

Challenges and Opportunities for MSMEs in the Fish Value Chain in Kebbi State, Nigeria: Results from a Rapid Reconnaissance Survey

By

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1.0 INTRODUCTION

According to data released by the National Bureau of Statistics (NBS) for Q1 2021, the fisheries sector accounted for 3.24% of Nigeria's GDP. This was a positive indicator for the fisheries sector, which had a -3.60% and -2.07% growth contribution in Q4 and Q3 2020, respectively (NBS, 2021). Despite having a 5.68% contribution in Q2 2020, its total contribution to the country's GDP in 2020 was 0.26% (NBS, 2021)

Most fish producers are peasant farmers who work in the subsector to earn a living (Udegbumam, 2021). Its relevance to the economy derives from the high demand for fish as a major source of protein in the country. Bureau of Statistics report estimated Nigeria's annual fish demand at 3.32 million metric tonnes, with domestic production at 1.12 million metric tonnes. Nigeria spends over N125 billion (US \$625 million) annually on fish importation (Okeleji, 2021). About 80% of locally produced fish come from small-scale operators, according to the Food and Agriculture Organization (FAO) in 2017. These operators use crude and outdated implements without consideration of food safety (Udegbumam, 2021)

According to Liverpool-Tasie (2022), Agrifood value chains have grown rapidly in recent decades, a transformation fueled by the aggregate investment of many Micro, Small and Medium Enterprises (MSMEs) in the midstream and downstream of these value chains comprising the wholesale, logistics, processing and retail segments. These MSMEs are instrumental in Nigeria's food supply, together determining the availability, affordability, and safety of nutritious foods, such as fish and vegetables. At the same time, they face significant challenges that can

impede their operations, growth, and productivity. Furthermore, limited attention in research and policy has been paid towards MSMEs in the midstream and downstream segments of value chains. The RSM2SNF project aims to fill this gap by working with MSMEs along the value chain for fish to understand its structure, conduct and performance and ultimately support MSMEs to provide affordable, safe, and nutritious foods. It is against this background that this study investigated through a reconnaissance (or “lay of the land”) survey, the fish value chain in Kebbi State, Nigeria.

Objectives of the study

The general objective of the study was to assess the fish value chain in Kebbi State with a view to understanding its structure as well as the challenges and opportunities for MSMEs.

The specific objectives were to

- i) understand the structure of the value chain and how actors at different nodes are related to one another,
- ii) understand how patterns vary according to the scale of the enterprises,
- iii) understand what stakeholders perceive to be the key challenges and opportunities in the fish subsector,
- iv) develop insights that will inform the design of a market study of fish markets as well as a micro-level study of the fish value chain using “stacked surveys” administered to MSMEs operating at various segments of the value chain,
- v) build a partnership with stakeholders.

2.0 METHODS

Data collection

Data for this study was collected through interviews. The interviews were administered to nano, micro, small, and medium-scale fish enterprises from input suppliers to farmers, processors, wholesalers, retailers, and distributors of the inputs and outputs associated with these value chains.

Basic information for the various actors was collected such as the name of the enterprise, years of experience, the node of the value chain, role in the value chain, number of people employed, and others working in the enterprise. Other

information elicited from the various actors include assets used in the enterprises, inputs used, procurement of these assets and inputs, challenges associated with procurement of the assets and inputs, production/sales/handling of the products, quantity produced, number of cycles per year, how much was realized after sales, and challenges associated with production/sales/handling of the products. Information was also elicited on marketing (such as the identity of the buyers, how they obtain the product, where the products are sold, and challenges associated with the marketing of the products) and what has changed since the enterprise began, among other topics.

Sampling procedure

The study used a rapid reconnaissance survey approach to arrive at a sample and achieve its objective. Respondents were identified from an existing stakeholder database in the State and then supplemented using a snowballing approach where identified respondents provided information on the location and/ or names of the actors operating at various value chain segments. Data was collected from these various actors (Table 2.1) from different locations in Kebbi State (Table 2.2). A map of the State is presented in Figure 1.

