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Analysis of stakeholders satisfaction regarding fishing port management in SENEGAL: Targeting the four artisanal fishing ports (セネガルにおける漁港管理に関する利害関係者の満足度分析－４つの零細漁港を事例として)

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**Master's thesis**

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－4つの零細漁港を例に－

**March 2021**

**Master's Course of Marine Policy and Management  
Graduate School of Marine Science and Technology  
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## **ACKNOWLEDGEMENT**

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## **LIST OF ACRONYMS**

**AFNOR:** French Association for Standardization

**CCE:** Consultative Operating Committee

**CLPA:** Local Artisanal Fisheries Council

**CRODT:** Oceanographic Research Center of Dakar –Thiaroye

**CSPro:** Census and Survey Processing System

**DTTP:** Directorate of Fish Processing Industries

**DPM:** Directorate of Maritime Fisheries

**EEZ:** Exclusive Economic Zone

**EU:** European Union

**FVO:** Food and Veterinary Office

**GIE.I:** Inter-professional economic interest groups (Association Responsible for the Management of the Artisanal Fishing Port)

**GDP:** Gross Domestic Product

**HACCP:** Hazard Analysis and Critical Control Point

**ISO:** International Organization for Standardization

**MPAs:** Marine Protected Areas

**PAPEC:** Project for the development of artisanal fishing in the small coastal area

**PSE:** Plan Senegal Emergent is the reference framework for economic and social policy in the medium and long term.

**QMS:** Quality Management System

**STABEX:** Senegal Fisheries Development and Management Strategy (SAGPS) COM/ STABEX ‘Fisheries’

**LPSDPA:** Sectoral policy letter for the development of fisheries and aquaculture is part of the implementation.

**TQM:** Total Quality Management

**RASFF:** Rapid Alert System for Food and Feed

## **TERMS AND OF DEFINITIONS**

**HAZARD:** A biological, chemical, or physical agent that is reasonably likely to cause illness or injury in the absence of its control.

**NON-CONFORMITY:** A failure to meet specified requirements of the HACCP System

**HACCP SYSTEM:** The implemented HACCP Plant and Prerequisite Program

**CONTROL:** To manage the conditions of an operation to maintain compliance with established QMS

## LIST OF TABLES

<b>Table 1:</b> Stakeholder requirements .....	5
<b>Table 2:</b> Scale of impact of the stakeholders .....	6
<b>Table 3:</b> Level of impact on product conformity .....	7
<b>Table 4:</b> Resources exploited by Senegalese fisheries .....	17
<b>Table 5:</b> Production in the last seven years .....	18
<b>Table 6:</b> Factories exports over the last five years .....	19
<b>Table 7:</b> Sampling rate.....	30
<b>Table 8:</b> Social surveys of the fishing community operators.....	30
<b>Table 9:</b> Socio-demographic information of the respondents .....	31
<b>Table 10:</b> Fishing gear used in the 4 fishing ports .....	32
<b>Table 11:</b> Statistics of the production in 2018 .....	32
<b>Table 12:</b> Statistics of the production in 2019 .....	33
<b>Table 13:</b> Method of fish preservation (refrigeration).....	33
<b>Table 14:</b> Operators who have benefited from training.....	34
<b>Table 15:</b> Operators who have benefited from awareness-raising.....	35
<b>Table 16:</b> Budget distribution .....	42
<b>Table 17:</b> Overall satisfaction with GIE.I services .....	42
<b>Table 18:</b> Communication with fish processing companies .....	43
<b>Table 19:</b> Participation of the GIE.I in CLPA's activities .....	49

## LIST OF FIGURES

<b>Figure 1:</b> General process of the distribution of fish products in Senegal .....	22
<b>Figure 2:</b> Four artisanal fishing port localization .....	27
<b>Figure 3:</b> Operators' satisfaction .....	36
<b>Figure 4:</b> Operators' opinions on the manager's leadership .....	37
<b>Figure 5:</b> Operators' opinions on the strategy and vision .....	38
<b>Figure 6:</b> Operators' opinions on hygiene services .....	39
<b>Figure 7:</b> Operators' opinions on maintenance service.....	40
<b>Figure 8:</b> Operators' opinions on the financial service .....	41
<b>Figure 9:</b> Origin of fish products .....	43
<b>Figure 10:</b> Main requirements of fish processing companies .....	44
<b>Figure 11:</b> Main causes of non-compliance .....	44
<b>Figure 12:</b> Involvement and consideration of factory expectations .....	45
<b>Figure 13:</b> Satisfaction regarding Joal's fish products.....	45
<b>Figure 14:</b> Satisfaction regarding Pointe Sarene's fish products.....	46
<b>Figure 15:</b> Satisfaction regarding Ngaparou's fish products .....	46
<b>Figure 16:</b> Satisfaction regarding Yoff's fish products.....	47
<b>Figure 17 :</b> Fish processing companies' opinions on the quality of the fish.....	48

## CONTENTS

ACKNOWLEDGEMENT .....	IV
LIST OF ACRONYMS .....	VI
LIST OF TABLES .....	I
LIST OF FIGURES .....	II
CONTENTS .....	III
ABSTRACT .....	XII
CHAPTER 1: GENERAL INTRODUCTION .....	1
1.1. Introduction .....	1
1.2. Problem statement .....	1
1.3. Objectives of the study .....	2
1.4. Methodology .....	2
CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK .....	4
2.1. Research progress on stakeholder satisfaction management .....	4
2.1.1. Definition .....	4
2.1.2. Identification of stakeholders in the artisanal fishing port .....	4
2.1.3. Determination of requirements of artisanal fishing port stakeholders .....	5
2.1.4. Evaluation of the relevance of the stakeholders: Stakeholder impact .....	6
2.1.5. General theoretical analysis on stakeholder involvement .....	7
2.1.6. Customer satisfaction .....	9
2.1.7. Management of quality .....	10
2.2. Research progress on fishing port management and stakeholder satisfaction .....	14
2.3. Summary of this chapter .....	15
CHAPTER 3: GENERAL OVERVIEW OF FISHERIES AND FISHING PORTS MANAGEMENT IN SENEGAL .....	16
3.1. Fisheries policy guidelines in Senegal .....	16
3.2. Importance of fisheries sector in Senegal .....	16
3.3. Marine fisheries sector .....	18
3.4. Industrial fishing .....	18
3.5. General overview of the artisanal fishing port in Senegal .....	19
3.5.1. Organization of the managed fishing port .....	20

3.5.2. Management bodies .....	20
3.5.3. Distribution channel .....	21
3.5.4. Stakeholders in the artisanal fishing ports: roles and characteristics .....	22
3.5.5. Texts and regulations .....	24
CHAPTER 4: RESULTS AND DISCUSSION.....	27
4.1. Study area.....	27
4.1.1. Joal fishing port .....	27
4.1.2. Ngararou fishing port .....	28
4.1.3. Pointe Sarene fishing port.....	29
4.1.4. Yoff fishing port .....	29
4.2. Results from the questionnaire surveys .....	30
4.2.1. Socio-demographic characteristics of the interviewees .....	30
4.2.2. Characteristics related to the production process .....	31
4.2.3. Results of the satisfaction analysis of the operators.....	34
4.2.4. Results of the satisfaction analysis of the fish processing companies .....	42
4.3. Summary of the main results of this thesis .....	49
4.4. Discussion .....	50
4.5. Summary of the chapter .....	56
CHAPTER 5: CONCLUSION, SUGGESTION, LIMITATIONS AND FUTURE STUDY .....	57
5.1. Conclusion .....	57
5.2. Suggestions .....	58
5.2.1. Commitment of managers and stakeholders.....	59
5.2.2. Training of managers and production operators.....	59
5.2.3. Communication and advocacy .....	60
5.2.4. Rational management of resources and skills.....	61
5.3. Limitation of the study and future perspectives .....	61
REFERENCES .....	62
ANNEXES .....	62

## **ABSTRACT**

Artisanal fisheries in Senegal are essential sources of employment, income, and foreign exchange. Particularly, fishing ports chiefly serve as providing access to fishing vessels and their crew to services and supplies and as fish capture landing for fishing operators. Despite the performance of the sector in recent years, there are several constraints related to the performance of artisanal fishing ports and related activities. In particular, the fishing ports are faced with difficulties related to basic facilities and sanitary management. These issues appear to be a major threat for the survival of fishing communities. Today, hygiene and services management has become a significant preoccupation for all stakeholders in the sector. To compensate for these shortcomings, Senegal has entrusted the management of the infrastructures to the fishing communities to improve the performance of the fishing ports and meet the legal regulatory requirements and the expectations (hygiene and the cold chain) of all stakeholders.

However, fishing port management remains a difficult task to effectively operate the ports, it is necessary to fully understand the actual situation of the ports' management and the stakeholders' perceptions related to the management. To attain this core objective, this study specifically aims at: analyzing the quality management practices related to the stakeholder satisfaction, evaluating the roles and responsibilities of the stakeholders, and analyzing the constraints related to the quality management of services and products. This study mainly targets stakeholders namely the ports' managers, the production operators (fishermen and fish wholesalers), and the fish processing companies (the main buyers of the fish wholesalers).

This study used a mixed methods research to conduct a comparative analysis of four fishing ports' quality management system, namely Yoff, Joal, Pointe Sarene and Ngaparou. Semi-structured interviews were conducted with 40 managers and questionnaires administered to 187 fishermen, 78 wholesalers and 24 of the 31 fish processing companies. The questionnaires mainly aim to evaluate the stakeholders' satisfaction of the studied fishing ports and their expectations regarding the managers' products and services.

The obtained data were analyzed by using the Census and Survey Processing System (CSPro) software.

The results identify that operators and fish processing companies are more satisfied with the services and products provided by Yoff fishing port than others. This may be caused by the principles of quality management-based system that is richly supported by the motivation, the commitment, the communication, and the inclusivity of the management. This may have shown a difference in the satisfaction of their customers. Moreover, this study contributes also to the understanding of applying the principles of quality management for customer satisfaction. This study concludes that it may be possible to improve the profitability of the artisanal fishing ports through the capacity and skill building and knowledge of the managers. These may lead all the stakeholders around a unifying objective to meet the current challenges of artisanal fishing ports. The commitment of artisanal fishing port managers, operators, the involvement of fish processing companies and competent authorities are valuable assets to ensure the competitiveness of artisanal fishing ports and the total stakeholder satisfaction.

**Keywords:** quality, management, fishing port, stakeholders, satisfaction.

## **CHAPTER 1: GENERAL INTRODUCTION**

### **1.1. Introduction**

The fisheries sector makes a significant contribution to the economy in Senegal; it is a major source of the nation's food supply, and nutrition security, employment, jobs, and foreign currency. It remains one of the main economic activities providing foreign currency in the country with USD 358, 420,243; USD 378, 665,893 and USD 452,257,812 since 2015 through fish exportations. Data shows that the fisheries sector contributes to 3.2% of the national Gross Domestic Product (GDP) and 12% of the primary sector's GDP in 2019. Moreover, fish products provide 70% of the animal protein intake for Senegalese presenting an average of yearly consumption of 29 kg per capita. The sector's performance is boosted by several types of infrastructures, such as the modern artisanal fishing ports, by the international trade throughout, Europe, Africa, Asia, and America. Senegal has seven maritime regions and 13 approved artisanal fishing ports that ensure the distribution of fish products, supplying 60% of the demand from fish processing companies and 95% from the national market (DPPD, 2019). However, the fishing ports are faced with difficulties related to the sanitary management of the infrastructures as confirmed by the results of the audit of the Food and Veterinary Office (FVO) held in 2010 (FVO, 2010). The main issues were particularly found regarding the sanitary conditions of the landing and first sale of fish products in artisanal fishing ports, the unmet sanitary requirements for artisanal fishing boats involved in exports to the European Union (EU) as well as the management of the cold chain and the transportation condition of the fish capture from the artisanal fishing ports (FVO, 2010). Further, the FVO inspectors have also identified 14 rejections of fresh and frozen fish by 2010 from 2012 the EU's Rapid Alert System for Food and Feed (RASFF) due to the defective quality of these products (deteriorated sensory characteristics) (FVO, 2013). Because of these issues, the quality management regarding the hygiene and upstream services has become a major preoccupation for all stakeholders in the artisanal fishery sector in Senegal. The reasons why we conducted this study are to primarily identify and analyze the stakeholders' satisfaction and the constraints linked to the management of the artisanal fishing ports.

### **1.2. Problem statement**

Artisanal fishing ports are a system combining infrastructure facilities, human resources, and management concepts, dedicated to the purpose of servicing the fishing fleet, the requirements of

the fish processing companies and operators. They play an important role. However, they faced several challenges related to the management of the basic facilities. It's for all these reasons that the State of Senegal has decided to build new infrastructures to improve production efficiency. To do this, Senegal has adopted a new approach based on quality management to improve the performance of fishing ports and to meet the legal regulatory requirements and customer expectations. Quality management has become a strategic factor for any organization wishing to improve the quality of its products and services to satisfy potential customers. For this, managers and other stakeholders are considered to play a crucial role.

### **1.3. Objectives of the study**

The main objective of this study is to analyze the quality management practices concerning the stakeholders' satisfaction regarding the quality management of the artisanal fishing ports in Senegal. Specifically, this study focuses on the evaluation of the roles and responsibilities of the different relevant stakeholders of the managed fishing ports, the analysis of the existing constraints and the identification of the factors that may ensure a successful quality management of the services and products offered by the managers. This study, which is among the first in the field of Senegalese fishing port management, will enable decision-makers and port managers to understand this tool to meet the expectations of stakeholders based on the principles of the quality approach.

### **1.4. Methodology**

For the realization of this work, we made a documentary research on books, dissertations, workshop brochures. In this study, stakeholders consist of the managers, the production operators (fishermen and fish wholesalers), and the fish processing companies (the main buyers of the fish wholesalers). We have carried out a stakeholder satisfaction survey by using semi-structured questionnaires. These questionnaires enabled us to compare the quality management system of four managed fishing ports, namely Yoff, Joal, Pointe Sarene, and Ngaparou. We gathered information from 40 managers, 187 fishermen, 78 wholesalers and 24 fish processing companies. The satisfaction data mainly targeted these three last categories of interviewees.

Analysis of the obtained data aims to evaluate the satisfaction of the stakeholders of the managed fishing ports based on their expectations on the services and products offered by the managers. Data were analysed by using the Census and Survey Processing System (CSPro) software. The

measurement of satisfaction is imperative in a quality approach. It is an essential condition for building and improving quality in an organization. Also, recommended by the ISO 9001 standard in its requirements; it enables the evaluation of roles and responsibilities of various relevant stakeholders. In addition, it helps to analyze the constraints and advantages to the management in the targeted fishing ports.

## **CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK**

### **2.1. Research progress on stakeholder satisfaction management**

The primary objective of a well-functioning company or organization is to constantly seek the level of quality that corresponds to the expectations of customers and stakeholders. This mission involves integrating the customer satisfaction function, whose determining factor is the quality of the offer? Today's world is marked by several changes that have led to increased competition and customer satisfaction that has become an essential element for any organization (Babin & Griffin, 1998). The concept of stakeholder integration, therefore, became the determining of a new method of management for companies and organizations that aim to perform. In this study, we considered stakeholders as the managers, production operators (fishermen and fish wholesalers) and the fish processing companies that buy the product from the wholesalers.

#### **2.1.1. Definition**

ISO defines stakeholders as a person that can affect, be affected by, or have a viewpoint that can affect them by a decision or activity. Therefore, it refers to all persons or organizations that could at one time or other influence/affect/evolve our quality system: quality management system (QMS), processes, activity and, strategy (ISO, 2015). In addition to that, Freeman (1984) defines stakeholders as *'the actors or groups of actors having a direct or indirect influence on the life of the company'*.

#### **2.1.2. Identification of stakeholders in the artisanal fishing port**

On one hand, among the internal stakeholders of a small-scale fishing port, we can mainly focus on the operators namely fishermen and wholesalers. According to EU food law, the operator is "the natural or legal person(s) responsible for ensuring compliance with the requirements of food law in the food business under their control". Operators must ensure that hygiene conditions are met at all production steps and place products on the markets that meet the standards. On the other hand, external stakeholders that are targeted in this study are competent authorities in the fisheries sector, the local municipal authority, and the fish processing companies. Several texts of the Codex Alimentarius define the competent authorities. In general, they are identified as "Official authority entrusted by all or part of the government working on the control of food hygiene, the management of official inspection and, certification systems" (FAO, 2013). They

are in charge of establishing regulations, standards for food products and carry out official controls. They must assess and communicate health risks transparently and independently.

### 2.1.3. Determination of requirements of artisanal fishing port stakeholders

As required by the ISO 9001 version 2015 standard, it is necessary to define their requirements.

**Table 1:** Stakeholder requirements

Stakeholders	Requirements
<b>Management:</b> Port manager	-Good brand promotion -Long-term profitability -Good communication
<b>Staff:</b> Internal stakeholders	-Friendly and safe working environment -Involvement in decisions making -Provision of material resources
<b>Public authority:</b> Competent authorities	-Respecting laws and regulations -Promoting employment
<b>Operators and suppliers of raw materials:</b> Internal stakeholders (fishermen and wholesalers)	-Compliance with the payment deadline -Have fair and clear information about the work -Have quality services concerning the services of GIE.I (compliant equipment)
<b>Customers:</b> External stakeholders(fish processing companies)	-Compliance with delivery times -Have products those are best adapted to their needs (traceability and product quality)

Source: (ISO, 2015)

Managers of artisanal fishing ports primarily should ensure the quality of the services offered to operators (fishermen and fish wholesalers) as the suppliers of the fish processing companies with products that comply with the requirements. This is why managers of artisanal fishing ports must provide all the hygienic conditions required ensuring the safety and suitability of fish products at all steps of primary production. Regulation (EC) 852/2004 on the hygiene of foodstuffs specifies

(Article 3) the following general obligation: "Food business operators shall ensure that all steps in the production, processing, and distribution of foodstuffs under their responsibility comply with the relevant hygiene requirements laid down in this Regulation". To fulfil this responsibility, port managers are required to be involved with various stakeholders in the control of chemical, biological, or physical hazards to fish products.

#### **2.1.4. Evaluation of the relevance of the stakeholders: Stakeholder impact**

After having identified the relevant stakeholders and determining their requirements, it is necessary to assess their impact on the ability of the managed fishing ports to provide a compliant product by classifying them on the three possible levels.

**Table 2:** Scale of impact of the stakeholders

<b>Degree or magnitude of impact</b>	<b>Characteristics of impact</b>
High impact	Failure to meet their requirements inevitably causes the product to be non-compliant.
Average impact	Failure to comply with their requirements may result in moderate product non-compliance.
Low Impact	Non-compliance with their requirements slightly leads to non-compliance of the product.

:

Table3: Level of impact on product conformity

Stakeholders	High impact*	Average impact*	Low impact*
Public authorities (competent authority): DITP and DPM (local fisheries department)	X		
Local administrative authorities		X	
Steering: Fishing port manager	X		
Staff: Maintenance technician, quality manager and hygiene manager	X		
Production: Suppliers and operators: fishermen and wholesalers	X		
Customers: Fish processing companies			X

\*High impact (in red); Average impact (in yellow) and low impact (in green)

### 2.1.5. General theoretical analysis on stakeholder involvement

Behavioralism is supported by the French sociologist Croizier (2014), who points out the need for stakeholders to coordinate to establish beneficial relationships to improve the performance of the organizations' activities. He also specifies that “all the actors called internal or external stakeholders must implement actions to incite and influence decisions” (Croizier, 2014). The assessment of stakeholder satisfaction includes the requirements and needs of stakeholders.

