



# WHO DECIDES?

Stakeholder and network analysis of customary governance  
in small-scale fisheries of Liberia



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### Acronyms

ADR: Alternative Dispute Resolution  
CMA: Collaborative Management Association  
CSO: Civil society organisation  
EJF: Environmental Justice Foundation  
EU: European Union  
GDP: Gross Domestic Product  
IEZ: Inshore Exclusion Zone  
INGO: International non-governmental organisation

IUU: Illegal, unreported, and unregulated (fishing)  
LAFAs: Liberia Artisanal Fishermen Association  
MoU: Memorandum of Understanding  
NaFAA: Liberia National Fisheries and Aquaculture Authority  
NGO: Non-governmental organisation  
SNA: Social Network Analysis  
SSF: Small-scale fisheries

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# Executive summary

Fishers casting net, Marshall, Margibi County.

## Key Findings

The small-scale fisheries (SSF) sector in Liberia relies on informal governance structures with multiple stakeholders at different leadership levels. These structures play an important role in addressing issues like overexploitation and unsustainable fishing practices. We conducted interviews with fishers, community leaders, and other influential people in 23 fishing communities. We found that the Liberia National Fisheries and Aquaculture Authority is the primary stakeholder in SSF governance at the national level. At the community level, sea chiefs, leaders of fishmongers and fish processors organisations, and local leaders are influential. Collaborative Management Associations established to support fisheries management in specific counties and the Liberia Artisanal Fishers' Association, an advocacy body for Liberia's SSF, also have a strong influence on governance processes. This report can help decision-makers and stakeholders in Liberia's SSF to strengthen these networks to improve SSF management in Liberia.

Liberia's SSF sector is governed by various stakeholders and networks operating at different levels. These stakeholders collaborate to ensure the effective and sustainable management of SSF in Liberia. The critical governance structures identified are:

- The Liberia National Fisheries and Aquaculture Authority is the head of SSF governance in Liberia. At the county (political sub-regions) level, SSF governance is headed by the Superintendent, the Vice Jury of the President of the Republic of Liberia. In a hierarchical structure, this is followed by the Development Superintendent, County Inspector, Statutory District Superintendent, District Commissioner, Paramount Chief, Clan Chief, General Town Chief, Town Chief, Quarter Chief, Sea Chief, Chairlady and Youth Chair.
- In fishing communities, SSF governance is led by the Sea Chiefs, who are selected based on their experience, age or inheritance to govern the affairs of fishermen in fishing communities. The Sea Chiefs supervise all fishing and related activities, preside over fishermen's meetings, promulgate local fishing rules, and support dispute resolution and settlement. They serve as community representatives for established Collaborative Management Associations (CMAs).
- The Council of Elders, Paramount chiefs, and Town chiefs, who are responsible for the overall governance of the community, also participate in SSF governance at the community level. They support the implementation of fisheries norms and lead conflict resolution processes.

- Boat owners, boatswains (captains) and the fishing crew, who organise and lead fishing trips and determine fish market prices, are also influential in SSF governance in the community.
- The fishmongers' and fish processors' heads (primarily women) are also influential stakeholders in SSF governance in fishing communities. They lead the women who work as fishmongers and processors, negotiate fish prices and buy fish from fishermen. They also preserve fishery products and transport them to markets and customers.
- The CMAs collaborate with NaFAA and local stakeholders to govern the SSF in counties and communities. In addition, the Liberian Artisanal Fishers Association also contributes to SSF governance processes.
- The working relationships and interactions among the various stakeholder groupings at the community level are mutually supportive and encourage collaboration to maximise limited resources and attain optimum productivity in fishing communities.

This research recommends that all relevant stakeholders be engaged and supported to ensure the effective operations of local governance structures in the SSF. This engagement should focus on enhancing fisheries laws and local norms, as well as building stakeholders' capacity to contribute to SSF governance effectively.

## 1. Introduction

During the prolonged civil discord in Liberia, governance in the fishing industry was non-existent and fishing was largely unregulated, resulting in widespread illegal, unreported and unregulated (IUU) fishing.<sup>1,2</sup> Since 2004, successive governments have sought to improve the governance of the fisheries sector, with a major overhaul of fisheries policy introduced in 2010.<sup>3</sup> This included the establishment of a six nautical mile (nm) inshore exclusion zone (IEZ) to protect the country's small-scale fisheries (SSF), following years of depletion due to the presence of industrial trawlers in the inshore waters.<sup>4</sup> This was the first major action taken by the Government to regulate foreign trawlers operating in inshore waters and to allow coastal fishery resources to recover.

Today Liberia's industrial fisheries are strictly regulated,<sup>5</sup> while the SSF are largely free to all. As in other open access fisheries,<sup>6</sup> Liberia's SSF sector is characterised by unsustainable fishing practices, with excess fishing effort and illegal fishing practices such as the use of monofilament nets, dynamite fishing, and beach seining, among others, driving overexploitation. Between 2004 and 2016, SSF fishing effort grew around nine-fold,<sup>7</sup> a figure expected to increase further. A general lack of management of the SSF sector has had implications for the sustainability of Liberia's fishery resources. In response to the inherent challenges of managing SSF, collaborative management, or co-management, has surfaced in recent years as a potential alternative approach to SSF management. It has been accepted by the Liberian Government as a way forward for managing SSF in Liberia.<sup>8</sup>

Fishmonger's fish purchase, Buchanan, Grand Bassa County.



Liberia has a coastline of 570 km and an exclusive economic zone of 246,152 km<sup>2</sup>. Nine of the country's 15 counties (political subdivisions) are located along the coast of the Atlantic Ocean. This stretch harbours valuable demersal and pelagic fisheries resources, which in turn are a source of nutrition and food security, where fish provides 65% of the animal protein intake, as well as a key source of livelihood and income for several thousand locals, accounting for around 10% of GDP.<sup>9</sup> The Liberian fishing industry comprises marine and inland fisheries subsectors, with the marine fisheries accounting for around 90% of the total landings.<sup>10</sup> The marine fisheries consist of an offshore industrial fishery, a coastal industrial fishery and SSF subsectors.<sup>11</sup> In terms of fish production, domestic fish supply and job security, the SSF subsector is the most important in Liberia. On average, the SSF sector accounts for 90-95% of the total landed catch per annum and directly employs over 33,000 people.<sup>12</sup> The inland fisheries are mostly in rivers, lakes, and wetlands like swamps and coastal lagoons. They are an essential subsistence activity for riverine communities. There are 114 fishing-dependent communities along Liberia's coastline whose primary income-generating activities revolve around fishing and related activities that are largely small-scale in nature. The SSF sector is centred on fishing activities by motorised and non-motorised canoes, with about 3500 canoes operating along the coast.<sup>13</sup>

## 1.1 Stakeholders within Liberia's SSF sector

A stakeholder may be defined as "any individual, group, or institution who has a vested interest in the natural resources of the project area and/or who potentially will be affected by project activities and have something to gain or lose if conditions change or stay the same".<sup>14</sup> Simply put, stakeholders are individuals, groups, or institutions who need to be considered in achieving the project goals and whose participation and support are essential to its success.<sup>15</sup>

In Liberia, coastal small-scale fishing is part of a larger and more elaborate value chain. Different stakeholders from the various stages of the value chain make meaningful contributions in terms of inputs and services that sustain the local economy of the SSF industry.

The SSF subsector in Liberia supports the livelihoods of over 75,000 people, such as fishermen<sup>16</sup>, fish processors, fishmongers, fish traders, boat builders, traditional leaders, transport vehicle operators, and marketers, among others.<sup>17</sup> The Liberian Government and its development partners, such as the European Union (EU), are increasing their efforts to improve governance and management of SSF in the country because of the crucial role of the sector in the livelihoods of fisherfolks and other users of fishery resources.

## 1.2 Social network analysis

A social network can be regarded as a social structure made up of individuals or participants (stakeholders) connected directly or indirectly by some type of relationship based on a common interest.<sup>18</sup> Social network analysis (SNA) seeks to use information obtained from participants to identify the key individuals or groups within a network and to analyse and map the connections that link these individuals or groups together.<sup>19</sup> The primary aim of a SNA is to analyse the structure of a network and the power of the different parties. Such an analysis can support goals including:

- i. strengthening understanding of social connections, any gaps in the flow of information and how best to deliver information to a target group;
- ii. developing relationships between the different stakeholders and addressing the issues that concern them;
- iii. supporting the design and implementation of regulations and policies, and identifying cost-effective ways to report violations.



