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Organizational structures, gender roles and upgrading strategies of smallholders: A qualitative study of the local value chain in the Nigerian fishing sector

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Abstract

To achieve the Sustainable Development Goals, research concepts and empirical evidence are needed to upgrade smallholder activities within local value chains (LVCs) of many developing countries. Yet, comprehensive gender-sensitive investigations of the evolution and multiplicity of governance in whole food systems with parallel functioning of local and modern value chains (MVCs) are greatly underrepresented in the scientific literature. This study aims to uncover LVCs' (a) value systems, (b) governance themes and gender roles for value addition and (c) smallholder upgrading strategies in developing countries' dualistic sectors. The global value chain framework serves as the conceptual basis for the study and is extended towards the gendered value web approach. Empirical data obtained through three focus group discussions, three Net-maps and 21 interviews from the Nigerian shrimp sub-sector represent the basis for the qualitative analysis. The results identified two lead actors—traders and women processors—who are crucial for the functioning of the complex value system. Further findings showed that fishermen and women processors are mutually reliant and are organized along their gendered comparative advantage. Based on these results, manifold managerial and policy implications, that are also applicable to other developing countries and cases, are derived to upgrade and develop smallholders' gendered activities and products along the LVC.

KEYWORDS

gender, global value chain framework, governance themes, Nigerian fishing sector, smallholder upgrading strategies, value web approach

1 | INTRODUCTION

The last decade has witnessed huge transformations in the food value chains of developing countries, such as rapidly increasing globalization, regionalization, modernization and technologization. These transformations are often associated with distributional effects that counteract the achievement of the Sustainable Development Goals (SDGs) (Dürr, 2015; WTO, 2019). Smallholders respond to these changing situations by switching their marketing channels or inter-organizational relationships (Lie, Rich, Kurwijila, & Jervell, 2012; Schipmann & Qaim, 2010). This intensifies the formation of dualistic systems in which both local value chains (LVCs) and modern value chains (MVCs) coexist. Differentiating by actors' size, level of formalization and target markets (Dürr, 2015), LVC is defined, in this study,

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as a series of value-adding activities that are mostly carried out by informally coordinated micro- and small-scale actors, the products of which are meant for consumers within the same geographical location, country or region (Herr, 2007). With this definition, actors along LVC could simultaneously target traditional and regional markets. Thus, LVCs are generally associated with rampant spot-market sourcing driven by specialized and competitive procurement agents in a "hub and spoke model" and, in some cases, differentiated gender relations and roles (FAO, 2016). Contrarily, MVC consists of a range of activities undertaken mostly by medium to large, formally coordinated firms and actors who target high-valued urban markets and international export markets (Dürr, 2015). MVCs and LVCs make up global value chains (GVCs), which represent a full range of activities performed by formally/informally coordinated actors who bring a product from its conception to regional and international markets (Dürr, 2015; Gereffi & Fernandez-Stark, 2016). GVC is characterized by increasing spatial distances and complexities, and activities are carried out through inter-actor networks that source products from different suppliers across the world.

Since the mid-1990s, the focus of development analysts and researchers in many developing countries has been on the expansion of food exports, the inclusion of smallholders in contract and standard-driven MVCs and increasing their welfare through such participation (Schipmann & Qaim, 2010). Even though LVCs represent a significant source of income for the poor rural population and ensure effective food delivery that meets the culturally diverse needs of urban and rural consumers in developing countries, only recently they received wider attention by agribusinesses' and development analysts' (Dürr, 2015; Lie et al., 2012). This attention aims to promote alternative development models and smallholder opportunities in those developing countries (Lie et al., 2012; Maertens & Swinnen, 2012). Despite this trend, existing scientific literature still shows a threefold gap that can potentially limit our understanding of LVCs' functioning in developing countries and corresponding implications for further development. First, most studies on LVCs' organizational structures have focused on non-dualistic sectors, while those studies that did, have not distinguished LVCs from MVCs (Lie et al., 2012). This has created a gap in the knowledge regarding how typical LVCs are organized and function in parallel to MVCs.

Second, most studies that have relied on governance analysis to uncover how smallholders are organized have failed to capture the evolution and multiplicity of governance schemes (Lie et al., 2012). This resulted in the identification and analysis of incomplete governance typologies, thereby limiting implications for value upgrading and development, since smallholders are often organized along multiple and interacting governance structures (Gereffi & Fernandez-Stark, 2016). Third, studies that have sought to understand how smallholders are organized in LVCs have, so far, neglected hidden socially constructed factors, such as gender roles and corresponding decision-making power (Lie et al., 2012), making gender-sensitive value chain analyses on regional networks even more crucial for achieving the SDG 5 "Gender Equality" (FAO, 2016; Schumacher, 2014). Such gaps exacerbate the debate on whether women's activities are economic-based with control over decisions or mere household survival strategies, consequently limiting effective gendered interventions for value chain development (FAO, 2016; Matsue, Daw, & Garrett, 2014; Udong, Niehof, & van Tilburg, 2010).

The objective of this study is to uncover LVCs' (a) value systems (b) governance themes and gender roles for value addition and (c) smallholder upgrading strategies in developing countries' dualistic sectors. Using qualitative data obtained from the Nigerian shrimp and prawn[1] sub-sector, this study seeks to achieve the sub-objectives in three ways. First, the study relies on the GVC approach (Gereffi, Humphrey, & Sturgeon, 2005; Kaplinsky & Morris, 2001) to distinctively map the value system and investigate how smallholders in LVCs function in parallel to MVCs in the face of regionalization and globalization. Second, we extend the GVC framework by developing and adding the gendered dimension of the value web approach (Cartwright & Oliver, 2000) to simultaneously analyse how smallholders are organized along several governance schemes and inherent gendered relations in LVCs. Third, we draw out concrete and novel managerial and policy implications needed to further develop LVCs, improve the future competitiveness of smallholders and posit gendered opportunities. These managerial implications are of great importance for interested parties, such as smallholders and artisan group leaders, while the policy implications are important for private firms and public stakeholders who seek to achieve SDGs by supporting poor smallholders and reducing poverty and gender inequality through LVC development.

African countries are among those developing countries with a growing real GDP (approximately 3.8% in 2018) that is largely driven by increasing domestic demand (+6.7%), regionalization and globalization, but still face development challenges from unfavourable business environments (AfDB, 2019). Apart from often obstructive foreign trade policies, the diversity and complexity of the African private sectors and inefficient smallholder integration into regional production networks represent major pitfalls (AUC/OECD, 2019). These trends are also observed in the Nigerian fishing industry that supplies over 1 million metric tonnes of fish resources, for example, demersal and shrimps concurrently via MVC and LVC in a functional dualistic system (WorldFish, 2018). The industry is an important source of employment for over 28.2 million people, 70% of whom are women. With artisan fisheries accounting for over 80% of total supply, LVC continues to drive overall fish supply in Nigeria (WorldFish, 2018). This holds for the shrimp sub-sector in which the LVC is characterized by numerous artisans—about 1.5 million (Bondad-Reantaso, Subasinghe, Josupeit, Cai, & Zhou, 2012)—most of whom are poor, limited in scope and operations, informally organized and dwell in rural coastal areas (Agbo & Usoroh, 2015).

Organizationally, artisan fishers target informal markets by supplying fish products through the LVC (Udong et al., 2010). Although artisan fisheries have, in the past, been associated with men, women's activities and influence have reportedly increased, as they tend to dominate distinct but complementary roles that include pre- and post-harvest activities (Udong et al., 2010). Despite this, women's commoditization and marketization activities and influence as in other African fishing industries are largely undervalued by chain actors and

practically unseen in management decisions documented by researchers and policy analysts (Fröcklin, De La Torre-Castro, Lindström, & Jiddawi, 2013; Kleiber, Harris, & Vincent, 2015; Máñez & Pauwelussen, 2016; Matsue et al., 2014). Consequently, gender-sensitive fisheries' policy interventions aimed at sustaining livelihood and alleviating poverty and gender inequality are limited in the sub-sector. Although the LVC is important as a source of livelihood for artisans, both fishermen and women processors continue to face the challenge of effectively coordinating their activities and remaining competitive (Agbo & Usoroh, 2015). With the LVC commanding higher shrimp values per unit of catch as MVC (Bondad-Reantaso et al., 2012), there are opportunities to foster economic gains among artisans. Yet, it remains to be understood how the artisans are organized and what implications are needed to enhance their economic benefits along the LVC. Since the Nigerian shrimp sub-sector share peculiar sectoral and structural characteristics with many agri-food sectors in other developing and transition countries (Kleiber et al., 2015; Matsue et al., 2014), insights from this study could be useful for other countries and cases where LVCs are underdeveloped and associated smallholders neglected.