Table 2.1: Number of fish value chain actors sampled in Kebbi State

Node/role in the fish value chain	Nano, Micro, Small and Medium Enterprises		Female	Minimum goal
	Male			
Fish farm	2		2	4
Fishermen	2		2	4
Fish processors (smokers)	2		2	4
Fish processors (Dryers)	2		2	4
Fish processors (Fried)	2		2	4
Fish wholesalers (Fresh & Frozen)	2		2	4
Fish wholesalers (Dry/Smoked)	2		2	4
Fish retailers (Fresh & Frozen)	2		2	4
Fish retailers (Dried, Fried & Smoked)	2		2	4
Input suppliers (Feeds)	2		2	4
Input suppliers (Medicines)	2		2	4
Input suppliers (Fingerlings)	2		2	3
Transporters fish	2		2	4
Others (e.g., one stop shop)	2		2	3
Total	28		28	54



Field survey, 2022

Table 2.2: Number of fish value chain actors surveyed across different locations (LGAs) in Kebbi State

Value Chain Actors	Birnin Kebbi	Kalgo	Jega	Yauri	Aliero	Shanga	Ngaski	Total
Fish farmers	2	0	1	2	0	0	0	5
Fishermen	1	0	0	1	0	2	0	4
Fish processors (smokers)	2	0	0	1	0	0	1	4
Fish processor (Dryers)	0	0	0	0	0	0	0	0
Fish processor (Fried)	2	2	1	1	1	0	0	7
Fish wholesalers (Fresh & Frozen)	2	0	1	0	0	0	0	3
Fish wholesalers (Dry/Smoked/Stocked)	4	0	0	2	0	0	0	6
Fish retailers (Fresh & Frozen)	3	0	0	0	0	0	0	3
Fish retailers (Dried, Stocked Fried, & Smoked)	3	0	0	2	0	0	0	5
Input suppliers (Feeds)	4	0	0	1	0	0	0	5
Input suppliers (Medicines)	3	0	0	0	0	0	0	3
Input suppliers (Fingerlings)	3	0	0	1	0	0	0	4
Transporters fish	2	0	0	3	0	0	0	5
Others (e.g., one stop shop)	0	0	0	0	0	0	0	0
Total	31	2	3	14	1	2	1	54



Figure 1: Map of Kebbi State showing the major aquaculture sample locations (Adopted from Rapid Transformation of Fish Value Chain in Nigeria: Evidence from Kebbi State)

3.0 RESULTS

Farmers along the fish value chain actors

S/N	Important issues related to farmers
1.	Most fish farmers surveyed purchase fingerlings from as far away as Kanji in Niger State which is about 310km away from Kebbi State.
2.	Fingerlings caught from the wild are also used in aquaculture production
3.	Most of the feed purchased by farmers from feed sellers is produced outside the state (mostly in Kaduna, Ilorin, and Ibadan)
4.	There are female fishers in parts of Yauri
5.	Sun drying is usually undertaken before roasting, smoking, or frying the fish
6.	Many farmers produce their feed locally around crop (rice, maize, soybeans, groundnut) harvesting period.
7.	There has been an increase in the number of input providers, farmers, processors, wholesalers, retailers, hatcheries, fishermen, and transporters in the last 5 years.

Gender issues along the fish value chain

S/N	Important issues related to gender
1.	Women are more involved in fish processing, frying and wholesaling/retailing while men are more involved in input supply, fishing, farming,
2.	Crayfish is mostly sold by women at both nano, micro, small, and medium scale
3.	Crayfish is not produced by farmers in the state
4.	There are fewer female fish farmers compared to male fish farmers

Food safety along the fish value chain

S/N	Important issues related to food safety
1.	Locally produced feeds do not have safety standards
2.	Chemicals are still being used for fish harvest and catch in some areas
3.	Chemicals used for farming (rice or vegetable) affect fish in the rivers
4.	People excrete around the riverbanks, especially in Yauri and Argungu
5.	While sun drying, fish is exposed to flies before smoking and frying etc.
6.	During fish production, there is no analysis and treatment of water by the farmers
7.	Large cold rooms are provided by the government in Birnin Kebbi, Yauri and Jega for the actors to preserve their fish products

Environment related issues along the fish value chain

S/N	Important issues related to the environment
1.	Due to climate change (reduction in the volume of water in the dry season), the land around the riverbanks is increasingly being used for rice farming
2.	There has been low fish catch due to annual fluctuations in water level
3.	Seasonality affects fish availability from the fishers
4.	Floods due to heavy downpours during the rainy season negatively affect fish catches in the wild.

3.5 Key findings related to MSMEs of different scales

Results in Tables 3.1 to 3.3 show for Kebbi State the structure of fish farmers by size, and composition and describe how actors at different nodes are related to one another.