Quality approach, therefore, improves motivation in return by solving problems and enabling better accountability. This is a fundamental point because the true value of a company naturally rests on the mobilization of internal and external interested stakeholders. According to O'Reilly and Chatman (1986), it is "the psychological attachment felt by the individual to the organization"

Subsequently, Allen and Meyer (1996) defined the attributes of organizational, involvement and suggest three distinct dimensions of involvement namely the emotional involvement, the calculated involvement, and the normative involvement. The degree of involvement has a direct impact on customer satisfaction.

*Emotional involvement* refers to emotional attachment, identification, and commitment to the organization. The individual "expresses an active and positive orientation towards the organization."

*Calculated involvement* refers to the individual's knowledge of the costs associated with leaving the organization: based on a reasoned choice, the individual considers that it is more appropriate to remain loyal to the company than to leave it, a disadvantageous operation, given the material and immaterial investments it involves.

*Normative involvement* refers to the feeling of obligation to remain in the organization out of moral duty, loyalty or to carry out a project in which the individual is involved (duty to remain in the network in view of what the company has brought to it) (Allen & Meyer, 1996).

In the case of an ISO 9001 certified company, the emotional involvement appears to be the most appropriate form of involvement to meet the eight principles (described in the following section) of the ISO 9001 quality management system. Each actor must therefore be aware of the importance of a quality approach. Furthermore, the degree of involvement of the actors in the approach will have a direct impact on customer satisfaction. However, management must face the main objections regularly raised by the actors in this respect, many of whom are not in favor of quality, considering it as an additional work constraint. In contrast others are not even aware of its advantages. The lack of information or involvement of stakeholders could lead to misunderstandings and non-performance of any organization. The technical aspects of quality management would be of no use if staff at all hierarchical levels are not convinced of the need to be involved in the continuous improvement process (Bou and Beltrán, 2005). However, Steingard and Fitzgibbons (1993) drew inspiration from Michel Foucault's work to understand the field that total quality management requires on employees through control methods such as "quality control". These two authors point out that the managerial ideology of total quality management permeates the body and mind of employees without involving them in the decision-making process. Parker and Slaughter (1993) add that total quality management is in fact a model that puts the interest of employees in the background and that its rhetoric conceals a system of managerial control and work organization, according to a model that can be described as "stress-based management". Boje and Winsor (1993) have also shown that total quality management (TQM) is a program where the workers' interests are trivialized in relation to what

Lyotard calls the “performance” needs of the organization. TQM seeks to develop control systems that produce and improve the consistency of products and employees.

### **2.1.6. Customer satisfaction**

There is no consensus on the definition of the word “satisfaction”, but the following definitions are the most used. First, based on the ISO 9000 standard: "*satisfaction is the customer's perception of the level of satisfaction of his expectations*" and according to Kotler and colleagues (2003): "*satisfaction is the opinion of a customer resulting from the gap between his perception of the product or service consumed and his expectations*". It is also "*the positive or negative opinion felt by a customer with regard to a purchasing and/or consumption experience*". Yves Legolvan (1995) indicates that "*satisfying customer needs is the very purpose of the marketing approach; it expresses the degree of satisfaction provided by the response to a wish*". Other authors consider customer satisfaction as the post-evaluation of an experience, which consists of the global evaluation of the company’s services (Parasuraman & al., 1985; Anderson & Fornell, 1994).

#### **2.1.6.1. Characteristic of satisfaction**

Previous literatures often mention the existence of the three characteristics of satisfaction. Satisfaction can be *subjective*: when each customer perceives the product or service differently, *relative* when the customer satisfaction varies according to expectations and, *evolutionary* when satisfaction evolves over time as customer expectations and standards change.

#### **2.1.6.2. Dimensions**

The dimensions of satisfaction are characteristics of a service experience, however, according to Bartikowski, Brown & Bellulo (2002), there are four types of dimensions of customer satisfaction with a service:

- *The dissatisfaction dimension*: if the dimension is perceived as inadequate, the customer will be very dissatisfied.
- *The satisfaction dimension*: the absence of the dimension has little impact on satisfaction, but its presence has a tremendous positive influence.

- *The critical dimension:* this dimension is both a dimension of satisfaction and dissatisfaction. Their presence has a strong positive influence on satisfaction; while conversely, their absence has a very negative influence.
- *The linear dimension:* a change in the provision of this dimension will proportionally affect customer satisfaction.

### **2.1.7. Management of quality**

Several definitions have been formulated for the concept; we have selected two of them and used them in this study. The French Association for Standardization (AFNOR, 2000) defines it as “*the ability of a product or service to meet the user’s needs*”. Besides, the International Organization for Standardization (ISO) defines quality as *a set of intrinsic characteristics to satisfy requirement*. These definitions show that quality management is the organization (process) and steering (management) put in place to ensure that the requirements (expressed or not) of the company's internal and external stakeholders are met and that risks of all kinds are taken into account. Indeed, quality management allows improving the level of conformity of products and services by having a positive impact on the organization (Flynn & al., 1995). The organization must progress to higher levels and become proactive with its customers, anticipating their expectations to satisfy them (Juran, 1981). The quality management system is considered necessary for the control and continuous improvement and performance of the organization. "*The organization shall establish implement, maintain and continually improve a quality management system, including the necessary processes and their interactions, following the requirements of this International Standard*"(ISO, 2015).

#### **2.1.7.1. Forms of quality**

Today, quality management considers the satisfaction of stakeholders, both internal and external to the company or organization. In practice, it takes two forms: external and internal.

##### **a. External quality**

External quality corresponds to customer satisfaction. The objective is to meet the expectations and needs of the organization’s external stakeholders to provide them with compliant products or services. This is why the organization needs to integrate the customer listening approach. It is the organization’s responsibility to take into account the expressed and explicit needs of external stakeholders.

## **b. Internal quality**

It corresponds to the control and continuous improvement of the internal functioning of the company. The internal quality aims to implement the best possible means to describe the organization, to identify and limit non-conformities. Internal quality generally involves a participatory application to identify and formalize the steps of internal processes. Workers and operators are potential beneficiaries (ISO, 2000).

### **2.1.7.2. Customer satisfaction relationship and quality approach**

The quality approach is the set of actions aimed at improving and managing quality. It aims to make the organization (the company) evolve to provide the best services and products. It essentially aims at the satisfaction of stakeholders and continuous improvement. These principles are derived from the best practices and experience of a large number of companies and institutions at the international level. They are essentially characterized by the implementation of procedures and services that meet the expressed and implicit needs of stakeholders. Literature reveals that there is a deep relationship between the quality approach and customer satisfaction (Heskett & al., 1994; Evans, 2011), as well as theoretical results which also indicate a significant link between quality and satisfaction. In addition, several researchers similarly confirm by considering quality as a determining factor of satisfaction (Tse& Wilton, 1988); Parasuraman, Zeithaml& Berry, 1994). Further, Malaval (1996) has proven that the quality provided by an organization in a business-to-business environment translates into customer satisfaction. Companies are under pressure to continuously improve the quality of their services and products to meet the customer's legal requirements and remain competitive. The most successful organizations have found that the quality approach's fundamental principles are essential for business success. The current challenge is to retain customers in a world where acquiring new customers is expensive. In an unpredictable global context full of competition, organizations have realized that their survival depends on the quality of their work (Silverman & Propst, 1999). Eight principles are identified to help companies improve their performance and satisfy their customers (ISO, 2015).

### **2.1.7.3. Principles of quality**

#### **a. Customer orientation**

Organizations need to meet or even exceed the customer's expectations (Ooi, Lin, Tan & Chong, 2011) whether in a short or a long term, and continuously increase their performance levels with improved services and products. However, customer expectations change over time, depending on the company's offerings and those of its competitors. Satisfaction is a relative issue to these expectations. Customer satisfaction, therefore, requires a thorough analysis and a perfect understanding of the customer's expectations, wishes, needs, and behavior. Therefore, the company or organization must live up to its customers' expectations to improve the performance of its services or products. To do so, the organization must offer different products or services that meet the needs and exceed its customers' expectations (Ooi, Lin, Tan and Chong, 2011). Customer experience management is essential to know what the customer wants because if we know the customer's expectations, we will make the services and products evolve. Such an approach contributes to bringing the customer spirit as deeply as possible into the company's heart (Chabry & al., 2017). Therefore, it is essential for companies seeking to obtain larger market shares on a long-term basis, both nationally and internationally, to implement procedures that enable them to integrate customers into the company as true partners who freely express their expectations and satisfactions. This will have a positive impact on the improvement of the entire organization since customers have a strong impact on the company's future existence and development. Listening to the customer, in this case, must be practiced by the departments that are in contact with customers for the sale of services or products. Therefore, the ISO 9001 standard requires customer listening at three different levels: upstream, during, and at the end of the service. Suppose the company manages these three levels well, in that case, the customer will be perfectly satisfied and the organization will be better placed on the market (Mougin, 2004). Measuring customer satisfaction is an invaluable listening tool in a quality approach; it is essential for building and improving quality in a company. It is strongly recommended by the ISO 9001 standard in its requirements. Such a measure is carried out after the product or service has been used.

### **b. Leadership**

Leaders need to establish a clear vision and mission and create the necessary conditions and commitment to achieve goals. According to ISO (2015), the organization's management must commit to implementing a quality policy and ensuring the necessary resources. Leadership consists of:

The quality management system operates efficiently and contributes to the improvement of customer satisfaction. The quality policy supports its strategy and guides its intent and the quality audit to set measurable targets. The quality policy is communicated, understood, applied and available to stakeholders; The roles, responsibilities, and authorities must be defined within the organization and the review of the quality management system is always appropriate, adequate, and effective, and aligned with the strategy(ISO, 2015).The style of leadership affects the customer's satisfaction by impacting the performances of the organization's employees (Abdullah & al., 2009; Salahat & Ahba, 2016).

#### **c. Staff involvement**

Competent, responsible, involved people at all levels are the key to an organization to improve the ability to create added value. Therefore, it becomes necessary to inform and motivate all employees, so that customer satisfaction becomes an integral part of the company's culture. The involvement and commitment of internal stakeholders allow the organization to improve its competitiveness and create a strong emotional bond of attachment to their organization. They allow employees to be actively involved in the decision-making process, to feel more engaged and put more effort into their work (Evans, 2011). Employee engagement is similar to Deming's notion of "pride and joy" in the workplace. Employee engagement refers to any activity through which employees participate in work-related decisions and improvement activities. Besides, employee engagement improves the organization's performance (Harter & al., 2002).To be more effectively involved, organizations need to improve the skills of internal stakeholders (employees and internal operators) by providing them with adequate training. Indeed, having a relevant training program is a strong signal to staff regarding their involvement in company policy. Training could have a direct impact on customer satisfaction. It enables the organization to develop the skills needed to achieve its objectives. A company that invests more in training can create more added values and gain the trust of its customers.

#### **d. Process approach**

If the related activities are understood and managed as processes, an effective and efficient result can be expected. Indeed, effective and efficient process management guarantees trust for customers and stakeholders (Larcher & al., 2013).

#### **e. Management by system approach**

Identifying, understanding, and managing correlated processes as a system contribute to the effectiveness and efficiency in achieving the organization's goals.

#### **f. Continuous improvement**

According to Jha, Noori & Michela (2016), continuous improvement is a set of activities in a process that aims to improve the organization's performance. The organization must identify weaknesses, correct them, and engage in a continuous improvement process to achieve the objectives set to satisfy the customer. Improving the quality of services and products will lead to more satisfied and more loyal customers (Handfield & al., 1998; Ahire & Dreyfus, 2000). To do so, the organization must measure its success by continuing to meet and verify customer requirements (Cole, 2012).

#### **g. Factual approach to decision-making**

A system must have a purpose. "Without a goal, there is no system" (Walton, 1990). Managing the system will require effective decisions based on analysis and evaluation of reliable data and information that can produce appropriate outcomes.

#### **h. Mutually beneficial relationships with providers**

For sustainable performance, the organization must establish lasting beneficial relationships with external stakeholders to create more value. "People at all levels are the heart of an organization and their total involvement allows their skills to be used for the benefit of the organization" (ISO, 2015).

### **2.2. Research progress on fishing port management and stakeholder satisfaction**

In recent years, there has been a growing awareness in the fishing world that fishing communities can play a major role in developing fisheries management systems (Pollnac, 1988). In this regard, Van Santen (2003) has reported on well-managed fisheries by fishing communities in several countries such as Japan, the Philippines, and the Maldives. This also corroborated with the case of the U.S. fisheries management system which was linked to the adaptive capacity of the fishing community to the challenges and changes in the fishery (Pollnac & Poggie, 1988). However, Scheffczyk (2004) provided a range of mandatory and prerequisite knowledge for the operation and performance of fishing ports managed by the fishing communities. In this sense, Berkes (1986) assessed the performance of fishing communities managing fishing ports by identifying the reasons for success (satisfaction) or failure

(dissatisfaction) related to the mastery of prior knowledge of the functioning of fishing cooperatives in Turkey. In general, the relationship between satisfaction and performance has been shown in many studies to be one of the main drivers of performance (Kornhanuser& Sharp, 1976; Mirvis & Lawer, 1977).To avoid fisheries management failure or dissatisfaction , an operational strategy for structuring fishing cooperatives is necessary (Pollnac, 1988).Mutual relationships, communication and, support of the stakeholders have been identified as the determining factors of satisfaction in the Marine Protected Areas (MPAs) of the Spanish Mediterranean (Jentoft, 2000).According to Kocel (1971), in addition to inadequate objectives and planning, the failure or dissatisfaction of the fishing community in Turkey is due to a lack of commitment of stakeholders including the competent authorities, the lack of solidarity and education of fishermen, the problem of leadership of fishing port managers.

### **2.3. Summary of this chapter**

This chapter has outlined different definitions of the concepts of stakeholders, quality management, and customer satisfaction. We have identified the relevant stakeholders that can positively or negatively influence the quality of products and services of the fishing ports. This identification allowed us to define the responsibilities of the operators (fishers and wholesalers), the competent authorities, the fish processing companies, and the fishing port managers in the management of the fishing ports. The literature review summarized concepts and revealed the success factors that favor the satisfaction of the stakeholders of the fishing ports. The reasons for satisfaction were reported in several cases previously mentioned in this chapter. This review also mentioned additional factors of failure or dissatisfaction related to managing the quality of service and products in fishing ports. Finally, the theoretical framework indicates that management based on the principles of the quality approach could be the ideal tool to guarantee the satisfaction of the fishing port' customers. Within this framework, the following chapter provides further investigations in the case of the four Senegalese fishing ports.

## **CHAPTER 3: GENERAL OVERVIEW OF FISHERIES AND FISHING PORTS MANAGEMENT IN SENEGAL**

### **3.1. Fisheries policy guidelines in Senegal**

The sectoral policy letter for the development of fisheries and aquaculture is part of the implementation (LPSDPA) of the Emergency Senegalese Plan (PSE). The plan identifies the fisheries sector as a motor for growth in Axis I of the PSE with the main role in contributing to food and nutritional security, wealth, and job creation. The objectives assigned to the fisheries sector are the sustainable management of fisheries resources, the restoration of habitats and the increased valuations of fisheries resources through development of artisanal fishing ports. These orientations have been translated into a strategy that defines the sectoral vision of the PSE as follows: "One sector, a sustainable motor for growth and social inclusion while ensuring the population is fed in 2023". (LPSDPA, 2016)

### **3.2. Importance of fisheries sector in Senegal**

The Senegalese maritime coastline lies between latitudes 160° 03 N and 120° 20 N, i.e., a length of about 718 km. It is bordered by a fairly wide continental shelf (23,800 km<sup>2</sup>) whose width varies from 8 km in the north to 50 km in the south. Senegal essentially benefits from hydro-physical and climatic conditions favourable to the development of fishing and maritime transport. It also gives it a position that facilitates access to sub-regional and international markets. Fisheries are one of the pillars of development in Senegal. It contributes up to 3.2% of the GDP and provides 70% of the Senegalese animal protein intake with an average annual consumption of 29kg per capita. Moreover, the sector provides employment at a 17% rate among the active population (DPPD, 2019).

The fishing sector is divided into three lines of activity: Marine fisheries, inland fishing, and aquaculture. However, most of the activities are related to marine fisheries, which play a significant role in the national economy. Marine fishing generates nearly 600,000 direct and indirect jobs. The production of artisanal and industrial marine fisheries (national and foreign) is estimated for the year 2018 at 524,851 tons (USD 501,317,386) against 510,596 tons for a commercial value estimated at USD 409,786,567 in 2017. This production is to the credit of 70,041 fishermen in 2018, embarked in 11,912 active boats and 292 processing units including 152 onshore establishments and 140 fishing vessels. Through its competent authority, Senegal

was approved for the export of fish products to the European Union (EU) by Decision 96/355/EEC of May 30, 1996. The Senegalese maritime waters are renowned for their affluent production areas. This productivity is due to a phenomenon of upwelling: the upwelling of cold, nutrient-rich waters generally occur from November to May under the action of trade winds (Champagnat & Domain, 1978; Domain, 1980; Cury et Worms, 1982; Cury et Roy, 1988). The fisheries resources exploited in Senegal are offshore pelagic resources, coastal pelagic resources, coastal demersal resources, and deep demersal resources.

**Table 4:** Resources exploited by Senegalese fisheries

<b>Type of resources</b>	<b>Characteristics</b>
Offshore pelagic resources (tuna, swordfish, sailfish)	Deep-sea fishing in Senegalese waters is very seasonal. The International Commission for the Conservation of Atlantic Tunas (ICCAT) assessments show that these species, which travel between Africa and America, are fully exploited except for skipjack tuna.
Coastal pelagic (sardinella, mackerel, horse mackerel)	These species are caught mainly by artisanal operations. They are mainly intended for national consumption and increasingly for export to countries in the sub-region. The CRODT (2009) indicates that both species of sardinella have a downward trend.
Bottom demersal fish (bottom shrimps, hake, shark, and monkfish)	These species are caught by industrial fleets. The results of the FAO-COPACE in 2007 show that, the hake ( <i>Merluccius spp</i> ) stock is in a state of overexploitation. Studies by CRODT (2009) indicate that the biomass of black hake is below that which would produce the maximum sustainable yield.
Coastal demersal (shrimps, octopus, cuttlefish, sole, groupers, and sea bream)	Keen seafarers highly target these species as they have the highest market value, mainly for export to Europe. This somewhat explains the overfishing and competition on the high seas between artisanal fishermen and industrial trawlers. Studies by Barry and colleagues (2002) have shown a sharp decline in the abundance of species such as ' <i>Sparus caeruleosticus</i> , <i>Epinephelus aeneus</i> , <i>Pagellus belottii</i> , <i>Pseudopenaeus prayensis</i> , <i>Galeoides decadactylus</i> ', as has Laurans (2005), who reports a rather worrying overexploitation of species such as " <i>Pagellus belottii</i> and <i>Epinephelus aeneus</i> ".

### 3.3. Marine fisheries sector

The Senegalese maritime fishing industry is mainly based on two types of fishing: artisanal fishing and industrial fishing. These types of fishing are practiced all along the coastal fringe by national and foreign fishermen. They generate many downstream activities including processing, packaging, handling, storage, and marketing. Artisanal fishing recorded in 2018 landed catches of 398,643 tons for an estimated commercial value of USD 329,417,027 against 394,036 tons in 2017, for an estimated commercial value of USD 25,851,112.

