

Organization of fishery supply and market structuring in the San Pedro Department (southwestern Côte d'Ivoire)

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Abstract

Small-scale fisheries play a central role in the coastal economy and food security of Côte d'Ivoire. Yet the concrete organization of local fish markets remains poorly documented at the micro-territorial scale. This study analyzes fishery supply organization and market structuring in the San Pedro Department, using field surveys conducted with 29 small-scale fishers and 49 fish distributors in San Pedro and Grand-Béréby. The results show differentiated market structures across the two localities. Grand-Béréby has a relatively multi-segmented market combining marine species (92%), freshwater species (77%) and crustaceans (46%), whereas San Pedro is more strongly polarized around the marine segment (75%). Economically, the findings reveal a clear hierarchy among species. Shrimps occupy the highest value segment, with median selling prices ranging from 5,750 to 7,000 CFA francs/kg and relative margins of 33 to 35%, markedly above those of common marine fish. In addition, the observed mismatch between the high frequency of crustacean catches and their low visibility in local markets suggests differentiated marketing channels oriented towards higher-value outlets. These results provide empirical evidence on small-scale fish markets at the micro-territorial level and offer a basis for fishery development policies adapted to local market specificities.

Keywords: Small-Scale Fisheries; Market Structuring; Fishery Supply; Economic Valuation; Côte d'Ivoire; Bas-Sassandra

1. Introduction

Small-scale fisheries are an economic and food-security pillar in West African coastal areas. They contribute substantially to the supply of animal protein and support local systems of employment, processing and marketing that are largely informal [1]. Beyond catch volumes, the way fishery products are organized, segmented and distributed in local markets determines their effective availability and economic valuation. Studies on fishery value chains show that small-scale fish markets do not operate according to a simple competitive model. They are shaped by local institutional arrangements, intermediary relationships and logistical constraints that influence product circulation and value distribution [2].

Market structuring therefore depends on several factors, including the species composition of supply, product perishability, circuit segmentation and storage capacity. Differences among species can generate distinct market dynamics, with some products dominant by volume and others by value [3].

In West Africa, the literature has mainly focused on resource governance and catch volumes [4]. In contrast, the concrete structuring of local markets, characterized by the hierarchy of marketed species, product segmentation and valuation patterns, remains insufficiently documented at the micro-territorial scale.

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In this study, market structuring refers to the set of mechanisms through which the species composition of supply, product segmentation and valuation differentials organize local circuits hierarchically. It is not limited to price formation in the strict sense. It refers more broadly to the way some products become central to the economic organization of the market, while others occupy more peripheral positions.

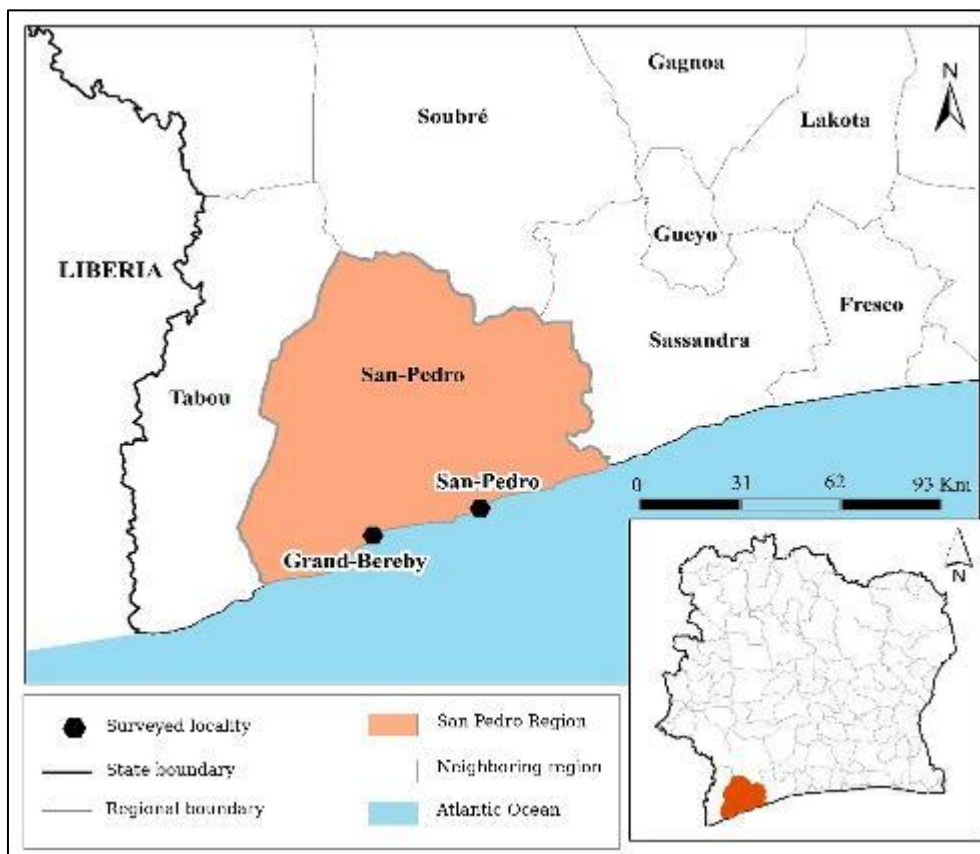
In the San Pedro Department, located in southwestern Côte d'Ivoire, small-scale fishing is concentrated in several coastal poles. The empirical analysis presented here is based on data collected in San Pedro and Grand-Béréby, which provide a relevant setting for analyzing market structuring at departmental scale. The species composition of the local fishery supply, including marine fish, freshwater species and crustaceans, is not neutral. It influences stall segmentation, actor specialization and valuation gaps among products. Crustaceans, for example, often occupy a specific position in coastal economies because of their high unit value and their ability to structure differentiated circuits.

