

# COVID – 19 and Small-scale fisheries in Africa: Impacts on livelihoods and the fish value chain in Cameroon and Liberia

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## ABSTRACT

This study explores the emerging impacts of the COVID-19 pandemic on coastal small-scale fishing communities in Cameroon and Liberia, where we conducted qualitative interviews with small-scale fish harvesters, fish processors, traders, and consumers. We found that the implementation of COVID-19 safety and health protocol initiatives impacted the entire fish value chain, which contributed to social anxiety and negatively affected social well-being for those who depend on small-scale fisheries for employment and livelihoods. Fisheries in both nations saw a reduction in fish catch, widened supply and demand gap and a significant spike in fish price. Drawing on the Sustainable Livelihoods literature, we discuss how COVID-19 interacted with other existing aspects of community vulnerability and lack of capacity, despite communities finding ways to respond safely to the challenges of the pandemic. Moving forward, these small-scale fisheries will require a holistic assessment of the long-term social, ecological and economic impacts of the pandemic. Better fish processing and storage facilities and more robust institutional structures around markets and fisheries management will improve the adaptive capacity of people in these communities, who will no doubt face future challenges related to issues such as climate change.

**Keywords:** Small-Scale Fisheries; COVID-19; Vulnerability; Resilience; Livelihoods; Africa

## 1. INTRODUCTION

Communities around the world are being impacted in numerous ways by the novel coronavirus (COVID-19) pandemic (Ali et al., 2020; Chakraborty & Maity, 2020). Nations are experiencing severe disruptions to their economies (Ozili & Arun, 2020), tourism and culture (Gössling, Scott & Hall, 2020), and already overstretched health care systems (Shadmi et al., 2020). Nevertheless, governments and citizens are mounting a wide array of responses to the pandemic, adapting as best they can to the challenges created by lockdowns, social distancing protocols, and trade stoppages. The seafood industry has been a case-in-point for the impacts of the pandemic on society: globally, the industry has experienced significant disruptions, including small-scale fisheries (SSF), because of how closely actors in the value chain must work together (FAO, 2020a; Bennett et al., 2020; Tester, 2020). However, some in the seafood industry are finding resilience and new venues for success through community-based and other alternative marketing operations (Smith et al., 2020; Love et al., 2021; Stoll et al., 2021).

This paper contributes to the Marine Policy Journal's Special Issue on the "Impacts of COVID-19 on the fisheries sector and value-chains." Specifically, the paper examines the impacts of the pandemic on SSF in Cameroon and Liberia. In general, SSF contributes significantly to the livelihoods and food security of coastal communities in both nations (Belhabib, Sumalia & Pauly, 2015). Depending on the season, small-scale fishers harvest a diverse portfolio of species which are primarily sold direct, at open-air markets near beachfront and other fish landing sites, by local fishmongers, who add value by processing fish in a variety of ways (Manyungwa, Hara & Chimatiro, 2019; Jueseah et al., 2020). These fisheries also contribute to local food security, as some quantity of catch is generally reserved for the household. These already marginalized communities (Sowman et al., 2014; Schuhbauer et al., 2017) face unique challenges because of the pandemic (Bennett et al., 2020). For example, the lack of alternative livelihood options exacerbates people's vulnerability by limiting adaptation options (Campbell et al., 2020; Jomitol et al., 2020). There is emerging, and compelling literature advocating for rapid investment to enhance and support the global seafood value-chain to respond, cope and adapt (Bennett et al., 2020; Love et al., 2021; Stoll et al., 2021).

As we discuss below, the pandemic has affected fishing activities in both countries by reducing the number of fishers actively harvesting fish and other disruptions throughout the value chain. The paper draws on qualitative interviews with fishers and other actors engaged in fisheries in Cameroon and Liberia to explore impacts being experienced and how people are presently responding. Analytically, the paper draws on the Sustainable Livelihood Framework (SLF) (Chambers & Conway, 1992; Scoones, 1998, 2015) to better explore the impacts of COVID-19, especially the vulnerability context of these SSF to systemic shock, and the circumstances that limit people's ability to respond effectively (Manyena et al., 2011).

First, we provide some background to these relatively understudied fisheries and a report on qualitative interviews with fishers, fishmongers and consumers in both countries. From there, we recommend a way forward for policy and future research. We also discuss how our work contributes to the broader discussions on vulnerability to rapid food systems disruptions, which many argue will continue to become more prevalent due to climate change (IPCC 2018).

### *1.1. Sustainable livelihood framework (SLF)*

The SLF is a popular framework for guiding development in the Global South (e.g., DfID, 1999). Broadly, the framework defines sustainable livelihoods as comprising the capabilities, assets and activities required for meeting local needs and coping with various stresses while not degrading natural resources (Scoones, 2015, p. 6). Two key features of the SLF stand out for the present discussion: the focus on multiple forms of capital (natural, physical, human, financial and social) and the cumulative context of vulnerability that hinders development, created by such existing challenges as poverty, environmental degradation, lack of resources, and political instability (Scoones, 1998). The SLF has been used in SSF research elsewhere to explore global challenges and local solutions (e.g., Allison & Ellis, 2001; Ferrol-Schulte et al., 2013). In addition to emphasizing the importance of different forms of capital, this research has highlighted the role institutional processes and structures (including formal and informal institutions) and procedures (policies, laws) that influence access to resources, and politics surrounding livelihood opportunities, especially for the rural poor (Chambers & Conway, 1992; De Haan & Zoomers, 2005).

