processed and cooked crustaceans.

5.3.6 Fisheries' Contribution to Economic Growth

5.3.6.1 *Contribution to national economy: employment and revenues*

The SSF sector is a great contributor to the national economy and represents the main source of employment for most of the participants of this study. Fishers have worked from less than 1 to more than 50 years (Mean:13.63±11SD), retailers less than 1 to 36 years (Mean:13.59±9SD) and processors 1-36 (Mean:9.52±10.070SD), as shown in **Table *5.7***; most had worked from 1-10 years.

Table 5.7. Length of time in which SSF stakeholders engaged in this activity.

Time working (in years)	Fishers		Retailers		Processors	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
<1	2	2.7%	1	2.3%	0	0%
1-10	36	48.6%	17	38.6%	20	74.1%
11-20	20	27%	18	40.9%	4	14.8%
21-30	10	13.5%	5	11.4%	3	11.1%
31-40	3	4.1%	3	6.8%	0	0%
>40	3	4.1%	0	0%	0	0%
Total	74	100%	44	100%	27	100%

The data suggests that while fishing is the primary occupation for most **fishers** (66%), a significant portion (34%) must rely on additional employment to meet their financial needs. Out of the 34% of fishers who have a supplementary job,11% work as farmers, 19% work in civil construction and commerce, and 4% work for the government. This reliance on supplementary work highlights the potential economic instability or limitations of fishing income alone. This distribution implies that fishing alone may not provide sufficient income stability or livelihood support for many fishers, necessitating diversification into other income sources.

The data show, as in **Figure *5.13***, that fishers with also work for the government are older than the other categories, as in opposite direction those who work as farmer are younger. However, a Kruskal-Wallis rank sum test did not show statistically significant association between fishers´ age and occupations ($p = 0.121$), suggesting that the age pattern among fishers in various occupations may not be consistent or strong within the sample, as it seems, indicating no statistically significant variation across these categories.

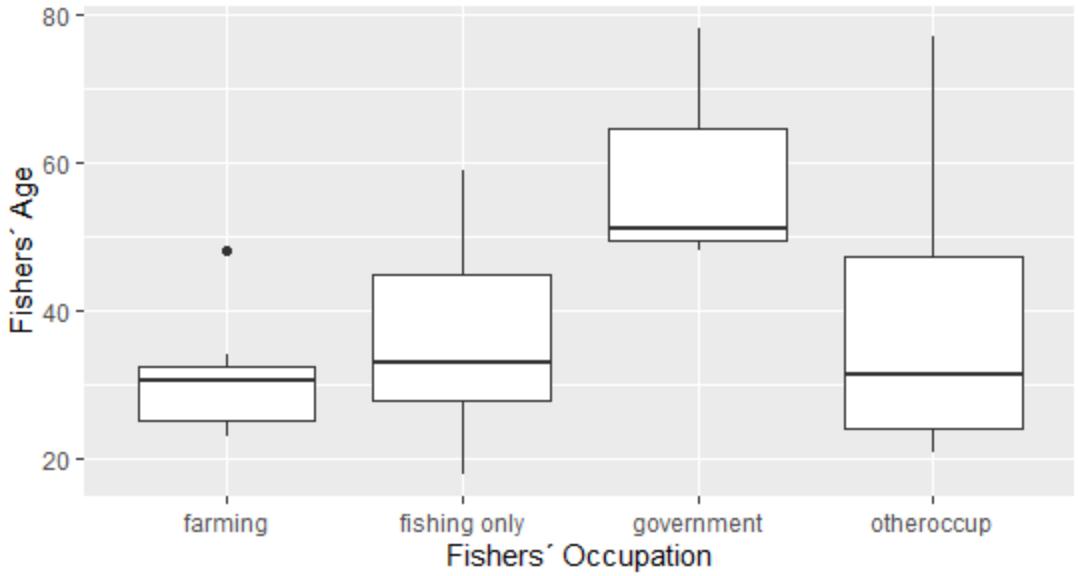

Figure 5.13. Relationship between the occupation and age of fishers from the study.

Retailers are mostly dedicated (89%) to fish retailing as their sole occupation while those involved in alternative jobs such as commerce, agriculture and moto-taxis make up the remaining 11%.

The study also reveals a significant gender-based influence on retailers' occupations since out of 39 fish retailers, 38 (97%)are female, while only one is male.

Processors in this region engage relatively more in other activities than the former two groups, as nearly 67% work solely as fish processors while the remaining 33% also have other jobs. Thus, amongst the SSF stakeholders in this study, they have the most diversified livelihood portfolio, completed by construction, dried fish trade and others (commerce and services).

The study found that most fishers found their job as the only one available (58.1%), followed by family heritage (13.5%) and the best job (28.4%). Retailers and processors, on the other hand, had only two reasons for joining the trading market: 63.6% finding the only job available and 16% receiving the best job offer (retailers), and 70.4% finding the only job available and 29.6% receiving the best job offer (processors).

5.3.6.1.1 Costs of fishing operations and revenues

5.3.6.1.1.1 Boats´ costs

As Table O.14 (Appendix O) shows, the average price in Angolan currency (AOA) to buy a commercial timber boat, in the study area, ranges from AOA 200,000 to 1,300.000 (USD 430-2,800), according to information provided by local stakeholders and fishers. Around 15 years ago, the price of a timber boat with or without an engine was equivalent to around AOA250,000-500,000 (USD 2,500-5,000). Currently, the price of an outboard engine is around AOA4,000,000 (around USD 6,600), in local stores or the informal market, which indicates an inflation rate of more than 24% (BNA, 2020).

The outcomes of the PCA done on data from the boats suggest that both partial and total investments for boats surveyed in this study to operate are very influenced by the size and the number of trips that a boat have in a week. As suggested in **Figure *5.14***, the trips a boat makes in a week is negatively correlated to all daily investments made for the boats to operate since the boats with the fewest travels in a week have the highest daily investments due to the longest distances and time spent at the sea. Therefore, a Pearson's product-moment correlation test was performed to assess whether the two variables are correlated which showed:

(1) weak negative correlation between number of trips in a week and daily costs for oil, $r(46) = 0.-35$, $p = 0.015$, with high statistical significance; trips in a week and costs with fishing equipment and gear, $r(46) = -.49$, $p < 0.0001$; and daily costs with ice, $r(46) = -.44$, $p = 0.001$; with very high statistical significance;
(2) moderate negative correlation, and very high statistical significance between number of trips in a week and daily total investments; $r(46) = -0.67$, $p < 0.0001$; daily costs with food, $r(46) = -.57$, $p < 0.001$; and daily costs with fuel, $r(46) = -.58$, $p < 0.0001$;
(3) high negative correlation and very high statistical significance between number of trips in a week and daily costs with bait, $r(46) = -.71$, $p < 0.0001$.

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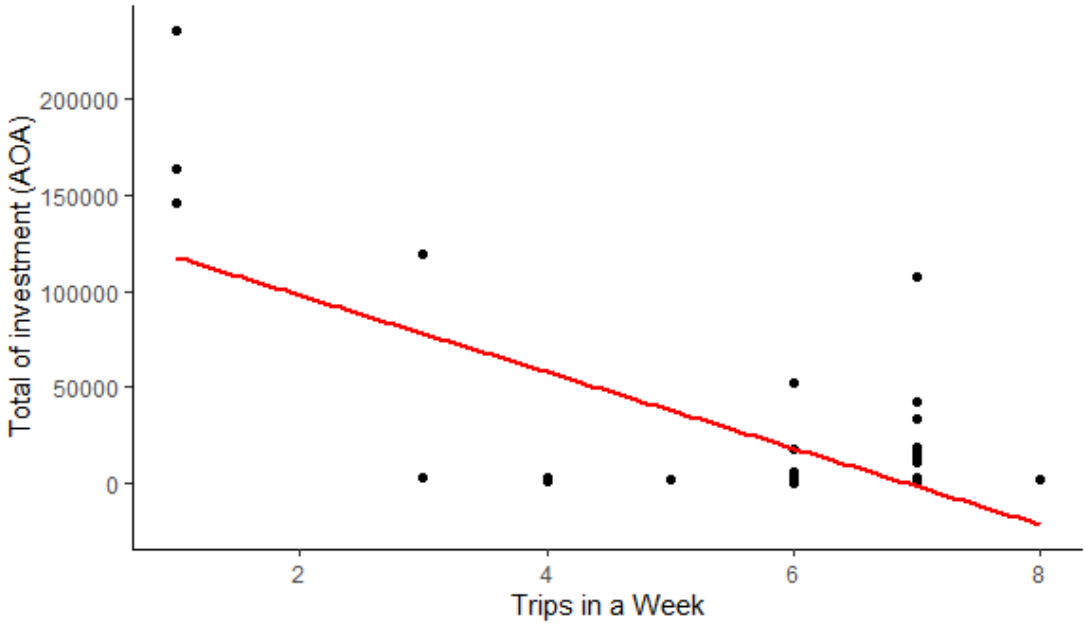

Figure 5.14. Relationship between the number of trips in a week and the total daily investments in boats surveyed in this study.

In contrast to the frequency of fishing trips, the results show that the size (length) of the boats is directly proportional to the investment. Therefore, a Pearson´s product-moment correlation test showed: (1) a low moderate positive correlation with highly statistical significance between the size of the boats and the daily costs with Ice $r(46) = .31$, $p = 0.02$; daily costs with bait $r(46) = .37$, $p = 0.007$; daily costs with food $r(46) = 0.41$, $p = 0.003$; and oil $r(46) = 0.49$, $p = 0.0003$; and (2) a moderate positive correlation with very high statistical significance between the size of the boats and the daily total investments, $r(46) = 0.52$, $p = 0.0001$; and daily costs with fuel $r(46) = 0.53$, $p = 0.0001$.

Results of this study also show great variation in potential profit and loss; for example, boat trips costing up to AOA52,000 (USD 111) for fuel, food, ice and fishing gear targeting horse mackerel, can yield revenues of up to AOA3 383,000 (USD 7,252) per trip. In contrast for an outlay of AOA18,700 (USD40) targeting sand steenbras, corvine, large-eye-dentex, and sardine, can result in losses of up to AOA10,000 (21USD). As **Figure *5.15*** shows, fuel costs are not applicable to all boats, but in those running on fuel, the values are the highest while food and bait are needed in most boats, but the costs are the lowest. The costs of fishing gear and engine oil seem to be low because they are not as frequently used as other categories.

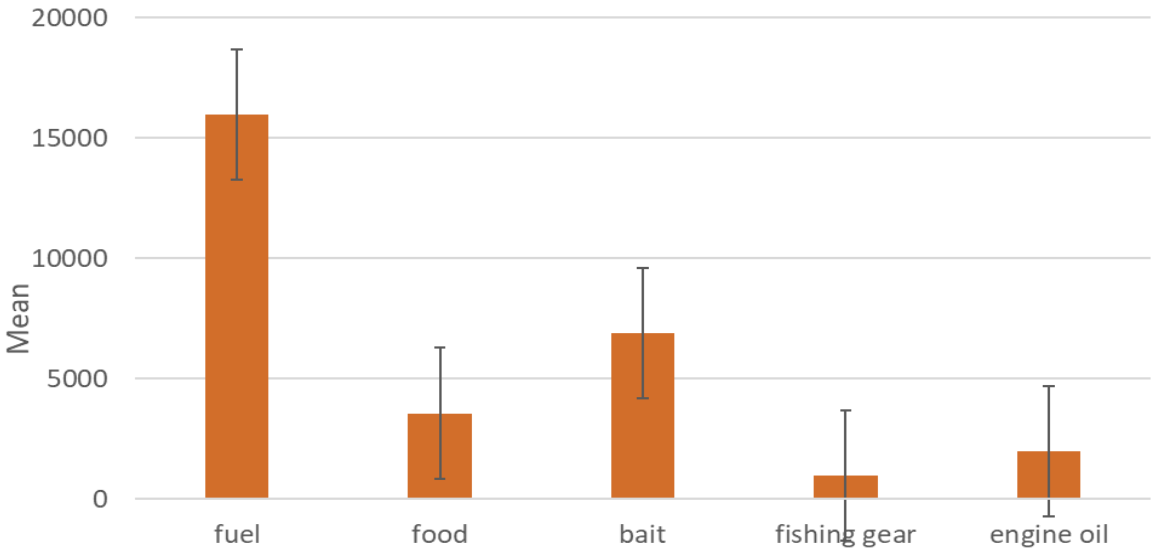

Figure 5.15. Daily average investments made in artisanal commercial fishing boats from the study area in AOA currency.

The data show that larger boats tend to harvest and land more fish than smaller boats, as **Figure 5.16** shows. A Pearson´s product-moment correlation test showed a low positive correlation between the boat size and fish harvested with a high statistical significance, *r(46) = 0.30, p* = 0.034, and a low positive correlation between the boat size and fish harvested with a highly statistical significance, *r(46)* = 0.39, *p* = 0.0059.

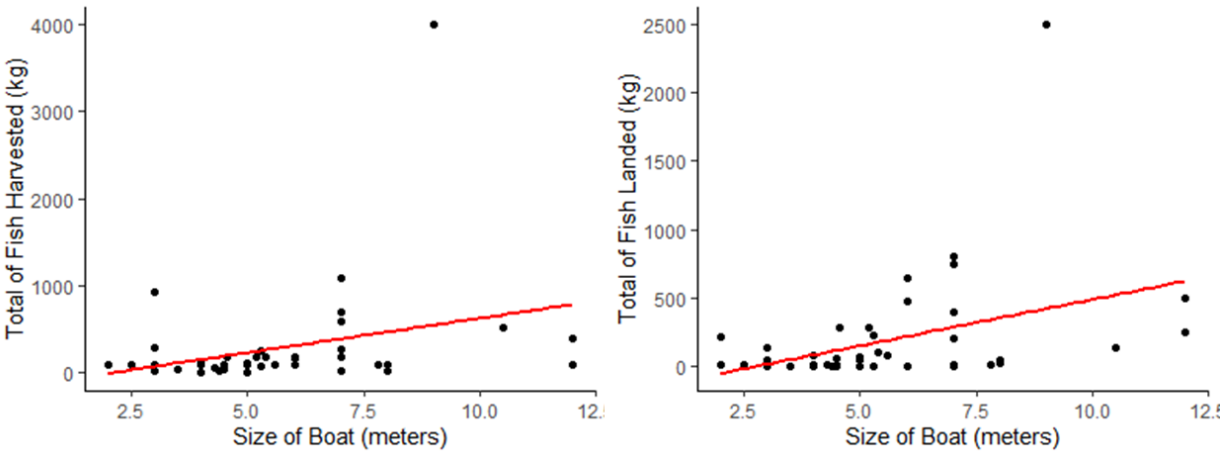

Figure 5.16. Relationship between boat size and quantity of fish harvested (on the left), and boat size and quantity of fish landed (on the right).

Because of the risks associated with fish losses, this study compared the quantity of fish harvested and landed per boat, The data analysis suggests that the quantity of fish caught is directly proportional to the quantity of fish landed. Not surprisingly, a Pearson´s product-moment correlation test indicated a high positive correlation between the two variables with very high statistical significance $r(46) = 0.87$, $p < 0.0001$. This result also suggests that participants in the study face very low losses of fish captured.

A Pearson´s product-moment correlation test also indicated a low positive correlation with very high and highly statistical significance between boat size and distance travelled to the fishing zone, $r(46) = 0.39$, $p = 0.008$) as well as the fishing zone depth in metres $r(46) = 0.34$, $p = 0.033$, respectively.

5.3.6.1.1.2 Boats´ revenues

The average difference between overall revenues earned and total expenses was used to calculate profit, while the total of all earnings from the selling of fish was used to calculate revenue; all costs incurred during the production process were included in the cost of operations as it has been done in other studies such as Asiedu et al.´s (2022).

The study examined the impact of navigation equipment on boat productivity and targeting profitable species, indicating that the proportion of boats without navigation equipment targeting profitable species was higher than the proportion with navigation equipment, as **Table *5.8*** shows. A Fisher's test for count data revealed a statistically significant association between navigation equipment and targeting profitable fish species ($p = 0.027$).

Noticeably, in an opposite direction of the more profitable species, the proportion of boats that target the most abundant species and are not equipped with navigation equipment is greater than the proportion of boats that target the more abundant species equipped with navigation equipment The Fisher´s exact test for count data indicated a highly statistically significant association between the two variables ($p = 0.032$).

Table 5.8. Number of boats surveyed for this study equipped with navigation equipment that target the more profitable and more abundant species.

Navigation equipment	More profitable		Most abundant	
	Yes	No	Yes	No
Yes	4	7	10	1
No	28	9	19	18

The study compared revenues and the level of acquisition of fishing material and gear on boats. Results showed that revenues are highest on boats where daily purchase is not necessary (NA), followed by average and difficult acquisition levels, as shown in **Figure *5.17***. However, a Kruskal-Wallis rank sum test did not show a significant association between the two variables, $p = 0.403$.

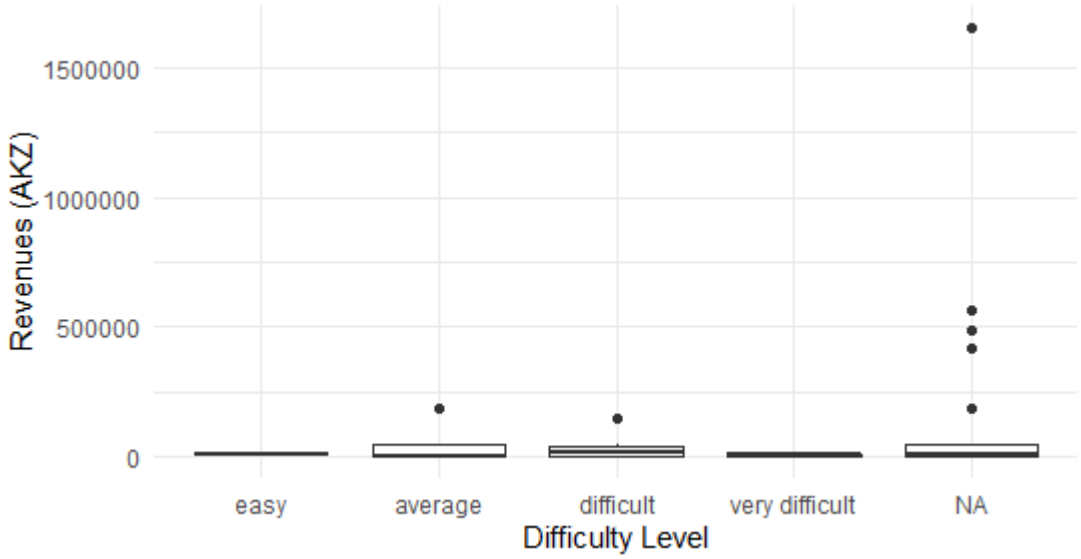

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Figure 5.17. Relationship between revenues and the level of difficulty in fishing material and gear acquisition.

The study also found that profits are highest on boats where daily fishing material purchase is not necessary, followed by those with average and difficult acquisition levels. However, some boats registered losses. The lowest profits were observed on boats with very difficult acquisition of fishing gear and equipment. A Kruskal-Wallis rank sum test also did not show a significant association between the two variables ($p < 0.610$).

The data analysis, through a Pearson's product-moment correlation test, also found a suggestive association at the $p < 0.10$ level between total of fish captured and revenues ($p = 0.077$) because some fish is retained for household consumption; see next section on economic benefits (Section 5.3.6.1.3). Similarly, a Pearson's product-moment correlation test indicated a high positive relationship with very high statistical significance between total fish sold and total revenues; $r(46) = 0.81$, $p < 0.001$; between total sold and profit; $r(46) = 0.81$, $p < 0.001$; and between total revenues and total profit; $r(46) = 0.98$, $p < 0.001$. However, there was a moderate significant negative relationship with very high statistical significance between total profits and other

variables such as crew number; $r(46) = -0.54$, $p < 0.001$; distance traveled $r(46) = -0.48$, $p < 0.001$; and fishing zone depth $r(46) = -0.47$, $p = 0.003$, which indicates that the larger the crew, the further and deeper the fishing zone, there is less profit.

Since Angolan law states that small subsistence boats are exempt from the payment of fees and taxes to contribute to the country's economy, we assessed whether the participants benefit from tax exemptions. There are two type of taxes; (1) one paid to the ministry of transport for licensing the boats to operate (tax1), and (2) another paid to the ministry of fisheries, to allow the boats to exploit the sea (tax2), The largest proportion of boats that pay both taxes are paddle-powered plank boats (37.5%) and outboard engine plank boats (42.5%). Canoes built from tree trunks represent 71.4% of those not paying taxes while rafts made of foam represent 28.6%. However, owners of two foam rafts make payment to the owners of the docks where the boats are secured.

The data shows that boats characterised as onboard, outboard engine and paddle-powered pay the highest tax, while rafts and canoes built with three trunks pay the lowest value. However, as **Table *5.9*** shows, the proportion of paddle-powered boats that do not pay taxes is higher than the proportion of engine-powered boats. A Fisher´s exact test for count data indicated a very high significant association between the boat´s propulsion, and the payment of taxes ($p < 0.018$).

Table 5.9. Relationship between boat category and the payment of tax for the boat to operate.

Boat propulsion	Payment of tax	
	Yes	No
Engine	18	0
Paddles	22	8

5.3.6.1.2 Stakeholders´ investment, costs, and revenues

Similar to boats, profits were calculated using the same formula for fishers, retailers and processors. The costs of operations will be described in the next sections. Some participants found it difficult to supply exact and comprehensive costs of their inputs, mainly because SSF fisherfolk do not keep detailed records of their operations (Wamukota et al., 2015).

5.3.6.1.2.1 Fishers´ costs and revenues

Fishers´ daily costs, as **Table 5.10** shows, mostly relate to transportation to the fishing communities, to food, and taxes and fees paid, either to the Ministry of Transportation, to docks owners or to the MINPESCAS. Differently from other studies (Asiedu et al., 2022), the cost of

gear/nets, ice, repair and maintenance, fuel, and labour were not included because these boat expenses are the responsibility of owners, managers, or captains.

Table 5.10. Fishers´ costs for a working day in Angola currency (AOA).

	Transport	Food
Mean	41	852
SD	241	825
Minimum	0	0
Maximum	2,000	3,200

Revenues are difficult to calculate because most fishers are not responsible for selling the catches, and crews adopt different methods of profit sharing, as in other parts of the world (Asiedu et al., 2022). However, where it is possible to estimate them, the results show, as in Table O.2 (Appendix O), an average of AOA75,000 of revenues and AOA63,275 of profits.

5.3.6.1.2.2 Retailers´ investments/costs and revenues

The costs of fish trading comprise fish purchases, transportation, food, and ice for fish preservation.

The taxes paid by the participants vary from AOA100 to AOA300 per selling day as established by the market managing team, which overall could generate a monthly total of around AOA1,000,000 for markets such as Kasseque, and Catumbela, where an estimated 3,000 traders work, including non-fish retailers. The costs of fish transportation vary between AOA200-2,000, depending on the distance involved and the quantity of fish carried.

Another cost for some retailers is for fish preservation. The cost of fish preservation varies between AOA150-3,000 (Mean: 599 ± 939 SD), either for ice to use in plastic bags or other material for transportation, or to rent freezer space. However, some retailers do not use ice because they state that it is not needed due the short distance from buying to retailing sites, or because they salt and dry the fish before trading. From the present study, 24 (54.5%) retailers buy ice or rent cold space, eight (18%) do not need ice due to short distances and immediate selling, two (4.5%) also do not need any because they sell crustaceans, and ten (23%) salt and dry before selling.

The graphic of quantitative variables from the PCA on retailer's dataset (**Figure *5.4***) shows that revenue is clustered with variables such as time working, number of family working with, retailer age and number of children. Therefore, Pearson´s product-moment correlation tests were performed showing that revenues have a negligible correlation with non-statistically significant association with retailers´ age: $r(42) = 0.23$, $p = 0.127$; and with the time in which retailers engage in this activity, $r(42) = 0.26$, $p = 0.08$.

5.3.6.1.2.3 Processors´ costs/investments and revenues

The costs incurred in artisanal fish processing are limited to paying for transportation to the market (mean:662.96±1252SD), food purchase (mean:304±144SD), and salt purchase (mean:37.04±91SD) for only 14.8% of participants.

Costs/Investments

Results of the analysis showed that all variables represented in the processors´ factor map (Figure 5.5), excepting transportation, are directly proportional to investment. Therefore, Pearson´s product-moment correlation tests were performed showing that daily investments have: (**1**) moderate high positive correlation and very high statistically significant association with payment of taxes; $r(25) = 0.57$, $p = 0.001$; monthly earnings; $r(25) = 0.58$, $p = 0.001$; number of children; $r(25) = 0.69$, $p < 0.001$; number of family working with; $r(25) = 0.60$, $p < 0.001$; and years working; $r(25) = 0.61$, $p < 0.001$; (**2**) high positive correlation and very high statistically significant association with Income per day; $r(25) = 0.81$, $p < 0.001$; and processors´ age; $r(25) = 0.81$, $p < 0.0001$; and (**3**) very high positive correlation and very high statistically significant association with daily investment in salt; $r(25) = 0.99$, $p < 0.0001$.

Revenues

Regarding revenues, the analysis of the data showed that it is directly proportional, not to all variables but to some such as income per day, daily investment in salt as well as in transportation, processor´s age, number of children, and years working as processor. Pearson´s product-moment correlation tests showed that revenues have (**1**) moderate positive correlation and very high statistically significant association with daily investment in salt; $r(25) = 0.63$, $p < 0.0001$; daily investment in transportation; $r(25) = 0.61$, $p < 0.0001$; and number of children; $r(25) = 0.64$, $p < 0.001$; (**2**) high positive correlation and very high statistically significant association with processors´ age; $r(25) = 0.82$, $p < 0.0001$; as well as years working; $r(25) = 0.77$, $p < 0.0001$; and (**3**) very high positive correlation and very high statistically significant association with income per day; $r(25) = 0.95$, $p < 0.0001$.

5.3.6.1.3 SSF contribution to stakeholders´ socioeconomic benefits (livelihoods)

With the revenues that artisanal fishers, retailers, and processors can obtain from fishing-related activities they are able to provide a range of economic benefits for many families in Benguela province.

5.3.6.1.3.1 Fishers´ socio-economic benefits

Artisanal fishing is the main source of employment and revenues for the majority of fishers in this study. Overall, the ways in which artisanal commercial and subsistence fishermen benefit from this activity do not differ substantially. In both categories, the major benefits relate to family food supply. However, with the revenues obtained from the fish sold, many commercial fishers can make investments in small family businesses such as the retail of industrialised products (beer, snacks, food) obtained in local warehouses, and give loans to other fishers, and fish retailers.

Fish retained by fishers for personal consumption is clustered, in the PCA, with various variables including investment in food. Therefore, the amount of fish retained for personal consumption was compared to daily investments fishers do for food to assess the type of relationship they have. A Pearson´s product-moment correlation test indicated a negligible correlation and high statistically significant association between the quantity of fish retained and the daily investment in food; $r(72) = .28$, $p = 0.015$.

The data also suggest that, curiously, the proportion of fishers in boats that land larger quantities of fish and do not provide a complete livelihood to their household is significantly greater than the proportion of fishers in boats that land smaller amounts but can provide a complete livelihood. Therefore, a Welch Two Sample t-test was performed to assess the relationship between fish landed and fishers´ family. livelihood affordability which showed no statistically significant association between the two variables ($p = 0.308$).

The data show that the number of crew working for a boat is inversely proportional to the number of fishers that can afford for a complete livelihood for their household, as **Figure *5.18*** shows. A further Welch Two Sample t-test showed that between the two variables exist a high statistically significant association ($p < 0.0001$). These results suggest that fishers who work in wider boats either work for an employer or have to share the revenues with a larger group of fishers; meanwhile, those in smaller boats either work for themselves or with 1-2 other people, which allows them to generate more revenues.

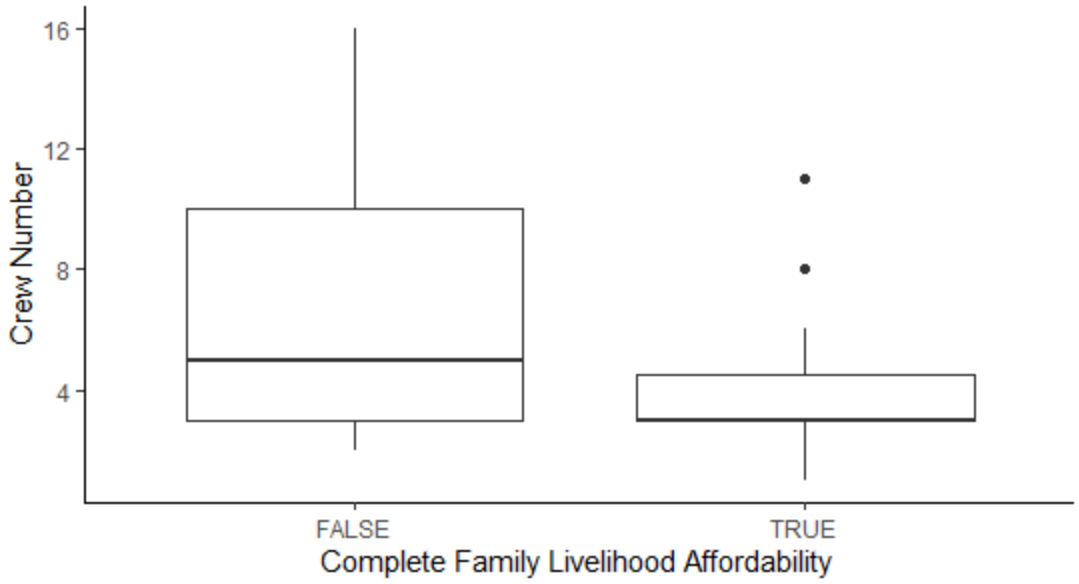

Figure 5.18. Relationship between the affordability of a complete livelihood for fishers´ household and the number of the crew of the boats they work in.

Overall, fishers in this study can achieve five main socio-economic benefits from SSF activity. Most fishers (67.7%) can (1) provide the family food supply while only 32.3% can (2) earn a complete livelihood. From the last group, 9.5% can also (2.1) pay school fees and taxes; only 2.7% can (2.2) sponsor other commercial activities from the revenues obtained from fishery; while 8.1% can afford (2.3) other benefits, including (2.3a) savings and (2.3b) purchasing personal gifts.

5.3.6.1.3.2 Retailers´ Socio-economic benefits

All fish retailers in this study (100%) can afford (1) to provide the family food supply; 59.1% can afford (2) school fees payment; 50% (3) earn a complete family livelihood, 9.1% can (4) sponsor other commercial activities, and the same percentage (9.1%) of participants can (5) put aside savings and gain other benefits from the revenues.

The data show that the proportion of retailers (12) who can afford to provide the family livelihood and sell fish in the most favourable places is smaller than the proportion (19) of those who cannot afford to provide the family livelihood but sell in the same places. A Fishers´ exact test for count data indicated a statistically significant association between the retailers´ family livelihood and the preference on selling in the most favourable place (p = 0.04).

5.3.6.1.3.3 Processors´ socio-economic benefits

As most people engaged in fish processing, in this study area, are young, single and without children, living mostly with their parents, the revenues that participants obtain from this activity helps to provide (1) the household's complete livelihood (70.4%). However, some of them (33.3%) use these earnings to (2) invest in other small business such as retailing of canned beer and plastic bags. Other processors (81.5%) use the revenues to contribute to (3) the family food supply and to (4) pay their own school fees and educational materials. Other processors (48.1%), earn other benefits, including transportation to school and (5) savings. This result reveals the potential of this activity to support educational opportunities amongst young people in Benguela province. The possibility for processors to help provide a complete livelihood to household depends on the daily revenues they achieve from this activity. As shown in **Figure *5.19***, the proportion and number of processors who can provide a complete livelihood to their household, earning up to AOA10,000.00 per day, is highly significantly greater than the proportion of processors who cannot afford to provide a complete livelihood to their household whose maximum wages per day is around AOA2,000.00. A further Welch Two Sample t-test showed a p = 0.007, showing that, not surprisingly, the higher the revenues processors can generate, the higher is their contribution to the household´s livelihood.

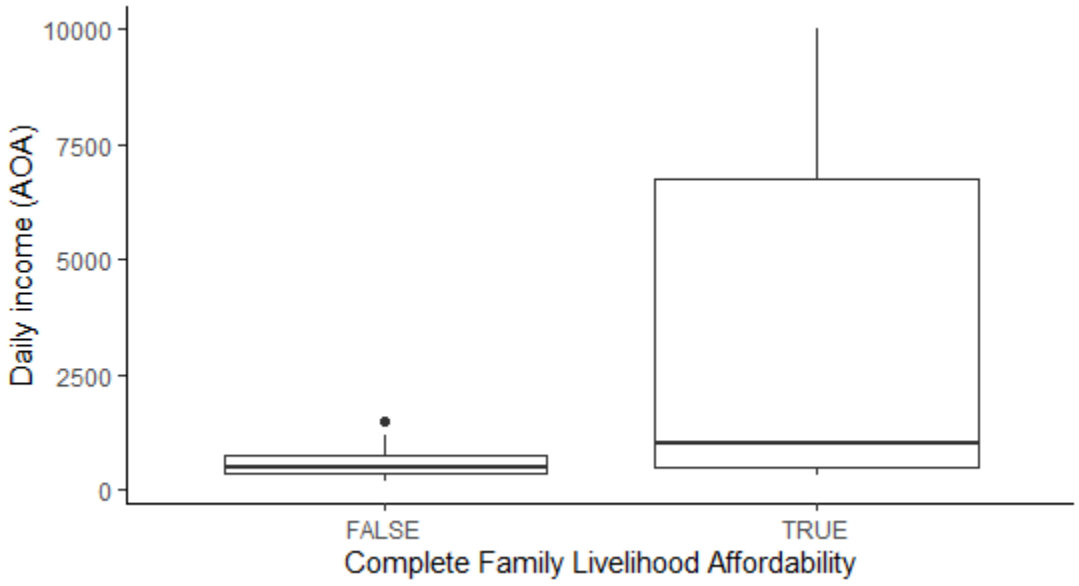

Figure 5.19. Relationship between processors´ daily total income capacity and affordability to provide a complete family livelihood.

The data also show that, although smaller, the proportion of processors who can sponsor other commercial activities also tend to invest more in food purchases than those who do not. A Welch Two Sample t-test showed a high statistically significant association between the two variables ($p < 0.0001$).

Similar to the capacity to sponsor other activities, the data also show that a small proportion of processors who can make some savings from the revenues invest higher amounts of money in daily transportation compared to those who cannot make savings. A Welch Two Sample t-test showed a highly significant association between the two variables ($p = 0.028$).

This study found that 96.3% of participants pay taxes and fees to market managers, but only 30% of those paying believe they offer fair value while only 22.2% see the benefits of paying, such as market permission and market cleaning. A Fisher's exact test showed a highly statistically significant association between payment and perceived fairness of taxes and fees paid (two-tailed $p = 0.037$).

Finally, the data show that the number of processors who make higher investments in daily food, while working, and can afford to provide family food supply to their households is greater than the number of processors who make lower investments in daily food, and cannot afford to provide food for the family. A Welch Two Sample t-test showed that daily investment in food and the affordability of family livelihood have a very high and statistically significant association ($p = 0.0001$).

5.3.6.2 Value chains, post-harvest, and trade.

This section addresses one of the main aims of this study, which is to describe the structure, the main actors, and the dynamics and interactions within the artisanal fishery sector in Benguela province.

Fishers and boats within the value chain

The dynamics of fishing operations within fishing communities vary greatly depending on variables including difficuties in acquiring proper fishing gear and navigation equipment. Therefore, fishing boats can differ in terms of construction material and propulsion method from one fishing community to another. For example, rafts made of foam were only observed in two closely located fishing communities in the municipality of Benguela, while canoes built of mixed materials including tree trunks and foam could only be found in Catumbela Praia in the

municiaplity of the same name. Plank boats with or without outboard engines can be found in almost every fishing community in the province.

Therefore, boat owners and captains were asked why they chose the fishing communities where they operate. The results show that the main reasons are that these fishing zones are (1) near their homes (37%), (2) have greater abundance of targeted fish species (54%) or (3) more appropriate for the use of the boats and fishing gear they have (9%). Those who responded that they chose the fishing zone because it is an appropriate area to use their boat were from only three fishing communities, namely Egito Praia (40%), Catumbela Praia (40%) and Vitula-Baía Farta (20%). The data also show that those who operate near home do not have the possibility of targeting the more abundant species which may indicate a limitation provoked by the lack of appropriate navigation equipment since, as **Table 5.11** shows, the proportion of boats equipped with navigation equipment that target fish in the areas where these are more abundant is smaller than the proportion of boats equipped with navigation equipment but do not target fish in the same areas. A Fisher´s exact test for count data showed a very high statistically significant association between fishing near home and the abundance of the species targeted ($p < 0.0001$). The test also showed a highly statistically significant association between the use of navigation equipment and targeting fish in the areas where it is more abundant ($p = 0.032$).

Table 5.11. Relationship between the choice of boats to operate in the fishing zones abundant in fish and the choice of fishing near fishers´ home as well as between the choice of boats to operate in the fishing zones abundant in fish and navigation equipment.

Abundant in fish	Fishing near home		Boat equipped with navigation equipment	
	No	Yes	No	Yes
No	1	18	18	1
Yes	27	2	19	10

A Fisher´s exact test for count data also showed a statistically significant association between beach seine and the choice of fishing in the areas that suits better the boats ($p = 0.048$).

Retailers within the value chain

Fish retailers in this study sell fish in all four coastal municipalities of Benguela province as well as in the provinces of Bié, Huambo, and Luanda, and in the Democratic Republic of Congo. The analysis also revealed that, in five out of nine markets, fish retailers work with close relatives. The highest percentages are in Catumbela (33.3%), Kasseque (33.3%) and Cotel roundabout (19%),

while in Baía Farta and Lobito – Velho they represent only 9.5% and 4,8% respectively. The data analysis also revealed that many of these relatives act as retailers´ fish providers.

Overall, the main fish providers are fishermen (95.5%) with no family relationship with retailers, who sell directly from boats on the beach. However, due to the high competition amongst retailers, some have to buy fish from other retailers (11.4%), and a few retailers work in a direct partnership with their spouses who are fishers (6.8%) and who provide them with fish, including on credit and with priority. **Figure *5.20*** shows the source of fish acquisition that retailers use. Only one participant, representing 2.3% of the sample, has his own boat from which he obtains fish to sell.

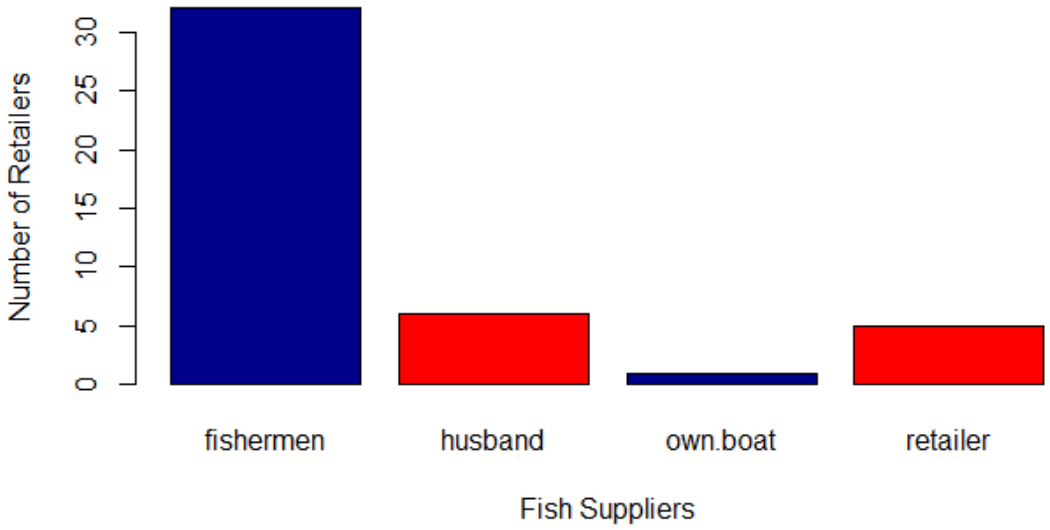

Figure 5.20. Source of seafood for retailers in the study area.

Processors within the value chain

The processors in the study sample are from only two fishing communities, namely Kasseque market (85.2%) and Praia do Bebé (14.8%). Most (81.5%) do not purchase the fish they process because they work for final customers in the market, and some (those from Praia do Bebé) only process bony fish before selling. Most processed fish species include sardines, large-eye-dentex, horse mackerel, and little tunny.

Since demand is for whole products, 100% of interviewed processors do not process raw crustaceans, except for crabs boiled in salty water. Crustacean processing is only done by restaurants and hotels serving food.

Most of the fish processors (59.3%) declared that they chose these markets to operate in because they are the most favourable in terms of relationship between customers and revenue, while the remaining 40.7% work there due to proximity to their homes.

In this study, the artisanal processors work for a variety of customers within and outside the fishing community, with the majority working simultaneously for other processors and for buyers in the market and in their houses (33%), followed by those working only for buyers in the market (30%). The smallest groups are composed of those processors working simultaneously for other processors and for buyers in the market and in their houses (7.4%) as well as for those working simultaneously for other processors, for local restaurants and customers in the market, and in their homes (7.4%). **Table 5.12** shows details.

Fisher´s exact tests for count data indicated highly statistically significant difference between the proportion of processors who work in the **most favourable markets** and work for buyers (p = 0.018); work for other processors, (p = 0.006); work in different markets (p = 0.018); have different educational levels (p = 0.026); and purchase or not salt (p = 0.018).

Table 5.12. Relationship Between Literacy, Salt Purchase, and Employment Choices in Seafood Processing.

Working in most favourable places	Working for Buyers		Working for Processors		Market Where Working		Literacy		Salt Purchase	
	No	Yes	No	Yes	P. Bebé	Tombas	No	Yes	No	Yes
No	4	7	9	2	4	7	4	7	7	4
Yes	0	16	4	12	0	16	1	15	16	0

Similarly, the results indicated highly statistically significant difference between the proportion of processors who work **near home** and work for buyers (p = 0.018); work for other processors (p = 0.006); work in different markets (p = 0.018); and purchase or not salt (p = 0.018).

The diversity of groups and their preferences show that most people opt for convenience and favourable conditions rather than processing fish close to home. This data above provides insight into the various motivations for processing fish, revealing that proximity to home and favourable conditions play significant roles in the decision-making process.

5.3.6.3 Gender equality - Women and youth participation in SSF

Gender equality for retailers

Most fish retailers within the SFF sector in the study area are women, as demonstrated in Section 1.1 (Chapter 1 – introduction). Similarly, the majority of fish retailers surveyed for this study are female. It is also shown that the proportion of female retailers who joined the profession because it was the best job offer (75%) is higher than the proportion of males giving the same reason (25%). More evident is the fact that 100% of retailers who entered the profession because it was the only job available were female. A Fisher´s exact test for count data showed that gender and best job offer are highly statistically significant associated (p = 0.013); as well as gender and only job available (p = 0.028).

The study also analysed the gender differences in livelihoods among fish retailers, focusing on seafood retail. Results showed that female retailers are more dedicated to fish retail (38) and commerce (02), while male retailers focus on agriculture (03) – only one dedicate exclusively to fish retail. A Fisher's exact test showed a significant association between gender and the type of fish-related activity (two-tailed p = 0.0003).

Gender equality for processors

Equally but in an opposite direction to fish retailers, the artisanal fish processors in this study sample were mostly young men. The study showed that male processors are predominantly found in the Kasseque market (22), while four out of five female processors are from Praia do Bebé and one from Kasseque. A Fisher's exact test revealed a strong statistically significant association between gender and the market where processors work in (Kasseque or Praia do Bebé) (p = 0.0002).

The data also show that, compared to male processors, female processors: (1) are older; (2) work for more years; (3) have higher daily income as well as (4) have higher monthly revenues; (5) more children; and (6) make higher daily investments (See Appendix P, Figures P.4 – P.10; and Appendix O, Tables O.7 – O.15). However, as shown in **Table *5.13***, male processors: (1) have higher education level; (2) can afford less for the payment of school fees as well as (3) for making savings.

Fisher's exact tests for count data showed very high statistically significant associations between processors´ gender and: level of education, two-tailed p = .0.001; the payment of school fees and taxes (p = 0.015) as well as savings (p = 0.047).

Further Welch Two Sample t-tests showed a high statistically significance between gender and years working as processors (p = 0.010); total daily income (p < 0.0001); and monthly revenues (p = 0.002).

Table 5.13. Comparison between female and male processors regarding education level, affordance of payment of school taxes and fees and making savings from fish processing.

Processors´ gender	Literacy		Payment of school fees		Savings	
	illiterate	Educated	No	Yes	No	Yes
Female	4	1	0	5	1	4
Male	1	21	14	8	16	6

Since 91% of the proportion of processors that do not work with family members are male, a Fisher´s exact test for count data was performed which indicated a significant association between gender and processors working with members of family (p = 0.029). Further analysis also indicated a significant association between gender and the family member working with the processors (p = 0.025) given that all the family members working with female processors (100%) are their daughters, while all the family members working with male processors (100%) are their brothers.

Equality for fishers

Overall, the lowest age within fishers from the study sample is 18 and the highest is 78 years old (mean 36.7±12.9SD).

The data show that there is a great variation and very clear distribution of age within the crew position, as shown in **Figure *5.21***; captains and owners are mostly over 40 years old, followed by co–captains aged between 20-45 years old, while fishers under 35 years old only hold positions of fishermen and “disembarkers” or “net pullers”, involving the offloading of boats or pulling the nets out of the sea, and occasionally to replace absent fishers. A Kruskal-Wallis rank sum test indicated a very high statistically significant association between fishers´ ages and crew positions (p = 0.0004).

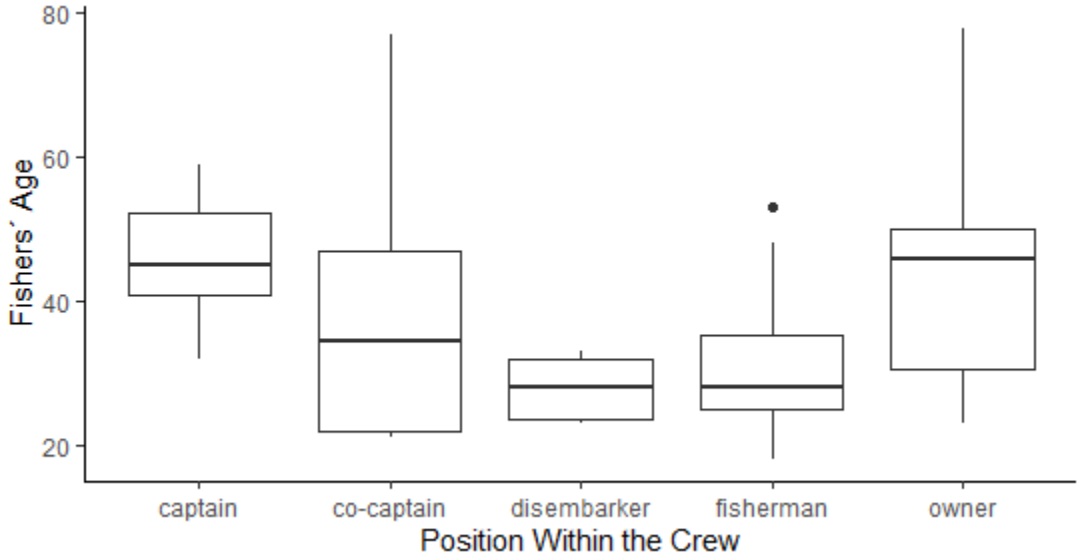

Figure 5.21. Distribution of fishers´ ages within the crews of artisanal commercial fishing boats.

5.3.6.4 The role of cooperatives

Since cooperatives have been seen as potential enablers of different benefits to SSF stakeholders, the association to fishers´ cooperatives was compared to other variables associated with the dynamics of the SSF in the study area, such as (1) reason for no association with cooperatives, (3) the payment of fees and taxes, (2) benefits for being associated to a cooperative, (4) access to financial credit, and (5) reservation of fish for household consumption.

Fishers´ benefits from association with cooperatives

The data showed that only 22 (30%) out of 74 fishers from this study sample are associated to fishers´ cooperatives. Most fishers (49%) do not associate with cooperatives because they have never been invited to be part of it, followed by those (13%) who have other reasons such as lack of ID or bank account as well as do not trust the cooperatives or think that it is not helpful; six (08%) fishers stated that cooperatives do not exist where they work or live.

The data also showed that only around 41% of the 22 fishers which are associated to cooperatives declared to have benefits from being member of a cooperative. A Fisher's exact test for count data indicated a very high statistically significant association between association to a cooperative and benefits from this participation (two-tailed $p < 0.0001$).

From these 22 fishers associated with cooperatives, 19 (86.4%) can afford to provide family food to their households, while 41.4% of non-cooperative fishers can also provide the same socio-economic benefit. A Fisher's exact test for count data showed a highly statistically significant association between the two variables (p = 0.030).

The association with fishers´ cooperatives was also compared with the taxes paid by fishers to work and operate the boats in the coastal area of Benguela province. Table 5.14 shows that 100% of fishers associated to cooperatives pay taxes though the proportion of these who think that the taxes paid are fair is almost the same as those who think that it is not. It also shows that most of the fishers do not think that there are many benefits of paying taxes. Fisher´s exact tests for count data indicated very high statistically significant association between belonging to a cooperative and the payment of taxes with a p = 0.007; belonging to a cooperative and the fishers´ perception of the fairness of paying taxes (two-tailed p = 0.0004); and belonging to a cooperative and the perception of the benefits of paying taxes (two-tailed p = 0.03).

All “NA” and “Not Sure” values were not included in the calculations to answers the questions in **Table *5.14***; Only “Yes” and “No” values, located in separated columns in the Excel spreadsheet, have been considered since they directly answers the questions making it binary and allowing to use Fishers´ Exact tests for this specific purpose.

Table 5.14. Relationship between association to fishers´ cooperatives and the payment of taxes to work.

Association with cooperatives	Payment of taxes		Fair taxes?			Benefits of paying taxes			
	No	Yes	No	NA	Yes	Not sure	No	NA	Yes
No	14	38	34	14	4	0	34	14	4
Yes	0	22	9	1	11	1	13	1	7

Retailers´ benefits from association with cooperatives

Out of 44 retailers surveyed for this study only 10 (23%) are associated with cooperatives. The data show that four (04) retailers are associated with the cooperative named *COPEBE*, five (05) to *Familia Unida* (05), and one (01) to a cooperative which name she does not know.

From the number of the remaining retailers, 10 (39%) are not associated with cooperatives due to lack of information, 12 (35%) to no invitation, 07 (21%) because they are not aware of the

existence of such cooperatives where they work or live, and 05 (15%) to other reasons such as lack of ID or lack of confidence in the cooperatives.

The study found that 50% of retailers associated with cooperatives benefit from institutional support from government and NGOs, while 50% value mutual aid provided among cooperative members, indicating the association's potential benefits. A Fisher´s exact test for count data indicated very high statistically significant association between association with a cooperative and benefits for being associated (two-tailed $p < 0.0001$).

Processors´ benefits from association with cooperatives

Only two fish processors´ cooperatives were mentioned in this study, namely FAMILIA UNIDA, for female retailers only and COPEBE, a mixed organization including fishers, retailers, and processors who represent 15% of the group.

Results of this study show that most SSF fish processors (81.5%), all male, are not linked to any fishers´ cooperative or association. This absence is given for the fact result that there are no (or they do not know of any) cooperatives for them in the market where they work (74.1%), that people do not cooperate well (3.7%), and that they do not know why they do not belong to a cooperative (3.7%). Not surprisingly, a Fisher´s exact test for count data indicated very high statistically significant association between processors´ gender and the association with a cooperative ($p < 0.0001$).

All associated processors declared that belonging to a cooperative brings a single benefit, which is mutual aid (help, support). Therefore, a Fisher´s test for count data was performed to assess the relationship between belonging to a cooperative and the socio-economic benefits of being engaged in fish processing. The results indicated a highly statistically significant association between belonging to a cooperative and the ability to pay school fees and taxes ($p = 0.015$) and for making savings ($p = 0.047$).

The data also indicated that processors who are associated with cooperative are likely to work more with family members since only 9.1% of fish processors who do not belong to a cooperative work with family members while 60% of those who belong to a cooperative work with relatives. A Fisher´s exact test for count data showed a highly statistically significant association between belonging to a cooperative and working with a family member ($p = 0.030$).

The study found a significant association between cooperative membership and perceived fairness in tax and fee payments for market managers (two-tailed $p = 0.030$). Among non-

cooperative fish processors, 77.3% find fees and taxes unjust, while 80% associate with cooperatives believe they are fair. This suggests a positive relationship between cooperative membership and fairness.

5.3.6.5 Barriers to fisheries economic growth

The study participants face many different difficulties and barriers. Similarly to the findings from the qualitative data analysis, the difficulties faced by SSF boats are mainly linked to the acquisition of inputs such as fishing gear and navigation equipment, and maintenance, while fishers, retailers, and processors also face a lack technical knowledge, limited access to financial credit, poor infrastructure, little collaborative work, and conflicts with the industrial fishing sector.

5.3.6.5.1 Influence of literacy on SSF stakeholders' socioeconomic profile

Since it is widely discussed within the literature whether educational and literacy levels influence people´s participation in fishing-related activities or not, this variable has previously been analysed by cross-tabulating against the demographic characteristics of the participants and other variables, including the reason for entering the activity.

Fishers´ literacy

The data show that most fishers (68%) have completed secondary school, who with those with primary school completed are considered literate in opposition to illiterate. Most of these literate fishers entered their profession because it was the only job available rather than any other reasons. However, a Fishers´ exact test indicated no statistically significant association between the literacy level of the fishers (illiterate and literate) and the reason they engaged in fishing activity; only job available (p = 0.710); best job (p = 0.688).

The analysis also shows that the proportion of participants dedicated only to fishing is greater among those who are educated, but there are no substantial differences between those who are illiterate and those who are not. Furthermore, a Fishers´ exact test for count data also shows no statistically significant association between literacy level and the occupation of the participants in the study (only fishing or engaged in other activity) (two-tailed p = 0.709).

Data in **Table *5.15*** show that the number of fishers who pay taxes is higher than the proportion of those who do not pay. Therefore, by comparing fishers' perceptions of the benefits of paying taxes to government institutions, this study found that 64% do not believe there are any benefits, with 47% being literate. The proportion of both illiterate and literate fishers who believe there are

no benefits is not statistically significantly different from those who believe taxes are beneficial to themselves (two-tailed $p = 0.583$).

This result contributes to answering the research question about the socioeconomic benefits that artisanal stakeholders get from SSF sector.

Table 5.15. Relationship between fishers´ literacy level and payment of taxes, and literacy level and fishers´ perception of the benefits of the payments of taxes.

Level of literacy	Pay taxes			Benefits for paying taxes		
	No	Yes	NA	No	NA	Yes
Illiterate	1	7	1	6	1	0
Literate	13	53	0	41	14	11

Retailers´ literacy

Most (81.5%) literate fish retailers use ice for fish transportation, while 70% of illiterate retailers do not, likely due to selling dried fish. A Fisher's exact test confirmed a highly significant association between literacy and ice usage (p = 0.0001), highlighting differences in practices based on literacy levels.