3.5.1 Fish production in Kebbi State

Table 3.1 shows the structure of fish farmers, a majority are male. The major assets of the farmers include hatcheries, ponds (both concrete and earthen), water pumps, a weight balance, plastic drums, jerry cans, nets, basins, water tanks, etc. The major sources of water for their farms include; boreholes, rivers, and wells. Most of the farmers obtain assets through purchase with personal savings, while a few obtain theirs through inheritance or rental. The purchase of assets usually takes place in these markets, Yauri, Birnin Kebbi, Jega, Bagudo, and Ambursa, among others. Buyers of fresh fish from these farms include wholesalers, retailers, processors, and consumers, in some cases, restaurant owners buy directly from the farms. Production on the farms is usually (all year round) except in a few cases where it is produced twice a year or where farmers decide to embark on pond repairs. In terms of what has changed in the last 10 years, there has been an increase in the number of fish farmers, an increase in the quantity of fish produced (output) from the farms and an increase in the number of assets and workers on the farms.

Table 3.2 shows the structure of fisher folk (fishermen/women), with a majority (over 90%) being male. The main assets of the fishers are nets, calabashes, canoes, baskets, basins and empty sacks. Fisher folks are found more in Yauri, Warah, and Bagudo around the major river that connects to the River Niger. The main sources of these assets are markets such as Yauri, Birnin Kebbi, Ambursa, Bagudo, and Argungu, among others. These assets are sourced mostly through purchase using the fisher folk's savings and in a few cases through inheritance. Fishing activities are carried out all year round i.e., during both the dry and rainy seasons. The catch is usually greater between October and May during the dry season when there is a reduction in water volume in the rivers; conversely, the catch is lower in the rainy season due to flooding. Buyers of fresh fish from the fisher folks include wholesalers, retailers, and processors, though consumers buy directly in certain situations.

Women are also involved in fishing activities, around Shabanda, Zamare, and Gumbi. In terms of what has changed over the last 10 years, there is an increase in the number of fishers, probably due to an increase in the population. There has also been a (reduction) in the quantity of fish caught, especially during the rainy season between July and October. There is also an increase in the number of women fishers. According to the respondents, this increase in the number of women fishers is a result of greater revenues generated through the fish caught in recent times. Women are also involved in fishing according to respondents because they see fishing as a source of livelihood and employment and as a means of generating income. Although women have ventured into fishing activities, men are still dominant. The study further revealed a means of fishing

among women whereby they block some portion of the river and/or separate it by raising an embankment, then use calabashes to empty water from the area and catch the fish. They later collapse the embankment and allow the free flow of water.

3.5.2 Fish wholesale in Kebbi State

Tables 3.3 and 3.4 show the structure of fish wholesalers (smoked, fresh and frozen). Most of the wholesalers are male. This is due to cultural/religious beliefs whereby some men don't allow their wives to be involved in businesses that will take them outside their environment. However, women are relatively more involved in processing, wholesaling and retailing activities than other segments of the fish value chain. Fish are procured by the wholesalers from (fishers, farmers, traders, etc.). Wholesalers sell their fish to retailers and restaurant operators that buy in bulk. For smoked fish, wholesalers transport fish to towns and cities within Nigeria (such as Abuja, Nasarawa, Onitsha, Ibadan and Lagos) or sometimes to neighboring countries (Niger Republic and Benin Republic). For fresh fish, wholesalers sell to fresh fish traders, restaurant owners, and processors. Fresh fish is transported from Yauri to Zuru, Jega, and Birnin Kebbi within the state. Species such as Elephant fish (*Giwan ruwa*), are transported as far as Abuja in freezers, while others are transported as far as Benin Republic and Niger Republic. Wholesale activities are carried out all year round. In terms of what has changed in the last 10 years among wholesalers, there has been an increased number of wholesalers, there are now large cold rooms established by the Government in Yauri, Jega, and Birnin Kebbi for the storage and preservation of fish and there has been an increase in the quantity of fish sold.

3.5.3 Fish retail in Kebbi State

Tables 3.5 and 3.6 show the structure of fish retailers (smoked, fresh and frozen). Most of the retailers are male due to cultural and religious beliefs that restrict women from engaging in businesses out of the home. These categories of traders operate daily. Those involved in smoked fish, buy smoked fish from wholesalers, farmers, fishers, or brokers. The retailers in turn transport the fish to areas where they reside or to local markets for regular sales. Fresh fish is procured from wholesalers, farmers, and fishers. Purchase usually takes place through bargaining, with fish brokers playing a major role in arriving at a settlement. The major species of fish traded are Catfish, Tilapia, *Gymnarchus*, *Heterotis*, *Labeo*, and *Synodontis*, among others. Retailers belong to market associations which facilitate their trading activities.

