Food and Agriculture Organization of the United Nations

FISH4ACP
Unlocking the potential of sustainable fisheries and aquaculture in Africa, the Caribbean and the Pacific

Market study of new oyster products and oyster byproducts in the Gambia

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DEUTSCHE ZUSAMMENARBEIT

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Contents

Acronyms

BMZ	German Federal Ministry for Economic Cooperation and Development
DoF	Department of Fisheries
EU	European Union
FAO	Food and Agriculture Organization (of the United Nations)
FGD	focus group discussion
GNSSP	Gambian National Shellfish Sanitation Program
KII	key informant interview
OACPS	Organisation of African, Caribbean and Pacific States
PPE	personal protective equipment
ToR	terms of reference
VC	value chain

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Executive summary

FISH4ACP is an initiative of the Organization of African, Caribbean and Pacific States (OACPS) to support sustainable fisheries and aquaculture development. The five-year value chain (VC) development programme (2020-2025) is implemented by the Food and Agriculture Organization of the United Nations (FAO) with funding from the European Union (EU) and the Germany's Federal Ministry for Economic Cooperation and Development (BMZ).

The Gambia mangrove oyster value chain is one of 12 value chains competitively selected from over seventy-five proposals worldwide for support from the FISH4ACP programme. In 2022 and based on extensive stakeholder consultation, data collection and analysis, FISH4ACP developed a VC upgrading strategy that is being implemented from 2023 to the end of 2025. **The upgrading strategy has four components**:

1. Improving oyster resource and mangrove ecosystem monitoring and management
2. Developing new and improved aquaculture methods
3. Market development for oysters and oyster by-products
4. Improving working conditions and enabling conditions

A priority activity under component 3 is to conduct a market study and assess potential for new oyster products and oyster byproducts. On the basis of the market study, a follow up activity is to develop a market strategy with time-bound responsibilities for market development.

This report is the output of the market study work and was prepared by the Institute for Social Research and Development (ISRAD). A separate output will be the market strategy itself. The study focusses on market opportunities allowing for value addition (e.g., fresh oyster sales, and packaged oysters in bottles/jars or vacuum packs) and shells e.g. ground for poultry feed or soil enhancement, or as handicrafts and jewelry.

The **methodology** to complete the study involved a literature review to explore the existence of oyster products and byproducts in other countries, and the use of structured questionnaires and interview guides to complete a series of key informant interviews and focus group discussions with relevant stakeholders in the Gambia (community producers, hotel and restaurant owners, supermarket/stalls, tourist handicraft and jewelry stores, potential buyers of shells for use in poultry feed, and consumers). Findings from the study were discussed at a stakeholder workshop for validation and additional input before finalizing this report. The study was completed between September 2023 and February 2024.

The **literature review** found that oysters can be a high value product and are much sought after in many markets (while the Gambia is currently only generating low sales values because of the products being produced). Export markets are accessed by many producing countries, but exporting is complicated given hygiene requirements. Fresh oyster sales are possible in similar/nearby locations (Senegal) and result in high prices (and there is no reason why Gambia could not develop such markets, learning in particular from what has worked and key lessons in Senegal). For all sales of oysters for human consumption ensuring/checking food safety/hygiene is critical to ensure consumer safety and consumer confidence (the implications for the Gambia relate to the need to improve production control and food safety testing for oysters). There are a very wide variety of commercial opportunities and markets for oyster shell by-products either as bulk sales (for inputs to poultry feed, fertiliser, a variety of different construction materials and uses, white lime) or high value products (handicraft and jewellery), which other countries have been successful in developing. There could also be potential uses of shells as 'nature-based solutions' to environmental degradation and to enhance the environment.

In assessing the **potential demand for new oyster products and oyster by-products** in the Gambia, key findings are that hotels/restaurants are the most likely outlet for **fresh oysters**, tapping into the tourist market (but also potentially relevant to domestic consumers), but that while business owners are interested in exploring such sales, doing so will require work to build trust and most important to be able to demonstrate that oysters don't pose a risk to their customers of getting sick from eating them. Supermarkets/stalls are most interested in buying and selling a variety of **packaged products** (boiled/steamed [fresh], boiled/steamed [frozen], smoked) in either jars/bottles or vacuum packs, and little interest in selling fresh oysters, and no interest in selling products that are not packaged in some form or another. Dried or fried oysters could also be packaged for sale. While tourists were not interviewed to assess their interest in fresh oyster sales, Gambian consumers were very interested in buying packaged oyster products to their increased shell-life, and good awareness and demand in the market already for Gambian oysters. For all fresh and packaged products, marketing would enable a move away from the current until of measurement for sales (of cups), breaking a link with established prices. This should enable prices to be set to cover investment and operational costs (although financial feasibility and price setting needs to be further explored).

It would likely be necessary to source large oysters for sale, and in the case of fresh sales these need to be in loose individual form rather than as oysters grouped together as is the case when harvested in the wild. This is likely to mean that farmed oysters (or the large rock oysters collected in Memmeh [North Bank Region] by diving) would be needed to develop the fresh oyster market. Larger oysters would also be most suitable for packaged products (although wild collected oysters could also be used as input to packaged products).

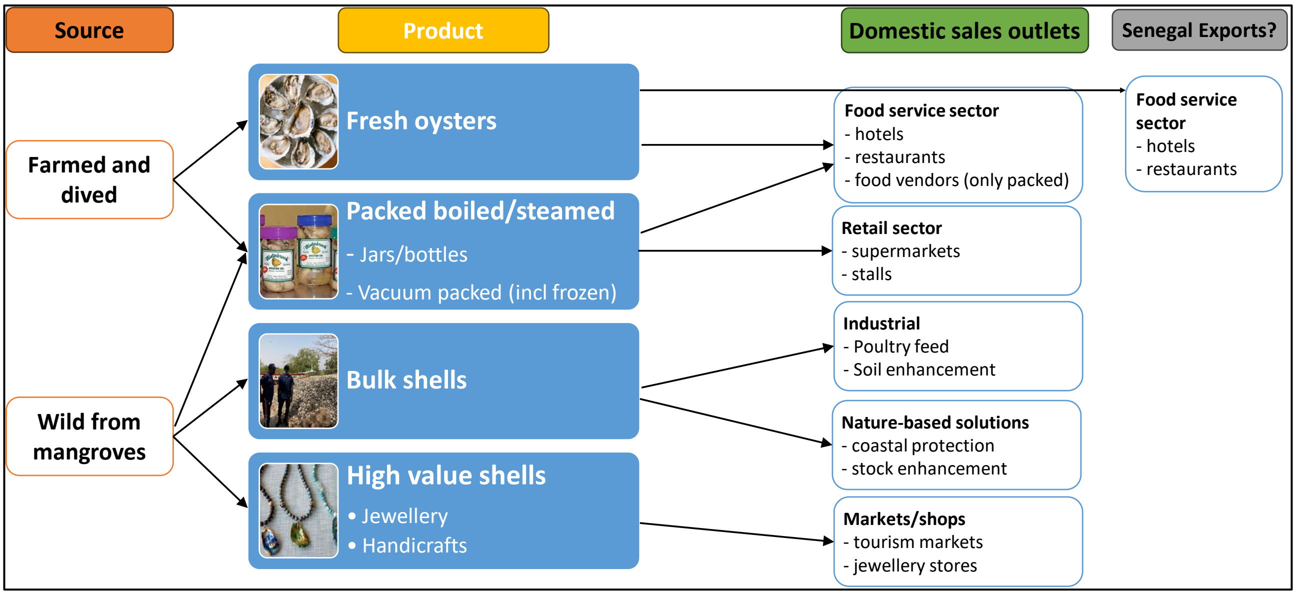
Sales of **shells in bulk** for grinding as an input to poultry (or other animal) feed is of interest to poultry feed producers/poultry farms. There may be a business opportunity for a private sector party (either an existing poultry feed producer or some other entrepreneur) to aggregate and coordinate activities to buy/collect shells from multiple communities, invest in a grinder (potentially supported by FISH4ACP), pay labour to clean shells, and then sell to other poultry farms (and to other markets e.g. for home garden or farmers for soil improvements etc). This proposal might be the subject of a small investment appraisal/business plan, with investment in a grinder provided by FISH4ACP justified on the basis of unlocking financial benefits to communities through sale of shells, and also contributing to the poultry sector in Gambia (and its food security contribution).

Tourist stalls and jewellery stores are interested in buying **handicrafts and jewellery products made from oyster shells**.

Community producers are interested in producing all the new oyster products considered (apart from smoking using the traditional smoking methods – alternative smoking methods were not discussed but could be explored). However, they are most enthusiastic about fresh oyster sales as there would be no processing time and would generate the highest price. They consider it realistic to work individually or together for new products within specific communities, but less so between communities.

Based on the above discussion, market segmentation and marketing channels may be as shown below.

FIGURE 1: PROPOSED/POSSIBLE MARKET SEGMENTATION FOR NEW OYSTER AND OYSTER BYPRODUCTS



Source: Elaborated by the authors. Note: Fresh oyster sales would be developed initially to target the domestic hotel/restaurant market. However considerable could be given over the longer term to exports to Senegal given that the market is already developed there. Fresh oysters could potentially be sold through restaurants located in communities e.g. in Kartong, Lamin, etc, when allied with tourist day trips to such locations.

The key finding about the **requirements of sales outlets for oyster products** is that quality (in terms of food safety) is the most important requirement for buyers. Buyers are terrified of selling poor quality product which would affect their reputation. Frequency of deliveries and consistency in supply are also important. Payment terms would vary depending on the specifics of supply and relations with suppliers. But buyers said payment on delivery would be possible (which would be good for women producers rather than having to deliver on credit and be paid after some specific period). Other requirements which buyers may have, but which were not explored in detail in the interviews, could relate to product information (nutritional contents, and origin – geographical location and whether farmed or wild).

With regards to the potential **effectiveness of different market promotion methods** promotional events (in hotels/restaurants), and high-quality packaging and price discounting (in supermarkets/stalls) could be particularly effective. Given concerns by hotel/restaurant managers and supermarket/stall owners about food safety issues, encouraging them to trial the sale of oysters may require active work to build trust between them and the communities and demonstrate that fresh oysters are safe to eat. This could involve explanation, and potentially site visits to observe, to communities, depuration facilities, and water quality testing. Oyster 'festivals' could also be considered

With regards to **market messaging to encourage consumer demand of oyster products**, views were very consistent amongst interviewees that market messages should focus on the health benefits of oyster consumption, and taste, rather than on the aspirational nature of oysters (being consumed by the wealthy) or the benefits to poor women in the communities. Consumer views about the positive benefits of products with a longer shelf-life suggest that this message could also be useful in promoting packaged oyster products. Other messages which could be emphasized, could relate to the safety of products, standards, and the product origin (geographical location and whether farmed or wild).