The study is organized as follows. The next section describes the conceptual framework employed in the study. Thereafter, the research methodology is elaborated, including the criteria for the selection of the study area and participants, data collection procedures, handling and analysis. Within the subsequent sections, the results and a discussion of the findings are presented, followed by the conclusions and implications.

2 | CONCEPTUAL FRAMEWORK

This study is based on two concepts: the GVC approach (Gereffi et al., 2005; Kaplinsky & Morris, 2001) and the value web (Allee, 2000; Cartwright & Oliver, 2000). The GVC approach is useful for tracing patterns of production and linking geographically dispersed activities and actors in a chain. Although the focus of the GVC approach crosses international boundaries, new evidence suggests the regionalization of GVCs (Gereffi & Fernandez-Stark, 2016). Four dimensions (**mapping**; **governance**; **benefit distribution**; and **upgrading** in value chains) are commonly employed in the literature to effectively analyse and fully understand broader issues of value chains (Figure 1) (Gereffi et al., 2005; Gereffi & Fernandez-Stark, 2016). With the first GVC dimension, the systematic **mapping** of value chains is represented, showing the entire input–output process that brings a product from conception to consumers and describes the value system. The main actors and their value-adding activities or segments are depicted in this map, including their specific characteristics and dynamics of segments, for example, preferred suppliers.

The second dimension emphasizes the role of **governance** and represents the first conceptual part applied to assess LVCs' organizational structures. Governance in the GVC approach ensures that interactions between actors reflect control and coordination (Kaplinsky & Morris, 2001). In GVC governance analysis, lead actors are first identified, reflecting on their position, inter-relationships and influence sources (Gereffi & Fernandez-Stark, 2016). Then, the distinction of value chains is made based on the type of lead actors identified. Producer-driven chains are mostly found in capital- and technology-intensive industries and controlled by large producers, while buyer-driven chains are mostly found in labour-intensive consumer goods industries and controlled by buyers (Kaplinsky & Morris, 2001). Lastly, the inherent governance structures in each segment are identified from the five governance types defined by Gereffi et al. (2005) based on the complexity and coding of information shared and the competence of the suppliers involved (Table 1).

The governance dimension of the GVC framework is extended by adding the gendered value web to simultaneously assess how

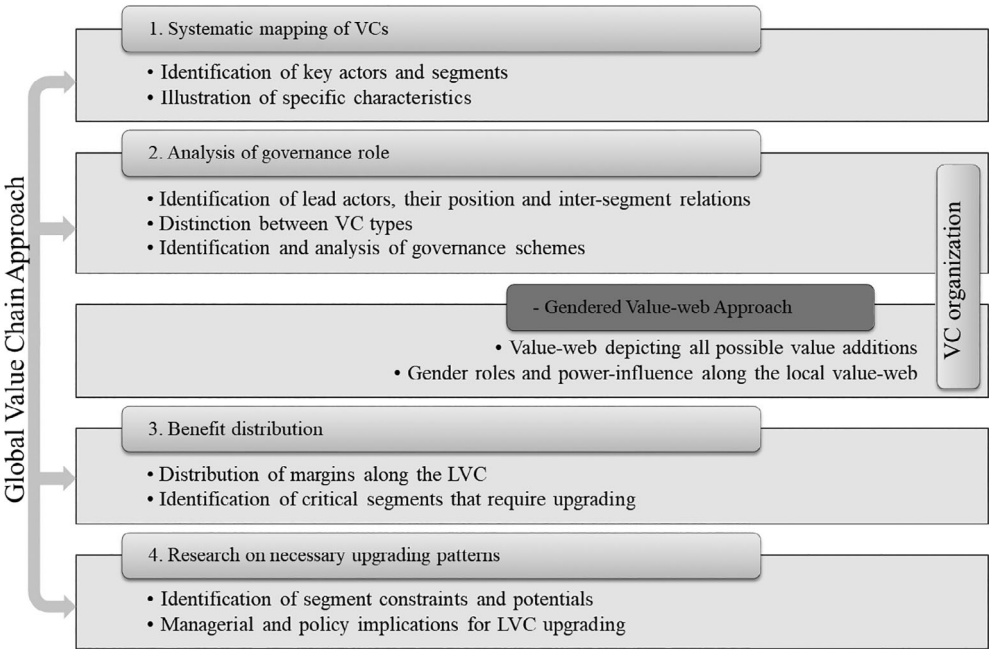

FIGURE 1 Conceptual framework. *Source:* Authors' illustration

TABLE 1 Categorization of governance types according to Gereffi et al. (2005)

Governance types	Description
Market	Typical of a spot market, the price mechanism is central, with little to no formal cooperation between actors. Low power relationship asymmetry exists, since the cost of switching to new partners is low.
Modular	Relationships between suppliers and buyers are tighter, with a high volume of information flow beyond price and semi-low power asymmetry. Suppliers take full responsibility for securing the generic processes/technologies needed to meet customers' specifications.
Relational	Interactions between suppliers and buyers are complex, with mutual dependence and high asset specificity managed through reputation, family and ethnic ties. Nevertheless, the lead actor can exert some levels of control in medium power asymmetry. Trust is built after repeated interaction, so the cost of switching partners tends to be high.
Captive	Characterized by high power asymmetry in which small suppliers are dependent on one or a few buyers. Producers face high switching costs by functioning under certain conditions set by a buyer, while the lead actor, whose competence tends to be outside production, exerts a high degree of monitoring and control.
Hierarchy	Products are complex and product characteristics are hard to transmit, so chains are characterized by vertical integration and managerial control.

Source: Adapted from Gereffi and Fernandez-Stark (2016) and Gereffi et al. (2005).

smallholders are organized based on their gender roles to drive and ensure the functioning of LVCs (Figure 1). While several studies have developed and delved into gender relations in value chains, contradictory findings, particularly on the roles and influence of women along value chains, have been discovered (Barrientos, Dolan, & Tallontire, 2003; Máñez & Pauwelussen, 2016; Schumacher, 2014). As a result, FAO (2016) developed a framework that captures gender issues in value chains and emphasized the importance of robust gender analysis in making effective recommendations for value chain upgrading strategies. This framework involves the inclusion of gender-sensitive information in the mapping of value chains; however, it is product specific and cannot effectively depict value additions created by non-physical inputs, such as disaggregated gendered activities and power influences. The value web approach, in contrast, offers a great advantage by depicting all possible value additions and visualizing where and how these value additions exist. This multidimensional framework provides an avenue to describe certain human factors, for example, knowledge and innovativeness that drive values and ensure synergy in different inter-linked values. Although the value web is an innovative approach that has commonly been employed in business and biomass-based literature (Allee, 2000), the relevance of its "web perspective" makes it crucial as a concept to further graphically depict social factors, for example, disaggregated gender-sensitive information in a competitive system.

Four steps have been suggested to practically analyse value webs (Cartwright & Oliver, 2000). The first step involves the collection of information on the business model, in which all seller–buyer product and information exchanges are categorized into business levels. In the second step, all possible value additions and the cascade use of their end-products are determined. The third step involves the identification of key actors that create the values along the value chain. To include the gender dimension, gender of predominant actors is identified and presented here to indicate values created by men and women. The fourth step involves the creation of the gendered value web in which (a) all values created are linked and placed under appropriate business levels; (b) gender roles are depicted and (c) gendered influences are determined. With this, the flow of products, revenue and knowledge, and intangible benefits, which represent key currencies of value, are depicted (Allee, 2000).

The third dimension of the GVC framework is the assessment of **benefit distribution** to pinpoint critical segments that require upgrading. Different measures have been used to describe the distribution of benefits along value chains. For instance, Lie et al. (2012) used three measures: profit, employment benefits and non-monetary benefits such as knowledge. Adopting these measures in this study will be problematic because of actors' heterogeneity and data unavailability. However, price has become an important measure of value since the 1990s because product processing and differentiation significantly add to margins (Manning, 2015). Therefore, this study employs price as a measure of benefit distribution.

