

Rapid Reconnaissance of the Fish Value Chain in Nigeria

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Key Messages

- In mid-2022, RSM2SNF conducted a rapid reconnaissance of the fish value chain in Ebonyi, Kebbi, and Oyo states. In total, 148 semi-structured interviews were conducted with key informants from nano, micro, small, and medium scale enterprises.
- The fish subsector has expanded in recent years. This reflects rising demand that stems from income growth and changing diets and is sometimes facilitated by government investment in infrastructure.
- Many products in the value chain are imported, including frozen fish and industrially-produced fish feed.
- The experiences of value chain actors vary considerably across states. While fish farming is common in Ebonyi and Oyo, capture fishing is common in Kebbi. Kebbi's distance from the coast means that feed is locally produced rather than imported.
- The depletion of wild fish stock is a widespread challenge and is partly attributed to agrochemical runoff and water pollution. Poor water quality in Ebonyi limits the establishment of hatcheries for fish seed.
- Food safety is a concern throughout the value chain: Fish farmers use unregulated substances in fish production, and processing is done with little consideration for hygiene or contamination.

Introduction

Fish plays an important role in the Nigerian food system, as it is among the cheapest sources of protein and accounts for about 40% of the country's protein intake (Liverpool-Tasie et al., 2021). Nearly 80% of local fish is produced or captured by micro, small, and medium enterprises (MSMEs) (FAO, 2007). At the same time, although Nigeria is the largest aquaculture producer in sub-Saharan Africa and the second largest inland capture fisheries producer (FAO, 2020), most fish consumed in the country are supplied through imports rather than domestic production. This presents an imperative to grow Nigeria's fish value chain and support the MSMEs that operate therein.

The RSM2SNF project aims to understand the structure, conduct, and performance of the fish value chain in order to support MSMEs to improve the availability, affordability, and safety of fish products in Nigerian markets. Toward this end, a rapid reconnaissance of the fish value chain was performed in mid-2022 in the states of Ebonyi, Kebbi, and Oyo (Figure 1). The team interviewed 44, 54, and 50 key

informants from MSMEs in Ebonyi, Kebbi, and Oyo states, respectively. The informants provided information on their enterprises, including their assets, procurement of inputs, production and handling practices, and marketing activities. They also shared narrative summaries of their experiences as MSMEs and how their business had changed over time.

Figure 1: Ebonyi, Kebbi, and Oyo States



Experiences of MSMEs

Producers

Fish production in Ebonyi, Kebbi, and Oyo mainly takes the form of inland (freshwater) capture and fish farming. While aquaculture dominates in Ebonyi and Oyo, wild capture is common in Kebbi.

In Kebbi, fisherfolk are found to catch fish in rivers by erecting an embankment to block off part of the waterway and then emptying the water from the dammed area using calabashes. Overall, a lack of storage facilities and food preservation technologies compels them to sell their fresh fish as quickly as possible, even at a low price. Fish that are not sold are either consumed or smoke-dried. Fish capture in Kebbi continues throughout the year, whereas in Ebonyi, fishing is seasonal and is supplemented with other activities in the dry season.

Fisherfolk in Ebonyi and Kebbi have noted a decline in fisheries over time; in contrast, fish capture in Oyo has increased, possibly in response to dam renovations. Sources of stress for inland fisheries include a growing trend of rice farming near rivers, chemical runoff from agricultural production, and human excretion along riverbanks.

Catfish are the main species reared by fish farmers. Farmers in Ebonyi and Kebbi tend to source their fish seed from out-of-state breeders, while those in Oyo either breed their own fingerlings or obtain seed from hatcheries in Ibadan. Feed accounts for the largest share of aquaculture production costs; while all respondents in Ebonyi use industrially manufactured feeds, this is true for just half of the farmers in Oyo and only for the early stages of fish rearing in Kebbi. Medicines (e.g., antibiotics) and chemicals (e.g., industrial salt) are widely used for disease control, and some farmers in Oyo adhere to strict bio-security measures, such as limiting the production environment to farm staff.

Aquaculture has recently seen an influx of investment in response to rising demand for fish in Nigeria. As the routine activities in fish farming are not time-consuming, farmers in Kebbi are able to allocate resources to both fish and crop production, and those with capital—including business people—are increasingly inclined to invest in fish farming.