Similarly, the use of equipment to preserve fish was compared to retailers´ literacy level by performing a Fisher´s exact test for count data, which also showed a high statistically significant association between the two variables (two-tailed p = 0.011). A vast majority (81.5%) of retailers who are literate use equipment to preserve fish while a high number of illiterate retailers (80%) do not.

The study compared the literacy level of retailers and their ability to provide a complete household livelihood. Results showed that 50% of the sample could provide a complete livelihood, but only 36% of these were illiterate, while 64% were literate. However, a Fisher's exact test showed no significant association between retailers´ literacy level and their affordance of providing a complete household livelihood (two-tailed p = 0.068).

Processors´ *literacy*

Processors´ literacy level, similarly to fishers and retailers, was compared to their other social characteristics.

The data shows that 25% of illiterate processors joined the profession due to the availability of the job, while 75% of literate processors joined due to the best job offer. However, a Fisher's exact test showed no significant association between literacy level and the reason for joining the profession (only job available, two-tailed p = 0.283; or the best job offer; two-tailed p = 0.279). **Figure *5.22*** suggests that illiterate processors may experience a broader range of income levels, with potential for higher earnings than processors who are literate. However, it is also shown that

most literate processors have more consistent (and generally lower) income levels. A Welch Two Sample t-test indicated a highly statistically significant association between processors´ literacy level and their daily incomes (p = 0.004).

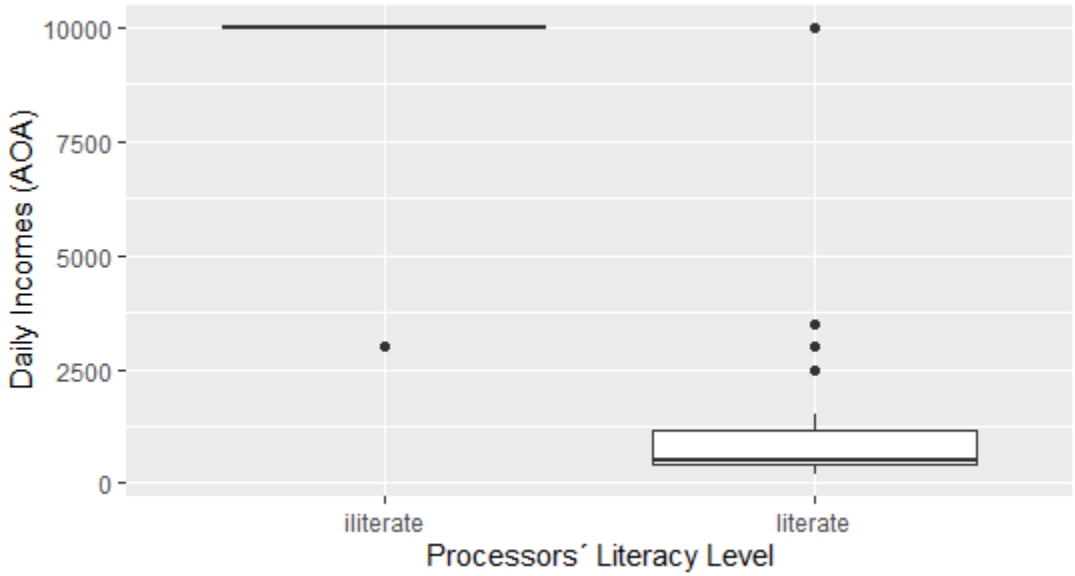

Figure 5.22. Relationship between processors´ educational level and income they make per day.

Out of 27 fish processors, in this study, only five are associated with cooperatives, with 80% being illiterate and 20% being literate. A Fisher's exact test for count data revealed a highly significant association between literacy level and cooperative association (two-tailed p = 0.001).

All fish processors, in this study, declared that the only benefit they receive from being associated with a cooperative is mutual aid, from which 80% are illiterate and 20% are literate.

Given that most (81.5%) of the fish processors are not associated to a cooperative, from which 95.5% are literate and the remaining 4.5% are illiterate, the reasons why they are not associated with cooperative were compared to their literacy level. The results showed that 74% of the participants who are literate declared that cooperatives do not exist where they work or live while 3.7% (illiterate) stated that they do not know the reason, and other 3.7% (literate) declared that there is lack of union amongst the fish processors. A Fisher´s exact test for count data indicated a highly statistically significant association between the literacy level and the decision to not joining a cooperative, (two-tailed p = 0.001).

5.3.6.5.2 Difficulties for fishers and with operating the boats

Although fishers and boats are very different subjects to refer to, it is quite difficult to disentangle the difficulties faced in putting the boats out to operate from the struggles that fishers live with while exploiting fish using these vessels. Therefore, separate analysis of the two sub-categories will be done as far as possible in this section.

One of the main difficulties that small-scale fishers presented in this study is the lack of technical knowledge. It has been found that some fishers do not know the characteristics of the gear used in the boats they operate. In the survey, 30 out of 48 boats use nets; however, from this number, only the crew members of three boats know the length, and just two fishers knew the mesh of the nets.

The results of the survey show that although the majority of the participants are able to repair their boats when damaged or for maintenance, there is no appropriate infrastructure for this purpose. Most of the boats (60.4%) are repaired on local beaches, followed by those that can be taken to a naval mechanic in Lobito municipality (25%), while 4.2% are repaired in local private docks, and 2.1% repair at home. Around 8% do not have options to repair the vessels they use.

Fishers using SSF boats also face many difficulties in exploiting the most valuable seafood species, including crustaceans, as **Table 5.16** shows.

Table 5.16. Reasons why artisanal fishers do not exploit more crustaceans in Benguela province.

Reasons for not focusing on crustaceans fishing	Number of fishers/boats (n=33)
Do not know how to fish for crustaceans	6
Lack of fishing equipment	12
Boat is not equipped with appropriate gear to capture crustaceans	15

The data also show that most boats in the survey are poorly equipped with navigation and safety equipment since 77.1% do not have any required item for this purpose.

Another drawback is related to the amount of fish captured, landed, and sold, and the revenues obtained, since the data shows that the minimum in some boats are lower than 1kg a day, and revenues are negative (Table O.2 – Appendix O). As was previously mentioned, *"in some cases,*

losses of up to AOA10,000 (USD) can be registered in boats where amounts up to AOA18,700 (USD) are invested for needs like fuel, food, and bait."

Another difficulty that fishers face is the acquisition of fishing gear and material. On a four-point Likert scale, boats owners, in this study, were asked to respond to four questions to assess the level of difficulty in accessing fishing material for the last trip they had taken, using the options "easy" = 1, "average" = 2, "difficult" = 3 or "very difficult" = 4. Those who had no need of acquiring fishing material in their last trip were assigned as N/A = 0.

Overall, this study shows that most participants (52%) have had difficulties, and 48% of boat owners declared that they had found it very difficult to find and acquire fishing gear, in their last fishing trip. This lack of fishing gear is evidenced by the fact that the beach seine, which is currently illegal, is still used as fishing gear in some of the boats (8.3%) surveyed in this study.

The data suggested that the boats with no need for daily fishing gear and equipment acquisition either sell more fish or make more revenues than the boats which level of acquisition is very difficult. Kruskal-Wallis rank sum tests indicated no statistically significant associations between the level of acquisition and the quantity of fish sold (p = 0.293); as well as between level of acquisition and the revenues obtained (p = 0.403).

The data also indicated that fishers who do not need to acquire fishing material frequently have more profits than those who need, as **Figure *5.23*** shows. However, a Kruskal-Wallis rank sum test indicated no statistically significant association between the level of fishing gear and material acquisition and the daily profits obtained from the fish sold (two-tailed p = 0.468).

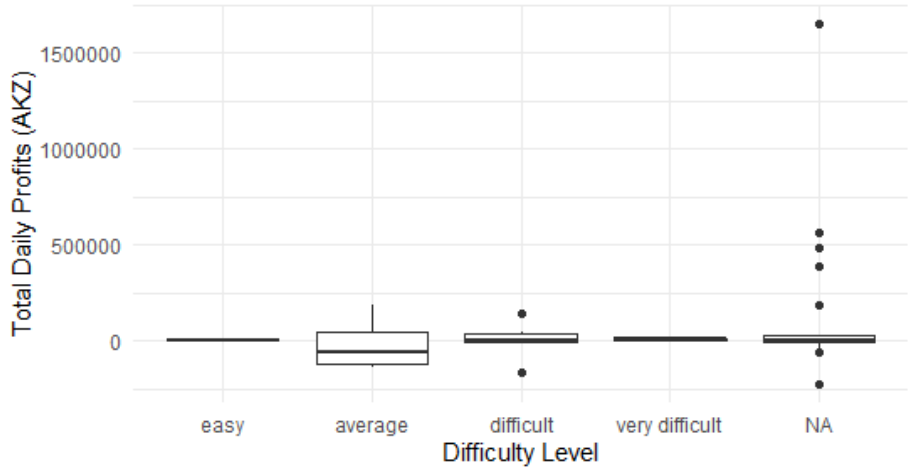

Figure 5.23. Relationship between the level of difficulty in fishing gear and equipment acquisition and the profits in AOA obtained from the fish sold.

The study compared the difficulty levels of acquiring fishing material and gear across different boats according to their motion. It was found, as **Figure *5.24*** shows, that paddle-powered boats have a slight higher difficulty level in acquiring these items than boats moved by outboard engines. A Kruskal-Wallis rank sum test indicated no statistically significant association between the boats´ motion and the level of acquisition of fishing material and gear (p = 0.076).

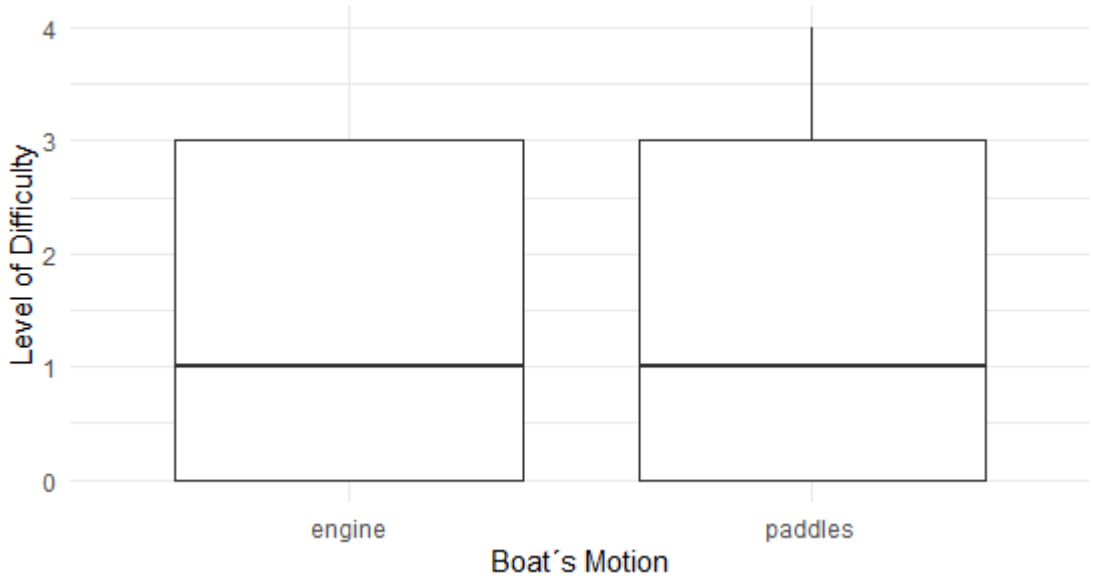

Figure 5.24. Relationship between the boats´ motion and the level of acquisition of fishing material and gear.

This study showed that most of the fishing gear for the boats surveyed in this study is acquired with a considerate level of difficulty and, mostly in the rural market. The data showed, as in **Figure *5.25***, that the number of boats with the level of acquisition “difficult” (47%) is greater than the number of boats with levels of acquisition “average” (18%), “easy” (23%) and “very difficult” (12%). A Kruskal-Wallis rank sum test indicated a very high statistically significant association between the level of difficulty of acquisition of fishing gear and their supplier (rural market or warehouses) with a p = 0.0004.

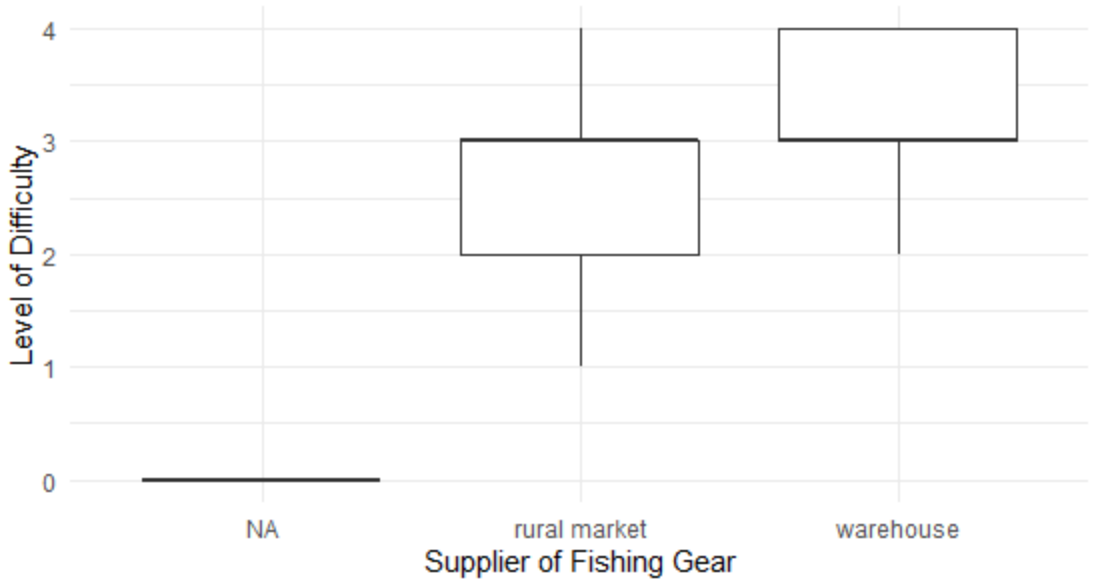

Figure 5.25. Relationship between the level of acquisition of fishing material and gear, and its supplier (source).

Fishers generally have difficulties in accessing any type of credit, either financial or material. Nearly 90% of participants in this survey declared that they do not have access to credit, stating that it is difficult to access (51%), or that it does not exist or has been suspended, and is, therefore, not allocated anymore (38.2%), as shown in **Table 5.17**. A Fisher´s exact test indicated, respectively, a highly and a very high statistically significant association between no acces to credit amd the reason that it does not exist (p = 0.02); and the reason that the access to credit is very difficult (p = 0.008).

Table 5.17. Barriers to accessing credit by fishers surveyed in this study

No access to credit	Reasons to no access to credit			
	Credit do not exist		Credit is very difficult	
	No	Yes	No	Yes
No	3	0	3	0
Yes	34	21	27	28

Due to these difficulties to access credit from formal institutions such as the government and NGOs, most fishers of the small number of those who have access to credit declared that it comes from friends and close relatives. A Fisher´s exact test for count data indicated a very high

statistically significant association between the access to credit and the benefit of it from friends and relatives (p = 0.001).

5.3.6.5.3 Retailers´ difficulties

Artisanal seafood retailers, differently to fishers, do not face difficulties with the acquisition of materials and equipment. However, they have similar problems regarding access to some of the most valuable species, with the payment of taxes and fees, as well as other socio-economic drawbacks including cooperative work and access to credit.

Out of 44 retailers, 24 were dedicated to bony fish trade, three to only crustaceans while 17 traded both bony fish and crustaceans, simultaneously. When asked why they do not dedicate their trade to crustaceans, some retailers declared that they are not adapted to this business (34.8%) or that they wish to avoid competition with other retailers (30.4%), there is low availability and limited access to fishers (21.7%), and some avoid crustaceans for religious reasons (13%). **Table 5.18** suggests that the proportion of retailers that dedicate their trade to bony fish exclusively is greater and has a higher percentage of people paying taxes than in the other categories.

Table 5.18. Relationship between the species traded and the payment of taxes by retailers in this study.

Species traded	Tax payment				Total
	No	%	Yes	%	
Bony fish and crustaceans	19	46%	22	54%	41
Crustaceans and bony fish	5	25%	15	75%	20
Bony fish exclusively	2	8%	22	92%	24
Crustaceans exclusively	1	33%	2	67%	3

Further Fishers´ exact test for count data indicates that a significant percentage of those considering taxes paid to be unfair, of which most (75%) do not see any benefits of paying these taxes and fees to market managers. Retailers who exclusively dedicate to bony fish mostly (79%) consider that the payment of taxes is unfair (p = 0.028). However, most of the retailers who trade both crustaceans and bony fish simultaneously (59%) consider that the payment of taxes is fair, and a Fisher´s exact test for count data indicated a statistically significant association between the trade of bony fish exclusively and the perceived fairness of the payment of taxes and fees (p = 0.023).

5.3.6.5.4 Processors´ difficulties

The study surveyed artisanal processors, who primarily do not have a license due to lack of legal recognition (85.2%), and 96% of them must pay taxes and fees in their markets. Most participants (69.2%) believe that taxes paid are not fair due to lack of infrastructure and unhygienic conditions, and around 77% of processors who pay taxes believe that there are no benefits. A Fisher's exact test showed a highly statistically significant difference between those who think taxes are unfair and those who believe there are benefits ($p = 0.037$).

Another difficulty that artisanal processors face is access to credit. Most (88.9%) do not have access because they have never heard about it (18.5%), never had been invited (25.9%), nobody has ever offered (14.8%) or simply do not know why they do not have access (29.6%).

Most artisanal processors (81.5%) do not belong to any cooperative, except for those who are retailers (18.5%). The reasons for this are lack of cooperatives (74.1%), lack of collaboration (3.7%), and uncertainty (3.7%). A Fisher's exact test showed a significant difference between the proportion of fish processors who do not associate with cooperatives and those who do not due to lack of union or uncertainty (two-tailed $p < 0.0001$). This result indicates that most fish processors likely do not join fishery associations because it does not exist where they work or live.

Chapter 6. General discussion

6.1 Introduction

Although Angola's vast natural resources, including oil, minerals, tourism, and agriculture, offer significant opportunities for food security, good livelihoods and poverty reduction, the socioeconomic importance of SSF and its specific contribution to these aims remain little known. Therefore, by bringing together the main outcomes from both the qualitative and qualitative data analysis, under the four themes emerged from thematic analysis, this chapter will discuss their similarities and differences with prior findings in the existing literature on the socio-economic importance of SFF worldwide. The chapter answers the research questions and fulfills most of the objectives of the study.

6.2 Governance

6.2.1 Characteristics and definition of small-scale fisheries and compliance with law and management

The results of qualitative analysis (document analysis) show that the fishery sector in Angola (especially SSF) is covered by full and complex legislation. Angola, in contrast to the other state members of the BCLME, is the only country where small-scale fisheries activities are fully recognised, protected, and supported by the government (Sowman & Cardoso, 2010). This legislation adopts boat length as the main characteristic to define SSF in Angola; Lozano et al. (2018) assert that this is the most common characteristic used in the few countries in the world that adopt a clear definition of SSF.

However, as other studies (Kraan, 2009; Silas et al., 2020) have observed, many of these laws are difficult for the authorities to apply and many stakeholders to adhere to. Compliance with adequate navigation equipment is one of the main problems for artisanal fishers in Benguela province. Decree nº 13/18 determines that "*all vessels, including that for artisanal fishing with length > 7 m, must be equipped onboard with appropriate communication means as well with navigation and orientation instruments such as compass and GPS*". However, of the 48 commercial artisanal boats of this dimension inquired about, only 11 use some of the mentioned equipment, as Table 5.1 shows. Low availability and high market prices hinder the acquisition of adequate navigation equipment, limiting boat navigation and fishers' access to productive zones, resulting in unauthorised species catches and resource waste. Furthermore, lack of navigation equipment such as GPS, sonar, compasses, and lights, causes crews to get lost and contributes to accidents with industrial vessels, as reported in literature and the data analysis.

According to Article 21, the provisions of the Law on Biological and Aquatic Resources state that the following constitute serious infractions:

- Fishing for species of a smaller size or weight than authorized (paragraph d).
- The use of fishing gears that do not meet the prescribed or authorized specifications, in particular the use of prohibited fishing gears and the use of nets whose mesh size is less than the authorized minimum mesh size (paragraph d).

Fishers also do not respect the restrictions imposed by the authorities on species caught by season. For example, **Table 4.2** shows a prohibition on lobster capture during the months of January, February, and March of 2018. However, **Figure 5.11** shows that this species is on the top 10 for catches by most fishing vessels throughout the year. The same can be observed for some demersal species such as large-eye-dentex, croakers, and groupers which are forbidden to be caught during the months of April, May, and June.

The evidence shows that fishers still target these species because of difficulty in reaching the fishing zones for authorised/intended fish, some of which are more distant from shore, caused by the lack of appropriate boats, engines, sonar, gear, and fishing materials, the absence of environmental education, and the lack of law enforcement by the authorities.

6.2.1.1 The case of beach seine fishing gear (Banda – Banda)

The results of this study show that beach seine, which is currently forbidden by law, is still used by many surveyed boats. Beach seine canoes, the least motorised fishing gear, are used in Benguela province, reflecting limited resources but raising concerns about law enforcement and sustainable fishing growth (Kraan, 2009). This study shows that this gear is used permanently by around 8.3% of participants due to their lack of other fishing gear, a figure which differs slightly from another study's findings (Cetra & Petrere Jr, 2001) that beach seine accounts for 30% of fish landings, but seasonal use is common due to climate change.

On the one hand, the present results show that this technique allows fishers to save some effort in long distance fishing and means more people can access the sector - a crew can involve up to 22 members. However, nearly 2/3 of this group are disembarkers who only pull the net from the sea; **Figure 6.1**. Through this technique, the crew can catch a large range of species in the coastal areas of the region. On the other hand, using this technique for the most valuable species is difficult, meaning they capture juvenile species, which could lead to serious environmental imbalances in this region: "*the "spawn-at-least-once" principle suggests that sustainability is secured if fish become vulnerable to commercial gears only after they have spawned*" (Vasilakopoulos et al., 2011, p.1525).

The fact that beach seine has been forbidden for more than 15 years (Law 6-A/2004 of 08th October reinforced by Decree nº 13/18) but many commercial artisanal fishers still use this fishing method, as Figure 6.1 shows, indicates that these laws have been very challenging to apply, possibly due to the general lack of law enforcement within the country, and the difficulties in acquiring fishing line. Furthermore, it seems that the authorities intentionally ignore these

violations, probably for political reasons due to the relatively high employment the method supports, avoiding conflict with this vulnerable segment of the population, as a fishers´ cooperative representative stated: "…*naturally, the law forbids it, but that's it, we can't replace this art with another*". Another reason could be that, as suggested by Hutchings et al. (2002, p.244), "*low technology fisheries, such as gillnetting, and beach-seine netting appear to be ideal solutions for allowing poor coastal communities access to marine resources*".

Figure 6.1. Artisanal fishers using beach seine to catch fish in the fishing community of Praia Bebé in Benguela province. Photo by author during field survey, Jan-July 2018.

6.2.1.2 How can the use of beach seine be addressed?

Through this study, it was not possible to draw suggestions from the participants on replacing beach seine with other fishing gear, because it seems to be a dilemma for the authorities to do so. However, the literature presents two main options to cope with beach seine practices.

The use of aggressive and forbidden gear such as beach seine vessels which are less motorised and unable to undertake long-distance trips, benefiting poor fishing resources but hindering sustainable growth also fuels overexploitation (Kraan, 2009). Although beach seine has been controversial globally, with critics criticising it for catching undersized fish, is still widely used in many countries due to the limitations on accessing appropriate fishing gear and to the negative effects of the climate changes, accounting for 30% of fish landings (Cetra & Petrere Jr, 2001). While some argue that banning beach seines is necessary for inshore and demersal biodiversity conservation (Stergiou, 1996), others state that it can be permitted; however, more information on permit holders' demographics, economic situations, and resource perception is needed before distributing new net permits (Hutchings et al., 2002).

Therefore, by eradicating this practice an environmental balance would be achieved, but on the other hand, it would be expensive, requiring vessel upgrades and increased fuel costs (Silas et al., 2020), and would potentially prevent thousands of people from accessing a traditional means of livelihood.

6.2.2 Management and governance of small-scale fisheries

6.2.2.1 Governance of small-scale fisheries

The participants and documents in this study provide evidence of the adoption, by Angolan authorities, of a Departmental Cooperation-Based Model of Small-Scale Fisheries Governance which has been stated by Xiong et al. (2022) and Preez (2009) to be an essential policy framework for reducing poverty and ensuring food security, particularly in developing nations. The interviews in this study demonstrated that members of different ministries in Benguela province have been working together to improve the governance of the region's fishery sector.

Although the main document guiding regulation of the fishery sector in Angola was elaborated prior to issue of the FAO's SSF guidelines, most of the outputs and subsequent legislation are in line with this internationally approved framework. Most of them, aiming to improve management, guarantee food security, end poverty, and support sustainable development goals, are in accordance with the FAO Voluntary Guidelines for Sustainable Small-Scale Fisheries which support SDG14, the 2030 Agenda, and the International Year of Artisanal Fisheries and Aquaculture in 2022 respectively, as stated by Xiong et al. (2022). The annual Angolan presidential decree's main aim is the sustainable management of marine resources.

However, none of the documents analysed in this study refers to McClanahan et al.´s (2015) conflict, food security, and vulnerability framework which uses the three elements of exposure, sensitivity, and adaptive capacity in order to evaluate the current state of marine fisheries. The most-used tool for this purpose are marine protected areas (MPAs) which are perceived to conserve marine ecosystems and maintain biodiversity. In accordance with FAO (2011) statements, MPAs in Angola are regularly evaluated and upgraded by presidential decrees. The evidence gathered in this study shows that they help to minimise waste, discards, and negative effects on non-target species as part of the ecological approach to fisheries of FAO technical guidelines to promote sustainable fishing (FAO, 2011). One of the most fishery specific frameworks to which Angola is a signatory is the Benguela Current Commission (BCC) that promotes integrated governance, sustainable development, and ecosystem preservation, aims which align with many authors' assumptions, such as Cochrane et al. (2009), Hutchings et al. (2009), and Harris et al. (2012).

The qualitative results of this study, especially the document analysis, agree with Sowman & Cardoso (2010) that although Angola, Namibia, and South Africa are all signatories to international and regional protocols and frameworks, their application in each country differs, with Angola alone in fully recognising and supporting subsistence and artisanal fishermen. However, according to Preez (2009), unregulated artisanal fisheries present governance difficulties, and many of the present participants stated that the support intended by this legislation is not implemented in reality, and that most of the programs have been suspended or failed due to high market informality especially in the post-harvest segment. The participants´ declarations are also in line with Belhabib & Divovich´s (2015) observations that the governance of many coastal zones is weak and ineffective, resulting in uncontrolled pollution, lack of coastal management and surveillance, and unregulated human activity, such as illegal fishing and overexploitation, causing rapid deterioration.

6.2.2.2 Management objectives and strategies for the sustainable development of SSF

The results of the present study show that the Angolan authorities promote and implement measures in accordance with the FAO SSF guidelines to ensure an ecological foundation for food production and the long-term conservation of fisheries resources. These measures follow authors such as Costello et al. (2020) and Gaines et al. (2018) who assert that properly managed fishery policy, including quotas and adaptive strategies, can ensure the recovery of overfished stocks and boost food production from wild fisheries while increasing revenues, harvest, and biomass.

In Angola, annual presidential decrees establish regular fishing closures, and the participants also declared that at the time they were observing *“restrictions, for horse mackerel in the months of June, July and August, and for crustaceans, i.e., shrimp, in January and February*”. These fishing closure measures are a clear demonstration that the Angolan authorities seek to promote fishery sustainability, in line with the idea that the strategy of the "spawn-at-least-once" maintains sustainability by reducing fish sensitivity to commercial gear after spawning (Myers & Mertz, 1998). This policy is also in accordance with Vasilakopoulos et al.‘s (2011) argument that avoiding overfishing and juveniles to encourage the generation of fish with lengthy lifespans are key components of traditional fisheries management because young fish stock conditions and recruitment are determined by extrinsic factors, which negates conservation.

Although some participants declared that the existing legislation is achieving the aim of guaranteeing sustainable exploitation of local fishery resources, no evidence was found of the implementation of adaptive fisheries management practices to ensure resources, social situation adaptation, and knowledge to lower environmental and social risks (McClanahan et al., 2015).

The present results show a partial implementation of some of the FAO SSF voluntary guidelines and principles, but the overall outcomes are not clearly visible and measurable. Although governmental representatives declare that local populations are involved in management through participatory methods like co-management, monitoring, control, and surveillance to ensure long-term small-scale fishing preservation, most fishers' cooperatives lack understanding of their rights and participation in management. These circumstances are clearly not in line with the FAO´s (2015) statement that states should protect the tenure rights of SSF and steer clear of financial and policy choices that could promote resource misuse and overcapacity.

This study also found no evidence that co-management promotes women's empowerment in environmental policies and fisheries programmes and includes them in decision-making for poverty reduction and food security (Harper et al., 2012). It is, however, clear from the document analysis and participants' statements that the Angolan fishery management model seeks to address the problem that traditional fishing methods are badly impacted by many small-scale fisheries being managed through non-participatory and centralised systems (FAO, 2023a).

6.2.2.3 Strategic development and support programs - the role of cooperatives

Fishery cooperatives are essential for sustainable marine fisheries management, poverty eradication, and wealth growth, by addressing the low involvement of fishery stakeholders in decision-making and marine resource conservation through collective action in isolated communities. Authors such as Basurto et al. (2013), Finkbeiner (2015), Unal & Yercan (2006) and Garza-Gil et al. (2020) mirror the results of this study since the participants demonstrated that MINPESCAS technically and methodologically supports associated stakeholders, improving fishing activity quality through organising, correcting, and guiding them according to the governing body's directives. However, this study did not reveal any actual results to support Garza-Gil et al.´s (2020) statement that strategic programs enhance sustainable small-scale fisheries development in developing countries through co-management strategies.

The findings here show that Angola´s intended governmental support primarily targets stakeholders, including women, in fishers' cooperatives and associations, as many participants explained that all formal and non-legalised and legalised cooperatives were created to benefit from governmental assistance. This clearly illustrates that Angolan law mandates fishers to form cooperatives and associations for financial and technical support, promoting bottom-up governance in fisheries (FAO, 2018; Preez, 2009). Moreover, these results match Hanh et al.´s (2016) assertions that this practice is common worldwide, with hundreds of cooperatives and associations supporting thousands of artisanal stakeholders.

Therefore, although insufficient, some benefits of association are visible since the present results in section 5.3.6.4 showed high percentages of stakeholders who belong to cooperatives and can afford to provide family food supply to their household . These results, with statistically significant association, align with the assumptions of Basurto et al. (2013) and Harper et al. (2012) that fishery cooperatives offer numerous benefits for stakeholders, including teamwork, expense allocation, formal agreements, access to fishing assets, and greater participation of women in SSF. Thus, not only in Angola but elsewhere, projects such as the IFAD in Malanje show that professionalism can be achieved within the fishing sector. Furthermore, cooperative work benefits fishers through experience exchange, motivation, financial support, generational inheritance, and improved fishing quality while also combating illegal fishing (Freudenberg & Arlinghaus, 2008; Romero et al., 2022).

In line with Preez (2009), due to governance uncertainty in Angola, implementing these management frameworks remains challenging. This study reveals that poor management practices and low capacity among artisanal fishers undermine government aid initiatives. Cooperatives' lack of cooperation leads to financial problems, disputes, abandoned vessels, and crew conflicts, resulting in poor management and poor unity. These challenges are linked to many factors, including literacy, as a clear relationship between education level and association with cooperatives is revealed here, suggesting that the sustainable development of fisheries needs investment beyond the immediate fisheries infrastructure. However, the qualitative data has shown that the authorities have tried to address these challenges by applying multisectoral strategies for education and law enforcement, in line with Finkbeiner´s (2015) suggestion that diversification, inner enforcement, and contest solution schemes within small-scale fishing cooperatives can help to alleviate uncertainty.

6.3 Exploitation of crustaceans

6.3.1 How effective is artisanal fishers' crustacean capture in Benguela province?

Fish-derived products are the most traded food items globally, with international trade increasing by 12% in the past three decades (Crona et al., 2015), and the same percentage increase was observed in international catches of crustaceans from 2010-2016 (Penn et al., 2019). However, the survey of the present study found no evidence for growth in exports of Angolan crustaceans. On the contrary, the literature review showed that Angola has registered an exponential rise in imports of low-quality fish and fish products, and a slow growth in exports of good fish products, especially crustaceans (mostly by industrial fishers) (FAO. 2014; FAO, 2018; OEC, 2021; FAO, 2023a).

Crustaceans can be caught using various fishing gears, but traps are the most usual for artisanal vessels (Penn et al., 2019; Gardner et al., 2020). The boats surveyed here harvest prawns, crabs, and shrimps using beach seine, mainly without engines (only one boat harvest, exclusively, crabs using traps), while lobster is also caught using traps and net fishing gears. However, most boats (68.7%) do not focus on crustaceans, because the majority of the surveyed boats do not use navigation equipment, as Table 5.8 shows. The data showed a significant association between navigation equipment and the use of traps as fishing gear in the boats targeting crustaceans. The qualitative results also showed that many fishers do not fish crustaceans because they do not have and dominate the technique required for this fishery, allied to the lack of fishing gear in the local market.

The profitable trading market for crustaceans in Benguela province has few artisanal boats catching crustaceans due to the need for specific gear and basic knowledge. Furthermore, fishers need to know the locations of abundant crustaceans to deploy equipment, which is difficult in the absence of navigation equipment such as sonar. Also, because most boats have no engine, fishers deploy their nets in shallow and most accessible waters where crustaceans are present amongst other species, so they can fish with the gear they own and with low investment. However, crustaceans captured in these areas often have little commercial value due to their immature growth (Penn et al. 2019).

These factors mean that SSF cannot meet market demand, and crustaceans are 8th out of the 10 most exploited seafood products by artisanal fishers in the study area; Figure 5.11. Therefore, buyers, especially restaurants and hotels managers, struggle to obtain crustaceans for their customers, and look outside the province including to international markets. All these factors contribute to the product becoming unaffordable for most local consumers.

6.3.2 Is the crustacean retailing process similar to bony fish in this study area?

The study shows that 50% of artisanal fish retailers focus on bony fish trading, with 38% selling simultaneously with crustaceans while the minority focus on crustaceans, cuttlefish and cephalopods.

Similar to other studies including Gay et al. (2022), Bondad-Reantaso et al. (2012), and Vasilakopoulos et al. (2018) which report that crustaceans such as prawns and lobsters are amongst the most traded and expensive species, this study reveals that some bony fish such as groupers have similar importance. The lowest prices in this survey were bony fish such as mackerel, sardines, and picarel. However, retailers prioritise certain seafood types over others

due to low market availability, causing them to avoid trading crustaceans. As has been demonstrated, the participants prefer bony fish trading over crustaceans due to ease of selling, preservation, and economic viability, but both types are equally profitable and market-demand-driven. These characteristics cause some retailers to avoid entering the business to avoid unnecessary competition.

Retailers of crustaceans and bony fish were surveyed about their preferred trade products, with most sticking to their existing products with a significant association between retailers' reasons for not engaging in crustaceans trade and their preference for trading one species or both.

As in other studies (Gay et al., 2022) which found that processing adds value, most crustacean species are sold fresh, with only crabs being boiled, salted and traded in the street by SSF street retailers, while other species are processed and cooked in restaurants. The qualitative data, therefore, indicates that crustacean sales in restaurants, which offer profitability, can promote tourism and economic development. However, while foreigners and tourists are the highest consumers of crustaceans in restaurants, market retailers stated that national residents buy more crustaceans than tourists.

Regarding profitability and market demand, the qualitative and quantitative results of this study show that both crustaceans and other types of fish are equal, but similarly to other studies, the crustaceans trade was found to require more discipline and resources to reach successful business goals. Crustaceans´ traders frequently target distinct market groups and demand greater prices (Gardner et al., 2020), which makes that trade risky for some participants.

6.3.3 Crustaceans' exploitation, demand, and prices

As has been discussed, the availability of crustaceans in Benguela's seafood market is limited due to low harvesting capacity among local artisanal fishers, lack of fishing gear, and culture. Industrial enterprises primarily exploit shrimp and crabs, with a single semi-industrial vessel exclusively capturing crustaceans, using traps. These assumptions are similar to other studies such as Tietze (2016) and Diedhiou et al. (2019), which emphasise the competition between industrial fishing and SSF in resources and capital.

Furthermore, unlike some regions of the world, local crustaceans catch by SSF seem not to have moved from subsistence to market-oriented (Gardner et al., 2017). Therefore, as stated by the participants, many of the crustaceans consumed in restaurants are imported from Europe and available in local supermarkets at very expensive prices or sought in neighbouring provinces of Namibe and Cuanza Sul.

The present study found that the low crustacean offer in Benguela province is influenced by poor transportation, lack of coordination, and informality in the market, as well as the absence of a distribution and trading framework. **Figure *6.2*** summarises these findings.

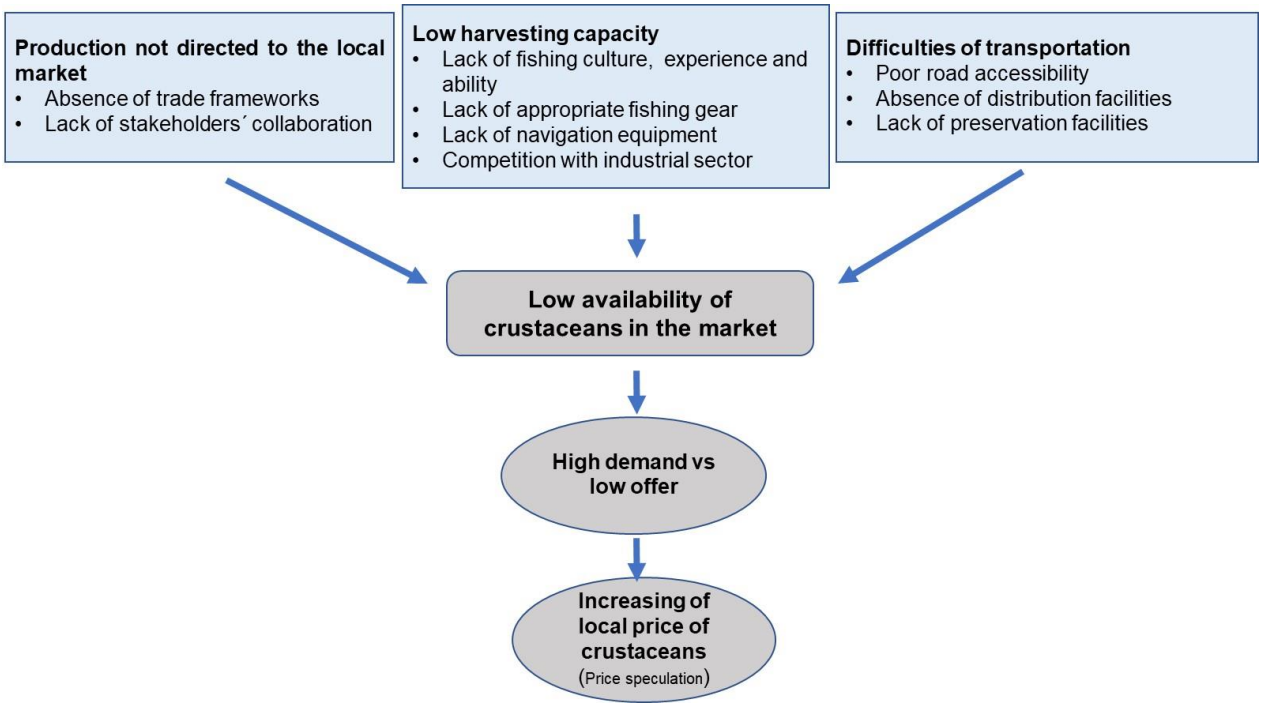

Figure 6.2. Factors influencing the availability and price of crustaceans within Benguela's artisanal seafood value chain (Source: author's own design).

6.4 Contribution of SSF to sustaining livelihoods and food security

The consensus in previous studies such as Lawal et al. (2016), Asiedu et al. (2022), Harper et al. (2012) and Xiong et al. (2022) that the SSF value chain supports many jods worldwide due to a lack of other employment options is reflected in this study´s results, which demonstrate that most participants joined fisheries due the lack of job opportunities in other sectors. Nearly 65% of participants started this self-employed activity as it was the only work available to them; actually, it became clear that no specific skills were required to become a SSF stakeholder. Although these stakeholders can engage in other parallel and better paid work, many of them prefer fishing-related activities.

Many studies have also shown that coastal SSF ensures food security and income for fishers worldwide, offering diverse livelihood opportunities (Ellis, 1998; Tietze, 2016; Short et al., 2021; Sowman & Cardoso, 2010; Belhabib et al., 2016). The present study has demonstrated that although most fishers fish as their main occupation, fishing complements and is also

complemented by other professions, not only in Angola but also around Sub-Saharan Africa (Sumaila et al., 2005) contributing to households' livelihood, in line with Lozano et al. (2018) and Kadfak (2019). However, this study's participants differ from fishers in many other countries, as they can only afford diversification for survival and other small economic benefits, but few can accumulate capital (Ellis, 1998). This study confirms that that SSF provides employment for young people in Benguela province, thus addressing the lack of job opportunities in other sectors (Young et al., 2016). This means that some from rural areas can invest in other businesses, such as tourism and commerce, and increase revenues and livelihood portfolios, in line with previous research, including in Angola (Allison & Ellis, 2001; Loureiro & Ferreira, 2014).

For example, male fish retailers in Baía-Farta, Cuio, and Dombe Grande, as **Figure *6.3*** shows, are increasingly working as moto-taxi drivers as a viable income source, transporting both stakeholders and customers from communities to markets, as well as their own fish for trading, thus diversifying their livelihoods (FAO, 2018; Aguilar-Manjarrez et al., 2021).

Figure 6.3. Motorcycles used by people (almost all men) to transport fish and as moto-taxis in Dombe Grande Community, Benguela province.

In line with previous studies (Ellis, 1998), artisanal fishing revenues are significant contributors to family livelihoods in Benguela province. Nearly 12000 families in the study area are directly supported by the artisanal fishery sector, including trading and processing, providing food, education, and sponsorship for commercial activities. Unsurprisingly, this study highlights the importance of SSF for food security, considering fish are a key source of animal protein for participants in this study, especially subsistence fishers, who reserve around 80% of their catches for own consumption, again reflecting previous studies (Asiedu et al., 2022; Lawal et al., 2016; Cañete et al., 2022, and Xiong et al., 2022).

Finally, SSF seems to be an old and important source of livelihood for many families in this region, since many participants had been fish traders for more than 30 years. Previously, Preez (2009) and FAO (2018) observed that small scale fisheries have played an important role for many families in Angola even since before its independence in 1975.

6.4.1 Opportunities – whose stakeholders are benefiting more from artisanal SSF in Benguela province?

Angola's monthly minimum national wage at the time of the survey was AOA 21,454; approximately USD37, which is not enough for basic needs as shown in Table O.3 (Appendix O) Therefore, fish retailing and processing profits; on average AOA180,000 and 50,000 respectively, or USD328 and USD91, alone would be enough for a family to guarantee their basic livelihoods and to reduce poverty amongst fishing and trading communities (Wamukota, 2020). Furthermore, both retailers and processors engage in complementary activities which together with fishing, give them stable livelihoods. Also, as most processors are young, single, and childless, they can use their revenues to meet their households' economic needs with their relatives and contribute to their own education by paying fees and for school materials as well as saving some money.

As other studies undertaken in Africa (Wamukota et al., 2015; Asiedu et al., 2022) have shown, retailers in Benguela province seem to be profiting more than fishers and processors. Although retailers invest more than processors, they invest less in inputs than fishers who have expenses including boat acquisition and upkeep, fuel, fishing gear, ice, bait, and permission fees, while retailers only invest for fish acquisition, transportation, ice, and sometimes fees depending on market location. Processors only purchase knives and pay permission fees to market managers. These observations are reinforced by the daily profit margins, which are on average AOA6,000 for fishers, AOA9,400 for retailers; and AOA1,150 for processors. Other studies such as Asiedu et al. (2022) have provided opposite results to this study, in terms of costs and similar results, in terms of earnings; while fishermen incurred the highest average total costs for their fishing operations, fish traders and processors incurred the lowest average total costs. Fishermen reportedly generated higher earnings than fish traders and processors.

6.4.2 Value chains, post-harvest and trade (internal and international trade)

The artisanal fishery sector's "value chain" usually refers to stakeholders, governmental institutions, partners and consumers interacting through a network where some have greater influence as the primary source of inputs while others are dependent on the policies and economic interests defined by the hierarchy (Gereffi & Fernandez-Stark, 2011; Grace et al., 2015). Similarly

to other studies which have demonstrated that capture fisheries contribute significantly to national economies, GDP, foreign currency, and government revenues through international trade and cooperation (de Graaf & Garibaldi, 2014), this study demonstrates that the Angolan fishery sector also contributes to revenues and foreign currency, especially through the crustacean trade. However, this contribution does not come from SSF but from the industrial sector (see the literature review, e.g., Jonico, 2004; FAO, 2014; FAO, 2018). SSF, on the other hand, contributes greatly to domestic trade and GDP as both the qualitative and quantitative analysis in this study show, since almost 98% of participants pay fees and taxes to governmental institutions linked to the fishery sector.

This study has demonstrated that the fish exploited by the participants has a value chain that extends beyond the geographic limits of Benguela province and reaches neighbouring provinces and countries. The contribution to international trade of SSF revenues is not clear, which matches other studies - but regarding inputs, most fishermen, fishing company managers, representatives of fishers' cooperatives and governmental institutions all stated clearly that almost 100% of fishing gear and material are imported.

Also, the results of this study support prior studies by showing that SSF are crucial for low-income coastal countries' GDP, but they still face value chain challenges such as limited trading opportunities and low international market value (Asiedu et al., 2022). The findings also support that Asian and African countries are increasing exports of high-demand species to wealthier Asian and European countries, benefiting industrial producers but not fishing communities due to competition and market diversification (Tietze, 2016). Prior research and the present qualitative analysis show that Angola exports high quality fish products, especially crustaceans, to Europe and Asia, and that SSF cannot compete with the industrial sector due to the costs and technology required to exploit the most valuable species for exportation. This study reveals that fish traders also face high competition as the primary source of fish acquisition are fishermen (95.5%) who sell directly from boats on the beach. Therefore, some retailers must buy fish from other retailers (11.4%). Only 2.3% of the sample had their own boat to acquire fish.

As an important component of the value-chain dynamics, this study shows that artisanal seafood pre-sale processing focuses on bony fish. However, most participants (81.5%) do not purchase the fish they process, as they occasionally work freelance for final customers in the market. This type of processing is unique, or at least, similar examples are difficult to find in prior research because a substantial percentage of the literature on fisheries focuses on fishers rather than

onshore processors, as Belton et al. (2022) assumes that when processing is considered, it refers quite exclusively to women.

The present results show that most fish processors (59.3%) choose fishing communities to work in due to favourable customer-revenue relationships, while 41.7% do so because they are close to their homes. Most artisanal processors work for various customers within and outside the fishing community, with the majority working simultaneously for other processors and buyers in the market and their houses (33%). These results reflect Kadfak´s (2019) assertions that that the proximity of some fishing communities to urban centres allows many SSF stakeholders to greatly vary their livelihood portfolio by also working in areas such as construction, mechanics, services, and commerce. Crustaceans processing is mostly done by restaurants and hotels that serve food with a limited number of retailers who boil it before selling it in the open-street markets.

The study's findings also indicate that fishermen have greater financial performance than processors and lower financial performance than retailers. These results are consistent with Asiedu et al.'s (2022) assertion that fisherfolk frequently receive lower net returns than actors in the downstream value chain. Asiedu et al. (2022) contends that calculating fisheries' profitability using value-chain analysis is essential in restructuring fisheries, improving lives, achieving resource sustainability, and understanding financial performance among various actors.

6.4.3 Women´s participation in small-scale fisheries value chains

The present results show that the fishers in Benguela province are all male. Cultural behaviours in Angola are the cause of women's low participation in fishing activities, supporting prior studies in finding that in many African countries religious faith is also behind this discrimination (Wamukota et al., 2015; Nzatuzola, 2005).

These cultural attitudes frequently place women as second-class citizens and subordinate in families, with local authorities and academics frequently disregarding their contributions (Williams et al., 2006; Hauzer et al., 2013). Likewise, both qualitative and quantitative results here show that women and youth face common issues in the small-scale fisheries sector, including discrimination and lack of empowerment, which underpins their poverty and degrades society's overall well-being (Sowman & Raemaekers, 2018; Arulingam et al., 2019).

No evidence was found of women's participation in offshore operations, but similar to other African nations, fishermen in Angola mainly rely on female family members to sell their catches (and thus achieve wealth creation), but this role is often hampered by limited market access and exploitative connections with other traders (Wamukota et al., 2015; Faria et al., 2021). Furthermore, other

studies in Angola show that women retailers significantly contribute to household economies, as many fishers rely on their spouses for income and livelihood, often as heads of families (FAO, 2018; FAO, 2023a) - which this study supports. Wamukota (2020) highlights the influence of fishers and traders, socioeconomic conditions, and resource features on price establishment.

Figure *6.4* shows that, as in many parts of the world, retailers in this study act as intermediate negotiators, playing a central role in price establishment (Mignot et al., 2012).

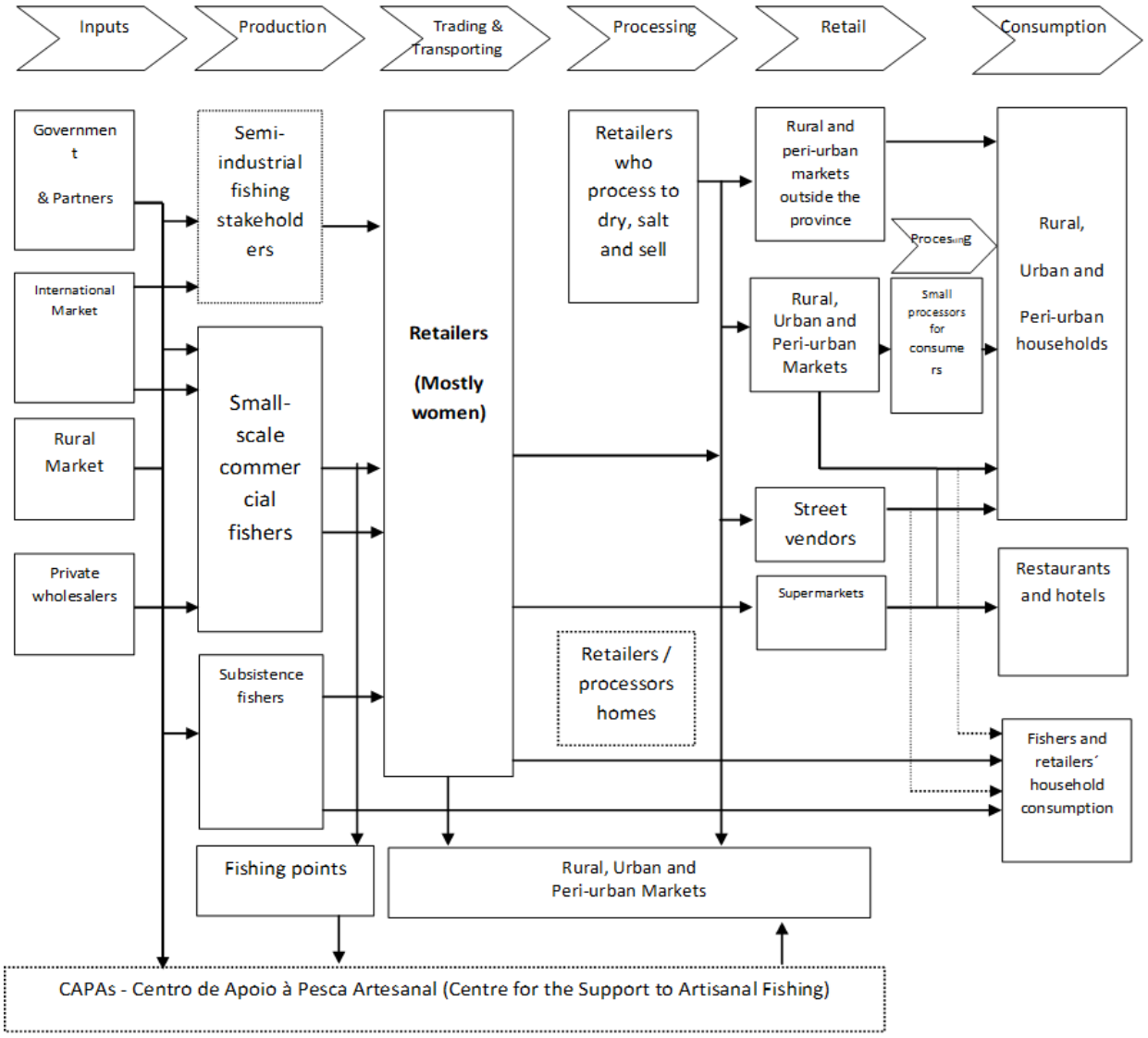

Figure 6.4. Map of the SSF value chain in Benguela province. Source: author´s drawing based on the study data and Kaminski et al. (2018). Note: Trading of seafood also includes inland municipalities, neighbouring provinces of Lunda, Bié and Huambo, as well as the DRC, Congo, Tanzania, and Zambia.

6.4.3.1 How do women retailers perform in Benguela province´s fish trading market compared to men and processors?

Women dominate fishing communities in Benguela province, often working in family groups, with inheritance playing a significant role in the seafood market. The variation in women´s ages within the artisanal fishery sector is similar to the general age of working women in Angola, which is 15-65 (INE, 2016).

Women retailers in Benguela province have less diverse portfolio of livelihoods than in many developing countries where studies such as those of Torre-Castro et al. (2017) found that they have a greater portfolio of livelihood than men; however, women achieve more economic benefits and revenues from fish retailing than fishers and other processors, in line with Gay et al.´s (2022) findings that processor-traders dominate the value chain, with women seafood processors demonstrating more value added than men. Furthermore, in this study, more women than men could provide a complete family livelihood, guarantee the family food supply, and pay school fees and other taxes.

Women have a crucial and central role in the entire artisanal seafood market value chain due to their multiple involvement in, and control of, all segments of the chain, including fixing fish prices in the market by negotiating directly with fish providers, consumers, and other retailers. Again, this is consistent with Gay et al. (2022) who also found that women dominate price negotiations.

Although women make more financial gains than men, they invest less in fishing related activity such as owning boats, as only one female participant here was a boat owner. This finding supports those of Gerrard & Kleiber (2019), that even in other markets where women have more representation, they own far fewer boats than men.

Finally, some women act as small retailers, waiting for opportunities to buy fish, even from other fish retailers, to sell in different markets. They also operate as street vendors and deliver seafood directly to the door of many houses and restaurants in urban zones, as stated by some restaurant managers. These findings are again similar to Gay et al.'s (2022); however, retailers in this study do not deliver live or processed seafood, which would increase add value, as found by Penn et al. (2019).