**Table5:** Production in the last seven years

	2012	2013	2014	2015	2016	2017	2018
Production (tons)	447, 961	441, 254	425, 002	430, 667	487,434	510,596	524,851
Artisanal fishing (tons)	405, 974	398, 214	372, 548	383, 222	397,871	394,036	398,643
Industrial fishing (tons)	41, 987	43, 040	52, 454	47, 445	89,563	108,723	118,561
Value (USD)	280, 234,248	266, 136,689	249, 412,934	284, 595,841	333, 079,761	411,614,323	503,553,393

Source (DPM, 2019)

### 3.4. Industrial fishing

Industrial fishing is carried out by a national and foreign fleet consisting of 120 vessels in 2018, compared with 111 vessels in 2017, an increase of 8.1%. Industrial fishing landings made up of the trawler, tuna, and sardine fishing segments, increased from 108,723 tons in 2017 to 118,561 tons in 2018, i.e., a 9% increase in landed catches. The former's estimated commercial value rose from USD 141,089,236 in 2017 to USD 162,377,184 in 2018. Onshore establishments carry out industrial production, essentially oriented towards the export of processed products presented in various forms (whole fresh, fresh processed, frozen, canned, etc.). In 2018, it was carried by 292 processing units composed of 152 onshore establishments and 140 fishing vessels. Compared to 2017, these processing units increased by 60 in absolute value and 25.9% in relative value. There are two types of fish product preparation or processing establishments, depending on the origin of their raw materials: factories without their vessels (89.6% of the exporting factories in 2011)

and factories with vessels (10.4%). Their approval and the compulsory export certification are issued by the competent authority represented by the Directorate of Fish Processing Industries (DITP, 2019). Only factories that have implemented a self-monitoring program that complies with the quality approach are approved to manufacture fish products intended for export. Since 2015, fish products have been the country's leading export earner with USD 358,420,243; USD 378,665,893 and USD 452,257,812 respectively (DPPD, 2019).

**Table 6:** Factories exports over the last five years

	2015	2016	2017	2018	2019
Volume (tons)	188,462.93	192,162.50	207,035.81	272,178.07	285,237
Value (USD)	358,071,756	376,136,153	449,604,415	449,236,429	541,913,522

Source: DITP (2019)

### 3.5. General overview of the artisanal fishing port in Senegal

Artisanal fishing is generally carried out by a wooden boat called a "pirogue". The artisanal fishing boat is divided into two types: the motorized boat with an outboard motor and the non-motorized one using a paddle or sail. The latter is mainly used in continental waters. The number of artisanal fishing boats registered in artisanal fishing is 21,100 (DPM, 2016), of which 9,469 are in maritime fishing and 2,506 in continental fishing (monthly average). In recent years, the Senegalese government has undertaken to replace these artisanal fishing boats with fibreglass boats that comply with the current technical and sanitary standards.

Senegalese artisanal fishing ports can be classified into two categories: managed and unmanaged fishing ports. Unmanaged fishing ports are landing points that lack standard handling facilities. The products from these landing points are destined for the local market or artisanal processing. In contrast, managed fishing ports have sanitary facilities standards. Senegal has 13 managed artisanal fishing ports approved by competent authorities. To ensure the traceability of fish products, a system of control and delivery of health certificates at the first sale, has been set up by these authorities. Moreover, managed artisanal fishing ports play a crucial socio-economic role in the distribution of fish products at national and international scales. Exports from artisanal

units in 2018 will amount to 21,614 tons for an estimated commercial value of USD 24,237,928 against 22,372 tons for a commercial value of USD 21,589,839.

### **3.5.1. Organization of the managed fishing port**

Within the framework of decentralization, the managed fishing ports have been transferred by the Ministry of Fisheries to the local administration for thirty years, then to the fishing professionals organized in inter-professional economic interest groups called the Association Responsible for the Management of the Artisanal Fishing Port (GIE.I) for ten years. There are several GIE.I depending on the different trades (e.g., GIE.Is of fishermen and wholesalers) in each fishing ports. The GIE.I is composed of members of different associations representing various professionals of the fishing port. The GIE.I is in charge of establishing the facilities, equipment, and materials available to the port operators in the form of rentals or access rights. This association manages equipment for rent among others and generates profits from them. A board of director's office has been set up and is composed of a president; a general secretary and two auditors, a treasurer; a treasurer assistant. Additionally, internal rules of operations and organizations are set out by internal regulations and manuals for operations and necessary procedures.

### **3.5.2. Management bodies**

The Consultative Operating Committee (CCE) controls the respective obligations of the local authorities involved and the inter-professional GIE.Is specified in the agreements and the retrocession of the Ministry of Fisheries' works. For example, it also settles all disputes related to the management and operation of the landing and/or processing sites, issues opinions, particularly on any question concerning the extension of the development program, the enhancement of the equipment and facilities granted the use of the equipment fee and any other question of interest to the parties. The supervisory body is an intermediary mechanism between the parties (GIE.I and local authority) and the CCE. It suggests proposals and guidelines regarding the partnership between the local authority and GIE.I. In charge of approving some expenses, the supervisory body also has the function of identifying the measures necessary for the port's successful operation. The municipality also assigns two controllers for the regularization of expenses and the ticket control. Besides, the regulatory controller is in charge of approving every expense and controllers play their roles in the operation monitoring.

### **3.5.3. Distribution channel**

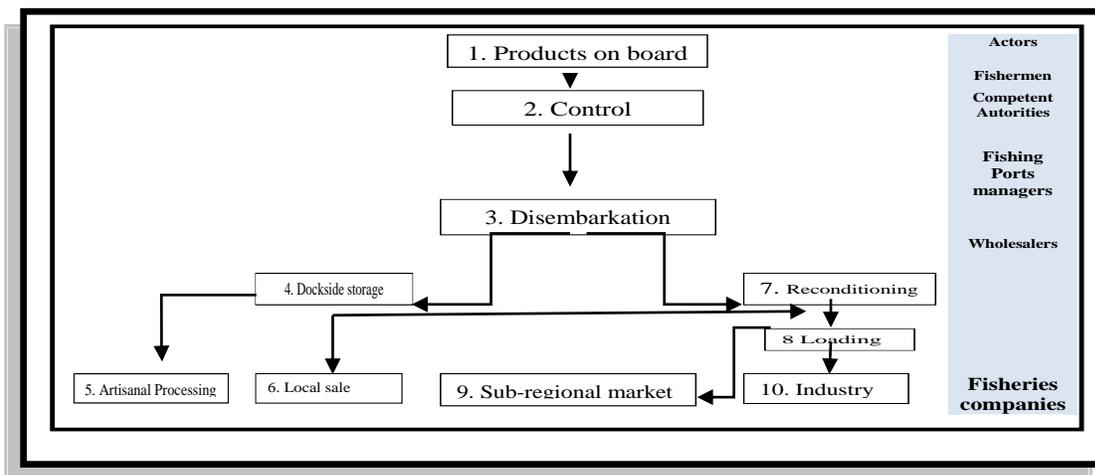
In artisanal fishing ports, one part of fish products landed by fishermen is destined for local consumption. In contrast; another part is bought by wholesalers who in turn resell them to fish processing companies. Fish species, sizes and weights, and freshness criteria based on the location of transactions are specified. The distribution channel differs according to species, market destination, the quality criteria, and the customer requirements. For instance, coastal demersal species are more coveted by fish processing companies than pelagic species, but fish processing companies exporting to the Asian and African markets also target pelagic species. Additionally, the first category of wholesalers directly purchases fish capture from fishermen than on the local markets for consumption purpose through a complicated process. Marketing is informal and the wholesalers have a dominant power over the fishermen in terms of prices and margins settings and leave the fishermen with less profit. The wholesalers hold the power in this relationship because they manage to maintain close relations with the fishermen by granting loans and gifts during religious ceremonies or festivals. Furthermore, the ignorance of fishermen on the pricing standards and the non-existence of contract between producers (fishermen) and traders (wholesalers and fish processing companies) limits the freedom of choice of trading partners. The wholesalers who sell to fish processing companies sometimes take advantage of this to fix their purchase price. Fish prices are usually negotiated by mutual agreement without any real confrontation between many bidders and askers. This is explained by the need for the producer to sell his fish as soon as he returns from fishing and obviously strengthens the buyers' negotiating power.

Buyers seek to maintain these conditions of partnerships despite successive failures in auction events in the port of Dakar (Kobe, 1982). Lawson & Kwei (1974), studying the modernization process of Ghanaian canoe fishing, indicate that the nature of the exchange links between producers and traders has evolved (to the benefit of the latter). The state has allowed traders to be the main beneficiary buyers of fish products. This point of view was confirmed by another author studying Senegalese fisheries who noted this same worrying domination of traders over the sector's future (Bonnardel, 1985). About the exportation system, the certification procedure to specifically, the EU countries is as follows: the quality manager first confirms the sensory analysis of the fishermen's products. Then, the health certificates at the first sale are issued to the

fish wholesalers by the local fisheries services. These wholesalers bring their products to the factories with the certificates. The factories then apply to the Directorate of Fisheries Protection and Surveillance (DPSP) for a simplified catch certificate. Health certificates accompany these applications at the first sale with the necessary information about the artisanal fishing boat and their registration numbers. The DPSP issues the catch certificates. The factories then apply to the Directorate of Fish Processing Industries (DITP) for export health certificates. The documents make it possible to establish the traceability of the products coming from the managed fishing ports. The catch certificate is not required for certification of non-EU countries.

### 3.5.4. Stakeholders in the artisanal fishing ports: roles and characteristics

The main actors in artisanal fishing ports include the fishing port managers, production operators (fishermen and wholesalers), fish processing companies that obtain their supplies from wholesalers, and the competent authorities. Figure 1 illustrates the intervention of specific stakeholders in each step of the fish distribution.



**Figure1: General process of the distribution of fish products in Senegal**

Source : ( GSAC, 2013)

The different production stakeholders operating in the managed artisanal fishing ports are:

Fishermen: carry out fishing as an activity. Fishermen fall into three categories. First, the fish wholesaler that sells catches or other fish caught by other fishermen and also sell their product to the second category of fishermen; secondly, the single wholesaler who buys fish and to re-sell to

fish exporting factories; and thirdly, the fish micro-wholesalers who buy small volumes of fish in fishing ports to resell them on local markets.

- Wholesale exporters of the third category or fish processing companies are those who have establishments that comply with the regulations in force, and can obtain supplies from wholesalers, and resell their product for export after processing.
- The managers of artisanal fishing ports are the managers or the steering committee of GIE.I, which is responsible for the management of artisanal fishing ports, and on a participatory basis the members of the Local Artisanal Fisheries Council (CLPAs).
- The CLPAs are defined by the Article 23 of the Law on the Maritime Fisheries Code, and the Articles 7 to 10 of the Decree laying down the detailed rules for the application of the Law on the Maritime Fisheries Code. Composed of stakeholders from the artisanal fisheries sector, the CLPAs are deliberative assemblies designed to resolve, through consultation, the various problems encountered by the artisanal fisheries sector (Code, 2015).
- The administrative authorities are the Ministry of Fisheries, the Maritime Economy (precisely the Directorate of Maritime Fisheries, the Directorate of Fish Processing Industries, and the local fisheries administration), and the local authority. Their roles are for instance the approval, issuance or withdrawal for processing entities and fishing vessels, the monitoring and sanitary inspection of the seafood quality and, the generation of health certificates and sanitary inspections.
- The Directorate of Fisheries Protection and Surveillance (DPSP) play a variety of roles in monitoring the fishing activities in the Exclusive Economic Zone (EEZ). The issuance of capture certificates (necessary when exporting) and monitoring the traceability of fish products are among their duties.
- The municipality or local authority is primarily responsible for the management and operation of the infrastructure of the managed fishing ports. They have attached the services of a private service provider in charge of operation and management and which reports to them (GIE.I).
- The managers of the artisanal fishing ports: Considering that the primary responsibility for food safety rests with the operator, GIE.I managing fishing ports set up in the person of their chairmen as legal entities must mark their commitment to adopt the HACCP approach, within their establishments, to ensure production following the current national and

international regulations. The managing presidents of the ports must commit themselves to respect all the provisions contained in the quality manuals, after its approval by the competent authority.

- Inter-professional economic interest groups GIE.I are private organizations whose mission is to manage community coastal infrastructures. The GIE.Is is responsible for putting into service the installations, equipment, and materials available to production operators (fishermen, fish wholesalers, and others) in the managed fishing ports (in the form of rentals or access rights). They are also responsible for ensuring hygiene in fishing ports and maintaining regular work. In addition to that, the GIE.I is implementing training sessions and conducting awareness-raising to stakeholders. Among other responsibilities, they also ensure regular communication and the perfect involvement of all relevant stakeholders in the managed fishing ports.
- The quality managers of the managed fishing ports: In each small-scale fishing port, there is a quality manager engaged by GIE.I who is responsible for implementing control measures and procedures guaranteeing the safety of products by analyzing potential global production hazards (surveillance, control, and traceability). Manufacturing diagrams, the various preventive and corrective measures and procedures for controlling hazards, and critical points are defined in a quality manual document drawn up by the quality manager and approved by the competent authority.

### **3.5.5. Texts and regulations**

In Senegal, the fishing sector is governed by Law No. 2015-18 of July 13, 2015 on the Maritime Fishing Code and Decree No. 2016-1804 of November 22, 2016 setting the terms of the application of this law. In Articles 5 and 6, the State promotes the fishing community's participation and empowerment and all other actors involved in maritime fishing activities. The terms and conditions of participation are determined by regulation.

#### **3.5.5.1. Competent authority**

The Ministry of Maritime Economy and Transport exercises the missions assigned by Decree No. 2005-569 of June 22, 2005 (Article 13) on the organization of the Ministry of Maritime Economy. It is in charge of implementing the policy defined by the President of the Republic, in

the fields of fisheries, aquaculture, management and exploitation of the seabed, merchant navy, and international maritime traffic.

1-The Directorate of Fish Processing Industries (DITP): Following the provisions of Article 13 of Decree No. 2005-569 of June 22, 2005, the Directorate of Fish Processing Industries (DITP) is responsible for implementing state policy on the processing, conservation, and marketing of fishery and aquaculture products at the industry level.

2-The Directorate of Maritime Fisheries (DPM): The Directorate of Maritime Fisheries is in charge of implementing the State's maritime fisheries policy and its missions are set out in Decree No. 1255 of August 23, 2011 on the organization of the Ministry. Its organization and functioning are set by Ministerial Order No. 02466 of April 19, 2006.

3-The Directorate of Fisheries Protection and Surveillance (DPSP): The DPSP is in charge of implementing the State's policy in terms of maritime fisheries surveillance and the safety of small-scale fishing. Its missions are set by Decree No. 1255 of August 23, 2011 on the organization of the Ministry. Its organization and functioning are set by Ministerial Order No. 02466 of April 19, 2006.

#### **3.5.5.2. Wholesalers:**

The profession of wholesalers is governed by Decree No. 2009-1226 of November 4 , 2009 on the exercise of the wholesaler profession and the Inter-Ministerial Order No. 03760 of April 21, 2010 setting the amounts and terms of payment of the professional wholesaler's professional card fees. This decree classifies three categories of wholesalers required to pay an annual fee for the proper exercise of their activities.

#### **3.5.5.3. Regulatory texts governing:**

The profession of wholesalers: Decree No. 90-969 of September 05, 1990 Technical conditions for the practice of wholesaler trade: Decree No. 2009-1226 of November 04, 2009; Exercise of the profession of wholesaler: Order No. 002202 of March 05, 2012.

#### **3.5.5.4. Regulatory texts**

Texts governing the technical and sanitary conditions of artisanal fishing ports: Order No. 003411 of March 29, 2011; Regulation of the technical and sanitary conditions of landing sites

for artisanal fish products: Service Note No. 00800 MEMDITP/ DF of December 2009; Microbiological criteria applicable to fish products other than canned products; Regulatory texts governing the technical conditions relating to the premises of the industrial establishment processing fish products; Order No. 3614 of April 15, 1991 Special technical provisions relating to the premises for processing and packaging of fish products intended for export (third category wholesale trade).

#### **3.5.5.5. Regulatory texts governing official health controls and self-checks**

Order No. 00243 of January 11, 2010: Rules for the organization of official sanitary controls in the fisheries processing industry under the principles of the HACCP (Hazard Analysis Critical Control Point) approach, Senegalese companies are required to put in place a system of sanitary self-controls to obtain export approval. This is governed by Order No. 00244 of January 11, 2010 Regulation of sanitary self-controls in the fisheries industry.

## CHAPTER 4: RESULTS AND DISCUSSION

### 4.1. Study area

For this study, three of the targeted areas are in the department of Mbour (Joal, Ngaparou and Pointe Sarene) and one in the department of Dakar (Yoff) (see Figure 2). The fishing port of Joal is known as one of the oldest ports in Senegal while Ngaparou, Pointe Sarene and Yoff as the most active in terms of co-management.

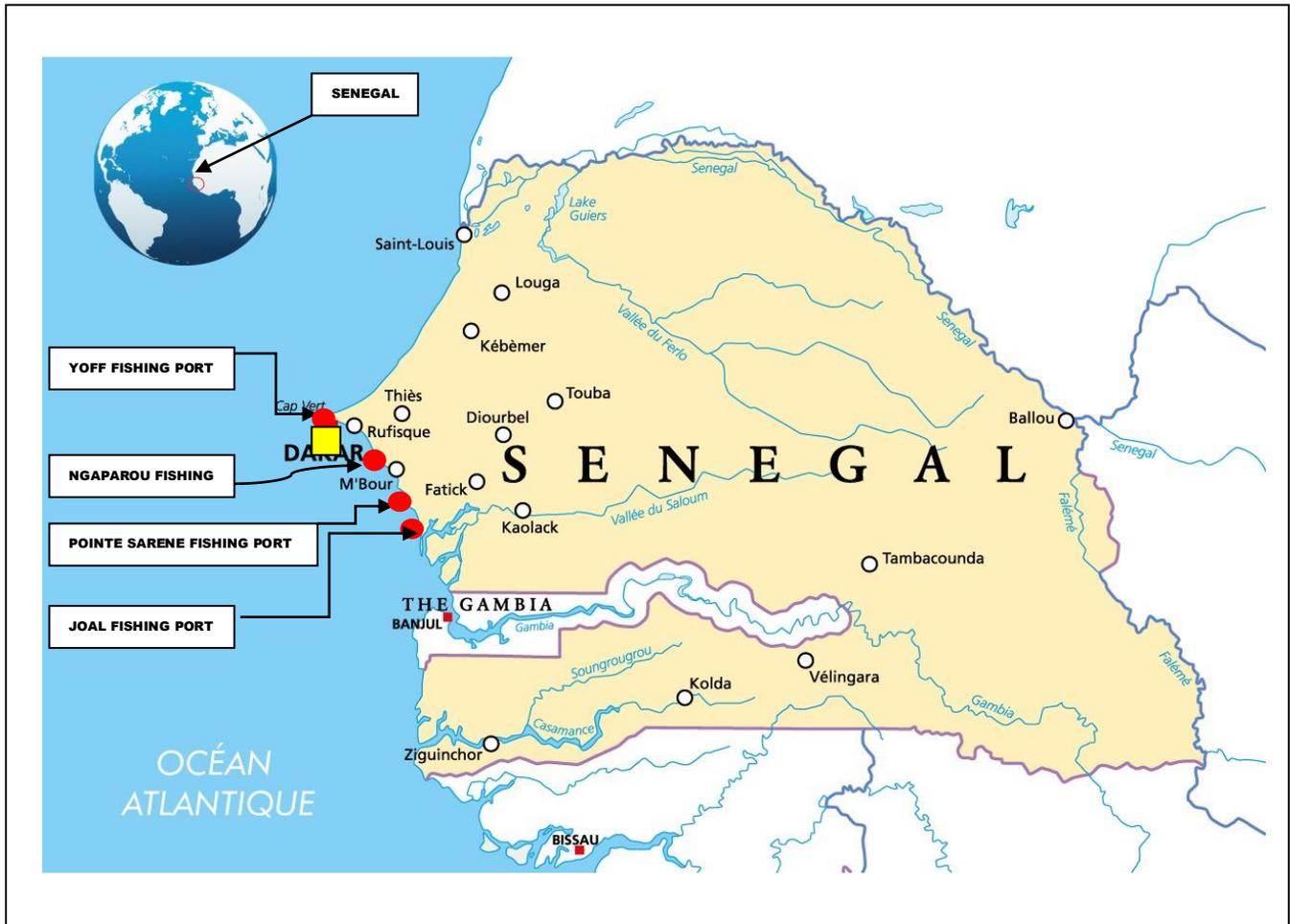


Figure2: Four artisanal fishing port localization

Source: (voyagesenegal.ch, n.d)

#### 4.1.1. Joal fishing port

Managed by the "DIAM PECHEURS MAREYEURS" GIE was created on May 2003, under a concession signed in September 2003, the fishing port of Joal located in the department of

Mbour in a tourist area is the first in Senegal in terms of landing volumes. It was built in 1992 within the framework of the PAPEC project (Project for the development of artisanal fishing in the small coastal area) and the surrounding wall was built by the PRAO-SN project. Like other fishing ports, all types of fishing are carried out here. The purse seine is used to catch sardinella and the ice line is used to catch thiof (*Epinephelus aeneus*) of Casamance and Guinea-Bissau. Large volumes of landings of sardinella and cephalopods are recorded in this port. The rectangular platform is 196 meters long and 36 meters wide. It includes an Africa zone, a laboratory with cold storage and an export zone. The latter is itself divided into three zones: a “fish zone”, a “cephalopod zone” and a “gastropod zone”. A 2.4 m high wall separates these zones. The entry of personnel into the export zone is more or less regulated, but no guards control access. The cold room is not used. The cold room provided by STABEX does not work. The number of wholesalers in good standing in 2020 is 72 second category wholesalers and 12 first category wholesalers. The GIE.I is responsible for the staff, which is made up of an operations manager, a technical manager, a quality manager, and a team of glue workers, among others.

