DAVAO RESEARCH JOURNAL
https://davaoresearchjournal.ph

ORIGINAL RESEARCH ARTICLE

Small-Scale Fisheries (SSF) Characteristics and Governance Challenges in Lagos State, Nigeria

Shehu Latunji Akintola, Akinkunmi Sunday Ojo*, Rosheedah Ademide Adeniji, Olubukola Omodele Sogbesan

Department of Fisheries, Lagos State University, Lagos, Nigeria, ORCID: Shehu Latunji Akintola https://orcid.org/0000-0002-7941-5609, Akinkunmi Sunday Ojo https://orcid.org/0009-0006-8195-558X, Rosheedah Ademide Adeniji https://orcid.org/0009-0001-9943-3943, Olubukola Omodele Sogbesan https://orcid.org/0009-0007-8061-852X

*Corresponding author: *sonyethakin@gmail.com*

ABSTRACT

Small-scale fisheries (SSF) are crucial to the local economy, providing food, income, and employment. However, they face challenges such as inadequate government support, limited fisher involvement in decision-making, and poor conflict resolution mechanisms, which hinder their sustainability and governance. The study examined SSF characteristics and governance challenges in Lagos State, and provide recommendations.The study is significant to inform policymakers and stakeholders on critical areas needing improvement to ensure the sustainability and productivity of small-scale fisheries in Lagos State. A mixed-methods research design was employed, combining both quantitative and qualitative approaches. Six fishing communities in Lagos State were sampled (Ibeshe, Moba, Eti Olokun, Ituagan, Ebute Alase, and Yovoyan) with 150 fishers in total randomly sampled in each fishing community. The data were collected through surveys, interviews, and focus group discussions with fishers, community leaders, and government representatives. A total of six FGDs were conducted, one in each of the study communities, with between 6 and 10 participants per session. The approach enabled analysis of both socioeconomic features and governance structures influencing fisheries sustainability. Findings showed uneven income distribution, strong dependence on traditional fishing rites, and fragmented governance frameworks. Limited extension services, scarce access to credit, and weak fisher participation in policy processes were consistent across communities. The study recommends improving credit access, strengthening cooperatives, providing modern gear and training, and creating inclusive governance platforms that integrate both state and community institutions. Strengthening these areas is critical to enhancing the sustainability and resilience of small-scale fisheries in Lagos State.

Keywords: *Conflict resolution, fisher participation, Lagos State, Small-scale fisheries, sustainability*

Submitted: 05 Jun 2025
Revised: 30 Jun 2025
Accepted: 02 Sep 2025
Published: 26 Sep 2025

OPEN ACCESS

How to cite: Akintola, S. L., Ojo A. S., Adeniji, R. A., Sogbesan, O. O. (2025). Small-Scale Fisheries (SSF) Characteristics and Governance Challenges in Lagos State, Nigeria. *Davao Research Journal*, 16 (3), 63-75. https://doi.org/10.59120/drj.v16i3.445

INTRODUCTION

Small-scale fisheries constitute a critical component of global food security and coastal livelihoods, supporting approximately 90% of the world's capture fishers and fish workers (FAO, 2020). These fisheries are particularly vital in developing nations, where they serve as primary sources of protein, employment, and income for millions of people. Nigeria's annual fish consumption is estimated at 13.3 kg per capita, equivalent to about 2.9 million tonnes yearly (Subasinghe et al., 2021; Ajayi et al., 2022; Simus et al., 2022). The fisheries sector employs over 8.6 million people, of which approximately 2.7 million are small-scale fishers (FAO, 2020). In Nigeria, small-scale fisheries are integral to the socioeconomic fabric of coastal communities, particularly in Lagos State, where they provide essential food security, employment opportunities, and income generation for thousands of fishing households (Béné et al., 2010). However, the sector faces significant governance challenges that threaten its long-term sustainability and effectiveness. Management frameworks such as the Inland Fisheries Decree 108 of 1992 and the Marine Fisheries Policy of 2005 failed to deliver intended outcomes due to weak en forcement and corruption (Enaikele and Olutayo, 2011; Bassey et al., 2017). Despite decades of implementation, illegal fishing and weak compliance remain prevalent. The Inland Fisheries Decree 108 (1992) aimed to regulate fishing gear, seasons, and licensing, but enforcement was weak, and illegal fishing persisted. It has been in place for over 30 years with poor compliance (Enaikele and Olutayo, 2011). The Marine Fisheries Policy (2005) promoting industrial licensing also failed due to corruption and weak monitoring (Bassey et al., 2017).

The governance of small-scale fisheries in Lagos State, Nigeria, is characterized by systemic deficiencies that undermine sustainable resource management and community welfare. Despite the promulgation of the Inland Fisheries Decree 108 of

1992, which aimed to achieve sustainable and socially beneficial exploitation of fishery resources, the sector continues to grapple with inadequate government support, limited fisher participation in decision-making processes, weak community organization structures, and ineffective conflict resolution mechanisms (Enaikele and Olutayo, 2011). These governance failures have resulted in persistent violations of fishing regulations, with artisanal fishers frequently resorting to illegal fishing methods due to poor enforcement and inadequate penalties.

The technological divide between manual and motorized fishing operations further worsens existing inequalities, with motorized fisheries demonstrating significantly higher efficiency and catch yields, yet lacking adequate support in terms of credit facilities, training, and infrastructure development (Akanni, 2010). In Nigeria, about 65-70% of artisanal fishers use non-motorized wooden canoes, while 30-35% use motorized boats (Akanni 2010; FAO 2020). Insufficient government assistance in providing fishing gear, financial aid, and capacity building limits fishers' ability to adopt sustainable practices and improve their livelihoods (Akintola et al., 2022). Concurrently, high input costs such as fishing nets, hooks, outboard engines, fuel, boat repair, and preservation materials (ice, smoking kilns), lack of microcredit access through institutions like LAPO Microfinance Bank, AB Microfinance, Accion Microfinance Bank, and cooperative credit societies, and inadequate processing and storage facilities continue to hamper productivity and long-term sustainability (Jim-saiki et al., 2014).

International experiences demonstrate varying approaches to small-scale fisheries governance, providing valuable insights for the Nigerian context. In Southeast Asia, countries such as Thailand and the Philippines have implemented community-based fisheries management systems that emphasize local participation and the integration of traditional ecological knowledge (Pomeroy et al., 2001). Recent studies in the Philippines show how small-scale fisheries management and conservation schemes have been applied effectively at the local level (Barboza et al., 2024) and how marine protected areas have been assessed for their management effectiveness, particularly in Southeastern Mindanao (Galveia and Macusi, 2025). Similarly, in West Africa, Senegal has developed co-management frameworks that balance government oversight with community autonomy, resulting in improved resource sustainability and fisher welfare (Watanuki, 2008). These examples highlight the importance of participatory governance and localized management in promoting sustainability, which could inform similar efforts in Nigeria.

Latin American countries, particularly Mexico and Chile, have successfully implemented territorial user rights systems that grant fishing communities exclusive access to marine resources, coupled with strong enforcement mechanisms and conflict resolution protocols (Albornoz and Glückler, 2020). These international models contrast sharply with the top-down governance approach prevalent in Nigeria, where fishers are systematically excluded from decision-making processes, leading to policies that inadequately address community needs and realities (Nwosu et al., 2011).

Community-based approaches in other African contexts, such as those implemented in Ghana and Kenya, highlight the importance of local fishing associations in managing common fisheries resources through participatory decision-making and community monitoring systems (Hauzer et al., 2013). However, in Lagos State, limited fisher involvement in community organizations and conservation groups reduces collective bargaining power and access to resources, while informal conflict resolution mechanisms led by community leaders or cooperative heads often result in biased outcomes and unresolved tensions (Torell et al., 2019).

Lagos State presents a unique case for examining fisheries governability because it is Nigeria's largest fishing hub, supporting a dense population of artisanal fishers who depend directly on lagoon, estuarine, and marine resources for their livelihoods (Béné et al., 2010; Akintola and Fakoya, 2017). Unlike other coastal states, Lagos combines intense urban pressures, rapid population growth, and high market demand with traditional fishing practices, creating complex governance challenges that are not well documented (Auwalu, 2023; Oyebamiji et al., 2021). While previous studies in Nigeria have emphasized production levels, fishing technologies, and socioeconomic characteristics of fishers (Akanni, 2010; Jim-Saiki et al., 2014), limited research has critically assessed how governance arrangements such as fisher participation, government support, and conflict resolution function in practice within Lagos. This gap leaves unanswered questions about the effectiveness of existing policies, the interaction between traditional and formal governance systems, and the extent to which current support structures enable or constrain sustainability (Enaikele and Olutayo, 2011; Torell et al., 2019; Akintola et al., 2022). By focusing on Lagos, this study addresses these unresolved issues and contributes new evidence on the governability of small-scale fisheries in a highly urbanized and economically strategic coastal setting.