6.4.3.2 Main drawbacks women face in Benguela province seafood market, and how SSF cooperatives help to address them.

Gender inequality is among the main barriers that the women in this study face, since they are neglected from cooperative work, representation, and management in small-scale fisheries. This was also found by de la Torre-Castro (2017), who states that gender inequality in SSF is exposed by the male-dominated management. The present research found that most women retailers were not part of formal cooperatives; indeed, there are no legal cooperatives or associations only for women in the fishing sector. The only women legally represented retailers and processors are those within fishers´ cooperatives. The only other group, "*Família Unida*" (United Family) is not formally and legally organised, but incorporates around 50 retailers. Operating in Kasseque market it is composed solely of women. It has developed a method of mutual aid that includes financial loans to members in emergencies. For example, in cases of illness or absence, community members take over the business on behalf of the member. In case of financial failure, the group contributes to gather funds and provide until the member is ready to repay. These findings are similar to other studies in which women benefit from fish cooperatives and associations establishing mutual-aid thrift organisations for income protection and loans (Pryck, 2013).

This method of mutual aid adopted by fishers in Kasseque market is a response to the current lack of support for SSF sector women since all current subsidy or equipment donation programs to boost SSF retailing and processing activity in Benguela have been suspended, as declared by representatives of the MINPESCAS and the fishers' association. Therefore, this study reveals that women have adopted many mechanisms of mutual aid either only amongst women or also involving fishers and male processors. However, small vulnerable groups of women, such as widows, face discrimination, as a result of skewed sex ratios in favour of women to this day; 52% of the country´s population are women (INE, 2016). These women, like many across the world, are significant household providers, as demonstrated by Harper et al. (2012), Asiedu et al. (2022), and Gay et al. (2022). In other Sub-Saharan countries, the numbers of widowed and other socially and economically fragile women are also considerable, and they face similar difficulties within the fishery sector as those in the present survey (Medard et al., 2002).

6.4.4 Does literacy influence small-scale fisheries in Benguela province?

The results in section 5.3.6.5.1 show that literacy within retailers in this study, do not differ significantly from the average of 63.3% of the people in Benguela province published by INE (2016), giving that 77.3% of retailers are literate. However, a slightly significative difference is

found compared to other stakeholders, giving that 89% of fishers and 81.5% of processors are literate. Notably, the percentage (10.8%) of illiterate fishers of this study is relatively low compared to the 30.5% recorded for the general population within the province. It can therefore be assumed that the SSF stakeholders, especially fishers, in this study are not fisheries stakeholders just because they are not literate enough to compete in other sectors, since UNESCO (2014) and INE (2016) define literate individuals as those aged 15 or above, with 40% illiterate in Angola and 44% in Benguela. Maddox (2009) and Vinevala, (2022) assert that because of low school enrolment and long-standing literacy practises, compared to the overall population and agricultural stakeholders, fishermen in some South Asian and African populations have greater literacy rates.

However, the findings also show that lack of knowledge of fishing techniques, business management, policies, and technical aspects hinders fishery economic growth in Benguela province. In 2008, MINPESCAS supported cooperatives with boats and fishing materials for artisanal fishery development. However, the participants stated that this support had since been cancelled due to stagnant returns and inadequate knowledge among some fishermen. Accordingly, although training of masters helps to manage acquired means, sometimes knowledge and assimilation are uneven, resulting in lost or sunk vessels. Participants also stated that as some fishing companies expanded, specific technicians were needed for each key sector; therefore, due to the lack of skilled workers in Angola, experienced expatriates had to be brought in to solve problems efficiently, enhancing efficiency and effectiveness. These findings match Pollnac et al.´s (2001) assertion that low literacy rates can affect job prospects and leadership abilities.

Most fishers, retailers and processors in this study enter the profession due to job scarcity, with no significant association between literacy level and fishing activity. Processors are mostly literate, with a low proportion of illiterate individuals also joining due to job scarcity, in line with Maddox´s (2007) findings that the ability to pick up new skills as well as fishing survival depends on an individual's learning and adaptation abilities, rather than their education or literacy.

However, this study highlights a general lack of technical knowledge among SS fishers, with only three out of 48 boats using net gears having crew members familiar with their gear characteristics, which might affect their ability to understand the negative effects of the use of forbidden gear - in line with (McClanahan et al., 2015) assumption that low literacy rates, poverty, and bad governance can impede knowledge acquisition and resource management.

Literacy of retailers and their ability to provide a complete livelihood were also compared in this study, showing that 50% of them do so. From these, 36% were illiterate and 64% were literate. These findings emphasise Williams et al.´s (2006) suggestion that basic training in commercial and technical skills could boost women's financial contribution to the family and community incomes.

The study also investigated the participation of artisanal processors in SSF associations and cooperatives, finding that most (81.5%), do not belong to cooperatives, as shown in **section 5.3.6.4**. Results in this study, as in many other parts of the world (Maddox, 2009) also show that literacy also does not conditions fishing-related work, including cooperative work, engagement in other non-fishing related activities. The lack of importance that fishers give to cooperative work, and to information related to their captures, seems to be mostly linked to low collaboration, to mobilization/recruitment issues, and to low government management capacity rather than fishers' illiteracy.

This study also found evidence that suggest that SSF stakeholders´ literacy may influence aspects linked to the use ice, to the choice of the working place, and the generation of revenues. The effects that literacy has on these aspects can contribute to undermining programs aiming at the sustainable development of fishing communities as assorted by McClanahan et al. (2015). Although some retailers have high revenues and contribute high fees to local administration markets, the study found that 70% of literate fishers do not believe that taxes are beneficial, as shown in **section 5.3.6.5.1**. This finding is statistically significant compared to those participants who do believe taxes are beneficial which might be because, in line with Williams et al. (2006), SSF stakeholders in other developing nations do not see a boost from taxes paid into suitable and secure working conditions.

6.5 Barriers to artisanal fisheries' sustainable development

Despite the location of Angola alongside the BCLME, the socio-economic importance that artisanal fisheries have for its population, and the efforts made by its government to tackle poverty through fishing, many factors still undermine the current programs and projects in the region.

The factors that determine and affect fishing operations and fish accessibility in Benguela province range from the availability of crew members, fishing gear, technical knowledge (literacy), cooperative work navigation and fish preservation equipment, It also includes fuel prices and poor road accessibility.

6.5.1 Fishing gear, crew composition and fishing operations

The present research shows that Angola's fishing industry relies heavily on imports of fishing gear, navigation, and preservation equipment due to the country's lack of industry, resulting in a high import dependency and loss of foreign exchange. Moreover, the resources to build a timber boat, raft, or canoe in Benguela province are scarce and becoming more expensive.

A quarter of the participants found it difficult to find and acquire fishing gear, contributing to the continued use of banned beach seines. Furthermore, most boats lack navigation and safety equipment, with more than 75% lacking necessary items, reflecting FAO (2018) and MEP (2021) that fishing gear acquisition relies on importation from regional and international markets.

These factors affect fishing operations, especially crew composition. Similar to most countries' SSFs, crew composition; averaging four in larger boats, depends on boat size, build material and the fishing gear used. Boat size and crew numbers are positively correlated, in line with other studies such as Mariano & Rosa (2010), Hutchings et al. (2009) and Sowman & Raemaekers (2018) who observe that different fishing methods and various nets, traps, and hooks are used, with a maximum crew of five on hand-line boats.

Due to their fragility and the lack of sufficient fishing and navigation equipment, beach seines are used as the primary fishing gear in commercial boats without engines. This allows the crew to sail close to the shore and have more than 16 people working on the boat, most of whom do not sail but load and unload gear and catches. This high number of people working on a single boat is not unique to Angola (Kraan, 2009).

The present study shows that stable crew sizes benefit young people in Benguela province, ensuring long-term fishing reliance, as 40% of disembarkers left Benguela's inland municipalities due to lack of investment and climate change impacts in agriculture, and as acknowledged by Carvalho et al. (2017), they seek alternative employment in fishing activities in coastal Benguela. These findings support Young et al. (2016) and Onyango (2011), who state that SSF provides safety for young people by offering a steady income and a secure setting.

Boat owners and captains choose fishing communities based on proximity to their homes (41.7%) or suitability for boat and gear usage. Only three communities, Egito Praia (40%), Catumbela Praia (40%), and Vitula-Baía Farta (20%) were chosen for their ease of use. Fishing communities' choices are influenced by boat type (built material and propulsion), with significant associations between boat type and proximity to fishers' homes and appropriate boat usage, and between

fishing communities and boat types. These results align with MINAGRI´s (2016) and Sumaila et al.´s (2005) findings that Benguela's people are relocating from rural areas to seek alternative livelihoods such as fishing. Kadfak´s (2019) ideas also support these results in that the proximity of fishing communities to urban areas allows people to associate these activities with a broad portfolio of jobs, potentially enabling them to engage in non-fishing activities.

Nearly 90% of fishermen face difficulties accessing financial and material credit due to lack of information, ID, bank accounts, or credit. These results match Kwen et al.´s (2013) suggestions that to enhance catch and income creation, the government should offer loans to fishermen, and restore subsidies for fishing, safety, and navigation equipment. Furthermore, Rahman (2006) states that financial assistance is essential for purchasing fishing inputs since low profitability is caused by a lack of investment in the artisanal sector globally, and Olaoye et al. (2017) suggests lower interest rates and collateral-free loan options as solutions.

Although our data shows that fishers do not need to invest in fishing material for daily trips which keeps trip costs low, this low investment means low revenues because they cannot reach the most lucrative species. The absence of an engine means their limit is four miles, and the lack of appropriate navigation equipment such as sounders and compasses mean they cannot locate the targeted species in the most abundant fishing zones. It is not unusual to observe fishers returning from the sea without any catch. Although in this study's observations hand-line users were most able to catch the most lucrative species, they struggle with high fuel prices.

Crustaceans, specifically lobster, are amongst the most exploited species of seafood, along with sardines, little tunny, large-eye-dentex, striped mullet, and Atlantic spotted grunter; the scientific names of these species are in the

List of species registered in this study and exploited by artisanal stakeholders.", in the introductory sections. The most favourable months to catch these species are March, April, July, August, and September, all in the non-rainy season, also known as "*cacimbo*" or dry season, thus indicating that the rain conditions affect fishing.

6.5.2 Influence of fuel cost on fishing operations

Over the past decade, Angola's fuel prices have increased fourfold due to declines in government subsidies to cover inflation and currency devaluation. During the survey data collection, the cost of a litre of petrol was AOA160, while diesel costs AOA120. The IMF's support for the Angolan government suggests further increases in fuel prices (BNA, 2020) (Africa Press, 2023). Given that most SSF boats, except semi-industrial ones, use petrol engines, and industrial boats use diesel, the fuel price decreases competitiveness between both sectors in Benguela province. The present findings reveal that boat crews spend 38.4% of their daily fishing expenses on food, followed by fuel.

It is also shown that high fuel prices and the lack of policies protecting stakeholders result in low fishing capacity, limited fish availability, and rising prices; therefore, small-scale fishers need more government support because despite promises of fuel subsidies, they have been purchasing expensive fuel.

These results are in accordance with Cheilari et al. (2013) and Moerenhout (2019) who consider fuel support as crucial for fisheries, as fuel costs are a significant component of overall costs globally. The complaints of the participants in this study are also stated in a regional newspaper, the Africa Press (2023), which reported that the Angolan government had plans to subsidise fuel for artisanal fisheries.

However, as subsidies for fuel can stimulate fisheries overexploitation by boosting efforts and the use of more aggressive gear (Pauly, 2018; Pauly et al., 2003), implementation must be cautiously analysed because investing in fuel subsidies requires innovation to tackle climate change-related issues, which can be challenging in developing countries like Angola (Lebel et al., 2021). This study found that boats investing up to AOA52,000 per trip in fuel, food, ice, and fishing gear can achieve revenues of up to AOA3,383,000 per trip but can also accrue losses of up to AOA10,000. Therefore, it is very challenging to predict where investments in fuel and future subsidies will have the negative or positive impacts referred to by Lebel et al. (2021), Pauly (2018), and Pauly et al. (2003) over the SSF in the study area. These results indicate that the boats that make fewer trips in a week are those which spend more time at sea, incurring more costs. Meanwhile, those boats

with a higher number of trips in a week are those which make very short trips closer to the shore, usually using fishing gear such as beach seine which incur less costs and some do not have costs with fuel and oil due to the absence of a motor.

As fuel prices rise, and shore fishing zones become less productive, artisanal boats with petrol outboard engines receive and transport fish from semi-industrial vessels. Although offshore transactions (with some exceptions) are forbidden by law, fishers use them to minimise costs, especially for fuel and gear. Fish transhipping affects market pricing by requiring more merchants and retailers to set selling prices in response to changes in buying prices, supply, and competition.

6.5.3 Conflicts over fishing grounds and resources

This study identified that different types of accidents occur in Benguela province, with most conflicts within the fishing sector arising between the two main sub-sectors (industrial and artisanal). However, within the artisanal sub-sector conflicts exist between artisanal vessels and semi-industrial vessels.

The data shows that the few wooden boats with outboard engines use navigation equipment more (81.8%), with a significant association between boat type and navigation equipment usage. This result justifies the reports from many Angolan media such as ANGOP (2019) regarding accidents. Another effect of inadequate navigational equipment is that crews frequently become disoriented at sea, causing fatalities.

Artisanal fishers and cooperatives declared that conflicts and accidents between small and larger vessels arise also due to fishing grounds, especially within artisanal fishing, where boundaries are established but semi-industrial vessels usually enter the sea along the coast, targeting licensed species, harming artisanal fishers' gear, and causing conflicts. Furthermore, boats without engines cannot navigate to deeper zones where demersal species are abundant and caught mostly by lines. Therefore, they operate in shallow waters close to the shore, leaving space for bigger boats to invade the four-miles zone limited to small scale boats.

These results are consistent with prior findings by Pauly (2018), FAO (2015) and Xiong et al. (2022) that conflicts between small- and large-scale fisheries in coastal regions worldwide impact society due to social, economic, and, especially, environmental factors. As the results show, these conflicts are mainly caused by boats targeting species that are scarce in some fishing grounds, as occurs in modified coastal habitats (due to potential biophysical changes), which force many fishers to seek fish where it is available, as per Pauly´s (2018) assumptions that small-scale

fisheries are at risk of huge overfishing because of pathological development – defined as harmful or unsustainable growth patterns that can lead to negative environmental and socio-economic outcomes, such as overfishing, resource depletion, and weakened community resilience, often due to modernization efforts (Steer, 2014).

The conflicts reported in this study due to collisions between industrial vessels, causing artisanal fishing gear destruction and boat sinkings, do not differ from those in other African countries like Senegal and Kenya that also face conflicts between small-scale and industrial fisheries, thus requiring ways to avoid equipment destruction and violence (DuBois & Zografos, 2012; Kadagi et al., 2020). Although prior studies lack references to conflict resolution in Angola, the results in this study show minimal differences with other African countries. For example, similarly to Senegal as reported by DuBois & Zografos (2012), there are two methods for mitigating conflicts: informal negotiations, and formal court proceedings. However, in Angola, formal resolution does not go to court but rather the Ministry of Fisheries takes the final decision.

Governmental institutions apparently give more support to industrial sub-sector fishers, who are more organised, increasing the competition between the two sub-sectors, which is not beneficial for artisanal fishers. On the one hand, artisanal fishers accuse industrial boats of frequently violating the four nautical miles limit reserved for artisanal fishing. On the other hand, Ministry of Fisheries and industrial fishing companies´ representatives claim the artisanal fishers do not have appropriate navigation equipment and blindly go to sea, violating their own area limits. The same happens in many other countries where, as declared by DuBois & Zografos (2012), the origins and methods of resolution of the conflicts between these two fishing categories have been noted, but not always studied.

6.5.4 Lack of data on small-scale fisheries sector for decision-making and management

This study´s qualitative results show that the CIP in Benguela is a public scientific research organisation with the goals of learning more about marine resources and fisheries, advising managers on the best levels of exploitation, safeguarding the marine environment, and creating and enhancing techniques for fish preservation and processing. It is from this department that SSF stakeholders in Benguela can access MINPESCAS's biological data on fishable marine resources through the annual documents which regulate fishing. This information supports Xiong et al. (2022), who asserts that data is crucial for science-based fisheries management, as it influences decision-making in food security and poverty eradication policies in developed and low-income countries.

However, both the present qualitative results and the literature show that communication and information access in African countries, particularly Angola, often lack transparency and thus impede socio-economic development. Interviews with government representatives show that they lack specific information and are not the most appropriate body to provide it, suggesting reaching out to senior Fisheries Department managers for assistance. Previously, Xiong (2022) and Harper et al. (2012) asserted that data scarcity hinders global small fisheries management and conservation, creating a knowledge vacuum and making science-based decision-making difficult because many managers are unaware of social scientists' conclusions in policy-making.

The main vehicle of gathering statistical information from SSF is the IPA monthly captures report model (see Appendix A) which must be filled out by fishers themselves without any supervision. The quality of the information in the reports is influenced by fishers´ literacy level, while retailers and processors do not have any mechanism to provide information on their activity. These reports are received by the authorities, to generate good information for management and decision-making, and then delivered to organisations such as FAO. Another statistical approach used to control and monitor biomass levels in the marine fishery sector, including semi-industrial vessels, is the monitoring by inspectors of the MINPESCAS who board ships to control areas and monitor unloading, ensuring the quality and quantity of fish landed. This is key in maintaining safety and efficiency in the fishing industry. A third method of collection of statistical information and estimation is done by local FAO specialists (PRODESI, 2021). This may be one of the reasons for the many inaccuracies in the data available on the artisanal fishery sector in Angola. Pauly (2018) observes that most FAO member countries do not record catches, affecting artisanal fisheries. As an example, China's SSFs have not received enough governmental attention, leading to marginalisation, and globally, after considering artisanal, subsistence, discarding, and illegal catches, the total yield of maritime fisheries has increased by 50% in recent years (Pauly, 2018).

The present results also show that although processors pay daily fees to operate in the local market, the authorities do not statistically monitor them. Data regarding women’s participation is also often missing. Previously, Williams et al. (2006), FAO (2023b), Pauly (2018) and Harper et al. (2012) have found that many developing countries struggle to provide data on local food safety and occupational risks in SFF. These authors state that subsistence and recreational fisheries have been particularly affected, with very limited information on women's participation and low catch statistics, making gender equality difficult in these regions. The present study agrees with this, and it also seems that fish processors in Angola are not counted in the SSF labour force, or

for any supporting project, as in many countries, because most of them only process fish before drying, as a part of the trading activity, as this study has demonstrated.

The qualitative results indicate that data communication between government and SSF stakeholders is often, and quite exclusively, done through cooperatives and associations, serving as intermediaries between actors and state institutions, with limited and very selected information being provided. These results align with Béné et al´s. (2016) and Sowman & Cardoso´s (2010) statements that in Angola, the small-scale fishing sector's economic importance to poor people is under-studied, with limited information available and access to information from Angolan governmental institutions and local government restricted by various formal procedures and bureaucratic requirements. The results also support Sumaila et al. (2005) and MEP (2021) in that the absence of statistical information on SSF hinders a thorough understanding of the sector's status. For example, for this study, different types of boats and subsistence fishers from two fishing communities, namely in Kasseque and Catumbela Praia, have respectively been observed and recorded - which does not match the information on the IPA's maps.

6.5.5 Child labour within the fishery sector

Allais (2007) points to more than 600,000 working children aged under the 12 years minimum age established by the International Law Organization (ILO). The results from observations in this study show that, although they have neither been interviewed nor counted as for statistical purposes, around 20-30% of people within the market involved in the trading and processing business are under 18 years old, which is the legal start of adult life in Angola. However, according to Angolan law, any individual aged 14 years old and up can, under specific conditions, including paternal authorisation and supervision, work for a third legal private or governmental institution. Most of these children, in the study area, are processors who work for customers without legal/parental consent. They are exposed to the same risks as the adults due the lack of infrastructure and unhygienic conditions and are subject to taxes. These results are in line with Ratner et al. (2014) arguments that child labour in SSF violates human rights, hinders poverty reduction efforts, and also involves trafficking and slavery. However, Bellwood-Howard & Abubakari (2020) and Pinilla-Roncancio & Silva (2018) argue that it is normal for families in developing countries to have their children work to contribute to the household livelihood.

Prior studies have also shown that child labour in Angola is high as a legacy of the civil war, resulting in poverty, unemployment, and forced employment for non-adults (Allais, 2007). ANGOP (2018) reports emphasise that coastline provinces such as Luanda, Namibe, and Benguela could

be considered relatively safe, with the fishing sector providing easy work and revenue for war zone residents, including those aged 14-18 years old. Angola's Children's National Institute reported 1,200 child victims of coerced labour in Luanda, where over 25,000 children work daily for survival, similar to other developing-world cities (ANGOP, 2018).

As shown previously, fishers' age influences their position in the crew, mainly due to their acquired experience over time. Therefore, it is very difficult for young fishers to hold a privileged positions such as captain or co-captain, so they tend to be disembarkers/net pullers and fishermen, which might demonstrate a lack of equality and opportunity for younger, less experienced fishers within the sector. Most have no specific or certified training for artisanal fishing, and those who do work for the industrial sub-sector. The young fishers' low rank within the crew, in this study, is at least partly linked to discrimination which is supported by Arulingam et al. (2019) observations that youth in fishery and aquaculture industry face discrimination, marginalisation, rural migration, and lack of access to resources.

6.5.6 Critical issues within the artisanal seafood trading market in Benguela province

The challenges facing the artisanal seafood trading market in Benguela are similar to other regions in Angola and worldwide; they range from a lack of physical structures to support the activity to social and financial constraints that impede trading and retailing process upgrades (Bassey and Schmidt., 1986; Olaoye et al., 2017; Owaga et al., 2023; Tall, 2002).

The present findings reflect authors such as Onyango (2011) and Olaoye et al. (2017) in confirming that developing countries face challenges in SSF, including distances, road accessibility, post-harvest losses, and inadequate capital and loan collateral. Other authors such as Pauly et al. (2003), Sowman and Cardoso (2010), FAO (2018, and FAO (2023a) also suggest that Angola's poor ports, jetties, and distribution systems lead to commercialised fresh harvests, low-quality fish, and an ineffective micro-credit system, causing overproduction and unsustainable fishing.

6.5.6.1 Lack of investment and financial aid

The lack of appropriate infrastructure and facilities is associated with the fact that currently, no official programs give SSF stakeholders access to financial or material credit and loans for fish and fish-related products. The results show that currently, stakeholders cannot access money, equipment, or seafood on credit, as most transactions are via cash purchases and sales. Some commercial transactions are agreed based on mutual trust or small business agreements.

The results also show that previous government financial aid to SSF cooperatives as well as the association's own contributions have ceased due to low fishing capacity caused by limited gear and equipment, and conflicts with industrial vessels. Furthermore, most cooperatives lack institutional structures, financial support, or a self-financing capacity, resulting in reliance on state aid. These findings corroborate FAO (2023b) who state that SSF stakeholders have limited access to financial services, supply chain infrastructure, and advanced processing, which affects food safety and how onshore infections affect fish supplies. Those findings align with the quantitative results of this study that most processors face difficulty accessing credit, with 88.9% lacking it due to lack of awareness and offers/invitations.

The qualitative results show that stakeholders highlight the importance of a support centre for fish processors who struggle with financial support in promoting and expanding their businesses, including local and international markets. The FAO (2023a) recently reported that currently, foreign investment in Namibe province supports fisheries education, community participation, sustainable production, market infrastructure, and extension services, promoting industry growth and sustainability.

6.5.6.2 Lack of infrastructure

The results emphasise the lack of facilities, including support centres and accessible roads in Benguela, which could improve fishing, post-harvest, and trade activities. Stakeholders emphasised the need for a support centre for cooperative dignity. Fishing operations can be impacted by infrastructural improvements, and to help small-scale fisheries produce sustainable goods for export and local use, states should encourage investment in organisational structures, infrastructure, and capacity expansion (FAO, 2015). In fact, in line with the participants' comments in this study, as GPB (2021) demonstrated, the new infrastructure in Benguela province that handles processing, treatment, preservation, and storage is still not fully functional despite huge investment, pointing to poor planning and management practises.

There are still no ice factories in the Benguela fishing community, raising fishers' concerns about depositing fish on ice for later sale, and causing delayed deliveries to retailers (see MINPESMAR, 2018; Duarte et al., 2005; FAO, 2011). Indeed, Angola has a single landing site for semi-industrial vessels in Nzeto, Zaire, which is for boats using bottom and pelagic trawling methods. This requires harvested fish to be transferred to suitable boats by artisanal fishing communities along the Angolan coastline. Artisanal processors argue that the taxes they pay are unfair due to inadequate infrastructure and unhygienic conditions.

6.5.6.3 Poor road accessibility

The poor road accessibility to and from some fishing communities leads to retailers and customers traveling from the provincial capital to places such as Egito Praia or Cuio and Equimina, located more than 90, 60, and 100 km away respectively, when they could easily get the same products from places such as Gengo, Chiome, Chamume, Macaca and Senga – however, although they are relatively close (at less than 52 km away), these places are almost inaccessible by road. Thus, this study shows that retailers adopt different ways to transport seafood from fishing communities to rural markets, restaurants, and neighbouring provinces, as they face challenges like distances, lack of ice, and equipment shortages. This difficulty of access to fishing communities prevents tourism and trade, especially during the rainy season. Onyango (2011) found that in other developing countries, SSF stakeholders also face constraints including distances, road accessibility, and inadequate equipment, resulting in post-harvest losses due to contamination, bacterial breakdown, and insect infestation.

Chapter 7. General conclusions and recommendations to encourage and promote the socio-economic growth of the artisanal fishery sector in Benguela province.

7.1 Introduction

This thesis has explored the artisanal fishing sector in Benguela province, Angola, focusing on its role in boosting food security, alleviating poverty, and reducing unemployment. It contributes a unique data set, presenting results which offer a foundation for future both qualitative and quantitative studies of the SSF sector in Angola.

The aim of this section is to draw conclusions and make recommendations on improving governance and the sustainable management of resources in Benguela province, contributing to the economic growth of the SSF in Angola, as well as social inclusion and a healthy environmental balance. These conclusions are based on the discussion of the main topics highlighted in the literature review in combination with both the qualitative and quantitative results. These topics encompass insights into improved policy, management, and law enforcement, financial and infrastructure investment, stakeholders´ literacy, gender equality, child labour, value chain analysis, and cooperative work. The recommendations are based on the conclusions obtained from the data collected and analysed in previous chapters.

This chapter goes through each objective to show how different stakeholder groups need to cooperate to achieve the proposed aims. The stakeholders considered are fishers, retailers, processors, hotel and restaurant managers, the governmental institutions of the Republic of Angola and its partners in the fishery sector, the economy, tourism and development, health and nutrition, entrepreneurs, NGOs, as well as academic and research institutions, both in Angola and worldwide.

7.2 Main research findings

7.2.1 *The Benguela fishery sector partially fits the FAO guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication*

Angola's fishery sector, particularly its SSF, is regulated and supported by the government. Angola and is unique in its recognition and protection of its SSF, with boat length being the main defining characteristic. This aligns with the literature review and the few countries adopting a clear definition of SSF.

This study has shown that the Angolan authorities are promoting measures in accordance with FAO guidelines to ensure an ecological foundation for food production and the long-term conservation of fisheries resources; the legislation supports subsistence and artisanal fishermen, but implementation is hindered by informality, weak governance, and unregulated human activity.

Angolan legislation aims for sustainable fishery resource exploitation, but evidence of adaptive fisheries management practices is lacking. The study has highlighted the partial implementation of FAO guidelines, low understanding of fishers' rights, and a lack of evidence of women's empowerment in environmental policies and fisheries programs. The study's findings indicate a lack of regulation of non-state actors' small-scale fishing activities to ensure that they adhere to international human rights standards, along with a lack of consultation and participation of SSF actors in decision-making and implementation.

Although boat characteristics, fishing operations and most target species comply with legislation, the fishery sector in Benguela province faces challenges in enforcing laws. Infractions include fishing for smaller, forbidden, and endangered species, using prohibited gear, nets with a smaller than authorised mesh size, and the absence of safety and navigation equipment. Fishers also disregard seasonal restrictions due to limited options, inadequate equipment, and lack of environmental education. Beach seine, which has been banned for over 15 years, is still used permanently by around 30% of participants, accounting for 36% of fish landings in the study area, higher than the global average (30%), saving effort and allowing more people to access the sector. However, it reduces the options for valuable species, causing the harvesting of juvenile fish, thus potentially leading to environmental imbalances, in a clear violation of the "spawn-at-least-once" principle (Myers & Mertz, 1998).

7.2.2 *The main social and economic characteristics of the artisanal fishery sector in Benguela province*

Regarding the main social and economic characteristics of the SSF sector in Benguela province, the study has revealed that fishing decisions depend on gear, preservation, and navigation equipment acquisition, and crew size and composition which is influenced by factors like boat size, build materials, propulsion and fishing gear. Most crews comprise 3-4 young men, with larger boats having an average of four members. Stable fishing crew compositions ensure long-term livelihoods for young people, who seek alternatives to agriculture due to lack of investment and climate change impacts. Boat owners and captains choose fishing communities based on proximity to their homes, abundance of fish, suitability for their boat and available gear. Boat types such as mid-water bottom trawl and handlines are significantly associated with fishing communities.

Commercial boats use hand lines and beach seine to exploit species like sardines, lobster, and grunters. Boat size significantly impacts the quantity of fish harvested and landed as well as the gear used in artisanal fishing, with surface gillnets and cages used in only five outboard engine plank boats. Beach seine is the main fishing gear in some commercial boats without engines.

The study also reveals that artisanal seafood processing primarily involves bony fish, with most processors not purchasing the fish and preferring markets with favourable customer-revenue relationships, while some work near their homes. Most artisanal processors work for a range of customers. Crustaceans processing, except crabs, is limited to restaurants and hotels.

Although women do not fish, they dominate the retail market in this study area, where women in fishing communities often work in family groups.

Literacy was not found to influence people's decisions to engage in SSF related activities. The study revealed that literacy levels among fishers is high, close to that of Benguela province's general population, with nearly 65% of participants joining this self-employed activity as the only work available. No specific skills are required to become a fisherman, retailer, or processor. However, a 10.8% illiteracy rate indicates insufficient education which may hinder fishery's economic growth. MINPESCAS supported cooperatives with boats and fishing materials in 2008, but this support was cancelled due to stagnant returns and inadequate knowledge. Furthermore, literacy influences retailers´ perceptions of the need to use ice and equipment for fish preservation, as well as retailers' ability to use their earnings from fish retailing to provide a

complete livelihood to their household. Among processors, literacy was found to influence their daily incomes, and association with cooperatives from which they benefit from mutual aid.

The study has not found a significant relationship between fishers' literacy and crew positions; rather, these depend on years of experience in fishing, age, and favouritism. Around 70% of fishers with higher literacy levels do not believe taxes are beneficial, possibly due to developing nations not transforming tax revenues into secure working conditions.

7.2.3 *The artisanal fishing sector provides many benefits to stakeholders and people in the coastal zones of Benguela province.*

This study has also shown that the SSF value chain supports many jobs due to the lack of other employment options. Therefore, SSF is crucial for income and **food security** for many fishers in Benguela province, aligning with FAO guidelines and recommendations. However, many cannot make a living solely from fishing, so they diversify their incomes by working in agriculture, construction, commerce, government work, and mechanics. Processors have the widest livelihood portfolio, followed by fishers and retailers, who can benefit from animal protein for household consumption by retaining around 30% of retail fish for family nutrition, while fishers only reserve around 20% of fish for family nutrition.

SSF provides jobs, livelihoods, integration and opportunities for younger female family members, and informal women retailers' cooperatives offer mutual aid, financial loans, and income protection to members in local markets. Women in Benguela province benefit from fish retailing, generating higher economic benefits and revenues than fishers and processors, ensuring a complete family livelihood, including a steady food supply and the ability to pay school fees. This study shows that women significantly influence the artisanal seafood market value chain, by engaging in price negotiations with fish providers and consumers. They make financial gains but invest less in fishing-related activities. Small retailers, including street vendors, sell fish directly to urban areas, but do not deliver live or processed seafood.

This study also observed that SSF provides employment for many people in fishing, processing, retailing, and in restaurants where seafood is served, thereby significantly impacting family households by providing livelihoods for around 12,000 families. It has been a vital source of livelihood for many families for over 50 years, even before Angola’s independence in 1975, as evidenced by numerous studies and authors. Many participants can only afford diversification for survival and limited economic benefits such as family food supply and school fees payment, but a few can accumulate capital. Many young people in Benguela province benefit from SFF by

expanding their businesses and increasing their revenues and livelihood portfolio. For example, motorcycles serve as fish transportation for fishers, transporting them from communities to markets, offering business opportunities and diversifying their livelihood portfolios through fish retailing.

The findings also showed that fishermen have higher revenues than processors, but lower than retailers. However, in terms of profits, retailers and processors benefit more than fishers because fishers spend more on inputs, while retailers invest mostly in fish acquisition. Processors only incur daily costs through paying permission fees. The profits from fish retailing and processing, on average, can guarantee a stable source of employment and income for families. These activities also help to reduce poverty among fishing and trading communities. Many processors are young and single and contribute to their own education by paying school fees and buying school materials. Processors significantly contribute to local economies by paying daily fees to market managers to allow them to work in market spaces, but authorities often overlook their statistical significance.

7.2.4 *Fisheries cooperatives could accelerate participation and stimulate improvement in SSF-related economic growth.*

Fishery **cooperatives** are crucial in achieving sustainable marine fisheries management, poverty reduction, and wealth growth. Therefore, the MINPESCAS, in an attempt to promote bottom-up governance, offers technical support aiming at improving fishing activity quality, combating illegal fishing, and guiding fishermen and women in cooperatives according to the governing body's directives. However, the uncertainty of Angolan governance has hindered artisanal fisher management frameworks, most notably by halting past government aid initiatives. Furthermore, poor cooperation, financial problems, disputes, and abandoned vessels are common issues alongside illiteracy. The lack of mobilisation and engagement on the part of governmental institutions contributes to these challenges.

The study also examined artisanal processors' participation in SSF cooperatives, finding that less educated processors participate less in fishers' cooperatives, probably because they are less likely to accept being recruited by governmental institutions.

7.2.5 *Lack of gear, navigation equipment and knowledge impede artisanal stakeholders in Benguela province to exploit crustaceans effectively.*

The global trade of fish-derived products has increased in recent decades, with Angola experiencing high imports but slow export growth in **crustaceans**. Crustaceans are caught using

traps and nets by artisanal vessels where possible, but due to local market constraints, the majority do not focus on crustaceans as they lack the necessary navigation equipment, engines, specific gear, and basic crustacean fishing knowledge. Lobsters, the most fished crustacean species in Benguela province, are only the 8th most caught fish species by artisanal boats, after bony fish.

The results show that Benguela province's crustacean trading market is profitable, but low investment and immature growth limit its commercial value. Furthermore, various factors affecting market demand for good quality crustaceans make them less accessible for local consumers, and less affordable in restaurants and hotels.

Crustacean fishing efforts should be stimulated since considerable numbers of foreign and national tourists demand crustaceans either directly from fishers and retailers or in restaurants. This opens up an opportunity to link leisure tourism to the artisanal seafood sector growth by integrating fishing communities, as has been suggested by Belhabib et al. (2016), as a way of ensuring sustainable benefits. According to Scheyvens (1999), this could lead to ecotourism, involving cultural and environmental tourism, benefiting local populations.

The study has shown that half of all artisanal fish retailers focus on bony fish trading, with 38% selling bony fish alongside crustaceans. Low market availability drives them to prioritise certain seafood types as 94% prefer existing products. The findings revealed that processing crustacean species increases value, but most are sold fresh. Some are boiled, salted, and traded in street markets, while others are cooked in restaurants. Crustaceans and bony fish are profitable, but require discipline, resources, and the targeting of specific market groups for successful trade. Although demand is similar for both, the crustaceans offer is lower because Benguela's SSF seafood market faces challenges due to low harvesting capacity, lack of fishing gear, and cultural differences. Industrial enterprises exploit shrimp and crabs, while local crustacean production remains subsistence-oriented, leading to high prices in supermarkets and neighbouring provinces. Compared to the qualitative data, this result shows that nationals buy raw crustaceans from retailers and tourists consume them cooked in restaurants.

7.2.6 *The main barriers and opportunities faced by SSF stakeholders in Benguela province.*

Despite the socioeconomic importance of SSF for the participants and the overall economy, and government efforts to tackle poverty, there are still many challenges in Benguela province. For fishers, factors affecting fishing operations include crew members, gear, technical knowledge,

navigation equipment, and fuel prices. It was found that boats without engines lack safety and navigation equipment due to the difficulties that fishermen face in accessing financial and material credit.

High fuel prices and the lack of stakeholder protection leads to low fishing capacity, limited fish availability, and price rises. Therefore, as fuel prices rise, and fishing zones become less accessible, artisanal boats engage in offshore transactions, transporting fish from semi-industrial vessels to landing sites to minimise costs. The New Law of Fisheries prohibits transferring catches to shore-based vessels but permits transhipping in specific contexts. This affects market prices and species harvest choices. Measuring the impact of fuel and future subsidies on the SSF is very challenging.

This study found that Angola's artisanal fishers experience frequent conflicts mainly linked to human error, involving industrial vessels causing the destruction of artisanal fishing gear, and even the sinking of boats, as it occurs in other African nations. Navigation equipment usage is significantly associated with boat built and propulsion (81.8%) and inadequate equipment (or its complete absence) can lead to crew disorientation and fatalities. However, minimal differences in conflict resolution methods are observed, with informal negotiations and formal court proceedings being used abroad, while in Angola the Ministry of Fishery leads the approach. These conflicts impact society due to social, economic, and environmental factors, as SSF face risks of exponential overfishing, resource deterioration, and habitat loss.

The study has explained that governmental support for the industrial sub-sector increases competition, negatively impacting artisanal fishery. Challenges include inadequate infrastructure, social and financial constraints, and poor ports, jetties, roads, and distribution systems as well as overexploitation, low-quality fish, and unsustainable fishing. Poor road accessibility and difficult beach access during rainy seasons in fishing communities also affects seafood distribution, causing retailers and customers to travel long distances. These constraints in developing countries often lead to post-harvest losses (Onyango, 2011). Therefore, participants in the study suggest the allocation of fisheries support centre for a better and sustainable fishing activity in Benguela province.

The results of this study have shown that lack of gender equality hinders women's participation in SSF, with limited representation in legal artisanal cooperatives and associations, management, and decision-making platforms. A few women benefit from loans from spouses and cooperative partners which enable priority access to fish, but those who cannot partner with their husbands

or fishers face discrimination in fishing communities. The study reveals that cultural behaviour is the primary reason for male fishers´ predominance and women's absence in seafood harvesting in Benguela province. Local authorities often disregard women's contributions and participation in SSF, leading to poverty and a decline in society's overall well-being.

Angola faces high levels of child labour due to the long civil war having damaged the economy, causing ongoing poverty, unemployment, and forced employment. This study estimated that around 20-30% of the SSF value-chain actors in Benguela province are under 18 years old, working as processors without parental consent, and exposed to risks arising from inadequate infrastructure and unhygienic conditions. This aligns with human rights concerns, increasing poverty, and human trafficking, while experts argue that it is normal for some families in developing countries to allow their children to work for household livelihoods.

Like other African countries, Angola’s governmental communication and information access lacks transparency and accuracy, affecting socio-economic development and hindering science-based decision-making in the study area. The limited communication of data between the government and SSF stakeholders affects the studied SSF sector's economic importance for poor people, and data on food safety risks is difficult to gather, as in many developing countries.

This study has highlighted that SSF plays a crucial role in low-income coastal countries' GDP but faces challenges in terms of its value chain, trading opportunities, and international market value. Angola exports high-demand species, benefiting industrial producers but not fishing communities, while nearly 100% of gear and material has to be imported. The contribution of SSF to Angola’s international trade revenues remains unclear.

7.3 Recommendations and contributions of the study

7.3.1 Recommendations

The FAO guidelines recommend that, in order to increase the value of fishery resources, states should invest in human resource development, education, literacy, and digital inclusion. Therefore, the Angolan government is urged to encourage investment in organisational structures, infrastructure, and capacity expansion to help small-scale fisheries to produce sustainable goods for local use and export; this could result in projects similar to that in Namibe province in which foreign investment supports education, community participation, sustainable production, market infrastructure, and extension services.

Simultaneously, to improve catches and income, the government should offer loans and subsidies, and restore credit for fishing, and safety and navigation equipment as well as low interest rates and collateral-free loan options. Furthermore, small-scale fishers demand more government support for fuel subsidies since these are crucial for fisheries, and significantly impact global costs. However, since fuel subsidies can increase fisheries overexploitation through the use of more aggressive gear and exacerbate environmental issues, implementation must be cautiously analysed, and innovation is needed to tackle climate change-related issues. Low technology fisheries like gillnetting and beach seine netting may be ideal solutions for some coastal communities. The problem is that since beach seine fuels overfishing, a ban may support biodiversity conservation, but it would also raise costs and reduce opportunities for subsistence.

The study has confirmed that most artisanal fishing boats in Benguela province are not suitable for capturing crustaceans due to inadequate gear and techniques. A possible solution to this problem could be the transformation of the artisanal fishing sub-sector in Angola onto a more semi-industrial scale by reducing the high number of timber boats without engines, adding more trawlers to the artisanal fleet. Long-term gear conversion should be the preferred management option, with incentives being crucial in encouraging conversion (Jenkins & Garrison, 2013). Semi-industrial vessels could improve navigation, reach well-stocked zones, prevent random fishing and increase control over investments and revenues. The authorities can improve tracking and information gathering by requiring proper navigation equipment on small-scale commercial boats, but partners should provide access to this equipment and encourage collaboration among fishers. Finally, gear substitution could reduce ocean-fishing pressure (Jenkins & Garrison, 2013).

Following the FAO guidelines and recommendations that states should also help women and youth in small-scale fishing communities to access services like insurance, credit, and savings,

this study found that basic training in commercial and technical skills could improve women's and youth´s financial contributions to family and community incomes.

7.3.2 Theoretical contribution

This study used an abductive mixed-methods approach at the local level to understand the socioeconomic importance that SSF has for stakeholders and people living in the coastal area of Benguela province.

Theoretically, the main contribution of this study has been to analyse how Benguela's SSF sector compares, in terms of governance and management, to the FAO guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication. It has provided valuable qualitative and quantitative data on addressing poverty, food security, livelihoods, and social and economic equality.

This study addressed the knowledge gap caused by the lack of data about SSF's contribution to the local and national economy, and the socioeconomic benefits that stakeholders can achieve from engaging in this activity. It contributes valuable data to the current discussion of the SSF sector, and specifically, the role of gender equality, fisheries cooperatives and associations, literacy, crustaceans adding value, tourism and the involvement of children in the sector. The study has also drawn some conclusions about the main barriers that SSF stakeholders face, especially in developing countries.

This study explored Benguela province, which due to its location alongside the BCLME has enormous potential to contribute to programs and policies aiming to increase food security and employment, and reduce poverty (Sowman and Cardoso, 2010). Therefore, the present research contributes to the current debate on the socioeconomic importance that marine resources have for this region as in many other coastal areas, especially in developing countries (FAO, 2023b), in contrast with the socioeconomic conditions faced by its people. By gathering and analysing detailed data on the experiences and difficulties of small-scale fishery stakeholders in Benguela province, the study has offered new empirical knowledge about the main barriers and opportunities that people in coastal communities have, considering that no prior studies have discussed the socioeconomic importance of SSF for people living in this study area.

This study also utilised Value Chain Analysis (Gereffi & Fernandez-Stark, 2011; Grace et al., 2015) to describe SSF characteristics in Benguela province and the interactions between its actors. The value chain in Benguela's artisanal fishery sector includes stakeholders, governmental institutions, partners, and consumers interacting through a range of networks, all

of which emphasise that the Angolan artisanal fishery sector contributes to the national economy, GDP, and government revenues through international trade and cooperation, primarily through trading crustaceans.

The research on applying multidisciplinary strategies to tackle poverty, food insecurity, malnutrition, and gender inequality contributes to the growth of this corpus of knowledge. In order to address the lack of empirical research in Angola, a mixed exploratory design that combined qualitative interviews and survey questionnaires was used. This is because the majority of studies addressing SSF issues, both in Angola and elsewhere in the world, have only used one method to examine the socioeconomic significance of SSF. Overall, this study produced robust results that can be used as a basis for future and more accurate qualitative and quantitative studies on the socioeconomic importance of seafood in the study area.

7.3.3 Policy implications

Angola's fishery sector regulation is in line with the FAO SSF guidelines, aiming to improve management, ensure food security, end poverty, and support sustainable development goals. The main framework is based on an annual presidential decree focusing on the promotion of resource management and fishery sustainability by establishing regular fishing quotas and closures for specific species, in line with Myers & Mertz ‘s (1998) "spawn-at-least-once" strategy. It sets Marine Protected Areas (MPAs) which are regularly evaluated and upgraded, with the aim of conserving marine ecosystems and maintain biodiversity.

This study has confirmed that the Departmental Cooperation-Based Model of SSF Governance is adopted by various ministries and boards in Benguela province to reduce poverty and ensure food security, particularly in developing nations. In the broader Southern African regional context, the Benguela Current Commission (BCC) promotes integrated governance, sustainable development, and ecosystem preservation (Sowman and Cardoso, 2010; FAO, 2018). The present study also contributes data that can help to support decision-makers aiming to widen collaboration among the countries that comprise this regional platform.

The study contributes to the debate on the role of fishery cooperatives in providing social benefits such as teamwork, expense allocation, formal agreements, access to fishing assets, and the increased participation of women in SSF. A further contribution relates to strategies to tackle issues such as lack of financial support and literacy, infrastructure improvement, law enforcement, overexploitation, and gear conversion.

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Appendix A: IPA monthly fishery captures report

REPÚBLICA DE ANGOLA
MINISTÉRIO DAS PESCAS
INSTITUTO DE DESENVOLVIMENTO DE PESCA ARTESANAL E DA AQUICULTURA

REPRESENTAÇÃO PROVINCIAL DE BENGUELA

Nome do Proprietário_____

Tipo de Embarcação _____ **Nome** _____ **Matricula**_____

Artes de pesca_____ **Zona de Pesca**_____

Relatório de Capturas do Mês _____ **Ano**_____

(Artigo 94 ° do Dec. Nº 41/ 05 do Regulamento Geral de Pesca)

DIAS	ESPÉCIE	Kgs	ESPÉCIE	Kgs	ESPÉCIE	Kgs	ESPÉCIE	Kgs
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
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14								
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16								
17								

Appendix B: List of artisanal fishery cooperatives in Benguela province

REPÚBLICA DE ANGOLA
MINISTÉRIO DAS PESCAS
INSTITUTO DE DESENVOLVIMENTO DA PESCA ARTESANAL E DA AQUICULTURA

REPRESENTAÇÃO PROVINCIAL DE BENGUELA

MAPA DAS COOPERATIVAS LEGALIZADAS NA PROVÍNCIA DE BENGUELA

Mapa 1 – Municipio do Lobito

Nº Ord	Nome da Cooperativa	Nº de Membros	Nome do Presidente do C.D.	LOCALIDADE	Endereço Telefónico	Observação
001	CAPEP –Egipto Praia	102	João Baptista Kaumba	Egipto Praia	923073687	
002	APAL – Lobito	53	António Cordeiro	Lobito-Velho	924147623	
003	VITULA, S.C.R.L.	25	Armando Brandão Lopes	Lobito-Velho	923687999	
004	Cais do lobito, SCRL	7	Festo Malungo Isaac	Restinga - Lobito	923496873	
005	PACAS, S.C.R.L	10	Alfredo Campos	Lobito	923712335/919034950	
06	Coop. Pesca Artes.da Hanha Praia –COOPAHAP, R.L	10	Miguel Pomba	Hanha-Norte Lobito	937 026 526	

Mapa 2 – Municipio da Catumbela

Nº Ord	Nome da ooperativa	Nº de Membros	Nome do Presidente do C.D.	LOCALIDADE	Endereço Telefónico	Observação
001	CAPACDA	39	Van-Dunen Gervásio Mujinga	Catumbela Praia	924768308	
002	APACP	15	Engrácia Josefa da Costa Macedo	Catumbela Praia	924630001	

Mapa 3 – Municipio de Benguela

Nº Ord	Nome da Cooperativa	Nº de Membros	Nome do Presidente do C.D.	LOCALIDADE	Endereço Telefónico	Observação
001	SAKULUKA,SCRL	62	Luciano Francisco da Silva	Damba-Maria Benguela	927463975/916466233	
002	TCHIOSSE	12	"Falecido"	Quioche Benguela		
003	COOPKASSEQUE	14	"	Kasseque – Benguela		
004	COOPER-PUNGO	56	José António Ngumbe	Caota – Benguela	924957258	
005	A.P.A.T.B	15	Amadeu José David	Benguela	923286400	
006	KATIANDULO,	10	Eduarda M.N. Sivestre Magalhães	Benguela	923587082- Srº Nicolau	
007	Coop. do CAMBOLO, SCRL	10	Tomás Miguel Rosa Flor	Caota	925 148 116/914 051 527	
008	OMBISSI YETO	10	José Gomes da Silva	Benguela	923643496	
009	CORRENTE FRIA	10	Rui Manuel Amaral Aníbal	Benguela	923690850	
010	SOCAPAB	10	Domingos César Kaley	Benguela	923748650	

012	ADRINELA, SCRL	10	Adriano da Graça Cardoso	Benguela	923485225/919023102	
013	SANTOLAS,SCRL	10	Fernando Fernandes Matilde	Benguela	925206214	
014	AUGUMAVI, SRCL	10	José Maria Martins	Benguela	923509751/927852846-	
015	Assoc. Apoio Ex.FAPLA	7000	António Chinhama dos Santos	Benguela	923 511 667	
016	COOTAMB, SCRL	250	João Fernando Capir	Benguela	923 591 812	
017	SOMBREIRO	10	Augusto Pedro Paixão Franco	Benguela	923 758 898	
018	Jovens Pescad. Kawape	10	António Jaime Canhama	Benguela		
019	O Velho e o Mar	10	José Zacarias Franco	Benguela	923 741 340	
020	MARAVILHOSA	10	Edivaldo Chiambo Estêvão Mendonça	Benguela	923712468	
021	EYOVOKO	10	Domingos Nambele Samuel	Benguela		
022	Coop. Amigos da Paz Assoc. ASPAR	250	Nito Alves Teixeira Júnior António Amadeu	Benguela " " "	923 508 505 923 486 798	
023	PRAIA MEIA LUA	10	Carlos Lúcio da Costa Matias	Benguela		
024	Assoc. APAKB	128	Madalena Chipuia	Benguela	923 758 599	
225	COPRIMECA, R.L.	10	Fernando Zeferino	Benguela	931 560 950/923 591 812	
026	AMIGOS DO MAR, SCRL	10	Nayro de Martinó Mesquita Cordeiro	Benguela	930 759 015/935 971 021	
027	Coop. Pesca Artesanal Damba-Maria Benguela	20	Carlos Alfredo	Damba-Maria Benguela	924 493 511	I.R.S.E.M
028	Coop. Pesca Artesanal Mar-Branco	12	José Manuel	Benguela	927 852 846	I.R.S.E.M

Mapa 4 – Município da Baia-Farta

Nº Ord	Nome da ooperativa	Nº de Membros	Nome do Presidente do C.D.	LOCALIDADE	Endereço Telefónico	Observação
001	TATUKEVELA,SCRL	13	Adriano Mumbanda	Baia-Farta Sede	924 430 688	
002	REDFISH, SCRL	10	Juliana de Jesus Maria Teixeira	Baia-Farta Sede	925 897 718/923 484 516	
003	COOPKALUNGA,SCRL	10	Joaquim António Salvador	Cuio- Dombe Grande	924 914 926	
004	ZIMBOLOVALA,SCRL	28	Pedro Nangolo	Alto-Liro Baia-Farta	935 751 961	
005	KAFABI, SCRL	10	João Teixeira Fonseca	Baia-Farta	923 570 802	
006	YOLELA, S.C.R.L	18	Gabriel Francisco	Baia-Farta	933 382 094	
007	Assoc. YO SANGA	10	Aldino Fernandes Munjenji	Dombe-Grande B-Farta		
008	KATCHAMA, SCRL	26	José Jamba Paulo	Baia-Farta		
009	COOPROSUL- Coop. Pesca Artesnal da Orla Maritima Sul	40	Miguel Segunda	Baia-Farta	938 803 578	I.R.S.E.M
010	COOPPROD-Coop. de Pesca Artesanal e Aquicultura ExMilitares	55	Francisco Vinho Betatela	Baia-Farta	932 957 096	I.R.S.E.M
011	CUIOPRODUÇÃO , Coop. de Pesca Artesanal e Aquicultura Ex-Militares	40	César Jumba /Alfredo Francisco	Baia-Farta		I.R.S.E.M

REPÚBLICA DE ANGOLA
MINISTÉRIO DAS PESCAS
INSTITUTO DE DESENVOLVIMENTO DA PESCA ARTESANAL E DA AQUICULTURA

REPRESENTAÇÃO PROVINCIAL DE BENGUELA

MAPA DAS COOPERATIVAS NÃO LEGALIZADAS OU EM VIA DE LEGALIZAÇÃO NA PROVÍNCIA DE BENGUELA

Mapa 1 – Municipio do Lobito

Nº Ord	Nome da Cooperativa	Nº de Membros	Nome do Presidente do C.D.	LOCALIDADE	Endereço Telefónico	Observação
001	Coop. Pesca Artes.da Hanha Praia	73	Domingos dos Santos	Hanha-Norte Lobito	931655972/911689867	I.R.S.E.M

Mapa 1 – Município da Catumbela

Nº Ord	Nome da ooperativa	Nº de Membros	Nome do Presidente do C.D.	LOCALIDADE	Endereço Telefónico	Observaçã
001	COPRAB	20	AUGUSTO SAPALO	Praia de Bebé	942 112 300	

Mapa 3 – Municipio de Benguela

Nº Ord	Nome da Cooperativa	Nº de Membros	Nome do Presidente do C.D.	LOCALIDADE	Endereço Telefónico	Observaçã
001	EUBI-APA-GOA	10	Fernando	Goa Benguela	939 490 796	
002	KUZAWLA, SCRL	14	Maya Kabela das Neves Felizardo e Sendra Fernandes	Benguela	927 539 521 924 709 502	
003	TIRO DO MAR, SCRL	10	Manuel António Chicuma	Benguela	924 187 620	
004	DA CANHOCA, SCRL	10	Francisco Jorge Morais	Benguela	923 511 731/998 590 137	
005	COTELMAR, SCRL	10	José Hermenegildo Gomes Correia	Benguela	923 545 368/ 928 877 586	

Mapa 4 – Municipio da Baia-Farta

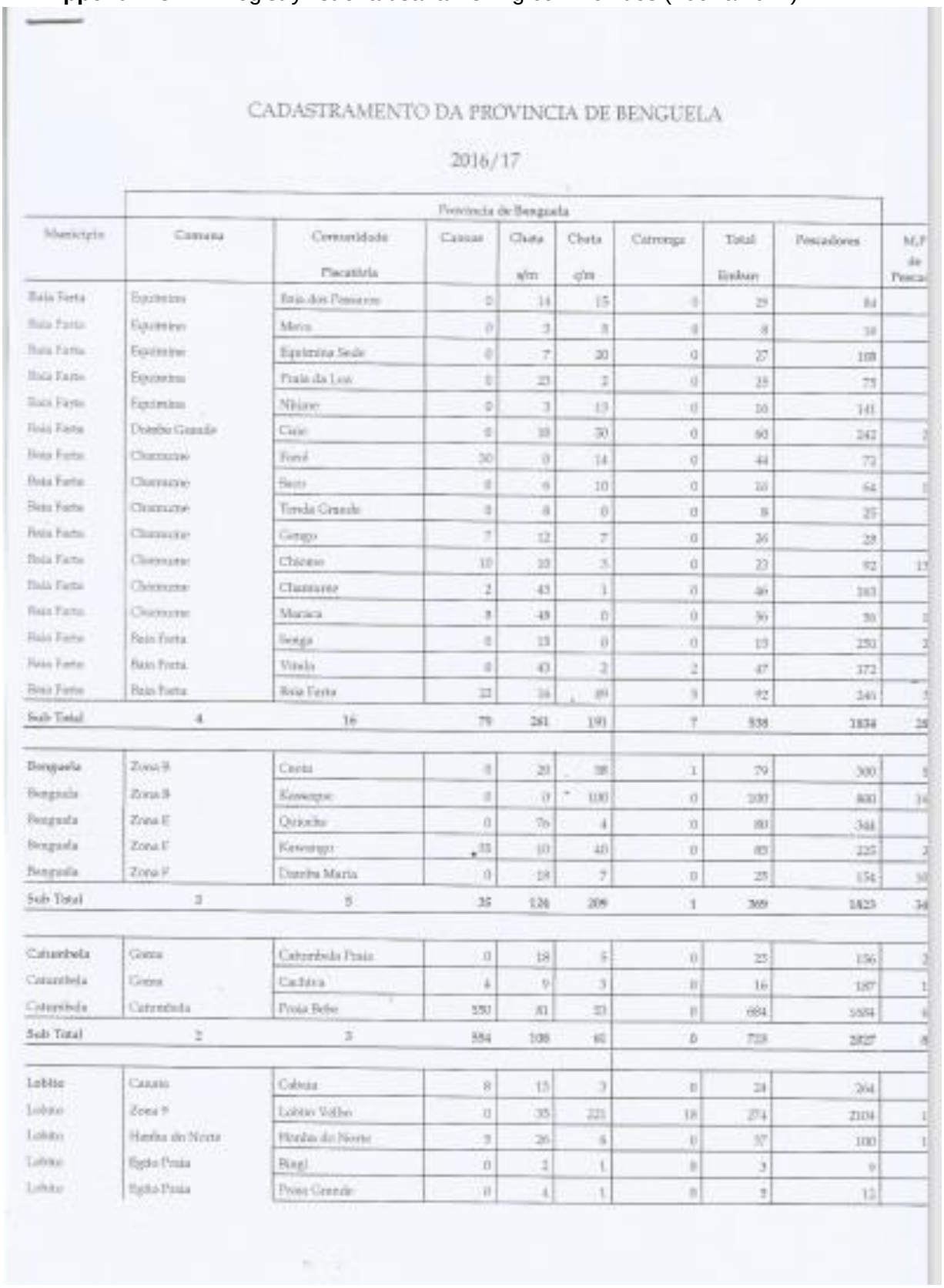
Nº Ord	Nome da ooperativa	Nº de Membros	Nome do Presidente do C.D.	LOCALIDADE	Endereço Telefónico	Observação
001	EQUICOP, S.C.R.L	10	Carlos de Sousa e Sr. Vasco	Benguela	923 975 285/927 476 412	
002	Coop. P.Art. Equimina	25	António Pedro Kanjamba	Equimina Baia-Farta	924 015 119	
003	Coop. P. Art. do CUIO	26	Adriano Kole	Cuio-Dombe Grande	924 776 141	
004	CPDDC e ASPAR	17	Luís Ernesto Bunga	Baia-farta	928 385 363	
005	Coop. Pa.A.Chamume	27	Dercy Paulo Custódio	Baia-farta	924 924 004/ 929 894 665	

REPRESENTAÇÃO PROVINCIAL DO INSTITUTO DE DESENVOLVIMENTO DE PESCA ARTESANAL E DA AQUICULTURA EM BENGUELA, AOS, 19 DE JANEIRO DE 2018.