This article aims to analyze the organization of fishery supply and market structuring in these two localities. More specifically, it first characterizes the typology of products marketed; second, it identifies dominant species in production and distribution; and third, it examines economic valuation gaps among species through a comparative analysis of prices and gross margins.

2. Materials and methods

2.1. Study area

The San Pedro Department is located in southwestern Côte d'Ivoire on the Atlantic coast (Figure 1). It belongs to the region of the same name and is one of the country's main economic poles outside Abidjan. The city of San Pedro hosts the second autonomous port of Côte d'Ivoire and is a strategic center for commercial, agricultural and fishery activities.



Source: BNETD, 2011; prepared by NIAMIEN Kadjo, 2026.

Figure 1 Location of the study area

The department is characterized by a natural environment that includes an open coastline on the Gulf of Guinea, lagoon areas, river mouths and forested zones. This ecological diversity favors the development of small-scale and industrial

fishing, agriculture and trade. Fishing plays an important role in the local economy. Landings from small-scale fisheries supply urban and peri-urban markets, while some products are integrated into wider commercial circuits. The presence of the port reinforces San Pedro's role as a redistribution point for fishery products towards other regions of the country. Demographically, the department experiences sustained migration linked to the economic opportunities offered by the port and agricultural activities. This population diversity contributes to the structuring of local markets and fish consumption patterns. Together, these geographical, economic and social characteristics make the San Pedro Department a relevant area for analyzing the organization of fishery supply and local market structuring.

2.2. Data collection and analysis

This study uses data collected from actors in the small-scale fishery sector in the cities of San Pedro and Grand-Béréby. These cities were selected because of their regional fishery importance. Field data were collected from marine small-scale fishers and fish product distributors using the KoboCollect application. In total, 29 fishers were interviewed, including 12 in San Pedro and 17 in Grand-Béréby. The survey also covered 49 distributors, including 36 in San Pedro and 13 in Grand-Béréby. Respondents were selected through non-probability convenience sampling.