Tables 3.7 and 3.8 show the structure of fish processors (fried, roasted and smoked) with the majority being female (60%). The major assets for processors include frying

pans, tables, basins, chairs, iron sheets, ovens (pit, mud, and drum), stalls, baskets, frying spoons, smash wires, colanders, etc. Most of the processors obtained these assets through purchases using their personal savings. The assets are procured from markets such as Birnin Kebbi, Yauri, Jega, Bagudo, and Argungu. Fresh fish is bought by the processors from fishers, farmers and sometimes from fresh fish traders. The major buyers of processed fish (fried, roasted and smoked) are direct consumers and retailers. Smoked fish are sold through agents, brokers and sometimes directly in person at markets. Brokers are usually involved in organizing transportation to major cities in Nigeria (such as Abuja, Onitsha, Ibadan, Lagos, and Nasarawa) or transported to neighboring countries (the Niger Republic and Benin Republic). Processing activities usually take place all year round.

In terms of what has changed in the last 5- 10 years, there has been a slight increase in the number of fish processors. This is attributed to the fact that some fish farmers are now engaging in fish processing particularly smoking.

Table 3.9 shows the structure of input suppliers (feed) all of whom are male. Most of the feeds sold by sellers are produced outside Kebbi State, such as in Kaduna, Ilorin and Ibadan. Most of the feed sellers are also medicine (drugs) sellers and in many cases, they are also involved in the sale of feed for poultry and agrochemicals used for crop production. Large farms such as Labana farms in Aliero, Sarkin Shiko farms at Kamba and Blessed farms in Birnin Kebbi produce their feeds using local materials/ingredients. These large farms also sell some of the feed they produce to small farms. Note that Labana farms and Blessed farms sell only a small quantity (less than 20%) to small farms during the peak season of crop harvesting. This is when the feed ingredients are cheaper. About half of these farms usually procure company-manufactured feed at the initial stage of production. However, after the fish have attained a certain size, they need to consume a lot more to reach table size, making it difficult for the farmers to afford the company-manufactured feed. Thus, the farmers resort to producing their own feed using local ingredients such as groundnut cake, dried fish, corn food and rice bran. This is aimed at reducing the cost of feed. Other farmers usually buy smaller-sized dried/fresh fish to use as feed. The biggest challenge related to locally produced feed is that it does not have safety standards. The main worry by the farmers on company-manufactured feed is when they are not stored well or when water mixes with the feed during transportation. This often results in the growth of mould and issues of Aflatoxin contamination that affects the well-being of the animals.

Table 3.10 shows the structure of input suppliers (medicine), all of whom are male (100%). Almost 100% of the drugs sold/provided are produced outside Kebbi State. They are sold in veterinary medicine stores (shops where drugs for animals/poultry

are sold) and shops where feeds for both fish and poultry are sold. These drugs are brought from Kaduna, Ilorin, Jos and sometimes as far as Ibadan. The drugs transported from Plateau State are largely produced by the Veterinary research institute at Vom, while others are often imported.

Table 3.11 shows the structure of input suppliers (fingerlings), all of whom are male. Most of the farmers purchase fingerlings from as far as Kanji in Niger State which is about 250KM away from the fish-producing locations in Kebbi State. The choice of Kanji may be related to the fact that it houses the National Institute for Fresh Water Fisheries Research where high-quality fingerlings are produced. Fingerlings caught from the wild are also used for production by farmers. Farmers (especially of large farms) sometimes travel to Kanji to procure fingerlings, while traders of fingerlings also distribute them from Kanji to the farmers in Kebbi State. But large farms such as Labana farms, Sarkin Shiko farms and Blessed farms usually breed their own fingerlings. Fingerlings caught from the wild are also purchased from fishers and fingerling traders for use in fish production.

In terms of what has changed over the last 10 years, there has been an increase in the number of fingerling producers, reflecting the increase in fish farms. There has also been an increase in the number of traders of fingerlings caught from the wild around Yauri, Bagudo, and Birnin Kebbi.

Due to climate change (reduction in the volume of water at dry season), land around the riverbanks is increasingly being used for rice farming. Fishing as an agricultural activity in the study area is typically seasonal although some fishers are involved in fishing all year round. The main fishing season starts around October when the frequency and intensity of the rains decrease and extend through May of the following year. Smoking is at its peak around May/June when prices of both fresh and smoked fish are usually low. At this time there is sometimes a glut of fish supply. The off-season for fish catches for smoking is usually around June to September. At this time both processors and fishers engage in crop farming (either in the form of rice farming or vegetable farming) instead of staying idle.