O REPRESENTANTE PROV. INTERINO

MANUEL PACHECO CHARRUA

Appendix C: IPA registry list of artisanal fishing communities (20016/2017)



CADASTRAMENTO DA PROVINCIA DE BENGUELA

2016/17

			Provincia de Benguela						
Municipio	Comuna	Comunidade Piscatória	Canoas	Chata a/m	Chata c/m	Catrenga	Total Embarc	Pescadores	M/F de Pesca
Baia Farta	Equimina	Baia dos Pescadores	0	14	15	0	29	84	
Baia Farta	Equimina	Mirco	0	3	5	0	8	38	
Baia Farta	Equimina	Equimina Sede	0	7	20	0	27	108	
Baia Farta	Equimina	Praia da Lua	0	23	2	0	25	75	
Baia Farta	Equimina	Nhiaro	0	3	13	0	16	141	
Baia Farta	Dombo Grande	Cais	0	10	30	0	40	242	
Baia Farta	Chiumuno	Forté	30	0	14	0	44	72	
Baia Farta	Chiumuno	Sacro	0	6	10	0	16	64	
Baia Farta	Chiumuno	Tereda Grande	0	0	0	0	0	25	
Baia Farta	Chiumuno	Gengo	7	12	7	0	26	28	
Baia Farta	Chiumuno	Chicuso	10	10	5	0	25	92	17
Baia Farta	Chiumuno	Chamuteo	2	43	1	0	46	163	
Baia Farta	Chiumuno	Maraca	8	48	0	0	56	56	
Baia Farta	Baia Farta	Senga	0	13	0	0	13	250	
Baia Farta	Baia Farta	Vitala	0	43	2	2	47	372	
Baia Farta	Baia Farta	Baia Farta	22	36	29	5	92	240	
Sub Total	4	16	79	281	191	7	558	1834	28
Benguela	Zona B	Centa	0	20	38	1	79	300	
Benguela	Zona B	Kawenge	0	0	100	0	100	800	16
Benguela	Zona E	Quicolo	0	76	4	0	80	344	
Benguela	Zona F	Kawenge	35	10	40	0	85	225	
Benguela	Zona F	Dombe Maria	0	18	7	0	25	154	10
Sub Total	3	5	35	124	209	1	369	1823	34
Catumbela	Gema	Catumbela Praia	0	18	5	0	23	156	
Catumbela	Gema	Cachiva	4	9	3	0	16	187	1
Catumbela	Catumbela	Praia Bebe	550	81	53	0	684	1604	6
Sub Total	2	3	554	108	61	0	723	2827	8
Lobito	Canata	Calema	8	15	3	0	28	264	
Lobito	Zona 9	Lobito Velho	0	35	221	18	274	2104	1
Lobito	Hamba do Norte	Hamba do Norte	3	26	6	0	37	100	1
Lobito	Egito Praia	Bingi	0	2	1	0	3	9	
Lobito	Egito Praia	Praia Grande	0	4	1	0	5	12	

Lobito	Egito Praia	Culula	0	4	1	0	5	15	22
Lobito	Egito praia	Mar	0	5	4	0	9	25	12
Lobito	Egito praia	Egito Praia	0	24	3	0	27	90	79
Lobito	Egito Praia	Chimbala	0	11	4	0	15	63	71
Lobito	Egito Praia	Cangarma	0	13	2	0	15	35	10
Sub Total	3	10	13	137	246	18	414	2717	500
Total Geral	12	34	681	630	707	26	2044	8401	7665

Appendix D: Decree 13/2018 - Management Measures for Marine Fisheries, Inland Fishing, and Aquaculture document as a reference

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SUMÁRIO

PRESIDENTE DA REPÚBLICA

Decreto Presidencial n.º 13/18
de 22 de Janeiro

As políticas de conservação e renovação sustentável dos Recursos Biológicos Aquáticos exigem do Executivo a adopção de medidas reguladoras adequadas para o acesso ao seu uso e exploração de modo responsável;

Havendo necessidade de assegurar a protecção e conservação de algumas espécies em perigo de sustentabilidade e das espécies a elas associadas, bem como os respectivos *habitats*;

Tornando-se necessário reforçar a tomada de medidas de gestão pesqueira e aquícola, conforme o disposto no artigo 10.º da Lei n.º 6-A/04, de 8 de Outubro — Lei dos Recursos Biológicos Aquáticos, e demais legislação aplicável sobre a Gestão dos Recursos Pesqueiros;

O Presidente da República decreta, nos termos da alínea 1) do artigo 120.º e do n.º 3 do Artigo 125.º, ambos da Constituição da República de Angola, o seguinte:

ARTIGO 1.º
(Aprovação)

São aprovadas as Medidas de Gestão das Pescarias Marinhas, da Pesca Continental e da Aquicultura para o ano de 2018, anexo ao presente Decreto Presidencial e que dele são partes integrantes.

ARTIGO 2.º
(Dúvidas e omissões)

As dúvidas e omissões que resultem da interpretação e aplicação do presente Diploma são resolvidas pelo Presidente da República.

ARTIGO 3.º
(Entrada em vigor)

O presente Decreto Presidencial entra em vigor na data da sua publicação.

Apreciado em Conselho de Ministros, em Luanda, aos 8 de Dezembro de 2017.

Publique-se.

Luanda, aos 15 de Janeiro de 2018.

O Presidente da República, JOÃO MANUEL GONÇALVES LOURENÇO.

MEDIDAS DE GESTÃO DAS PESCARIAS MARINHAS, DA PESCA CONTINENTAL E DA AQUICULTURA PARA O ANO DE 2018

ARTIGO 1.º
(Objectivo)

As Medidas de Gestão visam fundamentalmente ajustar a capacidade das capturas ao potencial disponível dos Recursos Biológicos Aquáticos e da Aquicultura.

ARTIGO 2.º
(Monitorização e uso do equipamento — EMC e GPS)

1. Todas as embarcações incluindo as de pesca artesanal com comprimento fora a fora superior a 7m devem possuir a bordo meios de comunicação apropriados, bem como instrumentos de navegação e orientação como a bússola e um GPS.

2. Todas as embarcações da pesca industrial e semi-industrial independentemente das respectivas artes de pesca, a partir dos 15m de comprimento fora a fora, devem obrigatoriamente instalar a bordo o Equipamento de Monitorização Contínua (EMC), conforme a legislação em vigor.

3. Todas as embarcações de pesca industrial e semi-industrial devem permitir a entrada e a permanência a bordo de observadores de pesca, nos termos do Decreto Executivo n.º 83/07, de 27 de Julho.

ARTIGO 3.º
(Períodos de veda)

1. Para o ano de 2018 os períodos de veda são os seguintes:

a) Os meses de Janeiro e Fevereiro para a pesca de camarão de profundidade (*Parapenaeus longirostris* e *Aristeus varidens*) em toda a costa angolana;

b) Os meses de Janeiro, Fevereiro e Setembro para a pesca da gamba costeira (*Penaeus notialis* e *Penaeus Kerathurus*) em toda a costa angolana, podendo as embarcações utilizar a arte de pesca à linha ou de emalhar nos meses em que a pesca não for efectuada;

c) O período de 15 de Junho a 15 de Agosto para a pesca do caranguejo (*Chaceon maritae*) em toda a costa angolana;

d) Os meses de Janeiro, Fevereiro e Março para a pesca da lagosta (*Panulirus regius*), em toda a costa angolana;

e) Os meses de Agosto, Setembro e Outubro para a pesca de moluscos bivalves, em baías fechadas, nomeadamente a de Luanda, Lobito, Tômbwa e outras áreas sensíveis a identificar;

f) Os meses de Abril, Maio e Junho para a pesca de arrasto demersal, em toda a costa angolana;

g) Os meses de Junho, Julho e Agosto para a pesca do carapau em toda a costa angolana, com excepção da Zona Sul, a partir dos 13 graus de Latitude Sul até a fronteira marítima com a República da Namíbia;

2. Os estuários são considerados sistemas sensíveis, sendo proibida qualquer actividade de pesca.

ARTIGO 4.º
(Malhagem permitida por arte de pesca)

As malhagens mínimas permitidas são:

a) 50mm para o camarão de profundidade;

b) 80mm para as espécies de peixes demersais;

c) 100mm para a pesca de caranguejo;

d) 25-30mm para a pesca de cerco.

ARTIGO 5.º
(Capturas acessórias)

1. Para efeitos das medidas ora adoptadas, entende-se por pesca dirigida, a um recurso ou espécie, aquela para a qual são emitidos os correspondentes direitos e licenças de pesca.

2. As espécies capturadas em simultâneo, no exercício da pesca dirigida e que não foram alvo de licenciamento, são consideradas espécies acessórias ou acompanhantes.

3. Todos os recursos biológicos capturados pelas embarcações de arrasto demersal «peixes e camarões» devem ser embalados para comercialização, preferencialmente no mercado interno.

4. A faina acessória capturada pelas embarcações referidas no número anterior deve igualmente ser embalada para comercialização ou transferida para as embarcações receptoras licenciadas para o efeito.

5. A percentagem de capturas acessórias na pesca dirigida é a seguinte:

a) 15% de carapau, do total da captura a bordo para pesca de arrasto demersal por faina;

b) 200 toneladas anuais para a captura de cefalópodes na pesca de arrasto demersal.

6. Todas as capturas acessórias superiores às fixadas nas alíneas anteriores revertem a favor do Estado, nos termos das alíneas a) e b) do n.º 1 do artigo 25.º do presente Diploma, e os responsáveis sujeitam-se à aplicação de medidas de punição correspondentes à infracção cometida.

ARTIGO 6.º
(Amostragem biológica)

1. O Instituto Nacional de Investigação Pesqueira (INIP) deve prosseguir com o Programa Nacional de Amostragem Biológica nos portos e locais de descarga.

2. A entrega das amostras para a realização do Programa Nacional de Amostragem Biológica é obrigatória e sem qualquer encargo para o INIP e as respectivas quantidades são definidas em instrutivos emitidos pelo Ministro das Pescas e do Mar.

3. O INIP pode, no âmbito do Programa Nacional de Amostragem Biológica, integrar um observador a bordo das embarcações de pesca, em especial as industriais e semi-industriais, com vista a cumprir com os objectivos traçados.

4. Os pescadores artesanais devem permitir a amostragem

ARTIGO 7.º
(Obrigatoriedade de prestação de informação estatística)

1. A prestação de informação estatística mediante o preenchimento do diário de pesca a bordo e do mapa de capturas por parte das empresas armadoras é obrigatória para todas as embarcações de pesca das frotas industrial e semi-industrial, até ao oitavo dia do mês seguinte à faina, independentemente da arte que utiliza, e é extensiva também as espécies acompanhantes.

2. É obrigatória a separação por espécie do pescado que geralmente é agrupado na classe de diversos ou outras espécies, para permitir o conhecimento real da composição específica das capturas e facilitar o trabalho de avaliação dos recursos.

3. Para a pesca artesanal a prestação da informação estatística continua a processar-se através dos modelos actualmente em vigor.

4. O incumprimento do estipulado nos números anteriores é punível nos termos previstos no n.º 1 do artigo 235.º da Lei dos Recursos Biológicos Aquáticos.

ARTIGO 8.º
(Limite de quota de pesca para o ano 2018)

1. É estabelecido o sistema de quotas de acordo com o Total Admissível de Captura — TAC fixado no artigo 9.º, priorizando as empresas com infra-estruturas de processamento e transformação em terra.

2. A soma das quotas de captura a atribuir para o ano 2018 não deve ultrapassar o TAC previsto no artigo seguinte.

ARTIGO 9.º
(Total Admissível de Captura)

O TAC para o ano de 2018 é o constante do quadro anexo ao presente Diploma, do qual é parte integrante.

ARTIGO 10.º
(Limite de esforço de pesca)

1. Pesca Artesanal:

a) O número de embarcações a operar em 2018 é fixado em 5500 (cinco mil e quinhentas) embarcações;

b) Na arte de linha deve ser utilizado o anzol até ao número mínimo 12 (doze);

c) As embarcações artesanais, de cerco, vulgo «rapa» que possuem guincho e alador passam a integrar a categoria das embarcações semi-industriais;

d) As embarcações artesanais que efectuam a pesca do caranguejo utilizando gaiolas passam a integrar a categoria das embarcações semi-industriais.

2. Pesca de Cerco:

Para a pesca com arte de cerco no ano de 2018 é recomendado o licenciamento de 90 (noventa) embarcações no máximo, com a capacidade seguinte:

a) 84 (oitenta e quatro embarcações com uma Arqueação Bruta (AB) igual ou inferior a 250 toneladas

b) Seis (6) embarcações com uma Arqueação Bruta (AB) superior a 250 e inferior a 800 e com uma capacidade máxima de porão equivalente a 400m3.

3. Pesca Pelágica:

Para a Pesca Pelágica podem ser licenciadas até 10 (dez) embarcações com limite máximo de potência do motor por embarcação não superior a 7000 HP.

4. Pesca Demersal Industrial:

Para a Pesca Industrial de Arrasto Demersal (peixe) é recomendado para 2018 o licenciamento de 40 (quarenta) embarcações com um limite máximo de potência de motor por embarcação de 2000 HP.

5. Pesca Demersal Semi-Industrial:

Para a Pesca Semi-Industrial de Arrasto Demersal (peixe) é recomendado para 2018 o licenciamento de 15 (quinze) embarcações.

6. Pesca de Palangre:

Para a Pesca com Arte de Palangre recomenda-se o licenciamento em 2018 de 7 sete embarcações.

7. Pesca de Emalhar:

a) Para a Pesca com Rede de Emalhar recomenda-se o licenciamento em 2018 de quinze (15) embarcações.

b) A rede de emalhar deve possuir as características seguintes:

i. Serem constituídas entre 200 e 400 panos de 50 metros cada, o que corresponde a 10km e 20km de comprimento respectivamente;

ii. Altura máxima 10 m;

iii. A malhagem mínima 100mm;

iv. Tempo máximo de imersão 24 horas.

8. Armações:

Até a realização de novos estudos esta arte deve ser considerada semi-industrial e como medida de precaução serão licenciadas até 12 (doze) armações.

9. Camarão de profundidade:

O esforço de pesca total para o recurso de camarão de profundidade é fixado em 25 (vinte e cinco) embarcações com um limite máximo de potência do motor por embarcação de 1200 HP.

10. Caranguejo:

a) O esforço de pesca para a pescaria de caranguejo em 2018 é limitado a 6 (seis) embarcações sendo 2 (duas) industriais e 4 (quatro) semi-industriais;

b) Relativamente às embarcações que transitarem para a categoria semi-industrial podem ser licenciadas até o máximo de 7 (sete);

c) O número de armadilhas por linha na pesca de

de 1200 (mil e duzentas) armadilhas no máximo para a pesca industrial.

11. Gamba Costeira:

Para a Gamba Costeira deve-se considerar o esforço de pesca em quinze (15) embarcações.

12. Cefalópodes:

Para os Cefalópodes são estabelecidos os requisitos seguintes:

a) O esforço de pesca dirigido aos cefalópodes em 2018 é limitado a 6 (seis) embarcações semi-industriais;

b) Para a pesca do choco e do polvo, recomenda-se a arte de armadilha e potes;

c) Para as lulas recomenda-se a arte de pesca toneiras, devendo a actividade de pesca ser acompanhada por observadores científicos.

13. Pesca do Atum do Alto:

a) O esforço de pesca total para o recurso do Atum do Alto é limitado ao licenciamento de 100 embarcações, podendo cada empresa licenciar até 10 (dez) embarcações no máximo;

b) Todas as capturas realizadas ao abrigo dos artigos 5.º e 9.º com excepção do Atum do Alto devem ser desembarcadas em portos, terminais pesqueiros ou ponte-cais de base, a constar do respectivo certificado ou licença de pesca para efeitos de fiscalização e controlo pelo Serviço Nacional de Fiscalização Pesqueira e da Aquicultura do Ministério das Pescas e do Mar.

14. Pesca Acessória:

Em 2018, serão licenciadas seis (6) embarcações para a recolha e transporte de espécies acessórias.

ARTIGO 11.º
(Regime de substituição de embarcações)

As embarcações de pavilhão estrangeiro em regime de contrato ou fretamento, que por qualquer motivo se retirarem da pescaria, só podem ser substituídas em função da disponibilidade do recurso.

ARTIGO 12.º
(Áreas reservadas e de pesca)

1. São estabelecidas as seguintes áreas reservadas:

a) Toda a extensão do mar territorial até as 4 milhas náuticas, bem como as águas continentais são reservadas à pesca artesanal, podendo estender-se até 8 milhas na Zona Norte do Ambriz à Cabinda;

b) 2 Milhas para as embarcações nacionais de pesca semi-industrial de cerco, em toda a extensão da plataforma marítima fora das baías e portos;

c) 4 Milhas para as embarcações de pesca de caranguejo com gaiolas, e da pesca desportiva e recreativa, em toda a extensão da plataforma marítima fora das baías e portos;

d) Para lá das quatro 4 Milhas para a pesca da gamba costeira;

e) Para além dos 400 (quatrocentos) metros de profundidade, para preservar a zona de desova, da pesca de caranguejo na Zona Sul;

f) Para lá das 12 Milhas, na Zona compreendida entre os 13 graus de Latitude Sul e a fronteira marítima Sul com a República da Namíbia, para a pesca de arrasto;

g) Os estuários são considerados sistemas sensíveis sendo proibida qualquer actividade de pesca.

2. São estabelecidas as seguintes áreas de pesca:

a) Para a arte de cerco na pesca industrial nas baías e portos, para lá das seis (6) Milhas e nas restantes áreas para lá dos quatro (4) Milhas da costa;

b) Para a arte de cerco na pesca semi-industrial nas baías e portos, para lá das quatro (4) Milhas e nas restantes áreas para lá das duas (2) Milhas da costa;

c) Para a arte de palangre nas baías e portos para lá das oito (8) Milhas e nas restantes áreas para lá das seis (6) Milhas;

d) Para arte de emalhar, arrasto demersal na pesca semi-industrial, nas baías e portos, para lá das dez (10) Milhas e nas restantes áreas para lá dos seis (6) Milhas da costa e a profundidade igual ou superior a 50m;

e) Para o arrasto demersal industrial, nas baías e portos são estabelecidas as seguintes áreas de pesca:

i. Para as embarcações com Arqueação Bruta (AB) inferior a 300, para lá das dez (10) Milhas da costa e nas restantes áreas para lá das 8 Milhas e à profundidade igual ou superior a 50 metros;

ii. Para as embarcações com Arqueação Bruta (AB) superior a 300 e igual ou inferior a 600, para lá das 12 Milhas da costa e a profundidade superior a 50 metros;

iii. Para as embarcações com Arqueação Bruta (AB) superior a 600 para lá das 15 Milhas e a profundidade superior a 50 metros.

f) Para a pesca do caranguejo com gaiolas, entre os paralelos 6º 00' S à 15º 00' S para lá das 4 milhas e entre o paralelo 15º 00' S e a fronteira marítima Sul com a República da Namíbia para lá das cinco 5 milhas e a profundidade superior a 400 metros.

3. Áreas ou centros de recolha da faina acessória:

O Ministério das Pescas e do Mar estabelece em instrumento próprio as áreas de recolha da faina acessória.

ARTIGO 13.º
(Proibições)

1. São impostas para o ano de 2018 as seguintes proibições:

a) A utilização de Carapau, da Cavala e da Sardinha do Reino para a produção de farinha de peixe;

b) A captura dirigida a fêmeas de lagosta e caranguejos ovados;

c) A captura de moluscos e bivalves em áreas fechadas como as Baías de Luanda, Lobito, Tômbwa e outras áreas comprovadas de risco;

d) A pesca de arrasto para terra (banda-banda);

e) A pesca de arrasto em parelha;

f) A rejeição ou descartes de qualquer produto da pesca para o mar;

g) O uso de redes nos estuários tanto do lado marinho como no do fluvial;

h) O trânsito e a pesca num raio de 1000m (zona de segurança) das plataformas petrolíferas em toda a costa de Angola.

2. Até a realização de novos estudos é proibida a exportação de espécies de lagosta e do carapau.

ARTIGO 14.º
(Percentagem de capturas, peso e tamanhos mínimos)

1. É proibida a captura, descarga ou comercialização de qualquer espécie que não obedeça os pesos e tamanhos mínimos, estabelecidos pelo Decreto Executivo n.º 109/05, de 25 de Novembro, salvo tratando-se de rejeições ou descartes da pesca.

2. O disposto no número anterior não se aplica à pesca de investigação científica.

3. A inobservância do disposto no n.º 1 do presente artigo constitui infracção de pesca prevista e punível, nos termos da Lei n.º 6-A/04, de 8 de Outubro — Dos Recursos Biológicos Aquáticos.

ARTIGO 15.º
(Cumprimento das normas de segurança marítima)

Sempre que qualquer embarcação estiver no mar em exercício de actividade de pesca ou outra, é obrigatório a observância rigorosa das normas de sinalização das artes e aparelhos de pesca, de navegação e de salvamento.

ARTIGO 16.º
(Gestão das focas)

1. É permitida a captura de focas como forma de assegurar a gestão racional e sustentável dos recursos biológicos aquáticos.

2. Devem ser organizados programas de monitorização em conformidade com as normas ambientais e prestação de informação estatística de exploração do recurso.

ARTIGO 17.º
(Pesca artesanal continental)

Para a pesca continental é obrigatório:

a) O uso de malhagem de 36 mm no mínimo;

b) A introdução do sistema de recolha de dados de esforço e capturas.

ARTIGO 18.º
(Aquicultura)

Ao nível da aquicultura recomenda-se aos órgãos competentes do Ministério, bem como aos aquicultores, o seguinte:

a) Aumento da monitorização contínua da qualidade de água e do solo;

b) Aumento da monitorização contínua das espécies cultivadas e comercializadas;

c) Controlo e monitorização na introdução das espécies exóticas a utilizar no cultivo;

d) Obrigatoriedade das unidades de produção aquícola de fornecer gratuitamente amostras de espécies cultivadas para efeitos de investigação, particularmente para amostragem biológica;

e) Obrigatoriedade de prestação de informação estatística da produção ao Ministro das Pescas e do Mar;

f) Desenvolver estudos que permitam conhecer o impacto da introdução de espécies exóticas no meio natural;

g) Avaliar o estado das unidades de produção aquícola actualmente inoperantes.

ARTIGO 19.º
(Baldeações e transbordos de pescado)

1. As embarcações devem descarregar nos portos de base, para efeitos de controlo das capturas realizadas por faina.

2. Os barcos da Pesca Artesanal devem desembarcar nos Centros de Apoio à Pesca Artesanal, aí onde houver.

3. Com excepção dos casos de força maior e da pesca do atum do alto, estão suspensas as baldeações e os transbordos de pescado por embarcações ao serviço de armadores nacionais, salvo se devidamente autorizados.

4. É proibido a baldeação de capturas da pesca semi-industrial e industrial para embarcações de apoio tipo chalandras e/ou de pesca artesanal.

ARTIGO 20.º
(Exercício da pesca sem concessão de direitos de pesca)

1. A prática ou tentativa de prática de pesca por embarcações nas águas angolanas sem concessão de direitos de pesca, em conformidade com a Lei dos Recursos Biológicos Aquáticos e seus regulamentos, constitui infracção punível com multa variável entre um mínimo equivalente ao valor da taxa anual de pesca estabelecida para o tipo de pesca exercido e o máximo de 100, 50 e 20 vezes esse limite mínimo, conforme se trate de pesca industrial, semi-industrial ou artesanal, respectivamente.

2. Tratando-se de pesca de investigação científica, incluindo a de prospecção, recreativa ou desportiva, o limite mínimo da multa é o valor da licença anual e o limite máximo o décupio desse valor.

3. É equiparada à pesca sem concessão dos respectivos direitos o exercício da pesca durante o período de suspensão da concessão dos direitos de pesca a que se referem a alínea f) do n.º 1 do artigo 238.º e a alínea c) do n.º 1 do artigo 254.º da Lei dos Recursos Biológicos Aquáticos.

4. Se a embarcação for estrangeira e tiver apresada, a tripulação pode, sem prejuízo do pagamento das despesas contraídas, deixar o País, à excepção do capitão e dos membros

da tripulação que haja necessidade de ouvir para instruir o processo e os indispensáveis à manutenção e segurança da embarcação.

5. O disposto no presente artigo aplica-se, com as necessárias adaptações, à pesca no alto mar por embarcação de bandeira angolana, sem a licença prevista na Lei dos Recursos Biológicos Aquáticos e seus regulamentos.

ARTIGO 21.º
(Infracções graves)

1. Constituem infracções graves, nos termos do disposto na Lei dos Recursos Biológicos Aquáticos:

a) A prática ou tentativa de prática de pesca por embarcações nas águas angolanas sem concessão de direitos de pesca;

b) A prática de pesca de investigação científica, incluindo a prospecção, recreativa ou desportiva sem a respectiva licença;

c) A pesca em época ou zona proibidas ou não autorizadas;

d) A pesca de espécies com peso ou dimensões inferiores às autorizadas;

e) O uso de artes de pesca que não correspondam as especificações prescritas ou autorizadas, nomeadamente o uso de artes de pesca proibidas e o emprego de redes cujas malhas sejam de dimensão inferior às malhas mínimas autorizadas;

f) O transporte, sem autorização, de produtos tóxicos, explosivos e meios de pesca por electrocussão, assim como o de substâncias susceptíveis de enfraquecer, atordoar, excitar ou matar os recursos biológicos aquáticos;

g) A utilização, sem autorização, no exercício da pesca, dos produtos, substâncias e meios mencionados na alínea anterior;

h) A omissão de fornecimento de dados ou a prestação de dados falsos, nomeadamente sobre as capturas e esforço de pesca ou relativos a posição da embarcação ou ainda à falsificação de registos de bordo, designadamente diários de bordo, diários de pesca ou outros documentos relativos às capturas;

i) A pesca por embarcação de pesca de tipo diferente ou a captura de espécies diferentes daquelas para as quais foram concedidos os respectivos direitos;

j) A fuga ou tentativa de fuga, após a respectiva interpelação pelos agentes de fiscalização no exercício das suas funções;

k) O não cumprimento das condições estabelecidas no título de concessão dos direitos de pesca ou no certificado de pesca;

l) A alteração fraudulenta dos dados que figuram na licença de pesca;

m) A falsificação do título de concessão de direitos de pesca, de quaisquer licenças ou certificados previstos na Lei dos Recursos Biológicos Aquáticos e demais legislação aplicável;

n) Não ter a bordo da embarcação de pesca o dispositivo de controlo do sistema de indicação automática da posição, devendo tê-lo instalado;

o) A manipulação, alteração, danificação ou qualquer forma de interferência com as comunicações ou o funcionamento do dispositivo do sistema de indicação automática de posição automática da embarcação;

p) A não observância da obrigação de manter a bordo da embarcação o diário de pesca, assim como qualquer outro documento previsto na legislação;

q) A tentativa de pesca ou a pesca, recolha ou colheita de corais e outras espécies cuja pesca seja proibida nos termos da Lei dos Recursos Biológicos Aquáticos e seus regulamentos, seja por que meio for e a sua posse, venda ou exposição para venda;

r) A eliminação, destruição, simulação ou alteração de provas da prática de uma infracção de pesca;

s) A pesca em zona não autorizada para o tipo de embarcação de pesca, a transmissão não autorizada de quotas ou licenças de pesca, nomeadamente de um armador para o outro;

t) A inobservância em especial das obrigações relativas à arrumação e selagem das artes de pesca e a sua recolha em compartimentos apropriados;

u) O fornecimento, nas águas angolanas, às embarcações de pesca de provisões ou combustível, sem a devida autorização do Ministério competente;

v) A destruição e danificação intencionais ou negligentes das embarcações de pesca ou das artes de pesca pertencentes a outras pessoas;

w) A agressão ou obstrução com ou sem violência ou ameaça de violência contra um agente de fiscalização no exercício das suas funções;

x) A permanência das artes de pesca nas águas angolanas para além de 48 horas;

y) O exercício ilegal de funções de agente de fiscalização ou de capitão de embarcação;

z) A prática ou tentativa de prática de actividade de pesca sem os seguros exigidos por lei;

aa) A captura de recursos aquáticos com violação das condições do título de concessão, certificado de pesca relativas à quota ou aos limites do esforço de pesca;

bb) A introdução no ecossistema aquático de quaisquer substâncias que causem danos aos recursos biológicos aquáticos.

2. Constituem ainda infracções graves:

a) A pesca no alto mar por embarcações de pesca de bandeira angolana, sem a autorização da autoridade competente;

b) A violação de disposições e medidas internacionais de gestão e conservação de recursos de alto mar, incluindo as previstas na legislação aplicável;

c) A realização de baldeações e transbordos não autorizados pelo Ministro competente.

ARTIGO 22.º
(Outras infracções)

1. Constituem outras infracções:

a) A detenção a bordo de artes de pesca em contravenção do disposto na Lei dos Recursos Biológicos Aquáticos e nos Regulamentos Aplicáveis;

b) A não detenção a bordo ou a não exibição de cópias de licença de pesca, certificado de navegabilidade, certificado de pesca, certificado de matrícula e a propriedade e, se for caso disso, certificado de arqueação bruta, sempre que forem solicitados por agentes de fiscalização em exercício de funções;

c) A não marcação das embarcações de pesca, nos termos previstos na Lei n.º 6-A/04, de 8 de Outubro e seus regulamentos;

d) A falta de cooperação com os agentes de fiscalização em exercício de funções;

e) A inobservância das normas relativas ao destino a dar às capturas;

f) A inobservância das normas em vigor relativas a operações de pesca conexas;

g) A inobservância das obrigações relativas ao posicionamento, entrada e saída das embarcações de pesca dos portos, baías e zonas de pesca em águas angolanas;

h) A inobservância das normas referentes ao porto de base;

i) A inobservância das normas relativas à qualidade higeo-sanitária dos produtos da pesca;

j) A inobservância das normas relativas à criação e exploração de culturas aquáticas.

ARTIGO 23.º
(Punição das infracções graves)

1. As infracções graves descritas na alínea a) do n.º 1 do artigo anterior são puníveis com multa variável entre um mínimo equivalente ao valor da taxa anual de pesca estabelecida para o tipo de pesca exercido e o máximo de 100, 50 e 20 vezes esse limite mínimo, conforme se trate de pesca industrial, semi-industrial ou artesanal, respectivamente.

2. Tratando-se de pesca de investigação científica, incluindo a prospecção, recreativa ou desportiva, o limite mínimo da multa é o valor da licença anual e o limite máximo o décuplo desse valor.

3. As demais infracções graves previstas no artigo anterior são puníveis com multa graduável entre um mínimo igual a metade do valor da taxa anual de pesca estabelecida para o tipo de pesca que estava a ser exercida e o máximo equivalente a 50, 40 ou 30 vezes esse mínimo, consoante se trate de pesca industrial, semi-industrial ou artesanal, respectivamente.

ARTIGO 24.º
(Punição às outras infracções)

As outras infracções são puníveis com multa graduável entre um mínimo igual a 1/3 do valor da taxa anual de pesca estabelecida para o tipo de pesca ou actividade exercida e o máximo equivalente a 30, 20 ou 15 vezes aquele mínimo, consoante se trate de pesca industrial, semi-industrial ou artesanal, respectivamente.

ARTIGO 25.º
(Medidas de punição acessórias)

1. Em função do dano ou perigo de dano para os recursos biológicos aquáticos e das circunstâncias da infracção cometida, podem ser aplicadas como medidas acessórias da multa:

a) A perda a favor do Estado da embarcação, da carga, do combustível, dos equipamentos, das artes de pesca e das capturas ou produtos delas derivados encontrados a bordo da embarcação;

b) A perda a favor do Estado do pescado capturado em águas angolanas e os produtos deles derivados;

c) A perda a favor do Estado de todos os produtos proibidos ou não autorizados, existentes a bordo da embarcação, que possam servir de instrumento ao exercício ilegal da pesca;

d) A interdição do exercício da profissão em Angola, pelo período de três meses a dois anos, ao capitão da embarcação;

e) A revogação do certificado de pesca ou a sua suspensão pelo período de um a seis meses, aos proprietários ou armadores da embarcação;

f) A revogação da concessão ou suspensão dos direitos de pesca, pelo período de seis meses a um ano, aos respectivos titulares;

g) A revogação, suspensão da licença ou alvará do estabelecimento ou instalação de aquicultura, ao respectivo titular, pelo período de um a 10 meses;

2. As medidas acessórias previstas no número anterior são aplicáveis:

a) A prevista na alínea a), ao exercício da pesca sem concessão de direitos de pesca;

b) A prevista na alínea b), as infracções graves descritas nas alíneas c), d), e), l) e p) do artigo 20.º e a pesca sem concessão de direitos se não for aplicada a medida acessória prevista na alínea a) do n.º 1;

c) A prevista na alínea c), a infracção grave descrita na alínea f) do artigo 20.º;

d) As medidas de interdição do exercício da profissão, revogação ou suspensão do certificado de pesca,

de licenças e proibição do exercício da pesca, previstas nas alíneas e), f) e g), do número anterior às infracções descritas no artigo 20.º, conforme o caso, de harmonia com a natureza, objecto da infracção e respectivo autor ou responsável.

ARTIGO 26.º
(Reincidência)

1. Há reincidência, quando, nos 12 meses posteriores à aplicação de uma sanção, pela prática de uma infracção, o infractor comete outra igual ou da mesma espécie e com gravidade.

2. Em caso de reincidência os limites mínimos e máximo das multas e das medidas acessórias aplicáveis são aumentados para o dobro.

ARTIGO 27.º
(Orientações a investigação e a gestão)

1. Para efeitos das presentes medidas de gestão orienta-se ao órgão responsável pela investigação e a gestão dos recursos biológicos aquáticos o seguinte:

a) A instalação de mareógrafos ao longo da costa;

b) O Instituto de Apoio à Pesca Artesanal e da Aquicultura e o Serviço Nacional de Fiscalização Pesqueira e da aquicultura devem elaborar projectos e actuar no sentido de reduzir substancialmente a pesca de juvenis em toda a costa em colaboração com as administrações locais;

c) Recomenda-se um melhor acompanhamento da pescaria de crustáceos dando ênfase a uma amostragem mais exaustiva para a gamba costeira e de profundidade envolvendo o maior número de embarcações na recolha de dados da pesca e da biologia;

d) Recomenda-se fazer um acompanhamento da pesca que utiliza armações e gaiolas ao Sul de Angola, relativamente ao estudo das artes e ao seguimento mensal das capturas;

e) Melhorar o acompanhamento da pesca do atum costeiro e do atum do alto;

f) Recomenda-se à Direcção Nacional de Pescas e Protecção de Recursos Pesqueiros a melhorar e reforçar o Plano de Recolha de Dados da Pesca, instruindo aos armadores o preenchimento adequado dos diários de bordo, com inclusão das horas, dias e áreas de pesca;

g) O INIP deve realizar estudos que permitam a interligação do conhecimento dos factores ambientais à biologia das espécies;

h) Inclusão de um programa de educação ambiental que trata das afloraçães de microalgas nocivas junto às comunidades de maricultores, pescadores e outras instituições, de modo a auxiliar no controlo dos riscos para a saúde pública;

i) O Instituto de Apoio à Pesca Artesanal e da Aquicultura e a Direcção Nacional de Pescas e Protecção dos Recursos Pesqueiros devem caracterizar as artes de pesca e fazer o respectivo censo;

j) O INIP deve continuar a realizar cruzeiros de avaliação do caranguejo de profundidade com apoio da indústria ao longo da costa angolana;

k) O Instituto Nacional de Investigação Pesqueira e o Instituto de Apoio à Pesca Artesanal e da Aquicultura devem fazer um estudo do impacto do esforço da pesca artesanal na dinâmica dos Recursos Pesqueiros.

2. Para a sardinha do reino orienta-se o seguinte:

Acompanhar o comportamento e estrutura do recurso na República da Namíbia.

3. Para a cavala orienta-se o seguinte:

Intensificar a recolha de amostras biológicas e em conjunto com a Direcção Nacional de Pescas e Protecção dos Recursos Pesqueiros organizar a estatística de pesca de modo aplicar-se o modelo de análises de coortes.

4. Para as focas orienta-se o seguinte:

a) A captura deve ser acompanhada por técnicos do Instituto Nacional de Investigação Pesqueira, da Direcção Nacional de Pescas e Protecção dos Recursos e dos Serviços Nacionais de Fiscalização da Pesca e da Aquicultura;

b) A instalação de uma fábrica no Município do Tômbwa, Província do Namibe, para processamento das focas.

ANEXO

a que se refere o artigo 9.º do presente Diploma

Item	Recursos/Grupo de Recursos	TAC 2018 (Toneladas)
I	**Crustáceos e moluscos (a)**	**4.590**
a)	Camarão (P. longirostris)	1.200
b)	Alistado (A. narvikensis)	700
c)	Caranguejo de Profundidade	1.200
d)	Cefalópodes	1.400
e)	Gamba Costeira	90
II	**Espécies demersais (b)**	**59 773**
a)	Cachucho e outros espardídeos	7.472
b)	Corvinas	8.657
c)	Garoupas	327
d)	Marionga	6.000
e)	Rasoadores	12.787
f)	Pescada de Benguela	7.195
g)	Pescada do Cabo	2.436
m)	Outras espécies	14.899
III	**Espécies Pelágicas**	**354 867**
a)	Carapau do Cunene	50.000
b)	Carapau do Cabo	30.000
c)	Sardinelas	130.000

Item	Recursos/Grupo de Recursos	TAC 2018 (Toneladas)
d)	Sardinha do Reino	0
e)	Cavala	14.000
f)	Outras espécies	10.869
	Total (I)+(II)+(III)	319.232

O Presidente da República, JOÃO MANUEL GONÇALVES LOURENÇO.

MINISTÉRIOS DAS FINANÇAS E DOS TRANSPORTES

Decreto Executivo Conjunto n.º 3/18
de 22 de Janeiro

Havendo a necessidade de ajustar as Tarifas de Transporte Aéreo de Passageiro para a Rota de Cabinda, visando a adequá-las ao poder de compra da população mediante atribuição de uma subvenção ao preço por passageiro, com vista a materializar a estratégia definida pelo Executivo para a melhoria da mobilidade de transporte aéreo, especialmente entre a Província de Luanda e Cabinda, nos termos prescritos no Decreto Presidencial n.º 325-A/17, de 12 de Dezembro;

Tendo em conta o facto de a Província de Cabinda ser uma localidade de difícil acesso terreste, tornando a via aérea o meio de transporte mais corrente para a mobilidade de passageiros;

Os Ministros das Finanças e dos Transportes, em conformidade com os poderes delegados pelo Presidente da República, nos termos do artigo 137.º da Constituição da República de Angola, conjugado com os n.ºs 1 e 3 do Despacho Presidencial n.º 289/17, de 13 de Outubro, e de acordo com o n.º 3 do artigo 155.º da Lei n.º 1/08, de 16 de Janeiro — Da Aviação Civil, determinam:

ARTIGO 1.º
(Objecto)

É fixado o Preço de Referência e o Subsídios da Tarifa Aérea na Classe Económica para a Rota de Cabinda.

ARTIGO 2.º
(Tarifa da Classe Económica)

1. A Tarifa Económica de ida e volta para a Rota de Cabinda não deve ser superior a Kz: 27.726,00 (vinte e sete mil setecentos e vinte e seis Kwanzas) por passageiro.

2. A tarifa referida no número anterior é obtida por dedução de um subsídio ao preço, conforme os custos apurados nos termos do disposto no artigo 5.º do presente Diploma.

ARTIGO 3.º
(Tarifa da Classe Executiva)

As Tarifas da Classe Executiva ou dos voos fretados não são subsidiadas pelo Estado Angolano, ficando a sua definição sujeita ao Regime de Preços Vigiados.

ARTIGO 4.º
(Estrutura de Custos)

1. A Estrutura de Custos é referenciada em dólares americanos (U$S) para garantir a comparabilidade na Indústria de Transporte Aéreo sujeita à regulação, certificação e avaliação internacional.

2. A Estrutura de Custos é convertida em moeda nacional, Kwanza, de acordo ao câmbio oficial do Banco Nacional de Angola, referente ao último dia do mês a que fizer referência.

ARTIGO 5.º
(Subsídio ao Preço para a Tarifa Aérea na Rota de Cabinda)

O valor do Subsídio ao Preço da Tarifa Aérea na Rota de Cabinda corresponde ao diferencial entre o valor pago pelo passageiro, para uma passagem de ida e volta, na Classe Económica e os custos apurados, nos termos do n.º 3 do artigo 3.º do Decreto Executivo n.º 77/16, de 25 de Fevereiro.

ARTIGO 6.º
(Pagamento dos subsídios)

1. O pagamento do Subsídio ao Preço para a Tarifa Aérea na Rota de Cabinda é efectuado pelo Instituto de Preços e Concorrência, IPREC, designado, para o efeito, como entidade gestora do serviço de pagamento do referido subsídio.

2. O IPREC é responsável pela verificação da documentação comprovativa da elegibilidade do subsídio, não sendo permitida a realização de pagamentos indevidos, ou efectuados com base em documentação incompleta, ou incorrecta.

ARTIGO 7.º
(Revogação)

São revogadas todas as disposições legais que contrariem o disposto no presente Decreto Executivo Conjunto.

ARTIGO 8.º
(Entrada em vigor)

O presente Diploma entra em vigor na data da sua publicação.

ARTIGO 9.º
(Dúvidas e omissões)

As dúvidas e omissões resultantes da interpretação do presente Diploma são resolvidas pelos Ministros das Finanças e dos Transportes.

Publique-se.

Luanda, 22 de Janeiro de 2018.

O Ministro das Finanças, *Archer Mangueira.*

O Ministro dos Transportes, *Augusto da Silva Tomás.*

CONSELHO SUPERIOR DA MAGISTRATURA JUDICIAL

Aviso n.º 1/18
de 22 de Janeiro

Considerando haver necessidade de se proceder o preenchimento do quadro de Juízes Conselheiros, nos termos da Lei n.º 13/11, de 18 de Março — Orgânica do Tribunal Supremo;

Appendix E: IPA organic statute

Decreto Presidencial n.º 120/14
de 3 de Junho

Havendo necessidade de se adequar o Estatuto Orgânico do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal, nos termos do n.º 1 do Decreto Legislativo Presidencial n.º 2/13, de 25 de Junho, sobre a Criação, Estruturação e Funcionamento dos Institutos Públicos;

O Presidente da República decreta, nos termos da alínea d) do artigo 120.º e do n.º 1 do artigo 125.º, ambos da Constituição da República de Angola, o seguinte:

ARTIGO 1.º
(Aprovação)

É aprovado o Estatuto Orgânico do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal, anexo ao presente Decreto Presidencial e que dele é parte integrante.

ARTIGO 2.º
(Revogação)

É revogada toda a legislação que contrarie o disposto no presente Diploma, nomeadamente o Decreto n.º 45/05, de 8 de Julho.

ARTIGO 3.º
(Dúvidas e omissões)

As dúvidas e omissões suscitadas da interpretação e aplicação do presente Decreto Presidencial são resolvidas pelo Presidente da República.

ARTIGO 4.º
(Entrada em vigor)

O presente Diploma entra em vigor na data da sua publicação.

Apreciado em Conselho de Ministros, em Luanda, aos 2 de Abril de 2014.

Publique-se.

Luanda, aos 14 de Maio de 2014.

O Presidente da República, José Eduardo dos Santos.

ESTATUTO ORGÂNICO DO INSTITUTO DE DESENVOLVIMENTO DA PESCA ARTESANAL E DA AQUICULTURA COMUNAL (IPA)

CAPÍTULO I
Disposições Gerais

SECÇÃO I
Definição, Natureza, Sede e Âmbito

ARTIGO 1.º
(Regime, sede e âmbito)

1. O Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal rege-se pelas regras de criação, estruturação e funcionamento dos Institutos Públicos, estabelecidas pelo Decreto Legislativo Presidencial n.º 2/13, de 25 de Junho, pelo presente Estatuto, pelas normas de procedimento, pela actividade administrativa e demais legislação em vigor aplicável.

2. O Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal tem a sua sede em Luanda e a sua actividade circunscreve-se a todo o território nacional, podendo mediante autorização do órgão de tutela, ter representações nas distintas províncias do País.

SECÇÃO II
Tutela, Superintendência e Atribuições

ARTIGO 3.º
(Tutela e superintendência)

1. O Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal está sujeito à tutela e superintendência do Titular do Poder Executivo por intermédio do Ministério das Pescas, nos termos do disposto no artigo 5.º do Decreto Legislativo Presidencial n.º 2/13, de 25 de Junho ao qual incumbe o seguinte:

a) Aprovar o plano anual e o orçamento proposto pelo Instituto;

b) Acompanhar e avaliar os resultados da actividade do Instituto;

c) Conhecer e fiscalizar a actividade financeira do Instituto;

d) Suspender, revogar e anular nos termos da legislação, os actos dos órgãos próprios de gestão que violem a lei ou sejam considerados inoportunos e inconvenientes para o interesse público.

2. A faculdade a que se refere o número anterior deve ser aplicada no estrito respeito às atribuições e competências legais do Instituto.

3. A superintendência exercida sobre o Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal traduz-se na faculdade que assiste ao Executivo de:

a) Definir as linhas fundamentais e os objectivos principais da actividade do Instituto;

b) Designar os dirigentes do Instituto;

c) Indicar os objectivos, estratégias, metas e critérios de oportunidade político-administrativa, com enquadramento sectorial e global na administração

ARTIGO 4.º
(Atribuições)

O Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal tem as seguintes atribuições:

a) Promover, organizar e efectuar campanhas sociais visando a criação e o desenvolvimento das comunidades piscatórias artesanais e da aquicultura comunal;

b) Elaborar programas de assistência e de apoio técnico à pesca artesanal e de subsistência, nas águas marítimas, continentais e a aquicultura comunal, velando pela sua implementação e acompanhamento;

c) Elaborar estudos de natureza socioeconómica dirigidos à pesca artesanal e aquicultura comunal tendo em conta o desenvolvimento deste subsector e a gestão racional dos recursos piscatórios e da aquicultura comunal;

d) Promover e apoiar o fomento da aquicultura comunal, velando pela sua sustentabilidade e tendo em conta o seu impacto no desenvolvimento do País;

e) Apresentar propostas de criação e orientar o funcionamento dos Centros de Investigação e Desenvolvimento da Aquicultura Comunal;

f) Colaborar com as autoridades locais no desenvolvimento integrado das comunidades piscatórias através da elaboração de estudos técnicos e de captação de fundos financeiros nacionais e externos, tendentes a promover e apoiar a aquicultura e a pesca artesanal responsável;

g) Assegurar a realização de acções com as comunidades de base para promover a adesão livre e voluntária de pescadores artesanais e aquicultores comunais em cooperativas e/ou outras formas de organização comunitária de interesse para a pesca artesanal e a aquicultura comunal;

h) Criar e editar publicações técnico-pedagógicas destinadas à capacitação dos pescadores artesanais e dos aquicultores comunais, garantindo a sua difusão, através dos extensionistas;

i) Promover acções de sensibilização e informação para os pescadores artesanais e para os aquicultores comunais sobre a necessidade de se respeitar as leis e regulamentos e assegurar a auto-renovação dos recursos pesqueiros ou a criação dos recursos aquícolas;

j) Promover acções formativas visando a salvaguarda das espécies, seus ecossistemas e preservação do ambiente;

k) Controlar e acompanhar a actividade da pesca artesanal, marítima e continental e da aquicultura águas doces e salobras, no âmbito da aquicultura comunal;

o) Assegurar a recolha, análise e divulgação de dados de captura e esforço de pesca envolvido na pesca artesanal e na aquicultura;

p) Promover a criação de infra-estruturas para facilitar aos pescadores artesanais e aquicultores comunais, na aquisição de meios para a sua actividade e as respectivas actividades conexas, tais como, venda ou distribuição de combustíveis e materiais de pesca;

q) Acompanhar, em colaboração com outros organismos competentes, a distribuição dos produtos da aquicultura;

r) Registar os centros de larvicultura do País e controlar a distribuição de novas larvas de peixes, assim como a qualidade das mesmas;

s) Disciplinar a gestão e controlar as rações e medicamentos para o peixe utilizado na larvicultura, serviços veterinários de peixes, materiais químicos e bioprodutos usados na aquicultura comunal;

t) Exercer as demais funções que lhe sejam atribuídas por lei ou por determinação superior.

CAPÍTULO II
Organização em Especial

SECÇÃO I
Estrutura Orgânica

ARTIGO 5.º
(Composição)

A estrutura orgânica do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal compreende os seguintes órgãos e serviços:

a) Órgãos de Gestão;

b) Serviços de Apoio Agrupados;

c) Serviços Executivos.

ARTIGO 6.º
(Órgãos de Gestão)

O Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal integra os seguintes órgãos de gestão:

a) Conselho Directivo;

b) Director Geral;

c) Conselho Fiscal;

d) Conselho Técnico Científico.

SUBSECÇÃO I
Conselho Directivo

ARTIGO 7.º
(Natureza e atribuições)

O Conselho Directivo é o órgão colegial que delibera sobre

ARTIGO 8.º
(Composição)

O Conselho Directivo tem a composição seguinte:

a) Director Geral, que o preside;
b) Directores Gerais-Adjuntos;
c) Chefes de Departamento e representantes provinciais do Instituto;
d) Dois vogais, designados pelo Ministro das Pescas.

2. O Director Geral do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal pode convidar outros funcionários e entidades à participarem nas reuniões do Conselho Directivo, sempre que achar conveniente em função das matérias a analisar.

ARTIGO 9.º
(Funcionamento)

1. O Conselho Directivo reúne-se ordinariamente uma vez por mês, e extraordinariamente, sempre que for convocado pelo Director Geral, que o preside.

2. As deliberações do Conselho Directivo são aprovadas por maioria e o Presidente tem voto de qualidade, em caso de empate.

SUBSECÇÃO II
Director Geral

ARTIGO 10.º
(Provimento)

1. O Director Geral é o órgão executivo singular de gestão permanente do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal, nomeado em comissão de serviço, por Despacho do Ministro das Pescas.

2. O Director Geral é coadjuvado por dois Directores Gerais Adjuntos, aos quais podem ser conferidas competências específicas, no âmbito do Estatuto Orgânico ou do regulamento interno do Instituto.

3. Em caso de ausência ou impedimento do Director Geral, este designa um dos seus Directores Gerais-Adjuntos para o exercício das suas funções.

4. Os mandatos do Director Geral e dos Directores Gerais-Adjuntos têm a duração de três anos renováveis.

ARTIGO 11.º
(Competência)

Ao Director Geral compete, nomeadamente o seguinte:

a) Dirigir os serviços internos;
b) Exercer os poderes gerais de gestão técnica, administrativa, financeira e patrimonial;
c) Propor ao Ministro das Pescas a nomeação e exoneração dos Directores Gerais-Adjuntos e outros titulares de cargos de chefia, bem com os representantes provinciais nos termos da legislação aplicável;
d) Preparar os instrumentos de gestão previsional e submeter à aprovação do Conselho Directivo;
e) Remeter os instrumentos de gestão ao Ministro das Pescas e ao Tribunal de Contas, nos termos da lei, após parecer do Conselho Fiscal;
f) Exarar e fiscalizar ordens de serviço e instruções necessárias ao bom funcionamento do Instituto;
g) Convocar e dirigir as reuniões do Conselho Técnico
h) Delegar aos Directores Gerais-Adjuntos os poderes que achar conveniente em função da necessidade de melhorar a gestão do Instituto;
i) Propor e orientar os instrumentos de gestão previsional e os regulamentos internos que se mostrem necessários ao funcionamento do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal;
j) Exercer as demais funções que resultem da lei ou que lhe sejam determinadas superiormente.