The fourth dimension entails research on the necessary **upgrading patterns**. Four types of upgrading were highlighted by Kaplinsky and Morris (2001), namely process, which deals with how production efficiency can be increased; product, which entails enhancing products' quality by either producing new ones or improving old ones; function, which entails changing the scope and combination of the activities performed, and chain/inter-sectoral, which involves moving into new production activities. Analysis and identification of appropriate upgrading patterns for actors depend on the type of industry, input–output structure and institutional set-up of each country (Gereffi & Fernandez-Stark, 2016). Therefore, upgrading patterns are considered across firm and sector level, in this study, to determine how to develop the LVC and improve smallholders' inclusiveness.

3 | RESEARCH METHODOLOGY

Value system and organizational structures in LVCs typically involve the coordination of numerous actors along multifaceted governance schemes and gender roles (FAO, 2016; Herr, 2007). The definition and

meaning of these concepts are embedded within an individual constructivist view that is influenced by economic, social and cultural settings. This makes smallholders' value systems, organizational structures and gender roles complex and difficult to study, particularly from a quantitative research viewpoint (Mayring, 2015). The complexity is further compounded by the lack of extensive research, especially in the context of LVCs found within dualistic sectors. In this regard, a participatory qualitative research approach is employed in this study to elicit actors' implicit knowledge and constructivist definition of key concepts (Mayring, 2015). Through the use of sophisticated techniques, for example, focus group discussions (FGD), qualitative research allows for identifying, defining and mapping of value systems among numerous actors in the LVC (Herr, 2007) based on guided interaction and discussion among respondents. This process is needed to probe and comprehensively define value systems, multiple governance schemes and complex social constructs, such as power relations and gender roles, across segments without relying on large sample size (FAO, 2016; Lie et al., 2012). Similar analyses using quantitative research methods would have required large sample sizes that cover all segments.

Based on these considerations, the qualitative primary data collection took place between December 2017 and January 2018 in Nigeria using three FGDs, which included three Net-maps, with 27 artisan producers and processors and key informant interviews (KII) with 21 actors and experts (Table 2). In this study, FGDs and Net-maps were used to triangulate and cross-check findings from interviews while the overall findings were substantiated with relevant literature and statistical data reviewed.

3.1 | Sampling

Relying on the local knowledge of extension agents and experts from the Nigerian Institute for Oceanography and Marine Research, the study was conducted in three states: Lagos, Akwa-Ibom and Delta to encourage a diverse and appropriately representative pool of respondents and gain insights across different socio-cultural zones. Respondents were selected based on their level of experience and extensive knowledge of the shrimp sector. Due to initial difficulty in contacting respondents directly, due to the location of artisans in secluded rural coastal areas and rigorous bureaucratic processes among fishing companies, participants were enlisted through snowball sampling design. The design starts with experts identifying and contacting leaders of shrimping communities/groups and fishing managers. In Lagos, two settlement leaders were identified and interviewed before they determined 13 fishers and one helper that participated in KIIs, FGDs and net-mapping procedures. Two managers of fishing companies were also selected and interviewed to depict the MVC. In Akwa-Ibom, the head of the shrimping association, identified by experts from the state's Ministry of Agriculture, was interviewed. Thereafter, the head designated 10 fishermen and 8 processors that participated in KIIs, FGDs and net-mapping process. These participants further named two traders, three retailers of processed shrimp and three transporters that were interviewed in that state. To have an overview of fresh retailing, one retailer, identified by extension agents in Delta, was interviewed. Finally, two experts (one field officer and one researcher) from Lagos and Delta were interviewed to validate our findings. Overall, 48 stakeholders across eight categories were sampled as shown in Table 2.

TABLE 2 Details of the participants in the focus group discussions (FGDs) and key informant interviews (KIIs)

Expert number	Participants	Focus group discussions	Net-maps	Interviews
01	10 Fishers[a]	1	1	
02	10 Fishers	1	1	
03	Fishers			3
04	Helper			1
05	7 Processors	1	1	
06	Processor			1
07	Local collectors			2
08	Logistics			3
09	Processed retailer			3
10	Fresh retailer			1
11	Company manager			1
12	Marketing manager			1
13	Researcher			1
14	Field officer			1
15	Group leader			1
16	Settlement leader			2
Total		**3**	**3**	**21**

Source: Authors' illustration.
[a]In Lagos.

3.2 | Data collection

3.2.1 | Focus group discussions and key informant interviews

The data collection involved in-depth FGDs and KIIs and were organized and moderated by the researchers. Before the start of the FGDs and KIIs, the research objectives and significance of the study were explained to the participants, while permission to record the sessions was obtained. FGDs and KIIs were guided by semi-structured questionnaires using open-ended questions, complemented by the application of Net-maps. The FGDs started with general questions on the background of the participants, sector and fish resources transacted. Next, participants were asked open-ended questions about the four dimensions of GVC approach. To understand value systems in the LVC, participants were asked to identify and describe all value-adding activities, the actors involved and chain characteristics, such as percentage flow of fish resources and market destinations. Examples of questions asked were *"what are the different types of value-additions possible for shrimp* and *who are the main actors you interact with*?" From this stage on, Net-maps were applied to map and record participants' answers and facilitate the understanding of intricate associations among actors identified.

For the second dimension—governance analysis—participants were asked to identify and describe the type of chain, relationships among actors and lead actors in the LVC. The gendered value web was then added by asking participants to identify all possible values in each segment and the predominant gender involved in each value additions. Questions asked included "*how many female labourers are involved in each of these value-additions?*" Furthermore, participants were asked to describe the flow of price per unit to depict how benefits were distributed along the LVC. The researchers did this by asking: "*how does the price of shrimp differ along the chain?*" and noting participants' answers on the Net-map. Finally, necessary upgrading strategies were determined by asking participants to identify and discuss observed constraints and opportunities in the industry, actors' efforts in coping and what government can do to help them manage and upgrade their activities. Participants were asked questions such as "*how do you react and cope with such constraints?"*

KIIs with actors in the LVC were guided by the same open-ended questions. However, questions were varied according to the type of participant interviewed and topics that needed further investigation. Interviews with firm managers were directed using a separate questionnaire that was slightly adapted to the specificities of the value systems and organizational structures in the MVC. Most FGDs and KIIs were conducted in local languages (Yoruba), except KIIs with experts and firm managers, which were conducted in English. For all FGDs and KIIs, audio recorders and jotters were used to capture important details. FGDs lasted between 90 and 120 min and the interviews for 20–90 min.

3.2.2 | The Net-map

One important tool used during FGDs is the Net-map, which is often employed in participatory research methods to stepwise map how a process is implemented (Schiffer & Hauck, 2010). The Net-map is advantageous because it helps to visualize implicit knowledge and understand the interplay of complex value networks, power relations and actor roles. It allows for the active involvement of respondents in the process of visualizing LVCs, gender relations and influences, which are rather difficult to depict through conventional FGD methods. The implementation of Net-maps was adapted following the four steps described by Schiffer and Hauck (2010). Before the Net-maps start, the steps were described to the participants to ensure that everyone understood the procedure.

In the first step, the first GVC dimension—the mapping of the LVC—starts with the respondents identifying and naming all key actors and activities along the LVC. The moderator wrote the names of the actors and their activities[2] on stickers and glued the stickers to A1-sized cardboard. Arrows were drawn to link all the stickers using markers to connect the stickers and depict a chain. The same logic was applied for the value web, however, all possible value-adding activities in each segment were asked from the participants, written on the sticker and glued to the cardboard. The moderator continues to probe the respondents and add actors and their activities until the entire process is completed. The Net-map was modified either to rearrange and/or accommodate new actors/activities that had not been mentioned earlier.

In the second step, the respondents were asked to determine the proportion of shrimp capture that goes for each of the identified activities. Assuming the maximum shrimp captured by fishers is 10, the respondents were asked to determine what proportion of this goes to the next activities in the chain. The moderator visualizes this by writing the value decided under each sticker glued to the cardboard. Thereafter, the associated market margins accruable to each activity/actor are determined by the respondents. The current market price that the producer sell shrimp at the time of the research was used (₦ 800/per kg), after which respondents determine the amount each actor subsequently earns along the chains. Throughout Steps 1 and 2, respondents were encouraged to argue their points until they agreed on a single conclusion, thereby increasing the reliability of the information obtained.

The third step involves the ranking of actors' power relations by the participants for the second GVC dimension. Questions regarding the importance and influence of each actor were asked to determine power relations and lead actors in the LVC. To visualize the level of influence, participants were provided with flat button-like materials that could be piled up to form a power relation tower. The number of materials in each tower was counted and noted for each actor named on the map.[3] Thereafter, for the gendered value web, the value-adding activities in which both men and women were influential were also ranked using the same logic as above. In the fourth step of the process, the moderator uses the

resulting detailed Net-map to probe the participants on the LVC and the gendered web structure.