Landing site, Marshall, Margibi County.

## 2. Rationale and research objectives

Liberia's SSF are largely informal and bonded by a complex social network that is fundamental to the survival of the local fishing industry. Understanding these traditional SSF-related social webs that have endured over generations is critical to inform attempts to safeguard the SSF subsector and related livelihoods.

Local and national government structures exercise jurisdiction over Liberia's fishing communities, which are mainly situated in rural locations. In addition, the fishers<sup>20</sup> maintain their local norms and their own leadership structure, usually headed by a Sea Chief who exercises authority along the beaches. Amidst the plurality of national, local and community-level structures, rules, and norms, the stakeholders endeavour to maintain balance and co-exist within a network of varying and often overlapping frameworks.

Any entity working to improve governance within the SSF subsector should critically reflect on the complex network of different stakeholders and the numerous interests in the sustainable management of fishery resources.<sup>21</sup> Identifying the key stakeholders in the SSF subsector and the networks that sustain fishers and their communities is critical to understanding how these collaborations can be supported to improve livelihoods based on the SSF value chain.

The main objective of this stakeholder and network analysis of SSF in Liberia is to improve understanding of the complex network of leadership structures and national and local rules and norms affecting SSF governance. More specifically, this research seeks to:

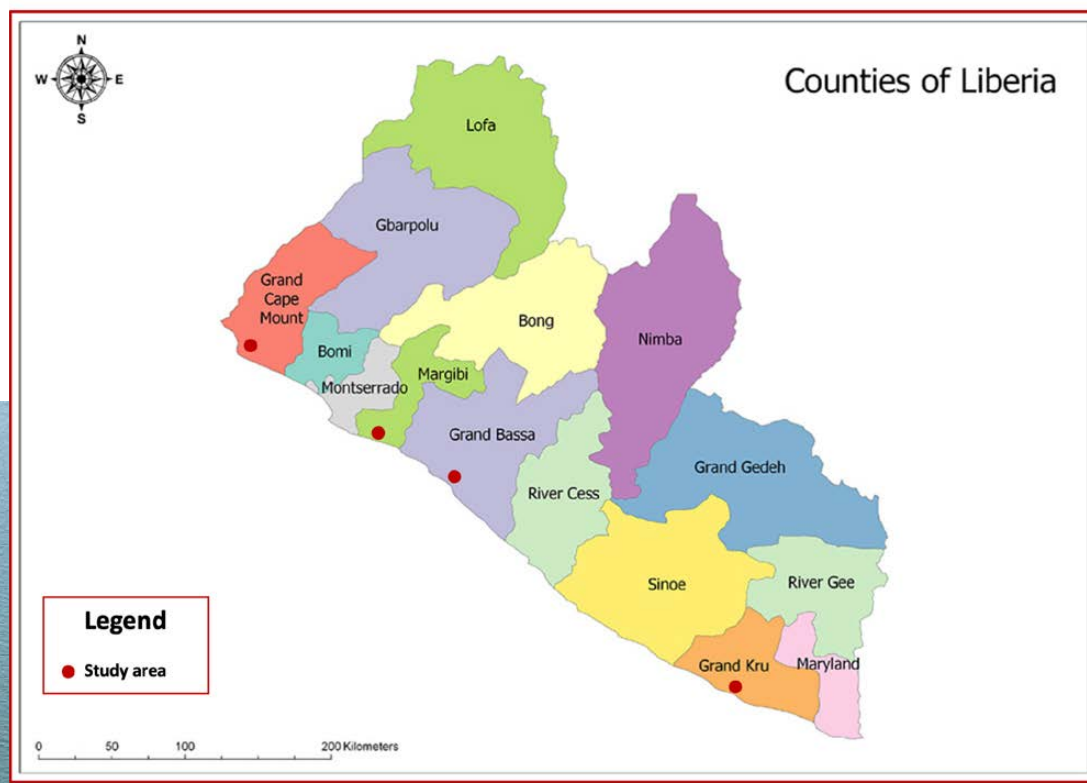
- i. identify the key stakeholders in the SSF subsector, their roles, and influence on SSF governance;
- ii. analyse the interests of the various stakeholders who may affect or be affected by this network and the potential conflicts or risks that could undermine their co-existence in order to identify groups that could be encouraged to collaborate and strengthen SSF governance; and
- iii. recommend how these relationships and networks could be strengthened and harnessed to improve SSF management in these areas.

### 3. Analytical approach and study area

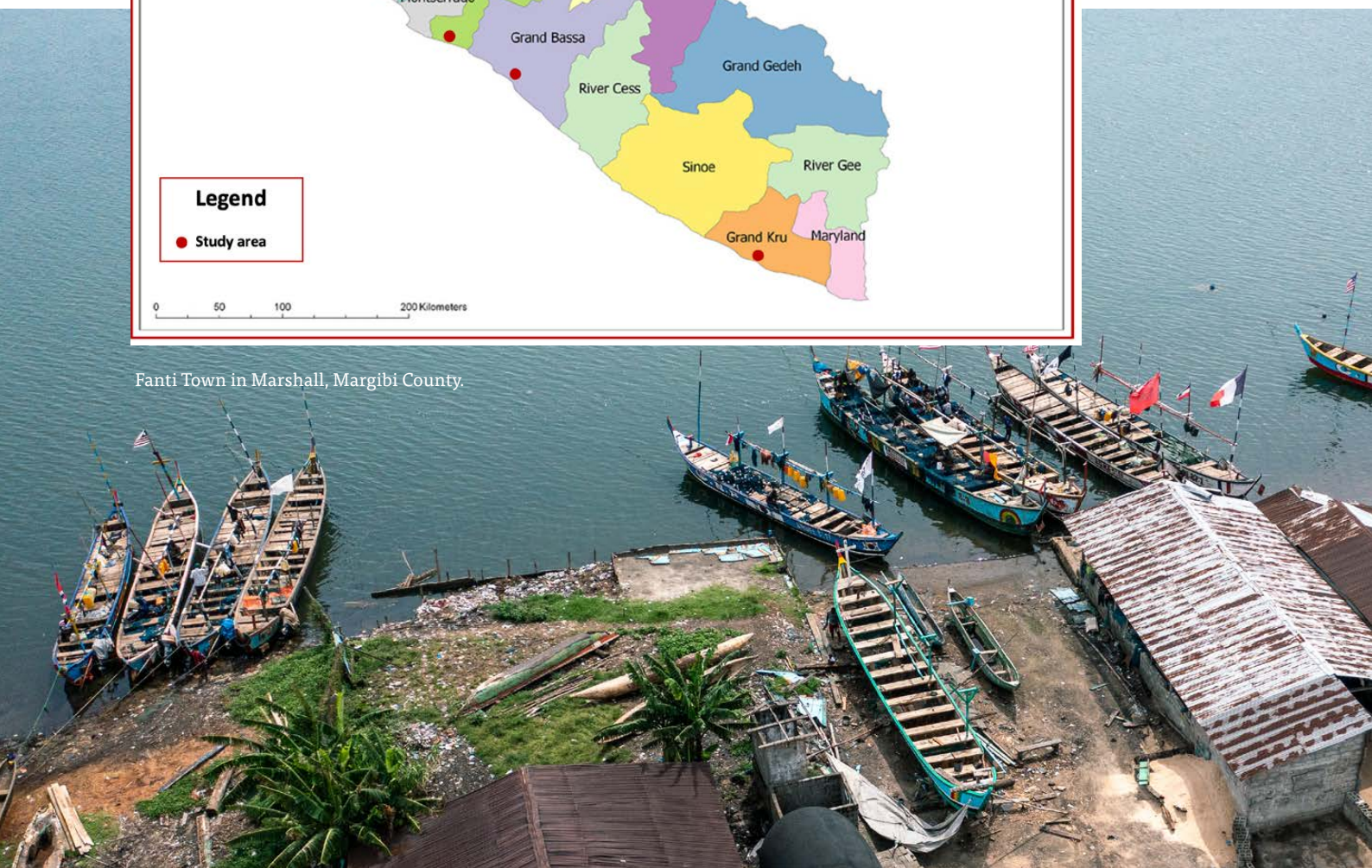
Primary data for this analysis were collected through interviews and focus group discussions with key stakeholders in the SSF subsector, including fishers, fishmongers, and local leaders across 23 small-scale fishing communities in four counties (Grand Cape Mount, Margibi, Grand Bassa and Grand Kru) in March and April 2021 (Figure 1). These four counties are target counties for interventions under the EJF Communities for Fisheries Project funded by the EU. Together, they encompass 52% of the SSF landing sites, 45% of the total number of small-scale vessels and half of the total number of fishers in Liberia.<sup>22</sup>