SUBSECÇÃO III
Conselho Fiscal

ARTIGO 12.º
(Natureza, atribuições e composição)

1. O Conselho Fiscal é o órgão de controlo e fiscalização interna, ao qual cabe analisar e emitir parecer de índole económico-financeira e patrimonial sobre a actividade do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal, designadamente:

a) Emitir, na data legalmente estabelecida, parecer sobre as contas anuais, o relatório de actividades e a proposta de orçamento privativo do Instituto;
b) Emitir parecer sobre o cumprimento das normas reguladoras da actividade do Instituto;
c) Proceder a verificação regular dos fundos existentes e fiscalizar a escrituração da contabilidade.

2. O Conselho Fiscal é composto por um presidente, designado pelo Ministro das Finanças e dois vogais, indicados pelo Ministro das Pescas, devendo um deles ser especialista em contabilidade pública.

3. O Conselho Fiscal do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal é nomeado pelo Ministro das Pescas.

ARTIGO 13.º
(Funcionamento)

1. O Conselho Fiscal reúne-se em sessões ordinárias, trimestralmente, por convocatória feita nos termos do presente estatuto e demais legislação aplicável e, extraordinariamente, sempre que for convocada pelo seu presidente.

2. A convocatória é feita com pelo menos 10 (dez) dias de antecedência, devendo conter a indicação precisa dos assuntos a tratar e ser acompanhada dos documentos sobre os quais o Conselho é chamado a pronunciar-se, sendo, no final de cada sessão, lavrada a respectiva acta, subscrita nos termos do regulamento interno do Instituto.

3. As reuniões extraordinárias do Conselho Fiscal devem ser convocadas com antecedência mínima de 5 (cinco) dias.

4. As deliberações do Conselho Fiscal são tomadas por maioria simples dos votos de todos os presentes, tornando-se vinculativa a todos os seus membros.

SUBSECÇÃO IV
Conselho Técnico Científico

ARTIGO 14.º
(Natureza, atribuições e composição)

1. O Conselho Técnico Científico é o órgão de assessoria da Direcção do Instituto de Desenvolvimento da Pesca

especializado e alargado, ligadas a investigação científica e desenvolvimento da pesca artesanal marítima, continental e da aquicultura comunal.

2. Ao Conselho Técnico Científico incumbe, em especial, o seguinte:

a) Propor estudos relacionados com os aspectos económicos e sociais determinantes para a gestão da pesca artesanal e da aquicultura comunal;

b) Propor, analisar e emitir pareceres sobre o programa de aperfeiçoamento especialização dos quadros técnicos e científicos;

c) Propor estudos de investigação aplicada à genética e patologias das espécies cultiváveis nas águas marítimas, continentais e salobras;

d) Analisar e aprovar os relatórios de trabalhos de natureza técnico-científica;

e) Propor a divulgação e publicação de estudos de investigação realizados nas Estações Experimentais de Aquicultura e nos Centros de Apoio Integrado à Pesca Artesanal.

3. O Conselho Técnico Científico é constituído por um coordenador que é o Director Geral, Director Técnico, Chefes de Departamento dos Serviços Executivos, e técnicos especialistas do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal.

4. O Conselho Técnico Científico reúne-se ordinariamente uma vez por ano, segundo uma agenda adoptada pelo Director Geral e em sessão extraordinária, sempre que as circunstâncias o justifiquem.

SECÇÃO II
Estrutura Interna

ARTIGO 15.º
(Composição)

A estrutura interna do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal compreende os serviços de apoio agrupados e os Serviços Executivos, respectivamente.

1. Serviços Executivos:
   a) Departamento de Estudos e Projectos;
   b) Departamento de Pesca Artesanal Marítima;
   c) Departamento de Pesca Artesanal Continental;
   d) Departamento de Aquicultura Comunal;
   e) Departamento de Estatística.

2. Serviços de Apoio Agrupados:
   a) Departamento de Apoio ao Director Geral;
   b) Departamento de Administração e Serviços Gerais;
   c) Departamento de Recursos Humanos e das Tecnologias de Informação.

3. O Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal compreende os serviços seguintes:
   a) Centros de Investigação e Desenvolvimento de Aquicultura;
   b) Centros Integrados de Apoio à Pesca Artesanal.

SUBSECÇÃO I
Serviços Executivos

ARTIGO 16.º
(Departamento de Estudos e Projectos)

1. O Departamento de Estudos e Projectos é o serviço executivo do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal que assegura a elaboração de estudos e programas de desenvolvimento da pesca artesanal e da aquicultura comunal.

2. O Departamento de Estudos e Projectos tem as seguintes atribuições:
   a) Propor os programas que visam a promoção da pesca artesanal, marítima, continental e de apoio à aquicultura comunal em termos microeconómicos;
   b) Elaborar os estudos e projectos de desenvolvimento da pesca artesanal, marítima e continental e da aquicultura comunal, de âmbito nacional e local;
   c) Promover acções de formação junto das comunidades piscatórias e aquícolas destinadas à preservação das espécies;
   d) Emitir parecer sobre a concessão de direitos de pesca artesanal, marítima e continental, sobre a respectiva certificação de embarcações e licenciamento da aquicultura comunal;
   e) Assegurar a monitorização e a avaliação dos projectos de desenvolvimento da pesca artesanal e da aquicultura comunal;
   f) Elaborar estudos socioeconómicos, com vista a melhoria das condições de vida das comunidades piscatórias, bem como realizar o melhor enquadramento das suas actividades;
   g) Manter relações estreitas com os centros de formação do ramo das pescas e da aquicultura com vista à obtenção da sua colaboração nas áreas da respectiva competência;
   h) Exercer as demais funções que lhe sejam atribuídas por lei ou por determinação superior.

3. O Departamento de Estudos e Projectos é dirigido por um responsável com a categoria de Chefe de Departamento.

ARTIGO 17.º
(Departamento de Pesca Artesanal Marítima)

1. O Departamento de Pesca Artesanal Marítima é o serviço executivo que assegura a realização e o acompanhamento dos programas e projectos do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal, junto das comunidades de pescadores artesanais marítimos.

2. O Departamento de Pesca Artesanal Marítima tem as seguintes atribuições:
   a) Implementar programas de ajuda às comunidades de pescadores artesanais marítimos;
   b) Manter relações com as autoridades locais tendo em vista o desenvolvimento integrado das comunidades piscatórias marítimas;
   c) Incentivar e aconselhar os pescadores para a utilização dos equipamentos, materiais e das artes de pesca, não lesivas e destrutivas, tendo em conta a sua adequação às características locais;

d) Promover a aplicação mais adequada das técnicas utilizadas pelas mulheres, processadores nas práticas pós-captura no que concerne ao manuseamento, ao processamento, higiene e à comercialização de pescado;

e) Prestar apoio às comunidades piscatórias marítimas na vulgarização das técnicas pós-captura e facilitar o acesso ao crédito bancário;

f) Dinamizar o movimento cooperativo e associativo das comunidades de pescadores artesanais marítimas;

g) Acompanhar a execução dos projectos inerentes à pesca artesanal e avaliar o seu impacto social e económico nas áreas de incidência;

h) Treinar os pescadores, na utilização dos materiais e equipamentos, de segurança a observar-se no mar;

i) Exercer as demais funções que lhe sejam atribuídas por lei ou por determinação superior.

3. O Departamento da Pesca Artesanal Marítima é dirigido por um responsável com a categoria de Chefe de Departamento.

ARTIGO 18.º

(Departamento de Pesca Artesanal Continental)

1. O Departamento de Pesca Artesanal Continental é o serviço executivo que assegura a realização e o acompanhamento dos programas e projectos do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal no fomento, organização de métodos e técnicas para o desenvolvimento da pesca artesanal continental.

2. O Departamento de Pesca Artesanal Continental tem as seguintes atribuições:

a) Implementar programas que visam a promoção e organização da pesca artesanal continental;

b) Garantir o desenvolvimento da pesca artesanal continental no contexto Nacional;

c) Implementar programas de extensão rural, promovendo o desenvolvimento sustentável da pesca artesanal continental à gestão compartilhada e participativa no uso dos recursos biológicos aquáticos;

d) Implementar programas de extensão rural na utilidade de materiais, artefactos e equipamentos de pescas adequados às características e realidades de cada local;

e) Desenvolver acções que promovam a melhoria da qualidade do pescado em toda cadeia produtiva visando a segurança alimentar e a valorização do produto Nacional;

f) Promover a organização das comunidades piscatórias da Pesca Artesanal Continental;

g) Colaborar com outras estruturas do Ministério na identificação e cadastramento dos rios, lagos e lagoas para prática da pesca Continental;

h) Divulgar acções para a criação de infra-estruturas de apoio, manuseamento, processamento dos produtos da pesca às mulheres processadoras e agrupadas em cooperativas e/ou associação;

i) Incentivar experiências de gestão integrada participativa para a protecção dos recursos através de métodos tradicionais e modernos observando a lei vigente para um desenvolvimento sustentável;

j) Identificar os problemas que afectam a pesca continental e propor a solução para o desenvolvimento do subsector;

k) Viabilizar acções específicas dirigidas a juventude na capacitação e orientação com vista a estimular a permanência de jovens no meio rural e desenvolver a pesca continental;

l) Participar nos estudos de identificação das espécies nos lagos, lagoas e rios do País;

m) Prestar apoio à pesca artesanal continental nas práticas pós captura e o acesso a crédito bancário;

n) Garantir a capacitação técnica dos pescadores da pesca artesanal continental através de programas de extensão pesqueira;

o) Promover acções para o enquadramento da pesca artesanal continental nas actividades económicas do País;

p) Exercer as demais funções que lhe sejam atribuídas por lei ou por determinação superior.

3. O Departamento de Pesca Artesanal Continental é dirigido por um responsável com a categoria de Chefe de Departamento.

ARTIGO 19.º

(Departamento de Aquicultura Comunal)

1. O Departamento de Aquicultura Comunal é o serviço executivo do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal, que assegura a coordenação e a realização de estudos científicos, bem como as actividades no domínio da aquicultura comunal, tais como: de fomento, aplicação, adaptação e de desenvolvimento de técnicas de cultivo de organismos aquáticos de interesse económico, de monitorização ambiental das áreas da aquicultura, assim como a promoção do desenvolvimento sustentável da aquicultura comunal nos corpos de águas Nacionais.

2. O Departamento de Aquicultura Comunal, tem as seguintes atribuições:

a) Realizar, promover, organizar e participar em estudos de investigação científica sobre a reprodução, a larvicultura, a nutrição, o crescimento e a engorda das principais espécies marinhas, de águas doces e salobras cultiváveis e de importância económica;

b) Coordenar a identificação, recomendar e emitir pareceres sobre as áreas propícias para o cultivo de espécies aquáticas;

c) Colaborar na realização de mapeamento das áreas com potencialidades para o cultivo de espécies marinhas e de água doce;

d) Levar a cabo estudos de investigação científica sobre a produção de alimento adequado para os organismos marinhos, de águas doces e salobras cultiváveis nas diferentes fases de desenvolvimento;

e) Promover e realizar estudos de selecção de organismos marinhos, das águas doces e salobras cultiváveis, considerando a sua biologia e os aspectos de interesse ecológico e económico;

f) Assegurar a emissão de pareceres sobre os estudos de impacte ambiental no domínio da maricultura e da aquicultura continental;

g) Colaborar no estabelecimento de planos de monitorização ambiental para o controlo dos efluentes

da actividade de aquicultura em águas marinhas, costeiras, salobras e doces de forma a preservar os ecossistemas naturais;

h) Estudar, propor e supervisionar as condições de apoio científico e tecnológico aos aquicultores no domínio da prevenção, diagnóstico e tratamento de patologias de espécies aquáticas cultiváveis;

i) Emitir pareceres sobre as espécies aquáticas endémicas;

j) Propor e promover a transferência de tecnologia para o sector produtivo;

k) Realizar e promover estudos específicos com vista a estabelecer as bases que permitam fomentar a piscicultura integrada e o policultivo;

l) Promover e realizar estudos para a elaboração de listas de produtos químicos que podem ser utilizados na aquicultura;

m) Contribuir para a realização de acções de formação de técnicos de aquicultura e extensionistas;

n) Exercer as demais funções que lhe sejam atribuídas por lei ou por determinação superior.

3. O Departamento de Aquicultura Comunal é dirigido por um responsável com a categoria de Chefe de Departamento.

ARTIGO 20.º
(Departamento de Estatística)

1. O Departamento de Estatística é o serviço executivo do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura, que assegura a recolha, elaboração e tratamento de informação da actividade da pesca artesanal e da aquicultura comunal.

2. O Departamento de Estatística tem as seguintes atribuições:

a) Elaborar programas que visam a recolha, compilação, tratamento e publicação de informação estatística da pesca artesanal marítima, continental e da aquicultura comunal;

b) Elaborar e executar planos de formação junto das comunidades piscatórias e aquícola, destinadas a recolha de dados de capturas e esforços de pesca;

c) Elaborar e publicar estudos estatísticos, relacionados com o exercício da actividade da pesca artesanal marítima, continental e da aquicultura comunal;

d) Assegurar a monitorização da base de dados da pesca artesanal marítima, continental e da aquicultura comunal;

e) Exercer as demais funções que lhe sejam atribuídas por lei ou por determinação superior.

3. O Departamento de Estatística é dirigido por um responsável com a categoria de Chefe de Departamento.

SUBSECÇÃO II
Serviços de Apoio Agrupados

ARTIGO 21.º
(Departamento de Apoio ao Director Geral)

1. O Departamento de Apoio ao Director Geral é o serviço de apoio do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal, ao qual incumbe, entre outras, as funções de assessoria jurídica e de cooperação internacional.

2. O Departamento de Apoio ao Director Geral tem as seguintes atribuições:

a) Assegurar as funções de assessoria jurídica, cooperação internacional, gestão de informação, documentação e imagem;

b) Colaborar na elaboração de projectos de diplomas legais e demais instrumentos jurídicos;

c) Emitir pareceres superiormente solicitados;

d) Assegurar a cooperação com organismos nacionais e estrangeiros congéneres, bem como a participação em reuniões por estes convocados, que digam respeito à pesca artesanal e a aquicultura comunal;

e) Prestar apoio informativo e bibliográfico aos trabalhos do Instituto;

f) Organizar a gestão da biblioteca e assegurar a recepção permanente da informação necessária à prossecução dos objectivos do Instituto;

g) Exercer as demais funções que lhe sejam atribuídas por lei ou por determinação superior.

3. O Departamento de Apoio ao Director Geral é dirigido por um responsável com a categoria de Chefe de Departamento.

ARTIGO 22.º
(Departamento de Administração e Serviços Gerais)

1. O Departamento de Administração e Serviços Gerais é o serviço de apoio do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal, ao qual incumbe, as funções de gestão orçamental, finanças, património, transportes, relações públicas e protocolo do Instituto.

2. O Departamento de Administração e Serviços Gerais tem as seguintes atribuições:

a) Elaborar o projecto anual de orçamento de acordo com o plano de actividades do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura e assegurar a sua execução;

b) Elaborar o relatório de contas de gerência do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura e submetê-lo à apreciação das autoridades competentes;

c) Assegurar a aquisição, manutenção dos bens e equipamentos necessários ao funcionamento corrente do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura e gerir o seu património;

d) Assegurar a execução das actividades de relações públicas e protocolo;

e) Assegurar o apoio logístico a todas as reuniões dos órgãos de gestão, reuniões técnicas, cursos, seminários e outros eventos promovidos pelo Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal;

f) Exercer as demais funções que lhe sejam atribuídas por lei ou por determinação superior.

3. O Departamento de Administração e Serviços Gerais é dirigido por um responsável com a categoria de Chefe de Departamento.

ARTIGO 23.º
(Departamento de Recursos Humanos e das Tecnologias de Informação)

1. O Departamento de Recursos Humanos e das Tecnologias de Informação é o serviço de apoio do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal, ao qual incumbe as funções de gestão de pessoal, modernização e inovação dos serviços do Instituto.

2. O Departamento de Recursos Humanos e das Tecnologias de Informação tem as seguintes atribuições:

a) Assegurar as funções ligadas a gestão de recursos humanos;

b) Elaborar as folhas de efectividade do pessoal e efectuar o processamento e pagamento dos salários destes;

c) Organizar e manter actualizados os processos individuais do pessoal, afecto ao Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal;

d) Assegurar a gestão integrada dos recursos humanos, promover e coordenar as acções da sua superação e formação profissional;

e) Controlar e inscrever o pessoal no serviço nacional de segurança social;

f) Assegurar e coordenar as actividades ligadas a informática do Instituto;

g) Exercer as demais funções que lhe sejam atribuídas por lei ou por determinação superior.

3. O Departamento de Recursos Humanos e das Tecnologias de Informação é dirigido por um responsável com a categoria de Chefe de Departamento.

CAPÍTULO III
Órgãos Locais

ARTIGO 24.º
(Estrutura dos serviços locais)

A nível das províncias e sempre que as necessidades funcionais o justifiquem, podem ser criados por acto conjunto dos Ministros das Pescas e da Administração do Território, serviços locais sob a forma de departamentos provinciais de apoio Integrado à Pesca Artesanal e da Aquicultura Comunal, ao abrigo do disposto na alínea e) do artigo 5.º do Decreto Legislativo Presidencial n.º 2/13, de 25 de Junho, cujas atribuições, estrutura orgânica e competências são estabelecidas em regulamento próprio.

ARTIGO 25.º
(Provimento dos representantes provinciais)

Para efeitos do artigo anterior, os chefes dos serviços locais são providos em comissão de serviço, por Despacho do Ministro das Pescas, sob proposta do Director Geral do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal, depois de ouvida a Direcção Provincial das Pescas da respectiva província, com a categoria equiparada a Chefe

CAPÍTULO IV
Princípios de Gestão

SECÇÃO I
Verbas, Gestão Financeira, Responsabilidades por Actos Financeiros e Instrumentos de Gestão

ARTIGO 26.º
(Verbas)

O IPA dispõe de verbas cabimentadas no Orçamento Geral do Estado, destinadas às despesas com o pessoal, aquisição de material, pagamento de serviços e outros encargos relacionados com a sua actividade.

ARTIGO 27.º
(Gestão financeira e patrimonial)

1. A gestão financeira e patrimonial da dotação orçamental fica sujeita às regras de execução do Orçamento Geral do Estado e ao Plano Geral de Contabilidade Pública.

2. No âmbito das suas atribuições, pode o Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal prestar serviços a outras entidades públicas ou privadas e dispor de conta bancária própria.

3. Para efeitos do número anterior os serviços prestados com carácter de continuidade são liquidados e pagos de acordo com as tabelas de preços a propor pelo Conselho Directivo e aprovar nos termos da legislação aplicável.

4. A alienação de património mobiliário e/ou imobiliário carece de autorização dos Ministros das Pescas e das Finanças.

5. O Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal só deve utilizar os recursos oriundos de transferências do Orçamento Geral do Estado para cobrir as despesas orçamentadas, após esgotadas receitas próprias.

ARTIGO 28.º
(Responsabilidades por actos financeiros)

A prática de actos financeiros, em violação do disposto no artigo 13.º do Decreto Legislativo Presidencial n.º 2/13, de 25 de Junho e das leis gerais sobre a matéria, faz incorrer os seus autores em responsabilidade disciplinar, civil, financeira e criminal que ao caso couber.

ARTIGO 29.º
(Instrumentos de gestão)

1. A gestão do IPA é orientada pelos seguintes instrumentos de gestão:

a) Plano de actividade anual e plurianual;

b) Orçamento próprio anual;

c) Relatório anual de actividades;

d) Balanço e demonstração da origem e aplicação de fundos.

2. Os instrumentos de gestão previsional a que se refere as alíneas a) e b) do número anterior devem, após apreciação e discussão pelo Conselho Directivo, ser submetidos ao Ministério das Pescas para aprovação.

ARTIGO 30.º
(Receitas)

Além das dotações que lhe são atribuídas pelo Orçamento

Artesanal e da Aquicultura Comunal dispõe de receitas próprias, nomeadamente:

a) Quantias recebidas por serviços susceptíveis de cobrança;

b) Produto de venda de publicações e impressos editados pelo Instituto ou deste em colaboração com outras instituições;

c) Valores arrecadados da cobrança de taxas por emissão de certificados de pesca artesanal e aquicultura comunal;

d) Subsídios e as doações que forem concebidos por qualquer entidade pública ou privada nacional ou estrangeira;

e) Quaisquer outras receitas que sejam atribuídas por lei ou provenientes de contrato.

ARTIGO 31.º
(Despesas)

Constituem despesas do Instituto, as seguintes:

a) Os encargos com o respectivo funcionamento;

b) As despesas com o pessoal;

c) Os custos de aquisição, manutenção e conservação de bens, de equipamentos e serviços a serem utilizados.

SECÇÃO II
Prestação de Contas e Sujeição ao Tribunal de Contas

ARTIGO 32.º
(Prestação de contas)

Anualmente, com referência para 31 de Dezembro de cada ano, são submetidos aos órgãos competentes do Ministério das Finanças, com o conhecimento do Ministro das Pescas, os seguintes documentos de prestação de contas:

a) Relatório de encerramento do exercício financeiro, instruído com o parecer do Conselho Fiscal;

b) Balancetes trimestrais.

ARTIGO 33.º
(Sujeição ao Tribunal de Contas)

O Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal está sujeito à fiscalização do Tribunal de Contas.

CAPÍTULO V
Regime Jurídico, Quadro de Pessoal e Suplemento Remuneratório

ARTIGO 34.º
(Quadro de pessoal)

1. O pessoal do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal está sujeito ao regime jurídico da função pública, para todos os efeitos, inclusive os de provimento e disciplina.

2. O IPA tem o quadro de pessoal próprio, reportando ao enquadramento nas carreiras do regime geral da função pública, que constitui Anexo I ao presente Diploma, do qual é parte integrante.

ARTIGO 35.º
(Suplemento remuneratório)

O IPA pode estabelecer uma remuneração suplementar para o seu pessoal, nomeadamente em função da especificidade [illegible] desde que disponha de receitas próprias que o permitem e cujos termos e condições sejam aprovados mediante Decreto Executivo Conjunto dos Ministros das Pescas e das Finanças.

ARTIGO 36.º
(Subsídios)

Ao pessoal do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal são atribuídos subsídios gerais da função pública.

CAPÍTULO VI
Disposições Finais

ARTIGO 37.º
(Regulamentos internos)

Os regulamentos internos dos órgãos e unidades de serviço do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal são aprovados pelo Ministro das Pescas.

ARTIGO 38.º
(Cooperação)

O IPA exerce a sua actividade através dos seus órgãos e/ou serviços, podendo recorrer quando necessário, a quaisquer outras instituições públicas nacionais ou estrangeiras, privadas ou cooperativas, mediante convénios de cooperação ou outros contratos especiais.

ARTIGO 39.º
(Prestação de serviços)

1. O IPA pode, sem prejuízo das atribuições que lhe estão acometidas, prestar serviços ou realizar trabalhos remunerados ou não, que lhe sejam solicitados por entidades públicas, privadas ou cooperativas.

2. Os serviços prestados com carácter de continuidade são liquidados e pagos de acordo com as tabelas de preço a propor pelo Conselho Directivo e a aprovar nos termos da legislação aplicável.

ARTIGO 40.º
(Formação)

O Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal assegura o aperfeiçoamento permanente dos seus trabalhadores.

ARTIGO 41.º
(Património)

Constitui património do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal o imóvel da sua sede, os bens, direitos e obrigações que adquira ou contraia no exercício das suas actividades e o que lhes vierem a ser disponibilizados pelo Ministério das Pescas.

ARTIGO 42.º
(Organigrama)

O Organigrama do Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura Comunal é o que consta do Anexo II ao presente Diploma, do qual é parte integrante.

ARTIGO 43.º
(Arquivo)

Os elementos de contabilidade e os expedientes úteis gerais são conservados em arquivo durante o prazo de 15 anos, podendo os restantes elementos serem inutilizados mediante autorização do Ministro das Pescas.

ARTIGO 44.º
(Direito subsidiário)

Em todas as matérias não previstas expressamente no presente Estatuto e nos regulamentos do IPA, são aplicadas as disposições legais em vigor e as instruções do Ministério das Pescas.

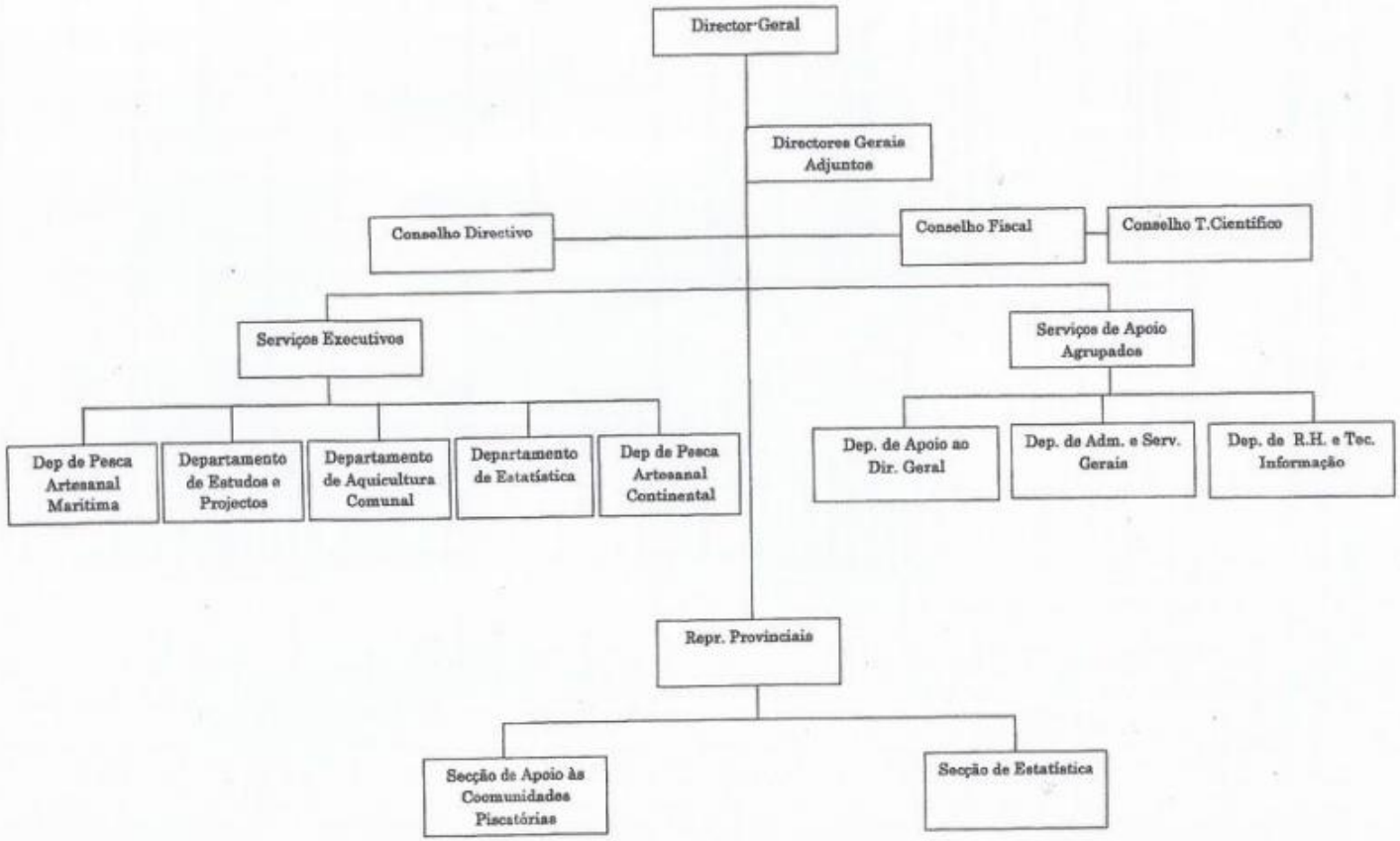
ANEXO I

Quadro de Pessoal a que se refere o artigo 34.º

Grupo de Pessoal	Carreira	Categoria/Cargo	Indicação Obrigatória da Especialização Profissional a Admitir	N.º de Lugares
Direcção		Director Geral Director Geral-Adjunto		3
Direcção E Chefia		Chefe de Departamento Chefe de Secção		26
Técnico Superior	Técnica Superior	Assessor Principal Primeiro Assessor Assessor Técnico Superior Principal Técnico Superior de 1.ª Classe Técnico Superior de 2.ª Classe	Biologia, Economia, Direito, Psico-logia, Recursos Humanos Adminis-tração Pública, Relações Internacionais, Gestão de Recursos Pesqueiros	32
Técnico	Técnica	Especialista Principal Especialista de 1.ª Classe Especialista de 2.ª Classe Técnico de 1.ª Classe Técnico de 2.ª Classe Técnico de 3.ª Classe	Gestão R. Humanos, Tecnologia de Pescado Biologia, Mestre de Pesca e Administração Pública	14
Técnico Médio	Técnica Média	Técnico Médio Princip. de 1.ª Classe Técnico Médio Princip. de 2.ª Classe Técnico Médio Princip. de 3.ª Classe Técnico Médio de 1.ª Classe Técnico Médio de 2.ª Classe Técnico Médio de 3.ª Classe	Gestão, Tecnologia de Pescado, Biológia, Gestão R. Humanos, Mestre de Pesca	25
Administrativo	Administrativa	Oficial Administrativo Principal Primeiro Oficial Administrativo Segundo Oficial Administrativo Terceiro Oficial Administrativo Aspirante Escriturário-Dactilógrafo		21
	Tesoureiro	Tesoureiro Principal Tesoureiro de 1.ª Classe Tesoureiro de 2.ª Classe		0
	Motoristas de Pesados	Motorista de Pesados Principal Motorista de Pesados de 1.ª Classe Motorista de Pesados de 2.ª Classe		3
	Motoristas de Ligeiros	Motorista de Ligeiros Principal Motorista de Ligeiros de 1.ª Classe Motorista de Ligeiros de 2.ª Classe		4
	Telefonista	Telefonista Principal Telefonista de 1.ª Classe Telefonista de 2.ª Classe		0
Auxiliar	Auxiliar Administrativa	Auxiliar Administrativo Principal Auxiliar Administrativo de 1.ª Classe Auxiliar Administrativo de 2.ª Classe		0
	Auxiliar de Limpeza	Auxiliar de Limpeza Principal Auxiliar de Limpeza de 1.ª Classe Auxiliar de Limpeza de 2.ª Classe		1
	Operário	Encarregado Operário Qualificado de 1.ª Classe Operário Qualificado de 2.ª Classe		1
		Encarregado Operário não Qualificado de 1.ª Classe Operário não Qualificado de 2.ª Classe		0
Total				130

ANEXO II

Organigrama a que se refere o artigo 42.º



O Presidente da República, JOSÉ EDUARDO DOS SANTOS.

Appendix F: MINPESMAR organic statute

Quarta-feira, 31 de Janeiro de 2018 I Série – N.º 14

DIÁRIO DA REPÚBLICA

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SUMÁRIO

PRESIDENTE DA REPÚBLICA

Decreto Presidencial n.º 23/18
de 31 de Janeiro

Considerando a necessidade de se adequar o Estatuto Orgânico do Ministério das Pescas e do Mar ao Diploma que rege a Organização e o Funcionamento dos Órgãos Auxiliares do Presidente da República, designadamente o Decreto Legislativo Presidencial n.º 3/17, de 13 de Outubro;

Com vista a dotar o Ministério das Pescas e do Mar de uma estrutura orgânica e funcional que lhe permita desenvolver com maior eficiência e eficácia a sua actividade, em função das novas atribuições;

O Presidente da República decreta, nos termos da alínea g) do artigo 120.º e do n.º 3 do artigo 125.º, ambos da Constituição da República de Angola, o seguinte:

ARTIGO 1.º
(Aprovação)

É aprovado o Estatuto Orgânico do Ministério das Pescas e do Mar, anexo ao presente Decreto Presidencial e que dele é parte integrante.

ARTIGO 2.º
(Revogação)

É revogada toda a legislação que contrarie o disposto no presente Diploma, nomeadamente o Decreto Presidencial n.º 92/14, de 25 de Abril.

ARTIGO 3.º
(Dúvidas e omissões)

As dúvidas e omissões resultantes da interpretação e aplicação do presente Decreto Presidencial são resolvidas pelo Presidente da República.

ARTIGO 4.º
(Entrada em vigor)

O presente Diploma entra em vigor na data da sua publicação.

Apreciado em Conselho de Ministros, em Luanda, aos 8 de Dezembro de 2017.

Publique-se.

Luanda, aos 26 de Janeiro de 2018.

O Presidente da República, João Manuel Gonçalves Lourenço.

ESTATUTO ORGÂNICO DO MINISTÉRIO DAS PESCAS E DO MAR

CAPÍTULO I
Disposições Gerais

ARTIGO 1.º
(Natureza)

O Ministério das Pescas e do Mar abreviadamente designado «MINPESMAR», é o órgão do Executivo responsável pela elaboração, execução, supervisão e controlo da política de gestão e ordenamento dos recursos aquáticos, e das actividades de pesca e aquicultura, da produção do sal, bem como da coordenação transversal dos assuntos do mar, a investigação, inovação e o desenvolvimento tecnológico na área do mar, o seu ordenamento, prospecção, uso, exploração e potenciação de recursos aquáticos, e de uma economia do mar sustentável.

ARTIGO 2.º
(Atribuições)

O Ministério das Pescas e do Mar tem as seguintes atribuições:

a) Propor a estratégia e implementar as políticas de desenvolvimento das pescas, da aquicultura e da produção do sal, em especial no que concerne a exploração e aproveitamento dos recursos pesqueiros, a produção no domínio da aquicultura, produção do sal e de outros recursos aquáticos;

b) Conceber e implementar em coordenação com os órgãos competentes do Executivo, Estratégias Nacionais para o Mar, para a Conservação da Natureza e da Biodiversidade Marinha, e para a Gestão Integrada da Zona Costeira;

c) Promover o desenvolvimento sustentável do Sector e assegurar, em colaboração com outros organismos competentes, a implementação das medidas de preservação e gestão sustentável dos recursos e ecossistemas aquáticos;

d) Assegurar a integração harmoniosa do Plano de Ordenamento da Pesca, da aquicultura e do Sal, no Plano de Desenvolvimento Económico e Social do País;

e) Assegurar a realização da investigação científica e do desenvolvimento tecnológico nos domínios da pesca, da aquicultura e do mar, em colaboração com os órgãos competentes do Estado;

f) Definir os requisitos técnicos e higio-sanitários a observar na produção, processamento, transporte, armazenamento e distribuição dos produtos da

g) Promover a cooperação internacional e regional no âmbito das pescas, da aquicultura, do sal e das questões do mar;

h) Elaborar a regulamentação necessária para uma gestão eficiente e sustentada dos recursos aquáticos;

i) Assegurar, de acordo com as orientações da política geral das pescas e da indústria, o desenvolvimento harmonioso da frota e da indústria da pesca nacional, através de instrumentos reguladores e de controlo do esforço de pesca e de transformação e processamento dos produtos da pesca e da aquicultura;

j) Elaborar na base de planos de ordenamento dos recursos, os programas de concessão de direitos e atribuição de licenças de pesca, e da aquicultura, zelando pela defesa da concorrência;

k) Assegurar o controlo, registo e monitorização dos dados relativos às capturas de recursos da pesca e respectivas operações conexas nas águas marítimas e continentais sob jurisdição angolana, bem como os respeitantes aos direitos de pesca, a produção no domínio da aquicultura e extracção do sal, em colaboração com as entidades competentes;

l) Promover e fomentar o desenvolvimento da pesca artesanal e da aquicultura, e assegurar os respectivos trabalhos de extensão;

m) Promover, em colaboração com os organismos competentes do Executivo, a formação técnico-profissional dos trabalhadores das pescas, da aquicultura, do sal e da área marinha;

n) Promover e acompanhar em colaboração com outros órgãos do Executivo, a execução dos projectos relacionados com a construção, reparação e gestão de portos e terminais de pesca, ancoradouros, obras acostáveis e outras infra- estruturas marinhas e fluviais de apoio às embarcações de pesca;

o) Coordenar toda a actividade de fiscalização do exercício da pesca nas águas interiores, na orla costeira, no mar territorial e na Zona Económica exclusiva, e nas águas fluviais, colaborando quando necessário com outros organismos competentes e assegurar as respectivas sanções;

p) Coordenar com os Ministérios competentes e os Governos Provinciais, o controlo das descargas agrícolas, aquícolas, industriais e outros efeitos da poluição sobre o ambiente aquático;

q) Coordenar com os Departamentos Ministeriais competentes a emissão de regulamentos de gestão da qualidade, segurança dos produtos da pesca

r) Orientar e disseminar informação sobre a transferência técnica e de tecnologia em matéria de pesca, aquicultura e do sal, processamento de produtos de pesca, protecção dos recursos pesqueiros e ecossistemas aquáticos;

s) Propor a regulamentação da actividade das entidades que actuam no Sector Marítimo, no âmbito das suas atribuições, designadamente aprovando normas administrativas de regulamentação do Sector, em articulação com os Departamentos Ministeriais competentes;

t) Emitir pareceres e recomendações sobre planos e projectos de instalações de infra-estruturas e de realização de obras no mar, em coordenação com outros órgãos ou entidades relevantes, sobretudo referentes a hidráulica marítima, ou de dragagens, que possam alterar o regime hidráulico dos portos, e sobre os trabalhos que possam originar poluição marinha;

u) Desenvolver as políticas de ordenamento e gestão dos espaços marítimos sob soberania ou jurisdição angolana, e garantir a sua execução e avaliação, promovendo a articulação com as políticas de ordenamento da orla costeira;

v) Realizar estudos de diagnóstico, controlo e mitigação da poluição marinha;

w) Assegurar a protecção e o aproveitamento sustentável de todos os recursos aquáticos, a excepção dos hidrocarbonetos, compreendendo também a organização e o planeamento do território e do espaço marítimo na perspectiva potenciadora e do desenvolvimento económico;

x) Criar mecanismos que permitam efectuar uma adequada monitorização do turismo marítimo em Angola, e assegurar o cumprimento de medidas que permitam propiciar a prática adequada da pesca desportiva, em colaboração com os Departamentos Ministeriais competentes;

y) Proceder ao acompanhamento dos trabalhos referentes a submissão da República de Angola na Organização das Nações Unidas, para a determinação do limite exterior da plataforma continental, assim como para a delimitação da fronteira marítima a Norte do País;

z) Proceder a supervisão e ao acompanhamento metodológico do sistema de balizagem e de sinais marítimos instalados ou a instalar em todo o território nacional, incluindo engenhos fixos no mar, em conformidade com as regras internacionais aplicáveis, e emitir parecer sobre os projectos ou

aa) Proceder a investigação das causas dos acidentes marítimos, e emitir recomendações em matéria de segurança marítima, com o objectivo de reduzir a sinistralidade marítima;

bb) Exercer as demais atribuições estabelecidas por lei ou determinadas superiormente.

CAPÍTULO II
Organização em Geral

ARTIGO 3.º
(Órgãos e serviços)

O Ministério das Pescas e do Mar compreende os seguintes órgãos e serviços:

1. Órgãos de Direcção:
   a) Ministro;
   b) Secretários de Estado.
2. Órgãos de Apoio Consultivo:
   a) Conselho Consultivo;
   b) Conselho de Direcção;
   c) Conselho Técnico-Científico;
   d) Conselho de Gestão Integrada dos Recursos Aquáticos.
3. Serviços Executivos Directos:
   a) Direcção Nacional de Pescas;
   b) Direcção Nacional de Infra-Estruturas e Indústria;
   c) Direcção Nacional de Aquicultura;
   d) Direcção Nacional de Produção e Iodização do Sal;
   e) Direcção Nacional para os Assuntos do Mar.
4. Serviços de Apoio Técnico:
   a) Secretaria Geral;
   b) Gabinete de Recursos Humanos;
   c) Gabinete de Estudos, Planeamento e Estatística;
   d) Gabinete de Inspecção;
   e) Gabinete Jurídico;
   f) Gabinete de Intercâmbio;
   g) Gabinete de Tecnologias de Informação;
   h) Gabinete de Comunicação Institucional e Imprensa.
5. Serviços de Apoio Instrumental:
   a) Gabinete do Ministro;
   b) Gabinete do Secretário de Estado.
6. Órgãos Superintendidos:
   a) Instituto Nacional de Investigação Pesqueira e Marinha;
   b) Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura;
   c) Instituto Nacional de Apoio às Indústrias de Pesca e Investigação Tecnológica;
   d) Serviço Nacional de Fiscalização de Pescas e da Aquicultura;
   e) Fundo de Apoio ao Desenvolvimento da Indústria Pesqueira e da Aquicultura;

CAPÍTULO III
Organização em Especial

SECÇÃO I
Direcção e Coordenação do Ministério

ARTIGO 4.º
(Ministro e Secretários de Estado)

1. O Ministro das Pescas e do Mar é o órgão a quem compete dirigir, coordenar e controlar toda a actividade dos serviços do Ministério, bem como exercer os poderes de superintendência sobre os serviços colocados sob sua dependência.

2. No exercício das suas funções, o Ministro das Pescas e do Mar é coadjuvado por Secretários de Estado, a quem compete delegar competências para acompanhar tratar e decidir os assuntos relativos à actividade e ao funcionamento do Ministério.

3. Nas suas ausências ou impedimento o Ministro é substituido por um dos Secretários de Estado.

ARTIGO 5.º
(Competências do Ministro)

1. O Ministro das Pescas e do Mar no exercício das suas funções tem as seguintes competências:

a) Assegurar sob responsabilidade própria a execução das leis e outros diplomas legais afectos ao Sector, bem como tomar as decisões necessárias para tal fim;

b) Orientar, coordenar e fiscalizar toda a actividade do Ministério, nos termos da lei e de acordo com as orientações superiores;

c) Dirigir e superintender a actividade dos Secretários de Estado, Directores Nacionais e Equiparados;

d) Decidir nos termos da lei sobre a concessão de direitos e atribuição de licenças de pesca, da aquicultura e do sal;

e) Superintender todas as actividades e acções de fiscalização do exercício da pesca, da aquicultura e do sal, bem como do mar e do seu ordenamento;

f) Decidir nos termos da lei aplicável sobre a imposição de sanções, ou a remessa dos respectivos autos para o tribunal competente, adopção de medidas complementares nos processos de infracções de pesca, da aquicultura e do mar;

g) Gerir o orçamento do Ministério;

h) Orientar a política dos quadros em coordenação com os órgãos nacionais competentes;

i) Exercer as demais competências estabelecidas por lei ou determinadas superiormente.

SECÇÃO II
Órgãos de Apoio Consultivo

ARTIGO 6.º
(Conselho Consultivo)

1. O Conselho Consultivo do Ministério das Pescas e do Mar é o órgão colegial de consulta do Ministério, ao qual

2. O Conselho Consultivo é presidido pelo Ministro e integra os seguintes membros:

a) Secretários de Estado;

b) Directores Nacionais e Equiparados;

c) Directores Gerais dos Serviços Superintendidos;

d) Chefes de Departamento dos Serviços Centrais;

e) Representantes dos Governos Provinciais;

f) Representantes das Associações dos Profissionais de Pesca e da Aquicultura de âmbito nacional;

g) Representantes de empresas do Sector.

3. O Ministro pode convidar, para participar no Conselho Consultivo, funcionários do Ministério, directores de empresas, representantes de outros organismos ou órgãos do Estado, instituições especializadas, associações profissionais de pesca e da aquicultura quando julgar necessário.

4. O Conselho Consultivo regesse por um regimento a ser aprovado por Decreto Executivo do Ministro.

5. O Conselho Consultivo reúne-se em regra duas vezes por ano, em conformidade com o preceituado na lei.

ARTIGO 7.º
(Conselho de Direcção)

1. O Conselho de Direcção é o órgão colegial restrito de consulta do Ministro em matéria de planeamento, de programação, organização e controlo das actividades do Ministério.

2. O Conselho de Direcção é presidido pelo Ministro e tem a seguinte composição:

a) Secretários de Estado;

b) Directores Nacionais e Equiparados;

c) Directores Gerais das Instituições Superintendidas.

3. Sempre que os assuntos em análise o exijam o Ministro das Pescas e do Mar pode convidar funcionários técnicos de outros sectores ou áreas especializadas de interesse para o Sector, bem como empresas de pesca e de aquicultura a participarem do Conselho de Direcção.

4. O Conselho de Direcção reúne-se em regra trimestralmente, em conformidade com a lei.

5. O Conselho de Direcção rege-se por um regimento, a ser aprovado por Decreto Executivo do Ministro.

ARTIGO 8.º
(Conselho Técnico-Científico)

1. O Conselho Técnico-Científico é o órgão de apoio consultivo do Ministro das Pescas e do Mar, para as questões de foro especializado e alargado, ligadas aos planos de ordenamento e gestão de recursos aquáticos e do mar, competindo-lhe em especial:

a) Emitir parecer sobre a adequação da capacidade e esforço de pesca aos mananciais exploráveis com base em recomendações científicas;

b) Analisar medidas técnicas de conservação das espécies, metodologia e normas destinadas ao apoio

2. O Conselho Técnico-Cientifico é presidido pelo Ministro e integra os seguintes membros:

a) Secretários de Estado;

b) Directores de Serviços de Apoio Técnico;

c) Directores de Serviços Executivos Directos;

d) Titulares dos órgãos superintendidos previstos nas alíneas a), b), c), d), e) e f) do n.º 6 do artigo 3.º;

e) Chefes dos Departamentos de Investigação Pesqueira.

3. Sempre que os assuntos em análise o exijam, o Ministro das Pescas e do Mar pode convidar funcionários e técnicos de outros sectores ou áreas, especializadas de interesse para o Sector a participarem das reuniões do Conselho Técnico-Cientifico.

4. O Conselho Técnico-Cientifico reúne-se em regra duas vezes ao ano, em conformidade com a lei.

5. O Conselho Técnico-Cientifico rege-se por um regimento a ser aprovado por Decreto Executivo do Ministro.

ARTIGO 9.º

(Conselho de Gestão Integrada dos Recursos Aquáticos)

1. O Conselho de Gestão Integrada dos Recursos Aquáticos é um órgão de apoio consultivo do Ministro das Pescas e do Mar, em matérias de concertação periódica e sócio-económica sobre o ordenamento e gestão dos recursos pesqueiros e da aquicultura.

2. O Conselho de Gestão Integrada dos Recursos Aquáticos é presidido pelo Ministro e integra os seguintes membros:

a) Secretários de Estado;

b) Directores dos Serviços de Apoio Técnico;

c) Directores dos Serviços Executivos Directos;

d) Titulares dos órgãos superintendidos previstos nas alíneas a), b), c), d), e) e f) do n.º 6 do artigo 3.º;

e) Chefes dos Departamentos e Centros de Investigação Pesqueira;

f) Chefes dos Centros de Apoio Integrado à Pesca Artesanal e Aquicultura;

g) Técnicos ou especialistas nacionais e estrangeiros de recomendada capacidade cientifica em matéria ambiental, biológica e multidisciplinar, convidados expressamente para o efeito pelo Ministro das Pescas e do Mar;

h) Representantes e técnicos dos Departamentos Ministeriais de instituições públicas ou privadas cuja actividade concorra para a coordenação da execução de politicas e gestão de actividades aquáticas e dos recursos aquáticos, respectivamente, que a convite do Ministro das Pescas e do Mar sejam designados, nomeadamente, pelos respectivos Ministros, ou responsáveis máximos dos pelouros do Ordenamento do Território e Reforma do Estado, ambiente, dos recursos minerais e petróleos, energia e águas, transportes, indústria, geologia e minas, turismo, assim como universidades cujas actividades sejam de interesse para o Sector Pesqueiro;

i) Representantes de cooperativas e associações de pesca e de aquicultura convidados expressamente para o efeito pelo Ministro das Pescas e do Mar;

j) Responsáveis provinciais das pescas que sejam convidados casuisticamente pelo Ministro das Pescas e do Mar.

3. Sempre que os assuntos em análise o exijam, o Ministro das Pescas pode convidar funcionários e técnicos de outros sectores ou de áreas especializadas de interesse para o Sector a participarem das reuniões do Conselho de Gestão integrada dos Recursos Aquáticos.

4. O Conselho de Gestão Integrada dos Recursos Aquáticos reúne-se em regra duas vezes ao ano em conformidade com a lei.

5. O Conselho de Gestão Integrada dos Recursos Aquáticos rege-se por um regimento a ser aprovado por Decreto Executivo do Ministro.

SECÇÃO III

Serviços Executivos Directos

ARTIGO 10.º

(Direcção Nacional de Pescas)

1. A Direcção Nacional de Pescas é o serviço com funções de concepção, direcção, controlo e execução da politica pesqueira, e de protecção e desenvolvimento dos recursos pesqueiros.

2. A Direcção Nacional de Pescas tem as seguintes competências:

a) Assegurar a gestão, conservação e protecção dos recursos biológicos aquáticos de forma sustentada, e estabelecer mecanismos eficazes de monitorização e controlo das actividades das Pescas e do Mar;

b) Pronunciasse previamente sobre o arranjo e as especificações técnicas das embarcações cuja autorização de construção ou modificação seja requerida, e submete-las à aprovação do Ministro das Pescas e do Mar, de forma a assegurar o crescimento harmonioso da frota pesqueira;

c) Gerir as operações de pesca levadas a cabo quer nas águas continentais, quer nas oceânicas sob jurisdição nacional, de acordo com os planos de ordenamento e legislação concernente;

d) Executar todos os procedimentos administrativos conducentes ao acesso aos recursos aquáticos nas condições previstas na legislação pesqueira e os processos de exportação e importação de produtos derivados do exercício da pesca;

e) Propor e adoptar planos de gestão das pescarias em colaboração com outras instituições do Ministério, incluindo organizações da comunidade pesqueira

g) Propor a concessão e o cancelamento de licenças e direitos de pesca de acordo com o estabelecido na legislação vigente;

h) Propor a listagem de espécies aquáticas que podem ser importadas e exportadas;

i) Propor os regulamentos relativos as actividades e épocas de pesca, as espécies que necessitam de protecção ou reabilitação, bem como as medidas para proteger os ecossistemas aquáticos, preservação das fontes genéticas e biodiversidade;

j) Propor a realização de cruzeiros de investigação e avaliação, incluindo a prospecção de novos recursos pesqueiros;

k) Assegurar em colaboração com os organismos competentes, a gestão das águas continentais protegidas e parques marinhos;

l) Participar na elaboração de programas sectoriais de desenvolvimento das indústrias pesqueiras, salineira, de reparação e construção de embarcações de pesca;

m) Cadastrar os titulares de direitos de pesca, as embarcações de pesca, respectivos armadores, tripulações, e efectuar os correspondentes averbamentos de declaração de caducidade da inscrição;

n) Propor denominações e padrões dos membros da tripulação e de embarcações pesqueiras;

o) Promover a adopção e controlar a execução de medidas de ordenamento de pesca que compatibilizam a sustentabilidade dos recursos pesqueiros e a obtenção de melhores resultados económicos e sociais;

p) Participar com as estruturas competentes no estabelecimento de politicas de comercialização de pescado, e colaborar no acompanhamento da sua distribuição;

q) Participar na elaboração de planos sobre a indústria de processamento e transformação de produtos da pesca;

r) Exercer as demais competências estabelecidas por lei ou determinadas superiormente.

3. A Direcção Nacional de Pescas compreende a seguinte estrutura:

a) Departamento de Gestão e Protecção das Pescarias;

b) Departamento de Gestão e Monitorização da Frota;

c) Departamento de Registo e Controlo dos Produtos de Exportação e Importação.

4. A Direcção Nacional de Pescas é dirigida por um Director Nacional.

ARTIGO 11.º

(Direcção Nacional de Infra-Estruturas e Indústria)

1. A Direcção Nacional de Infra-Estruturas e Indústria é o apoio às pescas nos domínios portuário, industrial, construção e reparação naval, conservação, transformação, distribuição e apoio à organização e funcionamento das redes de comercialização e pesquisa de mercados externos dos produtos da pesca e da aquicultura.

2. A Direcção Nacional de Infra-Estruturas e Indústria tem as seguintes competências:

a) Assegurar a concepção e a adopção de politicas e de medidas de implementação, organização e funcionamento de redes de infra-estruturas de apoio a pesca e à aquicultura, e de distribuição e comercialização dos respectivos produtos, em colaboração com estruturas de outros organismos competentes;

b) Assegurar a concepção e a implementação de politicas e de medidas de processamento e transformação dos produtos da pesca e da aquicultura, em condições adequadas à sua inocuidade, preservação do seu valor nutricional, redução de desperdicios e minimização dos efeitos negativos para o ambiente;

c) Difundir e promover a utilização de tecnologias e métodos adequados no domínio de infra-estruturas de apoio à pesca e estaleiro;

d) Zelar pela optimização dos mecanismos, infra-estruturas e equipamentos de construção e reparação naval, carga e descarga, e conservaçao da qualidade dos produtos da pesca e da aquicultura;

e) Coordenar com os Departamentos Ministeriais competentes o estabelecimento de politicas de comercialização, promover a criação e organização de lotas de pescado e a pesquisa de mercados;

f) Pronunciar-se previamente sobre o arranjo geral e especificações técnicas das infra-estruturas de pescas e da aquicultura, processamento e transformação de produtos da pesca e da aquicultura, cuja autorização de construção ou modificação for requerida, e submete-la à aprovação do Ministro das Pescas e do Mar;

g) Cadastrar os estabelecimentos de transformação e processamento dos produtos de pesca e da aquicultura, proceder a sua inspecção higio-sanitária, propor o licenciamento ou cancelamento das respectivas licenças e efectuar o averbamento da declaração de caducidade da sua inscrição;

h) Instruir a implementação de planos directores de infra-estruturas de apoio à pesca e à aquicultura;

i) Regular as condições de produção, e padrões higio-sanitários na captura, processamento, conservação e transporte dos produtos da pesca e da aquicultura para importação e exportação e gerir a respectiva qualidade;

de regulamentos de gestão de qualidade e rastreabilidade dos produtos da pesca e da aquicultura, bem como controlar a sua execução;

k) Participar da formulação e emissão dos padrões de qualidade, normas e regulamentos dos produtos da pesca, da aquicultura, equipamentos, infra-estruturas e indústrias;

l) Assegurar a certificação higio-sanitária dos produtos da pesca, da aquicultura e do sal;

m) Desenvolver em coordenação com as estruturas competentes dos demais Departamentos Ministeriais, os sistemas de portos pesqueiros e locais de desembarque do pescado, de acordo com o plano-director aprovado pelas autoridades competentes;

n) Assegurar a realização de acções de inspecção as infra-estruturas e indústrias públicas e privadas, em matérias de incidência ambiental marítima, adoptando medidas que previnam ou eliminem situações de perigo grave para a saúde e segurança públicas, dos bens e ambiente;

o) Coordenar, com as estruturas competentes dos demais Departamentos Ministeriais, o estabelecimento de políticas de comercialização e pesquisa de mercados externos de pescado;

p) Registar e inspeccionar a segurança técnica dos equipamentos de acordo com os padrões restritos de segurança do Sector das Pescas, tais como caldeiras, bombas de compressão e câmaras de refrigeração;

q) Acompanhar, em colaboração com outros organismos competentes, a distribuição e comercialização grossista, dos produtos da pesca e da aquicultura;

r) Coordenar com as estruturas competentes dos demais Departamentos Ministeriais, as políticas de ordenamento da orla costeira e na identificação de espaços para a instalação de infra-estruturas e indústrias;

s) Emitir parecer sobre os processos de licenciamento de estabelecimentos de transformação e processamento dos produtos das pescas;

t) Exercer as demais competências estabelecidas por lei ou determinadas superiormente.