To develop the market for handicraft and jewelry products, it is very likely that messaging around the benefits to women in communities of buying such products would be effective with customers/tourists. One could imagine visual tools (photos, or short social media video clips) being used to highlight this – showing women developing products in the communities. Market development will need to be based on piloting of a variety of different products which could possibly be made for sale.

For market development of new products, **a range of investments in assets and consumables will be necessary**, but investment costs are not expected to be significant and not large-scale investments are expected. Also of critical importance will be capacity building with community producers in: maintaining the quality of oyster products and oyster by-products alike; using and maintaining equipment; production methods and processes for the items to be produced and sold; how to engage with and implement market promotion methods; financial management and book-keeping; the regulatory environment in which selling takes place; and building and maintaining relationships with the buyers of their products. The market strategy to be developed will need to mitigate a range of risks and challenges in developing new products and markets, and also consider ways of financing the basic equipment and consumables required.

By way of conclusion, this study has found that there does appear to be potential to develop and sell new oyster products and oyster by-products in the Gambia, which could serve to add value for women oyster products, and result in a wider range of product offerings for consumers to meet their demand. Product safety and quality will be of critical importance.

1. Introduction

1.1 Background

The Gambia is blessed with a rich aquatic ecosystem along its Atlantic coastline, and in the river Gambia and its tributaries, with extensive growth of mangroves making it an ideal location for the production of mangrove oysters (*Crassostrea tulipa/gasar*). Historically, oysters have been collected from the wild, primarily in the nutrient-rich mangrove estuaries that line the country's coast. Oysters have been a traditional source of food and livelihood for coastal and riverine communities, and are therefore deeply rooted in the Gambian culture. For generations, Gambians have relied on oysters as a source of nutrition and income, and in recent years the domestic oyster market has gained significant attention due to its economic and social benefits to producers.

Some suspected overharvesting, and habitat degradation, have threatened wild oyster populations, necessitating the need for improved management of wild stocks as well as the search for sustainable alternative production methods. Current levels of value-addition during the processing of wild oysters is also very limited, with almost all products being sold in boiled/steamed form, loose, and without any packaging. Nevertheless, the oyster industry provides an important means of livelihood for local communities. One of the most notable advantages of the industry is its positive impact on women’s livelihood, given that almost all of those involved in the collection, processing and sale of oysters (around 1,200 people) are women.

The oyster value chain has the potential to contribute to economic stability in coastal and riverine communities, and as the oyster industry continues to grow, it is essential to build it on a solid basis for socio-economic development. With the right investment, policies, and community engagement, the oyster industry can thrive and serve as a model for responsible wild collection and farmed production of oysters in West Africa. The well-intended government policies seeking to develop commercial oyster aquaculture, and to generate more value-addition from existing wild harvests of oysters, will help develop a market-oriented and more commercial and vibrant oyster value chain. This will increase incomes and social benefits. It is in this context that the FISH4ACP project in the Gambia is supporting the government and beneficiary communities in the development of the oyster value chain.

1.2 The FISH4ACP project in the Gambia

FISH4ACP is an initiative of the Organisation of African, Caribbean and Pacific States (OACPS) to make fisheries and aquaculture value chains (VCs) more sustainable. It contributes to food and nutrition security, economic prosperity and job creation by ensuring the economic, social and environmental sustainability of fisheries and aquaculture in Africa, the Caribbean and the Pacific. FISH4ACP is implemented by FAO with funding from the European Union (EU) and the German Federal Ministry for Economic Cooperation and Development (BMZ).

The FISH4ACP programme aims to improve the productivity and competitiveness of twelve fisheries and aquaculture VCs in twelve OACPS member countries, ensuring that economic improvements are matched with environmental sustainability and social inclusion. It pays particular attention to small and medium-sized enterprises, because of their potential to provide economic and social benefits, especially for women and young people.

The mangrove oyster VC in the Gambia is one of the twelve VCs competitively selected from over seventy-five proposals for implementation of the programme. In 2022 and based on extensive stakeholder consultation, data collection and analysis, FISH4ACP developed a VC upgrading strategy that is being implemented from 2023 to the end of 2025.

The upgrading strategy has four components:

1. Improving oyster resource and mangrove ecosystem monitoring and management
2. Developing new and improved aquaculture methods
3. Market development for oysters and oyster by-products
4. Improving working conditions and enabling conditions

1.3 Objectives of this report

One of the upgrading strategy's priority activities under component 3, as identified in the FISH4ACP value chain analysis and design report (Macfadyen et al, 2022), is to conduct a market study and assess potential for new products and marketing channels for oysters and oyster by-products (e.g., shells). On the basis of the market study, a follow up activity is to develop a market strategy with time-bound responsibilities for market development.

A local research institute (ISRAD) has been contracted by FAO as a service provider to conduct the market study and strategy development. This report is the output of the market study work. A separate output will be the market strategy itself.

The market study report builds on the potentials identified in the value chain analysis and design report for new oyster products and the by-products (e.g., shells) for market development. The study aims to: a) understand the oyster market, the players (including governance) and how they operate, b) assess the growth potential of the oyster market and market for by-products, and c) identify market opportunities (e.g. niche markets for new oyster products and by-products) and critical success factors of the oyster market to inform the strategy.

1.4 Methodology and data sources

1.4.1 Scope of the market study

The study focusses on market opportunities allowing for value addition (e.g., fresh oyster sales, and packaged oysters in bottles/jars or vacuum packs) and shells e.g. ground for poultry feed or soil enhancement, or as handicrafts and jewelry.

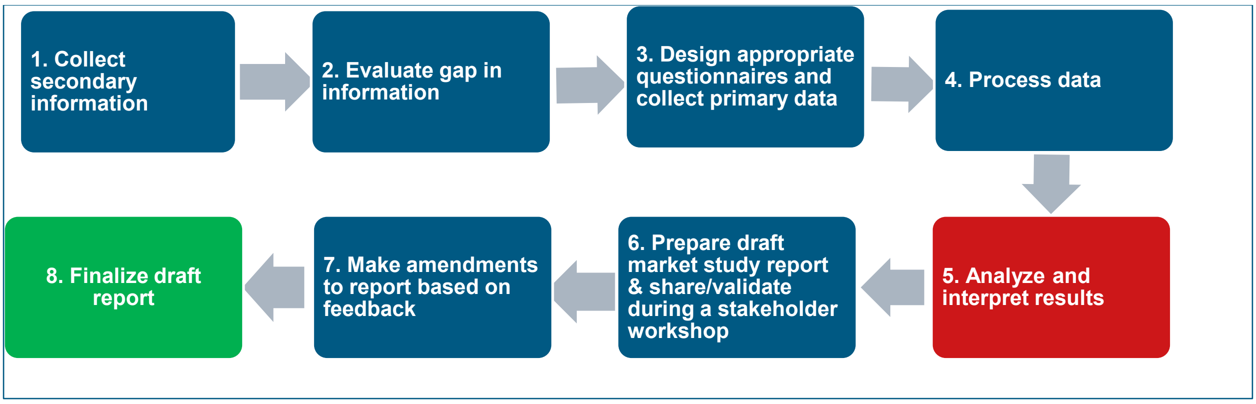
The market study considers and presents information related to what is being done in other countries with regards to market development of oyster and oyster by-products, and then in the Gambian context assesses the regulatory framework, market demand in different end markets for oyster and oyster by-products, buyer and consumer requirements, ways of effective market promotion, and the investment and capacity building requirements that could be necessary. It also presents key risks and likely challenges in developing new products and marketing channels for Gambia's new oyster products.

A comprehensive survey was completed of oyster producers/processors, consumers, supermarket and urban stalls (retailers), and hotels and restaurants in The Greater Banjul Area (GBA), West Coast Region (WCR) and North Bank Region (NBR); and small and medium enterprises (SMEs) which may provide a market for byproducts (shells) such as poultry feed producers, jewelry sellers and handicrafts outlets.

1.4.2 Approach

Based on the Terms of Reference (ToR) for the study, ISRAD approached the assessment by systematically implementing the following steps over the period September 2023 to February 2024.

FIGURE 2: STEPS INVOLVED IN COMPLETING THE MARKET STUDY

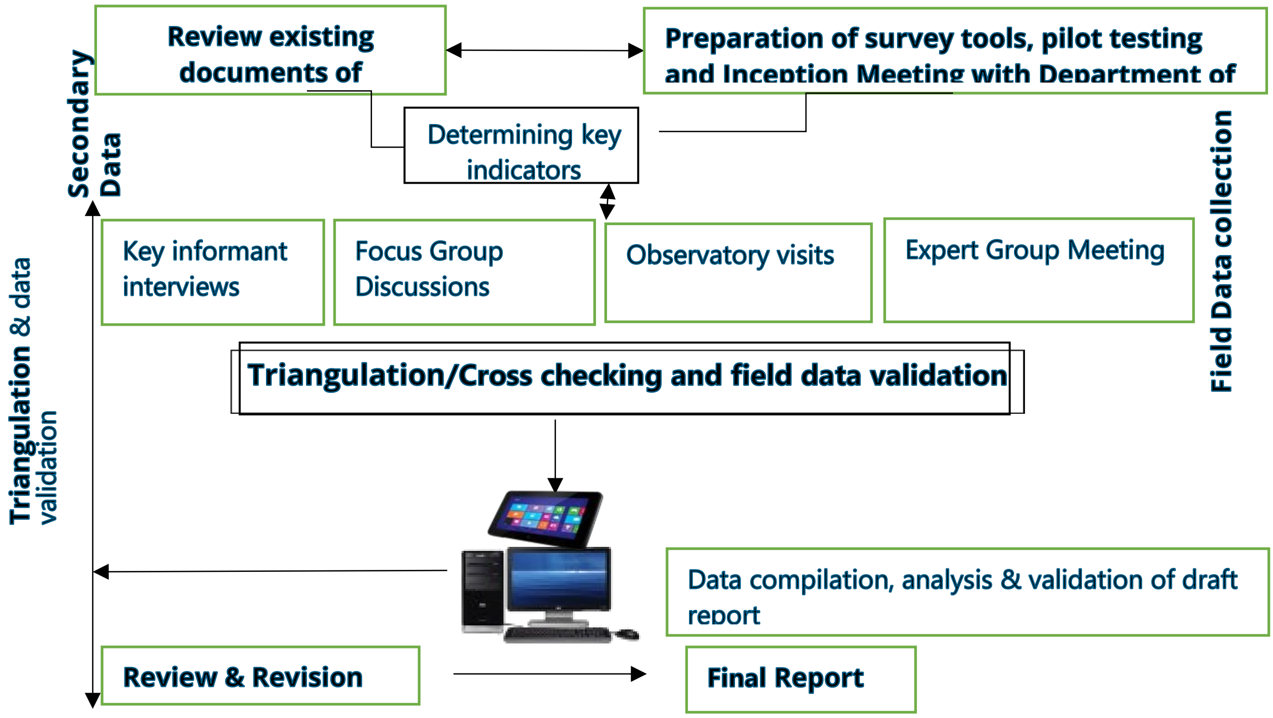


Source: Elaborated by the authors.