Scholars have utilized three different main dimensions to assess or measure the vulnerability of social and ecological systems (SES) to whatever kind of disruption. These include exposure – stress from environmental change; sensitivity – susceptibility to disruptions/perturbations; and adaptive capacity – existing preconditions to respond to change (See Adger, 2006; Cinner et al., 2012). Building resilience and ensuring a sustainable livelihood requires the ability for people to quickly have access to and be able to mobilize resources, including institutional mechanisms such as policies that facilitate their response (Ferrol-Schulte et al., 2013). Moreover, existing livelihood strategies and livelihood trajectories are equally understood as aspects that influence people's vulnerability and livelihood opportunities in different SES (De Haan & Zoomers, 2005). Therefore, the SLF, from its conceptual framing, emphasizes livelihood assets and institutional policies as key factors that shape vulnerability and influence livelihood strategies and outcomes. These factors can i) facilitate the response and mitigate the impact of a shock like COVID-19 to SSF ii) increase their vulnerability and impact of the pandemic on people and their livelihood. Thus, conceptualizing our paper on the impact of COVID-19 on these SSF within the SLF makes a significant and burgeoning contribution to the unfolding disruption of the pandemic to coastal fishing communities.

## **2. BACKGROUND ON SMALL-SCALE FISHERIES IN AFRICA**

Small-scale fisheries contribute significantly to most African countries' economies, including employment, GDP, and food security (Belhabib, Sumaila & Pauly, 2015). The World Bank estimates that, as of 2011, fisheries and aquaculture contributed about \$24 billion to the African economy and 1.3% to Africa's GDP (World Bank, 2020). However, SSF in the continent faces numerous challenges, such as illegal, unregulated and unreported (IUU) fishing, challenges to seasonality, and poor infrastructure (FAO, 2020b; Belhabib, Sumaila & Le Billon, 2019). Moreover, while the specifics of the challenges facing SSF in different African nations vary, there are also several common similarities evident among Cameroon and Liberia that are important in the context of COVID-19 (Belhabib, Lam & Cheung, 2016).

## Cameroon

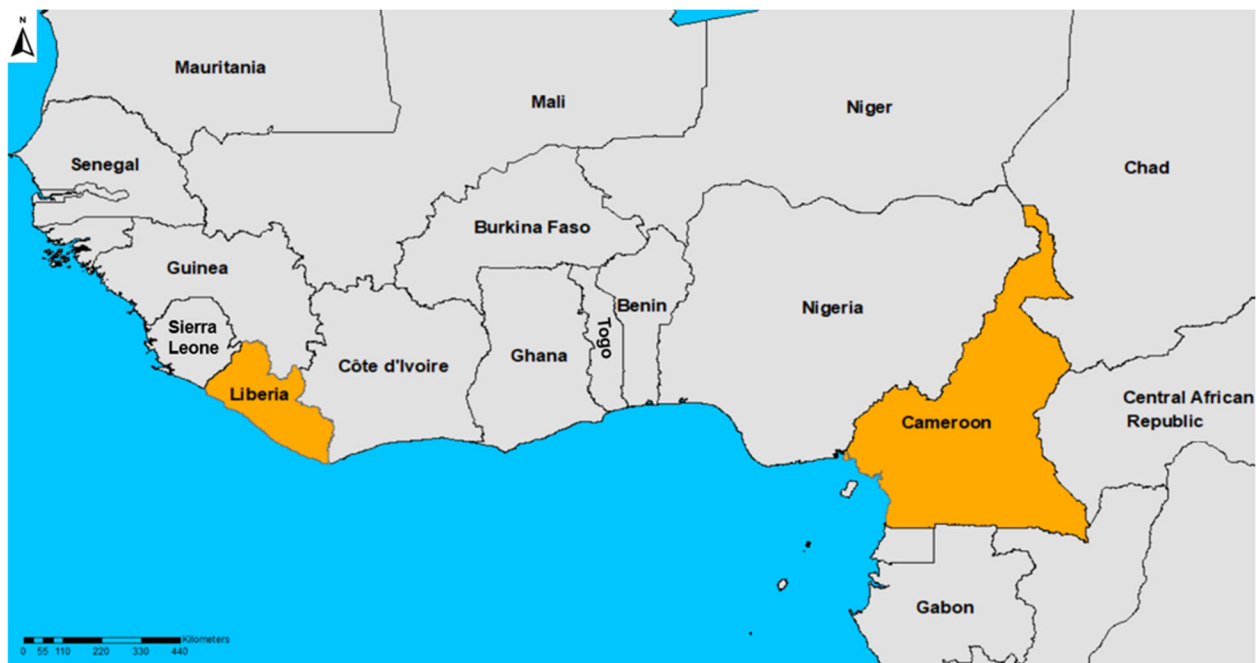
The Republic of Cameroon is a Central African nation bordered by the Atlantic Ocean to the South, Nigeria to the West, Chad to the North, Gabon and the Central African Republic to the East. Official languages are English and French. The current population is roughly 26 million (Worldometer, 2021), with GDP as of 2019 of US\$ 38 billion (World Bank, 2021). The fisheries sector employs more than 200,000 people, including migrants from neighbouring Nigeria, Ghana, Togo and Benin (Beseng, 2019). The sector is challenged with issues of IUU fishing activities and regular conflict between local small-scale fisheries and foreign industrial vessels (Beseng, 2019). Moreover, the country's licencing systems for fishing boats are poorly coordinated (Belhabib & Pauly, 2015). Likewise, there is a paucity of research on fisheries in this country (e.g., Gabche, Youmbi & Angwe, 2000; Brummett et al., 2010).