This study aimed to assess the characteristics of small-scale fisheries in Lagos, evaluate the existing support systems, assess conflict resolution mechanisms, explore fisher involvement in decision-making, and provide recommendations for improving governance. The significance of this study lies in its potential to inform policy makers and stakeholders about the critical areas needing improvement to ensure the sustainability and productivity of small-scale fisheries in Lagos State. By addressing these challenges, the governance of small-scale fisheries can be strengthened, leading to better management practices, enhanced fisher livelihoods, and more resilient fishing communities.

MATERIALS AND METHODS

Description of the study area

This research was conducted in six fishing communities within Lagos State, Nigeria: Ibeshe, Moba, Eti Olokun, Ituagan, Ebute Alase, and Yovoyan. These communities were selected to represent the geographical spread of Lagos fisheries, with Ituagan, Yovoyan, and Moba located in Badagry, Ibeshe in Ikorodu, Ebute Alase in Epe, and Eti Olokun on Lagos Island. Selection was guided by their geographic diversity, fishing intensity, community acceptance, and variety of fishing practices in both brackish and marine environments (Lawal-Are and Nwankwo, 2011; Akintola and Fakoya, 2017).

Lagos State, located in southwestern Nigeria, spans approximately 3,577 km² and is bounded by the Atlantic Ocean with numerous inland waterways (Lawal-Are and Nwankwo, 2011). Its coastal and estuarine systems support vibrant artisanal fisheries that contribute significantly to household income and food security (Akintola and Fakoya, 2017). Fishing communities are distributed across the western and eastern coastal axes, reflecting different ecological conditions and social structures. Ibeshe in Ikorodu serves as a major artisanal fishing hub due to its access to both coastal and estuarine fishing grounds (Lawal-Are and Nwankwo, 2011; Bolarinwa, 2014). The smaller settlements of Moba, Eti Olokun, Ituagan, Ebute Alase, and Yovoyan highlight the diversity of Lagos fisheries. These communities share common features such as reliance on artisanal methods, limited modern fishing technologies, and strong dependence on community-based management practices (Akintola and Fakoya, 2017).

The study areas also reflect different fisheries characteristics. Communities employ varied fishing gears and post-harvest practices, with Badagry settlements (Ituagan, Yovoyan, Moba) integrating both subsistence and commercial fishing into local

markets (Lawal-Are and Nwankwo, 2011; Ehizele et al., 2023). Despite this diversity, inadequate storage, poor infrastructure, and limited government support remain common challenges across all locations.

Accessibility to the selected communities is possible through both road and water transport, which facilitated data collection. Their proximity to Lagos' urban centers, while retaining strong traditional fishing practices, makes them important sites for understanding the intersection between small-scale fisheries, governance challenges, and broader socio-economic pressures.

Socioeconomic context

The socio-economic dimensions of these fishing communities reflect a rich tapestry of ethnic diversity, where various groups cohabitate and contribute to the fishing practices and governance structures in the region (Akintola and Fakoya, 2017). These communities confront common challenges regarding resource accessibility and market participation, necessitating responsive governance mechanisms that can adapt to the changing dynamics of small-scale fishing (Akintola and Fakoya, 2017; Oyebamiji et al., 2021).

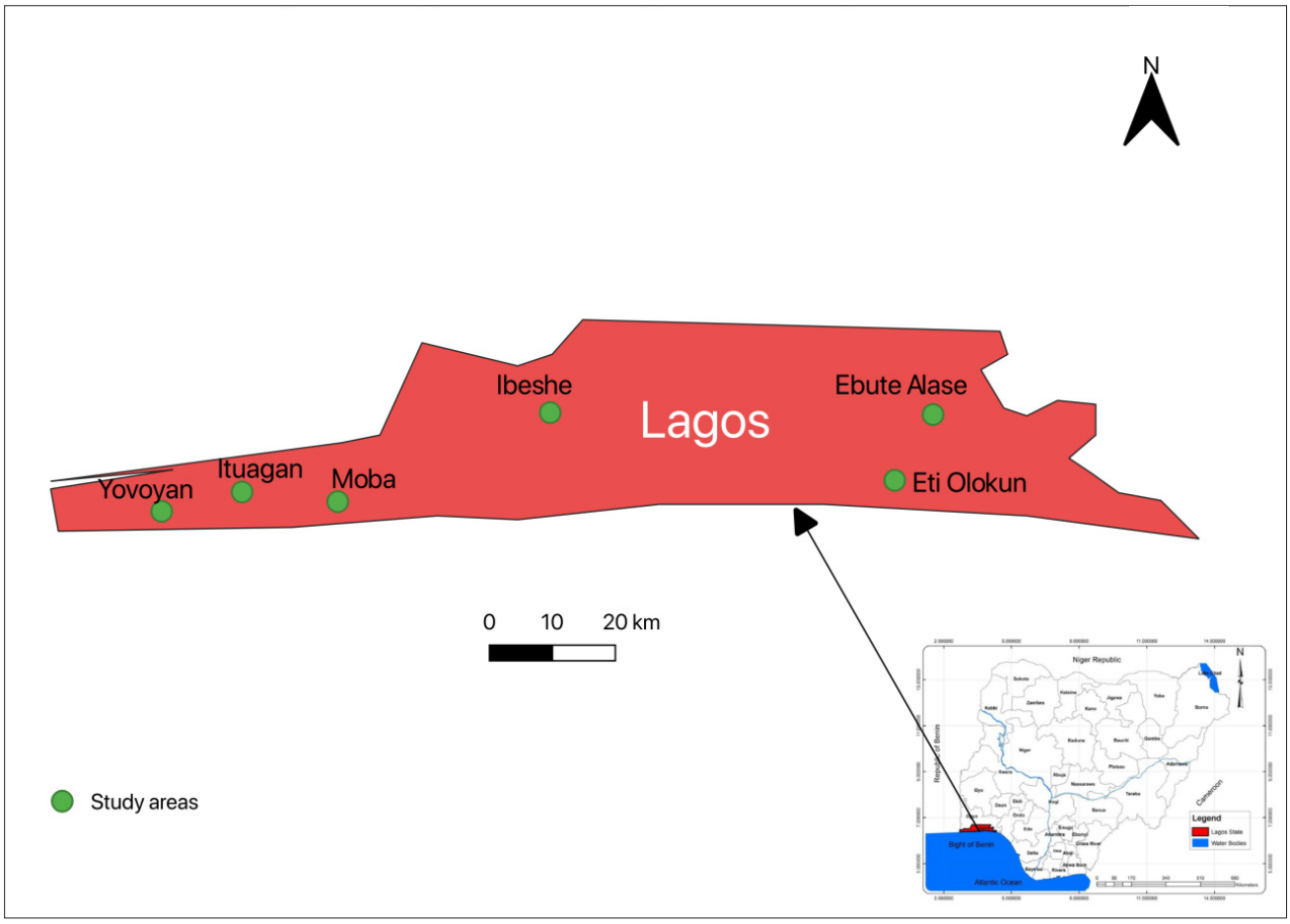

Figure 1. Map of Lagos showing the study areas.

Data collection

This study employs a mixed-methods research design, combining both quantitative and qualitative approaches to provide a comprehensive analysis of the governability of small-scale fisheries in six fishing communities in Lagos State, Nigeria (Tashakkori and Teddlie, 2010; Creswell and Plano Clark, 2018). The mixed-methods approach is chosen to ensure a thorough understanding of the socioeconomic, governance, and operational dynamics within these communities.

The study targeted small-scale fishers across six coastal communities in Lagos State: Ibeshe, Moba, Eti Olokun, Ituagan, Ebute Alase, and Yovoyan. A stratified random sampling method was employed to ensure fair representation from each community. The population was first stratified by community, after which fishers were randomly selected within each stratum. 25 fishers were chosen from each community using proportional allocation based on the estimated population of active fishers, ensuring a statistically reliable and representative sample.