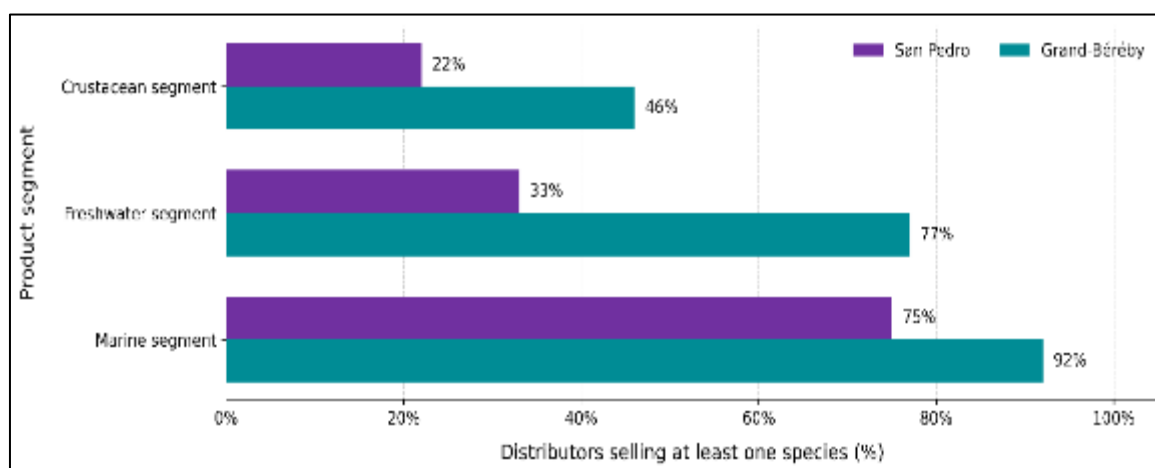
For fishers, the variables analyzed included the main species caught, declared weekly volume classes, average selling prices per kilogram and weekly budgets related to fishing activity. For distributors, the information collected concerned the typology of products sold, the presence or absence of specific species in the commercial offer, purchase and sale prices per kilogram, weekly supply budgets and declared revenues. The analysis is mainly based on comparative descriptive statistics between the two cities, with the objective of characterizing local market structuring through supply composition and valuation gaps among segments.

Because the sampling strategy was non-probabilistic, sample sizes were unbalanced between localities and prices and volumes were based on declared data, the results must be interpreted as an indicative comparative analysis of local market structuring, not as an exhaustive estimate of the regional fishery sector.

3. Results

3.1. Supply organization and product typology

Fish markets in San Pedro and Grand-Béréby are organized mainly around three product segments: crustaceans, marine fish and freshwater fish. Figure 2 presents the typology of supply marketed by local fish distributors. The percentages correspond to the proportion of actors declaring that they sell at least one species belonging to the segment considered.



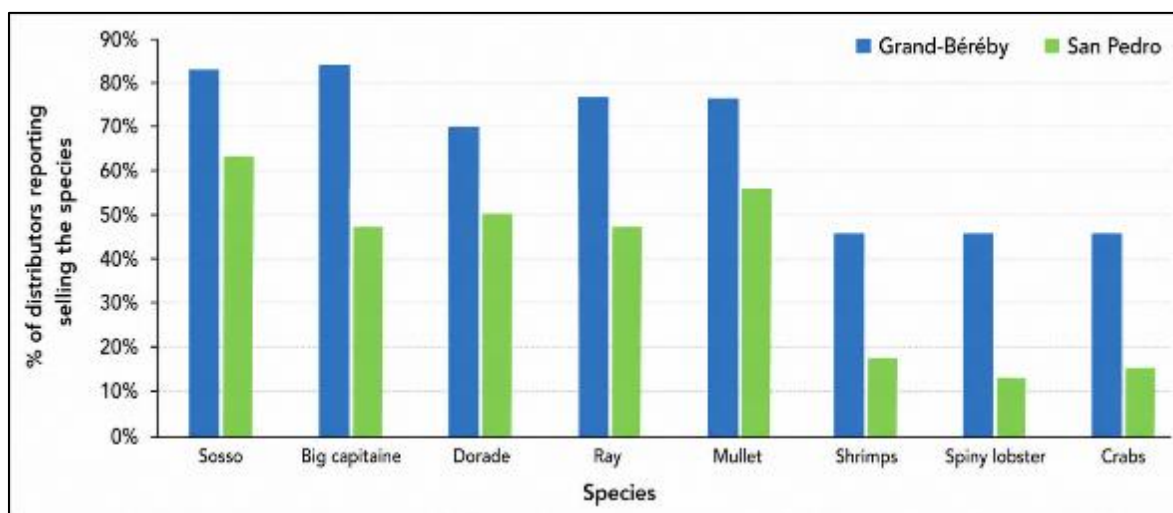
Source: Field surveys, 2025.