#### **4.1.2. Ngaparou fishing port**

The fishing port of Ngaparou is located in the coastal Western part of Senegal, also within a tourist area on the ‘Petite-Côte’ of Mbour. Managed by the “GIE.I” "ANDA DEFAR NGAPAROU", this port was built by the intervention of the Japanese International Cooperation Agency (JICA) within the framework of the PROCOVAL project. This port is composed of an administrative block, an ice storage area, a gastropod pre-treatment area, a weighing, sorting, and washing area, a packaging area, a rest area, and a car park for refrigerated trucks. The number of artisanal fishing boats active in 2019 is 309 against 431 in 2018. The number of wholesalers in good standing is 12 of the second category and 30 of the first category. The GIE.I is responsible for the staff, including an operations manager, technical manager, quality manager and glue workers. The profits of the Ngaparou fishing port come from the services offered to users and operators (fishermen and wholesalers), access rights, rental of equipment and shops, among others.

#### **4.1.3. Pointe Sarene fishing port**

Pointe Sarene is a tourist site located on the small coast south of the town of Mbour in Senegal, 100 km from Dakar and 50 km from Blaise-Diagne international airport. The Pointe Sarene site offers important opportunities for the development of seaside and wildlife tourism due to the quality of its landscape, its beach in the shape of a point, and the proximity of 2500 hectares of classified forest. The fishing port of Pointe Sarene was established by the funds from the Japanese International Cooperation Agency (JICA) and resulted from bilateral cooperation between Senegal and Japan that began in 1976. It reinforces the promotion of fisheries co-management initiatives already underway in the department of Mbour. It is composed of an administrative block, an ice storage area, a gastropod pre-treatment area, a weighing, sorting, and washing area, a packaging area, a rest area, and a car park for refrigerated trucks. The GIE.I (BOKK LIGUEY POINTE SARENE) is responsible for the employees composed of an operations manager, a technical manager, a quality manager, and gluers. The fishing port's profit comes from the services offered to users and operators (fishermen and wholesalers), access rights, equipment rentals, shops, among others.

#### **4.1.4. Yoff fishing port**

Situated at the north-western tip of the Dakar region between longitude 17°29' West and latitude 14°46' North Yoff, is one of the most important traditional ‘Lébou’ fishing ports in the region in terms of the number of products landed, especially cephalopods. Fishing and its related activities form the basis of the economy. Yoff fishing port has been financed by the State of Senegal (inaugurated on December 17, 2016). It has more than ten fishing fuel stations and a fish processing unit. It is composed of an administrative block, shelters, two landing stages, one reserved for the landing of pelagic species and the other for precious species for export, a car park equipped for refrigerated trucks and vans, two toilet blocks, a cold room (not functional), a processing room, a laboratory, a meeting room and a block of fifty canteens for women and young people. The number of wholesalers in good standing is estimated at around 48 second category wholesaler and 85 first category wholesalers in 2020. The GIE.I ‘SATIIP’ is responsible for staff consisting of technicians, workers and collators. Yoff's fishing port profits come from users and operators (fishermen and wholesalers), access rights, equipment rentals and others.

#### 4.2 Results from the questionnaire surveys

A total of 265 fishing community operators were surveyed from 4 different fishing ports namely Yoff, Joal, Ngaparou, and Pointe Sarene. We surveyed 24 out of 31 fish processing companies. We profiled the respondents according to gender, age, education level and marital status. We used performance criteria factors and some quality approach principles to evaluate the operators and the fish processing companies' satisfaction.

**Table7:** Sampling rate

Type of survey	Yoff	Joal	Ngaparou	Pointe Sarene	Total	Sampling rate
	Fishermen	60	45	42	40	187
Wholesaler	30	10	31	07	78	100%
Fish processing companies		----	----	---	24	77%
Total	90	55	73	47		
					289	100%

#### 4.2.1. Socio-demographic characteristics of the interviewees

**Table8:** Social surveys of the fishing community operators

Variables						
	Yoff	Joal	Ngaparou	Pointe Sarene		
Education level						
None	-----	1.64	-----	-----		
Elementary school	95	3.28	47.5	50		
High school	05		10	39.13		
Others (Arabia school)	---	93,44	42.5	10.87		
No answer	----	1.64	----	---		
Marital status						
Married			90.00	91.80	85.00	91.30
Single			10.00	8.20	15.00	8.70

**Table9:** Socio-demographic information of the respondents

Variable				
	Average	Standard deviation	Minimum	Maximum
Age	36.17	7.46	21	
Number of children	3.23	2,35	-	10
Number of persons in charge (include your family & workers)	8.01	4.30	-	22
Number of years of experience	19.81	7.20	4	39
Number of training attendance	2.14	2.47	1	13

The lack of academic education / training could explain the high number of respondents that could not answer the questionnaires. However, we also found that some operators refrained from answering certain questions for the fear of being misjudged by the port managers. In contrast, operators in Pointe Sarene’s area presents an average level of education as 50% having reached elementary school, compared to the fishing community of Joal presenting the lowest level in terms of elementary school attendance (3.28%)(Table 8).Moreover, most of the four fishing port actors are married and are responsible for an average of 8 household members. These respondents affirm to have less opportunity to attend training for the improvement of their livelihoods (only 2% got trained).

#### **4.2.2. Characteristics related to the production process**

##### **4.2.2.1. Fishing gear**

In the four fishing ports, there are two main categories of fishing gears: nets and lines. Manual fishing lines and long lines are lines on which hang leaders are equipped with hooks containing bait. Their sizes highly depend on the fishing areas ranging from 200 to more than 2000m of depth and their lengths vary according to the fishing season. The main characteristic of these

gears is their selectivity that categorizes the quality and the number of species of a fishing capture. Each fishing boat is commonly equipped with lines mainly targeting coastal demersal species for exportation. This study shows that the fishermen exclusively use this type of selective fishing gear in Yoff (50%) and Ngaparou (46.67 %) (Table10).

**Table10:** Fishing gear used in the 4 fishing ports

Designation	Joal	Ngaparou	Pointe Sarene	Yoff
1.Single line	8.82	46.67	24.32	50.00
2.Longlines	16.91	----	23.78	----
3.Locker	9.56	1.11	3.24	----
4.Net	19.85	7.78	23.78	----
5.Others	0.74	-----	0.54	----
9.No answer	44.12	44.44	24.32	50.00
Total	100.00	100.00	100.00	100.00

Fishermen with a one-day fishing use line in this case, the fishing time is actually short (about 5-6 hours). Bottom-set nets and surface drift nets are used by boats targeting pelagic species mainly distributed in the local markets and to other African markets. The distribution of boats using nets is respectively 19.85% (in Joal), 7.78 % (in Ngaparou) and 23.78% (in Pointe Sarene) (Table10). Fishing traps are rather considered as replenishing the resources according to the fishermen.

#### 4.2.2.2. Production

**Table 11:** Statistics of the production in 2018

Fishing ports	Volume (Tons)	Value (US\$)	Number of boats registered	Year
Ngaparou	1036, 4	3,302,083	431	2018
Joal	91,580	32,339,201	9,382	2018
Pointe Sarene	3 345. 685	7,158,202	5,854	2018
Yoff	17,898.6	33,514,632	1,391	2018

**Table 12:** Statistics of the production in 2019

Fishing ports	Volume (Tons)	Value (US\$)	Number of artisanal boats registered	Year
Ngaparou	1342, 5	2,854,615	309	2019
Joal	94,709	39,260,207	871	2019
Pointe Sarene	3,081. 47	5,227,436	480	2019
Yoff	14,501.4	32,479,318	1,329	2019

**4.2.2.3. Fish refrigeration**

The temperature of preservation is an essential condition for the quality of the product. Moreover, equipment and work methods are also very important. The fishermen in Yoff fishing port mostly have an icing system in their boats (29.17%) and as well as the fishermen in Pointe Sarene (28.77%), and in Ngaparou (25.16%) (Table13). However, it was found that fish is better preserved in the Yoff and Ngaparou fishing ports. Moreover, Joal and Pointe Sarene fishing ports were found more intentional to respect the cold chain.

**Table 13:** Method of fish preservation (refrigeration)

Designation	Joal	Ngaparou	Pointe Sarene	Yoff
1.Insulated box fish	9.90	23.23	-----	-----
2.Immediately frozen fish	11.88	25.16	8.22	29.17
3.Fish stored in the hold	17.82	0.00	28.77	5.00
4.Others	0.00	1.29	-----	-----
9.No answer	60.40	50.32	63.01	65.83
Total	100.00	100.00	100.00	100.00

### 4.2.3. Results of the satisfaction analysis of the operators

#### 4.2.3.1. Training attendance and awareness-raising of the operators

It is the responsibility of managers and the competent authorities to implement training and awareness actions for operators so that they can master good hygiene and manufacturing practices. The number of hygiene training courses offered to the fishing port operators is an important warning indicator to measure the managers' commitment.

Considering the results presented in Table 14, the competent authorities and the managers of the artisanal fishing ports have difficulty in complying with the obligations regarding the training of fishing port operators.

Our survey of the four managed fishing ports showed the following results. As for the authorities' responsibility, we detected an insufficiency of training sessions in Pointe Sarene, Ngaparou and Yoff fishing ports. Findings show that only 3.64% of the operators in Pointe Sarene port have received training organized by the competent authority, and 5.45% have received training organized by the GIE.I manager of the port. Whereas, in Ngaparou fishing port, 21.13% of operators have benefited from training courses initiated by the competent authority and in Yoff fishing port, 6.25% of the operators benefited from training organized by the DITP and 4.17% received training organized by the GIE.I. From this result, it can be generally concluded that the training sessions provided by the authorities and fishing ports' managers are scarce. This may negatively impact the coordination of the whole fishery activities in these locations.

**Table 14:** Operators who have benefited from training

Training provider	Joal	Ngaparou	Pointe Sarene	Yoff
Authority: DITP,DPM	16.80	21.13	3.64	6.25
Local community	0.80	---	---	---
The "GIE.I"	16.00	0.00	5.45	4.17
Others	---	1.41	---	---
No answer	66.40	77.46	90.91	89.58
Total	100.00	100.00	100.00	100.00

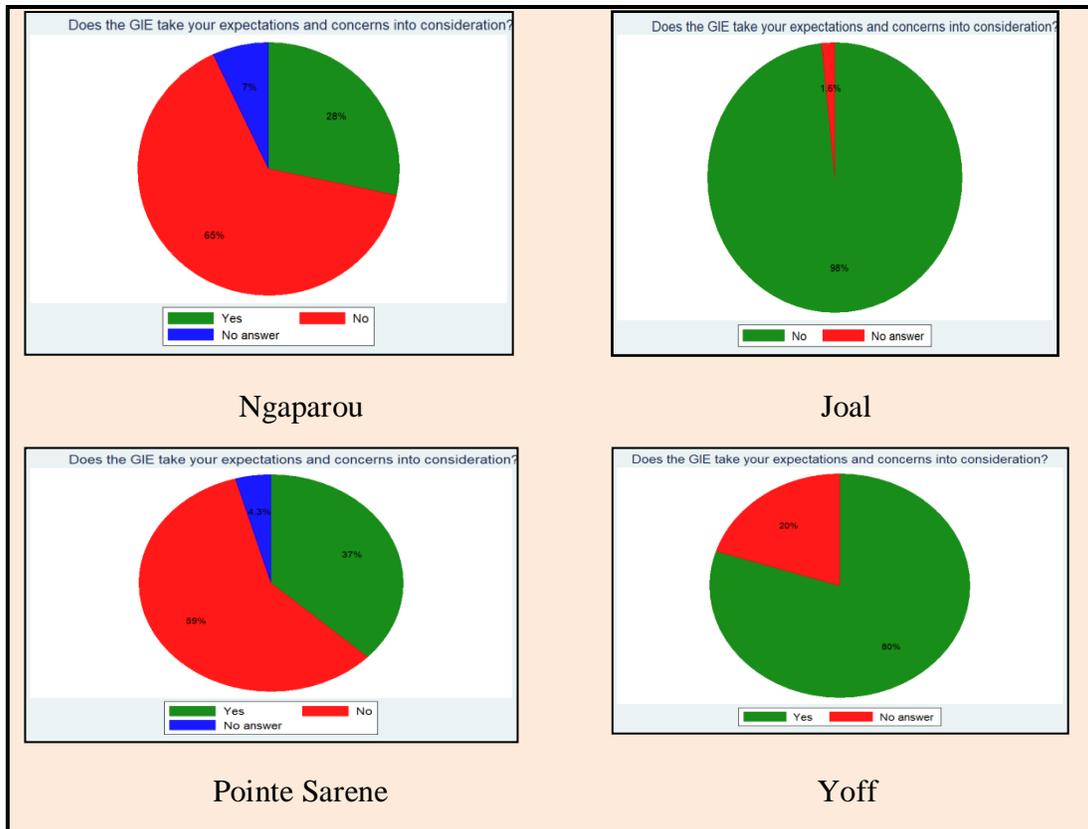
Table 15 shows that the commitment of port managers to raise awareness among operators remains low. This is seen by the small number of operators who benefited from awareness-raising (Table 15). Despite the budget availability to provide training, the implementation rate of training operators generally remains low.

**Table 15:** Operators who have benefited from awareness-raising

<b>Fishing ports</b>	<b>Yes</b>	<b>No</b>	<b>Total</b>
Joal	36.07	63.93	100.00
Ngaparou	40.00	60.00	100.00
Pointe Sarene	8.70	91.30	100.00
Yoff	7.50	92.50	100.00

#### **4.2.3.2. Operators' satisfaction related to their communication and involvement with the managers**

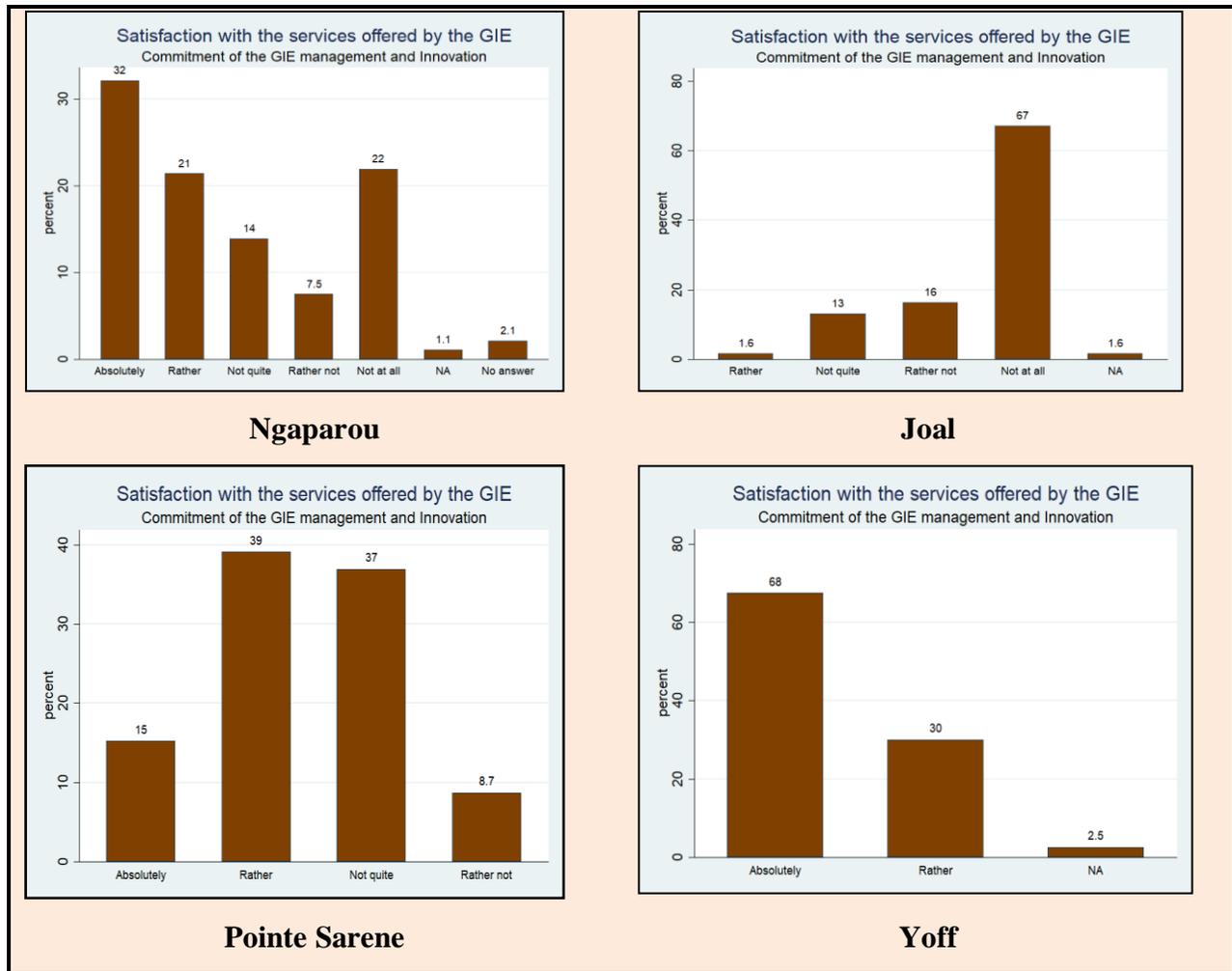
Figure 3 shows that the involvement and consideration of operators by the fishing port managers are very satisfactory in Yoff fishing port in contrary to Joal, Ngaparou and Pointe Sarene fishing ports. The significant challenge for fishing port managers is to meet customers' expectations in the short and long term. Today, the fishing port customers' satisfaction requires a thorough analysis and a perfect understanding of their expectations, wishes, needs and behavior. The leaders of the fishing ports must therefore be up to the expectations of its customers to improve the performance of its services or products.