3. A Direcção Nacional de Infra-Estruturas e Indústria compreende a seguinte estrutura:

a) Departamento de Infra-Estruturas;

b) Departamento de Pesquisa de Mercados e Redes de Distribuição;

c) Departamento da Indústria.

ARTIGO 12.º
(Direcção Nacional de Aquicultura)

1. A Direcção Nacional de Aquicultura é o serviço executivo responsável pelas funções de concepção, direcção, controlo e execução da política da aquicultura.

2. A Direcção Nacional de Aquicultura tem as seguintes competências:

a) Assegurar a elaboração de políticas, programas e planos de desenvolvimento sustentável e estabelecer mecanismos eficazes de monitorização e controlo das actividades da aquicultura;

b) Acompanhar, em colaboração com outros organismos competentes, a distribuição dos produtos da aquicultura;

c) Propor a regulamentação da introdução, domesticação, preservação, selecção, importação, e exportação de larvas, de peixes, e de outras espécies potenciais para a aquicultura;

d) Registar os centros de larvicultura do País, e declarar o reconhecimento de novas larvas de peixes e outras espécies potenciais para a aquicultura, assim como a gestão da qualidade das mesmas;

e) Promover e incentivar o surgimento de infra-estruturas para o desenvolvimento da aquicultura comercial;

f) Assegurar a gestão disciplinar, e controlar o alimento para o peixe utilizado na larvicultura, serviços veterinários de peixes, materiais químicos e bio-produtos usados na aquicultura;

g) Promover com as entidades competentes dos demais Departamentos Ministeriais e Governos Provinciais, o controlo das descargas agrícolas, aquícolas e industriais e outros da poluição sobre o ambiente da piscicultura nos termos da legislação aplicável;

h) Promover e incentivar a execução da política e medidas de desenvolvimento da aquicultura, de acordo com os respectivos planos directores, bem como a observação dos padrões de qualidade legalmente estabelecidos para os produtos da aquicultura;

i) Cadastrar os estabelecimentos de aquicultura e respectivos titulares, e propor o licenciamento ou cancelamento das respectivas licenças, que compatibilizam a sustentabilidade dos recursos, e a obtenção de melhores resultados económicos e sociais;

j) Exercer as demais competências estabelecidas por lei ou determinadas superiormente.

3. A Direcção Nacional de Aquicultura compreende a seguinte estrutura:

a) Departamento de Maricultura;

4. A Direcção Nacional de Aquicultura é dirigida por um Director Nacional.

ARTIGO 13.º
(Direcção Nacional de Produção e Iodização do Sal)

1. A Direcção Nacional de Produção e Iodização do Sal é o serviço encarregue de assegurar a produção, o controlo da qualidade, iodização e estabelecimento de quotas de importação de sal.

2. A Direcção Nacional de Produção e Iodização do Sal tem as seguintes competências:

a) Assegurar o licenciamento, cadastramento dos estabelecimentos de produção do sal e efectuar o averbamento da declaração de caducidade da sua inscrição;

b) Instruir a implementação de planos e propor estudos de apoio à indústria de produção do sal;

c) Coordenar com as estruturas competentes dos demais Departamentos Ministeriais a emissão de regulamentos relativos a iodização, higienização e refinação do sal, gestão da qualidade, condições de produção, conservação e transporte do sal;

d) Participar na formulação e emitir os padrões de qualidade do sal;

e) Acompanhar em colaboração com outros organismos competentes, a distribuição do sal;

f) Coordenar com as estruturas competentes dos demais Departamentos Ministeriais, a difusão e utilização do consumo do sal iodizado para o consumo humano e animal;

g) Exercer as demais competências estabelecidas por lei ou determinadas superiormente.

3. A Direcção Nacional de Produção e Iodização do Sal compreende a seguinte estrutura:

a) Departamento de Apoio à Produção do Sal;

b) Departamento de Monitorização e Controlo de Qualidade;

c) Departamento de Monitorização e Sensibilização para o Consumo do Sal Iodizado.

4. A Direcção Nacional de Produção e Iodização do Sal é dirigida por um Director Nacional.

ARTIGO 14.º
(Direcção Nacional para os Assuntos do Mar)

1. A Direcção Nacional para os Assuntos do Mar é o serviço executivo com a missão de elaborar e desenvolver uma Estratégia Nacional para o Mar, conceber, programar e executar toda a política referente ao mar, implementar os regulamentos da actividade marítima, o controlo da gestão dos portos pesqueiros, emitir parecer sobre o licenciamento de infra-estruturas no mar, licenciamento de actividades de pesquisas arqueológicas e o ordenamento da orla costeira.

a) Coordenar e dirigir o processo de formulação de propostas de políticas e estratégias sectoriais sobre os assuntos do mar, respectivos programas de acção e os projectos necessários a sua implementação e avaliação;

b) Promover a elaboração, ou emitir parecer sobre os instrumentos de planeamento e de gestão territorial, assegurando a sua articulação, nomeadamente, no âmbito da gestão integrada da zona costeira;

c) Apreciar e decidir, em articulação com a entidade competente do Executivo, sobre a realização de pesquisas relacionadas com projectos de natureza arqueológica, achados no mar e estuários;

d) Desenvolver e coordenar as acções necessárias a um adequado planeamento e ordenamento do espaço marítimo;

e) Participar no desenvolvimento das políticas para a exploração e utilização dos recursos naturais marinhos;

f) Criar mecanismos que permitam disponibilizar informação meteorológica e hidrológica necessárias a segurança no mar e nos estuários, que possam afectar o desenvolvimento das actividades nos espaços marítimos;

g) Conceber, coordenar e acompanhar os trabalhos para a implementação da Estratégia Nacional para o Mar em coordenação com os demais órgãos do Ministério e Departamentos Ministeriais com interesse na matéria;

h) Assegurar a participação do Ministério no processo de diálogo e alinhamento das posições regional e internacional, sobre matérias de interesse nacional no domínio do mar, estuários e pesca;

i) Criar mecanismos que permitam ao Ministério das Pescas e do Mar proceder ao combate a poluição marinha;

j) Promover a elaboração e implementação de Planos de Gestão da zona costeira e das áreas marinhas protegidas;

k) Criar mecanismos de protecção das áreas biológicas ecologicamente sensíveis em coordenação com os demais Departamentos Ministeriais;

l) Monitorar os efeitos das mudanças climáticas no mar e estudar formas para a sua mitigação;

m) Exercer as demais competências estabelecidas por lei ou determinadas superiormente.

3. A Direcção Nacional para os Assuntos do Mar compreende a seguinte estrutura:

a) Departamento para a Política do Mar;

c) Departamento para o Ordenamento da Orla Marítima e Controlo da Poluição Marinha.

4. A Direcção Nacional para os Assuntos do Mar é dirigida por um Director Nacional.

SECÇÃO IV
Serviços de Apoio Técnico

ARTIGO 15.º
(Secretaria Geral)

1. A Secretaria Geral é o serviço que se ocupa do registo, acompanhamento, e tratamento das questões administrativas financeiras e logísticas comuns ao Ministério das Pescas e do Mar, nomeadamente do orçamento, do património, das relações públicas, da documentação e informação de interesse para o Sector das Pescas, da Aquicultura e do Sal, e do Mar.

2. A Secretaria Geral tem as seguintes competências:

a) Dirigir, coordenar e apoiar as actividades administrativas;

b) Elaborar o projecto de orçamento de acordo com o plano de actividades do Ministério das Pescas e assegurar a sua execução;

c) Elaborar o relatório de execução orçamental do Ministério das Pescas, e submete-lo à apreciação das entidades competentes;

d) Assegurar a aquisição e a manutenção dos bens e equipamentos necessários ao funcionamento corrente do Ministério, e gerir o seu património;

e) Estudar e propor normas, circuitos e modelos de funcionamento contabilístico e financeiro do Ministério das Pescas e do Mar;

f) Assegurar as actividades de relações públicas e protocolo do Ministério;

g) Promover a aquisição de toda a documentação e bibliografia necessárias à consulta técnico-científica e de interesse imediato ou mediato, para a pesca, aquicultura e para o mar;

h) Exercer as demais competências estabelecidas por lei ou determinadas superiormente.

3. A Secretaria Geral compreende a seguinte estrutura:

a) Departamento de Gestão do Orçamento e Administração do Património;

b) Departamento de Relações Públicas e Expediente.

4. A Secretaria Geral é dirigida por um Secretário Geral equiparado a Director Nacional.

ARTIGO 16.º
(Gabinete de Recursos Humanos)

1. O Gabinete de Recursos Humanos é o serviço de natureza transversal, responsável pela concepção, controlo e execução das políticas de gestão dos quadros no domínio do desenvolvimento pessoal, e carreiras, recrutamento, avaliação do desempenho, rendimentos, entre outros.

2. O Gabinete de Recursos Humanos tem as seguintes competências:

b) Gerir o quadro de pessoal do Ministério;

c) Zelar por uma política uniforme de recrutamento e selecção de pessoal;

d) Assegurar o processamento do vencimento e outros abonos de pessoal que o pessoal afecto ao Ministério tenha direito, bem como proceder ao apuramento dos respectivos descontos;

e) Organizar e manter actualizados os processos individuais do pessoal afecto ao Ministério;

f) Pronunciasse sobre as reclamações e recursos interpostos no âmbito de processos de recrutamento de pessoal;

g) Coordenar e controlar as actividades do Sector nos domínios da segurança social, da protecção, da saúde e da higiene no trabalho;

h) Assegurar a gestão integrada dos recursos humanos, promover e coordenar as acções da sua superação e formação profissional;

i) Elaborar o plano de formação anual do Ministério, promovendo as respectivas inscrições e procedendo a avaliação dos resultados;

j) Elaborar os relatórios e manter a base de dados actualizada;

k) Exercer as demais competências estabelecidas por lei ou determinadas superiormente.

3. O Gabinete de Recursos Humanos compreende a seguinte estrutura:

a) Departamento de Gestão por Competências e Desenvolvimento de Carreiras;

b) Departamento de Formação e Avaliação de Desempenho;

c) Departamento de Arquivo, Registo e Gestão de Dados.

4. O Gabinete de Recursos Humanos é dirigido por um Director equiparado a Director Nacional.

ARTIGO 17.º
(Gabinete de Estudos, Planeamento e Estatística)

1. O Gabinete de Estudos, Planeamento e Estatística é o serviço de apoio técnico de carácter transversal, que tem como funções principais a preparação de medidas de política e estratégia global do Sector das Pescas e do Mar, de estudos e análise regular sobre a execução geral das actividades dos distintos serviços do Ministério, bem como a orientação e coordenação da actividade de estatística dentre outras.

2. O Gabinete de Estudos, Planeamento e Estatística tem as seguintes competências:

a) Propor políticas e estratégias de desenvolvimento do Sector das Pescas, da Aquicultura e do Mar;

b) Coordenar e acompanhar a execução dos investimentos públicos sob responsabilidade do Sector;

c) Elaborar em colaboração com os organismos do Sector, e de outros Ministérios, os planos anuais

d) Coordenar e elaborar, em colaboração com outros organismos do Ministério e de outros sectores os planos de ordenamento das pescas, da aquicultura e do mar;

e) Participar na preparação e compatibilização de contratos de investimento público e acordos para os quais seja designado o Ministério das Pescas e do Mar;

f) Promover a recolha, processamento e divulgação de informação estatística necessária às atribuições que lhe são acometidas, e a actividade pesqueira, aquícola, e referente ao mar em geral;

g) Estudar as oportunidades e necessidades de investimento do Sector;

h) Elaborar estudos e análises regulares sobre a execução geral das actividades e projectos do Ministério das Pescas e do Mar;

i) Exercer as demais competências estabelecidas por lei ou determinadas superiormente.

3. O Gabinete de Estudos Planeamento e Estatistica compreende a seguinte estrutura:

a) Departamento de Estudos e Estatistica;

b) Departamento de Planeamento;

c) Departamento de Monitorização e Controlo.

4. O Gabinete de Estudos, Planeamento e Estatística é dirigido por um Director equiparado a Director Nacional.

ARTIGO 18.º
(Gabinete de Inspecção)

1. O Gabinete de Inspecção é o serviço encarregue de assegurar o acompanhamento, fiscalizar, monitorizar e avaliar a aplicação dos planos e programas aprovados para o Sector, bem como o cumprimento dos principios e normas de organização, funcionamento e actividades dos serviços do Ministério das Pescas e do Mar.

2. O Gabinete de Inspecção tem as seguintes competências:

a) Acompanhar a actividade dos serviços que integram o Ministério das Pescas e do Mar;

b) Inspeccionar, e assegurar o acompanhamento das funções horizontais, ou de organização e funcionamento dos serviços no que se refere a legalidade dos actos;

c) Inspeccionar e acompanhar a eficiência e rendimento dos serviços;

d) Inspeccionar e acompanhar a utilização dos bens e meios do Ministério das Pescas e do Mar, bem como a proposição de medidas de correcção e de melhorias;

e) Verificar o cumprimento das leis, regulamentos e demais disposições legais pelos serviços do Minis-

f) Colaborar na realização de processos disciplinares, inquéritos, sindicâncias, inspecções extraordinárias, e outros ordenados superiormente, bem como comunicar aos serviços competentes as infracções que sejam criminalmente puniveis;

g) Verificar o tratamento dos assuntos passíveis de sanções e accionar o tratamento adequado, caso seja necessário;

h) Receber e dar o devido tratamento às denúncias, queixas, e reclamações que lhe sejam submetidas;

i) Emitir parecer sobre a actuação de ordem inspectiva que lhe sejam solicitados;

j) Analisar os métodos de trabalho dos serviços do Ministério das Pescas e do Mar, e propor medidas tendentes a melhorar a eficiência da sua actividade;

k) Exercer as demais competências estabelecidas por lei ou determinadas superiormente.

3. O Gabinete de Inspecção tem a seguinte estrutura:

a) Departamento de Inspecção;

b) Departamento de Estudos, Programação e Análise.

4. O Gabinete de Inspecção é dirigido por um Inspector Geral equiparado a Director Nacional.

ARTIGO 19.º
(Gabinete Juridico)

1. O Gabinete Juridico e o serviço de apoio tecnico ao qual cabe realizar todas as actividades de assessoria e de estudos nos domínios legislativo, regulamentar e do contencioso.

2. O Gabinete Juridico tem as seguintes competências:

a) Elaborar estudos sobre a eficácia de diplomas legais e propor alterações;

b) Investigar e proceder a estudos de direito comparado, tendo em vista a elaboração ou o aperfeiçoamento da legislação inerente ao ordenamento e gestão dos recursos pesqueiros, da aquicultura e do mar;

c) Coordenar a elaboração dos projectos de diplomas legais e demais instrumentos juridicos necessários à organização e ao funcionamento dos órgãos e serviços do Ministério das Pescas e do Mar, e uma gestão eficiente e sustentada dos recursos pesqueiros;

d) Participar das negociações e dar corpo juridico aos actos e acordos internacionais de interesse para Angola, designadamente convenções, tratados, e protocolos de cooperação no domínio das pescas, da aquicultura e do mar, e outros para os quais seja superiormente designado;

e) Coligir, controlar e manter actualizada toda a documentação de natureza juridica necessária ao funcionamento do Ministério, e velar pela sua correcta aplicação;

f) Assessorar os órgãos e demais serviços em questões

g) Velar em colaboração com o Gabinete de Inspecção, pelo cumprimento das leis e regulamentos aplicáveis ao Sector das Pescas e do Mar, notificando os casos de violação ou incumprimento;

h) Emitir pareceres, prestar informações e proceder a estudos jurídicos sobre quaisquer assuntos que sejam submetidos à sua apreciação pelo Ministro das Pescas e do Mar;

i) Pronunciar-se sobre as propostas relativas às sanções e multas a aplicar sobre as infracções às leis e regulamentos referentes a pesca, a aquicultura e ao mar, que sejam submetidos à sua apreciação pelo Ministro das Pescas e do Mar;

j) Dar tratamento as questões contenciosas referentes às atribuições do Ministério das Pescas e do Mar;

k) Prestar assistência jurídica nos processos de negociação no âmbito da aplicação da Lei dos Contratos Públicos, dos quais o Sector seja parte;

l) Exercer as demais competências estabelecidas por lei ou determinadas superiormente.

3. O Gabinete Jurídico é dirigido por um Director, equiparado a Director Nacional.

ARTIGO 20.º
(Gabinete de Intercâmbio)

1. O Gabinete de Intercâmbio é o serviço encarregue de apoiar a realização das tarefas nos domínios das relações internacionais e da cooperação externa.

2. O Gabinete de Intercâmbio tem as seguintes competências:

a) Estudar e propor as políticas de cooperação e intercâmbio entre o Ministério, instituições nacionais e outros organismos homólogos;

b) Estudar e Propor estratégias de cooperação internacional no domínio da gestão dos recursos aquáticos e das actividades de pesca e da aquicultura, em articulação com os restantes órgãos e acompanhar os trabalhos decorrentes dessa cooperação;

c) Elaborar propostas com vista a assegurar e coordenar a participação da República e Angola nas organizações internacionais de pesca, aquicultura e do mar;

d) Propor a orientação a seguir nas negociações de acordos e convenções com países e organizações internacionais no domínio das pescas, da aquicultura e do mar;

e) Elaborar monografias técnicas e coligir dados sobre organismos internacionais de pesca, bem como da aquicultura e do mar, de países que possam ser de interesse para o desenvolvimento do Sector Pesqueiro, da Aquicultura e do Mar em Angola;

f) Apresentar propostas para a assinatura ou ratificação;

g) Exercer as demais competências estabelecidas por lei ou determinadas superiormente.

3. O Gabinete de Intercâmbio é dirigido por um Director equiparado a Director Nacional.

ARTIGO 21.º
(Gabinete de Tecnologias de Informação)

1. O Gabinete de Tecnologias de Informação é o serviço de apoio técnico responsável pelo desenvolvimento das tecnologias de informação com vista a dar suporte as actividades de modernização e inovação do Ministério das Pescas e do Mar.

2. O Gabinete de Tecnologias de Informação tem as seguintes competências:

a) Elaborar e implementar um Plano Director de Tecnologias de Informação no Ministério;

b) Assegurar a gestão dos meios afectos a execução da política de informatização do Sector Pesqueiro;

c) Coordenar a rede informática nas diferentes modalidades, garantindo a sua segurança e operacionalidade, promovendo a unificação de métodos e procedimentos;

d) Coordenar e emitir parecer sobre a realização de investimentos no domínio da informatização e telecomunicações nos órgãos e serviços afectos ao Ministério, bem como controlar a sua implementação em articulação com os mesmos;

e) Criar e manter bases de dados nos órgãos e serviços do Ministério, e velar pelo seu funcionamento;

f) Assegurar a permanente adequação dos sistemas de informação e telecomunicações as necessidades de gestão e operacionalidade dos órgãos e serviços integrados no Ministério;

g) Assessorar os utilizadores na exploração, gestão, manutenção dos equipamentos e sistemas informáticos e de telecomunicações;

h) Exercer as demais competências estabelecidas por lei ou determinadas superiormente.

3. O Gabinete de Tecnologias de Informação é dirigido por um Director, equiparado a Director Nacional.

ARTIGO 22.º
(Gabinete de Comunicação Institucional e Imprensa)

1. O Gabinete de Comunicação Institucional e Imprensa é o serviço que assegura a elaboração, implementação, coordenação e monitorização das políticas de Comunicação Institucional e Imprensa do Ministério das Pescas e do Mar.

2. O Gabinete de Comunicação Institucional e Imprensa tem as seguintes competências:

a) Elaborar o Plano de Comunicação Institucional e realizar campanhas de publicidade e *marketing* em coordenação com o Departamento Ministerial encarregue da Comunicação Social;

b) Promover a divulgação nos órgãos de comunicação

c) Recolher informação relativa a actividade do Ministério, bem como a informação produzida pelas diversas áreas, e proceder a sua divulgação;

d) Elaborar e manter actualizado em articulação com as demais áreas do Ministério um manual referente às políticas a serem implementadas no domínio das pescas e do mar;

e) Acompanhar e assessorar as actividades do Ministro que devam ter cobertura na comunicação social;

f) Adquirir, recolher, classificar, catalogar, arquivar e conservar a documentação técnica produzida pelas diferentes áreas do Ministério, e toda a documentação de interesse geral, e assegurar o acesso a mesma às áreas do Ministério e ao público em geral;

g) Seleccionar, recolher boletins, livros e monografias necessários a gestão dos recursos biológicos aquáticos e marinhos;

h) Organizar e coordenar a biblioteca central do Ministério das Pescas e do Mar;

i) Organizar e gerir o arquivo histórico e morto do Ministério;

j) Participar na organização de eventos institucionais do Ministério;

k) Actualizar o portal de internet e de toda a comunicação digital do Ministério;

l) Exercer as demais competências estabelecidas por lei ou determinadas superiormente.

3. O Gabinete de Comunicação Institucional e Imprensa é dirigido por um Director equiparado a Director Nacional.

SECÇÃO V
Serviços de Apoio Instrumental

ARTIGO 23.º
(Natureza)

Os Serviços de Apoio Instrumental visam o apoio directo e pessoal ao Ministro e aos Secretários de Estado, no desempenho das respectivas funções.

ARTIGO 24.º
(Gabinete do Ministro e dos Secretários de Estado)

1. Os Gabinetes do Ministro e dos Secretários de Estado são órgãos de apoio instrumental aos quais compete o seguinte:

a) Assegurar as relações com outros gabinetes ministeriais;

b) Assegurar a ligação entre o Ministro, os Secretários de Estado, e os responsáveis dos diversos órgãos do Ministério;

c) Exercer as demais competências estabelecidas por lei ou determinadas superiormente.

2. Os Gabinetes do Ministro e dos Secretários de Estado são dirigidos por Directores de Gabinete com a categoria de Directores Nacionais, e organizar-se nos termos previstos na

CAPÍTULO IV
Disposições Finais e Transitórias

ARTIGO 25.º
(Quadro de pessoal)

O Ministério da Pescas e do Mar dispõe do pessoal constante dos quadros da carreira comum e da carreira especial de inspecção, que constituem os Anexos I e II do presente Estatuto Orgânico do qual são partes integrantes.

ARTIGO 26.º
(Provimento e progressão na carreira)

O provimento dos lugares do quadro de pessoal e a progressão na respectiva carreira é feito nos termos da legislação aplicável na Administração Pública.

ARTIGO 27.º
(Orçamento)

1. O Ministério das Pescas e do Mar dispõe de orçamento próprio para o seu funcionamento, cuja gestão obedece as regras estabelecidas na legislação em vigor.

2. Os serviços superintendidos dispõem de orçamento próprio, e autónomo destinado a cobertura dos encargos decorrentes da sua actividade, sendo a sua gestão da responsabilidade dos respectivos Directores Gerais ou Presidentes do Conselho de Administração, de acordo com a legislação em vigor.

ARTIGO 28.º
(Organigrama)

O organigrama do Ministério das Pescas e do Mar é o constante do Anexo III ao presente Estatuto Orgânico e que dele é parte integrante.

ARTIGO 29.º
(Regulamentos internos)

Os regulamentos internos indispensáveis ao funcionamento dos Serviços que integram a estrutura orgânica do Ministério são aprovados por Decreto Executivo do Ministro.

ARTIGO 30.º
(Órgãos superintendidos)

1. O Ministro das Pescas e do Mar superintende os seguintes órgãos:

a) Instituto Nacional de Investigação Pesqueira e Marinha;

b) Instituto de Desenvolvimento da Pesca Artesanal e da Aquicultura;

c) Instituto Nacional de Apoio às Indústrias de Pesca e Investigação Tecnológica;

d) Serviço Nacional de Fiscalização de Pescas e da Aquicultura;

e) Fundo de Apoio ao Desenvolvimento da Indústria Pesqueira e da Aquicultura.

2. Sem prejuízo das competências próprias dos Departamentos Ministeriais responsáveis pela Educação e pelo Ensino Superior, Ciência, Tecnologia e Inovação, o Ministério das Pescas e do Mar superintende também os seguintes órgãos:

ARTIGO 31.º
(Regime jurídico dos órgãos superintendidos)

Os órgãos sob superintendência do Ministro das Pescas e do Mar são pessoas colectivas de direito público, dotadas de personalidade jurídica, autonomia administrativa patrimonial e financeira, que se regem por estatuto próprio a aprovar nos termos da lei.

ARTIGO 32.º
(Norma transitória)

De acordo com as necessidades e até a conclusão do processo de criação das condições para o pleno funcionamento dos novos serviços, ou para o exercício de novas funções por parte dos serviços e institutos públicos previstos no presente Estatuto, as respectivas actividades continuam a ser exercidas pelas estruturas responsáveis à data de aprovação do presente Diploma.

ANEXO I

Quadro de pessoal do regime geral a que se refere o artigo 25.º

Grupo de Pessoal	Carreira	Categoria/Cargo	Especialidade Profissional a Admitir	N.º de Lugares
Direcção		Director Nacional ou Equiparado		15
Direcção e Chefia		Chefe de Departamento		26
		Chefe de Secção		6
Técnico Superior	Técnica Superior	Assessor Principal Primeiro Assessor Assessor Técnico Superior Principal Técnico Superior de 1.ª Classe Técnico Superior de 2.ª Classe	Economistas, Juristas Informáticos, Rel. P. Marketing, Relações P. e Marketing Química, Cartografia, Marketing, Informática, Mecânica Naval, Electrónica, Ambiente, Comunicação Social, Relações Internacionais, Especialistas em Línguas Inglês/Francesa, Relações Internacionais, Psicologia do Trabalho Gestão de R. Humanos, Pedagogia, Tecnol. Pesc. Veterinário, Aquicultura, Construção Naval, Hidrografia, Oceanografia, Biólogos, Técnicos de Pesca, Engenheiros Navais	65
Técnico	Técnica	Especialista Principal Especialista de 1.ª Classe Especialista de 2.ª Classe Técnico de 1.ª Classe Técnico de 2.ª Classe Técnico de 3.ª Classe	Administração Pública Economia Tecnologia de Pescado Biólogos mecanica Ambientalista Aquático, Electrónica, Hidrografia, Oceanografia	20
Técnico Médio	Técnica Médio	Técnico Médio Principal de 1.ª Classe Técnico Médio Principal de 2.ª Classe Técnico Médio Principal de 3.ª Classe Técnico Médio de 1.ª Classe Técnico Médio de 2.ª Classe Técnico Médio de 3.ª Classe	Economia-Juristas, Administ. Pública Informática, Bibliotecário Estatística, Tecnologia de Pescado, Construção Naval, Ambientalista Aquático, Química Alimentar, Ambiente	36
	Tesoureiro	Tesoureiro Principal Tesoureiro de 1.ª Classe Tesoureiro de 2.ª Classe		0
	Motorista de Pesados	Motorista de Pesados Principal Motorista de Pesados de 1.ª Classe Motorista de Pesados de 2.ª Classe		10
	Motorista de Ligeiros	Motorista de Ligeiros Principal Motorista de Ligeiros de 1.ª Classe Motorista de Ligeiros de 2.ª Classe		6
	Telefonista	Telefonista Principal Telefonista de 1.ª Classe Telefonista de 2.ª Classe		1
Auxiliar	Auxiliar Administrativa	Auxiliar Administrativa Principal Auxiliar Administrativa de 1.ª Classe Auxiliar Administrativa de 2.ª Classe		3
	Auxiliar de Limpeza	Auxiliar de Limpeza Principal Auxiliar de Limpeza de 1.ª Classe Auxiliar de Limpeza de 2.ª Classe		15
	Operário	Encarregado Operário Qualificado de 1.ª Classe Operário Qualificado de 2.ª Classe		4
		Encarregado Operário Não Qualificado de 1.ª Classe Operário Não Qualificado de 2.ª Classe		4

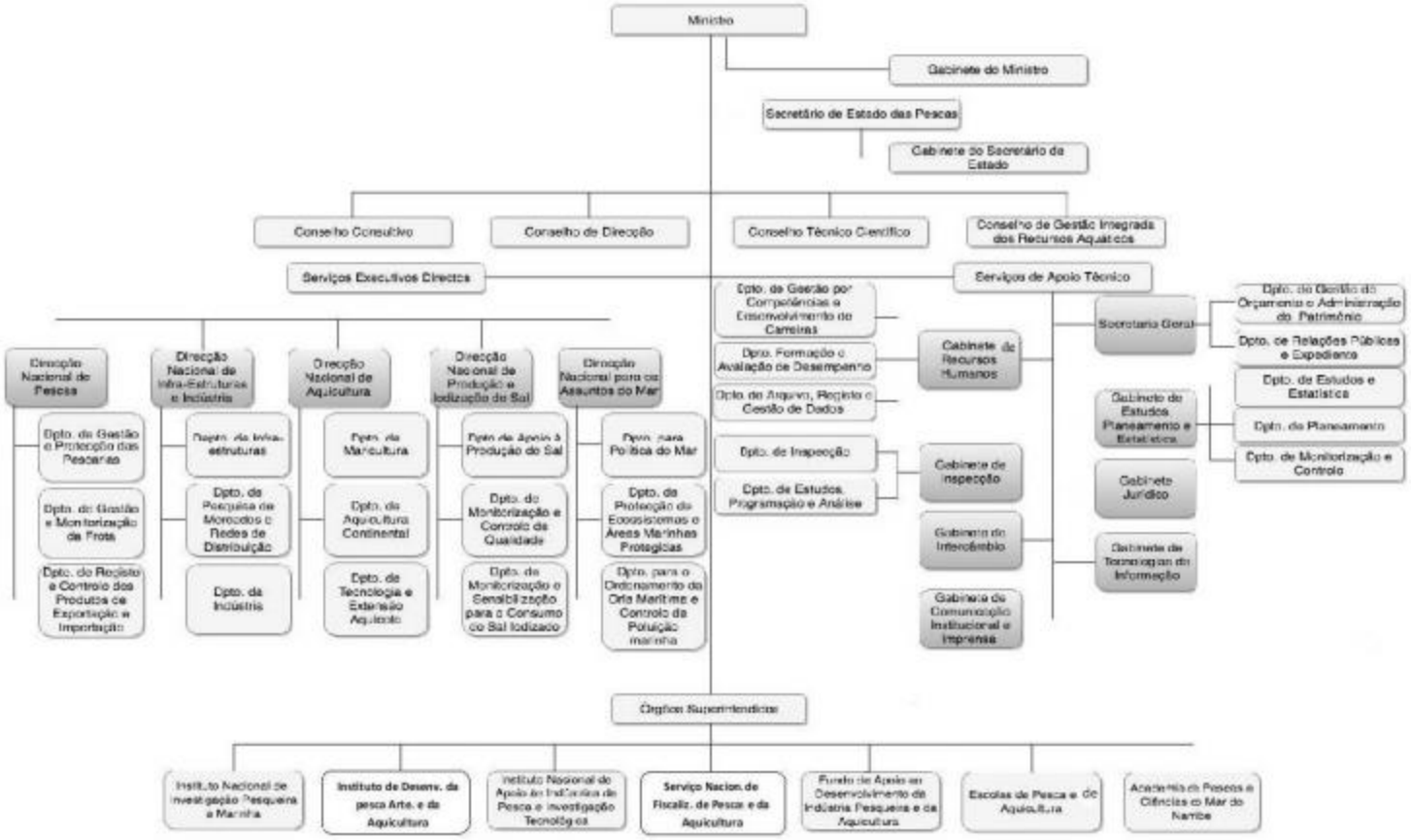
ANEXO II

Quadro de pessoal do regime especial de Inspecção a que se refere o artigo 25.º

Grupo de pessoal	Carreira	Categoria/cargo	Especialização profissional a admitir	N.º de lugares
Direcção		Inspector Geral		1
		Inspector Chefe de Primeira		2
Técnico superior	Inspector Superior	Inspector Principal Assessor Inspector Primeiro Assessor Inspector Assessor Inspector Superior Principal Inspector Superior de 1.ª Classe Inspector Superior de 2.ª Classe	Economia Administração Pública, Direito, Gestão Rec. Humanos	6
Técnico	Inspector Técnico	Inspector Especialista Principal Inspector Especialista de 1.ª Classe Inspector Técnico de 1.ª Classe Inspector Técnico de 2.ª Classe Inspector Técnico de 3.ª Classe	Economia Administração Pública, Direito	2
Técnico médio	Sub-Inspector	Subinspector Principal de 1.ª Classe Subinspector Principal de 2.ª Classe Subinspector Principal de 3.ª Classe Subinspector de 1.ª Classe Subinspector de 2.ª Classe Subinspector de 3.ª Classe	Administração Pública, Economia - Auxiliar	2
Total				13

ANEXO III

Organigrama a que se refere o artigo 28.º



O Presidente da República, JOÃO MANUEL GONÇALVES LOURENÇO.

Decreto Presidencial n.º 24/18
de 31 de Janeiro

Havendo necessidade de adequar o Estatuto Orgânico do Ministério da Energia e Águas e definir a respectiva estrutura, competências e atribuições de cada um dos seus organismos, de acordo com o Decreto Legislativo Presidencial n.º 3/13, de 23 de Agosto, que estabelece as Regras de Criação, Estruturação, Organização e Extinção dos Serviços da Administração Central do Estado e dos demais organismos legalmente equiparados, com as alterações introduzidas pelo Decreto Legislativo Presidencial n.º 8/15, de 29 de Dezembro;

Para dar cumprimento aos objectivos preconizados pelo Executivo, da política da energia e das águas é importante dotar o Ministério com uma estrutura organizacional assente nos serviços e organismos que actuam nos respectivos domínios;

O Presidente da República decreta, nos termos da alínea g) do artigo 120.º e do n.º 3 do artigo 125.º, ambos da Constituição da República de Angola, o seguinte:

ARTIGO 1.º
(Aprovação)

É aprovado o Estatuto Orgânico do Ministério da Energia e Águas, anexo ao presente Decreto Presidencial e que dele é parte integrante.

ARTIGO 2.º
(Revogação)

É revogada toda a legislação que contrarie o disposto no presente Diploma, nomeadamente o Decreto Presidencial n.º 116/14, de 30 de Maio.

ARTIGO 3.º
(Dúvidas e omissões)

As dúvidas e omissões resultantes da interpretação e aplicação do presente Decreto Presidencial são resolvidas pelo Presidente da República.

ARTIGO 4.º
(Entrada em vigor)

O presente Diploma entra em vigor na data da sua publicação.

Apreciado em Conselhos de Ministros, em Luanda, aos 28 de Novembro de 2017.

Publique-se.

Luanda, aos 28 de Dezembro de 2017.

O Presidente da República, JOÃO MANUEL GONÇALVES LOURENÇO.

ESTATUTO ORGÂNICO DO MINISTÉRIO DA ENERGIA E ÁGUAS

a formulação, conduzir, executar e controlar a política do Executivo nos domínios da energia e das águas.

ARTIGO 2.º
(Atribuições)

O MINEA tem as seguintes atribuições:

a) Propor e promover a execução da política a prosseguir pelos Sectores da Energia e das Águas;

b) Estabelecer estratégias, promover e coordenar o aproveitamento e a utilização racional dos recursos energéticos e hídricos, assegurando o desenvolvimento sustentável dos mesmos;

c) Elaborar, no quadro do planeamento geral do desenvolvimento económico e social do País, os planos sectoriais relativos as suas áreas de actuação;

d) Propor e promover a política nacional de electrificação, da utilização geral de recursos hídricos, sua protecção e conservação, bem como a política de abastecimento de água e saneamento de águas residuais;

e) Promover actividades de investigação com repercussão nas respectivas áreas de actuação;

f) Propor e produzir legislação que estabeleça o enquadramento jurídico e legal da actividade nos sectores da energia, das águas e do saneamento de águas residuais;

g) Propor o modelo institucional para a realização das actividades de produção, transporte, distribuição e comercialização de energia eléctrica e promover a sua implementação;

h) Propor o modelo institucional para a realização das actividades de captação, adução, transporte, distribuição e comercialização de água potável, nos domínios das águas e do saneamento de águas residuais e promover a sua implementação;

i) Definir, promover e garantir a qualidade do serviço público na sua área de actuação;

j) Licenciar, fiscalizar e inspeccionar a exploração dos serviços e instalações do Sector da Energia;

k) Licenciar, fiscalizar e inspeccionar aproveitamentos hidráulicos e sistemas de abastecimento de água e saneamento;

l) Promover acções de intercâmbio e cooperação internacional na sua área de actuação;

m) Promover o desenvolvimento dos recursos humanos nos domínios da energia, das águas e do

Appendix G: Questionnaire to subsistence fishermen of Benguela province

SECTION I

A – PERSONAL INFORMATION

1. Age:____
2. Sex: Male □ Female □
3. Family status:
   Single □
   Married □
   other_____
4. No of children_____
5. Members of family working with: Yes □ No □ Other _____
6. Literacy:
   a) Not literate □
   b) Primary school □
   c) Secondary school □ 1st cycle □ 2nd Cycle □ (normal intermediate education □ PUNIV □ technical education □ course_____)
   d) Higher education □ course _____
7. Address:
   a) City_____
   b) Town _____
   c) District / neighbourhood / zone _____

B – WORK INFORMATION

1. Reasons for choose fishing as a subsistence activity:
   a) _____,
   b) _____
2. How long have you been fishing? _____
3. What is the main purpose from which you fish?
   a) Family consumption □
   b) Family livelihood □
   c) Other □ _____
4. Do you engage in:
   a) Fishing only □
   b) Fishing and agriculture □
   a) Industry □
   c) Commerce □
   d) Other □ _____

C - FISHING PRACTISE AND MATERIALS

1. How do you fish?
   a) I fish alone on my boat □
   b) I fish without a boat □
2. What type of boat do you crew?

a) Canoe□
b) Chata (plank boat) □
c) Other _____

1. Is this boat your own property?
   a) Yes □

3. Needs in materials (spending):
   a) Hooks_____
   b) Nets□
   c) Lines□
   d) fishing net □
   e) Vessel´s Engines□
   f) Thread/yarn □
4. Acquisition:
   a) Easy□
   b) Average □
   c) Difficult □
   d) Very difficult □
5. Who supplies the fishing material (lines, hooks, etc.)?
   _____
6. What are your daily responsibilities for exploration?
   a) Fuel □
   b) Food □
   c) Bait □
   d) Fishing equipment □
   e) Other □ _____

D - PERIOD AND CHARACTERISTICS OF THE FISHING ZONE

1. Do you go out every day?
   a) Yes □
   b) No □
   c) If No, when you don´t go? _____
   d) No of trips per week: ____ /month: ____
   e) Why? _____
2. Time that last a trip ____ day ___ hour
3. Reasons to go to this area to fish?
   a) Near from home □
   b) Most abundant in the targeted species □
   c) Authorised area to fish □
   d) Other _____
4. Do you have problems with industrial fishing? Yes□ No □
   a) If yes, what type of problems? _____

E – FISHING PROCESS / EXPLOITATION

1. What species do you well target? What is the material you have been use to do it? (if possible, order it from the most to the less)

Species _____ material (method of fishing) _____
Species _____ material (method of fishing) _____
Species _____ material (method of fishing) _____

2. Reasons to have chosen these targeted species?
   a) Most abundant □
   b) Easier to catch □
   c) The only possible using my fishing methods □
   d) Easier to prepare and cook □
   e) Most profitable when sold □_____

   Other_____
3. Which species have you been capturing? (if possible, order it from the most to the less)

   Species _____ material (method of fishing) _____
   I._____
   II. _____
   III. _____
   VI. _____
4. Most favourable fishing period of the year:

   Period of the year _____ species _____
   Period of the year _____ species _____
   Period of the year _____ species _____
   Period of the year _____ species _____
5. Are there any restrictions for fishing some species?
   a) Yes □
   b) No □
   c) If yes, which species and in which period?

      Species _____ period of restriction _____
      Species _____ period of restriction _____
      Species _____ period of restriction _____
      Species _____ period of restriction _____
      Species _____ period of restriction _____
6. Do you obey these restrictions?
   a) Yes □
   b) No □
   c) Why? _____
7. Quantities of fish surplus reserved for sell:

   Species _____ amount _____
   Species _____ amount _____
   Species _____ amount _____

F – FISH PRESERVATION

1. Usage of ice to preserve fish:
   a) Yes □
   b) No □
   c) If yes, which type of equipment to preserve fish is used?

      Thermal box □
      Isothermal box □
      Other_____

2. Do you think it is important to use equipment to preserve fish?
    a) Yes □
    b) No □
    c) Why? _____

G - FISH UTILISATION

1. How do you consume the fish you catch? (List it from the most to the less)
    Species _____ Fresh □ Smoked □ Dried □
    Species _____Fresh □ Smoked □ Dried □
    Species _____Fresh □ Smoked □ Dried □
    Species _____Fresh □ Smoked □ Dried □
    Species _____Fresh □ Smoked □ Dried □

2. What are the quantities of fish you do consume and sell?
    Species _____ quantity: to consume _____ to sell _____
    Species _____ quantity: to consume _____ to sell _____
    Species _____ quantity: to consume _____ to sell _____
    Species _____ quantity: to consume _____ to sell _____
    Species _____ quantity: to consume _____ to sell _____
3. How often you sell the fish you catch?
    a) _____ time a week □
    b) _____ times a month □
    c) Always □
    d) Other _____
4. Which species do you prefer to sell instead of selling it? Why? (List it from the most to the less)
    Species _____ reasons: More profitable□ We don´t consume it □
    Species _____ reasons: More profitable□ We don´t consume it □
    Species _____ reasons: More profitable□ We don´t consume it □
    Species _____ reasons: More profitable□ We don´t consume it □

5. What are the reasons that lead you to sell the fish you catch?
    a) Food supply □
    b) Family livelihood □
    c) sponsorship of others commercial activities □
    d) Supply school fees □
    e) To buy medicines □
6. Selling price per kilo or other reference:
    I. Species_____ amount_____ price _____
    II. Species_____ amount_____ price _____
    III. Species_____ amount_____ price _____
    IV. Species_____ amount_____ price _____
    V. Species_____ amount_____ price _____
7. Do you sell:
    a) Directly to consumer □
    b) To co-operative □
    c) To women □
    d) To wholesalers □
    e) To retailers □

f) To restaurants □
g) Other _____

8. Priorities of selling:
   a) to family relatives □
   b) Best offer □
   c) Other _____
9. Methods of payment:
   a) Cash □
   b) Credit □
   c) Other _____

H – FINANCIAL ISSUES

1. Do you have access to any form of credit?
   a) Yes □
   b) No □
   c) If yes, from which agency/person? _____
   d) If No, why? _____
2. Do you pay any fee or taxes?
   a) Yes □
   b) No □
   c) If yes, to whom? ____ How much? _____
   d) Are they fair?
      Yes □
      No □
3. Are there any benefits from be paying it?
   a) Yes □
   b) No □
   c) If yes, which benefit (s)? _____
4. Do you belong to any cooperative?
   a) Yes □
   b) No □
   c) If yes, which? _____
   d) If No, why? _____
   e) Is there any advantage (s) for being part of it?
      Yes □
      No □
      If yes, which? _____

I - CRUSTACEANS ASSESSMENT

I. If you only dedicate to crustaceans for family consumption and occasional sell:

1. Why you do prefer crustaceans?
   a) Easier to catch □
   b) Economic viable to catch □
   c) Easier to preserve □
   d) Easier to prepare and cook □
   e) Very nutritious □

f) Highly demanded □
g) Easier to sell □
h) Very profitable when sold as surplus □
i) Other □_____

2. Are there any restrictions for fishing some species you target?
a) Yes □
b) No □
c) If yes, which species and in which period?
Species _____ period of restriction _____
Species _____ period of restriction _____
Species _____ period of restriction _____
Species _____ period of restriction _____
Species _____ period of restriction _____

3. Do you obey these restrictions?
a) Yes □
b) No □
c) Why? _____

4. Quantities of crustaceans sold as surplus:
Species _____ amount _____
Species _____ amount _____
Species _____ amount _____

5. Quantities of fish consumed:
Species _____ amount _____
Species _____ amount _____
Species _____ amount _____

II. If you don´t catch many crustaceans:

1. What are the reasons? (Tick as many as are necessary)
a) More difficult to catch □
b) Less economic viable to catch □
c) More difficult to preserve □
d) More difficult prepare and cook □
e) It is not used for family consumption. Why?
Not part of local cuisine □
Used only as snack □
People don´t know how to cook for consuming as a regular food □
Note usual for the family to have it as a daily food □
f) Harder to sell as a surplus □
g) Less profitable to the family livelihood □
h) other_____
2. What happens when you accidentally catch crustaceans?
a) Discard □
b) Land and sell □
c) Land and offer □
d) Land and consume □
e) Other_____

III. If you dedicate in both crustaceans and general fish capture and trade:

1. Which type is easier to catch?
   a) Fish □
   b) Crustaceans □
2. Which type is more economic viable to catch?
   a) Fish □
   b) Crustaceans □
3. Which type is easier to preserve?
   a) Fish □
   b) Crustaceans □
4. Which type is easier to prepare and cook?
   a) Fish □
   b) Crustaceans □
5. Which type you think is more nutritious?
   a) Fish □
   b) Crustaceans □
6. Which type is easier to sell?
   a) Fish □
   b) Crustaceans □
7. Which type is more profitable when sold?
   a) Fish □
   b) Crustaceans □

J - ACQUACULTURE ASSESSMENT

1. Do you have any background in aquaculture?
   a) Yes □
   b) No □
   c) If yes, what? _____
2. Do you think crustaceans' culture would supply the current livelihood needs of your family?
   a) Yes □
   b) No □
3. Have you ever received any incentive to dedicate to crustaceans culture?
   a) Yes □
   b) No □
   c) If yes, what kind of incentive? _____
   d) Are you implementing it?
      Yes □
      No □ Why? _____
4. Would you invest in crustaceans' cultivation?
   a) Yes □
   b) No □
   c) If yes, what you would need in order to proceed? _____
   d) If no, why? _____

K - LAST FISHING DAY INFORMATION

I. NEEDS IN MATERIALS (Last fishing day)

1. Materials acquired:
   a) Hooks□
   b) Nets□
   c) Lines□
   d) fishing net □
   e) Thread/yarn □
2. Acquisition:
   a) Easy□
   b) Average □
   c) Difficult □
   d) Very difficult □
3. Who supplied you the fishing material (lines, hooks, etc.)?

   _____

4. What were your responsibilities for exploration in that day?

a) Fuel □ cost _____
b) Food □ cost _____
c) Bait □ cost _____
d) Fishing equipment □ cost _____
e) Other □ _____ cost _____

II. PERIOD AND CHARACTERISTICS OF THE FISHING ZONE (Last fishing day)

1. Duration of the last trip: _____ Hour of departure: _____ Hour of return: _____
2. Fishing zone
   a) Varied □
   b) Well defined □
3. Depth of the zone in metres: ____
4. Time that the trip last: _____
5. Reasons for you to have chosen this area to fish?
   a) Near from home □
   b) most abundant in the targeted species □
   c) Authorised area for fishing □
   d) other _____
6. Did you have problems with industrial fishing?
   a) Yes □
   b) No □
   c) If yes, which problems? _____

III. FISH EXPLOITATION (Last fishing day)

1. What species do you targeted? (if possible, order it from the most to the less)

   _____
   _____
   _____
   _____

2. Reasons to have chosen these targeted species?
   a) More abundant □
   b) Easier to catch □
   c) Most profitable when sold □

d) Most suitable to prepare and to cook
e) other_____

3. Which species did you capture in the last trip?

Species_____ amount _____
Species_____ amount _____
Species_____ amount _____
Species_____ amount _____
Species_____ amount _____

4. Which quantities did you land in the last trip?

Species_____ amount _____
Species_____ amount _____
Species_____ amount _____
Species_____ amount _____
Species_____ amount _____

Total_____

5. Unwanted species caught:

species_____ amount _____
species_____ amount _____
species_____ amount _____

Total_____

IV. FISH PRESERVATION (Last fishing day)

1. Did you use ice to preserve fish in the last trip?
   a) Yes □
   b) No □
   c) If yes, which equipment was used to preserve fish:
      Thermal box □
      Isothermal box □
      Other_____
   d) If no, why?

V. FISH UTILISATION: (Last fishing day)

1. What was the main destination the captured fish had?
   a) Consumed by family □
   b) Sold □
   c) Other _____
2. Quantities of fish reserved for family consumption:
   I. species_____ amount _____
   II. species_____ amount _____
   III. species_____ amount _____
3. How did you consume it?
   a) Fresh □
   b) Smoked □
   c) Dried □
4. Quantities reserved for sell purpose:
   I. species_____ amount_____ price _____
   II. species_____ amount_____ price _____

III. species_____ amount_____ price _____
IV. species_____ amount_____ price _____

5. Direct sale:
   a) To consumer □
   b) To co-operative □
   c) To women (“Zungueiras”) □
   d) To wholesalers □
   e) To retailers □
   f) To restaurants □
   g) Other _____
6. Priorities of selling:
   d) to family relatives □
   a) Best offer □
   b) Other _____
7. Methods of payment:
   a) cash □
   b) credit □
   c) other _____
8. To whom, in the last time of selling, you sold more fish or crustaceans?
   a) Fish
      To national residents □
      To national tourists □
      To restaurants □
      To foreigner residents □
      To foreigner tourists □
   b) Crustaceans
      To national residents □
      To national tourists □
      To restaurants □
      To foreigner residents □
      To foreigner tourists □

ONLY USE THIS SECTION WITH ONE PERSON PER BOAT

SECTION II

A – VESSELS INFORMATION

1. Type of vessel:
   a) Canoe □
   b) Chata (plank boat) □
   c) Other □ _____
2. Boat size _____
3. Propulsion system:
   d) Sail□
   e) Paddles □
4. Possibilities for repairs:
   a) Yes□

b) No□
c) Where? _____

5. Navigation equipment:
   a) Yes□
   b) No□
   c) Type: _____
6. What is the main purpose from which the boat is used to fish?
   a) Family consumption □
   b) Surplus occasional sell purpose □
   c) Other □ _____

B – FISHING MATERIALS

1. Needs in materials:
   g) Hooks□
   h) Nets□
   i) Lines□
   j) fishing net □
   k) Thread/yarn □
2. Acquisition:
   e) Easy□
   f) Average □
   g) Difficult □
   h) Very difficult □
3. Who supplies the fishing material (lines, hooks,, etc.)?
   _____
4. Daily responsibilities for exploration
   a) Fuel □
   b) Food □
   c) Bait □
   d) Fishing equipment□
   e) Other: _____

C – CREW INFORMATION

1. No of people on board ____

Crew member no 1

a) Age_____
b) Does he only work in this boat?
   Yes□
   No □ In how many? _____
c) Member of the family?
   Yes □ degree of kinship _____
   No □ Relationship _____
d) What are his job and/or position in the boat?
   The owner □
   Head of the family□
   Captain □
   Fisherman □

Other _____

Crew member no 2

a) Age_____
b) Does he only work in this boat?
   Yes□ _____
   No □ In how many? _____
c) Member of the family?
   Yes □ degree of kinship _____
   No □ Relationship _____
d) What are his job and/or position in the boat?
   The owner □
   Head of the family□
   Captain □
   Fisherman □
   Other _____

Crew member no 3

a) Age_____
b) Does he only work in this boat?
   Yes□ _____
   No □ In how many? _____
c) Member of the family?
   Yes □ degree of kinship _____
   No □ Relationship _____
d) What are his job and/or position in the boat?
   The owner □
   Head of the family□
   Captain □
   Fisherman □
   Other _____

Crew member no 4

e) Age_____
f) Does he only work in this boat?
   Yes□ _____
   No □ In how many? _____
g) Member of the family?
   Yes □ degree of kinship _____
   No □ Relationship _____
h) What are his job and/or position in the boat?
   The owner □
   Head of the family□
   Captain □
   Fisherman □
   Other _____

D – FISHING METHODS USED ON THE BOAT

1. Mid-water bottom trawl type □
   a) Pelagic □

b) Semi-pelagic□
c) Demersal □

2. Hand lines □
   No of lines____ No. of hooks per line____
3. Gillnet □
   a) Surface gillnet □
   b) Bottom gillnet □
4. Beach seine (Banda Banda) □
   Length____ Mesh____
5. Seine net □
   Length ____ Mesh ____
6. Lift net □
   No of Boats involved_____ Nets: No. Length____ Height ____ Net size/mesh____ fishing net No: ____
7. Polling/Palangre (French = angling) □
   How many palangres? _____Total no. of hooks _____

E – PERIOD AND CHARACTERISTICS OF THE FISHING ZONE

5. Does the boat go out every day?
   f) Yes □
   g) No □
   h) If No, when the boat doesn´t go? _____
   Why? _____
   i) No of trips per week: ____ /month: ____
6. Time that last a trip ____ day ___ hour
7. Reasons to go to this area to fish?
   e) Near from home □
   f) Most abundant in the targeted species □
   g) Area in which this type of boat is authorised to operate □
   h) Area in which this type of boat is capable to operate □
   i) Other _____
8. Does the boat have problems with semi industrial fishing?
   b) Yes □
   c) No □
   d) If yes, what type of problems? _____
9. Does the boat have problems with industrial fishing?
   a) Yes □
   b) No □
   c) If yes, what type of problems? _____

F – FISHING PROCESS / EXPLOITATION

8. What species does the boat target? (if possible, order it from the most to the less)
   I._____
   II. _____
   III. _____
   VI. _____
9. Reasons to target these species?
   a) More abundant □

b) Easier to catch using this type of boat □
c) The only possible using this type of boat □
d) Other_____

10. Which species have the boat been capturing? (if possible, order it from the most to the less)
    I._____
    II. _____
    III. _____
    VI. _____
11. Most favourable fishing period of the year to use this type of boat for each species:
    Period of the year _____ species _____
    Period of the year _____ species _____
    Period of the year _____ species _____
    Period of the year _____ species _____
12. Are there any restrictions for fishing some species using this type of boat?
    a) Yes □
    b) No □
    c) If yes, which species and in which period?
    Species _____ period of restriction _____
    Species _____ period of restriction _____
    Species _____ period of restriction _____
    Species _____ period of restriction _____
13. Does the boat crew obey these restrictions?
    a) Yes □
    b) No □
    c) Why? _____

G – FISH PRESERVATION

3. Has Ice been used on this boat to preserve fish?
    a) Yes □
    b) No □
    c) If yes, which type of equipment to preserve fish is used?
    Thermal box □
    Isothermal box □
    Other_____

H - FINANCIAL ISSUES

5. Is there any fee or taxes to pay for the boat to be operating?
    e) Yes □
    f) No □
    g) If yes, to whom? ____ How much? _____
    h) Are they fair?
    Yes □
    No □
    Why? _____
6. Are there any benefits from be paying it?
    d) Yes □

e) No □
f) If yes, which benefits? _____

I - CRUSTACEANS ASSESSMENT

I. If the boat is only used to catch crustaceans for family consumption and occasional sell of surplus:

1. Why this boat is exclusively used to catch crustaceans? (Tick more than one reason if it is needed)?
   a) Easier to catch crustaceans using this type of boat □
   b) More economic viable to catch crustaceans using this type of boat □
   c) Easier to preserve crustaceans using this type of boat □
   d) Other □ _____

2. Are there any restrictions for fishing some species of crustaceans using this boat?
   d) Yes □
   e) No □
   f) If yes, which species and in which period?
   Species _____ period of restriction _____
   Species _____ period of restriction _____
   Species _____ period of restriction _____
3. Does the boat crew obey these restrictions?
   a) Yes □
   b) No □
   c) Why? _____

II. If the boat is not used to target crustaceans for family consumption and occasional sell of surplus:

1. Why?
   a) More difficult to catch crustaceans using this type of boat □
   b) Less economic viable to catch crustaceans using this type of boat □
   c) More difficult to preserve crustaceans using this type of boat □
   d) Other_____
2. What happens when using the boat crustaceans accidentally are caught?
   a) Discarded □
   b) Landed and sold □
   c) Landed and offered □
   d) Landed and used for personal consume □
   e) Other _____
   f) Why?
   _____

III. If the boat target both crustaceans and general fish for family consumption and occasional sell of surplus:

8. Which type is easier to catch using this type of boat?
   c) Fish □
   d) Crustaceans □
9. Which type is more economic viable to catch using this type of boat?
   c) Fish □

d) Crustaceans □

10. Which type is easier to preserve using this type of boat?
    c) Fish □
    d) Crustaceans □

J - LAST TRIP INFORMATION

I. FISHING MATERIALS (Last fishing day)

1. Needs in materials:
    a) Hooks □
    b) Nets □
    c) Lines □
    d) fishing net □
    e) Vessel´s Engines □
    f) Thread/yarn □
2. Acquisition:
    a) Easy □
    b) Average □
    c) Difficult □
    d) Very Difficult □
3. Who supplied the fishing material (lines, hooks,, etc.)?
    _____
4. Responsibilities for exploration on the last trip:
    a) Fuel □
    b) Food □
    c) Bait □
    d) Other □ _____

II. CREW INFORMATION (Last fishing day)

1. Is the crew that worked on the last trip the same as usual?
    a) Yes□
    b) No □
    c) If no, who were absent?
    Crew member no 1 □ reason for absence _____replaced? Yes□ No □
    Crew member no 2 □ reason for absence _____replaced? Yes□ No □
    Crew member no 3 □ reason for absence _____replaced? Yes□ No □
    Crew member no 4 □ reason for absence _____replaced? Yes□ No □

    d) Who replaced him/them?