Figure 2 Typology of marketed supply by segment

Figure 2 shows the proportions of actors selling at least one of the three segments considered in the study. In Grand-Béréby, almost all distributors sell marine species (92%). A high proportion also sell freshwater species (77%), while nearly half sell crustaceans (46%). This configuration reflects a relatively multi-segmented market, characterized by several product categories coexisting within local circuits and, in many cases, with the same distributor. In San Pedro,

the market appears more polarized around the marine segment, with more limited diversification. The marine segment remains dominant (75%), whereas freshwater species (33%) and crustaceans (22%) are much less present.

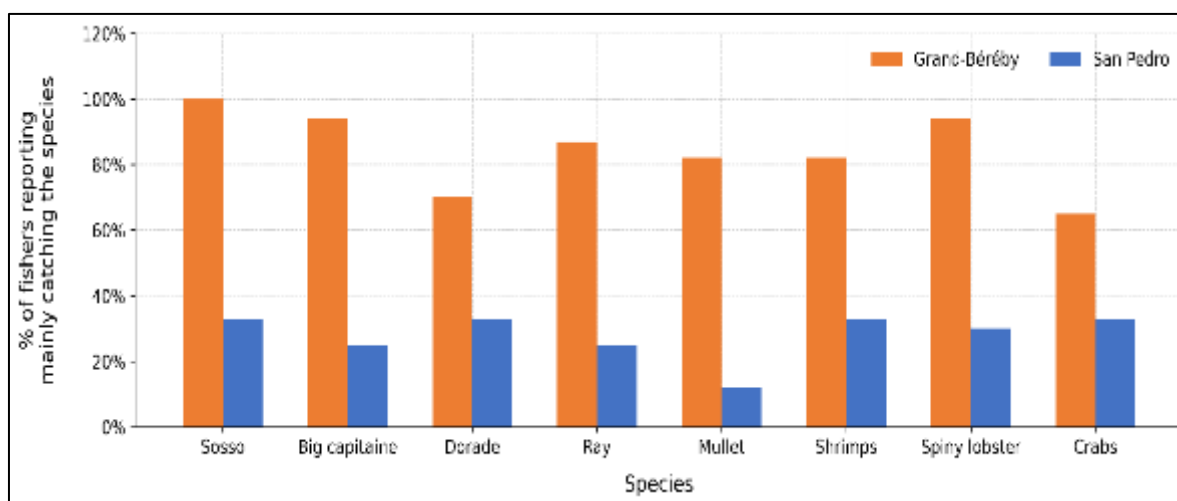
Beyond broad segments, market organization can also be observed through the species sold, as shown in Figure 3.



Source: Field surveys, 2025.

Figure 3 Distribution of marketed species in San Pedro and Grand-Béréby

The results of this first section show that market organization differs between the two cities. In Grand-Béréby, marine species form the core of supply, with Sosso and big capitaine present among more than 84% of distributors. They are followed by Ray (77%), Mullet (77%) and Dorade (70%). Crustaceans are also significantly distributed (46%). In San Pedro, although the same marine species are present, their distribution is more heterogeneous. Crustaceans occupy a more marginal position, below 20%. This spatial configuration of fishery product supply on the market is confirmed by fishers' declarations on catches (Figure 4).



Source: Field surveys, 2025.

Figure 4 Species most frequently reported as main catches by fishers

In Grand-Béréby, fishers' catches confirm the strong market presence shown in Figure 3 for species such as Sosso (100%) and big capitaine (94%). However, 94% of fishers reported catching spiny lobsters, while this product is weakly visible in the local market. This difference suggests the existence of distinct marketing circuits for spiny lobster, a hypothesis that cannot be confirmed without specific data on product destinations. Although Mullet appears relatively widespread among distributors in San Pedro while it is less frequently declared as a main catch by surveyed fishers, this difference does not allow us to conclude that supply comes from outside the locality. It suggests a possible diversity of supply sources, which cannot be confirmed in the absence of specific data on product origins.

3.2. Economic structuring of fish markets in San Pedro and Grand-Béréby

The structuring of fish markets in San Pedro and Grand-Béréby is strongly expressed through the economic hierarchy of products and the valuation gaps observed among species. To characterize this structuring, purchase and sale prices declared by distributors were used to calculate gross and relative margins (%) by species. The values presented in Table 1 are medians, in order to limit the influence of extreme values. The medians are based on transactions declared by species and locality, which requires cautious interpretation when sample sizes are small.