A minimum of 10% of the identified fishers in each community was selected for this study. This sampling approach is consistent with previous fisheries research in Lagos State. For example, Ayanda et al. (2022) applied proportionate sampling by selecting 10% of registered fishers from fisherfolk association records across multiple coastal communities. Using at least 10% ensures representativeness of the fisher population and also provides a balanced sample size across communities of varying fisher populations, allowing for comparative analysis.

In this study, a purposive sample of 25 fishers per community was adopted. This decision ensured that the number interviewed met or exceeded the 10% threshold while also standardizing the sample size across the different communities. A fixed minimum of 25 respondents per site increased compatability between communities with varying fisher populations and improved the reliability of cross-community analysis. The distribution is presented in Table 1, which outlines the fisheries characteristics, available infrastructure, estimated number of active fishers, and those interviewed.

Table 1. Community fisheries characteristics, infrastructure, and number of fishers interviewed.

Fishing community	Fisheries aspects and livelihoods	Fisheries-related infrastructure	Estimated number of active fishers	Number interviewed (minimum 10%)
Ibeshe (Ikorodu)	Brackish water fishing, artisanal canoe fishing	Landing site, smoking kilns	200	25
Moba (Badagry)	Marine fishing, canoe and net fishing	Landing beach, cold storage (limited), fish market	220	25
Eti Olokun (Lagos Island)	Marine fishing, market-linked livelihoods	Large landing site, market sheds	180	25
Ituagan (Badagry)	Brackish water fishing, subsistence plus commercial	Landing site, cooperative society hut	200	25
Ebute Alase (Epe)	Brackish water fishing, mixed artisanal activities	Landing site, storage sheds, large fish market	250	25
Yovoyan (Badagry)	Marine fishing, migrant fisher presence	Landing site, cooperative society	250	25

The data collection process was preceded by a series of courtesy visits to each of the communities. During these visits, the research team engaged with community leaders, cooperative heads, and local stakeholders to introduce the objectives of the study, build trust, and obtain permission to conduct fieldwork. These preliminary engagements helped foster local support and provided valuable insights that informed the development of the survey instruments.

For the primary data, the study utilized a combination of surveys, interviews, and focus group discussions (FGDs). Structured questionnaires were first developed and pre-tested to ensure clarity and relevance. These instruments included both closed- and open-ended questions to capture quantitative and qualitative data on the fishers' socioeconomic characteristics, fishing practices, income levels, and access to support systems. Trained research assistants administered the questionnaires during face-to-face interactions with selected fishers, ensuring that language barriers or literacy challenges were addressed.

Semi-structured interviews were conducted with key informants, including six community leaders, 12 cooperative heads, and four representatives from relevant local government bodies. These interviews provided in-depth perspectives on governance arrangements, policy implementation, fisher representation, and conflict resolution mechanisms. The interviews were conducted using flexible guides, allowing respondents to elaborate on their experiences while ensuring consistency across responses.

To further explore communal perceptions and shared experiences, Focus Group Discussions (FGDs) were held in each community. Each FGD comprised of 6 to 10 participants selected based on their active involvement in small-scale fisheries. Discussions were moderated by the lead researcher and guided by a structured FGD protocol covering themes such as governance challenges, support mechanisms, and fisher participation in decision-making. FGDs provided a platform for collective reflection and peer interaction, which often revealed context-specific concerns not easily captured through individual surveys or interviews. Each session was recorded (with participants' consent) and transcribed for thematic analysis.

For the secondary data, an extensive review of academic literature, government publications, and policy documents was conducted. This included analysis of the Inland Fisheries Decree 108 of 1992 and other legislative and regulatory frameworks relevant to fisheries governance in Nigeria. The secondary data supported the interpretation of primary findings and provided a broader policy and institutional context for the study.

In line with ethical research standards, informed consent was obtained from all participants prior to data collection. The study objectives, voluntary nature of participation, and assurances of confidentiality and anonymity were clearly explained to each respondent.

The study encountered some limitations. Self-reported data may have been affected by response biases, including underreporting of income or overreporting of regulatory compliance. Additionally, logistical challenges in accessing some remote or waterlogged areas occasionally limited engagement with certain respondents, potentially affecting the generalizability of findings. Nonetheless, the combination of multiple data sources and methods helped to mitigate these challenges and strengthen the reliability of the results.

Data analysis

Descriptive statistics (bar charts and percentages) and tables were used to summarize the quantitative findings. Primary qualitative data, including focus group discussions and interviews, were analyzed thematically to capture the experiences, perspectives, and collective views of fishers. Attention was given to both recurring themes and points of divergence across communities. FGD transcripts were transcribed, coded, and thematically analyzed under categories such as governance challenges, fisher participation, conflict resolution, and support systems. Secondary qualitative data, drawn from academic literature, government reports, and policy documents such as the Inland Fisheries Decree 108 of 1992, were analyzed through document review. This provided the policy and institutional context needed to interpret the primary findings and situate them within broader governance frameworks.

RESULTS

Socioeconomic characteristics

Fishing across the six communities is almost entirely male-dominated, with Ebute Alase (16%) being the only site where women were engaged. This reflects the cultural and physical demands of fishing and highlights a gender imbalance that may influence participation in governance structures. Marital status patterns show that most fishers are married, indicating household responsibilities and dependence on fisheries

as a primary livelihood. Widowhood, though less common, was more visible in Ebute Alase and Eti Olokun, pointing to vulnerability among households with weaker labor support. Age distributions varied by community, but a key observation is the dominance of younger fishers in Ibeshe (20-30 years) and Moba (31-40 years) compared to older age groups in Ebute Alase (41-50 years), Eti Olokun (51-60 years), and Ituagan (51-60 years). This suggests that while some communities are attracting younger entrants into fisheries, others are aging, raising concerns about succession and long-term sustainability.

Religious affiliation also differed. Ituagan and Yovoyan were exclusively Christian, while Ebute Alase and Eti Olokun had strong Muslim presence. This diversity suggests that governance approaches must be sensitive to religious and cultural contexts, especially where traditional fishing rites intersect with modern regulations.

Educational levels were generally low across the six sites, with Ibeshe showing almost complete absence of formal education (96%). In contrast, Ituagan and Yovoyan had higher levels of secondary and even tertiary education among fishers. This uneven distribution of educational attainment is important for governance, since literacy and formal education often influence the ability to engage with training, regulations, and alternative livelihoods.

Household structures were split between monogamous and polygamous arrangements, with polygamy more common in Ituagan (52%) and monogamy dominant in Eti Olokun (84%) and Ebute Alase (60%). These family systems affect household labor allocation, decision-making, and financial responsibilities, all of which shape how governance measures are perceived and adopted.

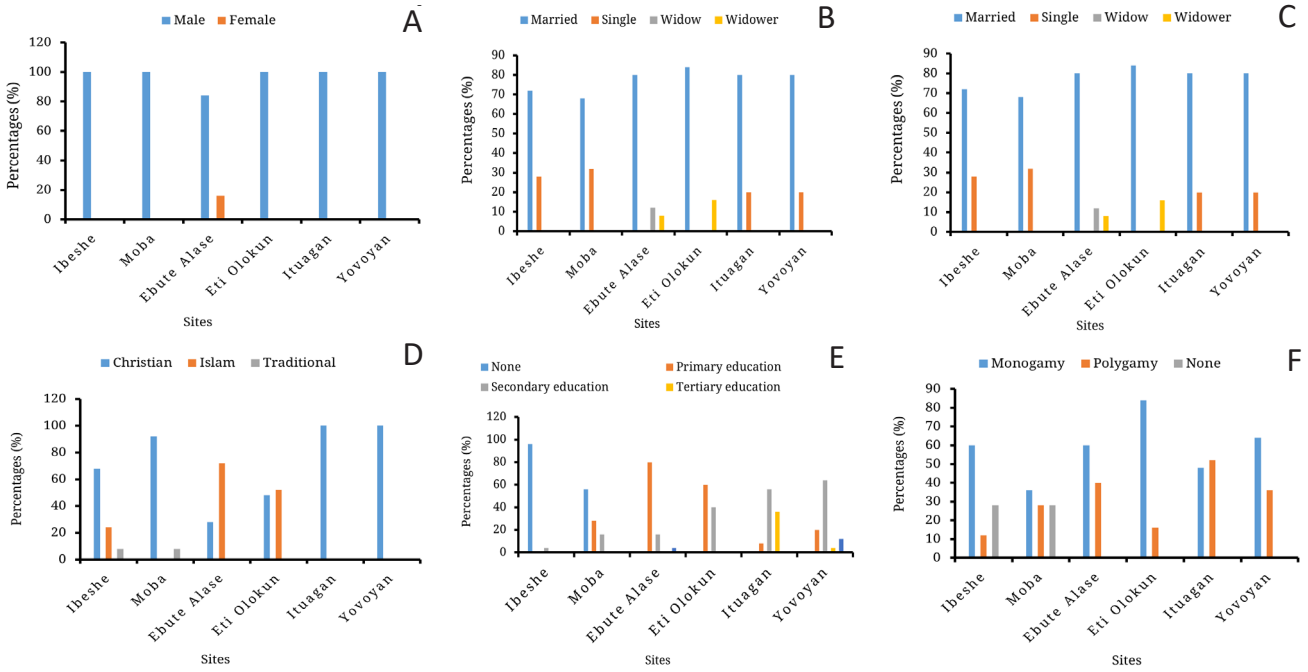

Figure 2. Socioeconomic characteristics of the fishers: (A) Gender, (B) Marital Status, (C) Age, (D) Religion, (E) Educational Qualification, and, (F) Family Type.