A series of inception meetings were convened through the Town and Sea Chiefs upon entry into the targeted coastal counties and fishing communities<sup>23</sup>. Representatives of all stakeholders in the SSF communities attended these meetings. During the meetings, the researchers provided participants with an overview of the research and the purpose of the study. At the end of the inception meetings, participants were divided into groups to facilitate focus group discussions and key informant interviews.

**Figure 1:** Map of Liberia showing study area (adapted from Mappr: <https://www.mappr.co/counties/counties-of-liberia/>)



Fanti Town in Marshall, Margibi County.





The study carried out 29 focus group discussions. Prior to the discussions, the research team explained the questionnaires and the role of each group in the study. Discussions were conducted in Liberian pidgin, and in cases where participants did not understand pidgin, the services of interpreters were used. Participants in the focus group discussions were drawn from the landing sites in the study areas. They included fishers, fishmongers, fish processors and traders, leaders of women's groups, youth groups, elders, and local leaders of the fishing communities. Women were specifically engaged to ensure their participation in the process. The participants responded reasonably

well to the research questions, in some cases with the aid of interpreters and scribes. Each focus group discussion consisted of 10-15 participants and lasted an hour. The research questions were designed to solicit information on the complexities of the network of leadership structures, rules and norms, the interests of the various stakeholders, potential conflicts or risks, and the groups that could be encouraged to collaborate. Questionnaires were predesigned and included both open-ended and closed research questions. Open-ended questions allowed for a follow-up discussion on initial responses.



Focus group discussion, Sobobo, Grand Kru County.

In addition to the focus group discussions, 34 key informant interviews were conducted in the four targeted coastal counties and fishing communities. These interviews were aimed at corroborating earlier information from the focus group discussions. A total of 617 participants were reached through focus groups and key informant interviews, of which 47.5% were women.

A Social Network Visualiser tool was used to analyse the data collected. The aim was to identify the main stakeholders in the Liberian SSF sector and their networks, their roles and the effects of their activities on SSF governance, as well as to examine customary power structures to determine hierarchies within the SSF sector. Figures were produced to illustrate the findings.

## 4. Key findings

### 4.1 Governance structures in the SSF sector

The official local governance structure, at the county level, is headed by the Superintendent, who is the Vice Jury of the President of the Republic of Liberia. In a hierarchical structure, this is followed by the Development Superintendent, County Inspector, Statutory District Superintendent, District Commissioner, Paramount Chief, Clan Chief, General Town Chief, Town Chief, Quarter Chief, Sea Chief, Chairlady and Youth Chair.

#### 4.1.1 Traditional governance

Local leaders in fishing communities are selected by the Council of Elders or key social groupings in the community. The selection criteria for leaders includes experience, status, inheritance, understanding of the traditional customs and practices, ability to negotiate well and the display of leadership charisma. There are two separate governance (leadership) structures in the towns and at the beaches. At the town level, the formal governance structure is headed by the Town Chief. Residents of the town are, by tradition, governed by the Town Chief. At the beach, the traditional governance system is headed by the Sea Chief as reported in a previous study<sup>24</sup>. Usually, fishermen at the beaches are governed by the Sea Chief. While two separate governance structures exist in the local communities, the relationship between the two leadership sets remains cordial and mutually collaborative.

Sea Chiefs are traditionally chosen by inheritance or elected by the community based on experience and knowledge (Table 1). In terms of roles and responsibilities, the Sea Chief heads the fishing communities, supervises all fishing and related activities (such as chairing fishermen meetings, promulgating local fishing rules, presiding over fishermen disputes and settlement), serves as community representative for established CMAs, and represents fishers at county and national meetings. Sea Chiefs have a direct role in the fisheries and are perceived to have a very high influence in the fishing communities (Table 1).

The head of the Council of Elders in small-scale fishing communities is selected either by inheritance or appointed by the Town Chief based on several factors, most importantly age, experience, knowledge, and influence in the community (Table 1).

The head, among other things, leads the Council of Elders, chairs council meetings, issues council announcements, sanctions council action or inaction and represents the council in external meetings and communities. The head of the Council of Elders has a direct role in the fisheries by supporting the implementation of local fisheries norms and is perceived to have a significant influence in the communities (Table 1).

The Paramount Chief, a local government official, is appointed by the President of the Republic of Liberia. The Paramount Chief's main roles in the communities are statutory and include ensuring adherence to national laws and regulations, managing town chiefs and presiding over matters beyond the jurisdictions of the town chiefs. While the Paramount Chief has no direct control over the fisheries, he is perceived to have a very high influence in the fishing community.

Boatswains (captains), typically males, are appointed by the canoe owners in the fishing communities. The captains are responsible for setting plans for fishing trips, setting the market price of fish at the landing site, selecting the local fishing crew, and maintaining the business interests of the fishing enterprise. They are perceived to have a relatively high influence in small-scale fishing communities (Table 1).

The fishing crew is selected by the boat owner and is traditionally governed by the captain of the boat at sea and on land. The fishing crew's key roles are to carry out fishing activities, supply fishery products for sale to fishmongers and others at the landing beach and ensure the protection of other crew members and equipment such as the canoe, fishing gear, and food for the crew, among others. They are seen to exercise considerable control in small-scale fishing communities (Table 1).

The safeguards are normally selected and governed by the boat captain and are mostly responsible for loading and unloading the fishing boats, assisting in untangling fishing gear and leading rescue missions (Figure 4). Safeguards' role in the fisheries is direct, although their influence is low compared with other local leaders in the fishing communities (Table 1).



Fishing crew hauling their net from the sea.

**Table 1: Leadership and roles in the fishing communities**

| Leadership                           | Method of selection  | Criteria for selection   | Roles and responsibilities  | Direct role in fisheries                    | Perceived influence (1- 5)* |
|--------------------------------------|--|--|---|---|-----------------------------|
| <b>Sea Chief</b>                     | <ul style="list-style-type: none"> <li>● Inheritance</li> <li>● Election</li> </ul>                    | <ul style="list-style-type: none"> <li>● Experience</li> <li>● Knowledge</li> <li>● Trust</li> </ul>                                     | <ul style="list-style-type: none"> <li>● Heads fishing communities</li> <li>● Supervises fishing activities</li> <li>● Chairs fishermen meetings</li> <li>● Represents fishing community</li> <li>● Promulgates fishing rules</li> <li>● Issues announcements</li> <li>● Presides over fishermen dispute settlement</li> <li>● Endorses fishermen's action or inaction</li> </ul> | Yes   | 1                           |
| <b>Head of the Council of Elders</b> | <ul style="list-style-type: none"> <li>● Inheritance</li> <li>● Appointed by the Town Chief</li> </ul> | <ul style="list-style-type: none"> <li>● Age</li> <li>● Experience</li> <li>● Knowledge</li> <li>● Influence</li> <li>● Trust</li> </ul> | <ul style="list-style-type: none"> <li>● Heads Council of Elders</li> <li>● Presides over council meetings</li> <li>● Represents council</li> <li>● Issues council announcement</li> <li>● Endorses council action or inaction</li> </ul>   | Yes (advisory role, sit on critical issues) | 2                           |
| <b>Paramount Chief</b>               | <ul style="list-style-type: none"> <li>● Presidential appointment</li> </ul>                           | <ul style="list-style-type: none"> <li>● Political affiliation</li> </ul>  | <ul style="list-style-type: none"> <li>● Statutory roles</li> <li>● Ensures compliance with national laws</li> <li>● Oversees Town Chiefs</li> <li>● Sits on issues beyond the level of Town Chief</li> </ul>   | No  | 1                           |