1.4.3 Data collection methods

The study used a combination of methods to capture both quantitative and qualitative information. Desk research was used to review available reports, and was followed by field data collection to engage with stakeholders through: formal interviews with key informants (KIs), focus group discussions (FGDs) among market actors using semi-structured interviews; and expert group meeting to assess oyster sector governance and validate/triangulate available data; and on-site visits and direct observations. A stakeholder workshop ws also held in February 2024 to discuss draft findings and conclusions as a way of validating the study outputs and gaining additional stakeholder insights. In this way, methods were complementary and mutually reinforcing.

FIGURE 3: SCHEMATIC DIAGRAM OF THE METHODS APPLIED FOR THE CONDUCT OF THIS STUDY



Source: Elaborated by the authors.

1.5 Structure of the report

Following this short introduction in Chapter 1, the report is structured in chapters as follows:

- Chapter 2 deals with lessons from other countries about the sale and marketing of oysters and oyster by-products, based on a literature which was completed.
- Chapter 3 provides a short overview of the currently marketing of oysters in the Gambia, and the regulatory environment.
- Chapter 4 consider the potential demand for new oyster products in the Gambia and what they might be

- Chapter 5 proposes a possible strategy for segmenting the market when it comes to market development of the new products, and the marketing channels that would result.
- Chapter 6 explores market development, in terms of consumer and buyer requirements, market promotion methods, and messaging.
- Chapter 7 considers investments in assets and consumables that may be necessary for new oyster products and oyster by-products.
- Chapter 8 discusses some of the capacity building requirements that will be necessary.
- Chapter 9 considers potential risks and challenges in developing new products and successfully marketing them.
- A final Chapter (10) provides a short conclusion.

2. Oyster and oyster by-product sales in other countries

Text in this section is based on a separate and more detailed literature review which was captured in an additional background output to inform this market study report.

2.1 Oyster production and trade

2.1.1 Global production and export trade

Global oyster supply is heavily dominated by Asia comprising 95 percent of the global oyster aquaculture production by weight, and 88 percent by value in 2016. China alone accounted for 86 percent of global production by weight in 2016. (Botta et al, 2020) Other countries of significance in global oyster aquaculture production and supply are France, U.S., South Korea, Japan, and Canada.

The global oyster market size reached 7.11 million tons in 2022; and is expected to reach 8.34 million tons by 2028. (IMARC, 2022) Increasing demand for oysters comes from restaurants and supermarkets, and rising awareness about the health benefits of consuming oysters. This increase in demand is driving increases in global trade of oysters, as well as domestic consumption in countries which produce oysters.

Global oyster trade is growing with a total traded value of USD350M in 2021. Between 2020 and 2021 the exports of Oysters grew by 53.1 percent, from USD 229 million to USD 350 million. The top oyster exporters (data from 2018) are France (USD 110 million), Ireland (USD 49 million), Canada (USD 34 million) and the United States (USD 22 million). (Drago et al, 2022)

FIGURE 4. GLOBAL TRADE OF OYSTERS

Source: Drago et al, 2022

2.1.2 Regional oyster trade

Major oyster markets are mainly located in the United States of America, Europe, and Asia (predominantly China, but also Japan), and these three regions have a market share of over 95 percent. (Global Market Watch July 2023) France, China, and the United States of America are the countries which individually import the most oysters.

The United States of America and European countries primarily prefer farmed oysters to be sold in the raw and half-shell, receiving higher prices per unit weight than other oyster products (e.g., shucked meat, clumps for char-grilling, etc.) that are sold in other markets. Asian countries, including China, focus on shucked meat products used in canning and frozen meals as well as for oyster sauce.

Lack of standard criteria for selecting sites for shellfish farms; poor preservation and regulatory measures, and threat of poisonous shellfish due to toxic red tides or other shellfish toxins exacerbates pose threats to the quality of food safety of oyster from some countries, culminating in health and safety alerts, and subsequent rejections by developed markets at border controls. Access to international markets can be very challenging and expensive.

According to the Senegal FISH4ACP value chain analysis and design report (Drago et al, 2022), only 13 countries (including two African countries) are authorized to export fresh or processed bivalves to the European Union because of the health standards relating to microbial content (viruses and pathogenic bacteria), natural mollusc toxins and the level of water health classification and self-monitoring requirements. This implies a need for rigorous testing, standardization and certification of oyster products for the European Union market.

Major African players in terms of exports of oysters are South Africa and Namibia, which export to Hong Kong and mainland China; and Tunisia and Morocco which export bivalve molluscs to the European Union markets, as well as to the Russian Federation.

There is currently some limited regional and cross-border oyster trade between Senegal and the Gambia (Macfadyen et al, 2022) but such trade is informal in nature, not officially controlled or regulated, and due communities living close to borders. Demand for processed oysters in Senegal is high (exceeding the supply) thus, leading to importation of the commodity from neighboring countries on an informal basis. Therefore, there is demand for Gambian oysters in neighboring Senegal, but the trade may require formalization and standardization, ensuring compliance with food safety and quality standards and certification processes in oyster trading for risk reduction and protection of consumers.

2.1.3 West African domestic oyster markets

A number of countries in the West African region produce oysters which are sold domestically, generally in boiled/steamed, dried or smoked form, rather than for consumption as fresh products. Perhaps the most important however and relevant to this study given the size of production and its proximity to the Gambia, is Senegal.

In Senegal, oyster products marketed are in processed and fresh form. The processed form[1] is predominant and comprises of boiled and dried, and smoked oysters. Processed oysters constitute about 99 percent of the oysters sold while a relatively small quantity of fresh oysters is sold. Fresh oysters are usually large oysters (often graded by size) and are sold at higher price per kilogram mainly to tourists, in hotels and during feasts in the more affluent market in the capital city of Dakar. Processed oysters are mainly consumed by Senegalese and are sold at processing sites, in weekly markets and in urban centres directly to consumers or to middlemen or wholesale buyers and onwards sale to retailers. Smoked oysters are also processed and sold directly to consumers at processing sites or delivered to middlemen /wholesalers for marketing.

Key characteristics of oyster marketing arrangements in Senegal are: (Drago et al, 2022)

- An estimated Senegalese market value of USD 1.7 million from domestic production, plus USD 500 000 from imported oysters from neighbouring countries.
- Urban markets are the main outlets for consumers.
- National demand for oyster-based products is higher than supply and growing in proportion to population growth (FAO Focus Groups 2021), which was in the order of 3 percent in 2020.
- Fresh oysters for sale are sorted according to size and weight, and fresh oysters have a much higher value per kilo harvested (equivalent live weight) than the processed oysters.
- Key factors that determine oyster prices and price-stability in Senegal are the size and shape of the shell, the form of processed oyster (fresh, boiled, grilled, dry, fresh-in-half-shell, etc.), and methods of packaging and marketing.
- Packaging**:** Polystyrene crates costing between USD 3.7 and USD 5.5 each are suitable for transporting fresh oysters; while some market actors use plastic packaging to preserve and transport oysters. Both methods of packaging are commonly used in the local markets to preserve and transport oysters.
- Labelling: By regulation in Senegal, proof of the safe origin of the oysters must be provided. To this end, each package of oysters should bear a numbered label stating:
  - safety approval by fisheries official of the region from where the oysters are dispatched
  - the quantity of oysters
  - the date of dispatch
  - the origin (location) of product
  - the destination of the oyster
- Cold stores: the cold chain is one of the most important requirements for reaching markets for fresh oysters that ensure healthiness and economic sustainability, but this

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[1] a) Boiled oyster: means oyster cooked in its own stock, then half-shelled or in complete shell; b) Grilled oyster: oyster grilled/cooked over charcoal or wood fire until it opens, then it is half-shelled or in complete shell; c) Dried oyster: boiled or grilled oyster that is shucked then dried under the sun and in open air; d) Boiled and smoked oyster : means oyster cooked in its own stock, first half-shelled or fully shelled and then smoked.

is often not adequately accomplished. Apart from the main road artery, Senegal has little infrastructure dedicated to support services, particularly for agricultural and perishable goods.

FIGURE 5: PACKAGING OF BOILED AND DRIED OYSTER PRODUCTS IN SENEGAL

Source: Drago, et al, 2022

2.2 By products from oyster processing

The literature cites that oyster shells contain a large amount of calcium carbonate and can be used in the production of fertilizers, poultry feed, lime for paining, paper coating agents, pigments, cosmetics, and even pharmaceutical products. Oyster shells are used in a variety of other ways, including:

- in road construction
- to create artificial fish reefs and coastal embankments, as a method of enhavaing wild oyster stocks ie. nature-based solutions
- roof tiles
- concrete aggregates
- farm/soil improvement (e.g. to reduce salinity)

There are also examples in the literature from outside of the Gambia of oyster shells being used in the creation of jewelry and handicraft products (e.g. in Senegal and Tanzania).

2.3 Conclusions from the literature review

Considering all the literature reviewed, a number of key conclusions can be drawn which are of relevance to development of fresh and value-added oyster products, and oyster by-products, in the Gambia.

- Oysters can be a high value product and are much sought after in many markets (Gambia is currently only generating low sales values because of products being produced).

- Export markets are accessed by many producing countries, but exporting is complicated given hygiene requirements (so the Gambia upgrading strategy is sensibly not focussing on exports for now).
- Fresh oyster sales are possible in similar/nearby locations (Senegal) and result in high prices (and there is no reason why Gambia could not develop such markets, learning in particular from what has worked and key lessons in Senegal).
- Aquaculture/farmed product is often used as the basis for fresh sales, but ensuring quality of water in which oysters are grown is critical (implications for Gambia are obvious in terms of needing to increase aquaculture production, but in areas where water quality can be assured).
- For all sales of oysters for human consumption ensuring/checking food safety/hygiene is critical to ensure consumer safety and consumer confidence (the implications for the Gambia relate to the need to improve production control and food safety testing for oysters).
- Branding, education about health benefits of eating oysters, and good traceability can be important as part of market development.
- There are a very wide variety of commercial opportunities and markets for oyster shell by-products either as bulk sales (for inputs to poultry feed, fertiliser, a variety of different construction materials and uses, white lime) or high value products (handicraft and jewellery), which other countries have been successful in developing. (In Gambia shells are only really used for lime and as poultry feed input, so there could be potential for development of products and markets related to other by-products).
- There could also be potential uses of shells as 'nature-based solutions' to environmental degradation and to enhance the environment e.g. coastal embankment and protection, artificial reefs, etc (which are not being used in Gambia for such purposes but could be).

