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The role of women in the artisanal fisheries value chain on the island of São Vicente, Cape Verde

Faculdade de Ciências e Tecnologia

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The role of women in the artisanal fisheries value chain on the island of São Vicente, Cape Verde

Mestrado em Aquacultura e Pescas

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Declaração de autoria

Declaro ser a autora deste trabalho, que é original e inédito. Autores e trabalhos consultados estão devidamente citados no texto e constam da listagem de referências incluída.

Dedication

To my parents, Adriano Monteiro and Ana Paula Monteiro, for their love and support.

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This thesis is the result of a great effort and individual dedication, but without the collaboration and support, direct and/or indirect of third parties who have contributed a lot to make this task less difficult and more pleasant, I would like to take this opportunity to thank you here:

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Abstract

The role of women in the fishing sector has usually been neglected, where women are mostly "invisible" and their contribution to the sector tends to be overlooked, leading to unviable livelihoods. Fortunately, the role of women as fishers, processors, and sellers is gaining recognition, and important progress has been made regarding gender equality and promoting women's well-being in fisheries. This study shows the important and meaningful contribution of women to the fisheries sector and their role in the artisanal fishing value chain in São Vicente (Cape Verde). To achieve this a survey was carried out with women in the value chain and representatives of fishing associations in the main fishing communities in São Vicente, the communities of São Pedro, Salamansa, Calhau, and Mindelo. The Statistical Package for the Social Sciences (SPSS) was used to investigate women developing different roles in the value chain. *Peixeiras* (women fish sellers) play a fundamental role in marketing fish, the most representative channels are those where women are found, and they are the ones who add value to the fish. They do not have the same functions. The *peixeiras* were then distributed in four groups, (i) street vendors, (ii) local market vendors, (iii) intermediate vendors, and (iv) local market/intermediate vendors. Women fish sellers (street vendors and local market sellers) depend mostly on other *peixeiras* (intermediate) to gain access to fish. This leads to differences in economic power within the value chain, wherein women secure the rights to purchase the fish caught by the fisher by establishing contact with other *peixeiras*. Thus, the intermediate vendors are those who have greater purchasing power when compared to the other *peixeiras*. Recognizing and quantifying the role of women in small-scale fisheries has profound implications for management to support them and for countries to achieve sustainable development goals (SDGs), especially SDG5 (gender equality).

Keywords: small-scale fisheries, artisanal fisheries, gender role, supply chain, jobs.

Resumo

O papel das mulheres no sector das pescas tem sido geralmente negligenciado, onde as mulheres são na sua maioria "invisíveis" e a sua contribuição para o sector também tende a ser negligenciada, levando a meios de subsistência inviáveis. Felizmente, o papel das mulheres como pescadoras, transformadoras e vendedoras de pescado está a ganhar reconhecimento, e foram feitos progressos importantes em relação à igualdade de género e à promoção do bem-estar das mulheres nas pescas. Este estudo mostra a importante e significativa contribuição das mulheres para o sector das pescas e o seu papel na cadeia de valor da pesca artesanal na ilha de São Vicente, Cabo Verde é um arquipélago vulcânico localizado no Oceano Atlântico, a 500 km do continente africano, onde a pesca artesanal é uma atividade com grande tradição na ilha representando uma importante fonte de empregos e de rendimento. Para tal foi realizado um questionário a mulheres da cadeia de valor da pequena pesca (vendedoras de pescado) e outro para representantes de associações de pesca nas principais comunidades piscatórias de São Vicente, as comunidades de São Pedro, Salamansa, Calhau (as três primeiras realizam apenas a pesca artesanal) e Mindelo (é um ponto de convergência para a atividade pesqueira, tanto para o desembarque e comercialização como para a aquisição de insumos para o trabalho). A maioria do pescado captura pelas pescas artesanais e destinado ao consumo local (São Vicente). O Pacote Estatístico para as Ciências Sociais (SPSS) foi utilizado para investigar as mulheres que desempenham diferentes papéis socioeconómicos na cadeia de valor e a nível económico foram calculadas as margens de comercialização das mesmas. Os resultados mostram que as *peixeiras* (vendedoras de pescado) desempenham um papel fundamental na comercialização do pescado, servindo de elo entre os pescadores e o consumidor final. O seu trabalho é essencialmente realizado em espaços públicos, sendo uma atividade produtiva e que representa muitas das vezes a principal fonte de rendimento do agregado familiar. Os canais de comercialização mais representativos são aqueles onde se encontram as vendedoras de pescado, e são elas que agregam valor ao pescado. As principais espécies vendidas são os pequenos e grandes pelágicos (principalmente atuns), espécies demersais e marisco, e são comercializadas frescas, secas/salgadas ou congeladas. As vendedoras de pescado não têm as mesmas funções e nem as mesmas condições financeiras para a realização da venda do pescado. Para isso, as *peixeiras* foram então agrupadas em quatro grupos, (i) vendedoras ambulantes, (ii) vendedoras do mercado local (de Mindelo), (iii) vendedoras intermediárias e as (iv) vendedoras do mercado local/intermediárias, tento em consideração o tipo e o local de venda. As mulheres vendedoras de peixe (vendedoras ambulantes e as vendedoras no mercado local) dependem principalmente de outras *peixeiras* (intermediárias) para terem acesso ao pescado. Isto leva a diferenças de poder sociais e econômicos dentro da cadeia de valor entre elas, onde as mulheres, na maioria das vezes, garantem o direito de comprar o peixe capturado pelo pescador, estabelecendo contacto com outras *peixeiras*, e não com os pescadores como acontece em outros países. Assim as vendedoras intermediárias (grossistas) são aquelas que possuem maior poder aquisitivo quando comparadas às demais *peixeiras* (retalhistas), por conseguinte vendem maiores quantidades (kg) de pescado por dia. Além das diferentes funções e condições económicas, as *peixeiras* também apresentam vários constrangimentos que as afetam no dia-a-dia como altas taxas de roubo do dinheiro e do pescado, o custo do transporte, apresentam também um baixo nível de associativismo e de acesso a financiamento, as vendedoras ambulantes afirmam sentirem-se excluídas relativamente ao apoio dado pela associação das *peixeiras*, em relação aos outros grupos (intermediárias, vendedoras do mercado local e mercado local/vendedoras intermédias) o que indica que deveriam investir mais nas suas associações como mulheres e como vendedoras de pescado, o que lhes permite uma maior evolução económica, maior visibilidade no sector das pescas e posteriormente melhorar o acesso a um conjunto de políticas públicas, crédito e também assistência técnica, desta forma

ganhariam um lugar “visível” nas comunidades. A informação recolhida no estudo sobre as características socioeconómicas das mulheres vendedoras de peixe e outros atores é essencialmente relevante para caracterizar a classe dos operadores da pesca, para além de fornecer informações reais sobre os participantes, contribuindo assim para uma melhor perceção da estrutura dos recursos humanos na pesca artesanal. Assim torna-se importante reconhecer e quantificar o papel das mulheres na pesca de pequena escala (pesca artesanal) pois isto tem implicações profundas para a gestão de leis que apoiam as vendedoras de pescado e para que Cabo Verde e os outros países alcancem os objetivos de desenvolvimento sustentável (ODS), especialmente o ODS 5 (igualdade de género). Foi ainda possível concluir que a análise da cadeia de valor conduz a uma melhoria do desempenho económico, da sustentabilidade ambiental e da viabilidade socioeconómica a longo prazo, o que contribui para a redução de empregos e da pobreza e contribui para o aumento da segurança alimentar, tanto das mulheres como para os outros atores presentes na cadeia de valores das pescas artesanais.

Palavras-chave: pesca em pequena escala, pesca artesanal, papel de género, cadeia de suprimentos, emprego.

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List of abbreviations

DGRM - Direção Geral dos Recursos Marinhos

ECV - Escudos Cabo Verdianos

EEZ - Exclusive Economic Zone

FAO - Food and Agriculture Organization of the United Nations

GDP - Gross Domestic Product

GVA - Gross Value Added

INDP - Instituto Nacional do Desenvolvimento das Pescas

INE - Instituto Nacional de Estatística

INPS - Instituto Nacional de Previdência Social

NGOs - Non-Governmental Organizations

PNUD - Programa das Nações Unidas para o Desenvolvimento

SDGs - Sustainable Development Goals

SPSS - Statistical Package for the Social Sciences

SRS - Stratified Random Sample

SSF - Small-scale Fisheries

1. Introduction

Over 492 million people depend, at least partially, on small-scale fisheries (SSF) around the world, accounting for 90% of all fishers (FAO, 2022). It is estimated that 40% of people involved in SSF are women, but the need for comprehensive data makes it difficult to determine the full contribution of women (Harper *et al.*, 2017).

Fishing has been always considered a male-dominated activity and is characterized as difficult for women due to the need to use force. The term 'fisherman' implies that fishing is performed just by men (Harper *et al.*, 2013), however, a closer inspection of fisheries, indicates that while certain fishing activities are more commonly undertaken by men, others are dominated by women like gleaning, processing, and marketing of the catch, as well as financial aspects of fisheries (Weeratunge *et al.*, 2010; Kleiber *et al.*, 2017). Despite the important role played by women in the fisheries sector, their contributions go unseen because many of these have been overlooked and continue to be under-acknowledged in fisheries management and policy development (Harper *et al.*, 2013; Kleiber *et al.*, 2017; Nielson *et al.*, 2019). As a result, women are excluded, for example, from fishing organizations, ignored by creditors and most of the time receive little training to improve fishing techniques, opportunities, and conditions (Williams, 2002; Kleiber *et al.*, 2017). The social space they occupy has also often remained invisible to researchers, which can lead to unsustainable livelihoods at the community level (Bennett, 2005).

Gender equality is necessary for well-being and is a part of sustainable fisheries (Frangoudes and Gerrard, 2018). The need for the recognition of the role of women in fisheries is not new and although some important progress has been made very recently in developing gender-sensitive fisheries policies and programs in certain countries and contexts, in general much still needs to be done to address gender issues in fisheries and to promote the social-economic wellbeing of women in fishing communities around the world (Harper *et al.*, 2017).