| Leadership                     | Method of selection   | Criteria for selection  | Roles and responsibilities   | Direct role in fisheries | Perceived influence (1- 5)* |
|--------------------------------|---|---|--|--------------------------|-----------------------------|
| <b>Boatswain (captain)</b>     | <ul style="list-style-type: none"> <li>Appointed by the boat owner</li> </ul>                     | <ul style="list-style-type: none"> <li>Trust</li> <li>Fishing experience</li> </ul>             | <ul style="list-style-type: none"> <li>Sets schedule for fishing expedition</li> <li>Sets market price for fish</li> <li>Maintains business interests</li> <li>Selects fishing crew</li> </ul>   | Yes                      | 1                           |
| <b>Fishing crew</b>            | <ul style="list-style-type: none"> <li>Appointed/ selected by Boat Owner and Boatswain</li> </ul> | <ul style="list-style-type: none"> <li>Trust</li> <li>Fishing experience</li> </ul>             | <ul style="list-style-type: none"> <li>Conduct fishing activities at sea</li> <li>Supply fishery products to fishmongers</li> <li>Ensure safety of one another and fishing equipment</li> </ul>  | Yes                      | 2                           |
| <b>Safeguard</b>               | <ul style="list-style-type: none"> <li>Selected by Boatswain (captain)</li> </ul>                 | <ul style="list-style-type: none"> <li>Fishing experience</li> <li>Trust</li> </ul>             | <ul style="list-style-type: none"> <li>Loading and unloading of fishing canoes and boats</li> <li>Assist in untangling net and removing unwanted objects</li> </ul>  | Yes                      | 4                           |
| <b>Fishmongers (heads)</b>     | <ul style="list-style-type: none"> <li>Elected by fishmongers groups</li> </ul>                   | <ul style="list-style-type: none"> <li>Experience</li> <li>Influence</li> <li>Trust</li> </ul>  | <ul style="list-style-type: none"> <li>Negotiates fish pricing and sets market value</li> <li>Purchases fishery products from the fishermen</li> <li>Takes fish to the market and consumers</li> <li>Preserves and stores fishery products</li> </ul>          | Yes                      | 2                           |
| <b>Fish sellers (heads)</b>    | <ul style="list-style-type: none"> <li>Elected by fish sellers' groups</li> </ul>                 | <ul style="list-style-type: none"> <li>Experience</li> <li>Influence</li> <li>Trust</li> </ul>  | <ul style="list-style-type: none"> <li>Negotiates fish pricing and sets market value</li> <li>Purchases fishery products from the fishermen</li> <li>Takes fish to the market and consumers</li> <li>Preserves and stores fishery products</li> </ul>          | Yes                      | 2                           |
| <b>Fish processors (heads)</b> | <ul style="list-style-type: none"> <li>Elected by fish processor groups</li> </ul>                | <ul style="list-style-type: none"> <li>Experience</li> <li>Influence</li> <li>Trust</li> </ul>  | <ul style="list-style-type: none"> <li>Negotiates fish pricing and sets market value</li> <li>Purchases fish products from the fishermen</li> <li>Takes fish to the market and consumers</li> <li>Preserves and stores fish products</li> </ul>                | Yes                      | 2                           |
| <b>Canoe owner</b>             | <ul style="list-style-type: none"> <li>Self</li> </ul>  | <ul style="list-style-type: none"> <li>Business interest</li> <li>Financial capacity</li> </ul> | <ul style="list-style-type: none"> <li>Sets schedule for fishing expedition</li> <li>Appoints fishing captain</li> <li>Sets market price for fish when involved in the fishing expedition or when canoe lands.</li> <li>Maintains business interest</li> </ul> | Yes                      | 2                           |

\*Perceived influence rating: 1. Very high influence, 2. High influence, 3. Moderate influence, 4. Low influence, 5. Very low influence. This perceived influence is related to the fisheries and fishing activities



Safeguards pulling a canoe to shore, Grand Cess, Grand Kru County.

Fishmongers are governed by the fishmongers' heads, whose ascendancy is traditional, based on experience and influence in the fishing communities. Fishmongers' primary roles are to negotiate fish prices, set market prices of fish, buy fish from the fishermen, preserve fishery products and transport them to markets and customers (Table 1). They are directly involved in the fisheries and are perceived to command a high influence in the fishing communities.

Like the fishmongers' heads, the ascendancy of the fish sellers' heads is by experience and influence in the fishing communities (Table 1). They govern the fish sellers in the fishing communities and play a similar role to the heads of the fishmongers. Their involvement and perceived influence in the fisheries are the same as the fishmongers' heads (Table 1).

The fish processors' heads usually govern the affairs of all fish processors in the fishing communities. Their primary responsibilities, direct involvement in the fisheries and perceived influence are comparable to those outlined for the heads of the fishmongers and fish sellers.



A fish processor preparing fish, Buchanan, Grand Bassa County.

Canoe owners are not selected by the Council of Elders as the case is for other leadership positions in the community. Canoe ownership in the fisheries is based on business interest and financial capacity rather than selection. Canoe owners' main roles include to set plans for fish trips, appoint a captain of the boat, set the ex-vessel price of the fish, and keep their business. Their role in the fisheries and perceived influence is considered to be lower than the Boatswain (captains) because the Boatswains are often more involved in the day to day fishing activities, including providing access to fish to fishmongers, processors and sellers and pricing of the fish (Table 1).

#### 4.1.2 Financing mechanisms of the traditional governance system

Liberia's central government does not finance the activities or functions of the traditional governance structure in the communities headed by local leaders such as Town Chiefs and Sea Chiefs, among others as is also the case in Ghana.<sup>25</sup> Usually, inhabitants of the community provide services to the community on a voluntary basis. The resources to undertake and sustain the activities and functions of local leaders are generated primarily through community initiatives. Development projects and other activities are financed through individual and collective contributions. Alternative sources of income for the communities include fines, levies, fees, and charges obtained through penalties for offences, income from services rendered and products sold such as the sale of communal land, sand, rocks, and produce from cooperative farms, the rental fee of the community town hall, income from employment of the community labour force.

Local leaders such as the Paramount Chiefs, Clan Chiefs, Governors, and General Town Chiefs, under the state apparatus, are government employees of the Ministry of Internal Affairs and are paid as civil servants under the ministry pay structure.

#### 4.1.3 Local norms

The fishing communities are governed by local norms. They adopt and follow their own local norms which are applied as rules to regulate fishing and associated activities. The local norms are usually oral in nature as reported in similar fisheries.<sup>26</sup> Some fishing communities share or practise the same norms, which seem to have evolved into traditional laws over time across most fishing communities. Examples of the existing local rules that are common to most fishing communities are summarised below:

- i. Fishing on Sunday is not allowed.
- ii. Fighting on the beach or at sea is prohibited. Repeated acts of fighting may attract a ban from all fishing activities in the community.
- iii. Swimming at sea, especially on snapper grounds is prohibited.
- iv. All fishermen are required to assist in any rescue mission at sea.
- v. It is required that tiger sharks are turned over to the community when caught.
- vi. Braiding of hair is not allowed on the beach.
- vii. The transportation of corpses by canoe is not allowed.
- viii. Cleaning fish or fish processing are not allowed on the beach.
- ix. The turning over of tubs/baskets that carry fish is not allowed.
- x. Cooking on the beach is strongly prohibited.
- xi. No wearing of red shirts (only on Solokpo Beach in Grand Kru County).

Punishment for disobeying the local rules varies widely. Punitive measures, including fines, vary from community to community but are usually between LD\$ 1500 and LD\$ 5000 (US\$9.12 and (US\$,30.40)<sup>27</sup>, with second offences typically attracting an increased fine. A third offence may result in a ban from fishing activity enforceable in all fishing communities. As punitive measures are not harmonised, some fishers migrate between fishing communities and landing sites where local rules and corrective measures are non-binding or less enforceable. The study showed that no community norms have been formalised into the official fisheries laws or regulations.