3. General market and consumption patterns and regulatory requirements in the Gambia

3.1 General market overview

According to Macfadyen et al (2023), national consumption of oysters is estimated at c.a. 300 tonnes per year of processed oyster meat; giving a current capita consumption of 0.13 Kg (with Gambia's total population of 2.3 million). About 95 percent of oyster produced is for consumption at home (mainly in urban settlements); and 97 percent of consumers commonly buy boiled/steamed oysters. The report further revealed that a consumer can purchase an average of 13 cups in a month; and almost 40 percent of consumers buy oysters more than once a week, and 28 percent once every one or two weeks with household expenditures averaging around USD 10 on oysters. Of note, the study found that consumption frequency for bivalve meats was significantly lower than for fish and other shellfish due to its seasonality and limited availability.

Consumption of mangrove oysters from wild capture is a longstanding tradition in the country. Buyers of the products from retail markets are mainly women (85 percent of surveyed consumers) with an age of between 25 and 50 years (around 70 percent of respondents). During the season when oysters are available for sale, consumers most commonly buy boiled oysters (96 percent of surveyed consumers), with grilled/smoked oysters (5 percent) and dried (<1 percent) being far less purchased. Boiled/steamed oysters are often categorized by size - 'big' and 'small' fetching different prices. Grilled/smoked oysters are mainly sold as 'big'. Dried oysters are uncategorized by size, given that once dried the product remains in a small form.

The average number of cups (the unit of sale) purchased by a consumer in a month is around 13, with half of the consumers buying oysters, buying between 2 and 5 cups per month during the oyster season. With regards to purchase frequency, almost 40 percent of consumers buy oysters more than once a week, and 28 percent once every one or two weeks. Fresh oysters are not sold in the market, and there isn't (except for some small trials) any packaging of product e.g. in bottles or vacuum packs.

Oysters are mainly demanded by urban consumers in Greater Banjul Area including Kanifing Municipality, and West Coast Region, where an estimated 61.3 percent (1 409 900 people) of Gambia's total population were living in 2023. The supply of oysters is heavily dominated by the same regions - comprising about 80 percent of the total production. The oyster value chain is vertically integrated with 70 percent of actors processing, supplying and retailing the products they produced themselves, with the remainder collecting and processing only, or retailing only. There are no middlemen/Iterant traders involved.

Urban markets are thus the main outlet for oysters in the Gambia. Major markets are found in Banjul (the capital city), Serrekunda, Latri Kunda, Talinding, and Bakau (Kanifing municipality), Brikama and Lamin (West Coast Region), and Essau in North Bank Region. Market actors are mainly women. Retail marketing is the main method of oyster trade in the Gambia, and there are virtually no sales at present through food service establishments e.g. restaurants, stalls, although some servicing of school meals. A market survey conducted by members of the TRY Oyster Women's Association showed that the majority of food service businesses that were visited do not currently feature oysters on their menus due to a variety of reasons including limited availability of oysters (especially, during the long off-season period), lack of reliable delivery, sanitation concerns (especially in the higher class hotels), and previous experiences purchasing oysters from women's oyster stands that lacked adequate quality.

Prices for steamed/boiled oyster are quite homogeneous across regions. While there is high demand for oysters in the country, local markets are limited by low and irregular seasonal supplies of the commodity, with sales mostly taking place during the dry season from December to June. Despite the rising domestic demand for oyster from the growing consumers, the industry has so far been unable to tap into market development opportunities to increase value-addition from oyster sales through a broader range of value-added oyster products, or to make the most of shells which are the byproduct of oyster processing.

There are no dedicated physical structures for the selling of oysters in the main markets; and sales are conducted at various locations, sometimes using rudimentary shelters or umbrellas to provide shade from the sun. The inadequate market infrastructure, and lack of formalized marketing networks is hindering the efficient distribution of oyster products to local markets. Market actors, especially small-scale operators, face challenges accessing capital for investment in infrastructure, technology, and expansion. Most oyster vendors sell their produce in and around the periphery of urban markets in temporal makeshift spaces or by the roadside, especially in the Tanbi/Kamalo area. In more limited instances and involving only small volumes, oysters are sold by processors in the communities/villages where processing takes place. The small volumes of oysters being produced, with the domestic market showing high demand and being able to absorb the overall production, and at 'good' prices calls for a significant market expansion for the product.

The setting and enforcement of food quality standards related to oysters in domestic retail markets are lacking. There is no control of standards at oyster processing sites, and no testing of product safety at retail markets, which represent the main marketing channel.

Small quantities of oysters are shipped overseas (the UK, EU countries and the United States), mainly for family use of the Gambian Diaspora with occasional preference for traditional foods. The products are also taken for special ceremonial occasions of Gambians living abroad. There appears to be significant potential for expanded demand of oyster, especially after the Gambia has satisfied the sanitary requirements and private food safety standards stipulated for oysters and other bivalves.

With regards to the sale of oyster byproducts (e.g. shells), this is currently limited to the production of lime (for painting), and some use for road construction. There is currently no use of oyster shells in the production of handicrafts or jewelry.

3.2 Regulatory landscape

Various Ministries (e.g. of Fisheries Water Resources and National Assembly Matters, of Environment, Agriculture, Trade, and of Gender, Children & Social Welfare), are interested in promoting the oyster industry in the Gambia through the articulation of various policies and plans.

The regulatory landscape for producing and selling oysters in the Gambia includes:

Aquaculture Policy and Strategy which aims to foster growth in aquaculture (including oyster farming) and the promotion of private sector investments in the sector provides a framework for a sustainable oyster industry, addressing issues related to resource management, and environmental protection.

The Tanbi oyster and cockle co-management plan, which provides for user rights of riverine communities, and the setting of prices.

Environmental Regulations: Oyster farming is subject to environmental regulations aimed at safeguarding the health of coastal ecosystems - including regulations pertaining to water quality, habitat conservation, and the prevention of pollution, as well as efforts to mitigate the environmental impact of aquaculture activities.

Food Safety and Quality Standards and the Food Safety Act (2011) which aim to ensure food safety and quality standards for bivalve mollusks including oyster farming and marketing operations, as well as ensuring that oyster products meet rigorous safety and hygiene criteria for placing on the market, instilling confidence in consumers and trade partners as well as enhance access oyster export markets.

Trade and Export Regulations covering issues such as tariffs, quotas, and product safety and quality standards; and ensuring compliance with trade regulations and agreements to access international markets.

Licenses, Permits and Market Levies are typically required for aquaculture activities (including oyster farming and marketing. The licenses and permits specify the conditions under which oyster farming can take place, including location, production limits, and environmental safeguards, while the market levies are imposed on urban stalls. Registration and licensing requirements also exist for food business operations including for fishery products business operators to ensure official control and inspection for compliance with food safety and quality requirements.

The National Tourism Board oversees the domestic Tourist market e.g. stalls and handicrafts, restaurants, etc)

The Gambia has been a member of ***Codex Alimentarius*** since 1971, which supports international food standards, guidelines and codes of practice for the safety, quality and fairness of this international food trade.

Although recent policies and plans exist at national and sectoral levels, their implementation has been poor due to low capacity, lack of coordination and inadequate budgetary allocations, and they need to be upgraded with a food systems lens. For example, there is a current lack of adequate laboratory facilities for the testing of food products to ensure their safety. Despite the presence of requisite structures with clearly defined roles and responsibilities of stakeholders in the governance of the oyster industry, this assessment identified diverse challenges with each key institution, at national, decentralized and community levels. They relate to issues of inter-sectoral coordination requiring inputs from all the key ministries to upgrade the oyster industry.

Key challenges which may be faced in developing the oyster market in the Gambia include limited enforcement of norms and standards, as well as quality control for both domestic and international market. As the oyster industry has the potential to become a robust engine of inclusive growth in the aquaculture sub-sector, key stakeholders realize the need for collective and collaborative efforts to regulate the oyster trade. The Gambian National Shellfish Sanitation Program (GNSSP) for example was designed and intended to boost consumer confidence (Rice et al, 2011) but never actually implemented. Water sampling to assess and monitor total coliforms and fecal coliforms at stations near shellfish harvesting areas to ensure sanitary quality of molluscan shellfish is favoured, but is not in place.

The USAID Women Shellfishers and Food Security project sampled three sites in The Gambia from June 2021 to March 2022 and found low total fecal coliforms and E coli. Nevertheless levels of E. coli contamination at some locations, limited post-harvest shellfish sanitation, and a lack of cold chain management from harvest-to-market remain as key challenges.

4. Potential demand for new products

Currently, as noted earlier, oysters in the Gambia are sold in three main product forms (steamed/boiled, grilled/smoked, and dried), and purchased almost exclusively by consumers in retail markets. Though Gambia's oyster industry is relatively small, it has significant potential for developing new products to meet the demands of its diverse consumers, and to expand into the food service sector. The productive use of the byproducts of oyster processing, in the form of shells, is virtually non-existent in the Gambia, representing a missed opportunity.

This market study has thus explored the potential to produce and sell a variety of new products and byproducts[2] rather than focusing on the existing products that dominate the value chain.[3]

4.1 Fresh oysters, and oysters in packaging

Fresh oysters are already being sold in Senegal where a successful market has developed with hotels and restaurants, largely servicing tourists. A depuration facility in Senegal serves to provide confidence over food safety. Fresh oysters are mainly consumed by foreign nationals, especially expatriates and some European and Asian tourists; and wealthy urban consumers are beginning to appreciate the product. In Senegal, fresh oysters are being sold for around USD 7.5 for 12 oysters (=about 1kg implying that large oysters are required for this market).

FIGURE 6: FRESH OYSTERS SOLD AS HALF-SHELL

Source: ©James Green Whitstable Oyster Company Limited

[2] There are some very limited sales of vacuum packed oysters in The Gambia, and also some sale of shells for use in poultry feed, but volumes are small and not well developed.
[3] Oyster sauce was not considered given the large volume of oysters required, the related packaging costs, and the low market price, all of which mean that such a product offers no/low potential in The Gambia given the prices already obtained for boiled/steamed oysters in the domestic market.

In the Gambia, urban stalls, supermarkets, hotels and restaurants are not selling fresh oysters.

Neither are they selling packaged oyster products in the form of bottles/jars, or vacuum packs – see Figure 7: Examples of oyster products in bottles (of boiled/steamed oysters following processing, or these oysters in frozen form and then vacuum packed) – except for some limited trials supported by projects which are underway.