As noted, SSF in Cameroon operates in an open-access regime (Belhabib & Pauly, 2015). Many foreign fleets operating in the country are unlicensed partly due to the nation's poor infrastructure and investment in the sector (Belhabib & Pauly, 2015). There are 57 coastal small-scale fishing landing sites in Cameroon, predominantly in local administrative areas of Ndian, Fako, Wouri and Sanaga. Fishing is done with locally made wooden motorized or by paddle canoes (Figure 1). Fishers use dugout planked canoes of varying sizes, including different gear types (hooks and lines; gillnets; and purse seines) to catch different types of fish species. Some local fish species include *Sardinella maderensis* (strong kanda), *Ethmalosa fimbriata* (bonga), *Clarias gariepinus* (catfish), *Polydactylus spp.* (threadfin), *Palaemon spp.* (white shrimps/njanga), and *Ilisha Africana* (munyanya). Fishing supports local livelihood with men engaged in fish harvesting and women in processing (drying/smoking using firewood ovens) and fish trade. Also, fishing supports food security with varying fish species sold in open-air markets around the country and some consumed by the fisher's household. Predominantly, boat owners use family members or hire migrant workers and locals for labour in the fishery value-chain (Njock & Westlund, 2010).

Regarding the global coronavirus pandemic, Cameroon recorded its first cases on March 6, 2020, at the political capital Yaoundé which later spread to other regions in the country (World Health Organization, 2021). Cameroon instituted several preventive measures, including shutting down its international borders, encouraging physical distancing, prohibited social gatherings, and mandating face masks and hand sanitizers (UNAIDS, 2020; IMF, 2020). Like many African countries, Cameroon has low infection rates, low fatality, and a high recovery rate of about 94% (Tih, 2020).

Cameroon's economy is quite unstable and sensitive to shocks in the global economy (Aminadeh, 2020). The fallout of the pandemic led the government to institute fiscal policies aimed at mitigating the socio-economic impacts, including a US\$ 226 million fund backed by the International Monetary Fund (IMF) Rapid Credit Facility (IMF, 2020). Tax exemption policies for the tourism sector, small business enterprises; increase in family allowance, and an US\$ 825 million 3-years preparedness and response plan (IMF, 2020). Of particular interest is that there is currently no specific governmental plan for supporting the recovery of the fisheries sector despite its contribution to local livelihoods and food security. The emergency of the COVID-19 pandemic further exacerbates and contributes to low economic growth in the country, which is already struggling with Boko Haram terrorist insurgency in the North region and the ongoing anglophone crisis in the North West and South West regions (Aminadeh, 2020). With minimal social safety

nets for its citizens, the government was forced to reopen the economy in early April 30, 2020 (Ojong, 2020; IMF, 2020).



**Figure 1:** West and Central Africa map showing the geographical location of Cameroon and Liberia (in yellow) and other neighboring countries.

## *Liberia*

Liberia is a small West African country bordered by Côte d'Ivoire, Guinea and Sierra Leone. The official language is English. According to the World Bank (2021), Liberia's population as of 2019 stood at about 4.9 million; the nation had and a GDP in 2019 of US\$ 3billion, with agriculture, forestry and fisheries collectively contributing about one-third of that amount. The country's small-scale fisheries sector contributes about 86% of total fisheries production, providing livelihood and supporting food security to Liberians (Wehye, 2019; Jueseah et al., 2020), although the full potentials of the sector are underreported (See Belhabib et al., 2016).

Liberia's SSF sector employs about 33000 people through direct and indirect fishery-related activities (Chu et al., 2017). There are more than 144 landing sites in the country for small-scale fisheries with some prominent coastal areas such as West Point, Fish Market, Grand cape Mount. The SSF sector provides fish for home consumption and sale in local open-air markets. Fishing permits are mostly owned by Liberians and migrant fisherfolk from neighbouring nations. Primarily, fishers use small dug-out canoes made of wood and mounted with motorized engines or paddles, often referred to as 'Kru' (Chu et al., 2017; Jueseah et al., 2020). Fishers use various gear types (e.g., cast-nets, gillnets, hooks and lines, beach-seines, and traps) to catch multiple fish species (Jueseah et al., 2020, p. 2). Some local fish species include *Hemiramphus sp.* (penten), *Sardinella maderensis* (flat bonny), *Pseudotolithus senegalensis* (cassava croaker), and *Chloroscombrus chrysurus* (porjoe).