Fishers have limited information concerning the central government laws and regulations, and other fisheries policies. In most cases, the fishers are only aware of the annual licence fees they are supposed to pay to the government. The study identified a need to improve fishers' understanding of official laws and policies relating to the fisheries sector.

#### 4.1.4 Restricted areas

In some fishing communities, there are restricted areas where certain activities may be prohibited due to respect for tradition. For instance, in the Solokpo fishing community in Grand Kru County, vehicle movement is strictly prohibited on the beaches because they are used by the community as burial sites.



Fisher meeting, Sowie Beach, Grand Cape Mount County.

#### **4.1.5 Decision-making process in fishing communities**

Decision-making across the fishing communities is traditionally done through a participatory process. When an issue arises that requires a policy decision or enactment of an ordinance, the Sea Chief, through the town crier, calls all stakeholders to a mass meeting to discuss and resolve the matter. A decision is taken through consensus, or majority vote, and the agreed action is transmitted through the tribal governors to the Town Chief for adoption and proclamation into communal laws and subsequent enforcement.

#### **4.1.6 Conflict resolution**

Alternative dispute resolution (ADR) is the principal method for conflict resolution and settlement in fishing communities. ADR involves mediation, arbitration, negotiation, compromise, and settlement. The Chiefs or Sectional heads and Council of Elders are the arbitrators of cases. When there is an issue, the aggrieved party registers their complaint with the Sea Chief or relevant sectional head, who then invites the defendant and the elders to sit and hear the case. Where the gravity of the matter surpasses the authority of the Sea Chief, the case is then referred to the Town Chief for consideration. Settlement efforts are routed through the hierarchy to arrive at a reasonable resolution. Even the police, under the principle of community policing, encourage resolution of cases at

the community level with community participation. When all efforts by the community's traditional governance structures to settle an issue fail, the matter is then referred to the police or legal jurisprudence (magistrate court), where the matter is adjudicated or referred to an upper court if the case so demands. Out of court settlement is, however, the typical course of dispute settlement in the fishing communities.

#### **4.1.7 Tenurial rights**

Fish landing site (or beach) ownership is communal and is perceived to be acquired by the ancestors of the fishing communities based on oral history. In the communities, the selection and naming of fish landing sites are based on factors such as proximity to the communities, the strength of the ocean waves, size and nature of the beach (sandy beaches are preferred), distinguishable landmarks for identification purposes and the number of canoes landing at the beach. The fishing grounds are identified and demarcated by landmarks such as trees, tall buildings, and rocks, among others. According to fishers, authority over the landing sites and selected fishing grounds is inherited by the fishermen or fishing community under the leadership of the Sea Chief. This type of land ownership is enshrined (captured) in the community land rights custom and oral history, and guaranteed under the Identification of Customary Land, An Act to Establish the Land Rights Law of 2018 (Article 32)<sup>28</sup>.

Community fishing grounds are demarcated for each community with landmarks such as trees, rocks or estuaries. Local fishermen in a fishing community enjoy unrestricted access to fish in the fishing grounds of their respective community, while fishers originating outside the community wishing to access the fishing grounds and landing sites are required to request entry from the Sea Chief through a resident fisherman. According to respondents, this procedure is necessary to ensure that non-resident fishermen adhere to the norms and traditional practices of the community. Several norms have been adopted by the fishing communities to protect access to and abuse of the fish landing sites. These norms have served their purpose, according to fishers interviewed.

Fishers reported that the spatial extent of their fish landing sites has reduced gradually over time compared to the land inherited from their ancestors. The fishing communities have attributed the reduced area of the fish landing sites to factors such as erosion and sea level rise due to the changing climate.

## 4.2 Coordination and collaboration

The working relationships and interactions among the various stakeholder groupings at the community level are mutually supportive and encourage synergy to maximise limited resources and attain optimum productivity in the fishing communities. Despite the diverse community structure such as ethnicity, religious and political affiliation, the stakeholders maintain a transparent flow of information dissemination in the communities through decision-making processes that bring the fishing communities, the local leadership and the CMA to a common understanding and collaboration. Some external actors and regulators do not enjoy the same level of coordination and collaboration. For example, there are reports of disconnect between fisheries regulators/managers and communities regarding payment of fishing licences and inclusion in the decision-making process.

### 4.2.1 Fishermen and Sea Chief interactions

The Sea Chief and his fishing folks carry out their activities in a mutually supportive and respectful manner. Issues of concern that affect their fishing and related activities are discussed and resolved in a participatory and collective way. While the Sea Chief heads the fishing community, matters requiring attention are brought up by the Sea Chief or a fisher. To resolve an issue, a meeting is usually convened by the Sea Chief to amicably settle the problem, typically through consensus. The fishing communities do not uphold established or regular meeting schedules. Meetings are convened according to the urgency of the matter and may be scheduled with fishers for discussion on violations, conflict resolution, death, the passing of judgement or payment of fines. Meetings can therefore be called whenever the need arises and the situation dictates. Notwithstanding, in most instances where time allows, general meetings are held on Sundays, and attendance may or may not be compulsory depending on the nature of the meeting agenda. If the issue requires the attention of the Town Chief, the matter is relayed to the Town Chief by the Sea Chief.

### 4.2.2 Local authority and fisher interactions

The fishing communities, the local authorities, and other key stakeholders strive to maintain a cordial and mutually supportive relationship. The fishing communities have created a medium to communicate with the local authorities for support and vice versa. The channels of communication established by the fishing communities usually take the form of town hall meetings, focus group engagements and radio announcements. The use of these communication channels enables fishing communities to voice their issues and request assistance from local authorities as necessary. The local authority can interact with fishing communities through these communication channels, learn about their needs and difficulties, and then respond to those issues in a way that is acceptable for the community.

Rules adopted by the fishing communities are forwarded to the local authority or rather, in the first instance, to the Town Chief for validation, agreement, promulgation and enforcement. Over time, rules adopted by the fishing communities have been incorporated into local laws. Where the situation confronting the fishing communities is critical, normally the community seeks the assistance of the local authority to help them find a timely resolution to the matter.



### 4.2.3 Fisher folk and NaFAA interactions

The fishing communities maintain a generally acceptable relationship with NaFAA, the national regulatory arm of the fishing industry. The fishing communities endeavour to keep up with NaFAA requirements and fees. However, there are instances of delay in the payment of fishing licence fees by fishers, so the NaFAA ensures payment through compliance and enforcement activities in the fishing communities across the nine coastal counties. NaFAA also provides extension services to fishers through its County Fishery Inspectors to promote participatory management of fishery resources.

### 4.2.4 CMA and fisher interactions

The first CMA was established in 2012 in Grand Cape Mount County in the western part of Liberia. The formation of the CMA was financed by the World Bank. The CMA has since conducted two constitutional elections to determine changes in leadership. However, the functionality of the Grand Cape Mount County CMA has been restricted due to a lack of funds to conduct new elections and perceived interference by NaFAA.<sup>29</sup> An additional CMA has been established by NaFAA in Bomi and Montserrado counties and a further four CMAs under EJF's EU-funded Communities for Fisheries project. NaFAA, the CMAs, and the fishing communities operate and interact through a defined framework, outlined in a memorandum of understanding signed between NaFAA and the CMA. The CMA is the direct medium through which NaFAA works with the various fishing communities and vice versa. The fishing communities select both the Representative Council and the Zonal Heads based on the CMA constitution. The Representative Council and Zonal Heads are representatives of the various fishing communities in the counties. The elected representative council, Zonal Heads, and the incumbent executive committee members then proceed to elect the Executive Committee of the CMA. The CMA assists in enforcing fisheries regulations and supports NaFAA with collecting canoe registration and licence fees.

### 4.2.5 Dissemination of information

Information dissemination is carried out through the different local community institutional structures such as the CMA, the various chiefs and the NaFAA County Fishery Inspectors. Depending on its origin, the information flows upward or downward. Information flows downward when

it originates from the top local organs, such as the Paramount Chief, along the tiers discussed earlier. Conversely, information from the fishing communities flows upward to the Sea Chief along the upper layers. In the fishing communities, information is mostly conveyed and spread through meetings, town criers and other forms of communication such as door-to-door information sharing.