Africa contributed significantly to worldwide fisheries employment, likely because of the limited job opportunities in a part of this continent (Harper *et al.*, 2013; Raemaekers and Sunde, 2015) and has gained considerable attention regarding the contribution of small-scale fisheries to poverty reduction and food security (Kébé, 2009). In addition, processing and trading have been recognized as adding substantial value to national economies, which had previously been underestimated (Harper *et al.*, 2013). With respect to gender and fisheries, some recent work has highlighted the roles of women in African fisheries (Harper *et al.*, 2013; Raemaekers and Sunde, 2015, Harper *et al.*, 2017).

The fisheries sector in Africa, and developing countries in general, provides income-generating opportunities for women, often considered among the poorest and most marginalized groups (Willians, 2002). In West Africa, women play a key role in the processing and financing of fisheries (Raemaekers and Sunde, 2015). Women in West Africa provide monetary credit to fishermen and maintain well-defined client–patron relationships (Tvedten and Hersoug, 1992). Although these women mostly tend not to catch fish, they have a key role in distributing it, which determines economic returns to the family, and supports activities such as supplying provisions and repairing fishing gear (Tvedten and Hersoug, 1992).

1.1. Value chain

The term value chain was introduced by Michael Porter in his book "Competitive Advantage: *Creating and Sustaining Superior Performance"* published in 1985, where he states that "the value chain disaggregates a company into its strategically relevant activities so that it can understand cost behavior and existing and potential sources of differentiation" (Porter, 1985)

Later the concept was improved by other authors, for Kaplinsky (2000) "the value chain describes the complete range of activities required to make a product or services from conception through the intermediate stages of production (involving the combination of physical transformation and the entry of various services businesses), supply to final consumers, and final disposal after use", for Russel and Hanoomanjee (2012) a value chain can be considered the linkage of all steps in production, processing, and distribution of a product together, allowing the evaluation of each step in relation to the previous and succeeding steps and for FAO (2023) a value chain is the range of activities that are required to bring a product or service from its conception to the final consumers, this includes activities such as design, production, marketing, distribution and support services. Value chains include local, regional, and global markets. Key activities considering a fisheries value chain can include fishing, aquaculture production, processing, transport, wholesale, and retail marketing.

The value chain literature in a development country context has hence placed a lot of emphasis on assessing women's abilities to benefit from engagement in value chains, particularly through addressing the gender distribution of labor between and within different value chains (Stoian *et al*., 2018), identifying enabling conditions to more equitable participation and benefit sharing (Terrillon, 2010), as well as exploring barriers and opportunities to various forms of value chain upgrading (Christian *et al*., 2013).

Women's skills are often undervalued, and they are stuck in low-status jobs, but they can play a vital role in supporting value chain upgrading as workers, farmers, producers, and

consumers. They cannot often negotiate the terms and conditions of work with their employers, organize through independent trade unions, or raise grievances (Barrientos *et al*., 2019). Policy and commercial strategies need to proactively support the more equitable participation of women, because this enhances value chain upgrading, improves women's lives, and promotes more inclusive development (Christian *et al*., 2013).

Women play an important role in fisheries and the fisheries value chain worldwide and in Cape Verde. The *peixeiras* (the name given to women fish sellers in Cape Verde) face similar obstacles to women in the fisheries sector worldwide. Despite an estimated 86% of representation in fish processing activities (INE, 2022), women fish sellers continue to battle poor conditions, lack of resources, and gender discrimination in the sector (Sutherland, 2021).

In Cabo Verde, the informal nature of women's roles, lack of social security benefits, and poor labor law parameters for the fisheries sector also contribute to women's everyday challenges (Sutherland, 2021).

1.2. Fisheries in Cape Verde

Cape Verde fishing is a multispecies sector and a strategic pillar of great importance for the economic and social development of the country (INE, 2022). Fishing accounts for the livelihoods of approximately 30% of the population of Cape Verde (Dionísio, 2018).

According to official data, this sector accounted for around 2% (in 2011) and 1% (in 2016) of the Gross Domestic Product (GDP) of Cape Verde. However, this contribution concerns only the Gross Value Added (GVA) of extractive fishing, obtained from the total price of the first sales minus intermediated consumption, it does not point to first sales. This contribution also does not consider the contribution to the GDP of the entire fisheries sector; if we include employment, exports, industry, and customs, it could account for up to 8% of GDP (Ferreira, 2011; Gonzalez *et al*., 2020). It is estimated that the fishing sector employs around 5% of the active population in Cape Verde and contributed to more than 80% of the value of the country's total exports of goods in 2017 (INE, 2018). In terms of food security, the fishing resource also plays an important role in the population's diet, being the main source of animal protein consumed in the archipelago, with an estimated consumption of 25 kg per capita (DGRM, 2016), which exceeds the world average of 19 kg, so it is urgent to ensure diligent and responsible management (FAO, 2016).

The fishing activity, both artisanal and industrial, as well as landings by foreign ships and the transshipment of fish, generate hundreds of jobs, providing food products to final consumers and transformation industries, hospitality industry and even exports (INE, 2018).

Artisanal fishing is an activity that has long occupied an important place on the West African coast (Raemaekers and Sunde, 2015). According to data from the last population census carried out in 2021 by the "Instituto Nacional de Estatística" (INE), the number of artisanal vessels in Cape Verde was 1,462 (of which 72% are active), with 33% of these vessels located in the island of Santiago and 6% in the island of São Vicente (INE, 2022).

Cape Verde uses no official definition for SSF but can be defined as fishing carried out by a small size vessel with an open mouth (commonly known as a boat), being able to be propelled by oar, sail, and/or outboard engine edge and, which uses manually maneuverable capture means (INE, 2022).

Almost 100% of catches from the artisanal fisheries are directed to local consumption, the local fish markets, restaurants and bars, and retailers, this is because the value chain in Cape Verde differs between fisheries sectors and the high quantity demanded, and the low price paid, almost exclude the artisanal fleet from exporting (Fortes, 2019).

1.3. Women in fisheries in Cape Verde

As in most fishing communities around West Africa, women in Cape Verde have always been involved in fishing, although not always publicly recognized as such. Despite their substantial activities such as the day-to-day management of the business (e.g., paying bills, managing taxes) they are also involved in the processing and selling of the fish (FAO, 2016). However, statistical systems omit women's important functions and economic contributions in the sector (Frangoudes and Gerrard, 2018).

In Cape Verde the capture activities are the responsibility of men, where they also carry out the first sale, which takes place on the beach upon arrival from a fishing trip, from this stage onward, women take over all processing and commercialization of fish products (Carneiro, 2012) both in the fish markets (intermediate fish sellers and/or local market sellers) and on the streets (street vendors). Women perform their work in complete independence from men and are the ones responsible for managing the economic and financial aspects of commercialization. Fish processing exists in relatively incipient forms, limited mostly to sporadic salting and smoking (Carneiro, 2012).

Overall, women play a crucial role throughout the Cape Verde seafood value chain. Where appropriate technologies and capital are at their disposal, they also act as small-scale entrepreneurs, particularly in household-level cottage operations (FAO, 2016).

1.4. Justification of the thesis topic

The interest in approaching this theme is due to the importance of the fishing sector for Cape Verde's economy and the important role of women in the seafood value chain. Artisanal fishing is an activity with a great tradition on all the islands, representing an important source of employment. In some islands, it constitutes the main production base and axis of development (Fortes, 2019).

The study focuses on São Vicente Island, as fishing provides a large number of jobs (2,753 jobs) generated by the private sector, 8% of the total employed population on the Island. Making the fishing sector an important and strategic sector for development and poverty reduction (Gonzalez *et al*., 2020). In the last two years, the landings by artisanal fishing on the island of São Vicente averaged 381.8 tons, representing 13% of total landings in 2017 and 6% in 2018 (INE, 2018).

The present study maps and describes the structure of the seafood value chain and the role of women in artisanal fishing in São Vicente, specifically in São Pedro, Salamansa, Calhau and Mindelo. This study contributes to increasing our understanding of the role of women and their importance for the sector, essential for the formulation of public policies, as well as private investments that can contribute to increased income and improved livelihoods. The analysis of the value chain makes it possible to understand the reason for inefficiencies in the value chain and potential leverage points to improve the performance of the value chain and understand how incomes are distributed, to provide answers to fish worker´s problems, access to finance, market access and even food security.

It should be noted that the choice of the island of São Vicente is because fishing is quite concentrated on the island, having one of the largest support platforms for the activity. The choice to investigate the role of women in the value chain is due to the fundamental role they play in the fisheries value chain, the lack of official knowledge about their role, and the fact that their contribution is often neglected. With limited access to technological training, mobility, and resources, unequal access to fisheries resources greatly undermines women´s productivity.

Furthermore, it is necessary to emphasize the lack of studies focused on the role of women in seafood value chains and fisheries in general. In the end, this study provides a set of recommendations that can be adopted by local and central authorities, investors, and actors in the chain to boost the sector and promote positive externalities in these communities.

1.5. Objectives

For the elaboration of this thesis, the following starting question was adopted "What is the role of women in the artisanal fishing value chain in São Vicente?" with the main objective to map, describe, and characterize the role of women in the seafood value chain in São Vicente.

The specific objective includes:

● Understand the role and contribution of women to the socio-economic development of the island;

● Identify the challenges that women face in the seafood value chain.

1.6. Format of the Thesis

The thesis is split into five chapters. Chapter One is the introduction to the theme, the justification of the thesis topic, and the aims. Chapter Two describes the methodology, including research methods and statistical analysis. Chapter Three presents the results which include the mapping and description of the artisanal fisheries value chain in São Vicente, identifying the actors in the value chain, and the women's contribution to the socio-economic dimension of the artisanal fisheries. Chapter Four holds the discussion and the constraints and problems identified by the *peixeixas* and the presidents of the fishing associations (fishers). The final chapter, Chapter Five presents the conclusion, the limitation, and the recommendation for the thesis topic.