According to some of the fish farmers around Yauri and Bagudo, when the rainy season is over, they usually position earthen ponds close to the river with the hope of easily accessing the river water. Most of the communities around the riverbanks engage in both fishing/aquaculture and crop production, allocating land to both activities.

For frozen fish wholesalers especially in Yauri, Jega and Birnin Kebbi, there has been an improvement in terms of the provision of large cold rooms that are linked to a steady power supply by the government. Stand-by generators are also

provided by the government to reduce the losses incurred due to the hitherto non-availability of storage facilities over time. This has improved the ability to store fish for longer periods and the quantity of fish that can be stored. These cold rooms are provided by Government for any of the actors to preserve their products for fees that are paid according to the number of days and volume/quantity of fish products stored.

A challenge noted relates to unauthorized charges on the highway. Respondents felt that there is a need for government to carry out campaigns against illegal levies on both transporters and fish traders by corrupt tax officials. There is also a need for the apprehension and trial of corrupt tax officials. The implication of these unauthorized taxes/levies on the enterprises is that they add to the cost of marketing and thus reduce the profit margin.

Alongside an increase in the number of fishers, farmers, wholesalers and retailers across the value chain, there has been a commensurate increase in the number of frozen fish sellers. However, in terms of size, the increase has been more of small scale frozen fish sellers. This increase is attributed to the fact that fresh fish are increasingly available from local farms within the State. There has also been an increase in the population resulting in greater demand for fish products which the local supply of fish is not able to meet.



Table 3.1: FISH FARMERS

Segment	Gender	No of workers	Place of Purchase	Assets & Equipment	Farm Location	Number of Production Cycle	Choice of purchase Location	How Business Started
Nano	Male	2 Male	Hatchery (B/K), Feed B/K & Sokoto	Ponds, Trampoline, weigh balance, Net, Basin (2,000)	Birnin Kebbi (Urban)	All year round	Wholesalers Retailers & Consumers (50, 30, 20)	Borrowed Rented & purchased
Small	Male	10 Male	Kanji & wild Feeds: Yauri & locally made	Ponds, Shop, Water pump, Basin (6,000)	Yauri (Peri-Urban)	All year round	Wholesalers	Purchase (own savings)
Micro	Male	5 Male	Kanji & Yauri, Feeds: Yauri	Ponds, weight balance, water pump, basins (2,500)	Yauri (peri-Urban)	All year round	Wholesalers Retailers & consumers	Inherited, Purchase
Micro	Male	4	Hatchery (B/K) Wild (Yauri) Feeds: B/K & Jega	Ponds, Water pump, Weigh balance, Drums, Tank, Jerrycan (10,000)	Jega (Peri-Urban)	Twice a year	Wholesalers Retailers & consumers	Purchase
Nano	Female	2	Hatchery (B/K) Feeds: B/K	Ponds, Water pump, Weigh balance, water tanks (2,000)	B/K (Urban)	All year round	Wholesalers Retailers & consumers	Purchase



Table 3.2: FISHERMEN/WOMEN

Segment	Gender	No of workers	Place of Purchase	Assets & Equipment	Farm Location	Number of Production Cycle	Choice of purchase Location	How Business Started
Nano	Female	-	Manufacturers & traders Within the LGA/State	Net, Calabash, Canoe, Basin ½ - 1 basket)	Birnin Kebbi, Kushi, Ambursa, Dadinkowa etc	Rainy & low at Dry season	Processors & consumers river side	Purchase in terms of assets
Micro	Male	4	Traders Manufacturers in Yauri LGA	Canoe, Gura (Calabash) Net, Hook (1-10 basket)	Shanga & Yauri	Rainy and Dry season	Processors & consumers, Yauri market & River side	Inheritance & Purchase
Nano	Male	-	Traders Manufacturers in Yauri LGA	Canoe, Net, (1-5 basket)	Shanga & Yauri	Rainy and Dry season	Processors & consumers, Yauri market & River side	Purchase
Nano	Male	-	Traders Manufacturers in Yauri LGA	Canoe, Net, (1/2 - 1basket)	Yauri	Rainy and Dry season	Processors & consumers, Yauri market & River side	Purchase



Table 3.3: FISH WHOLESALERS (SMOKED AND STOCK FISH)