**Figure 3: Operators' satisfaction**

**4.2.3.3. Operators' satisfaction related to the managers' commitment**

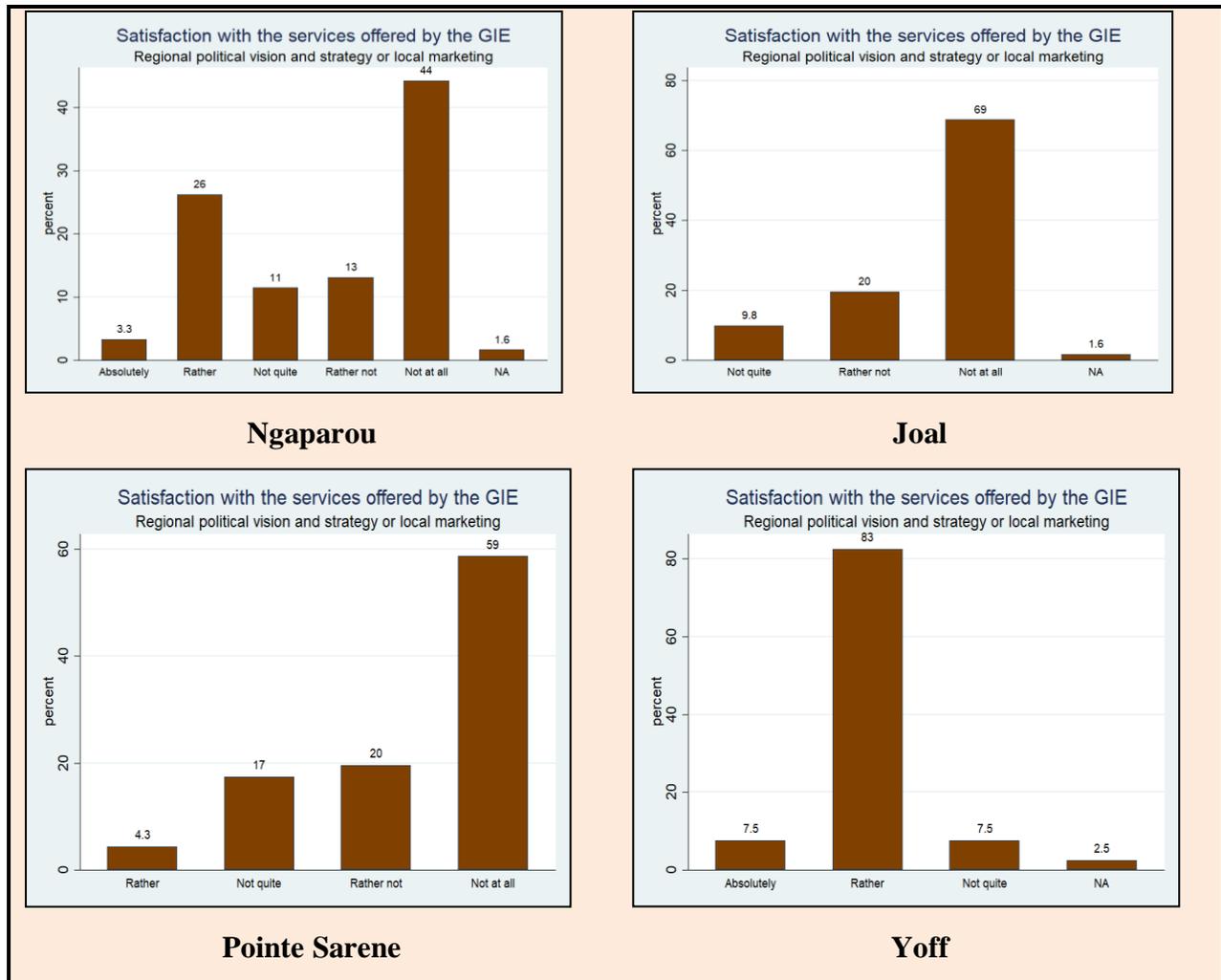
The opinions of the respondents about the four fishing ports differed with the management of the fishing ports. According to the respondents, the leaders of the fishing port of Yoff are the most committed, with 68% of respondent's from Yoff. The lowest commitment was noted in Joal with 67% (Figure 4).



**Figure 4: Operators’ opinions on the manager’s leadership**

**4.2.3.4. Operators’ satisfaction related to the leadership and strategy orientation**

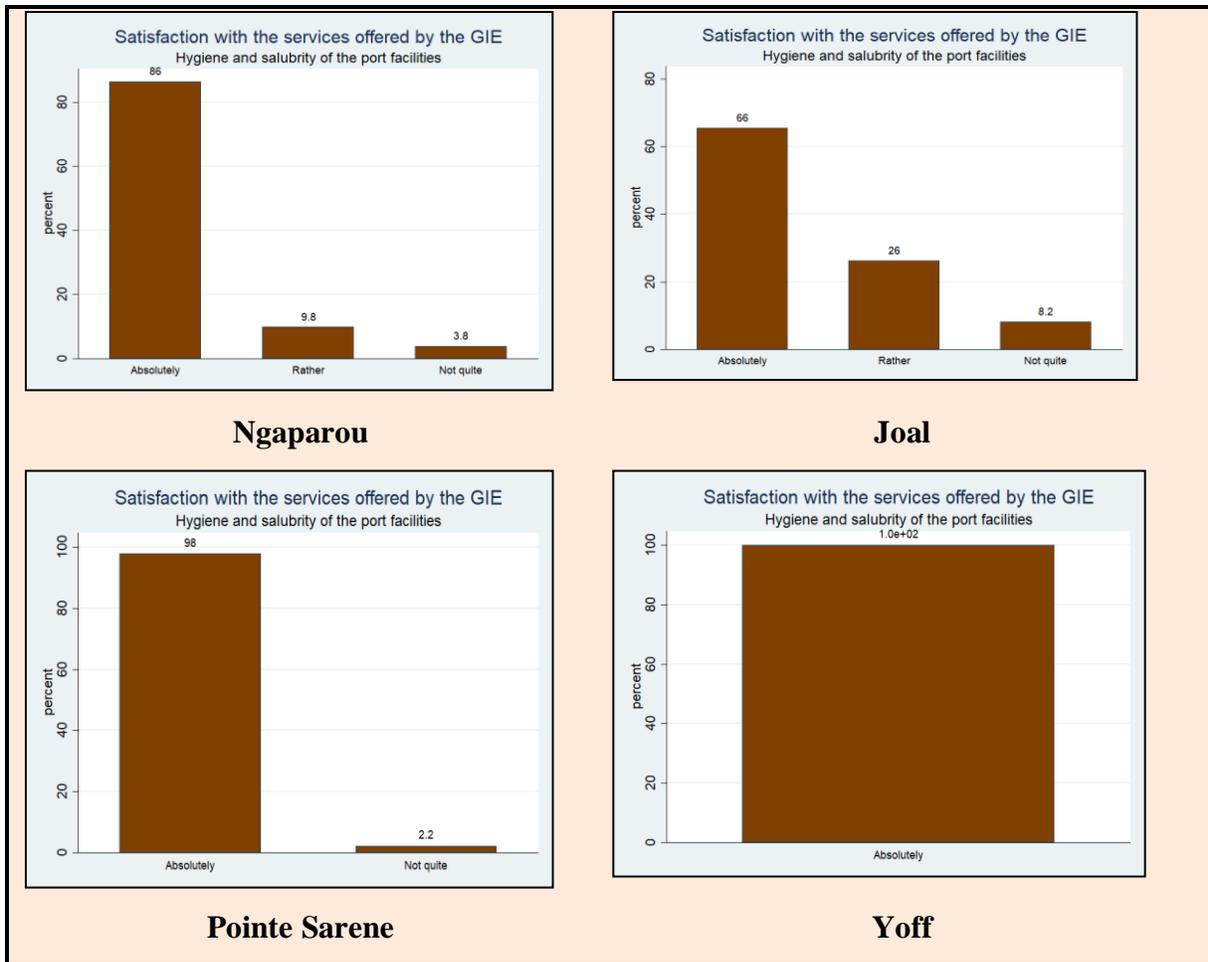
The comparison of the strategic policy, the vision and the local marketing undertaken by the management of the four fishing ports, showed that the management strategy of the fishing port of Yoff is more satisfactory (83%) (Figure5).



**Figure 5: Operators’ opinions on the strategy and vision**

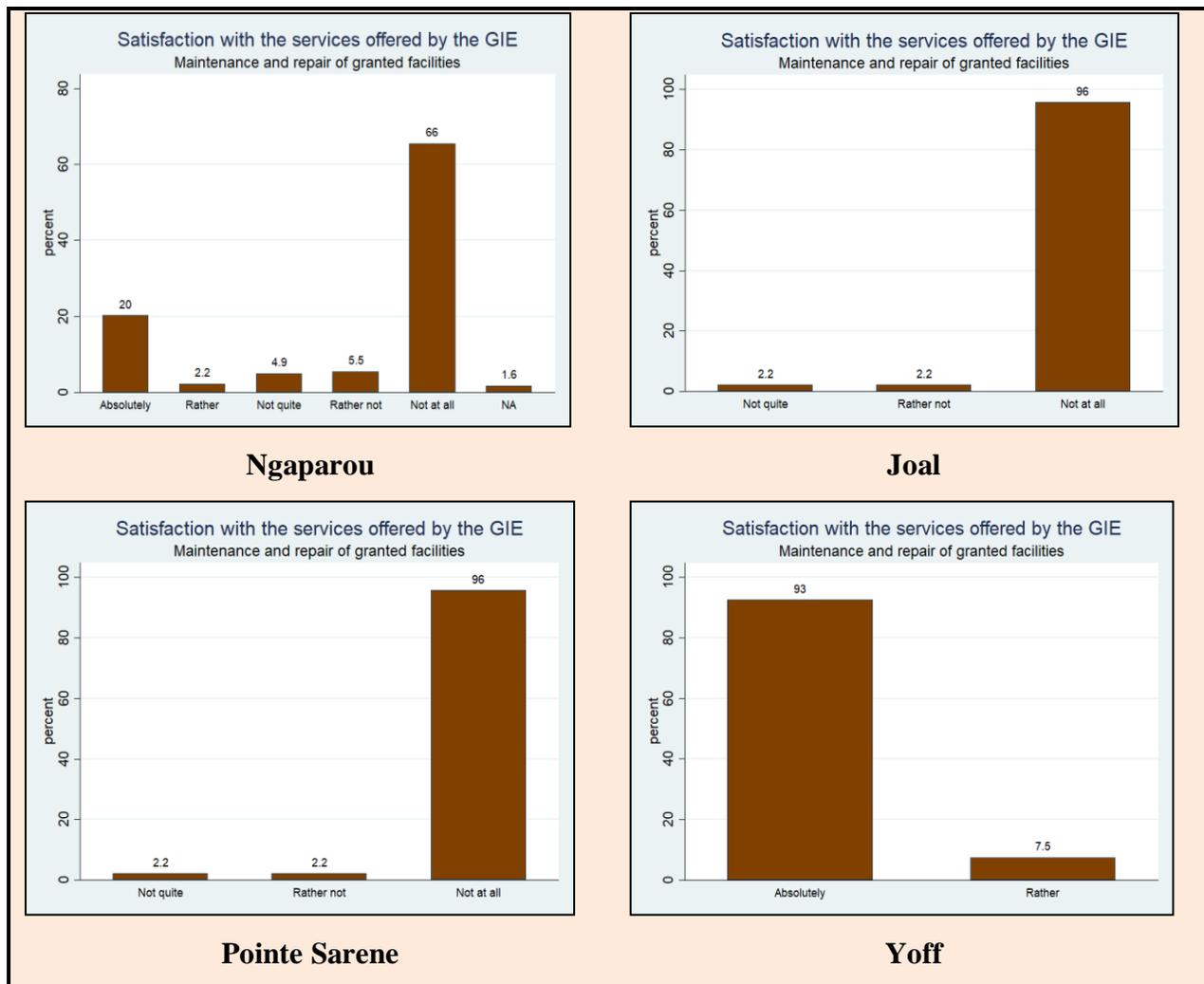
**4.2.3.5. Operators’ satisfaction related to the hygiene and maintenance services**

Figure 6 demonstrates that the fishing port operators are more satisfied with the services offered in terms of general hygiene, as confirmed by all the respondents (100%). This finding shows that the managers of the fishing ports of Yoff, Pointe Sarene and Ngararou fishing ports take very seriously the risks related to the hygiene of the facilities which remains a major concern of the stakeholders of the fishing sector.



**Figure 6: Operators' opinions on hygiene services**

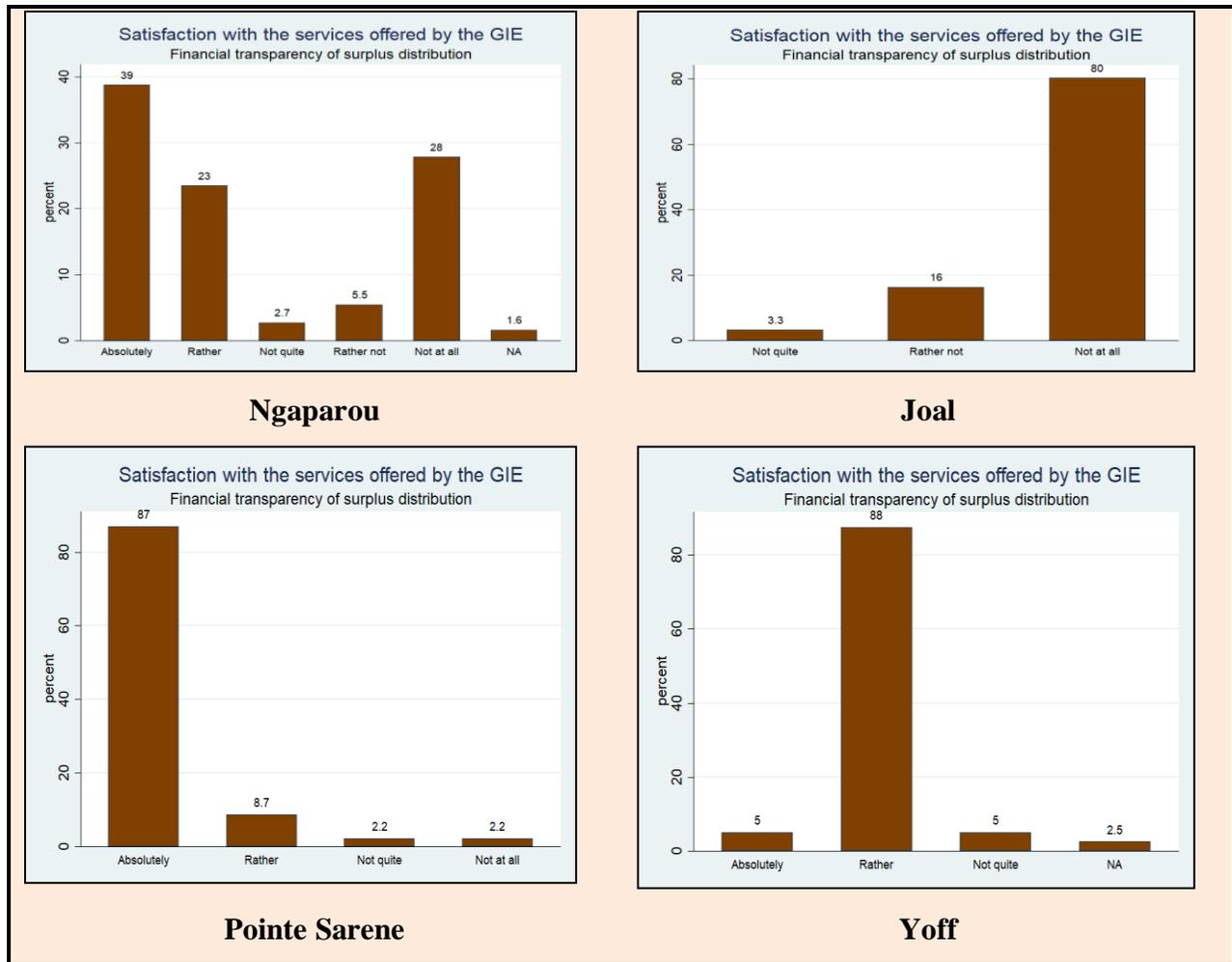
Yoff operators are also the most satisfied by the maintenance and upkeep of the facilities (Figure 7). In contrast, the opposite is true for the other three ports, where there is a lack of user satisfaction. This could be considered as important indicator to meet the expectations of the stakeholders related to the management of the cold chain of fish products.



**Figure 7: Operators' opinions on maintenance service**

**4.2.3.6. Operators' satisfaction related to the financial services**

The management and financial transparency were found satisfactory by respondents from Yoff (88%) and from Pointe Sarene (87%), while operators in Joal fishing port have the lowest score (80% of the operators claim to be dissatisfied). Eighty percent of Figure8 shows the operators' satisfaction with the financial health of the organizations responsible for the management. A size indicator could emerge to measure the transparency and the capacity of the organization to meet the stakeholders' expectations and legal regulatory obligation in view of these results.



**Figure 8: Operators' opinions on the financial service**

Table 15 shows the distribution of the surpluses of the four fishing ports. The fishing port of Joal does not reserve a budget for the support of the CLPA's activities. The share received for the local community of Joal seems to be very high compared to the other fishing ports.

**Table 16:** Budget distribution

Fishing ports	Local authority	Training	CLPA	Reserve fund	GIE financial support
Ngaparou	20%	10%	5%	45%	20%
Joal	40%	10%	----	30%	20%
Pointe Sarene	20%	10%	5%	45%	20%
Yoff	20%	5%	5%	50%	20%

In our surveys, we have noticed that the operators of Yoff (90%) and Pointe Sarene (93.48%) are generally very satisfied with the services offered by the managers. On the contrary, the operators of Joal are not satisfied with the services offered by the port manager (Table 17).

**Table 17:** Overall satisfaction with GIE.I services

Fishing ports	YES	NO	NA	Total
Joal	3.28	91.80	4.92	100.00
Ngaparou	42.50	45.00	12.50	100.00
Pointe Sarene	93.48	4.35	2.17	100.00
Yoff	90.00	7.50	2.50	100.00

#### 4.2.4. Results of the satisfaction analysis of the fish processing companies

The goal of any company is to provide quality products to its customers. The company must perpetuate its production system to satisfy its customers: the artisanal fishing ports through the wholesalers' supply fishing products to the fish processing companies. After a satisfaction survey conducted among the fish processing companies, that obtain their supplies from each of the four fishing ports, an overall assessment of the quality of the products coming from the four fishing ports gave the following results: Based on the surveyed fish processing companies, the products from Yoff fishing port are the most satisfactory with 76% (63% satisfactory, 13% very satisfactory).

#### 4.2.4.1. Mutual relationship with fish processing companies: Communication and involvement

The potential customer of the managed fishing port is the fish processing companies. Hence, to meet the fish processing companies' criteria and needs, the managers should establish a regular commendation. We assessed exchange relationship between the operators, managers of the fishing ports and the fish processing companies. It emerges from our study that only the managers at Yoff fishing port have regular communication with the fish processing companies (40 %) (Table18).

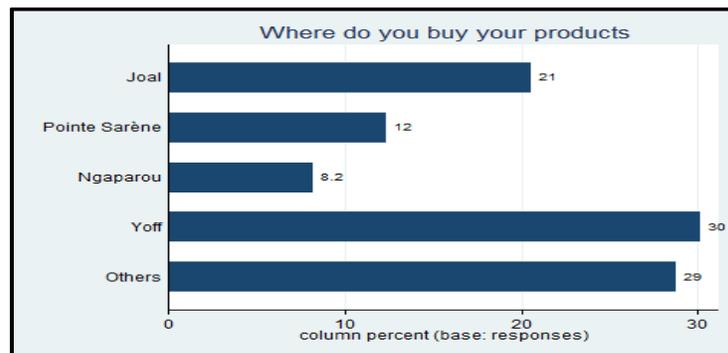
**Table 18:** Communication with fish processing companies

Fishing port	Yes	No	No answer	Total
Joal	-	100.00	-	100.00
Ngaparou	-	16.67	83.33	100.00
Pointe Sarene	0.00	93.48	6.52	100.00
Yoff	40.00	55.00	5.00	100.00

#### 4.2.4.2. Fish origin distributed to fish processing companies

Fish processing companies obtain their supplies and buy fish from the ports of Yoff, Ngaparou, Pointe Sarene and Joal.