Migrants from Ghana and Guinea, including family members, provide necessary labour across the fish value chain. Gender also plays an essential role in Liberia's fisheries. Women participate and dominate in fish trade and processing activities (drying and smoking with firewood ovens), and men engage in harvesting. However, there are frequent issues of post-harvest losses, especially during large harvest and due to lack of infrastructure to support processing and post-harvest fish management (Jueseah et al., 2020). Although current improvements and supports from the World Bank are seeing an increase in infrastructural investments in some fishing sites (World Bank, 2019).

Liberia reported its first COVID-19 case on March 16, 2020 (WHO, 2021). A few days later, the government announced multiple response measures, including social distancing, the closure of schools, beaches, worship centers, and banning of street businesses (IMF, 2020). Further measures were put in place, and a state of emergency was declared on April 10, 2020 (IMF, 2020). However, as of July 21, 2020, all restrictions were eased, including international travel.

Liberia has a struggling economy with problems of inflation, substantial fiscal deficit, with a GDP of just over US\$ 3 billion (World Bank, 2021). So far, the government has been able to secure relief funds from the World Bank and the African Development Bank totalling around US\$ 31million for investments in the health sector and to implement other covid-19 related measures (IMF, 2020). Although there is no specific financial support for the fisheries sector, the EU supported the government through the National Fisheries and Aquaculture Authority (NAFAA) to provide safety and hygiene materials for fishers in different fishing communities (FAO, 2020a). The small-scale fisheries sector responded immediately to the disruptions of COVID-19 by putting in place safety protocols and ensuring they were being observed. In order to sustain their livelihood, measures such as the enforcement of social distancing, wearing of face masks and avoiding overcrowded buying and selling points.



**Fig 2:** Fishmongers waiting to buy fresh fish from fish harvesters at Down Beach, Cameroon (a) and fish drying ovens and a fishing boat at the West point fish landing site in Liberia (b). Photos taken in October 2020.



### 3. METHODS

#### *Study Sites*

In Cameroon, the study was conducted in Down Beach, Idenau and the Limbe Main Market, located in the Fako Division of the Southwest Region of Cameroon. According to the 2005 census, the total population in the Fako division is about 460 000 (CITY POPULATION, 2017). In Liberia, data collection was conducted at the West Point, St Paul Bridge and Fish Market in the Montserrado County, with a population including the capital city Monrovia of about 1.1 million (World Population Review, 2020).

Fisheries in the two countries offer apt case studies for the exploration of the immediate impacts of the pandemic on SSF in Africa. We consider these cases to be “revelatory” SSF cases (Yin, 2003) because they share key features such as their open-access nature and importance to local livelihoods. SSF has operated in both areas for several generations supporting multiple cultural activities and attracting tourists. Both countries also have a similar fishing season, with more fish harvested in the dry season (early October to late March) and less in the rainy season (early April to late September). Seasonality is a major stress to the fisheries value chain, with varying catch volumes, fish prices and income (Jueseah et al., 2020).

#### *Data collection*

We conducted open-ended qualitative interviews with fisherfolks, fishmongers and fish consumers in September and October 2020, a time when most COVID-19 restrictions had been uplifted, and business operations had commenced. At the time of the study, both countries had experienced relatively low COVID-19 infections, hospitalizations, and deaths. Three of the authors reside in the region, and with the help and permission of local community leaders, were able to gain access to conduct interviews.

Interviewees were identified via informal (semi-random) encounters at beaches or boat launches and other locales frequented by active fishers. We sought purposively to recruit both men and women, as both participate in SSF in the two countries. Considering the health threats of COVID-19, the data collection was conducted while observing the mandatory COVID-19 health protocols, such as facemasks and frequent hand sanitation, and 1.5m physical distancing. We also required research participants to meet the COVID-19 research protocol checklist set out by McDougall and colleagues (2020). All the research participants voluntarily consented verbally to participate in the research; verbal consent was obtained as many participants have low levels of literacy/education and to also avoid contact as much as possible. An interview guide was used detailing the research focus, aims, how the data will be used, and the time required for the interview. The interview questions focused principally on COVID-19. We did not consider the other social and ecological problems and complexities in these fisheries.

#### *Data Analysis*

We interviewed a total of 29 people, 18 in Cameroon and 11 in Liberia, mostly in pidgin English – a common language use by locals, including fisherfolks and consumers. This included: Cameroon (7 men, 11 women) and Liberia (7 men, 4 women). In the region, men and women participate in the SSF value chain, with men primarily engaged in harvesting while women in processing and trade (Manyungwa, Hara & Chimatiro, 2019; Appiah et al., 2020). All the interviews were recorded, translated and transcribed. We then performed open coding on transcripts to identify emergent topics and then grouped these codes thematically (axial coding) to identify primary domains of impacts (Cobin & Strauss, 2014), using NVIVO 12 (NVIVO-QSR International, 2020). It is important to note that this qualitative research aims not to produce generalizable findings of how impacts vary across groups or populations but to identify emerging, revelatory themes that can inform how we begin to understand the implications of this novel disruption on SSF. As such, it would be inappropriate to report numerical details from the coding process as these would falsely imply a weighting or relative significance that our work does not purport to establish.