Segment	Gender	No of workers	Place of Purchase	Assets & Equipment	Farm Location	Number of Production Cycle	Choice of purchase Location	How Business Started
Nano	Female	2	Wholesalers who transport it to other States e.g., Nassarawa, Abuja etc	Basket, Basin, Stall, Chairs 20-30 basket (it depends on what I have on ground after every 4 days)	Yauri Central market, Warah	All year round	They buy in bulk	Direct to customers
Small	Male	10	Wholesalers, Retailers and direct consumers	Basket, Tables & Chairs, Shop 50-60 basket	Central market	All year round	They are our major customers	Direct to consumers
Micro	Male	4	Wholesalers, Retailers	Basket, Tables & Chairs, Shop 30-60 Carton after every 4 days	Transport it to Nassarawa State and Abuja	All year round	We have relationship with our customers	Direct to Retailers, restaurant owners, Benin & Niger Republic
Micro	Male	9	Processors Fishermen, Wholesalers, Retailers & consumers	Tables & chair, Stall, baskets About 20 baskets daily	Birnin Kebbi	All year round		Direct contact with Customers
Micro	Male	5	Processors, Wholesalers, Retailers & consumers	Tables & chair, Stall, baskets About 50 - 60 basket weekly	Birnin Kebbi	All year round		Direct contact with Customers
Nano	Female	1	Wholesalers who procured stockfish from Onitsha, Lagos etc	Basket, Basin, Stall, Chairs 2-4 bags monthly	Birnin Central market	All year round	They buy in bulk	Direct to retailers and customers



Retailers

Table 3.4: FISH WHOLESALERS (FRESH AND FROZEN)

Segment	Gender	No of workers	Place of Purchase	Assets & Equipment	Farm Location	Number of Production Cycle	Choice of purchase Location	How Business Started
Micro	Male	4	-Restaurant - Consumers	Freezer, Basin, Weigh balance, Basket, stall, drum	Jega (Peri- urban)	All year round	Major customers	Direct to customers
Small	Male	13	-Wholesalers -Retailers Consumers	Cold-room, Freezers, Weigh balance, Generator, shop	Birnin Kebbi (Urban), Sokoto, Niger Republic	All year round	They are our major customers	Direct to customers
Micro	Male	3	- Lagos & Ibadan	Cold-room, shop Generator, Weigh balance	Birnin Kebbi	All year round	Major suppliers	Wholesalers, Retailers & Consumers



Table 3.5: FISH RETAILERS (SMOKED, AND STOCKFISH)

Segment	Gender	No of workers	Place of Purchase	Assets & Equipment	Farm Location	Number of Production Cycle	Choice of purchase Location	How Business Started
Nano	Male	0	Processors & Wholesalers Consumers	Stall (2-3 basket daily)	Birnin Kebbi	All year round	Cheap / availability	Direct contact
Nano	Female	0	Processors & Wholesalers Consumers	(4-5 basket after every 4 days)	Yauri	All year round	Availability	Direct contact
Micro	Female	3	Processors & Wholesalers - Consumers	(8-10 basket after every 4 days)	Yauri	All year round	Availability	Direct contact
Nano	Male	0	Processors & Wholesalers Consumers	Stall (2-3 basket daily)	Birnin Kebbi	All year round	Availability	Direct contact
Nano	Female	0	Stockfish Wholesalers Consumers	Stall. 1 basket monthly	Birnin Kebbi	All year round	Availability	Direct contact



Table 3.6: FISH RETAILERS (FRESH, AND FROZEN)

Segment	Gender	No of workers	Place of Purchase	Assets & Equipment	Farm Location	Number of Production Cycle	Choice of purchase Location	How Business Started
Micro	Male	5	Fishermen, Fish farmers & fresh fish wholesalers in Birnin Kebbi, Ambursa, Gwadangaji Consumers	2-3 basket daily	Birnin Kebbi	All year round	Price difference	Direct contact
Nano	Male	1	Fishermen, fresh fish wholesalers in Tarasa, Dukku, Yamama Birnin Kebbi, Ambursa, Gwadangaji Consumers	1-2 basket daily	Birnin Kebbi	All year round	Price difference	Direct contact
Nano	Male	2	Frozen Fish Wholesalers Consumers	2-4 Cartons weekly	Birnin Kebbi	All year round	Availability	Direct contact



Table 3.7: PROCESSORS (FRIED & ROAST)