    Crew member no 1 substitute

    a) Age_____
    b) Where he come from?
    Another boat □
    Member of the family □ degree of kinship _____
    Other _____
    c) What were his job and/or position in the boat?
    The owner □
    Head of the family□

Captain □
Fisherman □
Other _____

Crew member no 2 substitute

a) Age_____
b) Where he come from?
Another boat □
Member of the family □ degree of kinship _____
Other _____
c) What were his job and/or position in the boat?
The owner □
Head of the family□
Captain □
Fisherman □
Other _____

Crew member no 3 substitute

a) Age_____
b) Where he come from?
Another boat □
Member of the family □ degree of kinship _____
Other _____
c) What were his job and/or position in the boat?
The owner □
Head of the family□
Captain □
Fisherman □
Other _____

Crew member no 4 substitute

a) Age_____
b) Where he come from?
Another boat □
Member of the family □ degree of kinship _____
Other _____
c) What were his job and/or position in the boat?
The owner □
Head of the family□
Captain □
Fisherman □
Other _____

III. PERIOD AND CHARACTERISTICS OF THE FISHING ZONE (Last fishing day)

7. Duration of the last trip: _____ Hour of departure: _____ Hour of return: _____
8. Fishing zone
Varied □
Well defined □
9. Depth of the zone in metres: ____
10. Time that last the trip: _____

11. Reasons to have went to the chosen area to fish?
    a) Near from home □
    b) Most abundant in the targeted species □
    c) Area in where this type of boat is authorised to operate □
    d) Other _____
12. Were there any restrictions for fishing some species using this type of boat in that day?
    d) Yes □
    e) No □
    f) If yes, which species were restricted?
    Species _____ type of restriction _____
    Species _____ type of restriction _____
    Species _____ type of restriction _____
    Species _____ type of restriction _____
13. Did the boat crew obey these restrictions?
    d) Yes □
    e) No □
    f) Why? _____
14. Did the boat have problems with industrial fishing?
    a) Yes □
    b) No □
    c) If yes, what type of problems? _____

IV. FISHING METHODS USED ON THE BOAT IN THE LAST TRIP (Last fishing day)

1. Mid-water bottom trawl type □
    a) Pelagic □
    b) Semi-pelagic□
    c) Demersal □
2. Hand lines □
    No of lines____ No. of hooks per line____
3. Gillnet □
    a) Surface gillnet □
    b) Bottom gillnet □
4. Beach seine (Banda Banda) □
    Length____ Mesh____
5. Seine net □
    Length ____ Mesh ____
6. Lift net □
    No of Boats involved_____ Nets: No. Length____ Height ____ Net size/mesh____ fishing net No: ____
7. Polling/Palangre (French = angling) □
    How many palangres? _____Total no. of hooks _____

V. FISHING PROCESS / EXPLOITATION (Last fishing day)

6. What species did the boat target? (If possible, order it from the most to the less)
    I._____
    II. _____
    III. _____
    VI. _____

7. Reasons to have targeted these species?
   More abundant □
   Easier to catch using this type of boat □
   The only possible using this type of boat □
   other_____
8. Which species have the boat captured? (if possible, order it from the most to the less)
   Species _____ quantity _____
   Species _____ quantity _____
   Species _____ quantity _____
   Species _____ quantity _____

VI. FISH PRESERVATION (Last fishing day)

1. Ice was used on this boat to preserve the captured fish?
   d) Yes □
   e) No □
   f) If yes, which type of equipment to preserve fish was used?
      Thermal box □
      Isothermal box □
      Other □_____

VII. CATCH DESTINATION (Last fishing day)

1. Quantities of fish surplus reserved to sell:
   IV. species_____ amount _____
   V. species_____ amount _____
   VI. species_____ amount _____
2. Quantity of fish landed by the boat?
   Species _____ quantity _____
   Species _____ quantity _____
   Species _____ quantity _____
   Species _____ quantity _____
3. If differences were observed between the amount captured and the amount of fish landed, what are the reasons?

_____

NOTE: DRAFT QUESTIONNAIRE excepting for personal information, crew information and finance information, questions in all other sections might be altered after initial investigations in Angola.

Appendix H: Questionnaire to crew members of commercial small-scale fishery (artisanal and semi – industrial) boats of Benguela province

SECTION I

A – PERSONAL INFORMATION

8. Age:____
9. Sex: Male □ Female □
10. Family status:
    Single □
    Married □
    Other □_____
11. No of children_____
12. Members of family working with: Yes □ No □
13. Literacy:
    e) Not literate □
    f) Primary school □
    g) Secondary school □ 1st cycle □ 2nd Cycle □ (normal intermediate education □ PUNIV □ technical education □ course_____)
    Higher education □ course _____
14. Address:
    f) City_____
    g) Town _____
    h) District/ neighbourhood/ zone _____

B –WORK INFORMATION

1. How long have you been fishing? _____
2. Reasons for choose fishing as a profession:
    a) The only job vacancy available □
    b) The only thing I can do □
    c) The best job offer □
    d) Family heritage □
    e) Other □_____
3. Do you engage in:
    e) Fishing only □
    f) Fishing and agriculture □
    b) Industry □
    g) Commerce □
    h) Other □ _____
4. Do you work in only one boat?
    a) Yes □
    b) No □ In how many? _____
5. How did you get access to this boat to work?
    a) Invited by the owner □
    b) I looked for it □
    c) My right as a family member □
    d) Other □_____
6. What is your job and position within the crew?
    a) The boat´s owner □
    b) The head of the family□
    c) The captain □
    d) Fishermen □
    e) Other □ _____

7. Are you involved in planning and deciding on fishing operations? (zone, hour of departure, species to target, etc.)?
   a) Yes □
   b) No □
   c) If no, Why? _____
8. Do you go out every day?
   j) Yes □
   k) No □
   l) If No, When you don´t go? _____
      Why? _____
   m) No of trips per week: ____ /month: ____

C – BENEFITS FROM THE FISHING ACTIVITY

1. What kind of benefit can you achieve from fishery?
   a) Family food supply □
   b) School fee payment □
   c) Family livelihood □
   d) Sponsorship of others commercial activities □
   e) Other □ _____
2. Quantity of fish given for personal consumption:
   Species _____ amount for personal consumption _____
   Species _____ amount for personal consumption _____
   Species _____ amount for personal consumption _____

D – FINANCIAL ISSUES

1. What your daily responsibilities/expenses are for fishing?
   f) Transportation □ cost _____
   g) Food □ cost _____
   h) Bait □ cost _____
   i) Fishing equipment □ cost _____
   j) Other □ _____ cost _____
2. Do you have access to any form of credit?
   e) Yes □
   f) No □
   g) If yes, from which agency/person? _____
   h) If No, why?
      _____
3. Do you pay any fee or taxes?
   i) Yes □
   j) No □
   k) If yes, to whom? _____ How much? _____
   l) Are they fair?
      Yes □
      No □
4. Are there any benefits from paying for it?
   g) Yes □
   h) No □
   i) If yes, what benefits? _____, _____, _____
5. Do you belong to any cooperative?
   a) Yes □
   b) No □
   a) If yes, which cooperative? _____
   b) If No, why? _____
   c) Are there any benefits for being part of it?
      Yes □

No □
If yes, what benefits? _____, _____, _____

E - LAST TRIP INFORMATION

I. VESSEL INFORMATION (Last trip information)

1. Type of vessel (s) you worked in:
   a) Canoe□
   b) Chata (plank boat) □
   c) Catronga Trawler□
   d) Other □_____
2. What was job and position within the crew? The boat´s owner □
   a) The head of the family□
   b) The captain □
   c) Fishermen □
   d) Other □ _____
3. Reasons why you have elected this boat to work?
   a) Invited by the owner □
   b) the best job offer □
   c) the only job vacancy available □
   d) Other □ _____

II. BENEFITS FROM THE FISHING ACTIVITY (Last trip information)

1. What kind of benefit could you achieve from fishery in the last trip?
   a) Family food supply □
   b) School fee payment □
   c) Family livelihood □
   d) Sponsorship of others commercial activities □
   e) Other □ _____
2. Quantity of fish given for personal consumption:
   Species _____ amount for personal consumption _____
   Species _____ amount for personal consumption _____
   Species _____ amount for personal consumption _____

III. FINANCIAL ISSUES (Last trip information)

1. What your responsibilities/expenses were for fishing in the last trip?
   a) Transportation □ cost _____
   b) Food □ cost _____
   c) Bait □ cost _____
   d) Fishing equipment □ cost _____
   e) Other □ _____ cost _____

ONLY USE THIS SECTION WITH ONE PERSON PER BOAT

SECTION II

A – VESSELS INFORMATION

7. Type of vessel:
    d) Canoe □
    e) Chata (plank boat) □
    f) Catronga Trawler□
    g) Other □ _____
8. Boat size _____
9. Propulsion system:
    i) Sail□
    j) Paddles □
    a) Engine:
    Yes □ No □
    If yes, size _____ Capacity Make_____ Size of gear _____
10. Possibilities for repairs:
    d) Yes□
    e) No□
    f) Where? _____
11. Navigation equipment:
    d) Yes □
    e) No □
    b) Type: _____

B – FISHING MATERIALS

5. Needs in materials:
    l) Hooks□
    m) Nets□
    n) Lines□
    o) fishing net □
    p) Thread/yarn □
    q) Vessel´s engine
6. Acquisition:
    i) Easy□
    j) Average □
    k) Difficult □
    l) Very difficult □
7. Who supplies the fishing material (lines, hooks, vessel´s engines, etc.)?
    _____
8. Daily responsibilities for exploration:
    f) Fuel □
    g) Food □
    h) Bait □
    i) Fishing equipment□
    j) Other: _____

C – CREW INFORMATION

2. No of people on board ____

    Crew member no 1

    e) Age_____
    f) Does he only work in this boat?
    Yes□

No □ in how many? _____

g) Member of the family?
Yes □ degree of kinship _____
No □ Relationship _____

h) What are his job and/or position in the boat?
The owner □
Head of the family□
Captain □
Fisherman □
Other □_____

Crew member no 2

e) Age_____

f) Does he only work in this boat?
Yes□ _____
No □ in how many? _____

g) Member of the family?
Yes □ degree of kinship _____
No □ Relationship _____

h) What are his job and/or position in the boat?
The owner □
Head of the family□
Captain □
Fisherman □
Other □_____

Crew member no 3

i) Age_____

j) Does he only work in this boat?
Yes□ _____
No □ In how many? _____

k) Member of the family?
Yes □ degree of kinship _____
No □ Relationship _____

l) What are his job and/or position in the boat?
The owner □
Head of the family□
Captain □
Fisherman □
Other □_____

Crew member no 4

a) Age_____

b) Does he only work in this boat?
Yes□ _____
No □ In how many? _____

c) Member of the family?
Yes □ degree of kinship _____
No □ Relationship _____

d) What are his job and/or position in the boat?
The owner □
Head of the family□
Captain □
Fisherman □
Other □_____

Crew member no 5

a) Age_____
b) Does he only work in this boat?
   Yes□
   No □ in how many? _____
c) Member of the family?
   Yes □ degree of kinship _____
   No □ Relationship _____
d) What are his job and/or position in the boat?
   The owner □
   Head of the family□
   Captain □
   Fisherman □
   Other □_____

Crew member no 6

a) Age_____
b) Does he only work in this boat?
   Yes□ _____
   No □ in how many? _____
c) Member of the family?
   Yes □ degree of kinship _____
   No □ Relationship _____
d) What are his job and/or position in the boat?
   The owner □
   Head of the family□
   Captain □
   Fisherman □
   Other □_____

Crew member no 7

a) Age_____
b) Does he only work in this boat?
   Yes□ _____
   No □ In how many? _____
c) Member of the family?
   Yes □ degree of kinship _____
   No □ Relationship _____
d) What are his job and/or position in the boat?
   The owner □
   Head of the family□
   Captain □
   Fisherman □
   Other □ _____

Crew member no 8

a) Age_____
b) Does he only work in this boat?
   Yes□ _____
   No □ In how many? _____
c) Member of the family?
   Yes □ degree of kinship _____
   No □ Relationship _____
d) What are his job and/or position in the boat?

The owner □
Head of the family□
Captain □
Fisherman □
Other □_____

D – FISHING METHODS

8. Mid-water bottom trawl type □
   d) Pelagic □
   e) Semi-pelagic□
   f) Demersal □
9. Hand lines □
   No of lines____ No. of hooks per line____
10. Gillnet □
    c) Surface gillnet □
    d) Bottom gillnet □
11. Beach seine (Banda Banda) □
    Length____ Mesh____
12. Seine net □
    Length ____ Mesh ____
13. Lift net □
    No of Boats involved_____ Nets: No. Length____ Height ____ Net size/mesh____ fishing net No: ____
14. Polling/Palangre (French = angling) □
    How many palangres? _____Total no. of hooks _____

E – PERIOD AND CHARACTERISTICS OF THE FISHING ZONE

10. Does the boat go out every day?
    n) Yes □
    o) No □
    p) If No, when the boat doesn´t go? _____
    Why? _____
    q) No of trips per week: ____ /month: ____
11. Reasons to go to this area to fish?
    j) Near from home □
    k) Most abundant in the targeted species □
    l) Area in which this type of boat is authorised to operate □
    m) Area in which this type of boat is capable to operate □
    n) Other _____
12. Who determines the fishing operations (zone, hour of departure, species to target, etc.)?
    d) The owner
    e) The captain
    f) All the crew
    g) Other _____
13. Does the boat have problems with industrial fishing?
    e) Yes □
    f) No □
    g) If yes, what type of problems? _____

F – FISHING PROCESS / EXPLOITATION

14. What species does the boat target? (if possible, order it from the most to the less)
    I. _____
    II._____
    III. _____

IV. _____
V. _____
VI. _____

15. Reasons to target these species?
    e) More abundant □
    f) Easier to catch using this type of boat □
    g) The only possible using this type of boat □
    h) Other_____
16. Which species have the boat been capturing? (if possible, order it from the most to the less)
    I. _____ quantity _____
    II. . _____ quantity _____
    III. _____ quantity _____
    IV. _____ quantity _____
    V. _____ quantity _____

17. Most favourable fishing period of the year to use this type of boat for each species:
    Period of the year _____ species _____
    Period of the year _____ species _____
    Period of the year _____ species _____
    Period of the year _____ species _____
18. Are there any restrictions for fishing some species using this type of boat?
    g) Yes □
    h) No □
    i) If yes, which species and in which period?
    Species _____ period of restriction _____
    Species _____ period of restriction _____
    Species _____ period of restriction _____
    Species _____ period of restriction _____
19. Does the boat crew obey these restrictions?
    g) Yes □
    h) No □
20. Why? _____

G – FISH PRESERVATION

4. Has Ice been used on this boat to preserve fish?
    g) Yes □
    h) No □
    i) If yes, which type of equipment to preserve fish is used?
    Thermal box □
    Isothermal box □
    Other □_____

H - FISH COMMERCIALISATION AND REVENUES

1. Selling price per kilo or other reference:
    VI. species_____ price _____
    VII. species_____ price _____
    VIII. species_____ price _____
    IX. species_____ price _____
    X. species_____ price _____
    XI. species_____ price _____
    XII. species_____ price _____

2. Captured fish is sold:

h) Directly to consumer □
i) To co-operative □
j) To women □
k) To wholesalers □
l) To retailers □
m) To restaurants □
n) Other □ _____

3. Priorities of selling:
   e) To family relatives □
   f) Best offer □
   g) Other □ _____
4. Methods of payment:
   d) Cash □
   e) Credit □
   f) Other □ _____

I – FINANCIAL ISSUES

7. Is there any fee or taxes to pay for the boat to be operating?
   m) Yes □
   n) No □
   o) If yes, to whom? ____ How much? _____
   p) Are they fair?
      Yes □
      No □
      Why? _____
8. Are there any benefits from be paying it?
   j) Yes □
   k) No □
   l) If yes, which benefits? _____

J - CRUSTACEANS ASSESSMENT

IV. If the boat is only used to capture and trade crustaceans:

4. Why this boat is exclusively used to catch crustaceans? (Tick more than one reason if it is needed)?
   e) Easier to catch crustaceans using this type of boat □
   f) More economic viable to catch crustaceans using this type of boat □
   g) Easier to preserve crustaceans using this type of boat □
   h) Other □ _____
5. Are there any restrictions for fishing some species of crustaceans using this boat?
   g) Yes □
   h) No □
   i) If yes, which species and in which period?
      Species _____ period of restriction _____
      Species _____ period of restriction _____
      Species _____ period of restriction _____
6. Does the boat crew obey these restrictions?
   d) Yes □
   e) No □
   f) Why? _____
7. Who more frequently buy crustaceans from this boat?
   a) National residents □
   b) National tourists □
   c) Foreigner residents □
   d) Foreigner tourists □
   i) Other □ _____

9. Quantities of crustaceans reserved for crew members' personal consumption:
   Species _____ quantity _____
   Species _____ quantity _____
   Species _____ quantity _____

V. If the boat is not used to capture and trade crustaceans:

3. Why?
   e) More difficult to catch crustaceans using this type of boat □
   f) Less economic viable to catch crustaceans using this type of boat □
   g) More difficult to preserve crustaceans using this type of boat □
   h) Other_____
4. What happens when using the boat crustaceans accidentally are caught?
   g) Discarded □
   h) Landed and sold □
   i) Landed and offered □
   j) Landed and used for personal consume □
   k) Other _____
   a) Why?
   _____

VI. If the boat is used to capture and trade both crustaceans and general fish:

11. Which type is easier to catch using this type of boat?
    e) Fish □
    f) Crustaceans □
12. Which type is more economic viable to catch using this type of boat?
    e) Fish □
    f) Crustaceans □
13. Which type is easier to preserve using this type of boat?
    e) Fish □
    f) Crustaceans □

K - LAST TRIP INFORMATION

I. VESSEL INFORMATION (**Last trip information)**

5. Needs in materials:
   g) Hooks □
   h) Nets □
   i) Lines □
   j) Fishing net □
   k) Vessel´s Engines □
   l) Thread/yarn □
6. Acquisition:
   e) Easy □
   f) Average □
   g) Difficult □
   h) Very Difficult □
7. Who supplied the fishing material (lines, hooks, vessel´s engines, etc.)?
   _____
8. Responsibilities for exploration on the last trip:
   e) Fuel □
   f) Food □
   g) Bait □
   h) Other □ _____

II. CREW INFORMATION (**Last trip information)**

2. Is the crew that worked on the last trip the same as usual?
   e) Yes□
   f) No □
   g) If no, who were absent?
   Crew member no 1 □ reason for absence _____replaced? Yes□ No □
   Crew member no 2 □ reason for absence _____replaced? Yes□ No □
   Crew member no 3 □ reason for absence _____replaced? Yes□ No □
   Crew member no 4 □ reason for absence _____replaced? Yes□ No □
   Crew member no 5 □ reason for absence _____replaced? Yes□ No □
   Crew member no 6 □ reason for absence _____replaced? Yes□ No □
   Crew member no 7 □ reason for absence _____replaced? Yes□ No □
   Crew member no 8 □ reason for absence _____replaced? Yes□ No □

3. Who replaced the last trip´s absent crew members?

Crew member no 1 substitute (**Last trip information)**

d) Age_____
e) Where he come from?
   Another boat □
   Member of the family □ degree of kinship _____
   Other _____
f) What were his job and/or position in the boat?
   The owner □
   Head of the family□
   Captain □
   Fisherman □
   Other _____

Crew member no 2 substitute (**Last trip information)**

d) Age_____
e) Where he come from?
   Another boat □
   Member of the family □ degree of kinship _____
   Other _____
f) What were his job and/or position in the boat?
   The owner □
   Head of the family□
   Captain □
   Fisherman □
   Other _____

Crew member no 3 substitute (**Last trip information)**

d) Age_____
e) Where he come from?
   Another boat □
   Member of the family □ degree of kinship _____
   Other _____
f) What were his job and/or position in the boat?
   The owner □
   Head of the family□
   Captain □
   Fisherman □
   Other _____

Crew member no 4 substitute (**Last trip information)**

a) Age_____
b) Where he come from?
   Another boat □
   Member of the family □ degree of kinship _____
   Other _____
c) What were his job and/or position in the boat?
   The owner □
   Head of the family□
   Captain □
   Fisherman □
   Other _____

Crew member no 5 substitute (**Last trip information)**

a) Age_____
b) Where he come from?
   Another boat □
   Member of the family □ degree of kinship _____
   Other _____
c) What were his job and/or position in the boat?
   The owner □
   Head of the family□
   Captain □
   Fisherman □
   Other _____

Crew member no 6 substitute (**Last trip information)**

a) Age_____
b) Where he come from?
   Another boat □
   Member of the family □ degree of kinship _____
   Other _____
c) What were his job and/or position in the boat?
   The owner □
   Head of the family□
   Captain □
   Fisherman □
   Other _____

Crew member no 7 substitute (**Last trip information)**

a) Age_____
b) Where he come from?
   Another boat □
   Member of the family □ degree of kinship _____
   Other _____
c) What were his job and/or position in the boat?
   The owner □
   Head of the family□
   Captain □
   Fisherman □
   Other _____

Crew member no 8 substitute (**Last trip information)**

a) Age_____
b) Where he come from?

Another boat □
Member of the family □ degree of kinship _____
Other _____

c) What were his job and/or position in the boat?
The owner □
Head of the family□
Captain □
Fisherman □
Other _____

III. PERIOD AND CHARACTERISTICS OF THE FISHING ZONE (**Last trip information)**

15. Duration of the last trip: _____ Hour of departure: _____ Hour of return: _____
16. Fishing zone
Varied □
Well defined □
17. Depth of the zone in metres: ____
18. Distance travelled in metres/miles and/or time that last the last trip: _____
19. Reasons to have went to the chosen area to fish?
o) Near from home □
p) Most abundant in the targeted species □
q) Area in where this type of boat is authorised to operate □
r) Other _____
20. Did the boat have problems with industrial fishing?
d) Yes □
e) No □
f) If yes, what type of problems? _____

IV. FISHING METHODS USED ON THE BOAT IN THE LAST TRIP (**Last trip information)**

8. Mid-water bottom trawl type □
a) Pelagic □
b) Semi-pelagic□
c) Demersal □
9. Hand lines □
No of lines____ No. of hooks per line____
10. Gillnet □
a) Surface gillnet □
b) Bottom gillnet □
11. Beach seine (Banda Banda) □
Length____ Mesh____
12. Seine net □
Length ____ Mesh ____
13. Lift net □
No of Boats involved_____ Nets: No. Length____ Height ____ Net size/mesh____ fishing net No: ____
14. Polling/Palangre (French = angling) □
How many palangres? _____Total no. of hooks _____

V. FISHING PROCESS / EXPLOITATION (**Last trip information)**

9. What species did the boat target? (If possible, order it from the most to the less)
I. _____
II. _____
III. _____
IV. _____

V. _____
VI. _____
VII. _____

10. Reasons to have targeted these species?
    More abundant □
    Easier to catch using this type of boat □
    The only possible using this type of boat □
    Other □ _____
11. Which species have the boat captured? (If possible, order it from the most to the less)
    Species _____ quantity _____
    Species _____ quantity _____
    Species _____ quantity _____
    Species _____ quantity _____
    Species _____ quantity _____
    Species _____ quantity _____
12. Quantity of fish landed (If possible, order it from the most to the less)
    Species _____ quantity _____
    Species _____ quantity _____
    Species _____ quantity _____
    Species _____ quantity _____
    Species _____ quantity _____
    Species _____ quantity _____
13. If differences were observed between the amount captured and the amount of fish landed, what are the reasons?

    _____
14. Quantities of fish reserved for personal consumption:
    VII. species_____ amount _____
    VIII. species_____ amount _____
    IX. species_____ amount _____
15. Unwanted species caught:
    I. species_____ amount _____
    II. species_____ amount _____
    III. species_____ amount _____
    a) Destination:
       Discarded □
       Landed □
       Reserved for personal consumption □
       Other □ _____
16. Discards:
    I. species_____ amount _____
    II. species_____ amount _____
    III. species_____ amount _____

VI. FISH PRESERVATION (**Last trip information)**

1. Ice was used on this boat to preserve the captured fish?
    a) Yes □
    b) No □
    c) If yes, which type of equipment to preserve fish was used?
       Thermal box □
       Isothermal box □
       Other □_____

VII. FISH COMMERCIALISATION AND REVENUES (**Last trip information)**

1. Captured fish was sold:
    a) Directly to consumer □

b) To co-operative □
c) To women (“zungueiras”) □
d) To wholesalers □
e) To retailers □
f) To restaurant representatives □
g) Other □ _____

2. Priorities of selling:
   a) To family relatives □
   b) Best offer □
   c) Other □ _____

3. Selling price in the last trip per kilo or other reference:
   V. species_____ price _____
   VI. species_____ price _____
   VII. species_____ price _____
   VIII. species_____ price _____
   IX. species_____ price _____
   X. species_____ price _____

4. Methods of payment:
   a) Cash □
   b) Credit □
   c) Other □ _____

XI. EXPENSES OF THE LAST TRIP (**Last trip information)**

1. Fuel: □ amount in litres ____ cost _____
2. Food □ cost _____
3. Bait □ cost _____
4. Fishing equipment □ cost _____
5. Other □ _____ cost _____
   _____ cost _____
   _____ cost _____
   _____ cost _____

NOTE: DRAFT QUESTIONNAIRE excepting for personal information, crew information and finance information, questions in all other sections might be altered after initial investigations in Angola.

Appendix I: Questionnaire to artisanal fish retailers of Benguela province

A – PERSONAL INFORMATION

15. Age:____
16. Sex: Male □ Female □
17. Family status:
    Single □
    Married □
    Other □_____
18. No of children_____
19. Members of family working with: Yes □ No □
20. Literacy:
    h) Not literate □
    i) Primary school □
    j) Secondary school □ 1st cycle □ 2nd Cycle □ (normal intermediate education □ PUNIV □ technical education □ course_____)
21. Higher education □ course _____
22. Address:
    k) City_____
    l) Town _____
    m) District/ neighbourhood/ zone _____

B - WORK INFORMATION

1. Do you engage in?
    i) Fish retail only □
    j) Crustaceans retail only □
    k) Both fish and crustaceans □
    l) Fish retail and other □
    c) Crustaceans retail and other □
    d) Other □: agriculture □____ commerce □_____ industry □ _____
2. Do you have any licence to be retailing fish/crustaceans?
    a) Yes: □
    b) No □
    c) If No, Why? _____
3. How long have you been retailing fish/crustaceans? _____
4. Reasons for choose fish/crustaceans retail as a profession:
    f) The only job vacancy available □
    g) The only thing I can do □
    h) The best job offer □
    i) Other □_____

C - FISH ACQUISITION

1. Who supply you the fish?
    a) Fishermen □
    b) a third person □
    c) Other □
2. Do you buy the fish?

a) Yes □
b) No □

3. If yes, methods of payment you do:
   a) Cash payment □
   b) Credit payment □
   c) Other □_____
4. Do you buy/receive fish every day?
   a) Yes □
   b) No □
   c) If no, When you don´t do? _____
   d) Why? _____
5. Time of the day to start buying/receiving fish: _____ Time to end _____
6. Relationship with the fish seller/provider:
   a) Business partner □
   b) Parent □
   c) Other □_____
   d) None □
7. Amount of fish bought/received in the last day (Kg or other reference):
   XIII. species_____ amount_____ price _____
   XIV. species_____ amount_____ price _____
   XV. species_____ amount_____ price _____
   XVI. species_____ amount_____ price _____
   XVII. species_____ amount_____ price _____
   XVIII. species_____ amount_____ price _____
8. Reasons to have chosen this place to acquire fish:
   a) Near from home □
   b) Most favourable □
   c) Other □ _____
9. Is this the same place you acquire and sell the fish?
   a) Yes □
   b) No □
   c) If no, where you acquire the fish?
      Place 1 _____
      Place 2 _____
      Place 3 _____
10. How far the place (s) you buy/receive from the place you process fish is?
    Place 1 _____ distance _____ metres or _____ Km
    Place 2 _____ distance _____ metres or _____ Km
    Place 3 _____ distance _____ metres or _____ Km
11. How do you transport it?
    Place 1, By: Car □ Motorcycle □ Wheelbarrow □ Myself □ Other □ _____
    Place 2, By: Car □ Motorcycle □ Wheelbarrow □ Myself □ Other □ _____
    Place 3, By: Car □ Motorcycle □ Wheelbarrow □ Myself □ Other □ _____

D – FISH PRESERVATION

1. Usage of ice to preserve fish:
   a) Yes □
   b) No □

2. Equipment to preserve fish:
   a) Yes □
   b) No □
   c) If yes, type:
      Thermal box □
      Isothermal box □
      Other □ _____
3. Do you think it is important to use equipment to preserve fish?
   a) Yes □
   b) No □
   c) Why? _____

E - FISH SELLING

1. Reasons to have chosen this place to sell fish:
   a) Near from home □
   b) Most favourable □
   c) The place I have acquired it □
   d) Other □ _____
2. Is this the unique place/market where you sell fish?
   a) Yes □
   b) No □
   c) If no, other places: _____, _____, _____
3. Do you sell:
   a) Directly to consumer □
   b) to co-operative □
   c) to another retailers (“zungueiras”) □
4. Methods of payment you do accept:
   a) Cash □
   b) Credit □
   c) Other □ _____
5. Do you sell fish every day?
   a) Yes □
   b) No □
   c) If No, When you don´t do? _____ Why? _____
6. Time of the day to start selling fish: _____ Time to end _____
7. Most favourable selling period of the year:
   I. Species _____ period of the year _____
   II. Species _____ period of the year _____
   III. Species _____ period of the year _____
   IV. Species _____ period of the year _____
   V. Species _____ period of the year _____
8. What are the most sold species, the quantities and the selling price in the last day (in Kg or other reference):
   I. species_____ amount_____ price _____
   II. species_____ amount_____ price _____
   III. species_____ amount_____ price _____
   IV. species_____ amount_____ price _____
   V. species_____ amount_____ price _____

VI. species_____ amount_____ price _____

9. Quantities of fish reserved for personal consumption:
   I. species_____ amount _____
   II. species_____ amount _____
   III. species_____ amount _____

F – INVESTMENTS AND REVENUES

1. Daily investments for being selling fish:
   a) Transportation □ ____
   b) Food □ ____
   c) Fish purchase □
   d) Fish storage □ _____
   e) Other □_____
2. Total amount of revenue in the last day: _____
3. Usage of the revenues:
   a) Family Food supply□
   b) School fee payments □
   c) Family livelihood □
   d) Sponsorship of others commercial activities □
   e) Other □_____

G - CRUSTACEANS ASSESSMENT

I. ACQUISITION

1. Who supply you the crustaceans?
   a) Fishermen □
   b) A third person □
   c) Other □
2. Do you buy the crustaceans?
   a) Yes □
   b) No □
3. If yes, Methods of payment you do:
   a) Cash payment □
   b) Credit payment □
   c) Other □_____
4. Do you buy/receive crustaceans every day?
   a) Yes □
   b) No □
   c) If no, when you don´t do? _____ Why? _____
5. Time of the day to start buying crustaceans: _____ Time to end _____
6. Relationship with the seller/provider:
   a) Business partner □
   b) Parent □
   c) Other □_____
   d) None □
7. Amount of crustaceans bought in the last day (Kg or other reference):
   i. species_____ amount _____ price _____
   ii. species_____ amount _____ price _____

iii. species_____ amount _____ price _____
iv. species_____ amount _____ price _____
v. species_____ amount _____ price _____
vi. species_____ amount _____ price _____

8. Reasons to have chosen this place to acquire crustaceans:
   a) Near from home □
   b) Most favourable □
   c) Best physical conditions □
   d) Other □ _____
9. Is this the same place you acquire and sell the crustaceans?
   a) Yes □
   b) No □
   c) If no, where you acquire crustaceans to sell?
      Place 1 _____
      Place 2 _____
      Place 3 _____
10. How far the place (s) you buy from the place you sell crustaceans is?
    Place 1 _____ distance _____ metres or _____ Km
    Place 2 _____ distance _____ metres or _____ Km
    Place 3 _____ distance _____ metres or _____ Km
12. How do you transport it?
    Place 1, By: Car □ Motorcycle □ Wheelbarrow □ Myself □ Other □ _____
    Place 2, By: Car □ Motorcycle □ Wheelbarrow □ Myself □ Other □ _____
    Place 3, By: Car □ Motorcycle □ Wheelbarrow □ Myself □ Other □ _____

II. CRUSTACEANS PRESERVATION

1. Usage of ice to preserve crustaceans:
   a) Yes____
   b) No____
2. Equipment to preserve crustaceans:
   a) Yes □
   b) No □
   c) If yes, type:
      Thermal box □
      Isothermal box □
      Other □ _____
3. Do you think it is important to use equipment to preserve crustaceans?
   a) Yes____
   b) No_____
   c) Why? _____

III. CRUSTACEANS SELLING

1. Reasons to have chosen this place to sell crustaceans:
   a) Near from home □
   b) Most favourable □
   c) The place I have acquired it □
   d) Other □ _____
2. Is this the unique place/market where you sell crustaceans?
   a) Yes □

b) No □
c) If no, other places: _____, _____, _____

3. Do you sell:
   a) Directly to consumer □
   b) to co-operative □
   c) to another retailers (“zungueiras”) □
4. Methods of payment you do accept:
   a) Cash □
   b) Credit □
   c) Other □ _____
5. Do you sell crustaceans every day?
   a) Yes____
   b) No____
   c) If No, When you don´t do? _____ Why? _____
6. Time of the day to start selling crustaceans: _____ Time to end _____
7. Most favourable selling period of the year:
   i. Species _____ period of the year _____
   ii. Species _____ period of the year _____
   iii. Species _____ period of the year _____
8. What are the most sold species, the quantities and the selling price in the last day (in Kg or other reference)?
   i. species_____ amount_____ price _____
   ii. species_____ amount_____ price _____
   iii. species_____ amount_____ price _____
9. Quantities of crustaceans reserved for personal consumption:
   i. species_____ amount _____
   ii. species_____ amount _____
   iii. species_____ amount _____

IV. INVESTMENTS AND REVENUES

1. Daily investments for being selling crustaceans:
   a) Transportation □ ____
   b) Food □ ____
   c) Fish purchase □
   d) Fish storage □ _____
   e) Other □_____
1. Total amount of revenue in the last day: _____
2. Usage of the revenues:
   a) Family Food supply□
   b) School fee payments □
   c) Family livelihood □
   d) Sponsorship of others commercial activities □
   e) Other □_____

V. **If you only dedicate to crustaceans trade**:

1. Why you do prefer to sell crustaceans?
   a) Cheaper to buy □

b) More offer □
c) More demanded □
d) Easier to preserve □
e) Easier to sell □
f) More profitable □
g) Other □_____

2. Who, in the last time, bought you more crustaceans?
   a) National residents_____
   b) National tourists _____
   c) Foreigner residents_____
   d) Foreigner tourists _____
   e) Other □_____

VI. **If you don´t dedicate to crustaceans trade**:

1. Why?
   a) Limited access to fishers □
   b) Less offer □
   c) low costumers´ demand □
   d) More expensive □
   e) less economic viable □
   f) More difficult to preserve □
   g) harder to sell □
   h) less profitable □
   h) Other □_____

2. If there was a good customer´s demand for crustaceans, which product would you prefer to trade?
   a) Finfish □
   b) Crustaceans □
   c) Both (1/2 of each) □
   d) More of finfish and a bit of crustaceans □
   e) More of crustaceans and a bit of finfish □
   f) Why? _____

VII. **If you dedicate in both crustaceans and general fish trade**:

1. Which type is easier to sell?
   a) Fish □
   b) Crustaceans □
2. Which type is more economic viable to sell?
   a) Fish □
   b) Crustaceans □
3. Which type is easier to preserve?
   a) Fish □
   b) Crustaceans □
4. Which type is easier to sell?
   a) Fish □
   b) Crustaceans □
5. Which type is more profitable?
   a) Fish □
   b) Crustaceans □

6. Which type is more demanded?
   a) Fish □
   b) Crustaceans □

VIII. FINANCIAL ISSUES

1. Do you have access to any form of credit?
   a) Yes □
   b) No □
   c) If yes, from which agency, person _____
   d) If No, why? _____
2. Do you pay fee or taxes?
   q) Yes □
   r) No □
   s) If yes, to whom? ____ How much? _____
3. Are these taxes fair?
   a) Yes □
   b) No □
4. Are there any benefits from paying for it?
   a) Yes □
   b) No □
   c) If yes, which benefits? _____
5. Do you belong to any cooperative?
   d) Yes □
   e) No □
   f) If yes, which? _____
   g) If no, why? _____
6. Are there any benefits for being part of it?
   a) Yes □
   b) No □
   If yes, which benefits? _____

NOTE: DRAFT QUESTIONNAIRE excepting for personal information, crew information and finance information, questions in all other sections might be altered after initial investigations in Angola.

Appendix J: Questionnaire to artisanal fish processors of Benguela province

A – PERSONAL INFORMATION

23. Age:____
24. Sex: Male □ Female □
25. Family status:
    Single □
    Married □
    Other □_____
26. No of children_____
27. Members of family working with: Yes □ No □
28. Literacy:
    k) Not literate □
    l) Primary school □
    m) Secondary school □ 1st cycle □ 2nd Cycle □ (normal intermediate education □ PUNIV □ technical education □ course_____)
29. Higher education □ course _____
30. Address:
    n) City_____
    o) Town _____
    p) District/ neighbourhood/ zone _____

B - WORK INFORMATION

5. How long have you been fishing? _____
6. Reasons for choose fish processing as a profession:
    j) The only job vacancy available □
    k) The only thing I can do □
    l) The best job offer □
    m) Other □_____
7. Do you engage in?
    m) Fish processing only □
    n) Crustaceans processing only □
    o) Fish processing and other □
    e) Crustaceans processing and other □
    f) Other □: agriculture □____ commerce □_____ industry □ _____
8. Do you have any licence to b processing fish/crustaceans?
    d) Yes: □
    e) No □
    f) If No, Why? _____

C - FISH ACQUISITION

1. I don´t acquire the fish, I only process for buyers □
2. If you acquire fish, who supply you the Crustaceans?
    a) Fishermen □
    b) a third person □
    c) Other □
3. Do you buy the fish you process?

a) Yes: □
b) No □

4. Payment method:
   a) Cash □
   b) Credit □
   c) Other □ _____
5. Do you buy/receive fish every day?
   a) Yes □
   b) No □
   c) If No, When you don´t do? _____
      Why? _____
6. Time of the day to start acquiring the Fish: _____ Time to end _____
7. Relationship with the seller/provider:
   a) Business partner □
   b) Parent □
   c) Other □ _____
   d) None □
8. Type and amount of fish bought/received in the last day (Kg or other reference):
   I. species_____ amount_____ price _____
   II. species_____ amount_____ price _____
   III. species_____ amount_____ price_____
   IV. species_____ amount_____ price _____
   V. species_____ amount_____ price _____
9. Reasons to have chosen this place to acquire Fish:
   d) Near from home □
   e) Most favourable □
   f) Best physical conditions □
   g) Other □ _____
10. Is this the same place you acquire and process the fish?
    a) Yes □
    b) No □
11. Where do you acquire the fish?
    Place 1 _____
    Place 2 _____
    Place 3 _____

D – FISH PRESERVATION

4. Usage of ice to preserve fish:
   c) Yes □
   d) No □
5. Equipment to preserve fish:
   d) Yes □
   e) No □
   f) If yes, type:
      Thermal box □
      Isothermal box □
      Other □ _____
6. Do you think it is important to use equipment to preserve fish?

d) Yes □
e) No □
f) Why? _____

E - FISH PROCESSING

1. What are the most acquired species in the last day (in Kg or other reference):
   I. species_____ amount_____ price _____
   II. species_____ amount_____ price _____
   III. species_____ amount_____ price_____
   IV. species_____ amount_____ price _____
   V. species_____ amount_____ price _____
   VI. species_____ amount_____ price _____

2. Price per kilo/or other reference for processing fish:
   I. species_____ amount_____ price _____
   II. species_____ amount_____ price _____
   III. species_____ amount_____ price _____
   IV. species_____ amount_____ price _____
   V. species_____ amount_____ price _____
   VI. species_____ amount_____ price _____

3. Who are your costumers?
   a) Buyers from retailers □
   b) Co-operatives □
   c) Other processors □
   d) Tourists □
   e) Other □ _____
4. Methods of payment you accept:
   a) Cash payment □
   b) Credit payment □
   c) Other □ _____
5. Do you process fish every day?
   a) Yes □
   b) No □
   c) If No, When you don´t do? _____ Why? _____
6. Time of the day to start processing fish: _____ Time to end _____
7. Most favourable processing period of the year:
   I. Species _____ period of the year _____
   II. Species _____ period of the year _____
   III. Species _____ period of the year _____
   IV. Species _____ period of the year _____
   V. Species _____ period of the year _____
   VI. Species _____ period of the year _____
8. Is this the unique place/market where you process fish?
   a) Yes □
   b) No □
   c) If no, other places:
   1 _____ 2_____ 3_____

9. Reasons to have chosen this place to process fish:
    a) Near home □
    b) Most favourable □
    c) Best physical conditions □
    d) Other □_____

F – INVESTMENTS AND REVENUES

1. Daily investments for being processing fish:
    f) Transportation □ ____
    g) Food □ ____
    h) acquisition of processing material (e.g. knife, pots, buckets) □_____
    i) Other □_____
2. Total amount of revenue in the last day: _____
3. Usage of the revenues:
    a) Family Food supply□
    b) School fee payments □
    c) Family livelihood □
    d) Sponsorship of others commercial activities □
    e) Other □_____

G - CRUSTACEANS ASSESSMENT

I. WORK INFORMATION

1. Reasons for choosing crustaceans processing as a profession:
    _____
2. For how long have you been processing fish? _____
3. Do you have any licence to process fish?

a) Yes: □
b) No □
c) If No, Why? _____

II. CRUSTACEANS ACQUISITION:

1. I don´t acquire the crustaceans, I only process for buyers □
2. If you acquire, who supply you the crustaceans?
    a) Fishermen □
    b) A third person □
    c) Other □_____
3. Do you buy the crustaceans process?
    a) Yes □
    b) No □
4. Method of payment:
    a) Cash payment □
    b) Credit payment □
    c) Other □ _____
5. Time of the day to start acquiring crustaceans: _____ Time to end _____
6. Do you buy/receive crustaceans every day?
    a) Yes □
    b) No □

c) If No, When you don´t do? _____ Why? _____

7. Relationship with the seller/provider:
   a) Business partner □
   b) Parent □
   c) Other □_____
   d) None □
8. Type and amount of crustaceans bought/received in the last day (Kg or other reference):
   i. species_____ amount_____ price _____
   ii. species_____ amount_____ price _____
   iii. species_____ amount_____ price_____
   iv. species_____ amount_____ price _____
   v. species_____ amount_____ price _____
9. Reasons to have chosen this place to acquire crustaceans:
   a) Near from home □
   b) Most favourable □
   c) Best physical conditions □
   d) Other _____
10. Is this the same place you acquire and process the crustaceans?
   a) Yes □
   b) No □
11. Where you acquire the crustaceans? Place 1_____ Place 2_____ Place 3_____
12. How far the place (s) you buy/receive is from the place you process crustaceans?
   Place 1 _____ distance _____ metres or _____ Km
   Place 2 _____ distance _____ metres or _____ Km
   Place 3 _____ distance _____ metres or _____ Km
13. How do you transport it?
   Place 1, By: Car □ Motorcycle □ Wheelbarrow □ Myself □ Other □ _____
   Place 2, By: Car □ Motorcycle □ Wheelbarrow □ Myself □ Other □ _____
   Place 3, By: Car □ Motorcycle □ Wheelbarrow □ Myself □ Other □ _____

III. CRUSTACEANS PRESERVATION

1. Usage of ice to preserve crustaceans:
   a) Yes □
   b) No □
2. Equipment to preserve crustaceans:
   a) Yes □
   b) No □
   c) If yes, type:
      Thermal box □
      Isothermal box □
      Other □_____
3. Do you think it is important to use equipment to preserve crustaceans?
   a) Yes____
   b) No_____
   c) Why? _____

IV. CRUSTACEANS PROCESSING:

1. What are the most acquired species in the last day (in Kg or other reference):
   i. species_____ amount_____ price _____
   ii. species_____ amount_____ price _____
   iii. species_____ amount_____ price_____
   iv. species_____ amount_____ price _____
   v. species_____ amount_____ price _____
   vi. species_____ amount_____ price _____

2. Price per kilo/or other reference for processing crustaceans:
   i. species_____ amount_____ price _____
   ii. species_____ amount_____ price _____
   iii. species_____ amount_____ price _____
   iv. species_____ amount_____ price _____
   v. species_____ amount_____ price _____
   vi. species_____ amount_____ price _____

3. Who are your costumers?
   a) Buyers from retailers □
   b) Co-operatives □
   c) Other processors □
   d) Tourists □
   e) Other □_____
4. Methods of payment:
   a) Cash payment □
   b) Credit payment □
   c) Other □ _____
5. Do you process crustaceans every day?
   a) Yes □
   b) No □
   c) If No, When you don´t do? _____ Why? _____
6. Time of the day to start processing fish: _____ Time to end _____
7. Most favourable processing period of the year?
   i. Species _____ period of the year _____
   ii. Species _____ period of the year _____
   iii. Species _____ period of the year _____
   iv. Species _____ period of the year _____
   v. Species _____ period of the year _____
   vi. Species _____ period of the year _____
8. Is this the unique place/market where you process crustaceans?
   a) Yes □
   b) No _____
   c) Other places: 1 _____ 2_____ 3_____
9. Reasons to have chosen this place to process crustaceans:
   a) Near from home □
   b) Most favourable place □
   c) Best physical conditions □
   d) Other □_____

V. INVESTMENTS AND REVENUES

1. Daily investments for being processing crustaceans:
   a) Transportation: ____
   b) Food: ____
   c) Acquisition of processing material (e.g. knife, pots, buckets) _____
   d) Other _____
2. Total amount of revenue in the last day: _____
3. Usage of the revenues:
   a) Family Food supply □
   b) School fee payments □
   c) Family livelihood □
   d) Sponsorship of others commercial activities □

VI. FINANCIAL ISSUES

7. Do you have access to any form of credit?
   e) Yes □
   f) No □
   g) If yes, from which agency, person _____
   h) If No, why? _____
8. Do you pay fee or taxes?
   t) Yes □
   u) No □
   v) If yes, to whom? ____ How much? _____
9. Are these taxes fair?
   c) Yes □
   d) No □
10. Are there any benefits from paying for it?
   d) Yes □
   e) No □
   f) If yes, which benefits? _____
11. Do you belong to any cooperative?
   h) Yes □
   i) No □
   j) If yes, which? _____
   k) If no, why? _____
12. Are there any benefits for being part of it?
   c) Yes □
   d) No □
   e) If yes, which benefits? _____

NOTE: DRAFT QUESTIONNAIRE excepting for personal information, crew information and finance information, questions in all other sections might be altered after initial investigations in Angola.

Appendix K: Interview guide to the representatives of the fishing sector´s governmental institutions, associations and cooperatives of Benguela province

A – **INSTITUTION INFORMATION**

31. What is the aim of this institution?
32. For how long this institution does exist?
33. In which municipalities/localities is this institution represented?

B – **MEANS OF WORK**

34. What are your main means of work?
35. How do you control the fishery activity?
36. Does your institution hold any surveillance vessel?

C – **WORK INFORMATION**

37. What fish species has your institution control of?
38. What are the statistics related to the fishery activity in your area of jurisdiction (number of people involved, boats, catches, landings, profits, if possible)?
39. Is there any species being scarce?
40. Have your institution registered any species being overexploited?
41. Have your institution registered any species being underexploited?
42. Is there any restriction for fishing imposed by your institution?
43. Has been your institution registered any conflicts between artisanal and industrial fishery?
    a) What are the measures adopted to tackle these situations?
44. What kind of support your institution can provide to the people involved in the fishing and related activities?
45. Do you provide access to any form of credit to artisanal and industrial fishers?
    a) What are the criterions to select them?
46. Does your institution ask from taxes to fishers, retailers and processors?
    a) What is the purpose/finality of these taxes?

D - **CRUSTACEANS ASSESSMENT**

47. Does your institution have control or supervision over crustaceans capture and trade?
    a) How your institution takes control/supervision of it?
    b) What are the statistics related to this activity (number of boats, catches, landings, profits, if possible)?
    c) How many people are involved in the fishing process?
    d) How many people are involved in the retailing process?
48. Is the currently fish production satisfactory to the market?
49. Is there any restriction for the capture of crustaceans?

50. Has your institution any information about what happens when some fishers accidentally catch crustaceans?
51. What are the difficulties presented by the fishers?
52. What kind of support your associates has been requesting your institution for?
53. If the institution doesn´t dedicate to crustaceans´ capture and trade control:
    a) Why your institution doesn´t dedicate to crustaceans´ capture and trade control?

E – **AQUACULTURE ASSESSMENT**

54. Does your institution have any relation with aquaculture activity?
    a) If not, why?
55. Have you any project to implement aquaculture practice, especially crustaceans' cultivation?
    a) If not, why?
56. Do you think crustaceans' culture would supply the actual demand?
57. Is there any incentive from your institution to make the fishery companies to start investing in aquaculture?
    a) If not, why?
58. Is there any additional information that you would like to supply?

Appendix L: Interview guide to industrial fishery companies of Benguela province

A – FISHERY INFORMATION

59. What is the name of this company?
60. How long does the company exist?
61. Does this company invest in fishing only?
62. How long has this company been in fishing industry?
63. Reasons for choosing fishing as an investment?

B – HUMAN RESOURCES

64. How many employees the company holds?
65. What are their nationalities?
66. What is their average age?
67. How many hours of work they do?
68. Are all of them local residents?
69. What is their average stipend?

C – VESSELS INFORMATION

70. How many vessels does the fishery hold?
71. What are the characteristics of the vessels?
    a) Size
    b) Engine size
    c) Capacity
    d) Size / type of gear
72. How many crew members do exist by vessel?
    a) What are their nationalities?
73. What flag is each vessel registered to?
74. Who owns it?
75. Who determines the rules the boat operates under (quota, season etc.)?
76. Where and who repairs those?

D – FISHING PROCESS/EXPLOITATION

77. What species does this company target?
78. Reasons to have chosen these targeted species?
79. Which species has this company been capturing?
80. What are the quantities being caught?
81. What are the quantities landed by trip in average?

82. Where are the catches landed?
83. Where and how is the catch processed?
84. Has the company been capturing unwanted species? How has this situation been managed?
85. What is the most favourable fishing periods of the year and for what species?
86. Is there any species being scarce?
87. In a typical trip, where does the boat start?
88. How long are they at sea for?
89. What are the fishing methods used in this company´s vessels?
90. How does the company get access to fishing materials?
91. What are the period and characteristics of the fishing zones the company operates?
92. Has this company been having problems with small scale fishing?

E – FISH PRESERVATION

93. Are these company´s vessels equipped with appropriate equipment to preserve fish?

F - FISH COMMERCIALISATION AND REVENUES

94. Who are the customers of this company?
95. Which are the prices that this company practices?
96. Are there any priorities to sell?
97. What are the ways of payment accepted by the company when selling its products?
98. What kind of benefit the company (employers and employees) achieves from fishery?
99. Does the company belong to any cooperative or association?
    l) Is there any benefit for being part of it?

G - CRUSTACEANS ASSESSMENT

100. **If the company only dedicate to crustaceans capture and/or trade**:
    e) Why this company do prefer crustaceans to capture and/or trade?
    f) Who are its costumers?
    g) Is the currently production satisfactory to the market?
    h) Is there any restriction for the capture of crustaceans?
    i) What species does this company target?
    j) Reasons to have chosen these targeted species?
    k) Which species has this company been captured?
    l) What are the quantities being caught?
    m) What are the quantities landed by trip in average?
    n) Where are the catches landed?
    o) Where and how is the catches processed?
    p) What is the most favourable fishing periods of the year and for what species?
    q) Is there any species being scarce?
    r) In a typical trip, where does the boat start?
    s) How long are they at sea for?
    t) What are the fishing methods used by the company´s vessels?
    u) What are the period and characteristics of the fishing zones?
    v) Has the company been having problems with artisanal fishery

101. If the company doesn´t dedicate to crustaceans capture and trade:

b) Why this company doesn´t dedicate to crustaceans capture and trade?
c) What happens when the company accidentally catches crustaceans?

102. **If the company dedicates in both crustaceans and general fish capture and trade**:
c) Which type is easier to catch?
d) Which type is more economic viable to catch?
e) Which type is easier to preserve?
f) Which type is easier to sell and to which costumers? Local or international market?
g) Which type is more profitable?

H – AQUACULTURE ASSESSMENT

103. Does this company have any knowledge/ background in aquaculture?
104. Have you ever managed to practice aquaculture, especially crustaceans?
105. Do you think crustaceans' culture would supply the current demand?
106. Would this company invest in crustaceans' cultivation?
107. Is there any incentive from the ruler institutions to move the fishery companies to start investing in aquaculture?
108. Is there any additional information that you would like to supply?