Table 1 Median prices and unit gross margins by species and locality (CFA francs/kg)

Species	City	n	Median purchase price	Median selling price	Gross margin	Relative margin (%)
Sosso	Grand-Béréby	8	2000	2750	750	23
	San Pedro	20	2350	3000	650	20
big capitaine	Grand-Béréby	9	2500	3000	500	25
	San Pedro	15	2300	3000	700	20
Dorade	Grand-Béréby	9	2000	3000	1000	25
	San Pedro	16	2500	3000	500	20
Ray	Grand-Béréby	10	1250	2000	750	27
	San Pedro	15	2300	2500	200	20
Mullet	Grand-Béréby	10	2250	3000	750	30
	San Pedro	19	2000	2300	300	25
Shrimps	Grand-Béréby	6	4500	5750	1250	35
	San Pedro	7	6000	7000	1000	33

Source: Field surveys, 2025.

The results reveal an economic hierarchy among species. Shrimps systematically occupy the top of the valuation structure. Median selling prices reach 5,750 CFA francs/kg in Grand-Béréby and 7,000 CFA francs/kg in San Pedro, with respective median gross margins of 1,250 and 1,000 CFA francs/kg. They therefore constitute a high-value segment, distinct from common marine fish. Analysis of the median relative margin reinforces this interpretation. Expressed as a proportion of the purchase price, it shows that shrimps also display the highest valuation intensity among the products studied. In other words, their differentiation does not rely only on higher price levels, but also on a higher proportional capacity to generate value.

Among marine species, Dorade stands out in Grand-Béréby with a high median margin (1,000 CFA francs/kg), while Sosso and Mullet show intermediate margins (750 CFA francs/kg). Conversely, some species appear less valued in San Pedro, such as Ray and Mullet, with median margins of 200 and 300 CFA francs/kg respectively.

This structure highlights an internal economic segmentation of the market, where some species operate as value-structuring products (shrimps and, in some cases, Dorade), while others play a more ordinary role with low or moderate margins.

A comparison between the two cities also shows that economic structuring is not expressed only through price levels, but through species-specific valuation gaps. In Grand-Béréby, several marine species have relatively consistent margins (500 to 1,000 CFA francs/kg), suggesting a more regular valuation pattern. In San Pedro, margins appear more contrasted. Some species generate intermediate margins (Sosso: 650; big capitaine: 700 CFA francs/kg), while others are clearly less profitable (Ray: 200; Mullet: 300 CFA francs/kg). This heterogeneity reflects differentiated levels of valuation among species, without the available data allowing precise identification of the underlying mechanisms.

Among all the products analyzed, shrimps occupy a singular position in the economic structuring of local markets. In nominal terms, shrimps have the highest median prices in both cities (5,750 CFA francs/kg in Grand-Béréby and 7,000

CFA francs/kg in San Pedro), that is, 2,000 to 4,000 CFA francs/kg above the main marine species. This gap does not simply indicate a more expensive product; it points to a segment positioned in a distinct valuation category. In terms of margins, shrimps also generate the highest gross differences (1,250 CFA francs/kg in Grand-Béréby and 1,000 CFA francs/kg in San Pedro). This indicates that, beyond the high price, the product retains a greater capacity to generate added value than common marine fish. Shrimp therefore appears as a high-intensity economic product and, in this respect, constitutes the most distinctive and structuring segment of the analysis.

4. Discussion

4.1. Spatially differentiated structuring of fishery supply

The results of this study reveal a differentiated organization of fishery supply between the two cities. In Grand-Béréby, the coexistence of products from marine, freshwater and crustacean segments within the same distribution circuits reflects a relatively multi-segmented market. In San Pedro, by contrast, the market appears more polarized around the marine segment. These spatial contrasts are consistent with the literature on differentiated structuring of local fish markets, which shows that supply composition is closely shaped by available resources, supply circuits and local value-chain organization [2,5,1,6].

The specialization of the San Pedro market around the marine segment can partly be explained by the influence and commercial function of the city's port. In large port economies, sectoral specialization around marine species with high landing volumes is frequently documented [4]. In Grand-Béréby, the more diversified configuration of supply may reflect both the proximity of diversified resources and a strategy of commercial risk diversification by local distributors, as observed in other small-scale market contexts [7].