In the annex are the questionnaires applied (annex 1 and annex 2) and photos (annex 3). that supplement a better understanding of the value chain.

2. Methodology

2.1. Study area

Cape Verde is a volcanic archipelago located in the Atlantic Ocean, 500 km away from the African continent (Figalda *et al*., 2014). Formed by ten islands and some islets, the archipelago of 4,033 km2 is located between latitude 14º 23´ N and 17º 12´ N and longitude 22º 40 W and 25º 22 W (Figure 2.1), where fishery has always been of great socio-economic importance for coastal communities (INE, 2018).

As is the case in several West African countries, fisheries offer means of subsistence and employment opportunities (Figalda *et al*., 2014). The archipelago has an extensive

exclusive economic zone (EEZ), of approximately 800,000 km2, with a fishing production between 36,000 to 46,000 tons per year (DGRM, 2016).

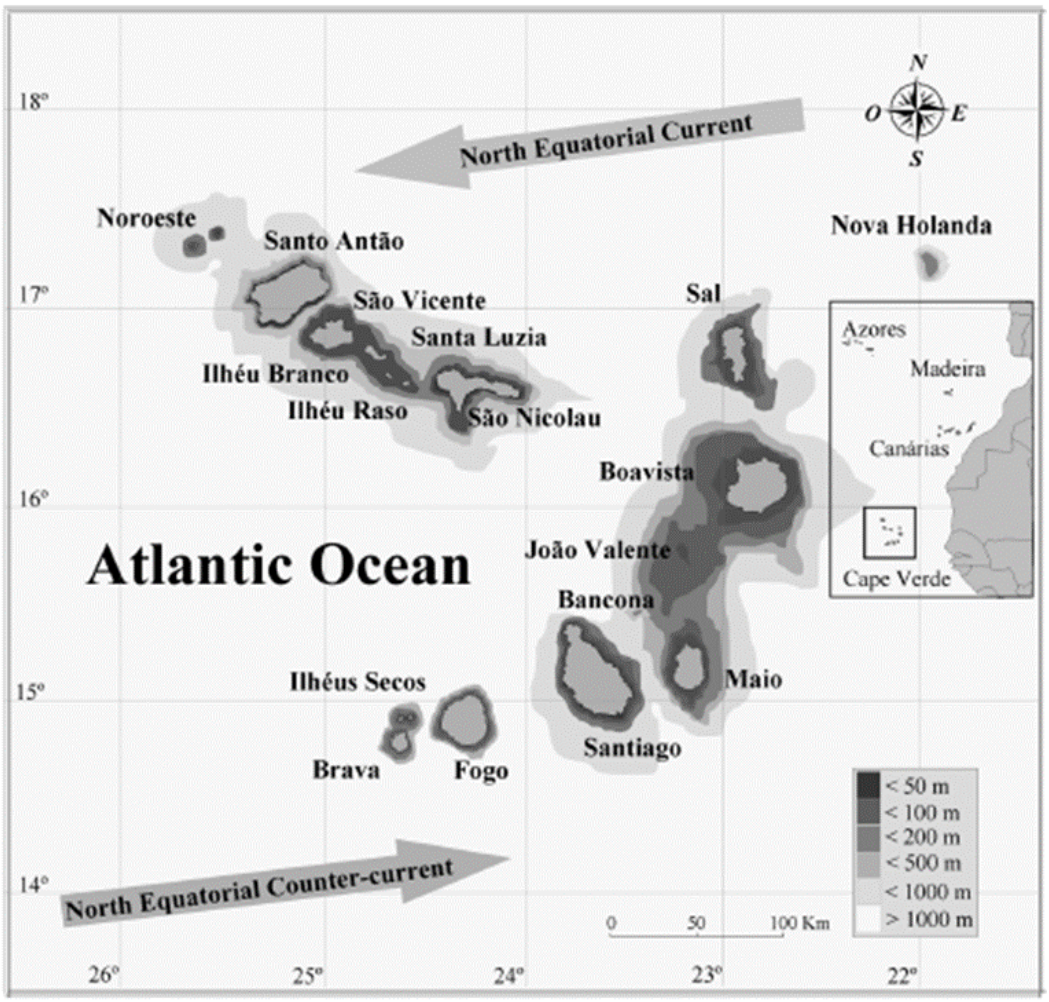

Figure 2.1 - Cape Verde Islands and its geographical location (Adapted from Medina, 2008).

The island of São Vicente is part of the Barlavento group, with a total area of 227 km2, which represents 5,6% of the inhabited territory of Cape Verde, it has one of the greatest potentials for economic development in the country (Silva and N'Deye, 2012).

The artisanal fishing activity contributes to generating hundreds of direct and indirect jobs, providing products to supply to final consumers (INE, 2018). Artisanal fishing on the island is practiced in the areas of São Pedro, Salamansa, Calhau and Mindelo (INDP, 2007) (Figure 2.2).

Figure 2.2 - Map of São Vicente and the respective case study communities in black circles (Adapted from Martins *et al*., 2019).

The fishing community of São Pedro stands out for the use of diversified and combined devices of fishing gear for catching in various locations around the island and beyond, making it the main community in terms of volume and variety of species landed on the island. In this locality, fishing plays an important role in terms of socio-economic development, with more than half of the population living off the income generated from this activity (INDP, 2007).

Regarding Salamansa, one of the specific features of this fishing community is the fact that it is the only community on São Vicente Island that uses a combination of outboard motors and sails as a means of propulsion for vessels. Still, in this community, the most practiced fishing technique is hook and line (INDP, 2007). It is a rural area that is essentially dedicated to fishing, where 95% of the population is dependent on income from this activity. This activity of fishing is complemented by other activities such as animal husbandry, agriculture (in the rainy season) and commerce (INDP, 2007).

Calhau is a community with little expressiveness in terms of fishing, compared to the others. However, the start of the exploitation of the first aquaculture unit of an industrial nature in the Calhau area could provide leverage for the sector in the community, especially in terms

of youth and female employment. Therefore, it is necessary to monitor this activity and the socio-economic dynamics of the community and be alerted to take advantage of emerging development opportunities (Fazenda-Camarão, 2009).

The city of Mindelo is a point of convergence for the fishing activity, both for landing and marketing and for the acquisition of inputs for the work. It concentrates operators residing in its surroundings, as well as in other more distant communities. The city centralizes most of the infrastructure and fishing support entities on the island (Silva and N'Deye, 2012).

2.2. Data collection

2.2.1. Review of the literature

To better understand the role of women in the artisanal fisheries value chain on the island of São Vicente, in Cape Verde, information was gathered systematically through online searches in directories and databases related to women, artisanal fisheries, and value chains.

All scientific information was compiled through a literature search. The documents consulted ranged from peer-reviewed papers to gray literature, including research reports, articles, books, and data (statistics or other types of official documents).

Primary literature was identified by searching Google Scholar (https://www.scholar.google.com), Web of Science (https://www.webofknowledge.com), and Research Gate (https://www.researchgate.net/) databases. A systematic search was employed using the search terms, “gender” or “women” and “artisanal fisheries” or “artisanal fishing” or “small-scale fisheries” or “small-scale fishing”, and “Cape Verde”, and “value chain” or “supply chain” or “market” in English and in Portuguese (the primary language for Cape Verde).

Titles and abstracts were selected to identify studies potentially eligible for further inclusion. All sources were reviewed for both quantitative and qualitative information on gender roles in the value chain and their participation in artisanal fisheries.

2.2.2. Survey

Information on the role of women in the seafood value chain was collected through questionnaires with women in the value chain. The questionnaires to identify the role of women in the value chain were adapted from Smith´s methodological guide (Smith, 2022), which developed a handbook for mapping women in small-scale fishery organizations and assessing their capacities and needs. This methodological guide has been published by the Food and Agriculture Organization (FAO) of the United Nations as a handbook in support of the

implementation of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication.

Two questionnaires were developed (annex 1 and annex 2), one for the women fish workers (the so-called *peixeiras*, in Crioulo) and the second for representatives of the fishing associations of the communities of São Pedro, Salamansa, Calhau (only artisanal fishing is carried out in these areas) and Mindelo to collect primary data for the socio-economic analysis. The questionnaires were carried out from March 1st to May 18th, 2023. Figure 2.2 shows the location of the communities where the questionnaires take place.

In Cape Verde, there are around 1881 fish sellers in total and women represent 86% of this total (INE, 2022). The Island of São Vicente accounts for 9.2% of fish sellers (173 people), and women represent 76% of the fish sellers (INE, 2022) which means a total of 132 women fish sellers in São Vicente. Table 2.1 provides information on the number of people involved in fisheries in each location, obtained through official data (INE, 2022).

Table 2.1 – Numbers of people involved in artisanal fisheries in the communities of São Pedro, Salamansa, Calhau, and Mindelo of São Vicente Island, by job type.

	Total numbers		
Communities	Fishers	Fish sellers	Fish handlers
São Pedro	143	20	2
Salamansa	175	24	1
Calhau	43	4	0
Mindelo	89	125	17
Total	450	**173**	20

Source: INE, 2022.

The questionnaire survey sampling frame consisted of a stratified random sample (SRS) based on location (communities of São Pedro, Salamansa, Calhau, and Mindelo), then a random sample of *peixeiras* was selected from the several survey sites. Prior to the implementation of the survey, contact was established with representatives of the associations requesting collaboration. Next, the questionnaire was pre-tested and adjusted. The final version of the questionnaire was administered to 75 *peixeiras* (from retailers to wholesalers) and all 4 presidents of the fishing associations of each community. The sample size accounts for 57% of the total number of *peixeiras* in the communities.

Based on the total pool of *peixeiras* (132 women fish sellers), the sample size should be 99 to allow for a ±5% margin error at a 95% confidence level (Leedy and Ormrod, 2001). This is a very large sample size for the time allocated for an MSc thesis, so the questionnaire was administered to 75 *peixeiras*, which account for 57% of the total number. According to Vaus (1995), when the sample size represents a sizable proportion of the population it can be safely assumed that the sample is relevant in terms of accuracy.