Other socioeconomic characteristics of the fishers

Income levels among fishers varied across communities. In Ibeshe and Eti Olokun, most fishers reported modest weekly earnings between ₦10,000 and ₦20,000 (US$7–14), reflecting the subsistence nature of their operations. By contrast, Moba and Ebute Alase recorded higher proportions of fishers earning above ₦20,000 (US$14) weekly, suggesting better market integration or access to more productive fishing grounds. These income disparities indicate uneven economic resilience across communities, which has direct implications for their capacity to adopt sustainable practices, pay levies, or invest in improved fishing technologies.

Housing conditions showed a relatively high level of home ownership in most communities, especially in Moba and Ibeshe, where the majority of fishers lived in self-built houses. This level of asset ownership may reflect long-term settlement stability and attachment to fishing as a livelihood. In contrast, a greater share of fishers in Eti Olokun, Ibeshe, Yovoyan and Ebute Alase lived in rented or inherited houses, signaling economic vulnerability and weaker investment capacity. Such differences in income and housing assets are important for governance, as they affect how fishers perceive risk, respond to new regulations, and engage with external support programs.

Table 2. Other socioeconomic characteristics of the fishers.

Variables	Ibeshe (%)	Moba (%)	Ebute Alase (%)	Eti Olokun (%)	Ituagan (%)	Yovoyan (%)
How much earn per week						
₦5,000 (US$3.5) - ₦10,000 (US$7)	4	0	8	4	-	-
₦10,000 (US$7) - ₦20,000 (US$14)	80	8	24	40	-	-
Above ₦20,000 (US$14)	16	92	68	56	-	-
Type of accommodation						
Rented	20	0	16	40	8	16
Inherited	4	8	32	20	16	16
Built	76	92	52	40	76	68

Fishing operations

Fishing practices varied across the six communities, reflecting both ecological differences and governance arrangements. Communities in Ibeshe, Ebute Alase, and Ituagan operate mainly in brackish waters, while Moba, Eti Olokun, and Yovoyan focus on marine environments. Across all sites, fishers acknowledged that climate change affects fishing activities. Many associated it with decreased catches, though perceptions differed slightly by location. This suggests that while climate change is widely recognized, its impacts are interpreted through local experiences, underscoring the importance of adaptive governance that incorporates fishers' knowledge.

Traditional practices remain central to fishing operations. Most fishers across the six sites perform rituals before fishing, often daily. This highlights the coexistence of cultural beliefs with livelihood activities, which can influence acceptance or resistance to external governance interventions.

Conflict resolution mechanisms were primarily community-based. Leaders and cooperative heads were the main arbiters in disputes, while only a small share of fishers, mainly in Moba, reported using formal legal channels. This reliance on informal systems indicates trust in local institutions but also raises concerns about fairness, transparency, and alignment with state regulations.

Rules guiding fishing activities were inconsistently reported. While communities like Ebute Alase, Eti Olokun, Ituagan, and Yovoyan confirmed the existence of fishing rules, Moba and Ibeshe reported the absence of such frameworks. This variation illustrates uneven governance across Lagos fisheries and points to weak state-level harmonization of fisheries regulations.

Livelihood diversification was another key finding. In Ituagan (88%) and Yovoyan (88%), most fishers had alternative occupations, while in Ibeshe (84%) and Eti Olokun (68%), fishing was almost the sole livelihood. Communities with limited alternative livelihoods are more vulnerable to shocks and less flexible in adopting conservation measures, making them critical targets for support interventions.

Fishing experience across the communities was high, with the majority of fishers having more than 20 years of practice. This indicates strong generational continuity but also suggests that long-established norms may shape resistance to change. Fishing times and frequency varied, with some communities (e.g., Moba) fishing daily and exclusively during the day, while others (e.g., Ituagan and Yovoyan) fished both day and night. These differences reflect adaptation to local ecological conditions but also raise questions about sustainability under increasing fishing pressure.

Fish marketing practices also differed. While fishmongers dominated sales in Ebute Alase and Eti Olokun, many fishers in Ituagan sold catches directly, while Yovoyan showed a mix of sales through fishmongers and household members. These marketing channels affect bargaining power, income distribution, and the role of middlemen in governance processes. Storage facilities were notably absent in all sites, forcing fishers to sell immediately after landing. This weakens their market leverage and reinforces dependence on intermediaries.

Cooperative membership was uneven. Fishers in Ibeshe (96%), Ebute Alase (88%), and Eti Olokun (80%) reported high participation in cooperatives, whereas Moba (4%) had very low membership. Cooperatives often provide collective strength in negotiations and access to credit or training, so weak participation in some communities represents a governance gap. Participation in conservation groups was generally low, reflecting limited awareness or weak institutional presence in local fisheries.

Finally, decision-making involvement was inconsistent. Fishers in Eti Olokun and Ebute Alase reported high active participation, while those in Ibeshe and Moba were largely excluded. This uneven participation directly links to the study's objectives, showing that governance processes in Lagos fisheries remain fragmented and often non-inclusive.

Table 3. Fishing operational activities of the fishers.

Variables	Ibeshe (%)	Moba (%)	Ebute Alase (%)	Eti Olokun (%)	Ituagan (%)	Yovoyan (%)
Type of water body						
Brackish	100	0	100	0	100	0
Marine	0	100	0	100	0	100
Fresh	0	0	0	0	0	0
Climate change experience						
Yes	100	100	100	100	100	100
No	0	0	0	0	0	0
Climate change affects fishing						
Yes	100	100	100	100	100	100
No	0	0	0	0	0	0
Does climate change brings about increase in catches	0	12	8	0	0	0
Yes	100	88	72	72	100	100
No	0	0	20	28	0	0
Neither						
Form of traditional rite						
Yes	60	92	100	100	90	100
No	40	8	0	0	10	0
How often is it carried out						
Once	0	0	0	0	10	0
Twice	0	0	0	0	0	0
Daily	100	100	100	100	90	100
How do you resolve conflict						
Community leaders	80	60	100	100	100	0
Cooperative head	20	0	0	0	0	100
Legal prosecution	0	40	0	0	0	0
Rules guiding fishing activities						
Yes	4	0	100	100	100	100
No	96	100	0	0	0	0

Any other occupation aside fishing						
Yes	16	40	36	32	88	88
No	84	60	64	68	12	12
Years of experience in fishing						
Less than 5years	16	4	0	0	0	0
5-10years	36	36	0	0	20	0
11-20years	12	12	12	12	28	12
Above 21years	36	48	88	88	52	88
Period of fishing						
Day	4	100	20	24	0	0
Night	0	0	8	0	0	0
Day and night	96	0	72	76	100	100
Number of days fishing per week						
Twice	4	0	8	16	0	0
Thrice	16	4	12	40	20	60
Daily	80	96	80	44	80	40
How do you market your catches						
Fishmongers	32	28	72	72	0	12
Wife	16	8	0	0	0	0
Self	28	20	8	0	68	0
Fishmongers and wife	24	16	20	28	32	88
Fishmongers and self	0	28	0	0	0	0
How many days you sell your catches per week						
Twice	4	0	0	4	-	-
Thrice	16	8	4	8	-	-
Daily	80	92	96	88	-	-
Any form of storage						
Yes	12	0	8	12	0	0
No	88	100	92	88	100	100
Fishermen cooperatives society						
Yes	96	4	88	80	-	-
No	4	96	12	20	-	-
Unit for sale						
Batches	0	0	80	80	0	0
Kilogram	100	100	8	0	100	100
Both	0	0	12	20	0	0
Do you belong to any community organization	4	32	12	16	-	-
Yes	96	68	88	84	-	-
No						
Fishing conservation group						
Yes	0	0	20	8	-	-
No	100	100	80	92	-	-
Decision making involving fishing						
Active	8	0	80	88		
Passive	12	4	20	12		
No	80	96	0	0		

Assessment of government intervention

Government support for small-scale fisheries across the study communities was limited and uneven, directly affecting the sector's governance capacity. Informal training opportunities were scarce in most sites, with Ituagan (44%) and Yovoyan (40%) reporting the highest exposure. Similarly, extension services such as training workshops on sustainable fishing techniques, demonstration of improved smoking kilns, provision of safety and navigation training, sensitization on fishing regulations, and occasional distribution of fishing gear, and ministry involvement were almost absent in Ibeshe, Moba, and Ebute Alase but much stronger in Ituagan (84%) and Yovoyan (100%). These findings highlight significant disparities in capacity building and knowledge transfer, which are essential for improving fishers' adoption of sustainable practices and align with the study objective of evaluating existing support systems.