#### 4. RESULTS

The various impacts of the COVID-19 pandemic on the SSF value chain that emerged from the coding process are discussed below: supply (fishing), labour, price, processing, marketing, post-harvest losses, and consumption.

##### *Fish harvest, labour and supply*

Interviewees in both locales shared with us how COVID-19 has disrupted the lives of all engaged in the SSF value chain. For example, several fishers raised concerns regarding their inability to sell their fish after harvesting due to the government social restriction measures and challenges to generate their usual fishing income. One fisher in Cameroon, for example, explained, "... with restricted movements [during the lockdown], there was a reduction in [both] sales and catch" (Interview no. 2). The reduction in catch directly affected fish availability for fishmongers who depend on fish processing and trade for their livelihood. During the lockdown, a fishmonger from Cameroon noted, "[We] did not have fish to buy; could no longer do business. We were not buying; we were not selling. When they said lockdown, everyone was indoors" (Interview no. 15). Likewise, fish traders and processors reported that their business had been impacted due to the lack of fish, which ultimately created shortages at markets. This is in line with findings from other coastal communities affected by COVID-19 disruptions, where fishers could not sell their fish (See Lau, Sutcliffe & Hungito, 2020). However, unlike fishing communities in nations with advanced economies and robust online sale platforms and delivery systems, another problem is that fishers in Liberia and Cameroon do not have such systems to connect and sell their fish to consumers or fishmongers.

Interviews with SSF traders also revealed similar challenges regarding their ability to connect with customers due to the pandemic restricting movements in local markets. The supply of fish was seriously affected, as buyers from neighbouring cities were restricted from travel. A fisherfolk explained: 'We did not have buyers, which really affected us because most of the fish we catch here is consumed in other neighbouring towns like Buea, Tiko and Douala' (Interview



no. 13). This reduced the supply chain for fish and resulted in a direct drop in fish sales, and the quantity of fish fisherfolks could catch (Jomitol et al., 2020).

Some respondents also reported that the pandemic affected the availability of labour. That is, the fear of contracting the virus led to several SSF labourers quitting their jobs. One fisher in Cameroon said, "... it affected our labour when the lockdown was announced, many people were scared, but later people became courageous again" (Interview no. 2). Generally, respondents reported high levels of anxiety in their communities during the onset of the pandemic in both countries, especially regarding information management surrounding the virus. A participant posited: "I am not scared for now because we have not seen anyone who has been affected and we only hear or watch on TV that it is killing people in other countries" (Interview no. 2). However, local officials put in place safety protocols by ensuring that fishers wear facemasks while selling their fish and restrict the number of people who get on the boat, thus dropping the quantity of fish caught (Interview no. 11). The pandemic has created preliminary disruptions to the SSF value chain that have impacted the levels of incomes and business operations.

### *Fish price, processing and marketing*

For these fisheries, fishers set their fish price depending on the fishing season and fish demand in the open market (Jueseah et al., 2020; Kimani et al., 2020). Fishmongers then buy fish and sell it at a prevailing market price set to optimize their profit. Fish buyers, including fishmongers and consumers, play an important role in fish trade and marketing in neighbouring towns, which usually have a high demand for fish (Tran et al., 2019). Fishmongers also play a significant role in the value chain in terms of processing, packaging, trading and marketing of fish to local and neighbouring markets and at times across borders in Sub-Saharan Africa (Ayilu & Appiah, 2020; Ayilu & Nyiawung; under review). Compared to fisheries in countries like Canada, Europe and the US, where harvesters can coordinate and supply fish directly to consumers at their doorsteps (Stoll et al., 2021) or the transition to alternative markets (Love et al., 2021; Stoll et al., 2021). However, this is not the case for small-scale fisheries in Liberia and Cameroon. There are no service providers or systems that can coordinate the supply of fish.

Therefore, due to the disruptions in fishing activities and reduced catch quantities during the lockdown, there was a direct impact on fishmongers' operations (Interview, no. 21). Supplies to hotels, restaurants and small street vendors were affected and halted in some cases. The study observed that once the catch volumes were reduced, local prices of fish prices recorded a sharp spike. One participant in Cameroon narrated:

'We used to buy a basin for about 28,000-to-30,000-franc CFA, but ever since March 2020, the price has increased to about 40,000-to-45,000-franc CFA' (Interview, no. 17).