Input Suppliers

Aquaculture input suppliers play an essential role in the fish value chain; to some extent, their activities determine the farmers' production choices and outcomes. The business of fish feed and medicine supply requires considerable capital investments for inputs, warehouses, and personnel. Fish farms that produce feed use local ingredients (e.g., grains, groundnut cake, wheat bran, bone meal, blood meal) and supplements such as lysine, methionine, and antibiotics. In Kebbi, some large fish farms also supply feed to small farms.

Most feed suppliers also sell medicine poultry feed, and agrochemicals for crop production. Many input suppliers also offer advisory services for fish farmers, especially regarding the use of medicine, and receive feedback on farmers' experiences with their inputs.

Coinciding with the growing industry of fish farming, input suppliers have proliferated in recent years. In Ebonyi, many input dealers had previously focused on other livestock feeds and medicines before diversifying into fish inputs. Although imported products are very common, there has been an increase in locally formulated inputs, such as feeds, crude implements, and fabricated equipment. Input suppliers in Oyo increasingly attend trainings to improve their business.

Wholesalers

Wholesalers typically procure fish from fisherfolk, fish farmers, processors, and other wholesalers and sell to retailers or businesses. In fresh fish wholesale, live catfish are transported by vehicle in large drums, while other species are transported in freezers and preserved with ice. Frozen fish in Nigeria are mainly imported; consequently, few frozen fish wholesalers operate in Kebbi, which is far from the coast. Frozen fish wholesale is a capital-intensive business, requiring considerable funds for building/renting cold rooms, installing and fueling power generators, maintaining facilities, and transport. Wholesalers of dried/smoke-dried fish are well integrated with catfish processors, with their roles overlapping or shared.

The wholesale market, especially for frozen fish, has grown over the years with gradual improvements in infrastructure, power supply, and market efficiency. Government investments to supply power or infrastructure, such as cold rooms, have played an

important role in this growth. Other changes have included the increasing use of social media platforms for marketing purposes among wholesalers in Oyo, and the more frequent use of dispatchers in Oyo.

Processors

Processed fish products are smoked, oven-dried, grilled, and fried. Processors typically sell to retailers or direct to consumers, sometimes in markets and sometimes through brokers. Most final consumers of dried fish are those with less time to prepare meals.

Smoke-drying is the preferred method of drying, with most processors using locally fabricated smoking kilns and fuelwood/charcoal. Processors in Kebbi and Oyo also produce fried fish using vegetable oil with gas burners or firewood. In Oyo, processors report an increasing availability of fish inputs, and in response to the high cost of procuring fish, some processors have begun breeding their own fish.

Third-Party Logistics Providers

Most logistics providers in the fish value chain are periodically contracted and are not engaged full-time to make fish deliveries. These service providers are more common in Kebbi and Oyo. Some are public transport providers who are paid for their services immediately after the delivery. In Ebonyi, logistics providers liaise with commodity transporters, collate inventories of the fish product marketers, organize the waybill, and make deliveries. Some transporters have staff for loading and offloading; products are tagged with customers' delivery information and moved unaccompanied from one location to another. In most cases, the client bears any cost for loss or damage that may occur during transportation.

Retailers

Most retailers purchase and transport fish to local markets for regular sales. Retailers typically procure fresh fish from wholesalers or fish farmers, with the fresh catfish stored in containers of water. Frozen fish is often purchased and picked up from cold rooms, and frozen fish retailers have their own cold rooms or chillers. Retailers also cut and degut fresh fish for customers.

Other retailers also sell various forms of dried fish. Stockfish retail is common in Nigeria as it is an essential ingredient in most soups, and because stockfish is mainly imported from Europe, retailers purchase in

bulk from major distributors located along the coast. Not surprisingly, the market for stockfish is highly affected by import regulations and volatile exchange rates.

As with other nodes in the fish value chain, fish retail has expanded in recent years in response to income growth and diet shifts in Nigeria, alongside government investments in infrastructure (e.g., roads, cold rooms, power supply). For example, the number of small-scale frozen fish sellers in Kebbi has grown in accordance with the provision of cold rooms.

Retailers face a struggle to preserve and store their fish; this compels them to limit their purchases. Retailers who use refrigerators confront a frequently unreliable power supply and must turn to generators, with the cost of diesel rising steadily.