2.3. Data analysis

The Statistical Package for the Social Sciences (SPSS), a powerful tool for social sciences data analysis (Levesque, 2007), was used for the statistical analysis, e.g., to report frequencies of responses, and investigate potential differences between women depending on the role in the value chain and type of market they carry out their activity (retailers and/or wholesalers).

For instance, differences between *peixeiras* from different types of markets were tested with Kruskal–Wallis, to compare statistical differences between the type of market and species they sell (demersal, big, and small pelagics, and shellfish).

For this, the *peixeiras* were then grouped into four groups, having as criteria their type of trade as mentioned, (i) street vendors, (ii) local market vendors, (iii) intermediate vendors, and (iv) local market/intermediate vendors.

Results were considered significant at $p < 0,05$.

For the economic analysis of commercialization, the following formulas were used (de Camargo Barros, 2007):

$$TM´ = (Rp - Fp) /Rp$$

where the Total Margin (TM) seeks to measure the consumer expenses due to the entire marketing process. It corresponds to the difference between the retail price (Rp) of the product and the payment received by the fishers (Fp) (after adjustment for by-products). Thus, the total relative margin is expressed as a proportion of the retail price.

The margin can also refer to specific market levels. Thus, the relative margin of the retailer (Rm) and the intermediate (Im) will be given by:

$$Rm´ = (Rp - Ip) /Rp \qquad Im´ = (Ip - Fp) /Ip$$

where Ip is the intermediate price.

3. Results

This chapter presents the mapping and description of the women in the artisanal fisheries value chain in the island of São Vicente.

3.1. Number of women in the survey

A total of 75 women, aged between 19 to 79, took part in the survey, 46 from Mindelo, 15 from São Pedro, 11 from Salamansa, and 3 from Calhau (Figure 3.1).

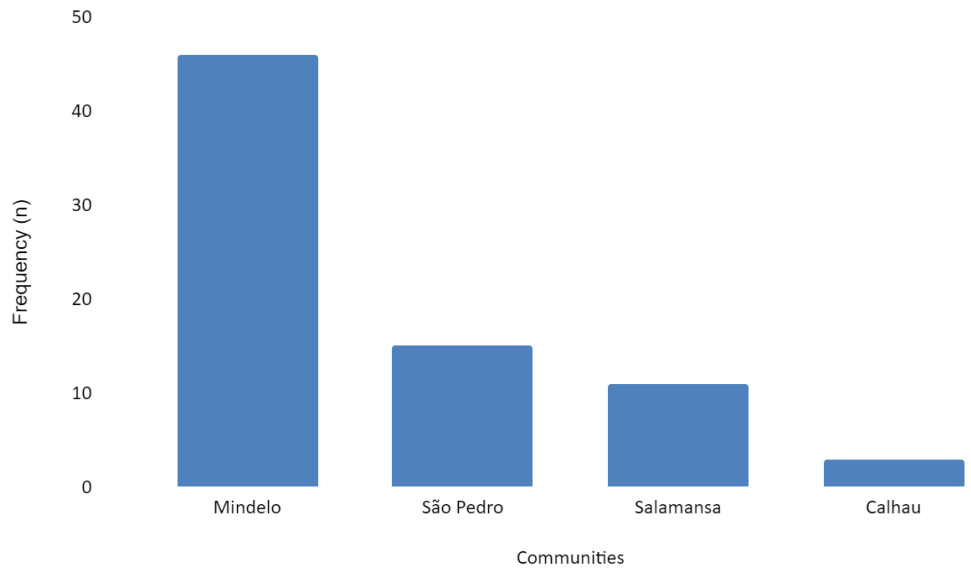

Figure 3.1 - Number of women fish sellers by fishing community where the questionnaires take place.
Source: Survey data.

In all communities mentioned in this study, it is possible to find different types of *peixeiras*, with 33 respondents selling seafood in the local market in Mindelo (both inside and outside the market), 27 street vendors, 10 being intermediaries-sellers, working as intermediaries but also selling in the local market, and 5 are intermediaries (Figure 3.2).

Figure 3.2 - Number of women fish sellers by different types of markets that *peixeiras* carry out their operation.

Source: Survey data.

3.2. Role of women in the value chain

The value chain of artisanal fisheries, considering the role of women, is organized into 4 actors, namely, sellers of fishing material and equipment (inputs) they support the value chain by supplying goods necessary for fishing, the artisanal fishers that have a support function by supplying fish to the population by capturing it, *peixeiras*, and finally final consumers.

All links in the fish value chain (from capture, processing, distribution, and commercialization) can affect and be affected by each other and by external factors, such as inputs and supplies, and the relationships between different actors.

The process is illustrated below in Figure 3.3.

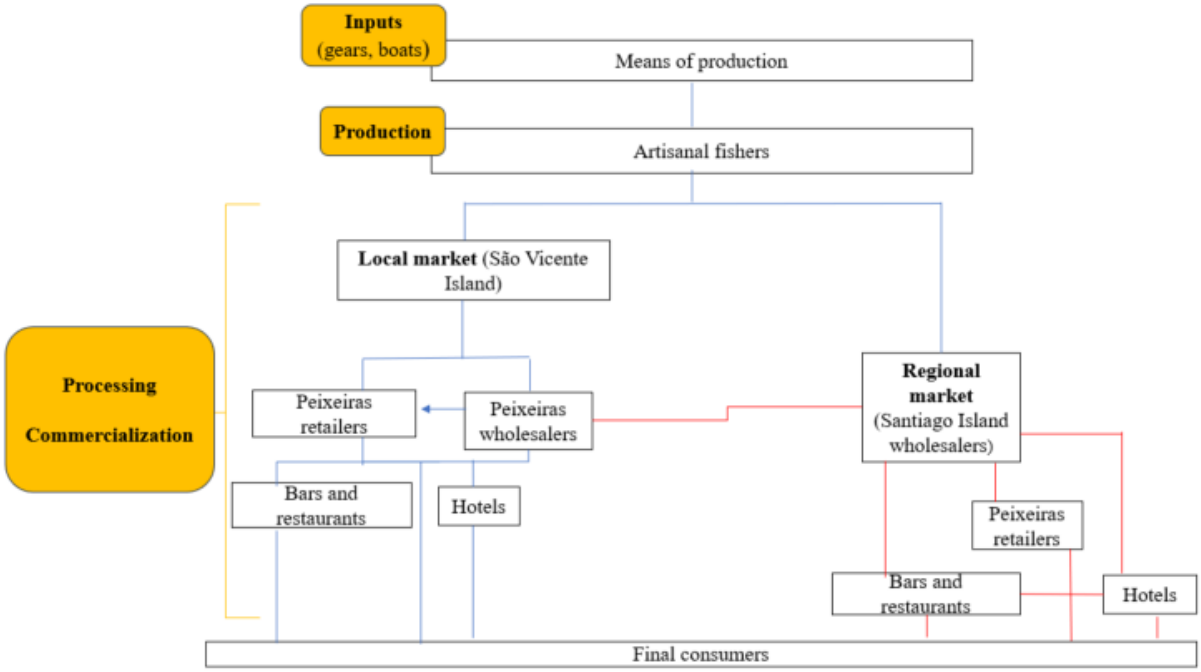

Figure 3.3 - Typical schematic representation of the artisanal fisheries value chain in São Vicente.

Source: Author.

Fish are sold on the Island of São Vicente, most of the time, at landing sites and may have different buyers. The *peixeiras* activities within the fishing value chain are associated with the processing, commercialization, and distribution of fish. In addition to local market sales (São Vicente Island) where women fish sellers are involved, there are also regional market sales (to other islands, e.g. Santiago Island), this was not considered in the thesis.

3.3. Characteristics of the women in the value chain

3.3.1. Socioeconomic characterization

Table 3.1 shows the sociodemographic characteristics of the women fish sellers ("*peixeiras*") who took part in the survey.

The *peixeiras* who took part in the survey have an average age of 48 years old, and 23 years of experience as fish sellers. The average household size of the *peixeiras* is 6 people, and around 82.7% declared that there are other members of the household who are also employed or have already been employed in fishing activities (Table 3.1).

Considering the marital status of the women fish sellers, 74% are single, 18% married, 4% divorced and 4% are widows, when considering the type of market, it is observed that most of the intermediates are married, while in the other groups the majority are single (Table 3.1).

In terms of education, 26.7% of *peixeiras* reported to be illiterate, 30.7% attended the first cycle of primary education, 29.3% completed the second cycle of secondary education and 13.3% attended high school. Most street vendors had the first cycle of primary education, while those in the local market and in the local market/Intermediate attended the 2nd cycle of secondary the most, and the Intermediates are largely illiterate (Table 3.1).

Table 3.1 - Sociodemographic characteristics of *peixeiras* according to market type. Data is shown as mean (±standard deviation) for continuous variables and percentage for categorical variables.

Sociodemographic data	**Role in the market**				**Total**
	Street vendor	Local market vendor	Intermediate vendor	Local market and Intermediate vendor	
Mean age (years)	48(14)	48(14)	49 (15)	47(13)	48(14)
Mean experience (years)	23(16)	24(16)	25(17)	23(16)	23(16)
Mean number of people in the household	6(3)	6(3)	6(3)	5(3)	6(3)
Have other family members worked in fisheries (%)					
- Yes	66.7	93.9	60	100	82.7
- No	33.3	6.1	40	0	17.3
Marital status (%)					
- Single	77.8	75	40	85.7	74
- Married	11.1	15	60	14.3	18
- Divorced	5.6	5	0	0	4
- Widow	5.6	5	0	0	4
Education level (%)					
- Illiterate	29.6	27.3	60	0	26.7
- First cycle of elementary school	44.4	24.2	0	30	30.7
- Second cycle of elementary school	22.2	30.3	20	50	29.3
- High school	3.7	18.2	20	20	13.3

Source: Survey data.

3.3.2. The product women sell

Regarding the production phase of the fish value chain, the women fish sellers were asked what type of species they sell, how they acquire their fish, and whether they use fish conservation techniques, among others.