Material support such as fishing gear or craft was largely unavailable in most communities, with only Ituagan (56%) and Yovoyan (40%) reporting some access. Loans and grants were rare, with Yovoyan recording the highest but still minimal support (24%). This lack of financial assistance limits fishers' ability to invest in modern gear or diversify livelihoods, perpetuating dependence on traditional methods and contributing to governance challenges.

Interactions between government and fishers were weak. In most communities, government meetings were infrequent or non-existent, and where they occurred (Eti Olokun), they happened less than once per year for the majority. Low visibility of fisheries staff and poor communication channels erode trust and reduce compliance with regulations. This links directly to the study objective of exploring fisher involvement in governance processes, as the absence of regular engagement prevents inclusive decision-making.

Perceptions of government performance also varied. Fishers in Ibeshe (88%) and Moba (72%) overwhelmingly believed the government was not promoting the artisanal sector, while perceptions were more positive in Eti Olokun and Ebute Alase. Rent capture and taxation were rarely imposed, although respondents in Eti Olokun expressed concerns that charges were too high (20%). These findings illustrate inconsistent and poorly coordinated governance approaches, where some communities experience over-regulation while others face neglect.

Finally, awareness of new innovations and conservation measures was highest in Ituagan (36%) and Yovoyan (88%) but minimal elsewhere. This suggests that innovation diffusion is

highly localized and dependent on the presence of extension services. The uneven distribution of knowledge and resources undermines collective progress toward sustainable management.

Overall, these results confirm that government support systems are fragmented, poorly targeted, and inadequate to address the governance challenges facing small-scale fisheries in Lagos. Without more consistent extension services, financial support, and inclusive engagement, efforts to strengthen governability will remain weak.

Table 4. Assessment of government intervention in fishing communities.

Variables	Ibeshe (%)	Moba (%)	Ebute Alase (%)	Eti Olokun (%)	Ituagan (%)	Yovoyan (%)
Any informal training						
Yes	0	0	4	16	44	40
No	100	100	96	84	56	60
Extension vs ministry						
Yes	0	0	4	12	84	100
No	100	100	96	88	16	0
Provision/support of fishing gear or craft by the government						
Yes	0	0	4	0	56	40
No	100	100	96	100	44	60
Provision of loans or grants by the government						
Yes	0	0	4	4	0	24
No	100	100	96	96	100	76
Any form of tax, fines or subsidies from government						
Yes	0	0	0	36	10	12
No	100	100	100	64	90	88
Any form of intervention from public or private organisations						
Yes	0	0	16	20	0	0
No	100	100	84	80	100	100
Do you know any fisheries staff						
Yes	0	0	16	4	-	-
No	100	100	84	96	-	-
Any new innovations from the government or private organisations						
Yes	0	20	12	8	36	88
No	100	80	88	92	64	12
A forum through which government meet with artisanal fishermen						
Yes	0	0	4	32	-	-
No	100	100	96	68	-	-
How often does government meet with artisanal fishermen per year						
Twice a year	0	0	4	0	-	-
More about once a year	0	0	0	12	-	-
Less than once a year	60	100	96	88	-	-
None	40	0	-	-	-	-
Is government perceived as a promoter of the artisanal sector					-	-
Very much so	0	0	0	0	-	-
To a limited extent	0	0	44	52	-	-
Not really	12	28	56	48	-	-
Not at all	88	72	0	0		
Rent captured						
Too high	-	-	4	20	-	-
Appropriate	-	-	96	80	-	-
Too low	-	-	0	0	-	-

Focus group findings

Across the six FGDs, fishers consistently emphasized limited government support, inadequate access to loans, and rising input costs as primary challenges. Participants reported that government extension officers rarely visited their communities, and formal training opportunities were scarce. Conflict resolution was primarily managed by community leaders or cooperative heads, though participants expressed concern that these mechanisms often favored influential members. Fishers also highlighted the lack of storage and processing facilities as a major cause of post-harvest losses. Across communities, there was a strong preference for cooperative-led microcredit schemes compared to bank loans,

which were considered inaccessible due to collateral requirements. FGDs also revealed frustration at the lack of involvement of fishers in policy design, with participants noting that "decisions are made for us, not with us."

DISCUSSION

Socioeconomic characteristics

The socioeconomic profile of fishers across Lagos communities revealed a male-dominated profession, with women's involvement limited largely to post-harvest activities such as processing and marketing. This observation is consistent with the findings of Oiku (2023) and Ahmed et al. (2021), who emphasized the predominance of males in small-scale fishing due to the physically demanding nature of the work. Similarly, Omitoyin and Tosan (2012) reported that the dominance of male fisherfolks in fish harvesting activities was greater than that of their female counterparts in Lagos State, while Akpaniteaku et al. (2005) noted that women's roles in fisheries are complementary. Medard et al. (2001) further explained that gendered participation in fisheries is shaped by cultural, social, economic, and political factors. These patterns mirror broader African contexts, but contrast with Southeast Asian countries such as Thailand and the Philippines, where women play more significant roles in local fisheries management and co-management institutions (Pomeroy et al., 2001; Barboza et al., 2024). The exclusion of women in Lagos fisheries governance thus represents a missed opportunity for inclusivity, legitimacy, and more effective participatory governance.

Age distribution across the communities showed that both younger and older fishers are engaged, though their dominance varies. For example, younger individuals were more represented in Ibeshe and Moba, while older fishers dominated in Eti Olokun and Ebute Alase. This mix places Lagos within the range of findings reported by Auwalu (2023) and Ahmed et al. (2021), who noted that most fishers fall within the economically active age group. Ande (2008) emphasized that fishers within this age range are more likely to adopt improved technologies, potentially enhancing productivity. However, generational divides are evident, as older fishers often rely on traditional practices while younger fishers may be more open to training and innovation. This situation is comparable to Senegal, where youth engagement in co-management has been critical to ensuring resource sustainability (Watanuki, 2008). Lagos governance reforms must therefore incorporate both groups, balancing respect for traditional practices with the promotion of innovation.

Educational attainment remains low, with many fishers lacking formal schooling. This finding is consistent with Ebenezer (2024) and Ahmed et al. (2021), who both reported that low literacy levels restrict fishers' ability to understand sustainable practices and engage with governance frameworks. Nonetheless, higher levels of education recorded in some communities, possibly due to Lagos' metropolitan character, suggest opportunities for greater receptiveness to innovations. As Olagunju et al. (2007) noted, fishers with basic education can quickly learn new practices related to production and marketing. Yet, the overall low literacy levels contrast with experiences in Latin America, where higher educational attainment facilitated the successful implementation of Territorial Use Rights in Fisheries (TURFs) in Chile and Mexico (Albornoz and Glückler, 2020). Lagos fisheries governance must therefore prioritize literacy and extension programs to empower fishers to participate more actively in decision-making.

Income differences across communities highlight further inequalities. For instance, Moba fishers, engaged in marine fisheries, reported higher earnings compared to those in brackish water communities like Ibeshe. Such uneven patterns emphasize the structural disparities within Lagos fisheries. These findings highlight the broader governance failures documented by Oiku (2023), Ahmed et al. (2021), and Bolarinwa (2014), particularly the absence of effective institutional support to address economic imbalances. By contrast, community-based management systems in the Philippines and co-management frameworks in Senegal have demonstrated success in reducing such disparities by granting equitable access rights and integrating local participation (Barboza et al., 2024; Watanuki, 2008). Lagos lacks such mechanisms, leaving income and productivity largely determined by geography rather than governance support.