The analysis of species distribution by distributor also reveals the existence of a structuring core in both markets. In Grand-Béréby, *Sosso* (*Sardinella* spp.) and big capitaine (*Pseudolithus* spp.) are present among more than 84% of surveyed distributors. These species therefore act as a basic core of supply. This structuring role of dominant species in the organization of small-scale markets is consistent with Guillen and Maynou [8], who show that the hierarchy of marketed species by frequency of presence and price attributes is a relevant indicator of the economic segmentation of fish markets.

4.2. Differentiated circuits for high-value species: the case of crustaceans

A particularly notable result of this study concerns the mismatch between catch frequency and market visibility for crustaceans. Although 94% of surveyed fishers reported catching spiny lobsters, this species remains weakly represented on local distributors' stalls. This bifurcation of circuits between ordinary species and high-value species is documented in the international fisheries literature. In small-scale fisheries, high-value species tend to move into specialized circuits that are distinct from local markets, either through specific intermediaries or through pre-established commercial arrangements with urban buyers or exporters [2,9,10]. In West Africa, Belhabib et al. [4] showed that the real contribution of small-scale fisheries to local economies is systematically underestimated. High-value products such as crustaceans often use commercial circuits that are poorly visible in official statistics. This result has also been observed for crustaceans in the study by Zabi and Le Loeuff [11] on shrimp value chains in Ivorian lagoons.

4.3. Economic hierarchy of species and price-based market segmentation

The analysis of median prices and gross margins by species highlights a clear economic hierarchy structured into three levels: crustaceans at the top, some high-value marine species such as Dorade and big capitaine at an intermediate level, and high-volume marine species such as Ray and Mullet in a more peripheral position. This finding is also consistent with the study by Kouman and Kouadio [12] on the trade of local fishery products in Grand-Bassam. These results also align with Asche et al. [3], who showed that price differences among fish species within markets cannot be reduced to production cost gaps, but also incorporate perceived quality attributes, consumer preferences and positions within the value chain. Guillen and Maynou [8] demonstrated that the economic characterization of species through prices is a useful management tool for anticipating actors' responses to changes in resource availability. The inter-locality heterogeneity of margins observed for the same species raises the issue of local mechanisms of price formation. These mechanisms generate significant price differentials between geographically close localities, as shown by Asiedu et al. [7] in their analysis of the small pelagic value chain in Ghana and by Belhabib et al. [4] for West African small-scale fisheries as a whole.

4.4. The structuring economic position of crustaceans

Among all the species analyzed, shrimps occupy a distinct position in the economic structuring of the two markets. Shrimps do not function as one product among others in these markets, but as a segment driven by a specific valuation logic. Median relative margins of 35% in Grand-Béréby and 33% in San Pedro confirm that this differentiation is not based only on higher nominal prices, but also on a proportional capacity to generate value that is higher than for all the marine species studied.

This singular position of crustaceans is consistent with dynamics observed in the global fisheries literature. According to FAO [1], crustaceans are associated with a systematic price premium in world seafood markets. Their positioning is linked to relative scarcity, logistical fragility and their status as high perceived-value products. In West African small-scale fisheries, shrimps and other high-value fishery products constitute high-added-value segments whose exploitation can significantly improve the income of value-chain actors [4,5,13].

4.5. Implications for governance and fishery-sector development

The results of this study provide useful lessons for the governance of the small-scale fishery sector in the San Pedro Department. The identification of an economic hierarchy structured around crustaceans and some high-margin marine species suggests that these segments should be considered priority levers for improving actors' incomes. Policies aimed at reducing post-capture losses, improving storage infrastructure and organizing differentiated marketing circuits for these products could significantly strengthen the profitability of distributors and fishers [5,1,14].

The structural divergence observed between San Pedro and Grand-Béréby also calls for a territorialized approach to development policies. Standardized interventions at departmental scale risk ignoring the local specificities of each market. In San Pedro, strengthening supply diversification could help reduce dependence on the marine segment and improve distributors' economic resilience to supply shocks. In Grand-Béréby, the issues seem more closely linked to the valorization of an already diversified supply, especially through improved price transparency and stronger bargaining capacity among actors.