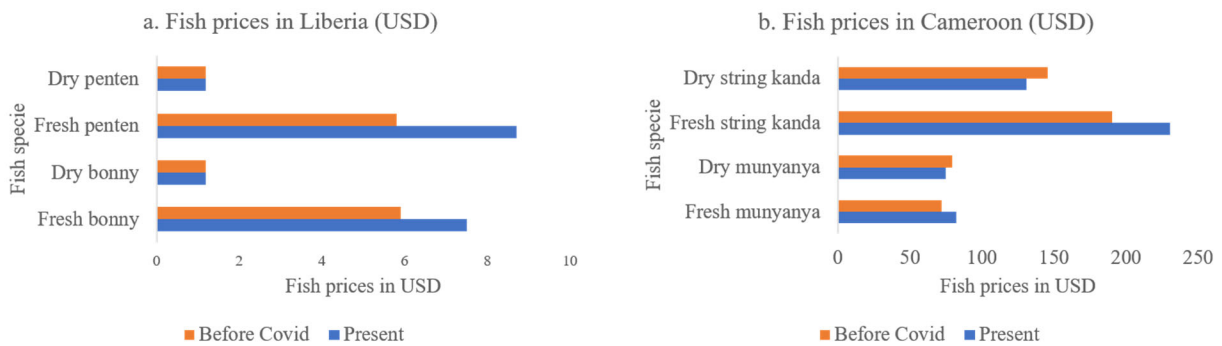
In addition to the increase in the price of fish paid to fishers by fishmongers, there are profound disruptions to the value chain as the demand for fish at local fish markets experienced a drastic drop. An interviewee said:

'... the restrictions on movements that were imposed in [March 2020] led to the shutdown of many institutions [referring to schools, hotels and restaurants] and other places ... this affected us greatly because we mostly dry and sell our fish to people from neighbouring Douala, Loum, Nkongsamba, Kumba. So, with the shutdown, we could not sell much since the local inhabitants here in Limbe

[referring to the coastal community] cannot buy and consume all of what we smoke since we have many fishmongers here in Limbe’ (Interview, no. 20)

The inter-city trade in fishery products is an important component of the small-scale value chain. The transportation of small-scale fishery products was not possible during strict lockdown restrictions, therefore impacting fishmongers’ ability to transport fish to neighbouring cities and trading centres (Sunny et al., 2020). The number of passengers on available inter-city buses was reduced and cargo transport vehicles charging double the regular fees. A fish seller in Cameroon explained:

‘It [referring to COVID-19] affected the business in that the restrictions led to a reduction in the number of people who come to the market to buy, transport fare also increased forcing consumers to stay home and not come to the market, and people who come and buy from other towns around like Douala, Buea could not come, and so all this slowed down business activities and led to a reduction in fish sales’ (Interview, no. 22).



**Fig 3:** Variation in different fish species prices before the pandemic was declared and their current prices in both Cameroon and Liberia (The franc CFA is the currency used in Cameroon and 1 franc CFA is equivalent to ~ \$US 0.00185; while the Liberian Dollar (LD) is equivalent to ~ \$US 0.0060; [www.xe.com](http://www.xe.com))

### *Post-harvest losses and consumption*

A related issue involves post-harvest losses, which are common in SSF in Africa (Gyan et al., 2020). Post-harvest management of fish remains a major challenge for both fishers and fishmongers. Fishmongers were, for example, most significantly affected by the pandemic. The price of both fresh and processed fish has increased considerably, with fresh fish slightly higher than processed fish (Figure 3). With the lack of consistent post-harvest management practices and storage facilities (e.g., Gyan et al., 2020), fishmongers are forced to sell their fish at whatever price to avoid spoilage and recoup their investments.

Even though this study could not readily quantify the volume of post-harvest losses, local fishers reported that during full implementation of the COVID-19 lockdown measures, the volume of post-harvest losses was increasing, especially in Liberia people reported that losses were on track to double from previous years. Fisherfolks narrated several occasions that they were unable

to sell large catch quantities and ultimately wasted the fish because they lacked access to adequate infrastructure for fish processing and storage. A fisher in Liberia explained:

‘COVID-19 affects our business greatly. Like before, we used to have customers from counties around Montserrado to buy our market, but currently, our mothers dry the fish we caught and take it to the West Point market to sell. After weeks from drying the fish and they are not bought it gets spoiled’ (Interview no. 3)

In Sub-Saharan Africa, fish provides more than 15% of animal proteins and other important micronutrients, fatty acids, and minerals (Chan et al., 2019; Tran et al., 2019). As discussed above, the disruptions in the SSF value chain activities by the COVID-19 pandemic affected the quantity of fish available and accessible to consumers (Campbell et al., 2021; Jomitol et al., 2020). With constrained fish harvest, restricted movements, and limited fish supply both locally and neighbouring communities, consumers resorted to alternative fish sources around their communities, mostly imported frozen seafood products and not their usual fresh and locally caught fish. It was observed that during periods of restricted movements, the local small businesses who often deal in frozen and usually imported seafood decided to control the demand and increased their prices. One fish buyer in Liberia made the following assertion:

‘COVID-19 is affecting us badly because the number of cold stores that currently sell fish in Liberia is limited. Only a few cold stores are now selling, and their price of a carton of fish is more than before’ (Interview, no. 29)

Furthermore, some fish buyers who had lost their jobs due to the pandemic were also confronted with an increase in fish prices and an inability to purchase fish for consumption. The finding is consistent with Lau, Sutcliffe and Hungito (2020), who studied COVID-19 disruptions in an island community in Papua New Guinea and found that “... the community predominantly relies on income from fishing to purchase food from the mainland ... lack of access to markets, led to lack of cash income, which decreased people’s ability to purchase store foods” (p. 11).