Overall, the socioeconomic characteristics of Lagos fishers highlight four critical governance challenges: gender exclusion, generational divides, low literacy, and income disparities. While the descriptive results provide a profile of fisher households, these patterns underscore deeper governance gaps. International experiences show that participatory governance models that integrate women, youth, and local associations, coupled with education-sensitive interventions, create stronger and more resilient fisheries (Pomeroy et al., 2001; Hauzer et al., 2013; Albornoz and Glückler, 2020; Barboza et al., 2024). Without addressing these structural issues, Lagos fisheries governance risks perpetuating weak compliance, limited innovation, and economic inequalities that undermine both sustainability and livelihoods.

Fishing operations

Fishing operations in Lagos communities fall into both brackish and marine environments, with fishers reporting significant operational challenges linked to climate variability and governance. The unanimous acknowledgement of climate change impacts across all six communities highlights the widespread perception of vulnerability. These concerns mirror global assessments, such as those of the IPCC (2019), which recognize small-scale fisheries as highly exposed to shifting weather patterns, changes in species composition, and unpredictable marine conditions. Utete et al. (2019) similarly emphasized that small-scale fisheries remain among the most climate-sensitive livelihoods in developing regions.

The Lagos findings reflect broader trends observed internationally. Macusi et al. (2021) reported that small-scale fishers in Southeast Asia identify climate variability as one of the most pressing threats, and recommended responses such as improved credit access, capacity building, and climate information services. Islam et al. (2013) also noted that vulnerability in fishery-dependent communities is shaped by a combination of exposure (e.g., storms, floods), sensitivity (heavy reliance on fisheries), and low adaptive capacity. Parallel cases, such as Setyaningrum (2024) on Pangpang Bay in Indonesia and Chavez et al. (2021) on the Philippine giant squid fishery, confirm that similar vulnerabilities are evident across global fisheries. Lagos fishers' reports of declining catches and erratic weather therefore align with an established international evidence base, underscoring the urgent need for localized adaptation strategies that integrate both traditional knowledge and external support mechanisms.

Beyond climate-related pressures, fishing methods vary across communities, with some relying on traditional artisanal techniques that are often labor-intensive and less efficient. At the same time, the persistence of illegal and unsustainable practices highlights enforcement gaps despite regulatory frameworks like the Inland Fisheries Decree 108 of 1992. This situation is consistent with the observations of Enaikele and

Olutayo (2011), who documented weak compliance and enforcement in Lagos inland fisheries. It also aligns with Malik and Kristiana (2021), who reported similar struggles in Southeast Asian small-scale fisheries, where inadequate monitoring allows destructive practices to persist.

For Lagos, the implications are clear: addressing operational challenges requires not only better enforcement but also an inclusive governance approach that accounts for fishers' lived realities. Climate adaptation interventions must be linked to fisheries governance reforms, ensuring that regulatory compliance is feasible, culturally grounded, and supported with training, financial access, and infrastructure. Without such alignment, both environmental stressors and governance gaps will continue to undermine the sustainability of small-scale fisheries in Lagos State.

Assessment of government intervention

Government intervention in the fisheries sector is critical for ensuring sustainable management of aquatic resources. Yet, evidence shows that government support for small-scale fishers in Nigeria remains inadequate. Limited access to credit facilities, irregular training opportunities, and poor provision of modern fishing gear continue to constrain the adoption of sustainable fishing practices, thereby reducing overall productivity (Akanni, 2010; Nwosu et al., 2011; Carvalho et al., 2011; Akintola et al., 2022; Akintola et al., 2024). Several studies confirm that insufficient governmental support correlates directly with persistent governance challenges in small-scale fisheries (Merino et al., 2012; Shamsuzzaman et al., 2022).

Forms of government assistance

In Nigeria, interventions have been inconsistent and poorly targeted. Most fishers report little or no access to loans or grants, a shortfall reported by Akanni (2010), Nwosu et al. (2011) and Akintola et al. (2022). Training and extension services remain sporadic, while fisheries officers are rarely present in coastal communities. These gaps result in limited awareness of sustainable fishing practices and innovations. Historical legislation, such as the Inland Fisheries Decree 108 of 1992 and various marine policies, has been plagued by weak enforcement and systemic corruption, which further undermined their potential (Brennan, 2022). The exclusion of fishers from decision-making processes has also been repeatedly highlighted as a factor leading to weak policy outcomes and lack of buy-in from stakeholders (Nwosu et al., 2011; Olopade and Dienye, 2017; Akintola et al., 2022).

Forms of non-government assistance

Non-governmental organizations (NGOs), cooperatives, and community-based groups have become essential in filling the gaps left by limited state interventions. In Nigeria, fishers often depend on local cooperatives for informal credit, conflict resolution, and collective marketing; forms of support identified by Akintola et al. (2022, 2024) as being more accessible than government credit schemes. NGOs occasionally provide gear, awareness campaigns, and training, while community groups extend welfare support (Gardner et al., 2020; Bhandari, 2017). Though fragmented and often donor-dependent, these non-state interventions provide practical, immediate assistance that directly addresses fishers' pressing needs (Trindade-Santos et al., 2020).

Differentiated impacts

The impacts of government and non-government interventions differ significantly. Government assistance, when effectively implemented, has the potential to create structural changes by delivering large-scale credit programs, policy frameworks, and national extension services. Yet, in Nigeria, weak enforcement and low fisher participation limit these outcomes (Akanni, 2010; Nwosu et al., 2011; Akintola et al., 2022). Non-government assistance, though narrower in scale, tends to have more immediate and tangible impacts at the community level, including access to credit, training, and welfare. This dynamic reflects findings from both Nigerian and international studies showing that hybrid governance models linking state-led regulation with NGO and cooperative-led initiatives are more effective in addressing the challenges of small-scale fisheries (Boucquey et al., 2019; Rouhi et al., 2019).

Towards collaborative governance

To address these gaps, governance frameworks must move toward collaboration between state and non-state actors. Nigerian studies emphasize that fisher inclusion in decision-making and policy processes is critical for legitimacy and effectiveness (Olopade and Dienye, 2017; Akintola et al., 2022, 2024). International literature reinforces that networked governance, combining state regulation with localized NGO and cooperative support, can improve sustainability and livelihoods (Rouhi et al., 2019; Bryan et al., 2023). A collaborative model that integrates structural reforms with community-level initiatives holds promise for improving governance outcomes and ensuring the long-term viability of Nigeria's small-scale fisheries.

Table 5. Forms of assistance and their differentiated impacts on small-scale fisheries.

Type of assistance	Forms of support	Impacts on fisheries
Government assistance	- Loans and grants - Training and extension services - Provision of gear and craft - Subsidies or tax incentives - Policy frameworks and regulations	- Structural reforms - Access to large-scale funding - Nationwide training programs - Formal regulations and enforcement
Non-government assistance	- Cooperative credit schemes - NGO support (gear, training, advocacy) - Private sector support - Community and religious welfare initiatives	- Immediate access to credit - Gear and training at community level - Localized welfare support - Conflict resolution and collective bargaining

Source: Field survey

CONCLUSIONS

This study revealed that small-scale fisheries in Lagos State face intertwined challenges of weak governance, inadequate institutional support, and climate-related pressures. Empirical findings show that governance structures are fragmented, with limited government presence in training, extension services, and financial support. At the same time, community-based mechanisms, such as conflict resolution through leaders and the persistence of traditional fishing rites, remain central to how fishers organize their activities. These findings underscore the coexistence of traditional and modern governance systems, and the tensions that arise when state interventions fail to adequately engage local realities.

Based on these insights, three priority actions emerge for strengthening governability in Lagos fisheries. First, enhancing fisher participation in decision-making is urgent, as the data showed that most communities have little or no voice in governance processes. Policies must institutionalize regular consultation mechanisms between government agencies, cooperatives, and local leaders to build legitimacy and compliance. Second, targeted support for training and capacity building is both urgent and feasible. With many fishers having limited formal education, practical training, extension services, and innovation awareness programs are critical to improve adoption of sustainable practices. Third, improving monitoring and enforcement should be pursued gradually, with emphasis on co-management systems that combine local traditional structures with state oversight. This is feasible where community leaders already hold authority in conflict resolution and rule enforcement.