Most of the women fish sellers (94.7%) report selling small pelagic species, 74.7% sell large pelagic species, 28% sell demersal species, and 18.7% sell shellfish. Table 3.2 reports the species sold by the different groups of women fish sellers and the *p*-value obtained from the

Kruskal-Wallis test to investigate if there are differences between the species sold by each group.

Table 3.2 - Percentage distribution of species that *peixeiras* sold and *p*-values calculated with the Kruskal-Wallis test.

	Species sold			
Type of market	**Demersal**	**Big pelagics**	**Small pelagics**	**Shellfish**
Street vendor	15%	70%	96%	4%
Local market vendor	30%	76%	97%	27%
Intermediate vendor	80%	40%	60%	20%
Local market/Intermediate vendor	30%	100%	100%	30%
Kruskal-Wallis test				
p -value	0.029*	0.08	0.005*	0.095

Source: Survey data.

* Significant differences ($p < 0,05$) between the types of market in terms of species sold.

Using the Kruskal-Wallis test, it was possible to verify significant differences between groups of *peixeiras* and the sale of demersal species (*p*-value = 0.029 < 00.5) and small pelagics species (*p*-value = 0.005 < 00.5). Intermediate vendors sell more demersal than the other groups (mostly street vendors), while the selling of small pelagics is lower in the intermediates compared to the other groups (the sample shows significant differences in the Local market/Intermediates and Intermediates, Local market and Intermediates and Street vendors and Intermediates).

Considering how they acquire fish 37.3% buy from fishers, 32% buy from fishers and/or intermediate sellers, 14.7% buy only from intermediate sellers, 10.7% buy from their husbands/relatives, and 5.3% acquire (without buying) from their husbands (Table 3.3).

Regarding the amount of kilos sold per day, most *peixeiras* claim to sell up to 10 kg (32%), while 14% claim to sell up to 20kg, 12% sell up to 30 kg, 10% sell up to 40 kg, 14% sell up to 50 kg per day, 12% up to 60 kg, and 4% and 2% up to 200 and 300 kg per day, respectively. Many did not provide an estimated amount sold per day. Figure 3.4 shows the daily average quantity sold (kg) by the different groups of *peixeiras*.

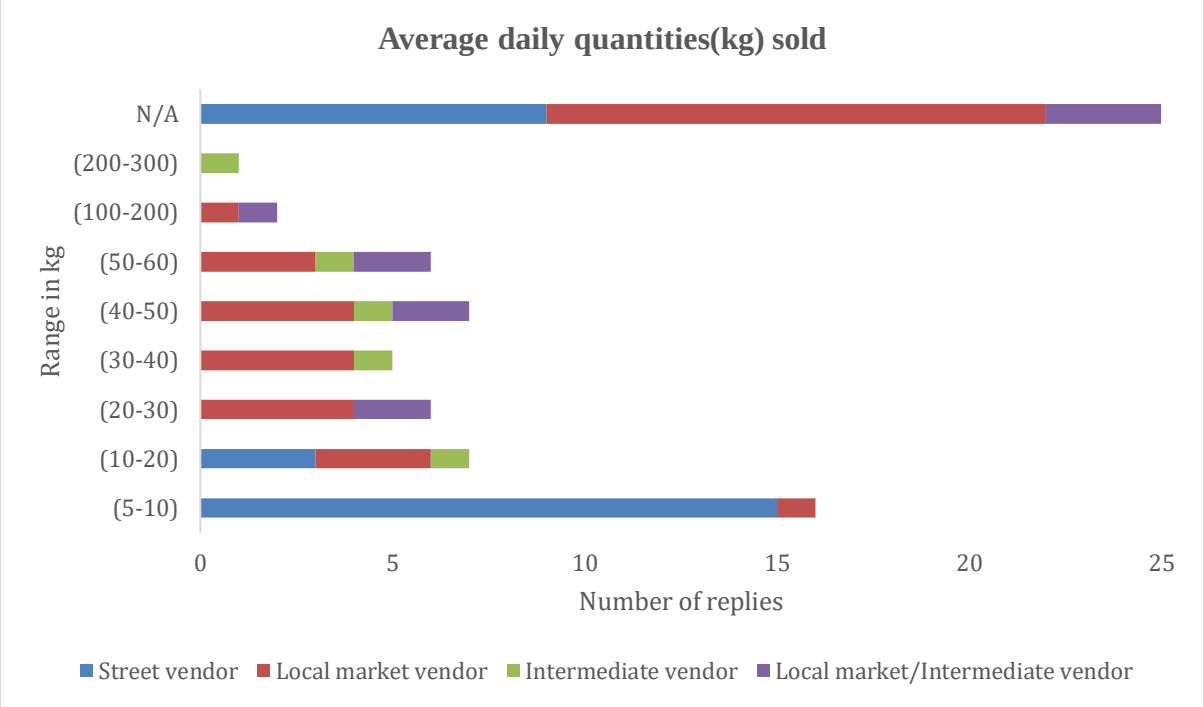

Figure 3.4 - Average daily quantities (kg) sold by the *peixeiras* according to market type. N/A= no answer.

Source: Survey data.

Most women fish sellers (44%) report to usually selling fresh fish, while 34.7% report selling fresh and/or salted/dry fish, 12% sell it in all forms (fresh, salted/dry, and frozen), 5.3% sell salted/dry and 4% sell fresh or frozen fish (Table 3.3). Thus, 93.3% claim to transform the product (Table 3.3).

Regarding access to goods and services, 68% report to having access to a place to store their seafood, 64% of *peixeiras* have access to a refrigerated space to keep the fish fresh, 45.3% have access to a place to salt and dry the fish, 41.3% have access to a car to transport the fish, 34.7% have access to a market stall and 16% have access to a wheelbarrow to transport the fish (Table 3.3).

3.3.3. Credit, savings and investment

When asked about credit, only 5.3% of women fish sellers said they benefited from some type of credit and 56% indicated that they were able to make savings (individual and/or collective) (Table 3.3).

3.3.4. Organization and representation

Most *peixeiras* (50.7%) report belonging to the *peixerias* association and/or to the fishers' Association. Considering the type of market, 80% of the intermediates report to not belong to an association, unlike other groups (Table 3.3).

Despite the majority being part of the association, 92% said that no institution/entity supports the class of fishing operators (fishers, *peixeiras*, and fish handlers) (Table 3.3).

In terms of retirement, 40% said they have never thought about it, 20% say they will resort to the social system, 18% say that they save as a way of contributing to their retirement, 12% contribute to the INPS (*Instituto Nacional de Previdência Social*) and 10% contribute to the INPS and saves (Table 3.3).

3.3.5. Basic public service

Considering the services designed to meet the needs of the population, the vast majority claim to have access to electricity (96.1%) and health clinics. As for drinking water, 60% have access through piped water, 20% through public *sentinas*, 14% through cisterns and 6% do not have access to drinking water.

Table 3.3 - Percentage distribution of *peixeiras* considering the phases of the fish value chain, investment and organization, and representation. N/A = no answer.

	Role in the market				
Stages of the value chain	Street vendor	Local market vendor	Intermediate vendor	Local market and Intermediate vendor	**Total**
How they acquire the fish (%)					
- Buy from fishers	48.1	30.3	40	30	37.3
- Buy from other peixeiras	25.9	3	40	10	14.7
-Buy from fishers or/and other peixeiras	25.9	45.5	20	10	32
- Buy from husband/family members	0	18.2	0	20	10.7
- Acquire from husband (without buying)	0	3	0	30	5.3
How do you usually sell the fish? (%)					
- Fresh	33.3	48.5	60	50	44
- Salt/dry	3.7	6.1	0	10	5.3
- Fresh and salt/dry	44.4	30.3	20	30	34.7
- Fresh and frozen	0	6.1	0	10	4
- Fresh, dry/salt and frozen	18.5	9.1	20	0	12
Do they use conservation techniques (%)					
- Yes	100	84.8	100	100	93.3
- No	0	15.2	0	0	6.7

Table 3.3 (*continued*)

	Role in the market				
Credit and savings	Street vendor	Local market vendor	Intermediate vendor	Local market and Intermediate vendor	**Total**
Have they benefited from any type of credit (%)					
- Yes	11.1	3	0	0	5.3
- No	88.9	97	100	100	94.7
Can they make any kind of savings (%)					
- Yes	55.6	46.2	N/A	70	56
- No	44.4	53.8		30	44
If yes, what type (%)					
- Individual	22.2	23.1		10	20
- Collective	25.9	15.4	N/A	40	26
- Individual and collective	7.4	7.7		20	10
- Don´t make	44.4	53.8		30	44
Organization and representation					
Do they belong to any association (%)					
- Yes	55.6	51.5	20	50	50.7
- No	44.4	48.5	80	50	49.3
In their opinion, which institutions support fishers/women fish sellers (%)					
- No entities	96.3	92.3	N/A	80	92
- Local institutions (associations, etc.)	3.7	7.7		20	8
They made or thought of any form of contribution to the reform (%)					
- Contributes to the INPS	14.8	7.7		10	12
- Make savings	14.8	15.4		30	18
- Use the social system	22.2	23.1	N/A	10	20
- Contributes to the INPS and make savings	11.2	0		20	10
- Never thought about reform	37	53.8		30	40

Source: Survey data.

3.3.6. General perception about their fishing activity

Peixeiras spend on average (daily) between 4 to 8 hours on fishing commercialization activities. Between 4 hours if they are intermediates, and 5 hours if they are street vendors, the latter do not have much purchasing power, so they end up finishing the sale in a shorter period of time, between 7 hours to 8 hours if they work in the local market, this is due to access to the sales stall, and even when the market closes they continue selling on the outside (Table 3.4). In addition to selling fish, 24% of *peixeiras* report working in other economic activities, such as micro-enterprises, catering, and cleaning, among others, dedicating around 5 hours a day to these activities, 2h are dedicated to domestic work and leisure time, they end up enjoying it on Sunday (since the market is not open).

Table 3.4 - Daily hours dedicated to economic and domestic activities.