3.3 | Data handling and analysis

The different components of the three Net-maps were combined to produce one complete value chain and gendered value web using Microsoft PowerPoint. For actors with different power rankings, their average influence levels were taken and rounded off to obtain integer values. The qualitative data obtained were transcribed from the audio recordings into a separate Microsoft Word document template and subjected to content analysis according to Mayring (2015). The procedure starts by identifying and establishing six themes that are relevant for the GVC and gendered value web analyses. These themes capture information on the inputs; fish resources caught, main actors (indicating the relationship and governance schemes existing between actors), possible value addition to the shrimp (indicating associated price and quantity flow and market destinations), chain characteristics (indicating the historical evolution of the chain, contingent situations, difficulties and opportunities, etc.) and gender roles and power relations within the LVC. Thereafter, transcribed data were transferred into Nvivo and six nodes representing the six themes were identified and created with the help of the software. On this basis, qualitative data were worked through line by line to identify relevant information and code each sentence into appropriate nodes. Each node was revised as the researchers went through the data while several sub-nodes were created to depict different sub-themes, for example, several sub-nodes were created for all identified actors under "main actors" node. Important reoccurring codes, texts and metaphors were then looked out for while meaningful storylines were formed from the different nodes and sub-nodes. Lastly, analysis and interpretation of the nodes and storylines were made, while complementing with information in the Net-maps.

For Sub-objective (1), relevant information presented in the Net-maps and qualitative data were combined to graphically portray detailed value systems in the LVC and MVC. The key input–output components of these value chains that include the main activities/segments and key characteristics of the actors were interpreted. Thus, LVC and MVC segments were identified and differentiated by values created/added. For Sub-objective (2) concerning how smallholders are organized, information on different governance concepts among actors, gendered roles and influence in the value web were analysed. The governance concepts analysed included the type of chain, governance schemes and lead actors, reflecting on their roles, positions and sources of power relations. An overview of the value-adding benefits accruing to each actor in the LVC was analysed to depict the third GVC dimension. For Sub-objective (3), qualitative data from FGDs and KIIs were further reviewed to determine key constraints and opportunities for development in each segment of the LVC. This allowed for the derivation of segment-specific implications regarding necessary upgrading strategies as part of the fourth GVC dimension (Trienekens, 2011).

4 | RESULTS AND DISCUSSION

4.1 | Value systems in the Nigerian shrimp sub-sector

In this section, we present the first dimension of the GVC approach which involves the systematic mapping of the value chain to address the Sub-objective (1). The Nigerian shrimp sub-sector consists of two types of value chains, namely the MVC and the LVC, as presented in Figure 2. The MVC is dominated by industrial fishing companies, many of which are organized under the umbrella of the Nigerian Trawlers' Owners Association (NITOA) (Expert 11). Figure 2 shows that the MVC is structured to target export and modern domestic markets from which premiums are earned for meeting export quality and quantity standards. About 85% of the shrimp caught by fishing companies is exported, mainly to EU countries, for example, Belgium and the Netherland. Compliance with strict export regulations and standards is stringently monitored and controlled by the Nigerian Federal Department of Fisheries. Shrimps that cannot meet these standards are absorbed by registered agents (15%) that sell either directly or through stores/supermarkets or big restaurants to final consumers in the high-value modern domestic market (Experts 11 and 12). Overall, the results indicate that producer–international markets–consumer link represents the predominant value channel in the MVC.

The LVC is structured to target traditional domestic markets, firms and regional markets.[4] The majority of the demand for shrimp comes from the traditional domestic market, comprising the urban, peri-urban and rural markets. In this value chain, all the shrimp captured by fishermen is sold off at the shore to fish mammies,[5] who, in many cases, both process and market shrimps. This is meaningful as it highlights one of the major differences between this LVC and other Nigerian and African fishing LVCs in which fishermen often have more marketing options by directly selling to processors, traders and/or consumers (Fröcklin et al., 2013; Matsue et al., 2014). The Net-maps also show that fish mammies sell processed shrimps either through their union or directly to traders that include village collectors/brokers and large traders/wholesalers. Of the total shrimp processed, 95% is sold to traders who demand in bulk and with whom processors have long-term relationships. The remaining 5% is bought by final consumers around the processing sites (Expert 05). This result is consistent with what is observed in other African fishing industries (Matsue et al., 2014), in which processors prefer to sell in bulk to traders rather than to final consumers.

Village collectors/brokers differ in their characteristics and activities from large traders/wholesalers, as the former are often closer to landing sites, transact frequently with processors and service markets around the landing sites but are sometimes missing along the LVC if the landing sites can easily be reached by large traders/wholesalers. In this regard, village collectors/brokers sell to large traders but not vice versa (Expert 07). The study depicts these differences by profiling these actors separately but in the same segment, as shown in Figure 2. Traders sell about 67% of shrimps caught to retailers, while about 18% is sold directly to final consumers in traditional domestic markets. Contrarily, retailers sell very significant quantities (62%) directly to final consumers through local retail

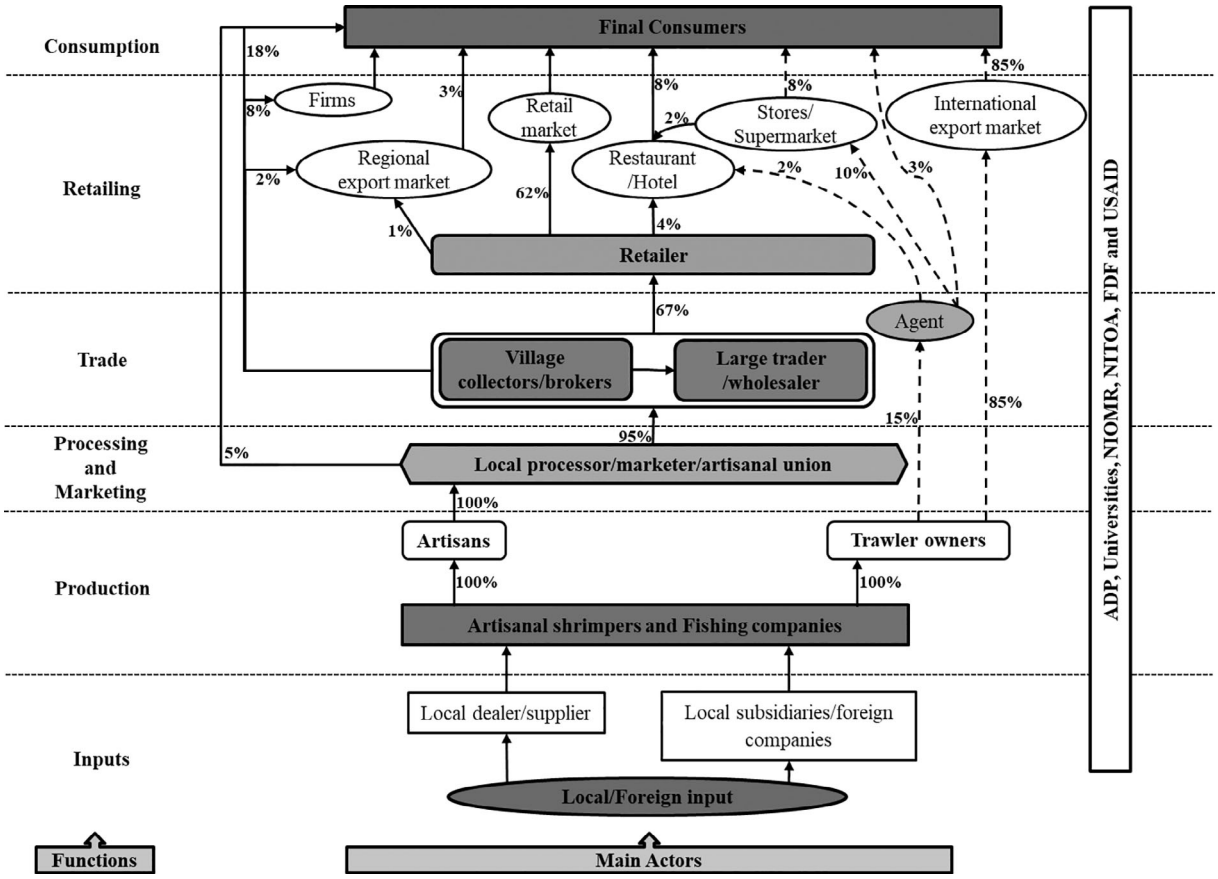

FIGURE 2 Shrimp and prawn value chain. *Source:* Authors' illustration based on focus group discussions (FGD) and key informant interviews (KII). Notes: The flowchart indicates both local value chain (LVC) and modern value chains (MVC) highlighting the sources of SP and their different marketing channels. The percentages depict the quantity flow of SP across tiers and were obtained based on participants' perception during FGDs and KIIs. Tick arrows are used to link actors and segments in LVCs while broken arrows depict MVC. Institutions that intervene to support and regulate the sector are listed in the box located at the right side of the figure. Lastly, several segments are listed on the left side of the chain, each separated by thin dotted lines