The results illustrated in Figure 9 below enable our study so that the customers of the fishing ports that have been managed, especially the fish processing companies, prefer products from Yoff. The figure shows that 30% of the fish processing companies surveyed obtain their supplies from the port of Yoff.



**Figure 9: Origin of fish products**

#### 4.2.4.3. Fish processing companies' claims and requirement

The requirements of the fish processing companies that obtain their supplies from the four fishing ports are: Health, hygiene, and product quality (26%); Size, weight, quantity (25%); Freshness of the product (23%), Price (16%) and traceability (10%) (Figure10).

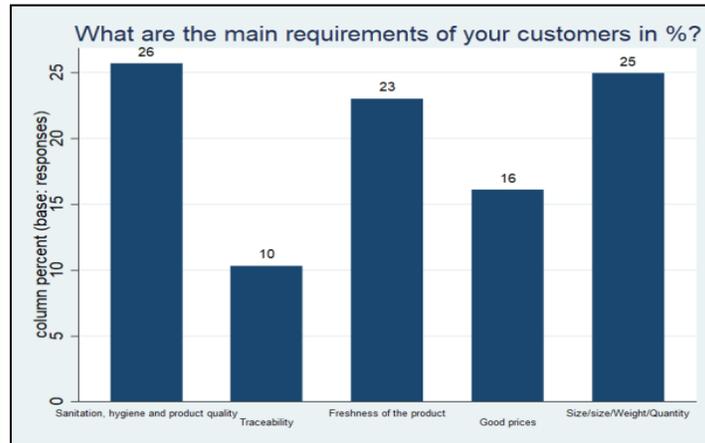


Figure 10: Main requirements of fish processing companies

The non-conformities claimed by the companies are that 12% of the fish processing companies had problems in complying with the detailed specifications, particularly related to the quantity of the products and delivery issue. In addition to that, 36% of the fish processing companies have noticed problems related to products' freshness from the fish wholesalers, while 52% had problems related to both freshness and size of the product (Figure 11).

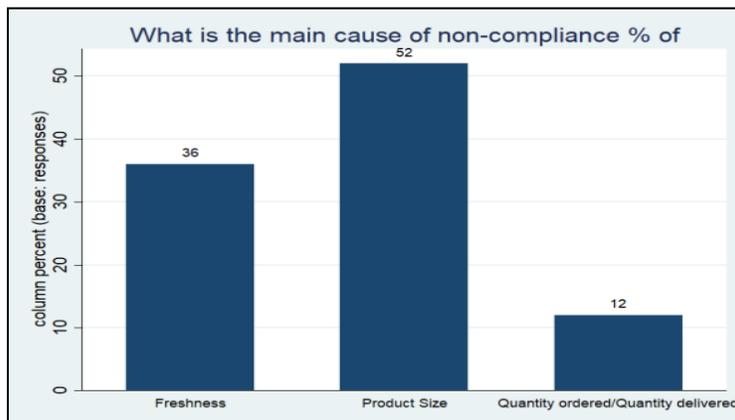
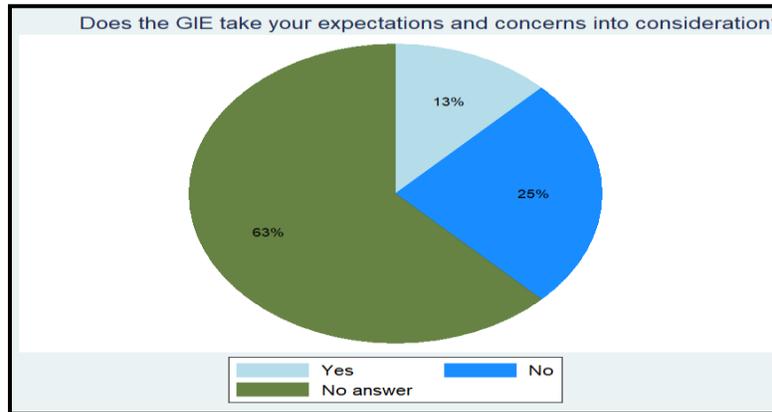


Figure 11: Main causes of non-compliance

The above figure shows the relationship between the managers of the fishing ports and the fish processing companies. Thus, we can see that, the fish processing companies are not involved by the managers in the management of the fishing ports and their expectations and concerns are not taken into consideration; only 13% felt that they are taken into consideration compared to 25% who are not.

**d. Mutual relationship: managers and fish processing companies**

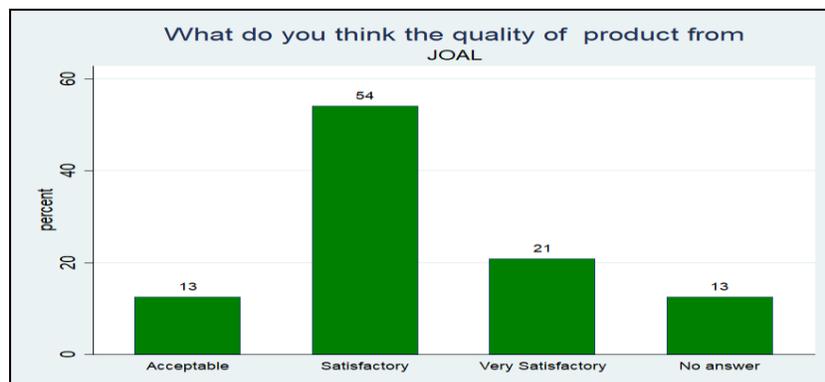


**Figure12: Involvement and consideration of factory expectations**

**4.2.4.5. Satisfaction of fishing products from each fishing port**

The quality of fish from the fishing port of Joal is considered satisfactory and more or less acceptable by the fish processing companies interviewed. Figure 13 shows that 13% of the fish processing companies are moderately satisfied. Fifty-four percent of the fish processing companies are satisfied and 21% are very satisfied with the quality of the products from Joal fishing port.

**e. Satisfaction of fishing products from Joal fishing port**



**Figure 13: Satisfaction regarding Joal's fish products**

The quality of the fish from the fishing port of Pointe Sarène is considered satisfactory to moderately satisfied by the fish processing companies surveyed. Moreover, Figure 14 indicates that 8.3% of the fish processing companies are moderately satisfied, 58% of the fish processing companies are satisfied and 8.3% are very satisfied with the quality of the products delivered by the wholesalers of Pointe Sarene.



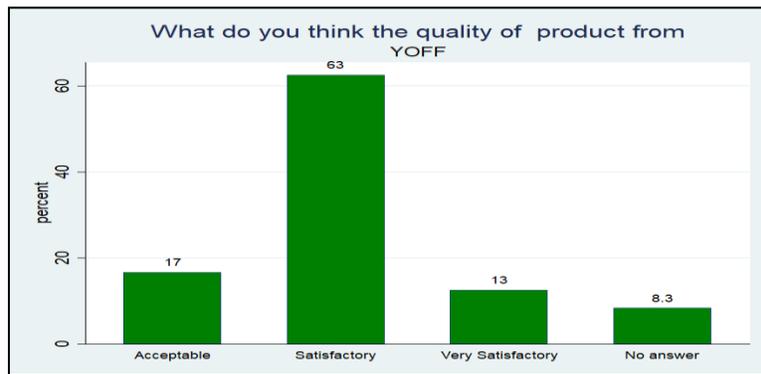
**Figure 14: Satisfaction regarding Pointe Sarene’s fish products**

The quality of the fish from the fishing port of Ngaparou is considered satisfactory to moderately satisfy by the fish processing companies’ surveyed. Figure 15 shows that 8.3% of the fish processing companies are moderately satisfied. Fifty-four percent of the fish processing companies are satisfied and 13% are very satisfied with the quality of the products delivered by the Ngaparou wholesalers.



**Figure 15: Satisfaction regarding Ngaparou’s fish products**

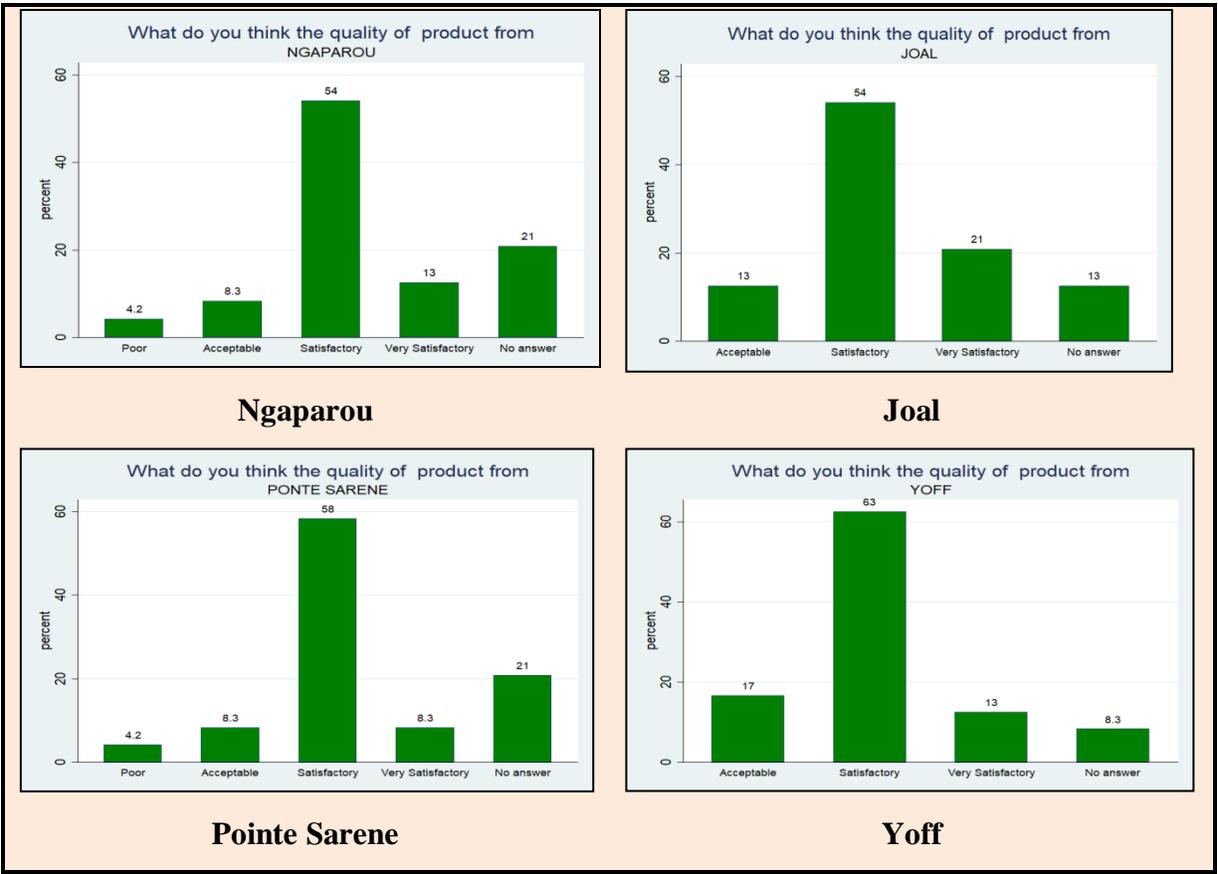
The quality of the fish from the fishing port of Yoff is considered very satisfactory by the fish processing companies surveyed. Lastly, Yoff's managers periodically organize awareness meetings with fish processing companies and operators to meet their expectations. These meetings are more often organized during the campaign of the species saber fish (*Trichiurus lepturus*), horse mackerel (*Trachurus trecae*) and octopus (*Octopus vulgaris*). These sessions' organization allowed the operators to have much more information on the expectations and requirements regarding the quality of the fish processing companies' products.



**Figure 16: Satisfaction regarding Yoff's fish products**

#### **4.2.4.6. Comparative results: Opinions from the fish processing companies on the fish quality from the four fishing ports**

The quality of fish in the fishing ports of Joal and Yoff is considered satisfactory to moderately satisfactory and more or less satisfactory in Ngaparou and Pointe Sarene fishing ports. The opinions of the quality managers towards the fish processing companies are illustrated in Figure 17. It was found that the fishing products from Yoff are more satisfactory in terms of quality. As previously stated, customer satisfaction is the neutral, negative, or positive feeling or behavior that a consumer or customer has regarded a product or service offered.



**Figure 17: Fish processing companies’ opinions on the quality of the fish**

**4.2.5: CLPA Association satisfactory analysis**

For an efficient fishing port, several elements and factors must be combined. Fishing ports must ensure a regular supply of fish products to the fish processing factories, hence the need to conserve the fishery resources. Fishing port managers have the responsibility to support CLPAs in initiatives to restore and conserve fishery resources.

The CLPA association organizes local fishermen to prevent and resolve conflicts between fishing communities and fishermen using different fishing methods and participates in the development and implementation of local fisheries management.

The managers of the artisanal fishing ports involve CLPA to improve the fishing ports and the satisfaction of the stakeholders. Table 18 indicates that the relationship between the CLPA organizations is generally very satisfactory in the four fishing ports. The operators are very committed to the resource restoration initiatives.

**Table 19:** Participation of the GIE.I in CLPA's activities

<b>Fishing port</b>	<b>Yes</b>	<b>No</b>	<b>No answer</b>	<b>Total</b>
Joal	93.44	3.28	3.28	100.00
Ngaparou	62.50	32.50	5.00	100.00
Pointe Sarene	45.65	54.35	0.00	100.00
Yoff	65.00	25.00	10.00	100.00

### **4.3. Summary of the main results of this thesis**

Fishing port managers are responsible for the stakeholder satisfaction. In this study, we assessed their level of commitment and the services they offer to the operators. To evaluate the commitment of managers, we considered three principles of quality: customer orientation, stakeholder involvement and leadership capacity. And, to assess the services offered by the managers, we considered some indicators (port hygiene, maintenance service and financial management). The consideration of the operator's expectations and the involvement (the first and third principle in the quality approach) is a strong signal to prove the level of commitment and strategic orientation of the managers regarding customer's satisfaction. Concerning the managerial capacity of leadership (principle two of the qualities approach): strategy, innovation, policy, vision, marketing, the results showed that managers were more proactive. There is a higher satisfaction of the Yoff operators regarding the port hygiene, maintenance of equipment and, financial management.

To measure the satisfaction of the fish processing companies that are the potential customers of the artisanal fishing ports, we considered the involvement, the customer orientation (taking into account the expectations), and the mutual relationship. We assume that the comparison of the quality of fish products that come from the four ports allowed us to evaluate the level of satisfaction of the fish processing companies. The findings of this study demonstrate the fish processing companies are as satisfied with the relations with Yoff fishing port as they are with the quality of the products coming from Yoff fishing port. Moreover, the comparison of the services offered by the managers to the operators of the four fishing ports shows that the level of fishermen's community satisfaction in Yoff fishing port is much higher than the other fishing ports.

The fishing port of Joal is the largest port in the department of Mbour. It has the largest number of migratory fishermen. Fishing is the main activity in this area. The results show that at the level of this fishing village, the operators are not satisfied with the services. This could be one of the causes of the illegal migration of fishermen to Spain. According to the interviews, this locality has recorded a significant number of fishermen leaving for illegal migration.

The operators of Pointe Sarene and Ngaparou fishing ports are more or less satisfied with the service. Moreover, according to the managers' interview, fisheries co-management initiatives have given very positive results in Ngaparou in the past. The good fishing port management and the stakeholders' involvement resulted in increased the yield of fish products in the protected fishing area. This had a positive impact on the income and satisfaction of the operators and stakeholders.

However, this performance was limited by problems related to the monitoring of the protected fishing zone, in particular the violation of fishermen from other fishing villages and the negligence of the competent local authority in following up infractions (ECADIM, (2013)).

Based on these results, we might consider that, the existence of a good communication system with the local fisheries administration, operators, and fish processing companies, the manager's strategic orientation to meet stakeholders' expectations, training and awareness of operators, stakeholder involvement, transparency in financial management, and continuous improvement of services supported by proactive managers, could be important in contributing to the satisfaction of fishing port stakeholders.

#### **4.4. Discussion**

The studied fishing ports operate differently. The findings of this study show that the four ports commonly have a quality management system that allows them to a better supply to the fish processing companies. However, this system is not perfect, and our results reveal the dissatisfaction of stakeholders of the fishing ports.

This is due to several reasons including the problems related to the commitment of managers, the involvement and consideration of the expectations of the stakeholders, the training of managers and operators. We suggest that these are caused by the approach to a stakeholder that is found mismatching to the needs of other stakeholders.

Although the fisheries sector is unstable in Senegal, the management exercised in some artisanal fishing ports, at all hierarchical levels, does not lead by itself to the improvement of internal relations within some artisanal fishing ports. A lack of total integration of all the actors and therefore a sense of belonging and ownership of the organization, due to management at the informal base should be expected. Moreover, this does not allow operators to develop and take initiatives. The work organization based on the informal system is nowadays the weakness in the managed fishing ports. Hence, the difficulty for some managers of managed fishing ports to assume their role to meet the expectations of the operators and fish processing companies.

In addition, the lack of collaboration and integration of the various stakeholders has not been beneficial to internal and external satisfaction. The comparative analysis of the four managed fishing ports in this study shows that the management system based on informality poses enormous problems and leads to dissatisfaction of the fishing port stakeholders. This is the case of the fishing port of Joal among the others. In contrast, Yoff fishing port presents customer focused practices, relationship, and involvement of all stakeholders to ensure customer satisfaction. This is further promoted by a good organization of the port's managers and contiguous improvement of their practices.

As a management system based on the informal sector led by proactive and motivated managers could help ensure the company's customers' satisfaction. The positive results that the fishing port management system has achieved in this study could be a significant positive signal. Some researchers have defended this ideology of an informally based management system which can achieve positive results. Mayo (1945), after questioning Taylorism, demonstrated the importance of psychological factors in motivation and group dynamics. Thus, group membership and the informal nature of organizational life can be more important for productivity than formal management principles. Additionally, the Hawthorne effect, or Hawthorne experiment, describes the situation in which the results of an experiment are not due to the experimental factor but to the fact, that subjects are aware of participating in an experiment in which they are being tested, which generally results in higher motivation. This effect, based on the Western Electric in Cicero sociological experience, consisted of setting up two working groups: one is continuing to work under the same conditions as before and the other benefiting from better working conditions, especially lighting.

It was expected that production would increase in the group that benefited from better conditions. However, the results were surprising as increased productivity was observed in both groups (Mayo, 1945). In this perspective Mayo (1945) wanted to show the important role of the informal in the organization. The discovery of the informal structure is at the origin of the current of human relations. The consideration of informality gave birth to the leader concept. The informal structural leader's concept has characteristics that make it useful to emanate from the group instead of the formal structural leader who tends to impose his power on the group. The power is embedded in the group in an informal leadership style.

From this experience we could deduce that the group's interest plays a decisive role in increasing productivity and should not be neglected. This is because in most organizations the informal is the hidden side of the iceberg. Unlike the classic school where productivity is based on working methods, the school of human relations, where it is the role that the group, the individual within the group, plays that is decisive. The feeling of belonging to the group of workers consolidates the bonds of solidarity. It soothes the social climate between individuals within the group. (Mayo, 1945). An employee who is affectively committed to the employer brand is likely to be satisfied. That satisfaction may lead to emotional attachment.