Hours (dialy mean)	Role in the market			
	Street vendor	Local market vendor	Intermediate vendor	Local market and Intermediate vendor
Fisheries activities	5 hours	7-8 hours	4 hours	7 hours
Other economic activities	5 hours	5 hours	5 hours	5 hours
Domestic activities	2 hours	2 hours	2 hours	2 hours

Source: Survey data.

As mentioned above, the average household size of *peixeiras* is 6 people and when asked about how many people work in their homes 38% say they support the house on their own, the others point *peixeiras* out that other family members normally work as security guards, fishers, *peixeiras,* farmers, and construction workers, among others, supporting their livelihood.

3.4. Local market

3.4.1. Creation of values

Market flow and channels

It was possible to identify 4 market channels that make the fish reach the final consumer as illustrated in Figure 3.5. Five market agents operate in these channels: Artisanal fishers, intermediates, retail women fish sellers, those that have both functions (intermediates and retailers), and consumers.

The fishers-consumer market flow is used less frequently and is the only one that is not dominated by the women fish sellers, occurring in cases such as the direct sale of fish (by fishers) to restaurants, hotels, public institutions, and families residing close to the location of landing. Women play a fundamental role in the remaining market channel in São Vicente Island. In the fisher-wholesaler and/or retailer-consumer channel, the fishers take the fish to the local market (in Mindelo), selling it to the *peixeiras* that sell fish both wholesale and retail. In the fishers-intermediate-retailer-consumers channel, in this the sale of fish is carried out by the intermediate *peixeiras* who are responsible for purchasing the fish from the fishers on the pier and then taking it to the fish market, selling fish in bulk at retail *peixerias* and to final consumers. Most *peixeiras* retailers sell fish in the local market but are there retailers that sell fish on the streets, going door-to-door to sell fish. The fishers-retailer-consumer channel, is

similar to the first, is the fisher who goes to the market to sell the fish to *peixeiras* who then sell it to the final consumer.

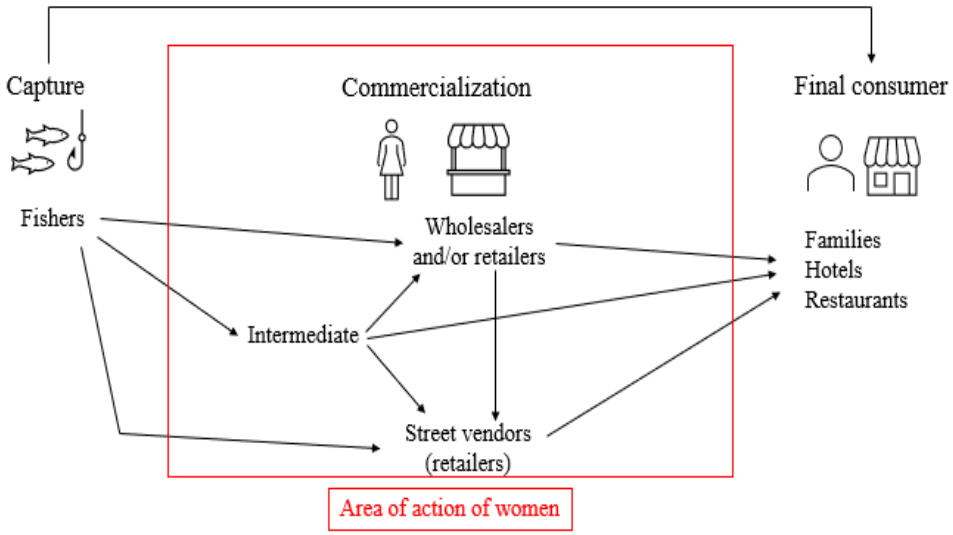

Figure 3.5 - Flow and marketing channels of fish caught in artisanal fishing in São Vicente. Source: Author.

Price of fish in the value chain

In the questionnaires carried out with both *peixeiras* and the presidents of fisher's associations, fish prices can vary.

This made it possible to identify the prices per kilogram in Cape Verdean escudos (ECV) of some species that occurred from March to May 2023 (Table 3.5). These prices were used to estimate market margins, an indicator that allows assessing how much of the final price paid by the consumer is appropriated by commercial agents in the value chain, of the yellowfin tuna (*Thunnus albacares*) (Table 3.6), the most important species traded in quantity and value. It should be noted that calculated margins do not represent the effective profit of each market participant.

The sales prices for fresh fish charged by women retailer sellers seem to be almost double the prices charged by fishers. The estimate of price margins of yellowfin tuna (*Thunnus albacares*) sales was chosen based on the quantity (kg) sold as approximately 50 tons of yellowfin tuna are landed annually by artisanal fisheries on the island of São Vicente, which corresponds to an average annual percentage of 54% and its contribution to the national GDP, thus being a type of great socioeconomic value.

Table 3.5 - Fish prices (minimum and maximum) at fishers, intermediate and retail levels, for several species.

	Reported fish prices (minimum and maximum value)		
	Fishers	**Intermediate**	**Retailer**
Yellowfin tuna (*Thunnus albacares*)	250-300	300-350	400-600$
Wahoo (*Acanthocybium solandri*)	300-350	400-700	500-800
Mackerel scad (*Decapterus macarellus*)	50-100	100$	100-150
Bigeye scad (*Selar crumenophthalmus*)	150-250	170-200	200-250
Moray eel (Muraenidae)	400$	---	500$
Garoupa (*Cephalopholis taeniops*)	300-350	---	400-450
Crab (Brachyura)	400$	---	500$
Conch (Gastropoda)	700$	---	800-900$

Source: Survey data.

Table 3.6 - Yellowfin tuna (*Thunnus albacares*) price at fishers, intermediate and retail levels, and their respective market margins.

Specie	**Price ($)**	**Fishers Price (Fp)**	**Intermediate price (Ip)**	**Retail Price (Rp)**	**Fishers Margin (FM)**	**Intermediate Margin (IM)**	**Retailer Margin (RM)**	**Total Marketing Margin (TMM)**
Yellowfin tuna	*Minimum*	250	300	400	63%	17%	25%	38%
	Average	275	325	500	55%	15%	35%	45%
	Maximum	300	350	600	50%	14%	42%	50%

Source: Survey data.

3.5. Constraints of the value chain

The value chain presents some constraints as shown in Table 3.7. In terms of constraints, there is a precariousness in labor relations on the part of women fish sellers.

Table 3.7 - Constraints of *peixeiras* in the fish chain, according to market type.

Role in the market	**Constraints**
Street vendor	High rate of robberies
	Access to credit (deficit)
	Transportation costs
	Lack of ice/refrigeration
	Price of fish
	Association support (deficit)
Local market vendor	Works in the Market
	High rate of robberies
	Working hours (market)
	Transportation costs
Intermediate vendor	Lack of access to sales/market stalls
	High rate of robberies
	Access to credit (deficit)
	Transportation costs
Local market and Intermediate vendor	High rate of robberies
	Access to credit (deficit)
	Transportation costs

Source: Survey data.

The *peixeiras* street vendors point out a greater number of problems, including theft of fish (during street sales), lack of financing, the cost of transportation (sometimes the trip to buy the fish is not compensated for by selling it), the lack of appropriate space for storing fish presents a major problem, because, in case of not selling all fish, they cannot preserve its quality without risk of loss from one day to the next also the lack of availability of fish needs to be highlighted because this leads to a constant variation in prices, which sometimes causes significant losses on the street vendors. They still indicate the lack of support from associations (*peixerias* association and fishers' association). Regarding local market vendors, a certain degree of insecurity can also be seen in the workspace and storage of fish, because many report theft of both money and fish. When talking about the local market in Mindelo, we see that the construction work on the Mindelo fish market (to improve it) has already been going on for 4 years, leaving many women sellers without a workspace, having to sell outside, without the necessary health or security conditions (e.g. exposed to the sun, easy targets for theft), so it would be necessary to improve the outdoor space in addition to the market. Another problem highlighted was the market´s opening hours (as it closes at 3 pm), and women point out that it should open longer hours, until 6 pm, to make for better use of the space and without the

peixeiras feeling the need to sell on the street (near the market) after it closes. Both women intermediate sellers and women in the local market/intermediates point out that they have transport costs related to traveling to sell the fish, robberies of both money and fish, and lack of access to credit (financing), the intermediaries also add that they lack a stall in the market to sell the fish.

4. Discussion

It was possible to identify 4 market channels for fish to reach the final consumer in São Vicente Island, these are (i) fishers-consumer, (ii) fisher-wholesaler and/or retailer-consumer, (iii) fisher-intermediate-retailer-consumer and (iv) fisher-retailer-consumer. Five market agents operate in these channels: artisanal fishers, intermediates women fish sellers, retail women fish sellers, those with both functions (intermediate and retailer), and consumers.

The fishers-consumer market flow is less used and is the only one that is not dominated by the *peixeiras*. Women play a fundamental role in the remaining market channel (fisher-wholesaler and/or retailer-consumer channel, fishers-intermediate-retailer-consumer channel, fishers-retailer-consumer channel) in São Vicente Island, selling fish both bulk and retail to final consumers. Similar studies indicated that women in continental West Africa (e.g Senegal, Benin, Ghana, among others), as in São Vicente Island tend not to catch fish, they also have a key role in commercializing it (Harper *et al.*, 2012; Raemaekers and Sunde, 2015; Ameyaw *et al*., 2020), on other hand in East Africa (e.g. Mozambique, Comoros Island, and Tanzania) women are engaged in the harvest of marine species in the intertidal zones, in Tanzania the women in addition to harvesting they also engage in seaweed farming (Harper *et al.,* 2012).

Women's fish seller work is essentially carried out in public space, being a productive activity and often representing the main source of income for the household. They are not associated with an extension of domestic work, despite the segregation of work by gender that is observed. Among the women fish sellers questioned, over one-third (38%) stated that they were the only ones responsible for the household income. The main reason for starting the profession of *peixeiras* was because the families (82.7%) had or still have a relationship with the fishing sector.