markets, while the remainder ends up in local restaurants and hotels (4%) and regional markets (1%), for example, Cameroon. Information from the Net-maps and Expert 06 further indicates that *"shrimps are being supplied to industrial firms that make Maggi and biscuits"* while regional export markets have sprung up and are being served by procurement agents who are well connected to the processors and village collectors along the LVC. This finding highlights further developments in the LVC from the situation in the past, in which the demand from firms and regional markets was missing (Agbo & Usoroh, 2015). However, industrial demand for shrimps is still small (8%) and quantities supplied to the regional markets are quite negligible (2%). Accordingly, the producer–processor–trader–retailer–consumer link represents the most important and predominantly used value system in the LVC.

4.2 | Connecting landing sites to markets: Smallholders' organization along LVC

In this section and Section 4.3, the answers relating to the Sub-objective (2) are presented. By analysing the second GVC dimension and the gendered value web approach, the study seeks to understand how smallholders are organized along the LVC.

4.2.1 | Second dimension: Governance themes and their role along the LVC

Reflecting on the second dimension of the conceptual framework (Figure 1), the LVC was found to be unregulated and buyer-driven in which traders were ranked as the overall lead actor. Expert 01 described traders as "*a group that has more power and influence during negotiations and price-setting generally*" and aggressively drive the distribution of shrimp along the LVC. This is consistent with many African sectors in which intermediary traders are influential and crucial to the proper functioning of value chains (Agbo & Usoroh, 2015; Gereffi et al., 2005). Although not as far-reaching as those of the traders, the power rankings made by Experts 01, 02 and 03 in Figure 3 indicate that fish mammies also have control over the chain, particularly upstream. This is underpinned by the fact that "*They (fish mammies) are very important in this system…*

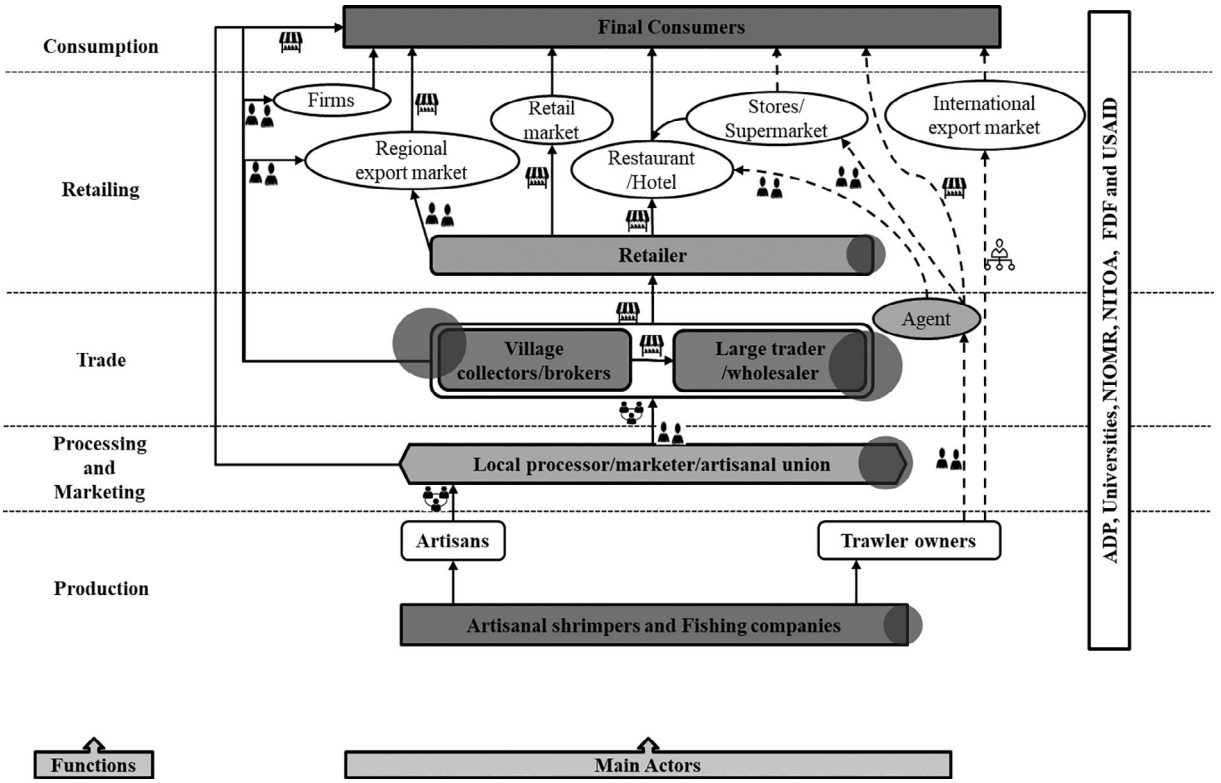

FIGURE 3 Governance typologies along the shrimp and prawn value chain. *Source:* Authors' illustration based on FGD and KII. *Notes:* ● depicts the level of power influence along the LVC. Different types of governance identified in the value chains include: market; modular; relational; and hierarchy

They can influence certain things within the community and along the supply chain" (Expert 02).

The dominance of the traders results from their relationships with multiple actors across tiers, as depicted in Figure 3. Information from the FGDs and Net-maps indicates that traders receive rich and essential market information from both ends of the chain, which is crucial for their business decision-making processes, especially for spatial price integration and determination. The hub and spoke business model that traders engage in, allows them to source products from different shrimping origins, consolidate them and sell in different markets (Experts 03 and 05). The same model is used for supplying firms and regional markets, although with more substantial relationships needed to meet certain quality and quantity specifications (Figure 3). It was also found that traders hold up essential market information to advantage themselves (Expert 01). This results in uneven and degraded marketing information across tiers, especially for artisan fishers and processors (Experts 01, 02 and 06), a finding that contradicts Agbo and Usoroh (2015)'s conclusion on smooth, free flowing information within the LVC. Further results suggest that information asymmetry causes a low level or even a lack of trust in fish mammy–trader relationships, as indicated by Expert 01: "*…Business does not bring trust. Our trading partners think we are cheating them while we think they are cheating us*." and confirmed by Expert 06. Traders face relatively less liquidity pressure and lower risk of shrimp perishability than fishers and fish mammies and so make more careful business decisions. This provides traders with the opportunity to shift negotiations in their favour while fish mammies continue to sell at their mercy (Expert 05). This was also confirmed by Expert 06: "*When there are so many shrimps available, we need to sell the shrimps quickly to prevent the product from perishing… Sometimes, we are forced to sell the product without someone to buy*." Finally, similar to Kenyan fishery industry (Matsue et al., 2014), traders were found to have relatively larger working capital resources and access to several sources of income, for example, credit facilities and non-fishing employments, which affords them purchasing and bargaining advantage and ability to transfer risks to their trading partners (Experts 01 and 02).

As shown in Figure 3, actors are mostly organized along "market governance" schemes in the LVC. Transactions from processing/marketing to the consumer segment of the LVC are mostly done at spot markets in which information on price determines the level of transactions between suppliers and the buyers. For example, Expert 05 revealed that *"If we (processors) cannot sell everything, we often take our products to the local market on the market day"* while Expert 10 claimed that "*…we will collect shrimp and bring it to the market…and sometimes take the products to other markets because the price in those markets might be favourable*." An exception is the collective selling-price fixing and marketing by processors/marketers through unions, as a way to improve bargaining power in some shrimping communities (Expert 06). Although producer groups also exist, there were no indications of collective marketing as activities of producer groups are targeted towards improving production-related activities, for example, employee sourcing and political lobbying (Expert 15). With "market

governance" dominating (see Figure 3), actors are faced with no entry barriers, thereby resulting in a relatively long and spatially diverse LVC with simple seller–buyer interactions. In an attempt to avoid additional transaction costs (Matsue et al., 2014), processors sell directly to traders at their processing site or nearest market hub (Expert 10). Over time, this relationship could develop into a more complex strategic and mutually dependent relationship between processors and traders (Figure 3).