Segment	Gender	No of workers	Place of Purchase	Assets & Equipment	Farm Location	Number of Production Cycle	Choice of purchase Location	How Business Started
Micro	Male	4	We bought Fresh fish from fishermen & fish farmers in Dukku, Bunza, Kanji (within & out of the State)	Frying pan, Stall, Tables and chair, colander, frying spoon, firewood, wire mash (Up to 3 basket a day)	Bagudo, Lolo, Birnin Kebbi (Peri-urban & Urban)	All year round	Choice of purchase is based on availability	Direct to consumers
Nano	Female	1	Purchase fresh fish from fishermen in Yauri	Frying pan, Basin, Colander, Firewood, oven (½ - 1 basket daily)	Yauri (Peri-urban)	During Rainy and dry season (when the price of fresh fish is slightly affordable)	Directly from fishermen is cheaper	Direct consumers
Micro	Male	3	Purchase fresh fish from fishermen in Jega and Bunza LGA	Frying pan, Basin, Colander, Firewood Stall, Table & Chair (1-4 basket daily depending on the availability on that day)	Yauri (Peri-urban)	All year round	Directly from fishermen is cheaper compared to cultured fish	Direct consumers
Micro	Male	5	fishermen & fish farmers in Dukku, Bunza, Kanji (within & out of the State)	Frying pan, Stall, Tables and chair, colander, frying spoon, firewood (5-10 basket a day)	Bagudo, Birnin Kebbi	All year round	Choice of purchase is based on availability	Consumers
Nano	Male	2	Fishermen	Frying pan, Stall, Tables and chair, colander, frying spoon, firewood, oven (1-2 basket a day)	Kalgo	All year round	Cheap	Direct contact
Nano	Male	1	Fishermen in Gwandu	Frying pan, Basin, Colander, Firewood	Jega (Peri-urban)	All year round	From fishermen	Direct consumers



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Nano	Male	2	Fishermen in Bunza	Frying pan, Basin, Colander, Firewood (1-2 basket daily)	Kalgo (Peri- urban)	All year round	Directly from fishermen	Direct consumers
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Table 3.8: PROCESSORS (SMOKED)

Segment	Gender	No of workers	Place of Purchase	Assets & Equipment	Farm Location	Number of Production Cycle	Choice of purchase Location	How Business Started
Micro	Male	5	Fishermen, fish farmers (Birnin Kebbi, Dukku, Kola) Wholesalers, Retailers & Consumers	Drums, Rack Net, Firewood, oven (20-30 basket weekly)	Birnin Kebbi	All year round	Prices	Direct contact
Small	Male	15	Fishermen & farmers Within the State Wholesalers, Retailers & Consumers	Drums, Rack Net, Firewood, oven (45-60 basket weekly)	Birnin Kebbi	All year round	Prices	Direct contact
Micro	Female	3	Fishermen Maishagali, Yauri, Warah, Wholesalers, Retailers & Consumers	Rack Net, Iron rod, Embarkment Firewood, oven (5-6 basket daily)	Yauri	All year round	-	Direct contact
Small	Female	10	Fishermen Warah, Yauri, Tunga sule, Gungu bisa, Balale, Tunga Maimuna, Kacha,	Rack Net, Iron rod, Embarkment Firewood, oven (8-10 basket daily)	Warah	All year round	Cheap	Direct contact



Wholesalers,
Retailers &
Consumers

Table 3.9: INPUT SUPPLIERS: FEED

Segment	Gender	No of workers	Place of Purchase	Assets & Equipment	Farm Location	Number of Production Cycle	Choice of purchase Location	How Business Started
Micro	Male	6	We bought feeds from Jos and Sokoto States And we sell to fish farmers directly	Shops	Birnin Kebbi (Urban)	All year round	Choice of purchase is due to brand They are our major customers	Direct to fish farmers
Micro	Male	3	We bought feeds from Sokoto, Kaduna Sells to direct fish farmers	Shops	Birnin Kebbi (Urban)	All year round	Different in brand They are our major customers	Direct to customers
Small	Male	10	- Kaduna, Kano, Kontagora	Shops	Yauri	All year round	Prices	Farmers
Nano	Male	1	- Kaduna	Shop	Birnin Kebbi	All year round	Closeness & quality	Farmers
Micro	Male	6	- Sokoto & Kaduna	Shops	Birnin Kebbi	All year round	Availability	Farmers



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Table 3.10: INPUT SUPPLIERS: MEDICINE

Segment	Gender	No of workers	Place of Purchase	Assets & Equipment	Farm Location	Number of Production Cycle	Choice of purchase Location	How Business Started
Nano	Male	1	We bought medicine (multi vitamin & Antibiotics) from Ibadan and Kaduna States And we sell to fish farmers directly	Shops	Birnin Kebbi (Urban)	All year round	Choice of purchase is due to brand They are our major customers	Direct to fish farmers
Micro	Male	6	We bought medicine (multi vitamin & Antibiotics) from Sokoto, Ilorin and Kaduna States And we sell to fish farmers directly	Shops	Birnin Kebbi (Urban)	All year round	Choice of purchase is due to brand and availability They are our major customers	Direct to fish farmers
Micro	Male	3	We bought medicine (multi-vitamins & Antibiotics) from Ibadan, Ilorin and Kaduna And we sell to fish farmers directly	Shops	Birnin Kebbi (Urban)	All year round	Choice of purchase is due to brand and availability They are our major customers	Direct to fish farmers