> *"I´m a peixeira because I did not have many alternatives. Since I was 13 years old, I accompanied my mother to sell fish, in order to earn a living for the family."*
>
> *- Peixeira of Mindelo, local market.*

When compared to studies on women in fisheries activities (fish processing) in Nigeria (Obasi, 2019) and with official sociodemographic on artisanal fishers in São Vicente (INE, 2022), women fish processor state that the main reasons for getting involved in the fish processing were to generate income in order to satisfy their daily, personal and family needs and it is observed that, unlike *peixeiras* in São Vicente, most fishers' families work in jobs not related to fishing activities (56%), respectively.

Considering the species captured by artisanal fisheries, the *peixeiras* sell mostly small and big pelagics, which are the main species caught on the Island of São Vicente, according to available statistical information; big pelagic (42%), demersal (30%), small pelagic (17%) species and shellfish (0.6%) (INE, 2018).

Regarding species, the market margin of the yellowfin tuna was found (45%) and our results have some similarities compared with another study. Thu *et al.* (2021) focused on analyzing the market structure and the financial performance indicators of actors in tuna's value chain, demonstrating that shipowners (fishers) achieved the highest market margin because of their tuna exploitation ability when compared with the ones that purchased and distributed the fish.

As mentioned, there are different groups of women fish sellers in São Vicente, and these vary according to their role in the value chain, thus being divided into street vendors, local market vendors, intermediate vendors, and local market/intermediate vendors, and this can also be observatory in Ghana, where fish reach the market through two groups of women the fish wives and fish mammies (Torell *et al.*, 2015)

Different groups of women in the value chain, retailers, and wholesalers, sold different quantities of fish. In São Vicente women street vendors (retailers) sell lower rates of demersal species than the women Intermediates vendors (wholesalers) in the value chain, while the selling of small pelagics is lower by Intermediates compared to the other groups (the sample shows significant differences in the Local market/Intermediates and Intermediates, Local market and Intermediates and Street vendors and Intermediates). We found that *peixeiras* have access to fish in different ways: by buying from fishers, intermediate sellers, their husbands/relatives, or by acquiring from their husbands at no cost. The amount sold per day on average varies significantly, 5 to 300 kg per day, these quantities vary according to the type of market women fish sellers operate in. Thus, the Intermediate *peixeiras* (wholesalers) are those who have greater purchasing power, as they sell larger quantities (kg) of fish per day, followed by the Local market/Intermediates *peixeiras* and the local market women fish sellers and finally the street vendors, which sell in smaller quantities (kg) per day, presenting the lowest

purchasing power when compared to the others. In Ghana, women fish sellers have access by acquiring or buying fish from their husbands (fish wives) or by having a greater economy where the women pre-finance a fisher's fishing trip and operative power (own fish processing equipment) (fish mammies). Fish wives operate on a small-scale level and sell fish either fresh or in a processed state to the final consumer and fish mammies on the other hand, can either process the fish themselves or employ the services of others (fish wives) to do the processing for them, and they in turn sell it, thus fish mammies are generally regarded as rich women by local standards as they have their own processing equipment such as fish trays, pans, smoking sheds as well as finance fishing trips of fishers (Ameyaw *et al*., 2020).

In São Vicente the marketing and presentation of commercialized fish can be done in different ways, frozen, dried, salted, and mostly sold fresh. Fresh fish are fish that have never been frozen or have undergone another form of conservation but can, however, be kept on ice to preserve their initial characteristics. Most women claim to transform the product, this can be justified by the fact that the majority have access to a place to store, to a refrigerated space to keep the fish fresh, and to a place to salt and dry the fish.

Peixeiras spend on average (daily) between 4 to 8 hours on fishing commercialization activities. In addition to selling fish, over one-fifth of *peixeiras* in São Vicente and 38% of women fish sellers in Dixcove, Ghana (Ameyaw *et al*., 2020) report working in other economic activities (an alternative livelihood).

Studies on the role of women in fisheries were carried out in other countries, to observe how they are involved in fishing activities and what they do. In Kenya, women fish sellers in the communities commonly form relationships with fishers, as part of the jaboya system (sex-for-fish), wherein women secure the rights to purchase the fish caught by the fisher by engaging in a relationship with him (Kwena *et al*., 2012). On Lake Victoria's shores, fish declined fish availability and hence economics (e.g., price) and sexual (e.g., condoms) negotiations. A primary goal of fish-for-sex relationships is resource access, not just income (Fiorella *et al*., 2015). This, when compared to the results obtained, shows that *peixeiras* do not depend much on men and there is no jaboya system in Cape Verde (as in Kenya), but the women fish seller (street vendors and the ones who sells in the local market) depends mostly on other *peixeiras* (intermediate) to gain access to fish. This leads to power differences within the value chain, wherein women secure the rights to purchase the fish caught by the fisher by establishing contact with other *peixeiras*.

During the questionnaires, not only did we obtain information about the market, but it was also possible to identify some of the constraints that those involved in the value chain go

through. With this, it was possible to identify the major constraints faced by women fish sellers, which allowed us to identify and better understand the difficulties that women face and need to overcome, thus allowing for the suggestion of a set of guidelines and measures that governments can apply to overcome or reduce the constraints faced by women in the value chain. In terms of constraints, there is a precariousness in labor relations on the part of women fish sellers; different groups of *peixeiras* in the value chain present different problems. Among the problems with the greatest impact on the fish value chain, the lack of availability of fish needs to be highlighted, this leads to a constant variation in prices, which sometimes causes significant losses on the part of women fish sellers, mainly to the *peixeiras* street sellers. Access to financing is also a limiting factor, in all groups of *peixeiras*, except the *peixeiras* in the local market. Only a small proportion of women fish sellers (5.3%) benefited from credit. They do not show much interest in credit because they think they have no way of paying the loan/credit back on time.

> *"I never thought about taking advantage of credit, I feel like I would not be able to sleep, I also do not know tomorrow and I don't want to leave anyone in debt."*
>
> *- Peixeira of Mindelo, Street vendor.*

The street vendors also point out that they feel left out, in relation to the support given by the association, in relation to the other groups (intermediates, local market vendors and local market and intermediate vendors).

In the Azores (Portugal), women were formerly known as helpers (an extension of women defining behavior as a good mother and wife) and became visible within fisheries, and more valued within the broader community (Nielson *et al*., 2019). Overall, women in fisheries in the Azores have slowly gained a place within the Azores fishing community through the creation of associations and activities that make their work and involvement visible, but this evolution has been slow and precarious and needs support from non-governmental organizations (NGOs) and government (Nielson *et al*., 2019). Taking this into account, when compared to women fish sellers in the Azores, the ones in São Vicente do not seem to be very connected to each other (considering the different groups), which indicates that they should invest more in their associations, which would allow them a greater economic evolution, they would have greater visibility in the fishing sector, being able to improve access to a set of public policies, credit, and technical assistance.

5. Conclusions

The development of this work made it possible to analyze, characterize, and map the artisanal fishing value chain in São Vicente (Cape Verde), considering the role of women.

In general, the fish value chain is currently organized/mapped into 3 stages, the first being the input where commercial establishments are located that help and allow fishers access to means that allow them to capture the fish, followed by production where artisanal fisher capture fish. The third and final phase, marketing, involves distributing the fish so that it reaches the final consumer, in this phase, the women fish sellers are identified, and they are who act as intermediaries between the artisanal fisher and the consumer.

In marketing, the most representative channels are those where women are found, and they are the ones who add value to the fish and enable greater income. It was possible to conclude that although *peixeiras* sell fish, they end up being described in different groups, (i) street vendors, (ii) local market vendors, (iii) intermediate vendors, and (iv) local market/intermediate vendors, considering their functions and powers of buying and selling fish, which leads to a demonstration of social and economic power within the artisanal fishing chain.

The information collected in the study on the socioeconomic characteristics of women fish sellers and other actors is essentially relevant to characterize the class, in addition to providing real information on the participants, thus contributing to a better perception of the structure of human resources in the artisanal fishing sector.

In the context of investigation for work, in this case for completing the thesis. In the specific case of this work, there were several limiting factors, but the following are mainly worth highlighting:

- Limitation of the availability of certain data/bibliographies by different entities, both in the area of fisheries and of gender;
- Some delay in responses from some actors in the chain;
- Limitation on the availability of certain data in women fish seller questionnaires.

In order to achieve greater profitability, reduce losses and provide a return on investments by agents in the artisanal fish value chain, here are some recommendations and suggestions.

Fish processing/transformation - it is necessary to invest more in fish processing to allow greater price stability since when supply is greater than demand, fish can be processed to allow storage of the fish even for a longer period. Processing for commercial purposes makes it possible to generate additional income and diversify income, allowing *peixeiras* not only to

generate income from the sale of fresh fish but also to earn income through other means. Processing also makes it possible to reduce fish losses, showing society another way of eating fish, thus opening doors to training and changes in mentality. A great example of fish processing would be fish hamburgers, croquettes, and fish flour.

Access to credit - One of the biggest limitations for *peixeiras* to expand, or sometimes even start working, is access to credit so that they can invest in the acquisition of inputs, without financial means they will not have the means materials so they can start the business. There is a need for banks and credit institutions to create targeted credit modalities adapted to the reality of fishmongers (considering social and cultural parameters), with affordable interest rates making access to credit possible.

Training and qualification - for better use and benefits of the *peixeiras*, it would be positive to promote specific programs aimed at it, to boost the valorization of the workforce, technically training the island's *peixeiras*, which could provide growth and economic development of the island.

With this work, it is hoped to spark interest in the development of more research on this topic to provide more information in terms of knowledge about how fish marketing works and the role of women in it.

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Annexes

Annex 1 - Questionnaire for women fish sellers (*peixeiras*) (in Portuguese, the official language of Cabo Verde)

Questionário sobre conhecimento do papel das mulheres na cadeia de valor na pesca artesanal em São Vicente (Cabo Verde)

Local: _____ **Data: __/__/2023**

Este inquérito é parte da tese de Mestrado em Aquacultura e Pescas da Universidade do Algarve, e tem por objetivo contribuir para melhorar o conhecimento sobre a cadeia de valor do pescado, incluindo padrões de consumo, o papel das mulheres, iniciativas para adicionar valor aos produtos da pesca e melhorar o rastreio. Toda a informação recolhida será tratada de modo confidencial e para uso interno do projeto e o seu nome nunca será revelado em nenhum documento ou apresentação, em conformidade com o Regulamento Geral de Proteção de Dados (RGPD).