Information from NaFAA is disseminated to the fishing communities through the CMA structures, or through the County Fishery Inspectors in general meetings and through the Sea Chiefs where there are no CMAs. The County Fishery Inspectors also receive fishing reports, general complaints and other useful information from the communities and communicate it to NaFAA.

In Robertsport, where a CMA MoU has been signed, NaFAA relays information to the communities through the CMA or the County Fishery Inspectors. The CMAs share the information with the zonal coordinators who are responsible for circulating the information in their different zones. The CMA executives are responsible for relaying information and concerns from the fishing communities to NaFAA.

Other fisheries partners (INGOs, NGOs and CSOs) engage the communities by first meeting with their heads and proceed to share information with the rest of the communities or targeted groups through general town hall meetings. These meetings are mostly facilitated by the community leaders, NaFAA Fishery Inspectors, the local county authorities such as the Town Chief, City Mayor, County Inspector and County Superintendent or the staff of fisheries partners stationed in the communities.

Other means of information dissemination in the communities are via radio and television stations, religious meetings i.e., weekly church services and mosque prayers, and other informal gatherings and discussions.

### 4.3 Policy and decision-making

Within the fishing communities that do not have CMAs, there is no formal structure that allows the communities to be represented and involved at the national level in policy formulation and decision-making. According to the fishers interviewed, they do not actively participate in decision-making processes to formulate regulations and requirements relating to the fisheries sector. In Liberia, national fisheries policies and decision-making processes follow a conventional top-down approach to fisheries management, an approach with significant shortcomings, as seen from the experience of fisheries around the world.<sup>30</sup>

#### 4.3.1 Legal pluralism

Legal pluralism – namely the existence of a hybrid of local norms and national level regulations and policies<sup>31</sup> – is present within Liberia’s fishing communities. Local norms in the fishing communities pertain to daily fishing activities and governance. Punishments handed out for harvesting activities are often enforced by the fishers without seeking remedy

from the formal legal system. Fishers are generally inclined to follow their local rules because they are the formulators and enforcers of those norms. On the other hand, national laws are often formulated without the participation of the local stakeholders.

There is, nevertheless, a general acceptance of the national laws, which are applied together with norms within the traditional legal system. This allows local fishers to seek recourse to the formal legal system should the need arise.

It seems the existence of legal pluralism undermines the uniformity and consistency of behaviour patterns and standards in the fishing communities. This creates difficulties and barriers where there is disagreement around enforcing the different laws by various agencies and government ministries. Most local laws rooted in custom and tradition practised by the fishing communities are not enshrined in the national laws and policies and are, therefore, illegitimate. The national law, through customary law, adapts to portions of local practices; however, existing national fisheries policies do not clearly articulate and incorporate local norms and practices.

Kru canoes on the beach, Grand Cess, Grand Kru County.



## 4.4 Fishing activities and IUU fishing

### 4.4.1 Fishing activities

Local fishing communities engage in artisanal fishing, using small-scale, low-tech equipment and inputs. Their catches are generally limited in quantity due to the scale of fishing and type of gear used.

According to respondents, catches have been negatively impacted by IUU fishing in Liberia's waters, an issue exacerbated by competition from industrial vessels operating in the same fishing grounds and the effects of a changing climate.

Fishing equipment used by the fishers interviewed includes line, hooks, nets, paddles, canoes, and engines with capacity varying between 10–40 horsepower. Fishers confirmed their catches are seasonal in nature, as reported elsewhere.<sup>32</sup> Fishers reported the period from May to October as the high season for catches, while catches are lower from November to April. IUU fishing is considered to be a key driver of low catches, however other factors are also believed to play a role, including increased competition from fishers and larger canoes from neighbouring countries such as Cote d'Ivoire and Sierra Leone. The type of fish harvested by local fishermen includes but is not limited to cassava fish, royal threadfin, sole, groupers, snappers, barracuda, grunTERS, crabs, lobsters, sardinella, and Atlantic flying fish.

The fishing sector in Liberia's coastal communities displays characteristics of the Dutch disease resource movement effect – a term used to describe the

phenomenon whereby a boom in one economic sector attracts labour and capital from other parts of the economy – which has left other areas of work practically dormant or non-existent in the communities. This appears to be the case particularly for men who gravitate towards fishing as their main source of livelihood. Female fishmongers, on the other hand, are more likely to find other sources of income during periods of low catch in the fishing communities.

### 4.4.2 IUU fishing

IUU fishing is critical as it affects catch levels and the food and nutritional security of coastal communities. There is limited knowledge and understanding in the fishing communities on the real meaning, scope, and consequences of IUU fishing. As cited by the fishers interviewed, the activities of industrial trawlers and other similar vessels of foreign origin have been observed and reported to the local and national authorities. However, determining whether these alleged intrusions of foreign vessels are within the limit of the six nm IEZ or beyond presents a challenge as most of the local fishers cannot clearly identify the legal boundary of the IEZ. Additionally, from the interview responses, local fishing communities appear not to understand the extent to which their own activities constitute IUU fishing. Fishers use prohibited fishing nets such as monofilament and mosquito nets, destructive fishing methods such as dynamite fishing, the killing of protected species such as sea turtles, as well as the disposal of dead and rotten fish into the sea, all of which are illegal under Liberian law.



Smoked barracuda sold in Marshall market, Margibi County.

## 4.5 Social groupings in the SSF

### 4.5.1 Fisher groups and associations

Six CMAs have been established in six counties in Liberia, namely Grand Cape Mount, Grand Bassa, Grand Kru, Margibi, Montserrado and Bomi counties. The other coastal counties and fishing communities along the coast of Liberia do not have a formally organised social structure that is guided by written rules. The Liberia Artisanal Fishers Association (LAFA) is a fisher advocacy group focused on protecting the rights of small-scale fishers; however, it is centralised in Montserrado County without any formal representation in fishing communities. In all fishing communities there exist two main types of groupings founded along ethnic lines, namely the Kru and the Fanti fishing tribes.

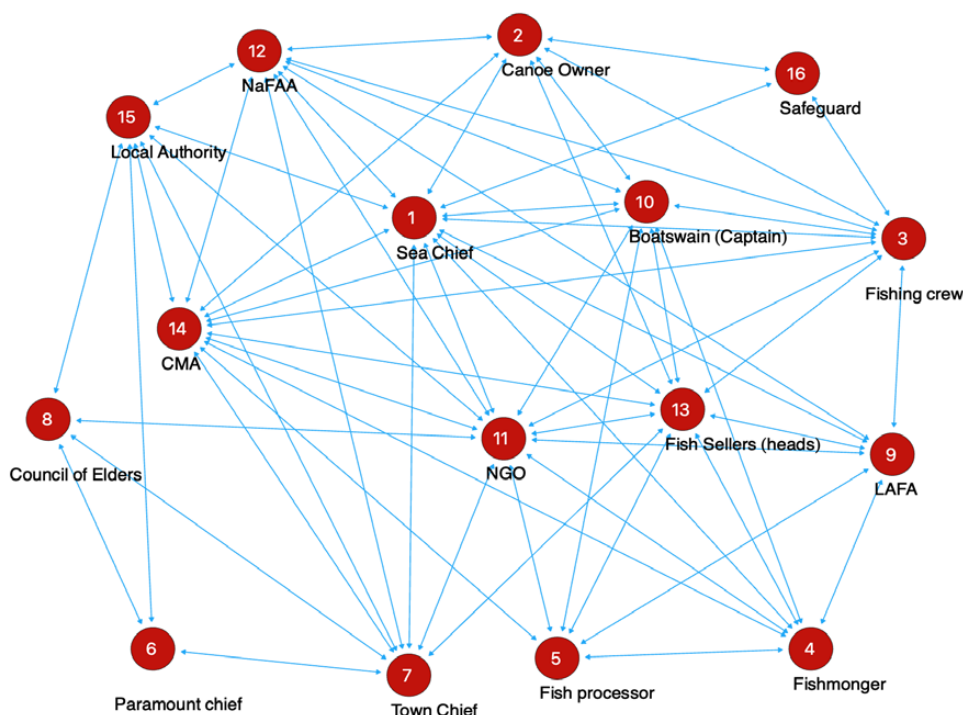
These two groupings each have their own tribal structures. Kru fishers in practice may be a mix of locals consisting of Kru, Via, Bassa, and Grebo, among other local tribes, and are weakly organised with a quasi-leadership structure in place. The Fanti fishers, on the other hand, have a more formalised structure, operating under an association called AMANFU across all fishing communities. AMANFU has a leadership structure, defined meeting days, and procedures for

conflict resolution, which are guided by unwritten tribal customs and norms. Fishing communities across Liberia, regardless of their tribal grouping, have expressed a unanimous proclivity to form and be a part of an organised social grouping, preferably under the structure of the CMA.