These considerations echo FAO [1] recommendations on the development of small-scale fishery value chains in sub-Saharan Africa, which emphasize the need to align sectoral policies with local market realities by involving value-chain actors in the design and implementation of interventions. They also converge with the conclusions of Belhabib et al. [4], who stress the importance of recognizing the functional diversity of local small-scale markets as a key determinant of the sustainability and effectiveness of fishery systems in West Africa.

4.6. Methodological limitations and research perspectives

Several limitations must be considered when interpreting the results. First, non-probability convenience sampling does not allow statistical inference in the strict sense. The results have descriptive and comparative value and should be interpreted as indicative of the observed market structures, without automatic generalization to the entire regional fishery sector. Second, price and volume data are based on actors' declarations, which implies a risk of underreporting or social desirability bias, frequently documented in surveys among actors in the informal economy [4,7]. Third, the absence of data tracing downstream marketing circuits limits the possibility of explaining the mismatches observed between local production and local marketing for some high-value species.

These limitations do not invalidate the relevance of the findings, but they require the study to be situated within a cumulative research agenda. The article provides an original empirical contribution to the micro-territorial analysis of Ivorian small-scale fish markets.

5. Conclusion

This study analyzed the organization of fishery supply and the economic structuring of small-scale markets in the San Pedro Department through a comparative analysis of San Pedro and Grand-Béréby. The results provide empirical evidence on supply composition and diversification by segment, the distribution and hierarchy of marketed species, and economic valuation gaps among products.

In terms of supply organization, the study confirms the existence of spatially differentiated structuring between the two localities. Grand-Béréby is characterized by a relatively multi-segmented market, where marine species, freshwater species and crustaceans frequently coexist within the same distributor's activity. San Pedro, by contrast, has a more concentrated supply around the marine segment, probably reflecting its function as a fishing port with relatively high

landing capacity. This structural duality highlights the importance of a territorialized approach to analyzing and governing small-scale fishery value chains.

In terms of the economic hierarchy of species, the results show that market structuring cannot be reduced to a simple dichotomy between present and absent species. It is based on an internal hierarchy in which some species act as structuring products through their price levels, valuation margins and frequency of presence on stalls. Common marine species such as Sosso, big capitaine, Dorade, Ray and Mullet form the basic core of supply in both markets. Crustaceans, especially shrimps, occupy a singular and distinct position because of both their median price levels (5,750 to 7,000 CFA francs/kg) and their high relative margins (33 to 35%). This places them in a privileged economic category within these local markets.

The mismatch between the frequency of spiny lobster catches declared by fishers in Grand-Béréby and their weak visibility in local distribution circuits is a particularly suggestive result. It points to the possible existence of parallel and differentiated marketing circuits for high-value species, oriented towards outlets outside the local market, including urban centers, restaurants or export channels. If confirmed, this phenomenon would have important implications for understanding the real distribution of added value within the sector and for evaluating its effective contribution to the local economy.

These results nevertheless require cautious interpretation. Non-probability convenience sampling, limited sample sizes for some species and the use of declared data are methodological limitations inherent to this exploratory study.

In practical terms, this study provides useful evidence to guide fishery-sector development policies in the San Pedro Department. The valorization of high economic-intensity segments is a priority lever for improving actors' incomes. Targeted investments in conservation and storage infrastructure, together with the organization of marketing circuits adapted to each product's specificities, appear to be relevant intervention areas. In addition, the structural divergence between San Pedro and Grand-Béréby supports a differentiated and territorialized approach to sectoral policies. These policies should take into account the specific dynamics of each local market rather than applying uniform intervention models.

Ultimately, this contribution is part of an effort to empirically document Ivorian small-scale fish markets at a micro-territorial scale that remains little explored in the literature. It invites consideration of local market structuring as a central dimension in the analysis of small-scale value chains in West Africa and as an essential determinant of their capacity to contribute sustainably to food security and the economic development of coastal communities.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

The authors declare no conflict of interest.

Statement of ethical approval

This study is based on a non-clinical field survey with professional actors. The manuscript reports aggregated data only and does not disclose personal identifying information.

Statement of informed consent

Verbal informed consent was obtained from all participants before data collection. Participation was voluntary, and the information collected was analyzed anonymously and in aggregated form.

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