Community producers are not interested in producing smoked oysters using the traditional method of smoking oysters in their shells because of the wood required, the smokey environment, and the risk of oyster shell fragments spitting out during the smoking process and damaging their eyes. However, smoked packaged products were also considered during this study because the smoking of oysters could take place after boiling/steaming for vacuum packing to create a value-added product. This could be done using small and low-cost smoking machines with no health risks to producers, and there is known to be demand from domestic consumers for smoked oysters.

FIGURE 7: EXAMPLES OF OYSTER PRODUCTS IN BOTTLES AND VACUUM PACKS

Source: TRY oyster women's association

In this study we assessed the potential interest of hotels/restaurants, and supermarkets/stalls, in purchasing and selling the products shown in the two tables below. However, a stakeholder workshop held in February 2024 also suggested that dried and/or fried oysters could be suitable products for sale in vacuum packs.

TABLE 1: INTEREST OF HOTELS/RESTAURANTS IN BUYING AND SELLING NEW PRODUCTS

Product	Range	Most common	Average	No. responses
Fresh	0-2	1	1.00	6
Boiled/steamed oysters (not packed/preserved)	0-2	0	0.67	6
Boiled/steamed oysters (preserved in jars or vacuum packed)	0-2	0	0.67	6
Boiled/steamed oysters (frozen)	0-2	0	0.67	6
Smoked oysters (not packed/preserved)	0-2	0	0.67	6
Smoked oysters (vacuum packed)	0-2	0	0.67	6

Source: Elaborated by the authors based on own data collection and analysis of interviews.
Note: Figures show the range of scores for respondents, the most common score/mode, and the average score, with scores attributed as follows: Definitely = 2, Maybe 1, No = 0, no response left blank

The key conclusions from hotel/restaurant responses are:

- Hotels/restaurants are most interested in fresh oysters compared to other products, however the average score of 1, and the fact that a range of responses was provided, suggests that demand would not be universal and considerable efforts may need to be made to encourage hotels/restaurants to sell fresh oysters.
- It is difficult for some interviewees to determine the real demand for fresh oysters when customers aren't asking for oysters and most business owners don't know much about oysters. However, a general inference from interviewees is that a market for fresh oysters in half-shell could be developed and they would be willing to try, but it would require sensitization of consumers and assurance of food safety.
- Some potential demand for packaged products may exist for oysters to be used as an ingredient to dishes being served.

TABLE 2: INTEREST OF SUPERMARKETS AND STALLS IN BUYING AND SELLING NEW PRODUCTS

Product	Range	Most common	Average	No. responses
Boiled/steamed oysters (preserved in jars or vacuum packed)	1-2	2	1.83	6
Boiled/steamed oysters (frozen)	1-2	2	1.67	6
Smoked oysters (vacuum packed)	1-2	2	1.67	6
Fresh oysters in half-shell	1-2	2	1.50	6
Boiled/steamed oysters (not packed/preserved)	0-2	0	0.50	6
Smoked oysters (not packed/preserved)	0-1	0	0.17	6

Source: Elaborated by the authors based on own data collection and analysis of interviews.
Note: Figures show the range of scores for respondents, the most common score/mode, and the average score, with scores attributed as follows: Definitely = 2, Maybe 1, No = 0, no response left blank

The key conclusions from the responses by supermarkets/stalls are:

- Supermarkets/stalls are most interested in buying and selling all the packaged products, and have less interest in selling fresh oysters and no interest in selling products that are not packaged in some form or another.
- Demand for packaged products seems very strong.

Key findings from a FGD with domestic Gambian consumers to assess their interest in purchasing these products are that consumers:

- are interested in buying all new oyster products.
- have no awareness of fresh oysters in half-shell as a product.
- like to purchase oysters for consumption at main meals, routinely and on special occasions, and so welcome products being available year-round.
- are willing to pay more for packaged products that last longer

Key findings from a FGD with oyster producers to assess their interest in producing these products are that communities:

- are interested in producing all new oyster products (apart from smoking using the traditional smoking methods – alternative smoking methods were not discussed during the FGD).
- are most enthusiastic about fresh oyster sales as there would be no processing time and would generate the highest price. But there is also an interest in other products because they can increase shelf-life.
- considered it realistic to work individually or together for new products within specific communities, but less so between communities (although knowledge transfer and exchange of ideas between communities could be useful).

- willingness to borrow money which may required to invest in related assets and consumables (see later section) is unclear - some would, some wouldn't.

Other key conclusions from the research and consultations completed are that:

- With a growing national population (3.1 percent growth rate per year), and strong demand by domestic consumers for oysters, growth in demand for packaged value-added oyster products can be assumed.
- The tourist market is well established in the Gambia, with increasing numbers of Asian tourists, and many European Union visitors being repeat visitors. This bodes well for the potential demand for fresh oysters. Fresh oysters could also be marketed to Gambian consumers.
- While some data were collected during interviews on possible sales volumes, the reliability of the data was not sufficient to model future demand in a quantitative way.
- For all fresh and packaged products, marketing would enable a move away from the current unit of measurement for sales (of cups), breaking a link with established prices. This should enable prices to be set to cover investment and operational costs (although financial feasibility and price setting needs to be further explored).
- It would likely be necessary to source large oysters for sale, and in the case of fresh sales these need to be in loose individual form rather than as oysters grouped together as is the case when harvested in the wild. This is likely to mean that farmed oysters (or the large rock oysters collected in Memmeh [North Bank Region] by diving) would be needed to develop the fresh oyster market, and would be most suitable for packaged products (although wild collected oysters could also be used as input to packaged products).
- Strong demand and existing knowledge of oysters in local market means that new products offer strong potential, especially when involving packaging to maintain shelf-life

4.2 Oyster by-products (shells)

With large volumes of oyster shells at almost all processing sites, this study explored the potential of using oyster shells to generate new products and value-added. Two main avenues were considered:

- The use of carefully selected shells for use in jewelry and handicraft products (currently not being done at all in the Gambia)
- The use of shells to be ground and used as an input to poultry feed or for soil enhancement e.g. bulk use of shells (this already occurs in the Gambia but only a limited way, with many poultry producers relying on imported ground oyster shells from Senegal as an input to their poultry feed.

Use of shells in bulk for nature-based solutions was not specifically explored in this study, on the assumption that selling shells for such purposes may be unlikely. However, this could be further explored.

4.2.1 Ornamental handicrafts and jewelry:

The study did not find ornamental and jewelry making from oyster shells anywhere in the Gambia. In Tanzania, producing ornamental/handicraft accessories and jewelry from oyster shells is contributing to local livelihoods, and a French/Senegalese jeweler is known to produce high quality jewelry using cowrie shells for sale mostly in African city markets through high-end jewelry stores, with production taking place in both Senegal (early production processes) and France (finishing) - some specific production functions are completed by communities, with specialist metalwork requiring metal-working and soldering expertise.

FIGURE 8: EXAMPLE JEWELRY AND HANDICRAFTS FROM OYSTER SHELLS

Source: ©Ngone

With a strong tourist industry in the Gambia (albeit very seasonal), and additional potential to sell products to Gambians, **conclusions from interviews with those running tourist handicraft stalls and jewelry store owners suggest**:

- a potentially vibrant market for jewelry and handicrafts.
- a strong interest by them in selling such products if produced.
- current imports of Senegalese and Asian gold-coated necklace, bangles, fingerings and earrings, and glittering beads including waistbands ("Jali-jali").
- a majority of consumers being middle class women with ages ranging 25 to 65 years.
- customers who include both Gambians, and foreign tourists.
- individual customers often spend GMD500 – GMD 1000 (USD 8-15) per item, depending on the product.

- opportunities for creating demand for handicraft and jewelry because younger generations like fashion, and visiting tourists cherish Gambian unique products.
- market development would need to be tested for specific products.

With regards to the views of women in the communities who could make such products:

- they expressed a strong interest in doing so, and confidence in selling to tourists, who like to buy local things.
- it would be sensible to encourage production on a group/community level so that different individuals could perform the production functions they are most interested in and capable of doing e.g. making holes in shells, painting and decorating, polishing, etc.

4.2.2 Bulk shell sales, or ground shells for sale

Poultry feed made of oyster shells is widely used as a calcium-addition because such feeds are highly effective in reducing egg cracking and increasing feed efficiency. GamHolland Heaven, Sahel Poultry Farms, EMPAS, Unique Global, G-farms, Astra Feeds and Royal Family farm are poultry farms into small-scale feed production in the Gambia. Shells could also be used as an input to other types of animal feed.

Some of these farms (owning equipment such as mixers, generator set, corn cleaner, etc.) are already buying some quantities (2 to 4 metric tons per month) of oyster shells as one of the ingredients to poultry feed, with the primary objective of producing their own feed and supplying their poultry farms first. But feed producers are also buying ground shells from Senegal, because of an inability to agree purchase prices for shells from communities in the Gambia which are sufficiently low to incentivize purchases of shells domestically for grinding. The farms do however also on-sell as much as 20 percent of their feed (produced) to other poultry farms that do not have the equipment necessary to produce poultry feed.

Oyster shells constitute 2-15 percent of the poultry feed depending on formulation, which is different for different birds at different levels of growth and development (broilers and layers, starter, grower and finisher formulations).

Less than 15 percent of the feed requirement is met by domestic production with annual imports from Senegal filling the feed gap. Feed coming from Senegal is priced at GMD8/kg (USD 0.12), while the cost of producing local feed is more than GMD20/kg (USD 0.3), which is uncompetitive against imported feed on an import price parity basis. The poultry industry is growing, but there is stiff competition with imported poultry products.

Oyster shells sold by communities for poultry feed are sold at GMD6-8 (c.a. USD 10 cents) per kg compared to imported prices of ground shells from Senegal of around GMD3/kg (USD 5 cents). Lime used for construction in the country is packed into 25kg or 50Kg bags with recent sales prices varying between GMD 100 (USD 1.47) and GMD 350 (USD 5.14) per 50kg.

Poultry feed producers in the Gambia express an interest either in buying shells already ground by Gambian communities, or in bulk for their own cleaning and grinding. Which, is not entirely clear from the consultations so far completed, but a preference seems to be for shells already ground. For feed producers, there will be issues of logistics to consider, along with a comparison of the price for imported ground shells compared to the total costs of buying, cleaning and grinding shells themselves if buying from Gambian producers.

For individual communities, costs of suitable grinding machines may be prohibitive (although in themselves are not very expensive), and communities appear reluctant to be responsible for delivering shells, or ground shells to feed producers. Communities are interested to sell shells in bulk and FGD discussions suggested they think it would be better to get something for the shells rather than nothing. The price of GMD 6 500 (USD 95.43) for a ton, and GMD 100 (USD 1.47) per 50kg bag were suggested during discussions. Some communities would and some wouldn't want to engage in the cleaning of them – and for those that would only if they were paid to do so.