One-Stop-Shops

A one-stop-shop is an enterprise that offers multiple services or products to customers, allowing customers to access these services with convenience in a centralized location. These services include logistics services, trainings, the sale of fish farm inputs, and the rental of ponds. One-stop-shops were observed only in Ebonyi and Oyo.

Geographic Patterns

The fish value chain and the behaviors of its participants vary across geographic locations. The value chain is first affected by natural endowments, such as river distribution, topography, soil profile, and groundwater quality. Fisherfolk in Ebonyi catch fish only during the rainy season, as the scorching dry season causes fish to hibernate or migrate. Meanwhile, fishing activities in Kebbi are carried out all year round, with a higher catch during the dry season and a lower catch in the rainy season due to flooding. Poor groundwater quality in Ebonyi also leads to a lack of fish hatcheries in the state, which inconveniences farmers in search of fish seed.

The distance to ports or coastal areas can also affect the fish value chain. Company-manufactured fish feeds are usually imported; this may explain why most farmers in Kebbi, which is far from the coast, use locally produced feed for production. Another difference induced by distance to ports is the supply and price of frozen fish, which are mainly imported. In Ebonyi, some

processors smoke-dry frozen fish, a practice that is not seen in other states.

Variation in socioeconomic conditions in each state can also influence the fish value chain, as can the quality of public goods such as road infrastructure, power supply, security, or the level of corruption. As an example, the large cold rooms established by the government in Kebbi have facilitated the expansion of the frozen fish market.

Cross-Cutting Themes

Environment

The fish value chain is necessarily shaped by its environment; in the other direction, the behavior of value chain actors affects the environment. The depletion of wild fish stock is a widespread challenge in Nigeria. This has been partially attributed to agrochemical use and water pollution. The Ebonyi State Fertilizer and Agrochemicals Industrial Plant is situated close to the Onuebonyi River, and local fisherfolk complain of a marked decrease in fish stock and the disappearance of some fish species over time. A rise in the use of agrochemicals, especially by farms close to streams and rivers, readily results in polluted waters. Lead mining activities in Ikwo and Izzi local government areas in Ebonyi are conducted without strict adherence to environmental protections, resulting in the pollution of nearby water bodies.

Fish farming activities are also affected by environmental issues. For example, the water quality in parts of Ebonyi is poor and unsuitable for rearing fish, especially in the early stages. This limits the production of fish seed in Ebonyi, and fish farmers must spend more sourcing fish seed from out of state. Aquaculture also generates waste, and wastewater is mainly discharged into the adjoining ground surfaces without consideration for the environment. Fish processing also uses a large amount of use of wood charcoal, which contributes to environmental degradation as well as greenhouse gas emissions.

Food Safety

MSMEs in the fish value chain sometimes endanger food safety by not following best practices associated with food safety and preservation. Some fish farmers use unregulated inorganic substances as boosters to increase the table weight of their fish. Another threat to food safety comes from the use of locally produced

feeds in aquaculture, for which there is a lack of safety standards. Aflatoxin contamination is also found in industrially-manufactured feed if it is not stored well.

Food safety is also a concern for processed fish. Fish handling during processing and packaging is mainly done with bare hands without strict adherence to hand-washing rules, and smoke-drying (the most preferred method) is done with little consideration for hygiene. Little attention is given to carbon monoxide and soot deposits on smoked fish, while fish that are sun-dried are exposed to flies during the drying process.

Gender

Roles in the fish value chain that involve dangerous or physical activities, such as capture fisheries, fish farming, and transport, tend to be dominated by men, whereas women are relatively involved more in input supply and fish processing. In Ebonyi, women are perceived as more trustworthy and better able to manage the business of perishables. In Kebbi, some men do not allow their wives to be engaged in work that takes them far from the home, leaving women to engage in local retailing and processing activities. In some markets in Oyo, gender discrimination and bias result in women being excluded from market activities.

Next Steps

Findings from this rapid reconnaissance will be incorporated into an RSM2SNF survey of wholesale markets in mid-2023, and a subsequent micro-level survey of MSMEs all along the fish value chain. Observations gleaned from this qualitative exercise will inform the research questions to be asked, the set of information collected, and the interpretation of survey results.

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