Broader investments such as financial credit access, provision of fishing gear, and infrastructure development are also needed, but these require long-term planning and stronger institutional commitment. In the short term, addressing participation gaps, education, and co-management structures is more achievable and will yield immediate governance gains.

The Lagos case contributes to global debates on fisheries governance by illustrating how traditional authority, limited state engagement, and climate pressures interact to shape governability in a metropolitan coastal region. Unlike many rural fisheries documented in Asia or Latin America, Lagos presents a hybrid context where urban pressures intensify resource use while traditional practices remain deeply rooted. These unique dynamics highlight the need for governance models that bridge customary practices with modern regulatory frameworks. In summary, strengthening Lagos fisheries governance requires immediate action on fisher participation, training, and co-management, alongside longer-term reforms in financing and enforcement. Prioritizing these measures will not only improve local sustainability but also offer lessons for other urbanized coastal fisheries facing similar governance complexities worldwide.

ACKNOWLEDGMENT

The authors gratefully acknowledge the support and cooperation of the fishers, community leaders, and local government officials in the six fishing communities of Lagos State who participated in this study. Special appreciation is extended to the research assistants who assisted with data collection, and to colleagues who provided valuable feedback on the manuscript. The authors also thank the Department of Fisheries, Lagos State University, for providing institutional guidance and technical support during the course of this research.

AUTHOR CONTRIBUTIONS

SLA: Conceptualization, Methodology, Supervision, Validation, Reviewing and Editing, Project administration; ASO: Conceptualization, Methodology, Investigation, Software, Data curation, Data Visualization, Validation, Writing- Original draft preparation, Reviewing and Editing, Project administration; RAA: Writing- Original draft preparation, Methodology, Data curation, Visualization, Software, Validation, Investigation, Reviewing and Editing; OOS: Methodology, Investigation, Software, Validation, Writing- Original draft preparation, Reviewing and Editing.

FUNDING SOURCE

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

DECLARATION

Informed consent statement

This study was conducted in accordance with established ethical principles for social science research. Participation was voluntary, and all respondents were informed about the purpose of the research and their right to withdraw at any stage without consequence. Informed consent was obtained verbally prior to interviews and surveys. No personally identifiable information was collected, and data were analyzed and reported in aggregate to ensure confidentiality and anonymity. The study posed no physical, psychological, or legal risks to participants.

Conflict of interest

We confirm that this manuscript has not been published elsewhere and is not under consideration by another journal. Therefore, the authors declare no conflict of interest.

REFERENCES

Ahmed, M., Mitu, S., Schneider, P., Alam, M., Mozumder, M., and Shamsuzzaman, M. (2021). Socioeconomic conditions of small-scale hilsa fishers in the Meghna river estuary of Chandpur, Bangladesh. Sustainability, 13(22), 12470. https://doi.org/10.3390/su132212470

Ajayi, O., Akinrinlola, A., Usman, A., Muhammed, A., and Van der Knaap, M. (2022). Aquaculture development in Nigeria and FAO's role. FAO Aquaculture News-International Year of Artisanal Fisheries and Aquaculture 2022, Special Issue, 21–24. Rome: FAO.

Akanni, K.A. (2010). Fishing Technologies and Catch Levels among Small-Scale Fishers in Lagos State, Nigeria. *North American Journal of Fisheries Management.* 30. 309-315. 10.1577/M08-061.1.

Akintola, S. and Fakoya, K. (2017). Small-scale fisheries in the context of traditional post-harvest practice and the quest for food and nutritional security in Nigeria. *Agriculture and Food Security,* 6(1). https://doi.org/10.1186/s40066-017-0110-z

Akintola, S.L., Fakoya, K.A., Danagalan, A.H., Akiode, O., Kappo, A., and Areola, F.O. (2022). A Situational Analysis of Small-Scale Fisheries in Nigeria: From Vulnerability to Viability. V2V Working Paper 2022-5. V2V Global Partnership, University of Waterloo, Canada.

Akintola, S.L., Areola, F.O., Fakoya, K.A., Olatoye, K. and Abiodun-Solanke, A. (2024). Legal and Policy Instruments on Rights and Provisions on Other Issues in Small-Scale Fisheries of Nigeria. 10.1007/978-3-031-56716-2_13.

Akpaniteaku, R.C., Weimin, M. and Xinhua, Y. (2005). Evaluation of the contribution of fisheries and aquaculture to food security in developing countries. Naga, world fish center, 28 (1&2), pp. 28-32.

Albornoz, C. and Glückler, J. (2020). Co-Management of Small-Scale Fisheries in Chile From a Network Governance P erspective. *Environments*. 7. 104. 10.3390/environments7120104.

Ande, C.E. (2008). *Essential Economics for senior secondary school (2nd edition).* Ogun State, Nigeria: TONAD Publishers limited. 157pp.

Auwalu, F. (2023). Exploring the contemporary challenges of urbanization and the role of sustainable urban development: A study of Lagos City, Nigeria. *Journal of Contemporary Urban Affairs*, 7(1), 175-188. https://doi.org/10.25034/ijcua.2023.v7n1-12

Ayanda, I. F., Olatinwo, L. K., Zakariyah, A. T., and Wahab, M. J. (2022). Assessment of fish catch among fisherfolks in Lagos State, Nigeria. *Niger. J. Agric. Ext.*, 22, 26–33.

Barboza, A., Macusi, E. D., Borazon, E. Q., Santos, M. D., Muallil, R. N., and Nallos, I. M. (2024). Small-scale fisheries (SSF) management and conservation schemes and their application in the Philippines. *Marine Policy*, 161, 106018.

Bassey, I., Ibas, J., and Akpan, E. (2017). A review of the marine fisheries policy and management in Nigeria. *African Journal of Fisheries Science*, 5(2), 215–221. Retrieved from https://www.internationalscholarsjournals.org

Béné, C., Hersoug, B., and Allison, E. (2010). Not by rent alone: Analyzing the pro-poor functions of small-scale fisheries in developing countries. Development Policy Review, 28 (3), 325-358. https://doi.org/10.1111/j.1467-7679.2010.00486.x

Bhandari, M. (2017). Role of nongovernmental organization in Bangladesh. are they challenging the government power? a case study from Bangladesh Rural Advancement Committee (BRAC). *Socioeconomic Challenges*, 1(4), 6-22. https://doi.org/10.21272/sec.1(4).6-22.2017

Bolarinwa, J. (2014). Length-weight relationships of some economic fishes of Ibeshe waterside, Lagos lagoon, Nigeria. *Journal of Aquaculture Research & Development*, 05(01). https://doi.org/10.4172/2155-9546.1000203

Boucquey, N., Martin, K., Fairbanks, L., Campbell, L., and Wise, S. (2019). Ocean data portals: performing a new infrastructure for ocean governance. *Environment and Planning D Society and Space*, 37(3), 484-503. https://doi.org/10.1177/0263775818822829

Brennan, R. (2022). Making space for plural ontologies in fisheries governance: Ireland's disobedient offshore islands. *Maritime Studies*, 21(1), 35-51. https://doi.org/10.1007/s40152-021-00257-8

Bryan, T., Lea, M., and Hyánek, V. (2023). Resilience, ambiguous governance, and the Ukrainian refugee crisis: perspectives from NGO leaders in the Czech Republic. *Central European Economic Journal*, 10(57), 35-49. https://doi.org/10.2478/ceej-2023-0003

Carvalho, N., Edwards-Jones, G., and Isidro, E. (2011). Defining scale in fisheries: small versus large-scale fishing operations in the Azores. Fisheries Research, 109(2-3), 360-369. https://doi.org/10.1016/j.fishres.2011.03.006

Chavez, P., Calderon, G., Santos, S., Cruz, E., and Santos, M. (2021). Vulnerability to climate change of "Giant Squid" (*Thysanoteuthis rhombus*) fishery in Marinduque, Philippines. *The Philippine Journal of Fisheries*, 181-190. https://doi.org/10.31398/tpjf/28.2.2021-0002

Creswell, J. W., and Plano Clark, V. L. (2018). *Designing and Conducting Mixed Methods Research* (3rd ed.). Thousand Oaks, CA: SAGE.