In conclusion, there may be a business opportunity for a private sector party (either an existing poultry feed producer or some other entrepreneur) to aggregate and coordinate activities to buy/collect from multiple communities, invest in a grinder (potentially supported by FISH4ACP), pay labour to clean shells, and then sell to other poultry farms (and to other markets e.g. for home garden or farmers for soil improvements, as an input to other types of animal feed, etc). This proposal might be the subject of a small investment appraisal/ business plan, with investment in a grinder provided by FISH4ACP justified on the basis of unlocking financial benefits to communities through sale of shells, and also contributing to the poultry sector in Gambia (and its food security contribution). Key to success would be agreement being reached between communities and the purchaser of shells to ensure a stable business environment for both parties. This may need to be mediated/negotiated by TRY oyster womens association.

5. Market channels and segmentation

Given the discussion, findings and conclusions presented in the previous section, there appears an obvious basis on which to segment the market for different new products, with related marketing channels.

Fresh oyster sales could be developed with targeting at the domestic hotel/restaurant market (or in some cases sales to tourist at the community level if aligned with tourist day trips). However considerable could be given over the longer term to exports to Senegal given that the market is already developed there. However, this could be logistically complicated and take considerable effort in time to explore and develop this market.

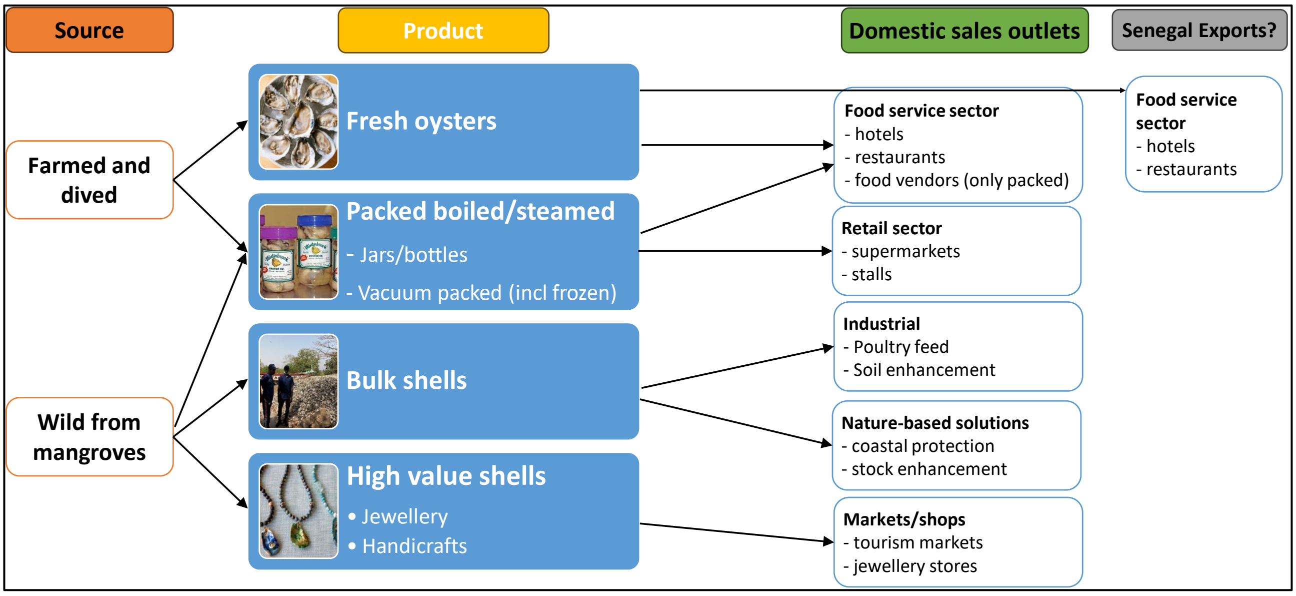
Packaged boiled/steamed (and potentially dried, smoked and/or fried) oysters (in jars/bottles, vacuum packs) could be targeted primarily at supermarket/stalls in the Gambia. However, there may be some lower potential to sell them to hotels/restaurants as an input to dishes using oysters.

These new oyster products would most likely be sourced from the farmed oysters being supported by the FISH4SACP programme, however large oysters collected through diving in Memmeh would also be suitable, and wild collected oysters could also be used as inputs.

New products from oyster shells (the byproduct of oyster processing after boiling/steaming and shucking) could be sourced from the wild collected oysters. Bulk sales of shells for grinding would be targeted at poultry feed producers in the Gambia or for soil enhancements, and their use in nature-based solutions could also be considered. Handicraft and jewelry products would be targeted at domestic tourism stalls and jewelry shops.

This market segmentation is presented in the Figure below to show the marketing channels involved.

FIGURE 9: PROPOSED/POSSIBLE MARKET SEGMENTATION FOR NEW OYSTER AND OYSTER BYPRODUCTS



Source: Elaborated by the authors. Fresh oysters could potentially be sold through restaurants located in communities e.g. in Kartong, Lamin, etc, when allied with tourist day trips to such locations.

With regards to sales relationships between producers of these new products and buyers of them, as under current arrangements in the value chain which do not involve middlemen/traders, it should be possible to establish direct selling/buying relationships between producers and the sales outlets.

6. Market development – consuymer and buyer requirements, market promotion methods, and messaging

6.1 Consumer preferences and requirements

6.1.1 Fresh oyster sales

These products will likely be consumed by foreign tourists, or perhaps to a lesser extent Gambians or other nationalities living in the Gambia (e.g. Asians, who often exhibit strong demand for seafood). Experience of consumer preferences for fresh oysters in developed country markets indicates:

- An over-riding concern of food safety and the risk of getting ill from eating oysters
- Other important buyer requirements being related to
    - Shell shape (ideally cupped to easily retain the oyster in the half-shell)
    - Shell size standardized
    - Meat content (large oysters in the shell)
    - Taste (not too salty)

It should be possible for Gambian producers to meet these requirements from farmed oysters, assuming a robust water quality and product testing system is put in place.

6.1.2 Packaged oyster products

These products will likely be consumed by Gambian consumers.

There are an estimated 12,500 existing consumers of oyster in the country, and at present about 97 percent of them prefer buying boiled/steamed oysters, which is almost the sole commodity on the market at present. Consumers are mainly Gambians, and some other African nationalities. Women of ages ranging 30 -50 years are the main customers of oysters in the urban markets, but men do occasionally buy especially during Ramadan.

Consumer preferences and requirements will play a significant role in shaping the oyster market for new products in the future. Understanding these preferences and demands are crucial in oyster businesses, and in developing new products and maintaining a competitive edge. Nutritious, quality and freshness of products were the most frequently reported preferences from the FGD conducted with Gambian consumers during this study, while price, seasonality and limited availability were the most commonly reported draw-backs. The extent to which consumers demand for new products may be price sensitive or not, is not year clear, and further work will be required to establish appropriate price points for different products. Value for money is certainly an important need for consumers who want to feel that they are getting value for their money when purchasing oyster products. Pricing strategies should thus align with perceived quality and benefits. Likewise the extent to which market promotion could generate new oyster consumers, rather than relying on existing consumers of oysters, is not yet clear.

Consumers showed varying preferences for the taste and flavor of oysters. Some prefer the briny and salty taste of ocean-picked oysters, while others favour sweeter or milder flavors associated with estuary or freshwater-grown oysters. Texture is another critical factor, with some consumers preferring oysters with a firm texture, while others like them plump and succulent. Preferences may also depend on culinary applications, such as boiling/steaming, grilling, or frying. Oyster size matters to some consumers - while large and small oysters are favored in boiled/steamed form, larger oysters are often preferred for grilled/smoked products.

Government stakeholders consulted during the study observed that consumers are increasingly turning towards seafood products for their health and nutrition benefits. Oysters are known for their nutritional value, including high levels of vitamins, minerals, and omega-3 fatty acids. Products that highlight these health benefits are appealing to increasingly health-conscious consumers.

Consumers' culinary interests can drive demand for new oyster products. Oyster-based dishes from different cuisines and cooking styles can spark interest and expand the market. Innovative oyster recipes and products that are easy to use in home cooking, and oyster sauces and soups can cater for consumers looking for convenience in their seafood preparation. Consumers want assurance about the source and quality of oyster products they will be buying. Traceability systems that would provide information about the oyster's origin and processing methods can build-up and increase consumer (especially tourist) confidence. Meeting or exceeding food safety standards will be paramount in developing future oyster markets. Consumers expect oysters to be safe for consumption, free from contaminants, and processed in sanitary environments.

This study found three oyster product forms of consumer preference for future home consumption:

- Fresh/frozen oyster – oysters generally fresh, and also refrigerated, but occasionally frozen;
- Processed oysters – oysters processed in ready-to-eat forms. Generally, these are prepared by boiling, steaming, smoking or salting/drying;
- Oyster stew or in “Ebbeh” – processed oyster stew, soup and sauces.

While processed oysters are firmly rooted in consumer eating habits, and are generally eaten as part of a typical family meal, consumers are still wary of oyster in half-shell, due to health reasons that may be associated with the product (e.g. "quality and pathology") and lack of awareness of the product among consumers. Also, consumption of such products is not part of normal eating habits in the Gambia.

Consumer preferences and requirements are vital drivers of innovation and growth in marketing any product. Businesses that can adapt to these preferences by offering diverse products, ensuring sustainability and quality, and providing information to consumers are more likely to thrive. Maintaining good quality products, value addition and improved market information communication can make the oyster market succeed.

The study found that the level of oyster consumption is influenced by socio-economic factors including culture and tradition, market price, quality and durability of products, quantity available and reliability – e.g. for supermarkets and hotels. Although majority of Gambians do not consume oyster, successful awareness and promotional programmes could increase level of consumption in future. Other factors that dictate frequency of purchase and consumption of oyster are market price differences – e.g. prices relative to other seafood products, gender and household size. Available data showed that women are major purchasers of oyster; and are most likely to try new oyster products. Males and those who consider the health benefits of oyster are part of the frequent buyers and consumers. However, more educated consumers tend to refrain from eating large quantities of oyster due to related product hygiene and sanitation. Awareness and concerns about oyster/food safety is becoming an issue among them.

6.2 Preferences/needs of oyster sales outlets

In this study we asked hotels/restaurants, and supermarkets/stalls, about a range of potential requirements they may have to determine which would be most important in encouraging them to sell new oyster products. The results are shown in the two tables below.