However, some respondents were more optimistic and expected that the various disruptions would be relatively short and that the SSF value chain could quickly bounce back to ‘business as usual’ (Campbell et al., 2020). In the words of one Cameroonian fisher:

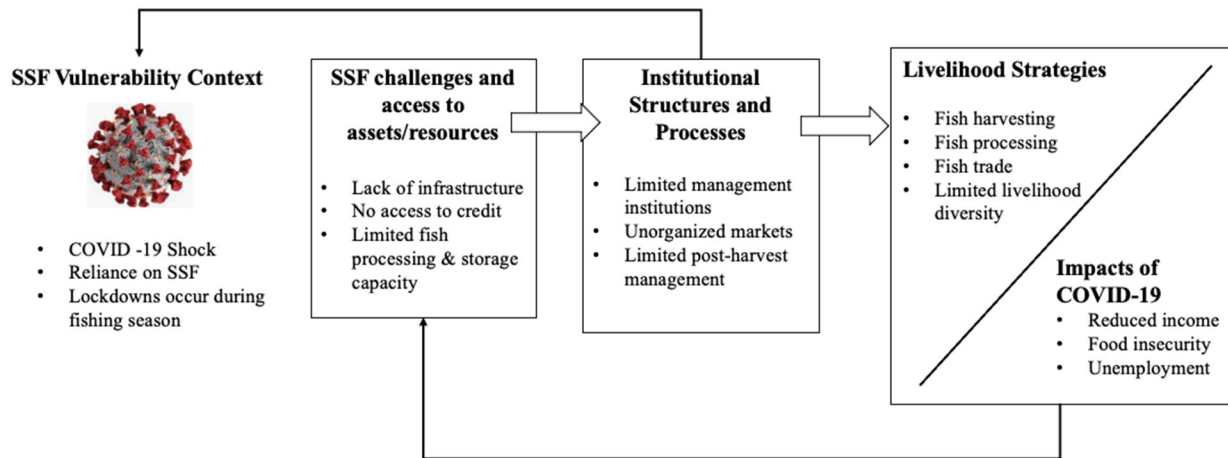
‘For now [October 2020], it’s not affecting our fishing activities in any way. But some months ago, it did affect us with restricted movements ... we were forced to go fishing wearing facemask. We also had restrictions on the number of people to go fishing, and there was no market to sell what we caught’ ... there were days we had a shortage of workers because when the lockdown was announced, many were scared to leave the house, and after a while, that fear gradually died, and now things are [back to normal]’ (Interview no. 6).

## 5. DISCUSSION

The impacts and concerns relayed to us by people engaged in SSF in Cameroon and Liberia span multiple aspects of their lives and livelihoods, from labour issues to food wastage and disruption of local markets and supply chains. Among the two countries, we see similar challenges across the fishery value chain; for example, the lack of livelihood diversification options and overdependence of local economies and food systems on SSF increases vulnerability to different stress and shocks. The sector in both countries is likewise challenged with a lack of capital and

policies to improve the socio-economic status and potentials of participants in the fishery sector. In this regard, our findings are consistent with those of others (e.g., Love et al., 2021; Stoll et al., 2021), who show that impacts are manifesting themselves across the supply chain and along the lines of existing vulnerabilities, ultimately driving responses that may be effective in the short term but do not always align with longer-term adaptation and development priorities. Despite some people’s optimism that the pandemic’s negative effects would fade with time, more research is needed to identify any long-term or cumulative effects, whether on food security or economic health and well-being in general. Given the developing nation context of this research, we argue that our findings nevertheless provide valuable insights into the vulnerability context of fishing communities in both countries: specifically, by highlighting the different forms of capitals and institutional policies that would strengthen local livelihoods and improve resilience to future disruptions (Figure 4).

In general, we know that small, natural-resource-dependent communities react similarly to environmental change and surprise. (Huntington et al., 2017). Generally, fisherfolk are highly adaptable, but their ability to respond and implement adaptive strategies (e.g., creating fishing cooperatives, sharing catch, or falling back to other economic strategies) depends heavily on the place-based nuances that drive people’s needs, capacities, and vulnerabilities (Adger, 2006; Pomeroy et al., 2006), such as institutional and governance structures (Chuenpagdee & Jentoft, 2015), and leadership characteristics (Olsson et al., 2006). Along these lines, our findings highlight two factors in particular that influence fisherfolk’s ability in both locales to respond effectively to disruptions of the pandemic: 1) poor institutional structures; and 2) the lack of assets.



**Fig 4:** SSF vulnerability context and factors hindering their resilience and the various impacts of COVID-19 (Adapted from DfID, 1999).

First, scholars have argued that effective institutional structures and policies act as a catalyst for building resilience and achieving sustainability (Chuenpagdee & Jentoft, 2015). SSF in low-income countries lacks the necessary resources and capabilities to ensure rigorous management of their fisheries. Despite its contribution to livelihood and GDP, the sector is often overlooked with little government investment in capacity, infrastructure or policies that reduce their vulnerability to emerging shocks. The organization of SSF markets is problematic with unregulated and irregular fish pricing systems as it was observed to be common in Cameroon and

Liberia. The local government is only interested in collecting “fees” from fishers. For example, many fisherfolks in Liberia complained that the tax season always falls during peak fishing season. Those who cannot pay are forced not to fish (Authors, *personal communication*). With no social protection programs or options for livelihood diversification, fisherfolks are overdependent on natural resources (Béné & Friend, 2011), exacerbating their exposure and sensitivity to shocks. Ensuring resilience for any social-ecological system depends wholly on institutional policies that put in place feasible measures that support the adaptive capacity to shocks such as COVID-19 (Leslie & McCabe, 2014).