Table 3.11: INPUT SUPPLIERS: FINGERLINGS

Segment	Gender	No of workers	Place of Purchase	Assets & Equipment	Farm Location	Number of Production Cycle	Choice of purchase Location	How Business Started
Micro	Male	3	We bought bloodstocks Ogun and Lagos States And we sell to fish farmers and Individuals that normally buy and sells to other fish farmers	Ponds, Trampoline, Borehole, Basin (40,000 – 50,000 fingerlings per cycle)	Birin Kebbi (Urban)	6 cycle a year that is almost all year round but low during harmattan period	Choice of purchase availability at the time we need them, and quality They are our major customers	We sell it to our existing customers and new customers
Nano	Male	1	We bought fingerlings from hatchery & fishermen that catch from the wild within the State And sell to fish farmers directly	Shop, drums and borehole (500 – 5,000 fingerlings)	Birin Kebbi (Urban)	All year round	The choice of purchase depends on farmers need. They are our major customers	Direct to fish farmers
Nano	Male	1	We bought fingerlings from hatchery within the State And sell to fish farmers directly	Jerrycans (Based on demand)	Birin Kebbi (Urban)	All year round	They are our major customers	Direct to fish farmers
Micro	Male	6	We bought fingerlings from hatchery	Jerrycans (Based on demand)	Birin Kebbi (Urban)	All year round	The choice of purchase depends on farmers need.	Direct to fish farmers



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And sell to fish
farmers directly

They are our
major
customers

Key constraints faced by MSMEs

1. Input Suppliers

- Bad road networks
- Excessive charges on the highway
- Low sales at off-season
- Insecurity on highways
- High cost of transportation

2. Farmers

- High cost of feeds
- High cost of fingerlings
- Diseases
- High cost of securing water due to cost of installing canals, pipes, etc.
- Theft

3. Processors

- Labor intensive
- High cost of ovens
- High cost of inputs during rainy season
- Fire incidents at processing sites
- Processing equipment are expensive
- Inadequate cold rooms
- Fish is susceptible to spoilage

4. Wholesalers/Retailers

- High transportation cost
- Exploitation by Government tax officials
- Insecurity on roads
- Additional processing cost for unsold products

5. Transporters

- High cost of fuel
- Spare parts are expensive
- Insecurity on roads
- Excessive charges on the highway
- Exploitation by Government tax officials

Conclusion

Despite the challenges faced by various fish value chain actors in Kebbi State, this study finds evidence of a large increase in the number of fish value chain

actors over the past decade. Through a rapid reconnaissance survey of these actors, we learned that majority are men.

The results revealed that most of the farmers purchase fingerlings from as far as Kanji in Niger State, about 310km from fish farming communities in Kebbi State, likely because Kanji is home to National Institute for Fresh-water Fisheries Research, implying that fingerlings produced from the institute guarantee better quality. The implication is that the farmers obtain the inputs at a high cost, bearing in mind the cost associated with transportation.

As a result of climate change (a reduction in the volume of water in the dry season), leading to fluctuations in rainfall, fishing is affected by the season. The off-season for fishing in Kebbi State is between June and September due to flooding while the peak season is between October and May, suggesting that the season affects the availability of fish. When the level of the water bodies drops along the riverbanks, fish farmers resort to the construction of fishponds close to the rivers while others resort to using those areas to establish rice or vegetable farms. The use of agrochemicals for crop farming along the riverbanks as well as the use of chemicals to catch fish poses a challenge to the safety of food.

There are a few large farmers that sell both feed and fingerlings to small farms at the peak season of crop harvest when feed ingredients are cheap.

Based on these findings, it is recommended that the following be considered in a micro-level study of the fish value chain:

1. Why are company-manufactured feeds used at the early stage of fish production, while locally manufactured feeds are used towards harvest?
2. As results revealed that fishermen resort to rice/vegetable farming during the off-season, while others establish earthen ponds, what is the profitability of rice/vegetable farming compared to that of fish farming?
3. What is the livelihood sustainability of fishing among female fishers?
4. What is the level of awareness of food safety concerns related to the use of agrochemicals in fish catch and the lack of water treatment by the farmers?
5. What is the effect of fish processing particularly (retailing, frying, and trading) on the income and livelihood/and or poverty eradication of women processors?

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