TABLE 3: IMPORTANCE OF DIFFERENT REQUIREMENTS FOR HOTELS/RESTAURANTS TO ENGAGE WITH NEW PRODUCTS (FRESH OYSTERS)

Buyer requirement	Range	Most common	Average	No. responses
Quality	2	2	2.00	5
Frequency of deliveries	1-2	2	1.80	5
Getting deliveries made to you	1-2	2	1.80	5
Consistency of supply	1-2	2	1.60	5
Formalised forward supply contracts	0-2	2	1.40	5
Buying from a trader or directly from community producers	1	1	1.00	4
Consistency in buying price	0-2	1	0.80	5

Source: Elaborated by the authors based on own data collection and analysis of interviews.
Note: Figures show the range of scores for respondents, the most common score/mode, and the average score, with scores attributed as follows: Very = 2, Quite =1, Not = 0, don't know or no response, no score

TABLE 4: IMPORTANCE OF DIFFERENT REQUIREMENTS FOR SUPERMARKETS/STALLS TO ENGAGE WITH NEW PRODUCTS (PACKAGED PRODUCTS)

Buyer requirement	Range	Most common	Average	No. responses
Quality	2	2	2.00	7
Frequency of deliveries	1-2	1	1.43	7
Formalised forward supply contracts	1-2	1	1.43	7
Consistency of supply	1-2	1	1.29	7
Consistency in buying price	1-2	1	1.29	7
Getting deliveries made to you	1-2	1	1.29	7
Buying from a trader or directly from community producers	0-2	1	1.00	7

Source: Elaborated by the authors based on own data collection and analysis of interviews.
Note: Figures show the range of scores for respondents, the most common score/mode, and the average score, with scores attributed as follows: Very = 2, Quite =1, Not = 0, don't know or no response, no score

Key conclusions about the requirements of sales outlets from these data and the interviews are that:

- Quality (in terms of food safety) is the most important requirement for buyers. Buyers are terrified of selling poor quality product which would affect their reputation. Every single interviewee responded that quality was 'Very important'.
- Frequency of deliveries is the second most important requirement for buyers.
- Consistency in supply (if necessary backed up by forward supply contracts or at least memorandums of understanding) is also important as is getting deliveries made to them.
- Payment terms would vary depending on the restaurant/hotel concerned, and would depend on specifics of supply and relations with suppliers. But buyers said payment on delivery would be possible (which would be good for women producers rather than having to deliver on credit and be paid after some specific period). This was also the case for most supermarkets/stalls interviewed.

6.3 Market promotion methods and messaging

This study also explored the potential effectiveness of different market promotion methods and messaging.

6.3.1 Fresh and packaged oysters

TABLE 5: HOTEL/RESTAURANT VIEWS ABOUT MARKET PROMOTION METHODS

Perceived effectiveness of promotion methods	Range	Most common	Average	No. responses
Physical in-house demonstrations and promotional events	2	2	2.00	4
Branding	2	2	2.00	3
Packaging	2	2	2.00	4
Social media	1-2	2	1.75	4
National media (radio/TV/billboards)	1-3	2	1.75	4
Print e.g. brochures	1-4	2	1.75	4
Price discounting	1-2	2	1.75	4

Source: Elaborated by the authors based on own data collection and analysis of interviews.
Note: Figures show the range of scores for respondents, the most common score/mode, and the average score, with scores attributed as follows: Very = 2, Quite =1, Not = 0, don't know or no response, no score

TABLE 6: SUPERMARKET/STALLS VIEWS ABOUT MARKET PROMOTION METHODS

Perceived effectiveness of promotion methods	Range	Most common	Average	No. responses
Packaging	2	2	2.00	7
Price discounting	0-2	1	1.29	7
Social media	0-2	2	1.14	7
Branding	0-2	0	0.80	5
National media (radio/TV/billboards)	0-2	0	0.71	7
Physical in-house demonstrations and promotional events	0-2	0	0.71	7
Print e.g. brochures	0-1	0	0.43	7

Source: Elaborated by the authors based on own data collection and analysis of interviews.
Note: Figures show the range of scores for respondents, the most common score/mode, and the average score, with scores attributed as follows: Very = 2, Quite =1, Not = 0, don't know or no response, no score

Some conclusions from the responses and other questions posed to interviewees about market promotion methods are:

- All methods may be effective to open the hotel/restaurant market, but promotional events could be particularly effective.
- The holding of oyster festivals could also be considered and could be effective.
- Given concerns by hotel/restaurant managers (and supermarket/stall owners) about food safety issues, encouraging them to trial the sale of oysters may require active work to build trust between them and the communities and demonstrate that fresh oysters are safe to eat. This could involve explanation, and potentially site visits, to communities, depuration facilities, and water quality testing.
- High quality and effective packaging is considered the most effective way of developing the market for packaged products in supermarkets/stalls – perhaps unsurprisingly. Price discounting (i.e. reduced prices for a particular period), and social media could also serve to unlock market demand.
- Having dedicated stalls/outlets for packaged oysters could be considered.
- Many supermarkets/stalls suggested methods less effective would be print (due to illiteracy), branding (again due to illiteracy), and national media (which could be expensive).

Interviewees were also asked about what 'messaging' might be useful to emphasis with consumers when trying to generate demand for new oyster products. The results are shown in the two tables below.

TABLE 7: HOTEL/RESTAURANT VIEWS ABOUT MARKET PROMOTION METHODS

Usefuless of messaging	Range	Most common	Average	No. responses
Consuming oysters is good for you (health benefits of eating oysters)	2	2	2.00	5
Oysters are a tasty product	2	2	2.00	5
Aspirational in terms of income status (oysters are for the wealthy)	0	0	0.00	5
Consuming oysters benefits poor and marginalised women	0	0	0.00	5

Source: Elaborated by the authors based on own data collection and analysis of interviews. Note: Figures show the range of scores for respondents, the most common score/mode, and the average score, with scores attributed as follows: Very = 2, Quite =1, Not = 0, don't know or no response, no score

TABLE 8: SUPERMARKET/STALLS VIEWS ABOUT MARKET PROMOTION METHODS

Usefuless of messaging	Range	Most common	Average	No. responses
Consuming oysters is good for you (health benefits of eating oysters)	0-2	2	1.86	7
Oysters are a tasty product	0-3	1	1.29	7
Consuming oysters benefits poor and marginalised women	0-4	0	0.29	7
Aspirational in terms of income status (oysters are for the wealthy)	0-1	0	0.14	7

Source: Elaborated by the authors based on own data collection and analysis of interviews. Note: Figures show the range of scores for respondents, the most common score/mode, and the average score, with scores attributed as follows: Very = 2, Quite =1, Not = 0, don't know or no response, no score

Some conclusions from the responses and other questions posed to interviewees about market messaging are:

- Views were very consistent amongst interviewees that market messages should not try to sell oysters based on it being a high-priced product consumed by the wealthy, or that consumption/purchases would benefit poor women in the communities. It is surprising that the hotel/restaurants don't consider messaging around oyster being aspirational would be effective. This might need to be further checked.
- Messaging should focus primarily on the health benefits of oyster consumption (e.g. emphasis on omega 3), and its taste.
- While not explored in interviews with business owners, consumer views about the benefits of products with a longer shelf-life being desired, suggest that this message could also be useful in promoting packaged oyster products.
- Other potentially useful messaging could focus on: i) product safety, ii) product origin (geographical and whether wild or farmed).

6.3.2 Jewelry and handicrafts

The basis on which existing tourist stalls and jewelry shops would sell oyster byproducts in the form of handicrafts and jewelry has not been explored. Further work is required to assess whether they would do so having purchased products from the communities, if they would sell on commission, and what the expectations/wishes of community producers would be.

It is very likely that messaging around the benefits to women in communities of buying such products would be effective with customers/tourists. One could imagine visual tools (photos, or short social media video clips) being used to highlight this – showing women developing products in the communities.

Another option for market development and promotion could be to establish dedicated stalls/outlets for these products, run by community producers themselves. Again, further discussion is needed with community producers on this issue.

What does seem clear is that market development would need to be based on piloting of a variety of different products which could possibly be made for sale, to determine:

- The costs and time involved in their development by the communities.
- The strength of demand for them from consumers/buyers.
- Prices obtained for different products.
- Based on all of the above, the financial viability of different items.

7. Possible investment and technology requirements to produce and sell new products and access new markets

7.1 Introduction

Both public and private sector investment in the oyster value chain is limited at present, and communities that are engaged in the mainly wild oyster harvesting, processing and marketing industry struggle hard to keep their small business operations going using simple equipment and infrastructure. Traditional oyster processing applies traditional cooking, boiling or steaming using barrels on makeshift fires using wood fuel. Shucking of oyster meat during processing utilizes manual methods with knives and locally available woven baskets and pans as containers that defy hygiene rules and food safety requirements. The operations are carried out mainly in the open or under limited makeshift shelters. Marketing of current oyster products is more often than not done without appropriate packaging and in open marketing spaces.

Women producers generally make do with what little personal investment finances they can gather from family members or informal lending '*osusu*' rather than from formal sources of finance e.g. micro-finance organisations. The government has not invested in the industry and there is virtually no private sector involvement from outside the communities in assets to support value-addition. This explains why almost all oysters are sold as boiled/steamed product and on the same day they are processed/shucked, with no additional value-adding.

There is limited utilization of oyster shells as an input to poultry feed. The poultry feed industry, although having a significant demand for oyster shells, has made limited investment in shell crushing technology and equipment for production and supply for feed formulation. The few poultry farmers and feed manufacturers either have to import crushed shells or use low-performing crushing machines. In fact, they have preference in buying ready-to-use products from suppliers than sourcing and crushing shells for their own. White lime production is carried out also using traditional methods that are labor-intensive and have very high demand on forest resources as they use large quantities of wood to burn the shells into powder.

Use of oyster shells in handicraft and jewelry making and selling are currently non-existent. However, given potential availability of technology applications, training and investment financing, there is potential for increased utilization of oyster shells in the production of valuable by-products for various other benefits.

All of the above mean that, implementation of component 3 of the oyster value chain upgrading strategy (market development) will require interventions and investment to support a shift to upgraded technology, equipment and facilities (and skills training and other forms of capacity building around their use). There is potential for better organization of the industry and support to the value chain through the application of improved technologies in the production, processing, packaging, transport and storage aspects of the value chain. Such potential exists around value addition, product development and the introduction of new products, while improving handling, storage, product safety and quality requirements, and marketing including product promotion and consumer education and awareness could all require investments. Improved technologies can also be applied to utilization and development of the oyster by-product market.

7.2 Revelations from the oyster market study survey data and results

The market study data collection and analysis revealed that different actors and potential actors in the production and marketing chains for oysters have varied interest in investment in the market segments and in the application of equipment and technologies for production and marketing of current oyster products, (and potential new products) and by-products. They also highlighted a lack of equipment and technological applications as challenges to the production and marketing of these products and therefore see these as limitations and barriers that constrain the market.