Ebenezer, A. (2024). Assessment of the UNDP's humanitarian assistance programme on community development in Lagos State, Nigeria. *JPDS*, 15(1), 82-94. https://doi.org/10.4314/jpds.v15i1.6

Ehizele, U., Akinsanya, B., Isibor, P., and Excellence, A. (2023). Bioaccumulation of polybrominated diphenyl ethers (pbdes), oxidative stress biomarker response and histopathological alterations in *Malapterurus electricus* (gmelin, 1789) from Lekki lagoon, Lagos, Nigeria. *Egyptian Academic Journal of Biological Sciences B Zoology*, 15(2), 111-130. https://doi.org/10.21608/eajbsz.2023.326965

Enaikele, M.D. and Olutayo, A.O. (2011). Explorative analysis of the effect of Inland Fisheries Decree on sustainable exploitation of Inland Fisheries in Lagos State, Nigeria. *Journal of Agriculture, Forestry and the Social Sciences*. 8. 10.4314/joafss.v8i1.64810.

FAO. (2020). *The State of World Fisheries and Aquaculture 2020: Sustainability in action*. Food and Agriculture Organization of the United Nations.

Galveia, M. C., and Macusi, E. D. (2025). Management effectiveness of marine protected areas (MPAs) in the Southeastern Mindanao, Philippines. *Marine Policy*, 174, 106596. https://doi.org/https://doi.org/10.1016/j.marpol.2025.106596

Gardner, C., Cripps, G., Day, L., Dewar, K., Gough, C., Peabody, S., and Harris, A. (2020). A decade and a half of learning from Madagascar's first locally managed marine area. *Conservation Science and Practice*, 2(12). https://doi.org/10.1111/csp2.298

Hauzer, M., Dearden, P. and Murray, G. (2013). The Fisherwomen of Ngazidja Island, Comoros: Fisheries Livelihoods, impacts and implications for management. *Fisheries Research*. 140. 28-35. 10.1016/j.fishres.2012.12.001.

IPCC. (2019). Special Report on the Ocean and Cryosphere in a Changing Climate. Intergovernmental Panel on Climate Change.

Islam, M., Sallu, S., Hubacek, K., and Paavola, J. (2013). Vulnerability of fishery-based livelihoods to the impacts of climate variability and change: Insights from coastal Bangladesh. *Regional Environmental Change*, 14(1), 281-294. https://doi.org/10.1007/s10113-013-0487-6

Jim-Saiki, L. O., Alhaji, T. A., Giwa, J. E., Oyeride, M. and Adedeji, A .K. (2014). Factors constraining Artisanal Fish production in the fishing Communities of Ibeju-Lekki Local Government Area of Lagos State. *International Journal of Innovative Research and Development*. 3(13):97 – 101

Lawal-Are, A. O. and Nwankwo, H. (2011). Biology of the Hairy Mangrove Crab, Sersema Huzardii (Decapoda: Gras-pidae) from a Tropical Estuarine Lagoon. J*ournal of American Science*. 7(7):402-408

Macusi, E., Camaso, K., Barboza, A., and Macusi, E. (2021). Perceived vulnerability and climate change impacts on small-scale fisheries in Davao Gulf, Philippines. *Frontiers in Marine Science*, 8. https://doi.org/10.3389/fmars.2021.597385

Malik, J. and Kristiana, H. (2021). Sustainability strategy for small-scale fisheries management: Case study in Semarang City coastal, Indonesia. *Tropical Fisheries Management Journal*, 5(2), 83-90. https://doi.org/10.29244/jppt.v5i2.34761

Medard, M., Sobo, F., Nagatunga, T. and Chirwa, S. (2001). Women and gender participation in the fisheries sector in Lake Victoria. In: Role of women in fisheries management. A workshop paper presented at the 6th Fisheries Forum, Kaoshiung, Taiwan, 29 November, 2001.

Merino, G., Barangé, M., Blanchard, J., Harle, J., Holmes, R., Allen, I., and Rodwell, L. (2012). Can marine fisheries and aquaculture meet fish demand from a growing human population in a changing climate?. *Global Environmental Change*, 22(4), 795-806. https://doi.org/10.1016/j.gloenvcha.2012.03.003

Nwosu, F. M., Ita, E. O. and Enin, U. I. (2011). Fisheries management in Nigeria: A case study of the marine fisheries policy. *International Research Journal of Agricultural Research and Soil Science*, 1(3), 070-076. https://www.interesjournals.org/articles/fisheries-management-in-nigeria-a-case-study-of-the-marine- fisheries-policy.pdf

Oiku, P. (2023). Strategic diversity and organisational resilience among small and medium-sized enterprises in Lagos State. *IJBT*, 13(3), 271-284. https://doi.org/10.58915/ijbt.v13i3.299

Olagunju, I., Adesiyan, I. and Ezekiel, A. (2007). Economic Viability of Cat Fish Production in Oyo State, Nigeria. *Journal of Human Ecology*. 21. 10.1080/09709274.2007.11905961.

Olopade, O. and Dienye, H. (2017). Roles of eco-labeling in fisheriesconservation and sustainability. Ilmu Kelautan *Indonesian Journal of Marine Sciences*, 22(2), 99-104. https://doi.org/10.14710/ik.ijms.22.2.99-104

Omitoyin, S. A. and Tosan, F. B. (2012). Potential impacts of climate change on livelihood and food security of artisanal fisher folks in Lagos State, Nigeria. *Journal of Agricultural science*, 4(9) 20-30

Oyebamiji, B., Sotean, O., Tolorunju, E., Oladeji, S., and Ojo, O. (2021). Constraints on fish preference and consumption pattern in Lagos state, Nigeria. *Journal of Agripreneurship and Sustainable Development*, 4(3), 137-143. https://doi.org/10.59331/jasd.v4i3.240

Pomeroy, R., Katon, B. and Harkes, I. (2001). Conditions affecting the success of fisheries co-management: Lessons from Asia. *Marine Policy*. 25. 197-208. 10.1016/S0308-597X(01)00010-0.

Rouhi, N., Gorji, H., and Maleki, M. (2019). Nongovernmental organizations coordination models in natural hazards: a systematic review. *Journal of Education and Health Promotion*, 8(1), 44. https://doi.org/10.4103/jehp.jehp_201_18

Setyaningrum, E. (2024). Analysis of the vulnerability of small-scale capture fisheries in Pangpang bay, Banyuwangi regency, Indonesia. *Iop Conference Series Earth and Environmental Science*, 1328(1), 012007. https://doi.org/10.1088/1755-1315/1328/1/012007

Shamsuzzaman, M., Islam, M., Begum, A., Schneider, P., and Mozumder, M. (2022). Assessing fisheries policies of Bangladesh: need for consistency or transformation?. *Water*, 14(21), 3414. https://doi.org/10.3390/w14213414

Simus, M., Subasinghe, R., Siriwardena, S. N., and Shelley, C. C. (2022). Nigerian aquaculture: An investment framework for improved incomes, new jobs, enhanced nutritional outcomes and positive economic returns (Program Report: 2022-10). WorldFish. https://hdl.handle.net/20.500.12348/5216

Subasinghe, R., Siriwardena, S. N., Byrd, K., Chan, C. Y., Dizyee, K., Shikuku, K., and Phillips, M. J. (2021). Nigeria fish futures. Aquaculture in Nigeria: Increasing income, diversifying diets and empowering women. Report of the scoping study. *Monographs*.

Tashakkori, A., and C. Teddlie (Eds.). (2010). SAGE handbook of mixed methods in social & behavioral research. Thousand Oaks, CA, SAGE Publications, Inc., 912 pages. ISBN 10: 1412972663.

Torell, E., Bilecki, D., Owusu, A., Crawford, B., Beran, K. and Kent, K. (2019). Assessing the Impacts of Gender Integration in Ghana's Fisheries Sector. *Coastal Management*. 47. 1-20. 10.1080/08920753.2019.1669098.

Trindade-Santos, I., Moyes, F., and Magurran, A. (2020). Global change in the functional diversity of marine fisheries exploitation over the past 65 years. *Proceedings of the Royal Society B Biological Sciences*, 287(1933). https://doi.org/10.1098/rspb.2020.0889

Utete, B., Phiri, C., and Fregene, T. (2019). Drivers and barriers to sustainable fisheries in two peri-urban impoundments in Zimbabwe. *Water* Sa, 45(4 October). https://doi.org/10.17159/wsa/2019.v45.i4.7536

Watanuki, N. (2008). Community-based fisheries co-management in Senegal. In IIFET 2008 Vietnam Proceedings. International Institute of Fisheries Economics and Trade.