Around the mid-1990s, though on a very small scale, processors were found to dominate both the production and processing segments of the LVC in which they catch shrimp, own production inputs, process and market (Expert 06). This confirms what Agbo and Usoroh (2015) also found. Over time, as the LVC developed, fishermen and processors became specialized in segments they both have a comparative advantage as "*…fishermen now catch and bring shrimp to the shore and women stand to buy shrimp from fishermen before processing and marketing*" (Experts 01). This result highlights the evolution of the LVC towards the divisiveness of the production and processing segments and formation of "relational governance" in fishermen–processors transactions. With most fishermen now owning their production inputs and shrimping under high trust levels and less exertion of processor's control, the evolution was found to foster mutual dependency between fishermen and processors (Expert 01). With this finding, the study was able to clarify that processors make independent economic decisions which are different from those made by fishermen. However, the result is in contrast to previous findings on this particular LVC (Agbo & Usoroh, 2015), in which the processing/marketing segment and the "relational governance" between fishermen and processors were not observed. The difference in the type of conceptual and research frameworks, employed by extant studies that do not allow for the capture evolutions in LVC, could be the reason for such a result.

The "relational governance" between fishermen and processors emerged due to the transactional complexities that arise from market uncertainties, shrimp's high perishability at the supply base and fish mammies' power influence along the LVC (see Figure 3). Referring to Experts 01 and 02, these contingencies influence fishermen's decision to form strategic bonds with fish mammies that are largely managed by long-term relationships, reputation, family or ethnic ties and social and spatial proximity (Gereffi et al., 2005). Instead of forging an element of "relational governance" with traders as found in many African fishing LVCs (Fröcklin et al., 2013; Máñez & Pauwelussen, 2016; Matsue et al., 2014), fishermen tend to improve their competitiveness by relying on few fish mammies who are their wives, relations or live near them (Experts 15 and 16). This is meaningful, as "relational governance" tends to enhance the coordination between fishermen and fish mammies. It is also needed to counter traders' power relations and, consequently, reduce associated risks along the LVC (Experts 01 and 15). Furthermore, "relational governance" ensures that the activities of both fishermen and processors are to a certain extent synchronized (Expert 02), giving rise to an important factor that drives the LVC.

In this type of arrangement, and as observed in the Philippine Tawilis chain (Trienekens, 2011), fishermen repeatedly transact with the same processor(s) for years, thereby allowing for trust-building. While both parties have distinct and mutually exclusive costs and benefits, shoreline prices or revenue-sharing formulas are agreed when shrimp is purchased or provided on credit, respectively. Alternatively, referring to Expert 02, "*…they (processors) will get the product, sell and then make repayments or sometimes make account at the end of every week*." Despite mutual dependency, both parties were found to enjoy certain levels of autonomy as "*we (processors) could get shrimp from different sources (fishermen) to maximize our own gains…You know shrimp from one canoe cannot be enough for me*" (Experts 05 and 06). This further confirms that fish mammies make their own economic decisions and can wield their influence along the LVC (Figure 3). This finding serves as a basis for the following results of the gendered value web analysis.

4.2.2 | Second dimension: Gendered value web in the LVC

The results indicate that activities in the shrimp value web[6] are undertaken on three business levels, namely the shoreline level, at which most of the exchanges between fishermen and processors take place; the local processing–household consumer level, at which most of the local processing and consumption are done, after active marketing by the middlemen; and the industrial level.

The gendered value web supports the previous finding on the existence of a strict division of labour and specialization based on actors' gender comparative advantages, especially at the supply base. Similar to other African fishing industries (Kleiber et al., 2015; Máñez & Pauwelussen, 2016), fishermen have a comparative advantage in shrimping mainly because of the physicality of paddling plank canoes and drawing nets on the high sea. Offshore security was another reason expressed in some areas. Thus, "*Women are experts in drying shrimp…Fishermen spend hours in the water and so rely on women to dry it, else shrimp will spoil*" (Expert 01), information also confirmed by Expert 03. Figure 4 further highlights that all value-adding activities in the local processing–household consumption level are gendered, with women managing the supply base and LVC.

Several trends that support the importance of fish mammies and fisherman–women processor reliance are summarized in the gendered value web. Fish mammies' processing or handling activities were found to encourage most industrial and local value additions for shrimp, thereby increasing the importance and influence of women processors along the LVC. Smoking or sun-drying is crucial to prolong shrimp's shelf life, enhance handling and make it available in forms that are generally acceptable to most local buyers (Expert 06). Referring to Expert 15 "*…shrimp spoils when it is dragged for 3-4 hours inside the water*." The activities of women processors, therefore, seem particularly important, as fishermen are assured of consistent demand and no financial loss from the continuous deterioration of shrimp after landing. Results in Figure 4 also reveal that all industrial value additions come only after fish mammies' value additions, highlighting the importance of gender relations in creating and driving values.

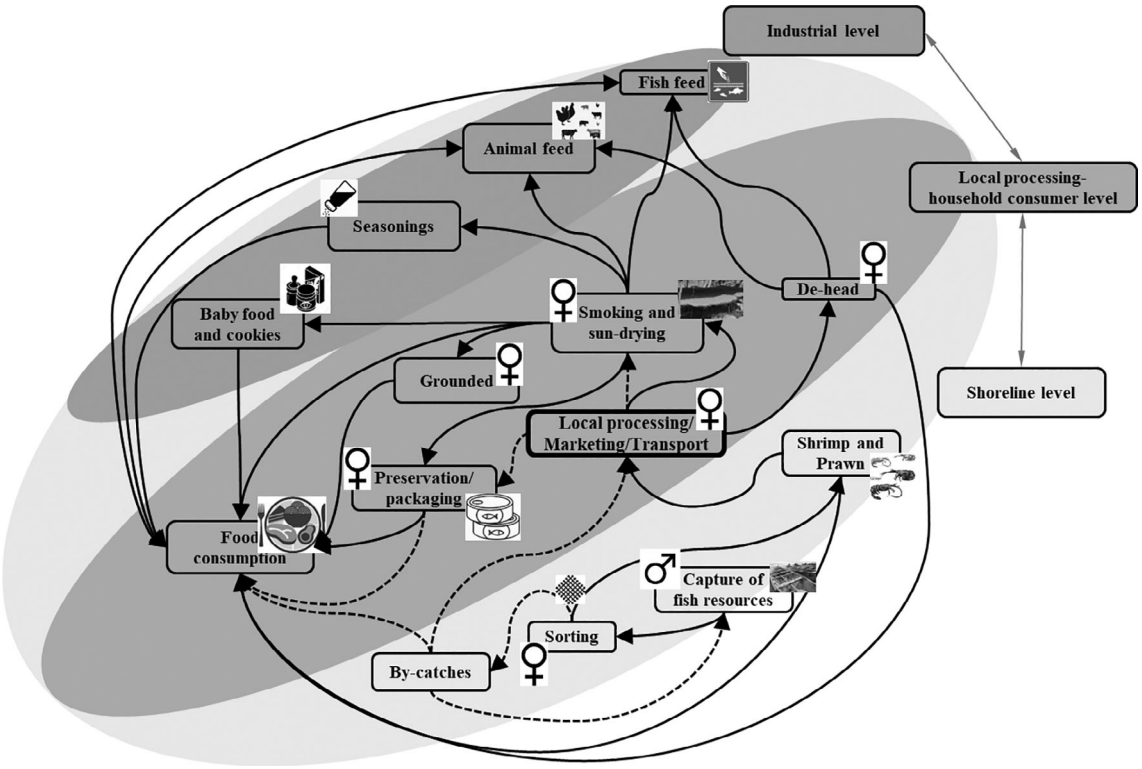

FIGURE 4 Gendered value web in LVC. *Source:* Authors' illustration based on FGDs and KIIs. Notes: The study depicts the different types of value addition possible for SP in LVC. It also depicts gender dominance in different activities: ♀ represents women dominance while ♂ depicts men dominance in the chain. Thick lines represent the flow of SP while the broken lines represent the flow of by-catches

Beyond direct value additions, fish mammies were important providers of a financial cushion for many fishermen as they offer them zero-interest credit, for which repayments are made in subsequent transactions. "*That is why you have a lot of fishermen with very white hair… If you get one basin that is not up to your fuel cost, they (fish mammies) will buy the little basin you catch and pay your money before trading on it. That is why many women are wealthier than most of the men here…It is those women who sometimes lend us money so that we can operate and they will take back their money after the sale of the shrimp*" (Expert 02). This has an important impact on fishermen and the whole LVC since a constant supply of shrimp is assured from the supply base.