I - LAST TRIP´S ASSESSMENT

109. Where did the boats start?
110. Where did they go?
111. How long they remained or are at sea for?
112. Who are the crew members (nationality, etc.)?
113. What are the fishing methods used?
114. What were the targeted species?
115. Reasons to have chosen these targeted species?
116. Which species were captured?
117. What are the quantities caught?
118. What are the quantities landed?
119. What about discards, is there any?
120. Where were or where will the catches be landed?
121. To whom were or will the catches be sold?
122. Is there any additional information you would like to provide us?

Appendix M: Interview guide to industrial fish processors of Benguela province

A – COMPANY INFORMATION

123. What is the name of this company?
124. How long does this company exist?
125. Which type of product processing does this company dedicate to?
126. Does this company invest in fish/crustaceans processing only?
127. For how long has this company been in fish/crustaceans processing industry?
128. Reasons for choosing fish/crustaceans processing as an investment?

B - FISH/CRUSTACEANS ACQUISITION

12. Where this company does acquire the fish/crustaceans to process?
13. Does this company buy the fish/crustaceans?
14. What are the payment methods the company has been asked to do?
15. Does this company buy/receive fish/crustaceans every day?
16. What is the time of the day to start and to finish acquiring the fish/crustaceans?
17. If no, when does this company doesn´t do it?
18. What is the relationship between this company and the seller/provider?
19. What type and amount of fish/crustaceans bought/received in the last day (Kg)?
20. What are the reasons to have chosen this place to acquire fish/crustaceans?
21. Is the place where the company acquires fish/crustaceans the same it is processed?
22. If no, where does this company acquire the fish/crustaceans?
23. How far is the place this company buy the fish/crustaceans from the place it has been processed?
24. How does the company transport it?

C – FISH/CRUSTACEANS PRESERVATION

7. Does this company use ice to preserve fish/crustaceans?
8. What sort of equipment to preserve fish/crustaceans has been used?

D - FISH/CRUSTACEANS PROCESSING

1. Does this company process fish/crustaceans every day?
2. If No, When this company does not do it?
3. What is the time of the day to start and to finish processing the fish/crustaceans?
4. What is and for what species is the most favourable processing period of the year?
5. Who are the company´s costumers?
6. What methods of payment does this company accept?
7. What was the processing price per kilo/or other reference?
8. What are the species and the quantities processed in average?
9. What were the species and the quantities processed in the last day?
10. What are the reasons to have chosen this place to process fish/crustaceans?

E – INVESTMENTS AND REVENUES

11. What are the company´s daily investments for being processing fish/crustaceans?
12. What was the total amount of revenue in the last day?

13. Is there any additional information you would like to provide? What kind of benefit the company (employers and employees) achieves from fishery? ????? Not very sure about this question...
14. Does the company belong to any cooperative or association?
    m) Is there any benefit for being part of it?

F - CRUSTACEANS ASSESSMENT

15. **If the company only dedicate to crustaceans processing**:
    w) Why this company do prefer crustaceans to process?
    x) Does the company belong to a fishery company?
    y) Who supply or sell to the company crustaceans to process? Does the company pay it by cash or credit?
    z) Who are its costumers?
    aa) Is the currently production satisfactory to the market?
    bb) Is there any restriction or inadequacy to process crustaceans?
    cc) What species does this company have elected to process?
    dd) Reasons to have chosen these elected species?
    ee) Which species has this company been processed?
    ff) What are the quantities daily processed in average?
    gg) Where and how have the crustaceans been processed?
    hh) What are the most favourable periods of the year to process crustaceans and for what species?
    ii) Is there any species being scarce?

16. **If the company doesn´t dedicate to crustaceans process and trade:**
    d) Why this company doesn´t dedicate to crustaceans processing?

17. **If the company dedicates in both crustaceans and general fish process and trade**:
    h) Which type is easier to process?
    i) Which type is more economic viable to process?
    j) Which type is easier to preserve?
    k) Which type is easier to sell and to which costumers? Local or international market?
    l) Which type is more profitable?

G – AQUACULTURE ASSESSMENT

18. Does this company have any knowledge/ background in aquaculture?
19. Have you ever managed to practice aquaculture, especially crustaceans?
20. Do you think crustaceans' culture would supply the current demand?
21. Would this company invest in crustaceans' cultivation?
22. Is there any incentive from the ruler institutions to move the fishery companies to start investing in aquaculture?
23. Is there any additional information that you would like to supply?

Appendix N: Questionnaire to restaurant (including hotels that serve food) representatives of Benguela province

A – RESTAURANT INFORMATION

129. Location_____
130. What is the name of this restaurant?
131. How long does the restaurant exist?
132. How many seats does the restaurant have?
133. Does the restaurant serve take away food?
134. Reasons for choosing restaurant as an investment?
135. What are the reasons to have chosen this place to establish this restaurant?

B – HUMAN RESOURCES

1. How many employees the restaurant holds?
2. What is their average age?
3. How many hours of work they do?
4. Are all of them local residents?
5. What is their average stipend?

C - FISH AND CRUSTACEANS ACQUISITION

9. Where the restaurant does acquire the fish and crustaceans to cook?
10. Does this restaurant buy the fish and crustaceans?
11. What are the payment methods the restaurant has been asked to do?
12. Does this restaurant buy/receive fish and crustaceans every day?
13. What is the time of the day to start and to finish acquiring the fish and crustaceans?
14. If no, when does this restaurant doesn´t do it?
15. When the restaurant receives/buy fish and crustaceans, does it come frozen?
16. How does is it transported when bought in a distant market, ice has been used?
17. What is the relationship between this restaurant and the seller/provider?
18. What type and amount of fish and crustaceans bought/received in the last day?
19. What are the reasons to have chosen this place to acquire fish and crustaceans?
20. If no, where does this restaurant acquire the fish and crustaceans?
21. How does the restaurant transport it?

D – FISH AND CRUSTACEANS DISHES SELLING

1. Does this restaurant cook fish and crustaceans every day?
2. If No, When this restaurant does not do it?
3. What is the time of the day to start and to finish cooking the fish and crustaceans?
4. What is and for what species is the most favourable cooking period of the year?
5. What are the current fish and crustaceans´ dish prices?
6. What is the estimated amount of crustaceans per dish?

7. What is the coast of crustaceans by dish?
8. What are the species and the quantities cooked in average?
9. What were the species and the quantities cooked in the last day?
10. What were the most sold dishes constituted by fish and crustaceans species in the last day?
    a) What were the quantities?
    b) What were the selling prices?
    c) Comparing fish and crustaceans which is the more profitable product? Why? Could you provide example with numbers to confirm?
11. Who are the restaurant´s costumers?
12. Who of them do consume more crustaceans?
13. What methods of payment does this restaurant accept?
14. Is the current production enough for the demand? Why?

E – INVESTMENT AND,REVENUES

15. What are the restaurant´s daily investments for being cooking fish and crustaceans?
16. What was the total amount of revenue in the last day?
17. What kind of benefit the restaurant (employers and employees) achieves from fishery?
18. Does the restaurant belong to any cooperative or association?
    n) Is there any benefit for being part of it?
19. Is there any additional information you would like to provide?

Appendix O: Thesis tables

Table O.1. Monthly fees paid by stakeholders in the study area (Angolan currency - AOA).

Stakeholder category	Minimum	Median (Interquartile range)	Maximum
Commercial Fishers	AOA2,000	AOA3,000 (AOA 3,000 - AOA3,000)	AOA5,000
Retailers	AOA0	AOA400 (AOA400 - AOA405)	AOA2,000
Processors	AOA1,200	AOA1,200 (AOA1,200 - AOA1,200)	AOA1,200

Table O.2. Financial investments/costs that artisanal retailers and processors do, and the financial gains generated.

Retailers' daily financial benefits	Minimum	Median (IQR)	Maximum
Costs	AOA4,300	AOA21,525 (AOA14,238 - AOA41,638)	AOA450,000
Earnings	AOA8,000	AOA40,850 (AOA23,000 - AOA46,800)	AOA480,000
Profits	AOA700	AOA9,399 (AOA3,513 - AOA20,338)	AOA203,000
Processors' daily financial benefits in AOA	**Minimum**	**Median**	**Maximum**
Costs	AOA100	AOA400 (AOA300 - AOA575)	AOA800
Earnings	AOA1,000	AOA1,500 (AOA1,313 - AOA1,725)	AOA3,500
Profits	AOA450	AOA1,150 (AOA825 - AOA1,450)	AOA2,800
Fishers' daily financial benefits in AOA	**Minimum**	**Median**	**Maximum**
Costs	AOA0	AOA2,050 (AOA500 - AOA14,525)	AOA204,000
Earnings	AOA1,575	AOA75,000 (AOA19,450 - AOA191,375)	AOA3,500,000
Profits	AOA-4,700	AOA63,275 (AOA16,575 - AOA185,500)	AOA3,448,000

*1USD ~ AOA57940; costs include payments of taxes, fees, and services, and the purchasing and rent of services and goods.

Table O.3. Prices of some basic products in Benguela province (source: author, compiled during field work, Jan-July 2018).

Product	Kwanza (AOA)	Dollar (USD)
Lettuce (1 unit)	AOA1,000	USD1.82
Onions (1kg)	AOA970	USD1.76
Potatoes (1 kg)	AOA930	USD1.69
Tomatoes (1 kg)	AOA1,100	USD2.00
Bananas (1kg)	AOA1,100	USD2.00
Eggs (12 units)	AOA2,100	USD3.81
Rice (1 kg)	AOA1,500	USD2.72
Bread (1 kg)	AOA2,000	USD3.63
Milk (1 L)	AOA1,200	USD2.18
Sugar 1kg	AOA1,000	USD1.82
Red beans (1kg)	AOA1,200	USD2.18
Corn flour	AOA500	USD0.91
Soap (1 unit; 300g)	AOA500	USD0.91
Vegetable oil (1L)	AOA1,500	USD2.72
Pasta (450g)	AOA500	USD0.91
School fees (monthly)	AOA12,000	USD21.80
Taxi	AOA5,000	USD9.10
Total	AOA34,100	USD62.06

Table O.4. List of documents provided during the interviews with representatives of local governmental institutions and fishers' associations and cooperatives.

Organisations	Scope	Representative	Supporting Documents Provided
Provincial Directorate of Fisheries and the Sea	Provincial	Head of the Department of Fisheries	-Map of restrictions on fishing. -Organic Statutes of the Ministry of Fishery and the Sea - Decree No. 41/05 - General Regulation of Fisheries - Decree No. 159/2006
Fisheries Research Center	Regional	Head of the Institution	Paper – annual activity report -IPA´s Organic Statutes Monthly captures report model (since 2005) -List of fishery sector cooperatives in Benguela province
IPA Institute for the Development of Artisanal Fisheries and Community Aquaculture	Provincial	Head of the Institution	-Registration map of fishing communities, number of boats, fishers, and landings in Benguela province for 2016/17 Decree No. 23/18 of 31 January of Ministry of Fisheries, Angola (management measures)

Table O.5. List of documents accessed through websites/online databases.

No	Type and title of document	Available at
1	Estratégia e Plano de Acção Nacionais para a Biodiversidade – NBSAP	www.cbd.int/doc/world/ao/ao-nbsap-01-pt.pdf
2	Programa de Ordenamento da Pesca e da Agricultura	https://www.pescas.gov.ao/public/documentos/2.pdf
3	Perspectiva Nacional e Resumo dos Resultados da Análise de Base sobre a Economia do Agregado Familiar	http://www.minagri.ao
4	*Pesca Marítima em Angola* [Poster presentation]. Programa de Apoio à Produção, Diversificação das Exportações e Substituição de Importações (PRODESI)	Shared during webinar
5	*Angola Tourism Master Plan*. MINHOTUR. Republic of Angola.	Legal Deposit: 358556/13. ISBN: 978-989-97664-2-6
6	Artisanal Fisheries in Angola. Instituto de Pesca Artesanal de Angola	www.ipangola.org/artisanalfisheries.pdf
	Censo Geral da População e Habitação – Resultados Definitivos da Província de Benguela	http://www.ine.gov.ao

Table O.6. Criteria established in Angolan legislation to classify vessels in segments of the fleet (Source: MINPESMAR, 2017).

	Fleet / Segment	Deck	Propulsion	Overall length (OL) in metres	Horsepower (HP)	Taxes due	Distance from shore permitted to fish	Purpose of fishing
	*Subsistence*							
	Canoe (Figs. 4a; 4b; 4c)	Open	Without or with motor	Up to 5m	NA	Free	4 Nautical Miles	Subsistence
	Timber boat	Open	Without motor	5<OL=7	NA	Free	4 Nautical Miles	Subsistence
	Artisanal (commercial)							
	Timber boat	Open	Without or with motor	5<OL=7	HP=250	AOA9,020	4 Nautical Miles	Commercial
	Trawl (Catronga)	Closed	With motor	7<OL=14	HP=250	AOA25,000	4 Nautical Miles	Commercial
	Semi-industrial (Trawl)	Closed	Interior motor	14<OL=20	250<HP=500	AOA42,000	4 Nautical Miles	Commercial
	Industrial							
	*Industrial*	Closed	Interior motor	OL>20	HP>500	AOA73,000	Over 4 Nautical Miles	Commercial

NA = Not Available; AOA = Angolan currency (Kwanza).

Table O.7. Comparison between female and male SSF stakeholders´ performance in Benguela province.

Comparative feature	Female	Male
Fish extraction	No	Yes
Retailing (location)	All markets	Only in Cotel roundabout, along the Road N123 and in Dombe Grande market
Processing	Prior to sale	Young men do so for customers, retailers, other processors, restaurants
Time in the activity	1 year - 35 years	1 day -17 years
Age range	18-60	30-44
Reason for working as retailer	Only option	Best option
Working with relatives	3-5 people	Only with 1 on average
Alternative jobs	None	Fisher, farmer, mechanic, builder, food and beverages seller,
Financial literacy	Low	Medium
Income generation	High	Medium
Socioeconomic benefits from SSF	High	Medium
Owning boats	Rare (just 1 participant)	Many

Table O.8. Number of artisanal boats involved in accidents with industrial vessels.

Type of accident in a year	Fishing community	Boats motion		Total of boats	Boats with safety equipment
		Outboard engine	Paddles (including rafts and canoes)		
Fishing gear snagged	Caota	1	2	3	1
	Cuio	4	0	4	1
	Egito Praia*	1	5	6	0
	Chindumbi	0	1	1	1
	Lobito Velho	1	0	1	0
	Praia Bebé	1	6	7	0
	SUB-TOTAL	***8***	***14***	***22***	***4***
Violation of fishing ground	Catumbela Praia	2	1	3	0
	Egito Praia*	0	1	1	0
	Kasseque*	6	1	7	2
	SUB-TOTAL	***8***	***3***	***11***	***2***
Boat sunk	Kasseque*	1	0	1	1
	Damba Maria	0	1	1	0
	SUB-TOTAL	***1***	***1***	***2***	***1***
TOTAL OF ACCIDENTS		**17**	**18**	**35**	**7**

**The boats marked in Egipto Praia and in Kasseque are the same ones which had two types of accidents, which gives a total of 33 boats only.*

Table O.9. Number of retailers who can afford household food supply compared to their number of children.

	Number of children				
Number of retailers	0	1-3	4-6	7-9	10+
	2	14	23	3	2

Table O.10. Reasons for working as a fisher and the way with which stakeholders get access to the boats.

Socio-economic characteristics		
Reasons for working as fisher	**Commercial fishers (n=58)**	**Subsistence fishers (n=16)**
Only job available	29 (50%, CI=37-62%)	9 (56%, CI=33-77%)
Best job-offer	19 (33%, CI=22-46%)	1 (6%, CI=0.3-28%)
Family heritage	7 (12%, CI=5.9-23%)	3 (19%, CI=6.5-43%)
Other reasons (extra job)	3 (5%, CI=1.7-14%)	3 (19%, CI=6.5-43%)
Ways to access to the boat (s)	**Commercial fishers (n=58)**	**Subsistence fishers (n=16)**
I searched	28 (48.3%, CI=36-61%)	4 (25%, CI=10-49%)
I was Invited	13 (22.4%, CI=14-35%)	3 (19%, CI=6.6-43%)
I am family member	6 (10.3%, CI=4.8-21%)	0 (0%)
I am the owner	11 (19%, CI=11-31%)	9 (56%, CI=33-77%)

Table O.11. Species of crustaceans caught by boat in fishing communities in Benguela.

Species	Number of vessels	Fishing methods	Fishing communities and landing sites (Table 3.1.)
Crabs (*Geryon maritae* and *Callinects marginatus*)	6	Pelagic Mid-Water Bottom Trawl, Cage, and Beach Seine	Lobito Velho, Kasseque – tombas, Chindumbi - Zone F, Catumbela Praia and Praia Bebé (Vala)
Spiny Lobster (*Panillurus regius*)	8	Bottom Gillnet and Trap	Egito Praia and Lobito Velho
Coastal prawn (*Penaeus notialis* and *Penaeus kerathurus*	5	Pelagic Mid-Water Bottom Trawl, Beach Seine, Seine Net and Surface Gillnet	Chindumbi - Zone F, Catumbela Praia and Kasseque - tombas
Deepwater rose shrimp (*Parapeneus longirostris and Aristaeus varidens*	6	Pelagic Mid-Water Bottom Trawl, Beach Seine, Seine Net and Surface Gillnet	Chindumbi - Zone F, Kasseque – tombas, Catumbela Praia and Praia Bebé (Vala)

Table O.12. Average prices of seafood species traded by artisanal stakeholders in Benguela.

Species	Estimated average price by kg in Angolan currency (AOA)	Estimated average price by kg in USD (USD)
Deep sea shrimp	AOA 4,500	USD 8.54
Lobster	AOA 3,300	USD 6.26
Squid	AOA 2,500	USD 4.74
Prawn	AOA 2,500	USD 4.74
Octopus	AOA 2,000	USD 3.79
Conger	AOA 1,000	USD 1.89
Mackerel	AOA 800	USD 1.51
Blotched picarel /sarda sarda	AOA 800	USD 1.51
Sardines	AOA 500	USD 0.95

Table O.13. Reasons for not trading crustaceans in seafood retail operations.

Retail type	Trade Crustaceans?	avoid competition	low offer	NA	not adapted	religious reasons
Retail Only Bony Fish	Yes	7	5	1	8	3
	No	0	0	20	0	0
Retail Only Crustaceans	Yes	0	0	3	0	0
	No	7	5	18	8	3
Retail both crust and bony Fish	Yes	0	0	17	0	0
	No	7	5	4	8	3

Table O.14. Cost of building and renting SSF vessels in Benguela province (as of 2018).

Type of vessel	Price to build (AOA)	Price to buy (AOA)	Price for rent by trip (AOA)
Timber with engine	AOA4,100,000	AOA1,300,000	Not Available
Timber without engine	AOA800,000	AOA200,000	Not Available
Tree trunk	AOA10,000	AOA15,000	Not for renting
Foam	AOA5,000	made by owners	AOA1,000
Mixed tree trunk/foam	AOA10,000	AOA55,000	Not Available

Table O.15. Investment and revenues in artisanal boats surveyed for this study.

Boats daily financial benefits in Angolan Kwanzas AOA	Minimum	Median (interquartile range)	Maximum	Mean	SD
Investments	AOA 0	AOA 2,050 (500-14,525)	AOA 204,000	AOA 20,776	AOA 44,669
Revenues (Earnings)	AOA 1,575	AOA 75,000 (19,450-191,375)	AOA 3,500,000	AOA 318,719	AOA 709,344
Profits	AOA-4,700	AOA 63,275 (16,575-185,500)	AOA 3,448,000	AOA 297,943	AOA 705,250

Table O.16. Characteristics of artisanal fleet dedicated to crustaceans' capture.

Characteristics of the boats	Commercial boats (n=33)	%	Boats lenght	Boats´ motion			Navigation equipment		Equipment to preserve fish	
				Paddle	Outboard engine	Onboard engine	Yes	No	Yes	No
Fishing for crustaceans mixed with other species	14	42%	3-8 m	10	4	0	2	12	1	13
Fishing exclusively for crustaceans	1	3%	12 m	0	0	1	1	0	0	1
Not fishing for crustaceans	18	55%	3-12 m	5	13	0	7	11	7	11

Appendix P: Thesis figures

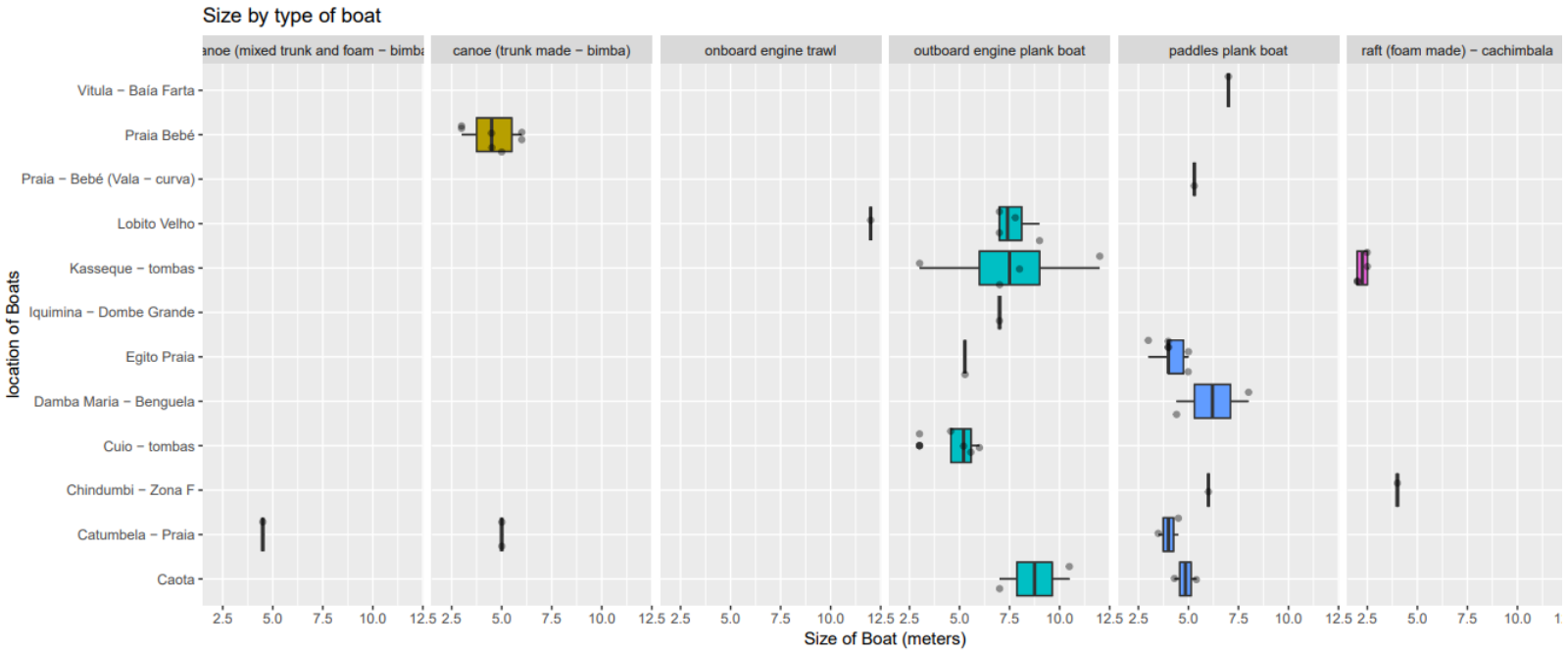


Figure P.1. Distribution of boats by size and motion by location in the study area.

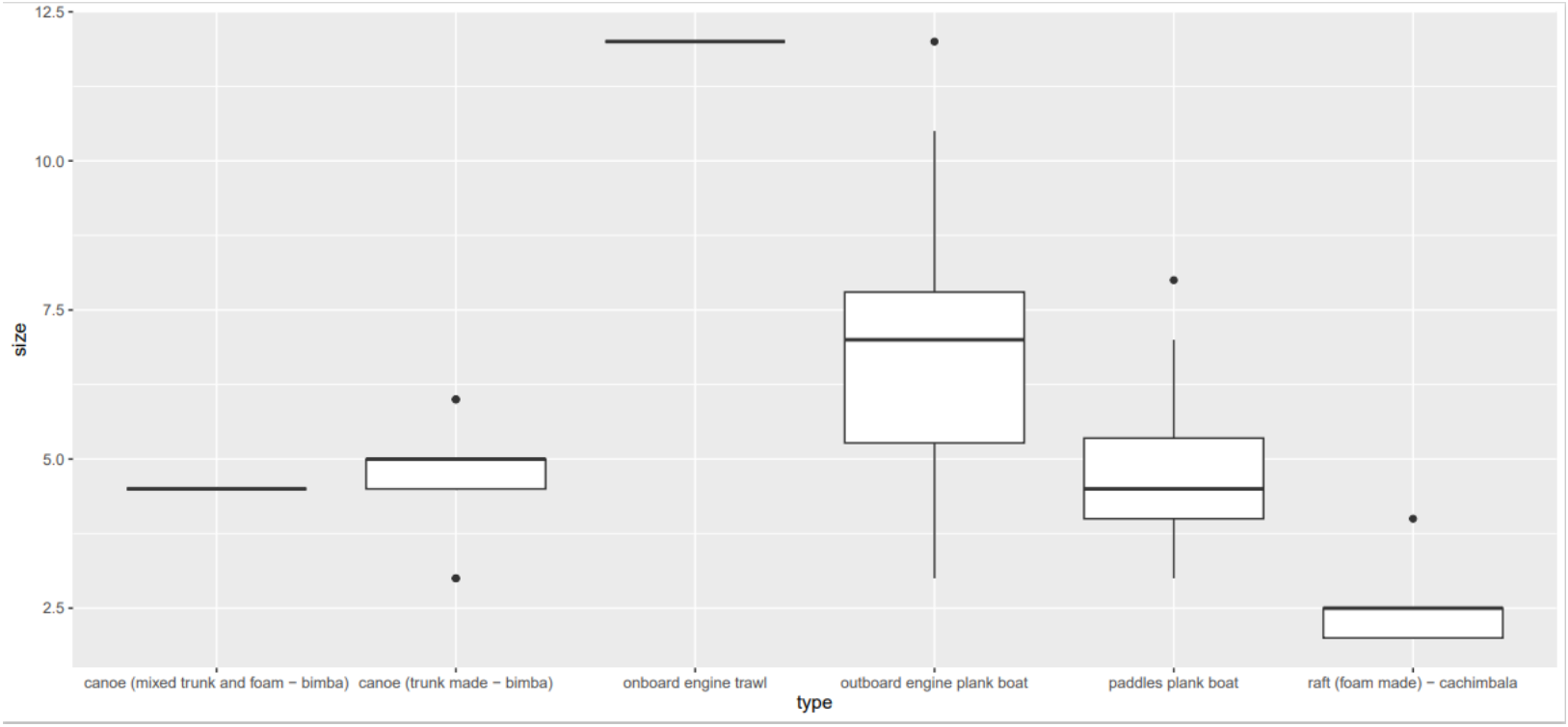


Figure P.2. Relationship between boat building type and motion and size.

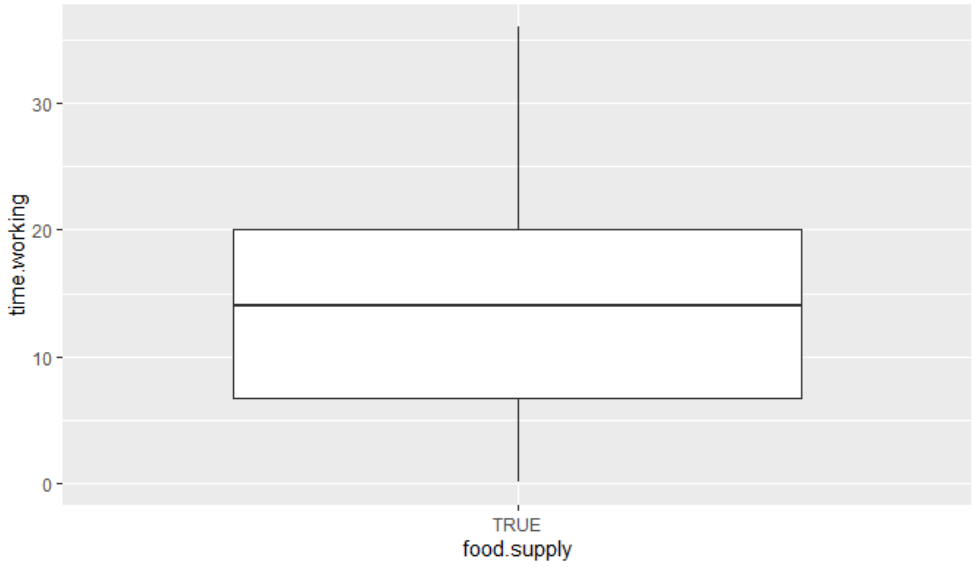


Figure P.3. Time in which participants who can afford food supply for households are engaged in the fish retailing process.

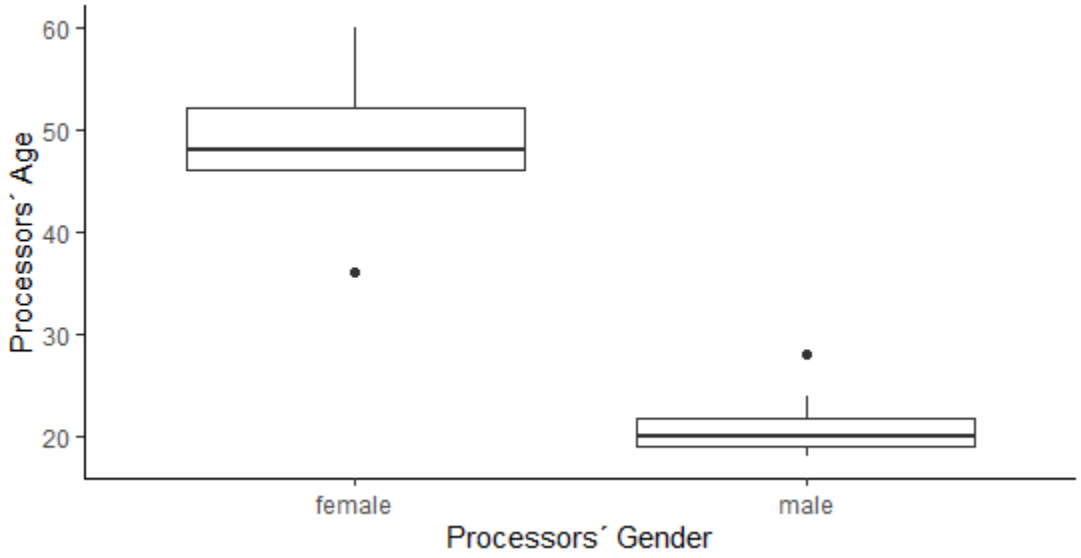


Figure P.4. Relationship between processors´ age and gender.

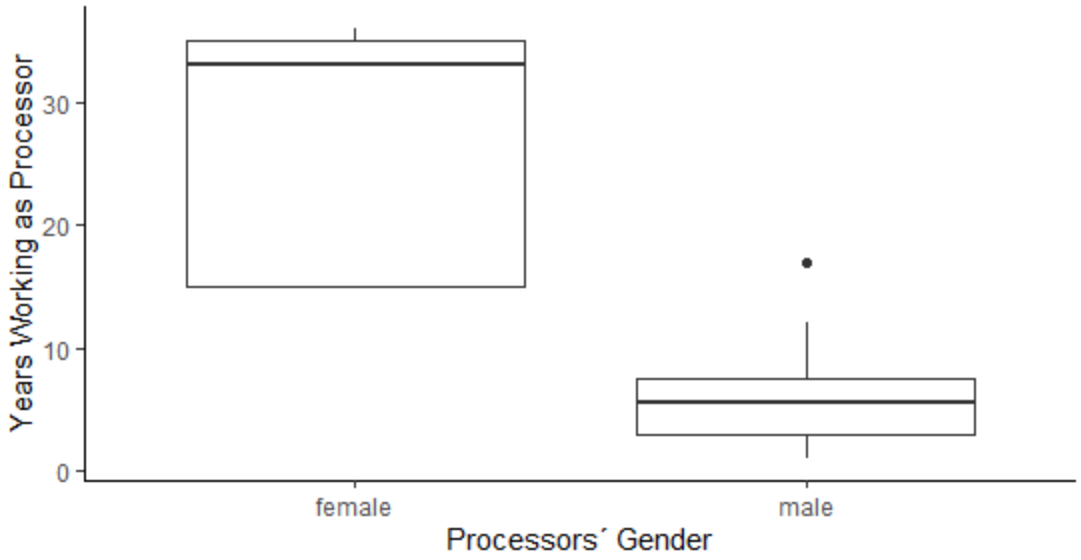


Figure P.5. Relationship between processors´ years of working experience and gender.

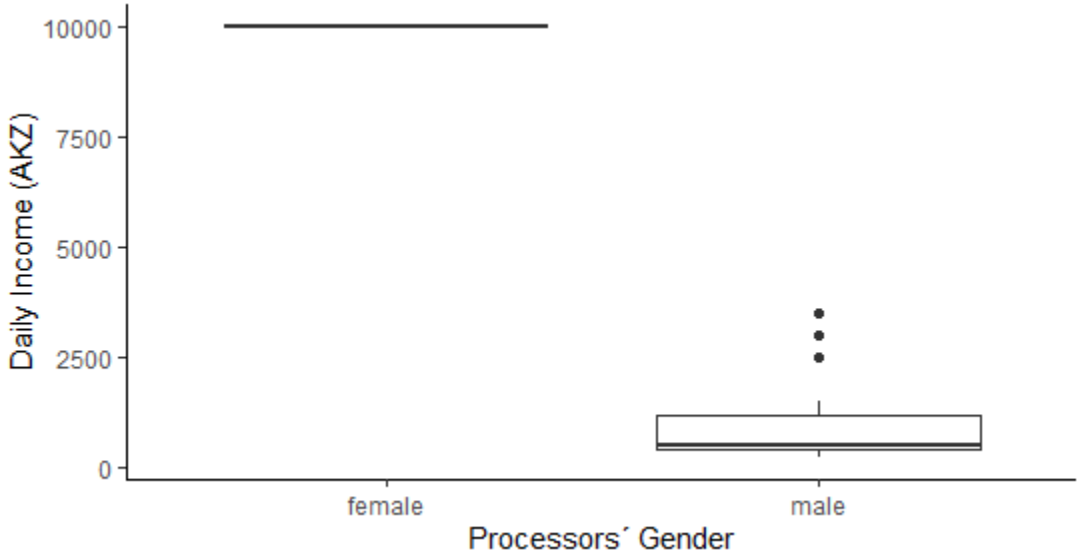


Figure P.6. Relationship between processors´ daily income and gender.

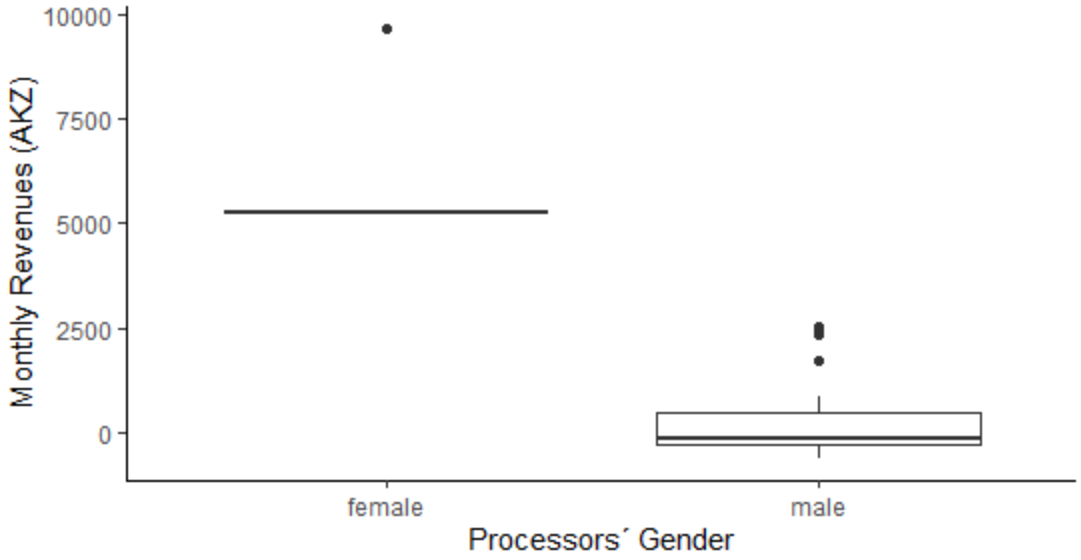


Figure P.7. Relationship between processors´ monthly and gender.

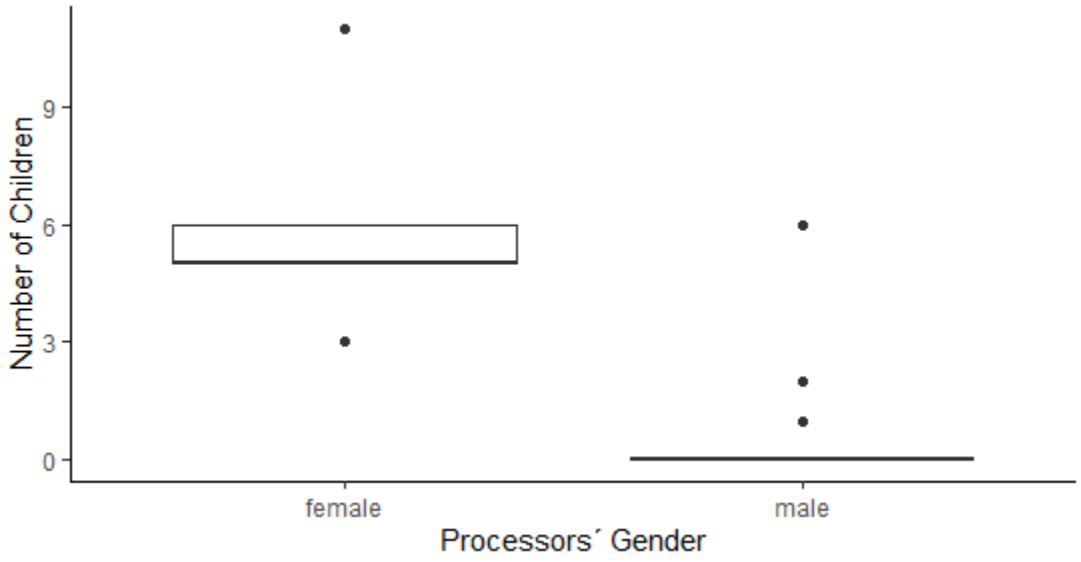


Figure P.8. Relationship between processors´ number of children and gender.

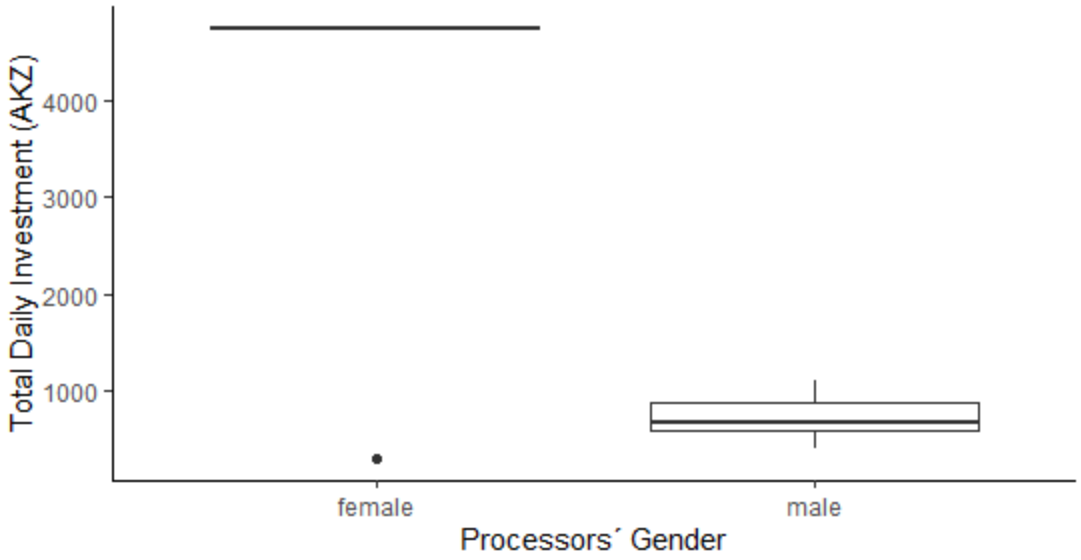


Figure P.9. Relationship between processors´ total daily income and gender.

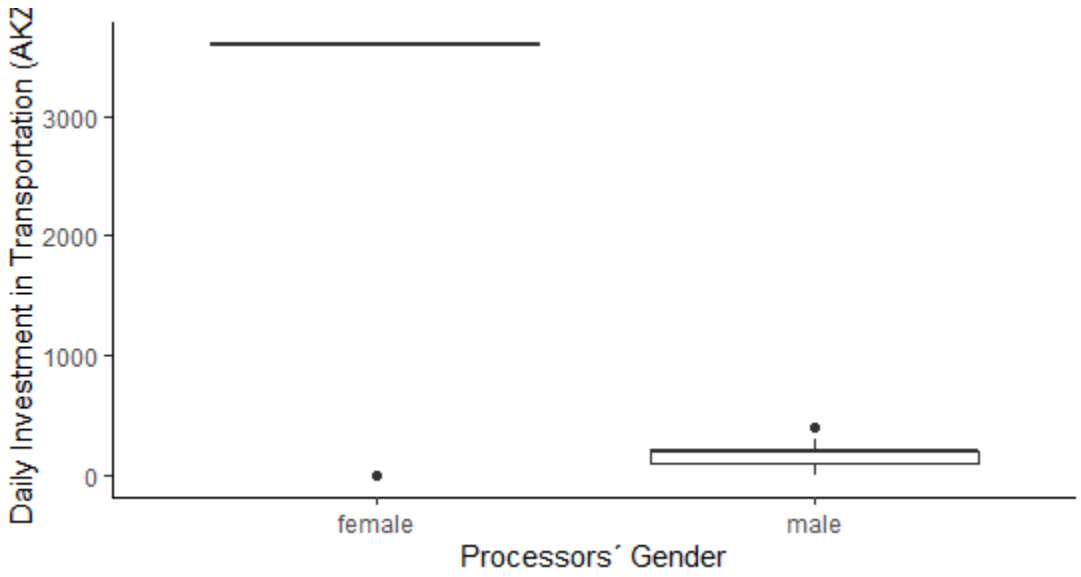


Figure P.10. Relationship between processors´ daily investment in transportation and gender.

Appendix Q: Variable's loadings

Table Q.1. Boats´ variables Loadings

Variables	Loadings				
	MR1	MR3	MR4	MR2	MR5
loc	0.195	**-0.470**	0.259	**0.348**	0.165
type	0.337		**-0.585**	**0.568**	-0.175
size	**0.392**	0.288	0.229		0.232
sail	-0.193	0.112	0.382	**-0.518**	
paddles	0.388		**0.584**		
outboard	-0.345	0.109	**-0.656**		0.101
onboard	-0.156	**-0.425**	**0.178**	-0.105	
nav.equip	**-0.890**	-0.215			
vest	**0.738**	0.192	0.219		
lantern	**0.849**	0.278			
compass	**0.885**	0.207			
gps	**0.948**				
Radio	**0.886**	0.137			
Sounder	**0.888**	0.109			0.111
anchor	**0.907**	0.110			
floats	**0.877**	0.217			
crew.num	0.303		0.213	-0.148	**0.579**
pelagic	-0.170	0.120		**0.280**	
demersal		**-0.507**	-0.159	0.145	0.107
handlines		0.184	-0.258	**-0.778**	
bottomg	0.151	-0.221		**0.545**	0.308
surfaceg	**-0.336**	**0.330**	0.181	**0.268**	0.206
beach.seine	0.161			0.125	**-0.572**
seine.net					**-0.169**
length				**-0.883**	-0.166
mesh		-0.108		**-0.884**	-0.106
cage	-0.151	**-0.758**	0.220		
trips.week		-0.144	**0.498**		
abundant	**-0.435**	0.290	-0.185		0.372
near.home	**0.487**	-0.313	0.145		-0.294
suits.boat	**0.219**			0.163	
easier.catch	-0.247	**-0.458**	0.363		
demanded				**0.204**	0.126
profitable	0.250	**0.437**	-0.164	0.153	0.200
tax1	-0.126	0.177	**0.531**	-0.217	0.215
tax2		-0.189	**0.578**		
material.acq	-0.183		0.125	**0.222**	**-0.234**
mat.supplier				**0.596**	-0.233
trip.hours		0.348	**0.608**		-0.201
ice.used	-0.110		0.279	**-0.548**	0.112
pres.equip		0.138	**0.479**	0.216	0.123
fuel	0.311	**0.664**	0.249		
food	0.163	**0.509**	0.383		-0.197
bait		**0.825**	0.216		-0.159
ice	0.143	**0.587**			
fishing.equi		**0.315**	**0.475**	0.278	-0.115
oil	0.179	**0.430**	0.273	0.319	
total.invest	0.214	**0.788**	0.309		-0.126
total.caught	**0.466**			-0.265	
total.sold	0.126	-0.227		0.211	**0.833**
revenues			-0.109		**0.918**
profit		-0.215	-0.162		**0.917**
landed	**0.547**	-0.124		-0.256	
reserved		0.176	**0.672**	0.176	-0.113
	MR1	MR3	MR4	MR2	MR5

SS loadings	9.323	5.475	4.654	4.762	4.053
Proportion Var	0.173	0.101	0.086	0.088	0.075
Cumulative Var	0.173	0.274	0.360	0.448	0.523

Table. Q.2. Fishers´ variables loadings

Variables	Loadings					
	MR2	MR1	MR6	MR3	MR4	MR5
Location	0.134	0.113	0.123	**-0.362**		
maritalstatus	0.144	**0.552**		0.276		-0.137
age		**0.705**	-0.121	0.288	0.161	
education		-0.164	0.146	-0.158	0.146	**0.256**
children	-0.167	**0.765**	0.108	0.245		
familyworking	-0.118	**0.272**	-0.169	0.199		
landed	0.103		-0.166	-0.212	0.121	**0.584**
retained		0.183	**-0.220**		0.105	0.103
occupation			0.120		**-0.393**	0.177
farming		**-0.307**		0.279	-0.257	
government		0.102	**-0.342**			-0.129
otheroccup/job			0.275	-0.100	**-0.371**	0.263
boatsworking in	**-0.469**	0.210	0.108		-0.139	
accessboat		**-0.605**		0.194	-0.115	0.107
timefishing		**0.732**		0.254		
reasonworking	0.230	-0.109	-0.114	**-0.308**	0.169	-0.153
position	-0.119	**-0.776**	0.105			0.117
planning.ops	-0.261	**-0.521**		0.108	0.234	
trips.month	0.186	**-0.342**				
typeretained			**-0.422**			-0.129
transport		-0.114				**0.142**
food		0.193	**-0.334**		-0.110	0.181
accesscredity	0.440	0.116			**0.833**	0.168
creditprovider	-0.389	-0.119		-0.103	**-0.786**	-0.127
reasonnocredit	0.298	-0.176		0.269	**0.583**	
taxes	-0.258	-0.210		**-0.811**		
taxayear	0.264		0.158	0.190	**-0.460**	-0.159
fairtaxes	0.156	0.218	0.162	**0.851**	0.155	
benefitstaxes	0.132	0.283		**0.780**	0.161	
typebenefits	0.208	-0.118	-0.212		**-0.527**	
associated		-0.347	**0.799**			
cooperative		0.298	**-0.540**			0.142
whynotassociated		0.166	**0.886**			
benefitsassoc?		0.315	**-0.763**			
assoc.benefits			**-0.525**	0.169	-0.302	-0.110
foodsupply	0.125	**-0.283**	0.231		-0.125	-0.239
livelihood		-0.280	-0.278	0.150	-0.169	**0.468**
schoolfees			0.133	-0.111		**-0.481**
sponsorshipofcommerce			**0.337**	0.172	-0.146	
otherbenefits	-0.137	0.183	0.284	0.122	**0.294**	
boatsize					0.237	**0.854**
boattype	0.495	0.105	0.221	**-0.515**	-0.251	
crewnumber		-0.247		0.294		**0.619**
pelagic	**0.848**			0.149	0.182	
demersal	**0.911**	-0.138			0.149	
handlines	**0.466**	-0.215		0.414	0.265	0.191
surfacegillnet	**0.541**		0.145	0.434		
bottomgillnet	**0.718**		0.241		0.300	0.159
beachseine	**0.660**	0.303	-0.189	-0.288		0.234
seinenet	**0.687**		-0.193		0.103	-0.378
traps		-0.129	0.204			
	MR2	MR1	MR6	MR3	MR4	MR5
SS loadings	4.946	4.701	4.000	3.868	3.415	2.727
Proportion Var	0.097	0.092	0.078	0.076	0.067	0.053
Cumulative Var	0.097	0.189	0.268	0.343	0.410	0.464

Table Q.3. Retailers´ variables loadings

Variables	Loadings: MR6	MR1	MR2	MR3	MR4	MR5
market	-0.284		0.187		0.263	**-0.522**
age	-0.215		0.149		0.170	**-0.736**
gender		0.253	0.175		**-0.492**	0.235
maritalstatus			0.156	0.389	**-0.483**	
children	-0.113				0.302	**-0.659**
workingfamily	-0.106	0.288	**-0.407**	0.258	0.282	-0.232
education	-0.147	**-0.694**				0.346
engagement	0.235	-0.121			**0.968**	-0.300
typeseafood	**0.607**	0.139		0.346	-0.294	
typecommerce	0.356		0.130		**0.830**	-0.157
workingtime	-0.101		0.158			**-0.368**
reasonsretail	-0.122	0.231	**0.344**	-0.304	-0.327	
supplier				-0.168	**0.288**	
relationprovider		0.135		-0.557		**0.578**
reasonsplace.acqu			0.167	0.100	**-0.236**	-0.119
ice	0.156	**0.895**	0.179	-0.217		
equipment	-0.105	**0.719**			-0.290	
whynoequip?	0.181	**0.928**		-0.147	-0.269	0.229
typeequipment		**-0.829**		0.147		
importantquipment?	-0.170	0.156	0.155	**-0.507**	0.311	-0.163
Whyimportantequipment?	-0.203	**-0.876**	-0.115	0.229		
reasonsplacesell		**-0.392**		0.144		
buyer		-0.271			0.345	**0.346**
paymentaccepted	-0.184	-0.221	-0.145	**0.316**	-0.224	
foodsupply		-0.152	-0.143	-0.360		**0.426**
schoolfees		-0.134	-0.185			**0.379**
livelihood	0.250	**-0.388**		-0.246		
sponsorcommerce	-0.148	0.233	-0.200		**-0.606**	
savings	-0.306	-0.109	0.249	**0.527**	0.107	-0.431
whycrustaceans?	0.245	0.354	-0.147	**0.379**		
nationalresidents	**0.717**	0.189	-0.136	0.183	0.287	0.257
nationaltourists	**0.937**	0.273	-0.218		0.366	0.175
foreignerresidents	**0.950**	0.365	-0.145	0.125	0.284	
foreignertourists	**0.974**	0.348	-0.171	0.125	0.278	
whynocrustaceans	**-0.661**		-0.153	-0.148		-0.450
crustaceansvsfish	**0.589**		0.480			
whypreference	0.227		0.276		**0.317**	-0.214
easiersell	**0.686**	-0.200	0.169			0.115
moreeconomic	**0.627**	-0.331	0.305			0.207
easierpreserv	**0.616**	-0.329			0.164	
moreprofitable	**0.693**	-0.211	0.236			0.159
moredemanded	**0.715**		0.117		-0.113	0.271
credit		-0.180		**0.803**		
creditprovider	-0.130	0.228		**-0.793**		0.166
whynocredit	0.234	-0.257		**0.739**		
taxes	**0.376**	-0.191	-0.262	-0.211	-0.216	-0.324
taxamount	**-0.350**	0.263	0.215	0.213	0.261	0.235
fairstaxes	**-0.497**	0.124		-0.118	0.273	0.281
taxesbenefits	**-0.481**		0.368	0.244	0.204	0.336
cooperative?			**-0.970**			
cooperativename		0.140	**0.859**		0.129	-0.154
whynocooperative	-0.150		**-0.829**	0.115		0.131
cooperativebenefits			**0.970**			
whichcoopbenefits		0.140	**0.859**		0.129	-0.154

	MR6	MR1	MR2	MR3	MR4	MR5
SS loadings	8.337	6.079	5.711	4.075	4.370	3.805
Proportion Var	0.154	0.113	0.106	0.075	0.081	0.070
Cumulative Var	0.154	0.267	0.373	0.448	0.529	0.600

Table Q. 4. Processors´ variables loadings

Variables	Loadings:					
	MR1	MR6	MR2	MR5	MR3	MR4
pmarket	**-0.565**	-0.486				-0.119
age	**0.851**	0.120	0.110			
gender	**0.969**					
mar.status	**0.636**		0.540	-0.165		
children	**0.718**		0.412	0.184	0.113	-0.153
working.family		-0.340		**-0.840**		0.135
Nofamily		0.340		**0.840**		-0.135
education	**-0.977**			0.142		
years.working	**0.823**		0.144	0.116		
reason.working	0.109		0.217	0.138	0.150	**0.232**
Occupation	0.331	-0.315	-0.207	**0.655**		0.183
~~paymentaccepted~~	~~**-0.683**~~	~~-0.352~~		~~-0.135~~		~~0.164~~
workingfor	-0.377	-0.294	0.184	0.146		**0.559**
reasonmarket	**-0.439**		0.242	0.156	-0.258	
tax		0.509	**-0.759**	0.192		
transport	0.151	**0.676**	0.147			0.322
food		0.309	-0.158			**0.745**
salt	**0.565**	0.486				0.119
investment	0.141	**0.659**	-0.194			0.529
incomeaday	**1.000**					
revenues	**1.001**					
monthly.earnings	**1.001**					
food.supply				-0.147	0.131	**-0.450**
school.fees	-0.338	0.127	0.128	**-0.427**	-0.116	0.130
livelihood	**-0.362**		0.175	0.270	-0.336	-0.180
sponsorship		-0.232		0.331		**-0.871**
savings		**-0.717**		-0.111	0.194	
credit	-0.332	0.150			**0.945**	
credit.provider		0.228			**-1.059**	
whynocredit		0.449	0.214		**0.564**	
pay,taxes			**0.934**	-0.100	0.149	
fair.taxes	-0.261		**-0.536**		0.149	-0.212
benefits.taxes	0.402	-0.183	**-0.695**	-0.106		
belong.cooperative	**-0.969**					
name.cooperative	**0.801**	0.267				
benefit.cooperative	**0.969**					
reasonnocoop	**-0.523**			-0.264	0.149	

	MR1	MR6	MR2	MR5	MR3	MR4
SS loadings	12.234	3.287	3.143	2.609	2.732	2.572
Proportion Var	0.331	0.089	0.085	0.071	0.074	0.070
Cumulative Var	0.331	0.419	0.504	0.575	0.649	0.718