For **community producers and processors**, to develop packaged products, investment would be needed in vacuum packing and bottling machines and related packaging, either at the community level or more likely at some central level to coordinated packing. They also indicated a lack of knowledge about the existence of shell grinding equipment and their use, with a current lack of demand for such equipment. They highlighted the lack of the right tools and equipment as challenges in being able to market handicrafts or jewelry. Some actors indicated a willingness to borrow money to invest in small equipment for handicraft and jewelry making, and as startup costs with availability of finance and training. On the other hand, other actors lamented being unable to take loans due to a lack of co-lateral or fear of losing co-lateral to lenders. However, they all welcomed the availability of training, finance and relevant equipment to engage in handicrafts and jewelry making.

As to whether there would be any equipment or small investment needs in selling oyster products, **supermarkets/stalls** identified possible investment needs in chill/cold storage (for frozen products) (fridges and freezers) to store products and prevent spoilage and losses with particular regard for unsold oyster products. It would also be necessary to have shelving to display packaged products.

Hotels and restaurants would not need any significant investments to market/sell fresh oysters, but product would need to be supplied to them in poly drip boxes containing ice. And investment in a depuration facility to ensure oysters are safe to eat could also be required.

Government institutions noted the potentially high cost of equipment, packaging materials, handling equipment and proper transport facilities as being among the investment challenges. It was insinuated that any investments and technology application for developing the oyster market would need to be coupled with product promotions to increase demand for products, consumer education and awareness creation relating to nutritional quality and product safety, and that this could also require financing.

Poultry farm and feed producers identified technology equipment and related investment costs requirements as: oyster shell crushing, grinding or milling machines with good hammers and strong sieves. This may need to be complemented with mixers, pelletizers, weighing scales, bags and labels.

Crushed or ground shells into fine powder could also find various uses including in animal feed preparations in agriculture as fertilizer or soil amendment, construction works.

Tourist handicraft stalls and jewelry shops/sellers indicated community investment requirements in the small equipment to produce products, which could include: equipment and hand tools for filing and grinding, scrapers, hand drills, scalpels, sandpaper, decorating paints or dyes, and brushes). They also suggested a potential need for some small investments they might need to make themselves in stalls to provide room for these new products.

These considerations are summarized in the table below. The market strategy will need to cost necessary investments in such items as part of a costed plan of action.

TABLE 9: SUMMARY OF POSSIBLE INVESTMENTS REQUIRED TO DEVELOP NEW PRODUCTS

Product	Possible assets	Possible consumables
Fresh oysters	• Depuration facility (building and equipment) • Perforated poly boxes • Trays • Knives for opening oysters	• Ice
Vacuum-packed boiled/steamed, dried or smoked oysters (frozen or not)	• Vacuum packing machine • Chest freezer • Poly boxes (for transportation) • Personal protective equipment (PPE) • Work tables • Drying and/or smoking machine • Aluminum bowls • Buildings	• Vacuum packs • Labels (and adhesive) • Ice (for frozen product during transport)
Bottled boiled/steamed (of smoked or dried) oysters	• Sealing/capping machine or boiling equipment • (smoking or drying machine)	• Bottles • Jars • Labels (and adhesive) • Preservatives
Bulk shell sales	• Grinding/milling machines • Wheelbarrow/carts (for transportation) • Buckets/pans • Spades	• Bags

Handicrafts	• Cutting/carving tools • Polishing tools/equipment • Brushes • etc	• Paints • Beads • String • Chains • etc

Source: Elaborated by the authors

8. Possible capacity development needs to unlock new markets

Capacity development needs in Gambia's oyster industry to unlock market potential is enormous. The market expansion and/or upgrading of the oyster industry will involve a shift from current wild harvesting/processing and the use of simple technology, towards oyster aquaculture (which will be source of fresh oysters as explained earlier) and the use of increasingly sophisticated technology for value-addition and the development of new oyster products and oyster by-products.

The capacity development needs for aquaculture development are not covered in this report, as they are the focus other activities falling under component 2 of the upgrading strategy. However, this emphasizes the inter-linkages between the upgrading strategy's components.

For market development of new products, the market strategy to be developed will likely need to have a specific focus on capacity building and to include activities related to:

- Maintaining quality of oyster products and oyster by-products alike.
- The use and maintenance of the assets considered in the previous section.
- Awareness about nature-based solutions.
- Marketing and business relationship skills.
- Production methods and processes for the items to be produced and sold.
- How to engage with and implement market promotion methods.
- Financial management and book-keeping.
- The regulatory environment in which selling takes place.
- Building and maintaining relationships with the buyers of their products e.g. the sales outlets presented in the market segmentation diagramme presented earlier.

9. Key risks and likely challenges in developing new products and marketing channels in the Gambia

The study identified a range of risks and **challenges in developing new oyster products and marketing channels** in the Gambia as follows:

- Quality Control: Maintaining product quality is crucial for consumer satisfaction. Current challenges include proper handling, storage, and transportation which are all potential risks factors affecting oyster product development.

- Supply Chain Challenges: Many future buyers especially hotels are concerned about a consistent and reliable supply of oysters which could be challenging due to factors like weather conditions, harvesting logistics, and potential overfishing.

- Regulatory Compliance: Adhering to regulations related to seafood processing and marketing is essential. Navigating these regulations may pose challenges for new product development.

- Market Acceptance: Introducing new oyster products may face resistance or slow acceptance in the market. Consumer preferences, cultural factors, and awareness play a role in determining success.

- Infrastructure Limitations: Limited infrastructure for processing, packaging, and transportation are currently the major impediments for the development of efficient marketing channels in the Gambia.

- Environmental Considerations: Sustainable harvesting practices are essential to ensure long-term viability. Awareness and commitment to environmental responsibility may pose challenges.

- Consumer Education: Educating consumers about the nutritional benefits and unique features of new oyster products may require strategic marketing efforts to overcome potential knowledge gaps.

- Distribution Challenges: Establishing effective distribution channels may be challenging, especially in regions with limited infrastructure or fragmented markets. The study found uncoordinated distribution channels with no formalized contract between actors particularly between community producers and hotels and supermarkets.

- Seasonal Variability: Oyster availability is seasonal, leading to fluctuations in inputs (in the form of oysters) to value-added oyster products. Managing this variability while maintaining market presence could be difficult.

Interviewees were asked whether they considered certain factors as important challenges in developing markets for new products. The results are shown in the two tables below, and indicate that **most of the possible challenges are considered as being prevalent and relevant to market development**, emphasizing that developing new products and successfully marketing them will require considerable efforts.

TABLE 10: HOTEL/RESTAURANT VIEWS ABOUT MARKET DEVELOPMENT CHALLENGES

Possible challenges in market development	Range	Most common	Average	No. responses
Market demand and consumer awareness	0-1	1	0.80	5
Transporting products from communities to you	0-1	1	0.75	4
Logistical issues	0-1	1	0.75	4
Skills and capacities of producers to meet your requirements	0-1	1	0.67	3
Working with community producers to meet your requirements for consistent and quality supply	0-1	0	0.50	4
Your own skills and knowledge of how to sell oysters	0-1	0	0.33	3

Source: Elaborated by the authors based on own data collection and analysis of interviews. Note: Figures show the range of scores for respondents, the most common score/mode, and the average score, with scores attributed as follows: Yes = 1, No = 0, Don't know left blank

TABLE 11: SUPERMARKET/STALLS VIEWS ABOUT MARKET DEVELOPMENT CHALLENGES

Possible challenges in market development	Range	Most common	Average	No. responses
Market demand and consumer awareness	1	1	1.00	5
Transporting products from communities to you	1	1	1.00	6
Logistical issues	1	1	1.00	5
Skills and capacities of producers to meet your requirements	1	1	1.00	6
Your own skills and knowledge of how to sell oysters	0-1	1	0.67	6
Working with community producers to meet your requirements for consistent and quality supply	0-1	0	0.40	5

Source: Elaborated by the authors based on own data collection and analysis of interviews. Note: Figures show the range of scores for respondents, the most common score/mode, and the average score, with scores attributed as follows: Yes = 1, No = 0, Don't know left blank

The study also considered **challenges related to developing consumer demand,** identifying the following:

- Inadequate processing and packing systems, and insufficient value additions to produce innovative product forms - thus limiting market demand and restricting oyster market development.
- Poor market facilities and lack of formalized marketing networks can hinder the efficient distribution of oyster products to local and international markets. Market actors, especially dedicated retailers and other small-scale operators, face challenges accessing capital (or credit) for investment in infrastructure, technology, and sales expansion.
- As the high-value markets (supermarkets, hotels and formal restaurants are not yet in the oyster business, they have little information about demand and supply conditions. Hence, there is need for comprehensive awareness and promotional efforts to increase consumer awareness on the health and nutritional benefits of oyster.
- Generating demand, ensuring quality, and transporting products to market are flagged by the urban stalls as the main challenges in the growing oyster business. Lack of appropriate transport, high and unstable costs of transport from producing communities would impact on oyster prices, and thus demand.
- Electricity supply is erratic in the Gambia, which may have serious implications on stored oyster in hotels, restaurants and supermarkets. Poor post-harvest handling and lack of cold storage facilities (fridge and freezers) - both at source and at inland distribution points are key challenges.
- Limited access to access market information on the required quality, food safety standards, prices, etc. could affect business choices and decisions of oyster entrepreneurs.
- Producers and processors may not have the skills for the development, marketing and commercialization of oyster by-products.

10. Conclusions

This market study report has covered a lot of issues and presented a wide range of information which should be of use for the development of the market strategy.

By way of conclusion:

- There does appear to be potential to develop and sell new oyster products and oyster by-products in the Gambia.
- Product safety and quality will be of critical importance.
- The market can be easily segmented for different products.
- There will be a need for capacity building to support all aspects of market development.
- There will likely be a need to finance basic equipment and consumables which may be necessary.
- Successful market development will require a market strategy with clear objectives, activities, responsibilities and a costed budget.

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Macfadyen, G., Vilela López, B., Thiao, D., Ward, A., 2023. The mangrove oyster value chain in the Gambia: Analysis and design report. Rome, FAO

This report presents the results of the value chain analysis of the mangrove oyster value chain in the Gambia conducted from 2023-2024 by the value chain development programme FISH4ACP.

FISH4ACP is an initiative of the Organisation of African, Caribbean and Pacific States (OACPS) aimed at making fisheries and aquaculture value chains in twelve OACPS member countries more sustainable. It contributes to food and nutrition security, economic prosperity and job creation by ensuring the economic, social and environmental sustainability of fisheries and aquaculture in Africa, the Caribbean and the Pacific.

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