In addition, Figure 4 indicates that fish mammies also serve as the face of the supply base, thereby determining LVC's shape by either selling to traders or local consumers. The marketization activity makes fish mammies crucial in determining what and how benefits are distributed to the fishermen. The gender relations and mutual reliance between both actors mean that the margins and liquidity that fishermen receive depend on how fish mammies fare in their negotiation with powerful middlemen. This trend holds because fishermen–fish mammies exchanges are often based on predetermined sharing formulas or post-marketing calculations (Experts 01 and 06). To reduce associated risks, fishermen tend to further mutually rely on and transact with fish mammies who are "*agile, understand the business relationship and can provide a financial background*" (Expert 02). Although this finding contrasts with what holds in some African fish industries, where fishermen tend to rely on women traders (Máñez & Pauwelussen, 2016; Matsue et al., 2014), this result further contributes to the general notion in African LVCs that women and their roles are shifting from being inferior and dependent to being one of the major drivers of chains at and beyond the supply base (FAO, 2016; Udong et al., 2010).

4.3 | Third dimension: Benefit distribution among actors in the LVC

The analysis, as well as the results shown in Figure A1.1 in Data S1, suggests inequitable benefit sharing in the LVC. Generally, more benefits accrue to lead actors (Trienekens, 2011), in this case, traders. If large traders/wholesalers sell to big cities, they earn three times (+200%) the shoreline price (₦800 = 2.20 USD per kg)[7] received by fishermen. Retailers can earn four times (+150–325%) the shoreline price. Contrarily, fish mammies earn an additional 7–25% depending on whether they transact with the final consumers or the traders. The mutual reliance between fishermen and fish mammies means that the uneven benefit shares accruing to fish mammies also resonate with fishermen. Such inequality in benefit shares of fish mammies cannot be regarded as indirect gender bias since the LVC is dominated by women. However, the result in Figure A1.1 in Data S1 tilts towards the theory that smallholders generally suffer from more inequitable product market effects in the LVC than in MVCs (Barrientos et al., 2003; Maertens & Swinnen, 2012; Schumacher, 2014).

TABLE 3 Constraints and opportunities in the production and processing segments

Segments	Key constraints	Opportunities
Production and supply	High natural seasonality/instability in production High seasonal demand High asset specificity and costs Conventional shrimping inputs Lack of basic and financial infrastructure Information asymmetry Limited incentive to store SP further	High domestic demand Increasing post-harvest value Collective action to upscale supply Communal structure to overcome constraints
Processing	Quality variability Lack of a cold chain Limited access to modern techniques Low education and financial illiteracy Lack of basic and financial infrastructure Insufficient working capital	Upscaling the quantity processed Collective action to overcome constraints increased processing hours
Marketing	High transportation cost Information asymmetry Limited market outlets Low negotiating power Huge competition Limited marketing skills Unstable demand and high price fluctuation	Collective marketing and price determination Weekly traditional markets

Source: Authors' illustration based on the FGDs and KIIs.

Therefore, further development of the LVC requires necessary upgrading strategies that will align benefits better with the supply base.

4.4 | Fourth dimension: Smallholders' upgrading strategies in the LVC

This section addresses Sub-objective (3) on the necessary upgrading patterns for smallholders in the LVC. Table 3 summarizes key constraints and opportunities relating to upgrading in the production and processing segments. KIIs and FGDs with fishermen and processors reveal that numerous constraints at the supply base significantly revolve around market access and orientation, the unavailability of innovative resources and physical infrastructure and institutions that prevent fishermen and fish mammies from enhancing their economic benefits along the LVC (Table 3). Thus, strategies aimed at overcoming these constraints will be crucial for smallholders' process and product upgrading and attainment of equitable benefits along the LVC (Trienekens, 2011).

4.4.1 | Public constraints and opportunities at the supply base

The institutional supply-side pillars emphasize the roles that the government (public) and private sectors play in providing an enabling environment for artisan fishermen and fish mammies to overcome their constraints (AUC/OECD, 2019; Trienekens, 2011). Fishermen, like smallholder farmers in Nigeria (Apata et al., 2020), lack access to a range of complementary assets, infrastructure, finance, technical assistance and skills that are required to improve their operational efficiency and product quality and effectively link them to growing local demand. With "*some of the processors marketing their products in the cities*," the lack of basic infrastructure, for example, tarmacked roads prevent fishermen and fish mammies from getting closer to final consumers and further limits private stakeholders in upgrading activities upstream (Expert 01). Regulation and enforcement of relevant laws to control pollution in water bodies and environmental degradation are also generally lacking, which leads to dwindling and unstable supply and high production costs for fishers, especially because they "*…are no longer able to fish nearby*" (Expert 02). With reliance on locally fabricated inputs, fishermen remain technically unable to deal with such constraints, including those occurring naturally, for example, seasonality and bad ocean weather (Expert 03).

Furthermore, most fish mammies were found to lack basic physical assets, for example, stable processing sheds, which limit their activities, increase their processing and haulage costs from the shoreline to the processing shed and consequently results in uncompetitive market prices. Generally, higher marketing costs are incurred in shrimping communities with no direct access to tarmacked roads. Several communities lack electricity, indicating that certain opportunities, for example, cold processing and sales upscaling cannot be undertaken by processors (Experts 01 and 06). This constraint significantly decreases processors' bargaining power and opportunities to differentiate products and target new markets. Moreover, the lack of modern processing facilities reduces processors' ability "*…to smoke it (shrimp) in no time (not more than 3 hours) with a uniform result*" (Expert 03) and incentives to improve and attain consistent quality (AUC/OECD, 2019). Although there are opportunities for quality upgrading, for example, premium for high quality from urban and peri-urban consumers, fish mammies rely on drudgery as a means to

process and ensure uniform quality and contaminant-free shrimp (Expert 13). In addition, and in most communities, there was no evidence of public–private coordination that includes support from the network of fishing companies in MVCs and non-chain actors (Experts 01 and 02). Consequently, fish mammies were found to lack adequate technical and financial assistance, training and market information and find it hard to organize themselves better into groups (Trienekens, 2011). Evidence that the activities of women processors are neglected by extant research was found, as policy instruments are gender-insensitive following the trend that *"men still lack access to government support not to talk of our women"* (Expert 01). Finally, according to Experts 13 and 14, firms in the shrimp-based value web also need technical infrastructure, a skilled labour force and financial instruments to support innovativeness, ensure a consistent demand and aid further research to develop existing and new markets (AUC/OECD, 2019).

4.4.2 | Organizational constraints and opportunities at the supply base

On the institutional demand side, the producer–processor interface lacks coordinated vertical and horizontal relationships, resulting in ineffective production and business decisions, high market information asymmetry and severe holdup problems. Findings revealed that fishermen often supply shrimp continuously even when fish mammies have reached full capacity or when the demand is low (Expert 03). This results in holdups and severe liquidity problems for fishermen, especially when exchanges with fish mammies are based on credit and profit-sharing formulae. Both producers and processors are negatively affected by such huge shrimp holdups because they "*…experience less purchasing and bargaining power when the holdup of products is longer than expected*" (Experts 01 and 02).

Furthermore, fishermen and fish mammies face market information asymmetry since traders hide information and smallholder groups are either non-functional or uncoordinated in most shrimping communities. Information asymmetry was found to worsen as activities in neighbouring shrimping communities remain unsynchronized and uncoordinated, leading to spatial price differences, over which traders take advantage (Expert 01). Results further indicate that fish mammies are unwilling to adopt modern processing technologies by showing scepticism towards their effectiveness: "*You cannot use any other technology to process shrimp effectively*" (Expert 05). However, there are opportunities to reduce the processing costs for fish mammies if modern techniques were used, instead of the conventional method that is unsustainable both from health and environmental points of view (Expert 01). Fish mammies' scepticism is further compounded by the lack of access to extension services and government-sponsored training, which could teach and encourage them to discard conventional techniques. With visual observation and information from Expert 06, it was found that the location of many processing sheds is often unfavourable, hard to reach or far from landing sites. Fish mammies, therefore, incur higher costs in maintaining sheds and transporting shrimp.