Nevertheless, satisfaction and affective commitment are not synonymous. Satisfaction does not automatically imply certain behaviors (Thomson & al., 2005). However, the workplace's organization in small units, allows each worker to feel more integrated and more motivated (Mayo, 1945). Luthans (1998) stated that motivation is the process that awakens, activates, directs, and sustains behavior and performance. It internally encourages people towards actions that help them achieve particular task effectiveness (Weitz & al., 1986). Thus, motivation can be considered a source of intermittent inspiration for people in the workplace. When motivated, employees produce more than what is formally expected of them.

Yoff's managers' management strength is essentially based on motivation, commitment, communication, and the ability to involve all stakeholders (authorities, fishermen, wholesaler, local authorities, and fish processing companies) in the management of the fishing port. This may be because in Yoff there is a strong relationship between the operators (fishermen and

wholesalers) and managers since the majority of them have always lived there. Most of them often belong to the same generation. According to the interview, the fishing community considered themselves as one big family. The fishing port of Yoff belongs to a “Lebou” village community anchored in their traditional values where human relations and family ties are essential. The theory of belonging to a community is critical. This makes the village an easy place to organize because there is a good system of communication and very close relationship. Previous literature describes the organizational culture as “*a culture common to all the members of an organization*” (Jambart, 2001).

The current management generally aims to be productive and participative. This will foster a framework for the blossoming of ideas and a positive organizational culture. Organizational culture is intended to guide the behavior of individuals. It is an element in the management of unavoidable behaviors (Dayan, 2004). The Japanese management style is an example recognized throughout the world for its convincing and participative character. It is based on principles and values shared by all. Co-management in Japanese companies ‘success is explained by a positive organizational culture oriented towards productivity (Dayan, 2004).

Meantime, Joal village gathers foreign communities from fishing village around, who come and settle there for economic reasons, so organizing them reveals difficult. Most of them do not live forever in the village, which might explain why the fishing village of Joal remains an outlier compared to others fishing ports. The small size of Yoff village, the presence of more proactive leaders or managers, and the fact that they belong to the same traditional community have favored the involvement of operators and stakeholders in the fishing port management compared to Joal which is a larger specific village. Indeed, Joal village is one of the largest fishing ports in the department of Mbour. This might be explained by the fact that the larger the fishing village is, the more difficult it is to organize the stakeholders and implement an effective participatory management system.

Hygiene issue, the organization of meetings between fishermen and wholesalers, managers and local fisheries administration, especially during the periods of the fish campaigns for the saber fish (*Trichiurus lepturus*) and; horse mackerel (*Trachurus trecae*) were among the reasons given by the fishermen and wholesalers concerning the level of satisfaction regarding the services

during our interviews. The organization of these sessions allowed the operators to have much more information on the expectations and requirements regarding the quality of the fish processing companies' products. They believe that meetings and exchanges enable them to unanimously decide the price of their products and other issues such as fishing methods, the avoidance of conflicts and the illegal competition between stakeholders. These meetings have led to the reduction of harmful practices but also the improvement of the operators' income. These comments are supported by the local fisheries administration, which also states that the fish processing companies have even had to increase the products' price due to this discussion network. This may have motivated the fishermen to become more involved in the activities of the GIE.I.

This positive organizational culture can be well developed in Senegal's artisanal fishing ports. The culture of dialogue is specific to Senegal and favors exchanges and therefore a better receptivity of operators and stakeholders. Organizational cultures should therefore be managed in such a way as to develop forms of thinking and behavior in fishing communities that are likely to generate benefits. The success of the organizational culture depends on the coordination of several elements including the decision-makers management of stakeholders, information sharing, communication within the organization and the training and awareness-raising of stakeholders. Companies need to develop employee skills to generate resources and increase productivity.

It was demonstrated in Ngaparou fishing port that the co-management initiatives have given very satisfactory results with the protected fishing areas. The management tool's benefits have been shown in the catching of the green lobster, which is highly prized by the market and local hotels, and coastal demersal species, which are also very present in the area. An increase in the size and volume of several species, including the lobster 1.5 kg / output (2006) to 3.5 kg / output (2010), i.e. 133%, was recorded, and a gradual recovery in the abundance of demersal species in the co-management area. Thus, due to all stakeholders' involvement in decision-making at the local level, the fishermen of Ngaparou have demonstrated their organizational capacity (ECADIM, 2013). This performance has enabled the managers of the fishing port of Ngaparou to increase the solidarity links with the operators by carrying out social activities (medical or school care, ceremonial expenses and micro-credit).

Furthermore, the impact of training on skills development and productivity is more significant when government incentives accompany organizational strategies (Dolan, Saba, Jackson, & Schuler's, 2002). However, developing skills is not enough; it must be accompanied by the judicious use of those skills to positively influence mobilization, commitment, trust and support (Allen, Shore & Griffith, 2003). The development of operators' skills through training, continuous improvement, information sharing, communication and stakeholder involvement applied by managers may have resulted in operators and fish processing companies' satisfaction. Artisanal fishing port managers have an essential role in promoting contacts between fishermen and wholesalers, fish processing companies and administrative services. Although participatory management presents considerable advantages, some researchers do not share this opinion. Managerial literature by (Kelemen, 2000; De Cock, 1998; Igalens, 1998) presents a critical perspective on co- management.

In this perspective, participation is seen more as a means of controlling employees than influencing the decision-making process. Through the implementation of co-management, management can establish a framework for participation that enables it to have effective control through the institutionalization of formal rules, norms and procedures, and more specialized activities. Parker and Slaughter (1993) add that total quality management is, in fact, a model that puts the interest of employees in the last position. Its rhetoric conceals a managerial control system and work organization, according to a model that can be described as management by pressure.

#### **4.5. Summary of the chapter**

This chapter presented an overview of the four target fishing ports of this study and the results of the satisfaction surveys. Through our interviews and research, we have identified the characteristics of the four fishing ports. The literature review highlighted the importance of the artisanal fishing ports in the fishing sector. Like the previous one, the literature review indicated a close relationship between the quality approach and customer satisfaction. The quality principles were used to measure the satisfaction of the fishing ports' internal and external stakeholders. Thus, we attempted to evaluate the practices related to the quality of the fishing port managers' services and products. As a result, operators (fishers and fish wholesalers) and fish processing companies gave their evaluations regarding the four fishing ports' quality of products and services.

The comparison of the four fishing ports in terms of the quality of services and products offered yielded the following results: Operators and fish processing companies are more satisfied with the quality of products and services offered by the fishing port of Yoff. The probable reasons for this satisfaction and dissatisfaction are reflected in the discussion section.

The following chapter will draw lessons, suggestions, limitations, and future studies in perspective.

## **CHAPTER 5: CONCLUSION, SUGGESTION, LIMITATIONS AND FUTURE STUDY**

### **5.1. Conclusion**

It can be concluded that the four managed fishing ports have stakeholders with different levels of satisfaction. This study compared the different dimensions of product and service quality management in terms of quality orientation and management practices with two specific types of performance: satisfaction of internal customers (operators) and external customers (fish processing companies) as customers of fishing ports. The analysis of quality management practices revealed: dissatisfaction in the fishing ports of Joal, Ngaparou and Pointe Sarene and satisfaction in Yoff fishing port. These results could appear in contrast to what the literature indicated concerning the significant role of stakeholders on the quality management.

The evaluation of the stakeholders' responsibility allowed us to realize that all stakeholders did not fully play their role in these three fishing ports. This could explain the weaknesses noted in the fishing ports of Joal, Ngaparou and Pointe Sarene. The quality management model proposed by these fishing ports is faced with constraints related to a lack of orientation towards quality, and particularly the leadership of managers, appropriate interaction between the design of strong links between managers, operators and fish processing companies in achieving service and product compliance and customer satisfaction. Achieving customer satisfaction requires greater attention to factors that affect subsequent relationships with customers (e.g. their involvement in quality improvement initiatives), exchange of quality information and contact during the design process. Achieving stakeholder satisfaction requires a strong orientation towards quality from the beginning.

The fishing port of Yoff was found the best in terms of the satisfaction of the stakeholders related to the services and products offered by the managers. This satisfaction could be explained by the fact that the management style applied by Yoff's managers is based on the quality approach based on the ability to mobilize the interactions of the different stakeholders around a single common objective creating a mutual benefit. Based on this example, one could say that quality management positively impacts customer satisfaction. This is only possible if the different stakeholders know and fully assume their role.

We can also conclude that the empowerment of fishing communities is a beneficial factor. Nevertheless, the management of a fishing port, or any other organization, requires great

managerial skills beforehand. Today, artisanal fishing ports must meet several expectations, particularly the maintenance of sanitary approval for exports, the creation of added value for stakeholders, and the reduction of the unemployment rate. Taking into account the regulatory legal requirements of products and services and the needs of stakeholders has become a concern for any company, whatever its size and sector of activity. It will be up to business leaders or managers who have the ability, skill, and knowledge to meet the legal regulatory requirements of products and services and gain stakeholder support to steer the business towards performance. The orientation towards quality requires a paradigm shift in the management of artisanal fishing ports. The implementation of these changes takes time, as behavioral changes for a specific community of fishermen, mostly illiterate, are notoriously slow. The results of this study could draw attention to the structural design of the management system of artisanal fishing ports. The proposed model could be a useful guide both for fishing port managers and competent authorities and for researchers in obtaining stakeholder satisfaction.

In summary, the managers and the operators (fishermen and wholesalers)' total commitment, the involvement of the fish processing companies, and the competent authorities are valuable assets to ensure the competitiveness of the artisanal fishing ports and the total satisfaction of the stakeholders.

## **5.2 Suggestions**

This study revealed the complexity of the management of the developed fishing ports.

To protect the health of consumers, artisanal fishing ports have put in place measures to comply with the regulations in force by improving the competitiveness and conformity of their products placed on the market. The shortcomings noted in the informal management of some managed fishing ports call for a paradigm shift. Although the emotional involvement observed in the management approach of the managers at Yoff fishing port has shown satisfactory results, the current stakes of the sector require much more structured management oriented towards the principles of the quality approach. The Senegalese government has given the fishing community responsibility for the management of artisanal fishing ports. This management style requires much more time, effort, and support from the relevant authorities to achieve effective management. However, the fishing communities will have to be aware of hygiene management's interest and fully assume their responsibilities.

## **5.2.1 Commitment of managers and stakeholders**

### **5.2.1.1. Commitment of managers**

The involvement of everyone is essential for the success of any quality project in the company. Therefore, each player must be aware of the importance of an improvement approach and voluntarily join in this logic, once they have become aware of all the benefits and advantages of such a restructuring. Furthermore, the degree of involvement of the players in the approach will directly impact customer satisfaction. There is a close link between stakeholders' degree of involvement in the improvement process and customer satisfaction. Also, lack of collaboration of the organization's actors will directly impact its objectives and customer's expectations.

### **5.2.1.2. Commitment of stakeholders**

Involvement and consultation between stakeholders are conditions for the installation of mutual trust, guaranteeing the success of any co-management activity. Only this trust makes it possible to provide the right information and the implementation of a monitoring plan that remains a major equation within the framework of this management plan.

*1-The competent authorities:* The competent authorities must undertake to fulfil their supervisory and monitoring responsibilities. They must ensure the strict application of regulations relating to hygiene rules.

*2-The operators:* They must undertake to respect good hygiene and manufacturing practices. They must fully assume their role in the management of the fishing port.

*3-The fish processing companies:* Collaboration and involvement of the fishing industries, which are the main customers of the wholesaler, is necessary to meet their expectations. A strengthening of the collaboration between the stakeholders (Managers of the GIE.Is and CLPA-Operators (fishermen and wholesalers, fish processing companies and local authorities) is a major asset that guarantees the sustainable management of the activity.

## **5.2.2. Training of managers and production operators**

Managers and production operators must be committed to having the technical skills necessary to comply with good hygiene and manufacturing practices. The real challenge in artisanal fishing ports remains in training the operators handling the product. The research results show that the level of education is relatively low. The techniques and mechanisms needed to transmit

knowledge will have to be found. The competent authority should set up a capacity building system of fishing port operators to meet product compliance requirements. Indeed, compliance with product requirements may be affected directly or indirectly by operators. To comply with product conformity requirements, the organization must enable operators to acquire the necessary skills.

### **5.2.3. Communication and advocacy**

#### **5.2.3.1. Communication**

Our research results show a communication deficit between operators and fish processing companies, between managers and operators and managers and fish processing companies. Communication is essential to carry out efficient fisheries production processes. It must be at the heart of interactions between stakeholders. The operator is required to comply with a well-defined set of specifications. Therefore, it is essential for the operator to establish good communication to comply with the instructions, requirements, and rules relating to the product. Fishing port managers must provide services to operators. They must meet their expectations and needs to satisfy them. Hence the need to communicate, communication integrates three characteristics: the managerial dimension, the pursuit and fabrication of opinions, and the search for compliance. Communication and information-sharing practices include all the organizational practices used to disseminate (top-down) and receive (bottom-up) information. This can only be achieved by improving managers and operators' communication and skills to carry out a management oriented towards the principles of quality management. However, in addition to this, it will be necessary to move towards management based on a territorial and ecological marketing system. It will also be necessary to leave a place for creativity and innovation.

#### **5.2.3.2. Raising awareness**

Operators (fishermen and wholesalers) must be made aware of the extent of their contribution to the quality management system and the beneficial effects of improved performance. Operators carrying out work under the control of the organization must be made aware of the quality policy, the relevant quality objectives, and their contribution to the effectiveness of the quality management system, including the positive effects of improved quality performance, the implications of non-compliance with the requirements of the quality management system.

## **5.2.4. Rational management of resources and skills**

### **5.2.4.1. Resource management**

The main interaction of this clause is to ensure that biological organizations identify, propose, and maintain the human resources and infrastructure necessary to establish, implement, maintain and continuously improve the quality management system (QMS) and its processes.

### **5.2.4.2. Skills management**

In order to define competencies, criteria must be established for each function that influences quality. These criteria can be used to assess existing competencies and define future needs. If these criteria are not met, some action is required to fill the gaps. Training may be considered. The retention of documented information is necessary to demonstrate that competencies are being addressed.

## **5.3 Limitation of the study and future perspectives**

The surveys were carried out with several difficulties. First, this study was conducted during the COVID-19 pandemic period. Thus, we did not directly interact with the responsible authorities at the central level, the Directorate of Fish Processing Industries (DITP) and the Directorate of Maritime Fisheries (DPM). We were unable to obtain a representative number for the interview of the local authorities. In addition, the number of fishermen and wholesalers who had difficulty answering some of the questions was high, due to the low level of study and the mistrust of the operators.

This study allowed us to analyze quality management practices concerning customer satisfaction. It also allowed us to identify the roles and responsibilities of the different actors involved in the managed fishing ports, to measure expectations (expected service and perceived service), to analyze the constraints and success factors related to the quality management of the services and products offered by the managers and to make recommendations. However, the in-depth continuation of the study's research by including the appreciations and points of view of the competent authorities, the Directorate of Maritime Fisheries (DPM), the Directorate of Fishing Industry Transformation (DITP), the local communities and the personnel of the artisanal fishing ports will allow for a greater appreciation of the situation.

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# **ANNEXES**

## **WHOLESALE QUESTIONNAIRE**

### **I) Identifier**

Sex: M; F Age:

Place of residence:

Origin:

Marital status: - Single –Married- Divorced -Widowed

Number of children:

Number of Dependents:

Main occupation:

Other activities:

Number of years of experience:

Do you have social security coverage? Yes or No

### **II) Quality -Safety –Environment**

#### **HACCP Process**

1) What parameters you control:

- Temperature
- Freshness criterion
- Presence of parasites

2) Are these controls formalized? Yes or no

3) What are the identified hazards of your activity?

- Biological hazard: alteration of the product
- Chemical hazard: hydrocarbons and heavy metals (fishing areas)
- Physical hazard: foreign bodies

4) What are the main critical points you have identified?

- Receiving the product
- Disembarkation Artisanal Fishing Port: workshop
- Stuffing and transport of the product

5) What preventive and corrective actions have you put in place?

- Early icing and cold chain compliance
- Good Hygiene and Manufacturing Practice
- Others

6) Do you clean your equipment before and after use? Yes or no

#### **COLD CHAIN MANAGEMENT: TRANSPORT**

7) How do you transport your products from the fishing wharf to the plant?

- Insulated refrigerated trucks
- Interurban transport vehicle
- Taxi
- Car
- Others to be specified

#### **TRACKABILITY**

8) Do you have a tracking system in place to identify your raw material suppliers? Yes or no

9) Do you understand the concept of product traceability?

- Yes
- No
- Partly
- No answer

10) Do you think traceability is an advantage for you? Yes or No

**HUMAN RESOURCES TRAINING: QUALIFICATION AND COMPETENCE**

- 11) What is your level of education?
  - Primary
  - Middle Secondary
  - Secondary
  - Upper
  - None
  - Other
- 12) Have you learned your trade? Yes or No
- 13) Are you aware of the regulations of your profession as a fish wholesaler? Yes or No
- 14) Have you ever received training on good raw material handling practices? Yes or No
- 15) If yes, what is the number of training programs in which you have participated?
- 16) Which organization initiated the training program?
  - The competent authority: DPM, DIC, DPSP
  - The local community
  - The GIE.I
  - The Fishery Company
  - Others?
- 17) If not, why not?
- 18) Do you make your suppliers and staff aware of good handling practices and product quality criteria to be respected? Yes or No
- 19) If yes, how many awareness-raising sessions do you organize per year?
  - One
  - Two
  - Three
  - Others

**III) Marketing**

- 20) To whom do you sell your products?
  - Private individual
  - Hotel
  - Factory
  - Others
- 21) Do you market octopus, squid, or cuttlefish to the Fishery Company? Yes or No
- 22) What are the five major species ordered by the Fishery Company?

.1	2.	3.	4.	5.
----	----	----	----	----

- 23) What are the five major plants you sell your product to?

.1	2.	3.	4.	5.
----	----	----	----	----

- 24) Do you buy fish products that are below the regulatory limit? Yes or No
- 25) Who sets the purchase price of the products?
  - Yourself

- The supplying fisherman

26) Who sets the selling price of the products?

- Yourself
- The fishery company's customer

27. Is the selling price fixed on the basis of the quality criteria of the product? Yes or no

#### **IV-Mutual relations with interested Stakeholders**

##### **IV-1-Relationship with suppliers**

28) Is there a contract between you and the supplying fishermen? Yes or no

29) If so, what is the advantage of such a contract?

30) How do you pay supplier fishermen?

- Cash
- With terms of payment
- Products are paid by bank transfer
- Others to be specified?

31) Do you finance the activity of your supplying fishermen? Yes or no

32) Are you an artisanal fishing dugout canoe owner? Yes or no

##### **IV-2-Relationship with Fishery companies' customers**

33) Is there a contract between you and the manufacturers? Yes or No

34) What are the industry's main requirements?

- Health, hygiene, and product quality
- Traceability of the raw material
- Freshness of the product
- Good price
- Size/Gauge/Weight/Quantity
- Others etc...?

**35) What is the method of payment for fishery companies?**

- a. Cash
- B. With terms of payment
- C. By bank transfer

36) What happens if the products are tampered with?

- The factory will bear the costs
- You bear the losses
- The industrialist compensates you (at what percentage?)

##### **IV-2-1-Claims of the customer**

37) Have you ever had a claim from the industrialist? Yes or no, if yes

38) What is the main cause of non-compliance?

- Freshness
- Product Size
- Quantity ordered / quantity delivered

- Sensory quality
- Late delivery time
- Others

**Complaint frequency: non-compliance rate**

39) How many customer complaints (return of goods or non-conforming products) do you have per month?

- Once a month
- Twice.
- Several times

40) How many ice plant shutdowns have you experienced per month?

- Once a month
- Twice
- Several times

**41) How many cold room shutdowns have you experienced per month?**

- Once a month
- Twice
- Several times

**IV-2-2-Continuous service improvement measures**

**42) Have you planned preventive and corrective measures to improve service?**

Yes or No

43) If yes, name it?