## 4.6 Social Network Analysis

### 4.6.1 Small-scale fisheries network

Based on the SNA, the network formed between and among the stakeholders in the SSF reveals multiple connections between the different stakeholders, such as NaFAA, local authorities, NGOs, and members of the fishing communities<sup>33</sup> (Figure 2). Results show the Sea Chief and NGOs are the most linked stakeholders in and central to the SSF network, followed by the CMAs, fish sellers and fishing crew (Figure 2). The central role of the Sea Chief in the network partly indicates their influential role in SSF management and suggests how they might be crucial to the success of any interventions to improve governance of the SSF sector. It is therefore important for fisheries interventions to be implemented with participation of the Sea Chiefs because of their central role in SSF management.

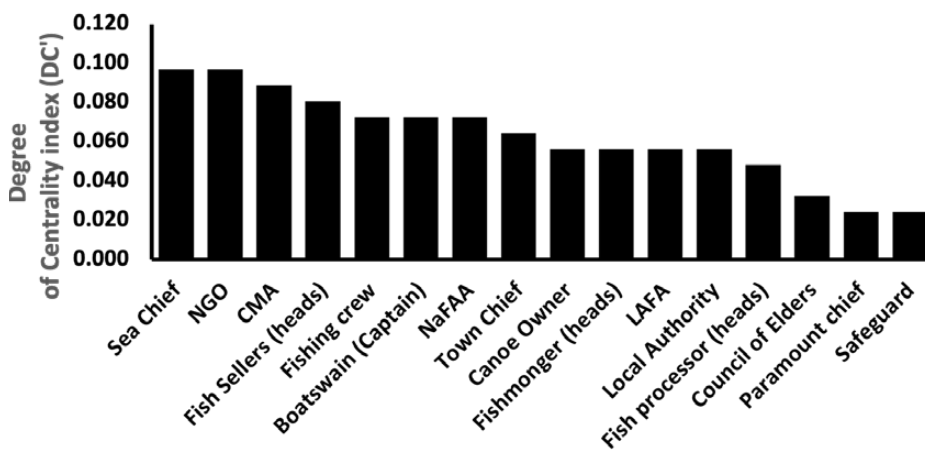


**Figure 2: Output of social network visualizer depicting how key stakeholders in the SSF network are connected based on information from fishers interviewed.**

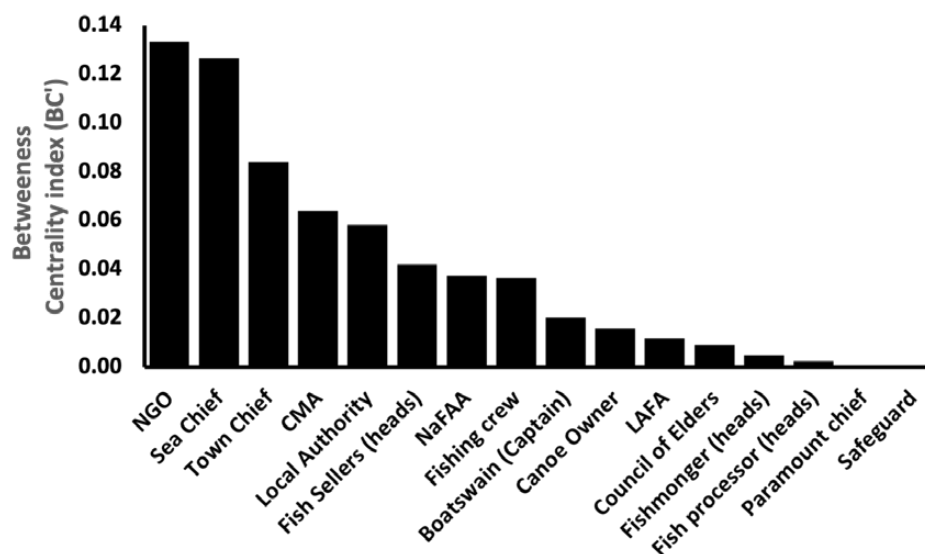
The degree of centrality index, which is the sum of edges attached to a node in the SSF network, was applied to gauge how each stakeholder within the network was linked to other stakeholders. In this type of analysis, the actor with the highest index is regarded as the most dominant and central. Based on the analysis of the SSF network, Sea Chiefs and NGOs are the most connected stakeholders in the network with the highest score (0.097) (Figure 3). While the analysis shows that the Sea Chiefs are the most linked and influential stakeholder in the SSF network, their roles and authority are largely informal and not recognized in the fisheries regulations of Liberia, as also reported in comparable fisheries in Ghana.<sup>34</sup>

The influence of NGOs is derived from their interventions carried out in the fishing communities.

The betweenness centrality measures the number of times a node (stakeholder) acts as a link along the shortest path between two other stakeholders. This index was introduced in the analysis to measure the relative influence a stakeholder exercises as an in-between in the communication and information dissemination processes within the network<sup>35</sup> (Figure 4). Results indicate that Sea Chiefs and NGOs are the most important stakeholders in terms of communication and information dissemination (Figure 4).



**Figure 3: Indices of the Degree of Centrality for the different stakeholders in the SSF sector**



**Figure 4: Betweenness Centrality indices for the different stakeholders in the SSF sector**

The analysis shows that NGOs are key stakeholders in the SSF network (Figure 9). NGOs have mainly been involved in carrying out fish processing and handling training, monitoring of and reporting on IUU fishing and supporting key fisheries data collection in the fishing communities.

In the SSF network, respondents perceived the influence of canoe owners to be below the boatswain (Captain) because they are not involved in managing and taking fisheries-related decisions. Canoe owners often leave the management of fishing activities to the captain, who in turn reports to the owner on financial and other matters. However, when there are issues concerning canoe business arrangements, which is typically not in the purview of the Sea Chiefs, canoe owners may intervene.

Fishers pulling canoe to safety, Small Fanti Town, Buchanan, Grand Bassa County.



## 5. Conclusions and recommendations

The Liberian national government, through NaFAA, is responsible for the overall management of fisheries in Liberia. However, in the fishing communities, which are mainly situated in the rural areas of Liberia, a number of other stakeholders play critical roles in the management of fisheries at that level. These stakeholders have successfully created and maintained strong networks, communication channels and governance approaches in their respective fishing communities. These governance approaches are led by their traditional leadership structures and are guided by local norms and regulations.

The analysis identified ten traditional governance roles in the fishing communities surveyed in Liberia. The Sea Chiefs were identified as the leader of the fishermen, and they work collaboratively with the Town Chiefs to govern fishing activities in the communities. In communities within counties that have active CMAs, these Sea Chiefs also serve as CMA representatives in their communities. The Sea Chief is nominated and elected to office through a voting process by the communities.

Women leaders were identified in the small-scale fishing communities for fishmongers, processors, and fish sellers, and their selection is traditionally based on experience, influence and ability to negotiate fish prices. Sea Chiefs and women leaders are not properly recognised nor are their roles formalised in the current fisheries laws. Therefore, they are only able to exercise limited authority, and this is usually at the beach level only.

Lafa and the six established CMAs were also recognised as key stakeholders in Liberia's artisanal fisheries sector. Lafa serves as an advocacy body, while the CMAs support NaFAA in managing the fisheries at the county level through co-management arrangements.