Second, the availability of and access to diverse livelihood assets is an essential prerequisite for resilience (Scoones, 2015; Cinner et al., 2018). Assets, including financial, physical, technological and social capital, are necessary to build adaptive capacity and influence response decisions to unprecedented stresses and shocks. Consistent with Cinner et al.’s (2018, p. 117), we find that assets, or lack thereof, are important components for building coping or adaptive strategies. Consider, for example, the problems of post-harvest losses and inadequate infrastructure to support adaptation in marketing and processing. Both linked to the lack of access to financial resources: access to formal loans is especially difficult for the fisheries sectors in West and Central Africa (Ayilu & Nyiawung, under review). Further, since the onset of the pandemic, fisherfolk have limited their fishing out of worry that their catch will spoil because they lack the infrastructure to preserve their fish for storage.

Notwithstanding the institutional problems and lack of assets, fishers in both countries also must content with a suite of baseline challenges, from chronic food insecurity to violence and extreme marginalization, that reduce their capacity to respond to something new like COVID-19. Thus, our findings match Loring and colleagues (2016), who highlight tensions among generalized capacity and general resilience versus the specific needs to respond to discrete, unexpected stressors.

### *Recommendations*

Love and colleagues (2021), writing on the kinds of responses SSF mount to COVID-19 and other disruptions, note an important distinction among short-term, reactive responses and longer-term preventative measures. The latter, they argue, is critical for building robustness in the face of future disruptions. In our research, we likewise see how COVID-19 has opened pathways for new and innovative ways to mitigate the existing vulnerability context in both regions while also boosting the various kinds of capital and institutional support that locals will need to build resilience and adaptability. Firstly, the profound threats and systemic shocks created by COVID-19 warrant attention not just to current vulnerabilities in SSF communities but also to policies that build on people’s existing coping and adaptive strategies, such as opportunities for fish sharing and cooperative fishing, fishing for alternative species, fishing in other locales, and non-fishing employment opportunities. These communities have a historic path-dependency on fishing, social interactions, and local activities to sustain their livelihoods. Building on these local adaptation strategies and increasing resources such as access to financial capital and access to the internet and social media will create more space for locals to innovate and diversify their livelihoods. Investments in online delivery and fish sales platforms will also reduce current vulnerabilities.

Next, the underdeveloped nature of these fisheries with poor data management systems makes it hard to understand and predict change caused by disruptions like COVID-19 to the fisheries value chain, coupled with existing social conflicts affecting fishing activities in the case

of Cameroon. It will be hard to understand the effects of COVID-19 on these fisheries unless there are adequate local knowledge and historical evidence to support claims that will help guide response strategies and policies. Support for more formal and institutionalized community-based management would create a platform for social learning and the continued development of local ecological knowledge.

Likewise, the presence of migrant fishers in these fisheries raises further issues regarding management complexities, power dynamics, access and most importantly, social cohesion, relationships and networking (Fabinyi, 2010). Cinner et al. (2018) posit that strong social networking, social learning, and flexibility in decision-making help build the necessary coping and adaptive capacity of people in SSF communities to environmental stress and sudden shocks COVID-19. It will be important to understand the effects of COVID-19 on migrant fishers with their unique role in SSF.

Finally, investments in infrastructure (e.g., fish processing facilities, freezers and other storage), better post-harvest management practices (to avoid wastage), and technology and financial capacity for these fisheries is needed that will help them improve their fishing activities, marketing options, and preparedness for unprecedented future shocks, which by all accounts should be expected to continue to manifest because of issues like climate change.

## **6. CONCLUSION**

This paper has presented preliminary findings on the emerging threats of COVID-19 on SSF in Cameroon and Liberia. These fisheries support the livelihood and food security of many coastal dwellers participating in the fish value chain as fish harvesters, fishmongers or consumers. These SSF have existed for decades, which is a testament to their resilience despite numerous economic and sociopolitical challenges and disruptions. The COVID-19 pandemic is just the latest example of an external stressor that has negatively affected the fishery's value chain, reducing catches and directly affected the fishing income of those engaged in the sector. The pandemic has exposed the vulnerability of these fisheries to systematic shocks and the limits of their resilience. The paper conceptualizes its arguments around the Sustainable Livelihood literature to show that the lack of capital and poor institutional structures further exacerbates and constrained responses to the sudden impacts of COVID-19 on livelihood and the fish value chain. We contend that there is more to be studied regarding the vulnerability and responses of low-income countries SSF to myriad stresses, trends and most importantly, sudden shocks like COVID-19 and the various implications for local livelihoods. Finally, this preliminary research has attempted to highlight some of the impending challenges to the fisheries supply and value chain, resilience for SSF in Cameroon and Liberia to COVID-19 disruptions.

## **Declaration of competing interest**

None.

## **Credit authorship contribution statement**

[Will be provided]

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