44) Did the planned actions have the expected effects? Yes or no

45) How many planned actions have had positive effects?

46) What would you like to improve for a better relationship with your supplier as well as your purchasing customer?

**47) Are you satisfied with your cooperation with your industrial customer?**

Service/need of the factory	Completely	Rather	Not completely	Rather not	Not at all
Payment terms and deadlines					
Communication/information provided					
Product description and specification information					
Compliance with specifications					
Selling price of the product					

**IV-3-RELATIONSHIP WITH THE ARTISANAL FISHING PORT MANAGER AND THE CLPA**

**IV-3-1-Relation with the manager of the GIE.I**

48) Are there any economic interest groups? Yes or no

49) If so, are you a member? Yes or No

50) Do you participate regularly in the activities of the group? Yes or No

51) If yes, does the group or dock manager regularly involve you in the different activities? Yes or No

52) Does the group take your expectations and concerns into consideration? Yes or No

### IV-3-2-Satisfaction with the services offered by the manager of the GIE Me Artisanal Fishing Port?

Service/provision of GIE.I	Completely	Rather	Not completely	Rather not	Not at all
Administrative management: Steering and governance					
Commitment of GIE.I management					
Vision and strategy: Regional policy or local marketing					
Promotional strategy: Fishing Port branding policy					
Capitalization and Valorization of the resources of the local territory					
Friendliness of the GIE.I staff					
Proactive attitude and reaction of GIE.I management					
Financial transparency of surplus distribution					
Information provided					
Compliance with complaint and maintenance deadlines					
Services and benefits offered					
Hygiene and sanitation of the port premises					
Safety of goods and people					
Availability of sufficient drinking water and lighting					
Disposal of waste and wastewater					
Cold room management					
Availability of cold rooms and ice factory					
Usage box, workshop, commercial space, warehouse					
Amount of fees and collection of charges					
Maintenance process					
Preventive and curative maintenance of cold rooms					
Preventive and curative maintenance of the ice factory					
Maintenance and repair of concessionary works					

53) Are you globally satisfied with the GIE.I's services? Yes or no

54) If no, do you think it would be desirable to remove the management of the artisanal fishing port from the GIE.I? Yes or no

### **IV-3-3-Relation with CLPA**

#### **Sustainable Resource Management**

55) Are you involved in the CLPA's fisheries resource restoration initiatives? YES or NO

**56) Do you respect biological rest? YES or NO**

57) In your opinion, are the fishery resources available in sufficient quantities to ensure your supply on a regular basis? Yes or No

58) If not, why not?

**59) In your opinion, what are the causes of the depletion of fisheries resources?**

- Bad fishing practice
- Climate change
- Overexploitation
- Unfavourable weather for fishing (Weather alerts)
- Others

**60) What are your expectations for improved services?**

- Organize meetings for exchange between actors
- Better sustainable management of fisheries resources
- Better management of dock hygiene, product quality and traceability
- Better management of jobs and customer expectations at the wharf
- Increased revenues and better in the wharf area
- Others

## **FISHING QUESTIONNAIRE**

### **I) Identification**

Sex:

M; F

Age:

Place of residence:

Origin:

Marital status:

Single –Married- Divorced- Widowed

Number of children:

Number of Dependents:

Main occupation:

Other income-generating activities:

Number of years of experience:

**How far is the nearest health facility?**

- 5km
- 10km
- 20km

**How far is the nearest school?**

- 3 miles
- 10km
- 20km

**How many of your children have finished primary school?**

- 1
- 2
- 3
- None

**How many of your children have completed high school?**

- 1
- 2
- 3
- None

**How many of your children have completed college?**

- 1
- 2
- 3
- None

Do you have your own boat? Yes or No

If not, who bought your boat?

- A fisherman owner
- A fisherman
- A fishery company
- Others to be specified

Do you have social security coverage? Yes or no

### **II) Quality -Safety -Environment**

#### **HACCP Process**

**1) What are the identified hazards in your production?**

- Biological hazard: deterioration of the product
- Chemical hazard: oil and heavy metals (polluted fishing areas)
- Physical hazard: foreign bodies

**2) What are the main critical points you have identified?**

- Fishing technique or gear
- Polluted fishing area
- Mishandling

- During capture

**3) What preventive and corrective actions have you put in place?**

- Early icing and cold chain compliance
- Good hygienic and handling practice during capture
- Selection of healthy fishing area and adapted fishing technical
- Others

**4) Do you clean your fishing gear and equipment before and after use? Yes or No**

**5) What fishing gear do you use?**

- Single line
- Long line
- Locker
- Fishing net
- Others

**COLD CHAIN MANAGEMENT**

**6) How do you keep your fresh produce on board?**

- Fish in an insulated box
- Fish frozen immediately upon capture
- Fish stored in the hold in ambient air

Others to be specified

**7) Do you have sufficient ice on board for each fishing trip? Yes or No**

**TRACKABILITY**

**8) Do you go fishing with a registered pirogue? Yes or No**

**9) Do you understand the concept of product traceability?**

- Yes
- No
- Partly
- No answer

**HUMAN RESOURCES TRAINING: QUALIFICATION AND COMPETENCE**

**10) What is your level of education?**

- Primary
- Middle Secondary
- Secondary
- Upper
- None Other

**11) Have you learned your trade? Yes or no**

**12) Have you already received training on Good Handling Practices on Board, Safety at Sea, Use of GPS and on traceability etc.? Yes or No**

**13) If yes, what is the number of training programs in which you have participated?**

**14) Which organization initiated the training program?**

The competent authority: DPM, DIC, DPSP

- The local community
- The GIE.I
- The fishery companies

- Other (Can check more than one)

**15) Do you educate your on-board staff on good handling practices? Yes or No**

### **III) Marketing**

**16) To whom do you sell your products?**

- Private Individual
- Hotel
- Wholesaler
- Other (Can check more than one)

**17) What are the five major species ordered by fish merchants?**

1.	2.	3.	4.	5.
----	----	----	----	----

**18) Who sets the selling price of the products?**

- Yourself
- The wholesale customer

**19. Is the selling price fixed on the basis of the criteria of the quality of the product perceived? Yes or no**

### **IV-Mutual relations with interested stakeholders**

#### **IV-1-Relationship with the purchasing customer**

**20) Is there a contract between you and the fish wholesaler? Yes or no**

**21) If so, what is the advantage of such a contract?**

**22) What are the main requirements of the fish wholesaler?**

- Health, hygiene, and product quality
- Traceability of the raw material
- Freshness of the product
- Good price
- Size/Gauge/Weight/Quantity
- Others etc...

**23) What happens in case of product tampering?**

- The wholesaler will bear the costs
- You bear the losses

**24) How are you paid by the wholesaler?**

- Cash
- With terms of payment
- Products are paid by bank transfer
- Others to be specified

**25) Who finances your business?**

- Yourself
- The fish wholesaler
- The fishery factories

**26) Have you taken out a credit or loan to carry out your professional activity? Yes or no**

**27) If not, why not?**

- No need
- Credit too expensive
- Conditions too restrictive
- Others

**IV-2-Relationship with fishery companies**

- 28) Is there a contract between you and the Fishery Company? Yes or No
- 29) Do you have frameworks for exchanges with industrialists and wholesalers? Yes or No
- 30) What is the method of payment for fishery companies?
  - A-Cash
  - B-With terms of payment
  - B-By bank transfer

**IV-2-1-Claims of the customer**

- 31) Have you ever had a claim from the wholesaler? Yes or no
- 32) If yes what is the main cause of non-compliance?
  - Freshness
  - Product Size
  - Quantity ordered / quantity delivered
  - Others
  - Complaint frequency: non-compliance rate
- 33) How many customer complaints (return of goods or non-conforming products) do you have per month?
  - Once a month
  - Twice
  - Several times

**IV-2-2-Continuous service improvement measures**

- 34) Have you put in place preventive and corrective measures to improve service? Yes or No
- 35) What would you like to improve for a better relationship with your buying customer?
- 36) Are you satisfied with your relationship with your wholesaler customer?

Service/need of the fish wholesaler	Totally	Rather	Not totally	Rather not	Not at all
Payment terms and deadlines					
Communication/information provided					
Product description and specification information					
Compliance with specifications					
Selling price of the product					

**IV-3-RELATIONSHIP WITH THE FISHING PORT MANAGER AND THE CLPA**

**IV-3-1-Relation with the manager of the GIE.I artisanal fishing port**

- 37) Are there any economic interest groups? Yes or no
- 38) If yes, are you a member? Yes or No
- 39) Do you regularly participate in the activities of the group? Yes or No
- 40) If yes, does the group or dock manager regularly involve you in the different activities? Yes or No
- 41) Does the group take your expectations and concerns into consideration? Yes or No

### **IV-3-2-Satisfaction with the services offered by the manager of the GIE.I**

<b>Service/provision of GIE.I</b>	<b>Completely</b>	<b>Rather</b>	<b>Not completely</b>	<b>Rather not</b>	<b>Not at all</b>
Administrative management: Steering and Governance					
Commitment of GIE.I management and innovation					
Vision and strategy Regional policy or local marketing					
Promotional strategy Fishing Port branding policy					
Capitalization and valorizationof the resources of the local territory					
Friendliness of the GIE.I staff					
Proactive attitude and reaction of GIE.I management					
Financial transparency of surplus distribution					
Information provided					
Compliance with complaint and maintenance deadlines					
Services and benefits offered					
Hygiene and sanitation of the port premise					
Safety of goods and people					
Availability of sufficient drinking water and lighting					
Disposal of wastewater					
Cold room management					
Availability of cold rooms and ice factory					
Usage box, workshop, commercial space, warehouse,					
Amount of fees and collection of charges					
Maintenance process					
Preventive and curative maintenance of cold rooms					
Preventive and curative maintenance of the ice factory					
Maintenance and repair of concessionary works					

**42) Are you globally satisfied with the GIE.I's services? Yes or no**

**43) If no, do you think it would be desirable to remove the management of the wharf from the GIE.I? Yes or no**

### **IV-3-3-Relation with CLPASustainable Resource Management**

**44) Are you involved in the CLPA's fisheries resource restoration initiatives? YES or NO**

**45) Do you respect biological rest? YES or NO**

**46) In your opinion, are sufficient fishery resources available? YES or NO**

**47) If not, why?**

**48) In your opinion, what are the causes of the depletion of fisheries resources?**

- Climate change
- Overexploitation
- Unfavourable weather for fishing (Weather alerts)
- Others

**49) What are your expectations for improved services?**

- Organize meetings for exchange between actors
- Better sustainable management of fisheries resources
- Better management of dock hygiene, product quality and traceability
- Others

**50) What type of fishing do you do?**

- Fishing of the day
- Tide

## FISHING COMPANIES QUESTIONNAIRE

### I) Identifier

Gender: M; F Age:

Factory name: Address:

Main profession: Position in the Company: Quality manager: Production manager: Director: Others:

### II) Quality - Safety - Environment

#### HACCP Process

**1) What parameters do you control when you receive the raw material?**

- Temperature
- Freshness criterion
- Presence of parasites

**2) Are these checks formalized? Yes or no**

**3) What are the hazards identified upon receipt of the raw material?**

- Biological hazard: deterioration of the product
- Chemical hazard: hydrocarbons and heavy metals (fishing areas)
- Physical hazard: foreign bodies

**4) What are the main critical points you have identified?**

- Transport of the product
- Receipt of the product
- Workshops

**5) What preventive and corrective actions have you put in place?**

- Early icing and respect of the cold chain upstream
- Good Hygiene and Manufacturing Practice
- Others

#### COLD CHAIN MANAGEMENT: TRANSPORT LOGISTICS

**6) How are your products transported from the fishing Port to the company?**

- Isothermal refrigerated trucks
- Interurban transport vehicle
- Taxi
- Cart
- Others to be specified

**7) What type of logistics transport do you use to export your products?**

- Air freight
- Sea freight
- Road Freight

**8) What type of anomaly did you notice during the transport of your products for export?**

- Delay
- Availability
- Long waiting time
- Frequent disturbance
- Others to be specified
- 

#### TRACKABILITY

**9) Do you have a tracking system in place to identify your raw material suppliers? Yes or no**

10) Do you think traceability is an advantage for you? Yes or No

**HUMAN RESOURCES TRAINING: QUALIFICATION AND COMPETENCE**

11) Are you aware of the regulations governing the profession of exporting fish wholesaler? Yes or no

12) Have you ever received training on good raw material handling practices? Yes or No

13) If yes, what is the number of training programs in which you have participated?

14) Which organization initiated the training program?

The competent authority: DPM, DIC, DPSP Others?

15) If not, why not?

16) Do you make your suppliers and staff aware of good handling practices and product quality criteria to be respected? Yes or No

17) If yes, how many awareness sessions do you organize per year?

- o One
- o Two
- o Three
- o Others

**III) Marketing**

18) How often do you buy?

- o Daily
- o Weekly
- o Other

19) From whom do ye buy the fish?

- o Fisherman
- o Wholesaler
- o Other

20) Do you have preferred suppliers? Yes or no

21) Where do you buy your products (place of supply)?

- o JOAL
- o SARENE TIP
- o NGAPAROU
- o
- o OTHERS PLEASE SPECIFY

22) To whom do you sell your products?

- o Private individual
- o Hotel
- o Foreign Customer
- o Others

23) Do you buy octopus, squid, or cuttlefish? Yes or No

24) What are the five most important species ordered by your main customers?

1.	2..	3.	4	5.	Nature of products exported	Frozen	<input type="checkbox"/>
						Fresh	<input type="checkbox"/>

**Frozen Fresh Processed**

25) What are the destinations of the products you export?

- o European Market
- o Asian Market

- American Market
- African Market
- Others

**26) Do you want to reach new markets? Yes or No if yes which ones?**

**27) What are the constraints?**

**28) What are the current trends in your market?**

- Whole fish,
- Easy to use processed fish requiring little preparation time
- Fresh fish
- Frozen fish
- Live fish

**29) What are your motivations for purchasing raw materials at the level of the Artisanal fishing Port landing?**

- Sales system and policy at site level: good service quality
- General condition of the site good: hygiene, location, etc.
- Product composition: quality and range of products sold
- Need for sufficient quantity and quality of raw material supply
- Affordable and cost-effective
- Promotion, product, and landing Port image
- Other.....

**30) Who sets the purchase price of the products?**

- Yourself (Fishery Company)
- The supplier

**31) Who sets the selling price of the products?**

- You (Fishery Company)
- The Customer

**32) Does the quality of the products influence the purchase price? Yes or no? If yes, to what extent?**

**33) In your opinion, what is the quality of the products at the following supply fishing Port?**

Artisanal Fishing Port	Appreciations			
JOAL	• Poor	• Acceptable	• Satisfactory	• Very Satisfactory
POINT SARENE	• Poor	• Acceptable	• Satisfactory	• Very Satisfactory
NGAPAROU	• Poor	• Acceptable	• Satisfactory	• Very Satisfactory
YOFF	• Poor	• Acceptable	• Satisfactory	• Very Satisfactory
Other artisanal fishing port	• Poor	• Acceptable	• Satisfactory	• Very Satisfactory

**IV-Mutual relations with interested stakeholders**

**IV-1-Relationship with suppliers**

34) Is there a contract that binds you to suppliers? Yes or No

35) If so, what is the advantage of such a contract?

**36) How do you pay the supplier wholesalers?**

- Cash

- With terms of payment
- Products are paid by bank transfer
- Others to be specified?

**37) Do you finance the activity of your supplier wholesalers? Yes or no**

**38) Have you artisanal fishing canoe owner? Yes or no**

#### **IV-2-Relation with foreign customer**

**39) Is there a contract that binds you to foreign customers? Yes or no**

**40) What are the main requirements of your foreign customer?**

- Health, hygiene, and product quality
- Traceability of the raw material
- Freshness of the product
- Good price
- Size/Gauge/Weight/Quantity
- Others etc...?

**41) What is the payment method for foreign customers?**

- a. Cash
- B. With terms of payment
- C. By bank transfer

**42) What happens if the products are tampered with?**

- The customer bears the costs
- You bear the losses

#### **IV-2-1-Customer 's Claims**

**43) Have you ever had a complaint from your foreign client? Yes or no**

**44) If yes, what is the main cause of the non-compliance?**

- Freshness
- Product Size
- Quantity ordered / quantity delivered
- Sensory quality
- Late delivery time
- Others

**45) How many customer complaints (return of goods or non-conforming products) do you have per month?**

- Once a month
- Twice.
- Several times

#### **IV-2-2-Continuous service improvement measures**

**46) Have you planned preventive and corrective measures to improve service? Yes or No**

**47) If yes, name it?**

**48) Did the planned actions have the expected effects? Yes or no**

**49) How many planned actions have had positive effects?**

**50) What would you like to improve for a better relationship with your supplier as well as your customer?**

**51) Are you satisfied with your cooperation with your customers and suppliers?**

<b>Service/Factory need</b>	<b>Totally</b>	<b>Rather</b>	<b>Not totally</b>	<b>Rather Not at all</b>
Payment terms and deadlines				
Communication/information provided				
Product description and specification information				
Compliance with specifications				
Selling price of the product				

**IV-3-RELATIONSHIP WITH THE ARTISANAL FISHING PORT MANAGER AND THE CLPA**  
**IV-3-1-Relation with the manager of the GIE.I**

**52) Do you regularly participate in the activities of the GIE.I group? Yes or no**

**53) If yes, does the group or dock manager regularly involve you in the different activities? Yes or No**

**54) Does the GIE.I group take into account your expectations and concerns? Yes or No**

**IV-3-3-Relation with CLPA**  
**Sustainable Resource Management**

**55) Are you involved in the CLPA's fisheries resource restoration initiatives? YES or NO**

**56) Do you respect biological rest? YES or NO**

**57) In your opinion, are the fishery resources available in sufficient quantities to ensure your supply on a regular basis? Yes or No**

**58) If not, why not?**

**59) In your opinion, what are the causes of the depletion of fisheries resources?**

- Poor fishing practice
- Climate Change
- Overexploitation
- Others

**60) What are your expectations for improving services at the procurement site?**

- Organize meetings for exchange between actors
- Better sustainable management of fisheries resources

Better management of fishing port hygiene, product quality and traceability.

<b>NO.</b>	<b>FISHERY COMPANIES SURVEYED</b>	<b>ADDRESS</b>
1	1-ETS MANDIANG ET FRERES	DAKAR
2	2- GANAAN PECHERIES	DAKAR
3	3- HELLO FISH	RTE HANN MARISTE
4	4-BLUE FISH	9 CITE MILLIONNAIRE DAKAR
5	5 -AFRICA FISH	RUFISQUE
6	6- SOPASEN	PAD MOLE 10
7	7- DELPHINUS	DIAMNIADIO
8	8-SACEP SA	CAMBERENE
9	9-AFRICA FISHING	RUFISQUE
10	10-TRADIMER 1	DAKAR
11	11- DAKAR POISSON	MBOUR
12	12 -MACEF	MACEF QUAI DE PECHE DE CAYAR
13	13 -ATLANTIK SEA FOOD	SANGALKAM
14	14 -OMEGA FISHING	JOAL FADIOUTH QUAI DE PECHE
15	15 -LA PECHE 153	KM 9 ROUTE DE RUFISQUE
16	16 -BALEINE EXPORT	RUFISQUE
17	17 -GVD	ALMADIES
18	18 -AFRICA COLD	DIAMNIADIO EXTENSION MBOUR
19	19 -TRADIMER	SICAP MBAO
20	20-ELIM PECHE LTD	JOAL
21	21-WAHIDOUNE FISH	YOFF
22	22 –BM SEA FOOD	MBALLING ROUTE JOAL
23	23-SENEGAL PECHE	MOLE 10 PAD
24	24-ATLANTIC TRADING	YOFF