The following actions are recommended to direct key stakeholders, and the several networks that emerge from their interactions, towards the effective operation of the local governance structures of the artisanal fishing industry of Liberia:

- Fisheries laws should recognise the important roles the Sea Chiefs and women leaders play in the management of artisanal fisheries and provide a legal basis for them to enforce regulations, as established by the CMA constitutions.
- LAFA should be supported to effectively advocate for the sustainable management of the country's fisheries sector. The support can be directed toward strengthening their governance structure and improving their ability to conduct research and collect fisheries data to inform their advocacy.
- NaFAA should improve its communication and information-sharing processes with the CMAs by making the CMAs central to disseminating information to and from the communities to ensure a free flow of information between NaFAA and the communities, and vice versa.
- Additional CMAs should be established in all fishing communities in Liberia to support local fisheries governance. These CMAs should be supported by the national government and be involved in decision-making and information dissemination. Lessons learned from the experience of setting up the early CMAs should be considered in this process.<sup>36</sup> The major ethnic groups in the fishing communities identified by the analysis should be equally engaged during the formation and operations of the CMAs.
- Local traditional and national laws should be reconciled to ensure that they complement and do not contradict each other.
- Robust IUU fishing awareness and sensitisation should be conducted across the fishing communities to improve understanding of the effects of IUU fishing. The awareness raising should aim at ensuring proper reporting of IUU fishing incidents in the fishing communities, and increasing fishers' understanding of what constitutes IUU fishing.
- Fishing crews should be provided with safety gear to improve their safety at sea to reduce fatalities associated with drowning at sea.
- Local fishers should be engaged in decision-making processes using the consultative bottom-to-top approach to increase compliance with national laws.
- Local norms should be developed into local laws with defined punitive measures to discourage violators and increase compliance with these laws.
- Tenurial rights of fishers should be protected against beachfront development, land-grabbing, and other encroachments through national or local law. This will secure fish landing sites and secure the livelihoods of fishers.

Canoe at Robertsport Landing Cluster, Grand Cape Mount County.



## 6. Appendices

### Appendix I: List of research communities

**Table: List of targeted fishing communities per county**

| No.       | County                  | Community             |
|-----------|-------------------------|-----------------------|
| <b>A.</b> | <b>Grand Kru</b>        | Sobobo                |
|           |                         | Grand Cess            |
|           |                         | Wedabo                |
|           |                         | Tugbaklee             |
|           |                         | Chainakalee           |
|           |                         | Solokpo               |
|           |                         | Jletekpo              |
|           |                         | Jugbekpor             |
|           |                         | Felorklee             |
|           |                         | New Cess              |
| <b>B.</b> | <b>Grand Cape Mount</b> |                       |
|           |                         | Up Town Landing Site  |
|           |                         | Kru Town landing site |
|           |                         | Fanti Town            |
|           |                         | Torsor                |
|           |                         | Sembehum              |
| <b>C.</b> | <b>Margibi</b>          |                       |
|           |                         | Kru beach             |
|           |                         | Fanti Town            |
|           |                         | Floko Town            |
|           |                         | Kpakpacom             |
| <b>D.</b> | <b>Grand Bassa</b>      | Umarco/Custom Beach   |
|           |                         | Port Beach            |
|           |                         | Small Fanti Town      |
|           |                         | Big Fanti Town        |
|           |                         | Kru Beach/Barden Wreh |



## Appendix II: Results of the SNA

### Degree Centrality (DC) report for different stakeholders

**Network name:** Stakeholder network analysis

**Actors:** 16

*In undirected networks, the DC index is the sum of edges attached to a node u.*

*In directed networks, the index is the sum of outbound arcs from node u to all adjacent nodes (also called “outDegree Centrality”).*

*If the network is weighted, the DC score is the sum of weights of outbound edges from node u to all adjacent nodes.*

*Note: To compute inDegree Centrality, use the Degree Prestige measure.*

*DC' is the standardised index (DC divided by N-1 (non-valued nets) or by sumDC (valued nets)).*

**DC range:**  $0 \leq DC \leq 15$

**DC' range:**  $0 \leq DC' \leq 1$

| Label                  | Node | DC | DC'      | %DC      |
|------------------------|------|----|----------|----------|
| Sea Chief              | 1    | 12 | 0.096774 | 9.677419 |
| NGO                    | 11   | 12 | 0.096774 | 9.677419 |
| CMA                    | 14   | 11 | 0.08871  | 8.870968 |
| Fish Sellers (heads)   | 13   | 10 | 0.080645 | 8.064516 |
| Fishing crew           | 3    | 9  | 0.072581 | 7.258065 |
| Boatswain (Captain)    | 10   | 9  | 0.072581 | 7.258065 |
| NaFAA                  | 12   | 9  | 0.072581 | 7.258065 |
| Town Chief             | 7    | 8  | 0.064516 | 6.451613 |
| Canoe Owner            | 2    | 7  | 0.056452 | 5.645161 |
| Fishmonger (heads)     | 4    | 7  | 0.056452 | 5.645161 |
| Lafa                   | 9    | 7  | 0.056452 | 5.645161 |
| Local Authority        | 15   | 7  | 0.056452 | 5.645161 |
| Fish processor (heads) | 5    | 6  | 0.048387 | 4.83871  |
| Council of Elders      | 8    | 4  | 0.032258 | 3.225806 |
| Paramount chief        | 6    | 3  | 0.024194 | 2.419355 |
| Safeguard              | 16   | 3  | 0.024194 | 2.419355 |

**DC Sum** = 124.000000

**Max DC'** = 0.096774 (node 1)

**Min DC'** = 0.024194 (node 6)

**DC' classes** = 9

**DC' Sum** = 1.000000

**DC' Mean** = 0.062500

**DC' Variance** = 0.000492

## Betweenness Centrality (BC) report

**Network name:** Stakeholder network analysis

**Actors:** 16

The BC index of a node  $u$  is the sum of  $\delta_{(s,t,u)}$  for all  $s,t \in V$  where  $\delta_{(s,t,u)}$  is the ratio of all geodesics between  $s$  and  $t$  which run through  $u$ .

Read the Manual for more.

BC' is the standardised index (BC divided by  $(N-1)(N-2)/2$  in symmetric nets or  $(N-1)(N-2)$  otherwise).

**BC range:**  $0 \leq BC \leq 105$  (Number of pairs of nodes excluding  $u$ )

**BC' range:**  $0 \leq BC' \leq 1$  (BC'=1 when the node falls on all geodesics)

| Label                  | Node | BC       | BC'      | %BC'     |
|------------------------|------|----------|----------|----------|
| NGO                    | 11   | 13.99844 | 0.133319 | 13.33185 |
| Sea Chief              | 1    | 13.27244 | 0.126404 | 12.64042 |
| Town Chief             | 7    | 8.837454 | 0.084166 | 8.416623 |
| CMA                    | 14   | 6.722436 | 0.064023 | 6.40232  |
| Local Authority        | 15   | 6.126007 | 0.058343 | 5.834293 |
| Fish Sellers (heads)   | 13   | 4.430037 | 0.042191 | 4.219083 |
| NaFAA                  | 12   | 3.935531 | 0.037481 | 3.748125 |
| Fishing crew           | 3    | 3.84478  | 0.036617 | 3.661695 |
| Boatswain (Captain)    | 10   | 2.149542 | 0.020472 | 2.047183 |
| Canoe Owner            | 2    | 1.672619 | 0.01593  | 1.592971 |
| LAFA                   | 9    | 1.25119  | 0.011916 | 1.19161  |
| Council of Elders      | 8    | 0.95     | 0.009048 | 0.904762 |
| Fishmonger (heads)     | 4    | 0.52381  | 0.004989 | 0.498866 |
| Fish processor (heads) | 5    | 0.285714 | 0.002721 | 0.272109 |
| Paramount chief        | 6    | 0        | 0        | 0        |
| Safeguard              | 16   | 0        | 0        | 0        |

**BC Sum** = 68.000000

**Max BC'** = 0.133319 (node 11)

**Min BC'** = 0.000000 (node 6)

**BC' classes** = 15

**BC' Sum** = 0.647619

**BC' Mean** = 0.040476

**BC' Variance** = 0.001724

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