Finally, evidence from the study indicates that the mid-stream is also constrained by several challenges that resonate back to the supply base (Table A1.1 in Data S1), most particularly high transportation costs (Experts 07, 08, 09 and 10). Middlemen increase the price of shrimp to accommodate and compensate for the high transport costs incurred (Udong et al., 2010) or, as found in this case, transfer the risk to fishermen and fish mammies by wielding their negotiating power to reduce processors' margins (Experts 01 and 06). Apart from the government providing an enabling environment, middlemen can alleviate these constraints through collective transportation, which helps to distribute the costs across several traders and marginally reduces the costs for individuals. Consequently, this could also reduce the level of risks transferred to smallholder producers and processors.

5 | CONCLUSIONS AND IMPLICATIONS

In this paper, we extend the GVC framework (Kaplinsky & Morris, 2001) towards the gendered value web approach (Allee, 2000; Cartwright & Oliver, 2000) to uncover LVCs' (a) value systems (b) governance themes and gender roles for value addition and (c) smallholder upgrading strategies in developing countries' dualistic sectors using the example of the Nigerian shrimp sub-sector. Results from the LVC Net-maps indicate that the predominant value channel is a long chain of producer–processor/marketer–trader–retailer–consumer. Against the background of LVCs, this study finds the LVC structure to be well defined, driven by traders and processors, and able to remain somewhat competitive in creating value, despite facing uncertain external situations and neglect. The results further indicate that smallholders in the LVC are informally organized, with "market governance" dominating middle and downstream stages and "relational governance" characterizing fishermen–processors transactions at the supply base. Activities between the shoreline and household consumption business level are gendered, as fishermen were organized to catch shrimp, while women dominate local processing, trade and retailing segments.

Several practical implications for effective upgrading and LVC development emerged from this study. The need for a linear process and product upgrading suggests that actors should, as a strategic business plan, initially target domestic and regional markets to remain competitive and avoid market failure. In this regard, managerial activities at the supply base and midstream should first be geared towards efficient input–output transformation, whereby value-adding systems are restructured and better technologies adopted (Gereffi & Fernandez-Stark, 2016; Trienekens, 2011; WTO, 2019).

To upgrade processes upstream, fisherman–processor organization along "relational governance" and gender roles are considered important for both parties to overcome inherent contingencies and constraints, consistently supplying shrimps and accruing more benefits. Fishermen and processors should, therefore, optimize their vertical coordination by implementing concrete and contingent-based business strategies and shrimping plans to avoid holdup and liquidity problems that currently reduce their bargaining power (Manning, 2015; Trienekens, 2011).

Periodic reconciliation of business strategies and financial records is one possible way to better coordinate activities in such a relationship.

Moreover, improvement in negotiating advantage through collective price determination should be prioritized by fishermen and processors to reduce the risks and inequitable margins transferred to them. Both fishermen and fish mammies should, therefore, intensify their horizontal bonds with their competitors to encourage economies of scale and achieve uniform market prices within fishing communities. In this respect, existing fisher groups and unions need to be empowered to encompass strategic objectives that benefit members and stimulate participation of non-members, while new groups are needed in areas where they do not exist (AUC/OECD, 2019; Dürr, 2015; Lie et al., 2012; Trienekens, 2011). Collective marketing, in particular, seems to be the most imminent and cost-effective approach with which fish mammies could overcome higher marketing costs associated with the lack of basic infrastructural facilities. Although difficult, smallholders and groups in adjacent shrimping villages also need to better coordinate their activities to spatially integrate and ensure uniform prices across neighbouring landing sites. In the midstream, traders and retailers can alleviate associated constraints by encouraging economies of scale through collective transportation. This would help distribute costs across several traders, marginally reduce costs for individual traders and consequently, reduce the level of risk transferred to fishermen and fish mammies.

Only after activities have been upgraded upstream and midstream could local product upgrading be achieved, so actors shift to produce more sophisticated and higher quality shrimp. Enhanced process upgrading, economies of scale and less-expensive financial facilities, for example, credit, are considered important for women processors to achieve product upgrading and increase gender equality (SDG 5), not only in the value system but also the rural communities. A cold chain, further development of local processing and industries in the value web and targeting institutions, for example, the national school feeding programme, are all good business strategies to simultaneously differentiate shrimp, maintain value and provide constant markets for consistent supply from the supply base (Lie et al., 2012).

Furthermore, several implications for politicians and policy analysts aimed at alleviating constraints inhibiting process and product upgrading along the LVC are suggested based on the results of this study. The government needs to implement policy instruments for fishermen and fish mammies that include provision of location and gender-sensitive infrastructure and financial facilities (e.g., tarmacked roads, electricity and credit) and modern technologies (e.g., weather/ocean warning systems and ovens) (Apata et al., 2020). More importantly, these interventions should simultaneously target mutually dependent production and processing segments. Institutionally, the government still needs to provide an enabling environment for private firms and stakeholders to act and make inclusive policies, for example, national artisan fishery development plan, which would reposition and involve artisans progressively within the fishing sector. The inequitable benefit share among artisans also points to the need for improving their technical ability and human capital, for example, financial education. The government should ensure that more extension services are provided to artisan fishermen and processors, while additional knowledge- and information-spillovers to the LVC can be achieved through periodic training by researchers and experts in the MVC in coastal areas.

Important research implications are also identified from the implementation of the framework based on GVC and the gendered value web approach in this study. First, the net-mapping of the value systems—the first GVC dimension—allowed for a clear depiction of a new segment, processing/marketing, while its interpretation at the supply base indicates that fishermen rely solely on transactions with women processors. Therefore, the conceptual framework and research approach, employed in this study, can be useful for future research that needs to explicitly depict hidden segments/activities. Second, the organizational evolution observed at the supply base was found to be in response to highly dynamic external and internal contingencies (e.g., unstable markets, power asymmetry and financial base) that fishermen and fish mammies face (Agbo & Usoroh, 2015; Trienekens, 2011). Even though this study's findings highlight possible theoretical explanations for the organizational evolutions documented in many GVCs (Gereffi & Fernandez-Stark, 2016), particularly among smallholders excluded from MVCs, future studies should aim at quantifying contingency influences.

Third, until now, there was no conceptualization and theorization of the governance structure that exists between fishermen and processors in African fishing industries (Máñez & Pauwelussen, 2016). Instead, results from the in-depth GVC's governance analysis show that business activities between the production and processing segments are controlled by "relational governance" (Gereffi et al., 2005). This finding can be important for future research that seeks to determine whether value-adding activities of mutually dependent smallholders are economic-based or household survival strategies. More importantly, this study adds "relational governance" as another possible governance in producer–processor transactions in African LVCs, against the common notion that such transactions are based on "market governance" and/or formal "captive governance" (Schipmann & Qaim, 2010). Fourth, results from the analysis of the gendered value web prove that the commoditization and marketization by women processors were vital in reducing fishermen's investment risks and ensuring the smooth flow of shrimp along the LVC. For example, women processors/marketers were found to act as a financial buffer for many fishermen, a point of contact and a precursor to all midstream value additions in the value web. This result and that of LVC's evolution propagate the conceptual and theoretical understanding that the dynamism of smallholders' organizational structures and gender roles simultaneously depend on their external and internal contingencies and gendered comparative advantages (Gereffi & Fernandez-Stark, 2016; Kleiber et al., 2015; Schumacher, 2014).

There are a few limitations to the study. The geographical scope of the study in three states means that certain hidden heterogeneous characteristics, such as social norms, could have been omitted. Moreover, the validity and generalizability of the results obtained and their implications could be limited because of the sampling method—snowballing—which could favour the selection of experienced and

better-linked respondents while suggested upgrading strategies were without comparable cost implications. Therefore, future studies should extend the sample to determine cost-effective strategies for process upgrading and capture the influence of hidden social norms on smallholders' organization and gender roles in the LVC. Finally, the qualitative nature of the study does not allow for quantifying contingency effects on organizational structures. Future empirical research should investigate the fit of organizational relationships quantitatively to segment-specific contingencies in order to enhance equitable benefit distribution across gendered and mutually dependent segments.

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ENDNOTES

[1] The product group is generally known as "shrimp."

[2] Different activities depicted different LVC segments.

[3] The power relation level ranged between 0 and 8, with 0 indicating the least and 8 the most influence.

[4] Very negligible exports are also made to OECD countries but are not profiled.

[5] The term "fish mammies" is used interchangeably with processors/marketers.

[6] Here, the value web only captures all the possible value additions along the LVC.

[7] 1 USD = ₦360.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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