Perfil

P1 – Qual é a sua profissão?
Peixeira.....
Peixeira/armador.....
Outra, qual.....

P2 – Há quanto tempo faz esse trabalho (anos de experiência)? .....

P3 – Na sua família tem mais pessoas que praticam ou que praticam atividades de pesca?

Sim----- Quem? ---

Não -------

Dados sociodemográficos

P4 – Qual é seu estado civil/ situação matrimonial? .....

P5 – Qual é a sua idade?

18-23---- 24-29---- 30 -35 --- 36 – 41---- 42 - 47----
48-53---- 54-59---- 60 -65 --- 66 – 71---- 72 – 77---- Maior que 77----

P6 – Quais as suas habilitações literárias?

Analfabeto..... 1º ciclo do Ensino básico.....
2º ciclo do Ensino básico ..... Ensino secundário.....
Ensino superior.....

P7– Qual o número do seu agregado familiar?

(1-5 pessoas)..... (6 – 10 pessoas)..... (mais de 11 pessoas).....

Fases da Cadeia de produtiva/valor de pescado

P8–Que espécie vende (por ordem de importância)? (mais importante em $, marcar 1º, 2º…)

Demersais…..

Grandes pelágicos (atuns)…..

Pequenos pelágicos.....

Mariscos .....

P9 – Como adquire o seu pescado? (por ordem de importância) (mais importante em $, marcar 1º, 2º…)

Compra a qualquer pescador.....
Adquire do marido (sem comprar)....
Compra ao marido/familiares....
Compra a vendedora/intermediária....
Outros.....

P10 – Por quanto compra um quilo do pescado (especificar a espécie)?
.....

P11 – Onde costuma vender o pescado?

Mercado local..... Na comunidade Porta-a-porta (cesta na cabeça)..... Porta-a-porta (carrinho de mão)..... Mercado afastado mais afastado (>2h de distância)..... Intermediária (vende a outras peixeiras).... Conserveiras.... Mercado nacional/ilhas.....Hotéis e restaurantes..... Outros. Quais .....

P12 – Em média quantos quilos vende por dia? .....

P13 – Qual período que mais e menos vende (meses/estação)?.....

P14 – Qual período que mais e menos vende (meses/estação)?. .....

P15 – Em média, qual o preço de venda de um kg de pescado?

Demersais…….....

Grandes pelágicos (Atuns)…….....

Pequenos pelágicos.....

Mariscos.....

P16 – Como costuma vender o pescado?

Fresco.... Salgado.... Filetado.... Eviscerado.... Outro,Qual.....

P17 – Utiliza técnicas de conservação do pescado?

Sim....Quais.....

Não....Porquê?.....

P18 –Acesso a bens e serviços:

Tem acesso a um espaço de frigorífico/refrigeração para manter peixe fresco?

Tem acesso a um local de salga e secagem?

Tem acesso a um local de armazenamento?

Tem acesso a uma banca de venda?

Tem acesso a uma carrinha/carro para transportar o peixe?

Tem acesso a uma carrinha de mão para transportar o peixe?

P19 – Processamento (salga e secagem de peixe):

Faz salga/secagem peixe? Sim....Como alternativa ?.....Não..

Se sim:

Tem acesso a terreno/local para secar pescado?....

Tem acesso a um local para guardar o produto?....

Tem acesso a esteiras/armações de madeira elevadas para secar peixe?....

Como fazem a secagem?.....

Crédito, poupança e investimento

P20 – Já beneficiou algum tipo de crédito?

Sim..... Quantas vezes?..... Quando?.....

Não..... Porquê?.....

P21 – Se sim. Qual instituição que lhe concedeu crédito?

Bancos Comerciais (quais?).....
ONGs (quais?).....
Instituições de microcréditos (quais?).....

Outras (quais?) .....

P22 – Qual foram os montantes solicitados? .....

P23 – Qual foi o período de reembolso?......

P24 – Qual foi a forma reembolso?.....

P25– Quais foram as garantias do crédito?

Hipoteca de bens.....

Apresentação avalista.....

Outra. Qual?.....

P26– o crédito era destinado:

compra consumíveis atividade pesca.....

compra equipamentos/matérias.....

questões saúde.....

habitação.....

Outra. Qual?.....

P27 – Consegue fazer algum tipo de poupança? Sim..... Não.....

Se sim, que tipo poupança faz?

Individual.....

Coletiva.....

Individual e coletiva.....

Outra. Qual?.....

Organização e Representatividade

P28 – Pertence a alguma Associação?

Sim.... Qual?.....

Não.... Porquê?.....

P29 –**Na sua opinião, que instituições que mais apoiam os pescadores/vendedores?**

Entidades do Estado.....
ONG´s nacionais.....
ONG´s Internacionais.....

Instituições locais (assoc. etc.).....

Entidades religiosas.....

Nenhuma entidade.....

Outro. Qual.....

P30 – **Tem feito ou pensou alguma forma contribuição para sua reforma?**

Contribui INPS.....
Faz poupança.....
Recorrerá ao Sistema Social.....
Nunca pensou em reforma.....
Outro. Qual?.....

Serviços públicos básicos disponíveis

P 31 – Tem acesso a eletricidade? Sim.....

Não.....Porquê?.....

P32 – Possui acesso a água potável através?

Canalizada.....cisterna.....poço.....sentina pública....não tem acesso, Porquê? .....

P33 – Tem acesso a posto de saúde: sim..... não.....

Perceção geral da actividade de pesca

P34 – Quanto tempo (diário) é dedicado:

Atividade de pesca..... outras atividades econômicas..... trabalhos domésticos..... lazer.....

P35 – Quantas pessoas trabalham em sua casa?.....

P36 – Em que atividades? .....

P37–Quais são os principais problemas/desafios que enfrenta no seu dia-a-dia?

Perdas de produto devido à falta qualidade.... Roubos.....

Insegurança/violência.... Custo transporte.....

Falta de acesso à banca venda/mercado.....

Perdas produto durante a salga/secagem....

Falta local de armazenamento... Falta de gelo/refrigeração.....

Falta de acesso a crédito/financiamento....

Quais são os principais problemas que enfrenta em relação à salga e seca.....

.....

.....

Outras.....

.....

Nenhum (sem problemas).....

P38- Notas finais - apontar aqui tudo o que seja importante (em relação a qualquer questão) ou outros temas de interesse

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Annex 2 - Questionnaire for fishers Association of São Pedro, Salamansa, and Calhau and for the *peixarias* Association in Mindelo (in Portuguese, the official language of Cabo Verde)

Questionário – *Associações Pesca*

Data: **Local:**

Este inquérito é parte da tese de Mestrado em Aquacultura e Pescas da Universidade do Algarve, e tem por objetivo contribuir para melhorar o conhecimento sobre a cadeia de valor do pescado, incluindo padrões de consumo, o papel das mulheres, iniciativas para adicionar valor aos produtos da pesca e melhorar o rastreio. Toda a informação recolhida será tratada de modo confidencial e para uso interno do projeto e o seu nome nunca será revelado em nenhum documento ou apresentação, em conformidade com o Regulamento Geral de Proteção de Dados (RGPD).

P1. Qual é a abrangência da sua organização (de onde vem os seus membros)? _____

P2. Em que ano se iniciou a organização? _____

P3. A sua organização está registada formalmente? Sim Não

3.1. Se sim, em que ano? _____

P4. Quem iniciou a organização? _____

P5. Com que objetivo se iniciou?

_____

_____

_____

P6. Quais são os objetivos atuais?

_____

_____

P7. A sua organização tem algum dos seguintes:

Constituição ou estatuto ___ Comité executivo ___

Conta no banco ___ Outro, qual? _____

P8. Quantos membros são mulheres? _____

8.1. Quais são os seus cargos?

_____

_____

8.2. Se tem, qual o seu rendimento/vencimento?

_____

P9. Com que frequência os elementos da organização se reúnem para trabalhar? _____

9.1. Que problemas tem para se reunirem?

_____

_____

9.2. As mulheres participam das reuniões?

_____

_____

P10. Tem acesso a uma área para uso das atividades pesqueiras? Sim __ Não __

P11.Têm acesso a um espaço para trabalhar de forma segura (ex. secagem/salga, processamento e armazenamento dos produtos ou guardar equipamentos)? Sim __Não __

P12.Têm acesso a um espaço para armazenar os produtos secos de forma a manter o seu valor? Sim __ Não __

P13. E para mantê-lo fresco? Sim __ Não __

P14. Tem acesso a um espaço para vender o pescado? Sim __ Não __

P15. Tem acesso a algum meio de transporte para o transporte do pescado? Sim __ Não __

P16. Que etapas na cadeia de valores o seu grupo representa?

Pré – apanha (reparar redes, limpeza de botes) __ Captura (pesca) __

Processamento __ Venda __ Compra (materiais) __

P17. Que espécies pescam e/ou vendem?

_____

_____

P18. Onde vende_____

_____

P19. Quais são os principais problemas/desafios que enfrenta no seu dia-a-dia?

_____

_____

_____

P20. A organização recebeu algum subsídio nos últimos 5 anos? Sim __ Não __

20.1 Se sim, qual? _____

P21. Os membros recebem algum dos benefícios abaixo:

Formações __ Acesso a empréstimos__ Apoio social__

Equipamentos __ Acesso ao mercado __ Outros, qual?

_____

Annex 3 - Figures from field research (captured by phone).

Sale of fish in the local market (Mindelo), inside and outside, respectively (Author).

Street vendor selling fish in a wheelbarrow (Author).

How fish is transported to the market, after purchase from fishers (Author).

Peixeiras preparing fish for sale and street vendor selling fish, respectively (Cristina Pita).

Local market *peixeira* fishing on the pier on her break (Author).