

**MANAGING EXPLOITATION RIGHTS IN THE INSHORE MARINE FISHERIES
OF SIERRA LEONE**

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ABSTRACT

Access to inshore fisheries in Sierra Leone and their management are discussed in order to provide a basis for improving fisheries management.

On the basis of the property rights framework, the state is the *de jure* owner of the inshore fisheries resources, exploited by the artisanal fishers as authorized users. Fishers perceive stocks as a free good and in extracting the resource rent, they can be considered as *de facto* owners. There is therefore an overlap in the roles of State and village management authorities. Fishers consider resource supply to depend on the willingness of "God" to replenish the stocks, ignoring the effects of fishing on stock abundance. No direct stock management problem is therefore perceived by the fishers, but to appease "God" they do not fish for at least one day every week, thereby contributing to stock conservation.

The direct management problem for the local authorities concerns equitable access to stocks and resultant conflicts, which they attempt to overcome by spatial and temporal arrangements for different gears. The state's attempts to conserve inshore stocks by excluding the industrial fleet, and the use of small mesh sizes, chemicals and dynamite, are ineffective because of their minimal enforcement and disregard by fishers. The fishers's self-regulatory measures

1 Introduction

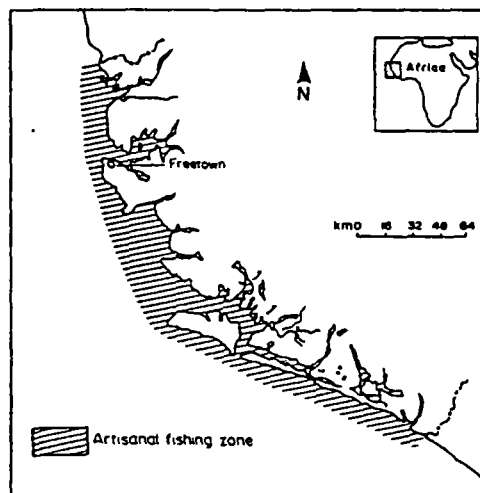
1.1 Objective and methods

To provide a sound basis for improving marine fisheries management in Sierra Leone, this paper examines access to inshore fisheries and their management. For this, part of the results of a three-month field study in Sierra Leone in 1994 by the author, are used. The main primary data, concerning property rights, and management authority, concerns and instruments, were generated from discussions with, observations and the administration of questionnaires to key artisanal fishing village personalities (18 in 10 villages), artisanal fisheries development projects (3), Department of fisheries (1) and fisheries research institute (1). The analysis is mainly based on the property rights framework (Eggertsson, 1994; Schlager & Ostrom, 1992).

1.2 Fisheries background

The Sierra Leone coastline (350 Km) and shelf area (30,000 Km²) constitute an important maritime fishing zone in West Africa. The inshore, officially reserved for the artisanal fisheries, extends up to five nautical miles of the baselines (see figure 1). Artisanal fishing participates in the economic development of the country mainly by supplying more than two-thirds of the domestic demand of seafood, which accounts for about 67% of the animal protein intake (Bonzon and Horemans, 1988), and providing direct employment and incomes for about 3% of the national workforce. Despite the suspected overfishing in the Sierra Leone waters (Ssentengo & Ansa-Emmim, 1986), development interventions tend to be biased towards fisheries expansion.

Figure 1: Map of Sierra Leone, showing the inshore fishing zone

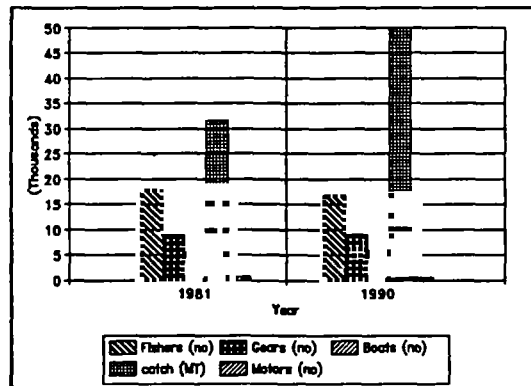


Source: Vakily (1992)

2 Fisheries types

The artisanal fishing industry is diverse and complex, due to the presence of multi-species, -gears, -fleet (see figure 2) and -stakeholders. The stakeholders include the Department of Fisheries, funding agencies (4) and large number of widely dispersed fishers (about 17,000 in 1990), fish processing-cum marketing agents and industrial fishing firms.

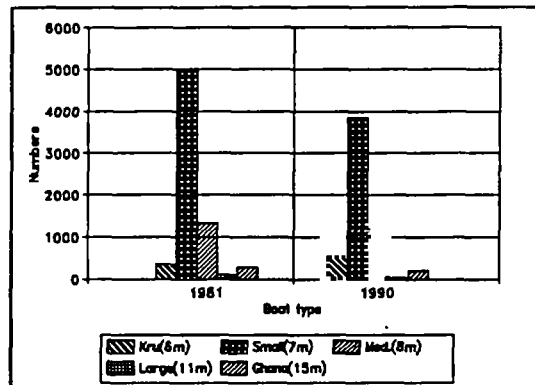
Figure 2: Artisanal fishing structure, showing changes in employment, gear and fleet, 1981 and 1990



Source: Adapted from Vakily et al (1993) and Jarchau (1988)

More than 200 pelagic and demersal species are being exploited by both artisanal and industrial fishing fleet in the Sierra Leone marine waters (Vakily, 1992). The pelagic species, dominant in the inshore zone (see figure 3), comprising mainly *Ethmalosa fimbriata* (bonga) and *Sardinella* species (herring), account for more than two-thirds of the total annual landings of the artisanal fishing (FAO, 1985). The dominant artisanal fishing methods are gillnetting (surface, encircling and bottom), line fishing, castnetting and beachseining (Figure 4). These fishing methods depend mainly on five types of canoes (either dug-out or planked) (Figure 5) with length and crew size ranges of (6-17)m and (1-20) persons respectively. Line fishing and bottom-set gillnetting target mainly demersal species, while the rest largely focus on pelagic species. Fishing is labour-intensive, evident in the excess number of fishing gears over boats and the low motorization rate of about 10% which is skewed towards the larger boats and depends on motors with power range of (8-40)hp. The dominance of small crafts

Figure 5: Structural change in boat types, indicating an overall decrease in the number of fishing boats from 1981 to 1990



Source: Adapted from Vakily et al (op cit) and Jarchau (op cit)

The fisheries diversity and complexity is therefore a source of incompatibility among certain objectives of some of the stakeholders, and of gear interactions, which can translate into conflicts. The resolution of such conflicts requires resources and probably certain degrees of trade-offs.

3 Results and discussion

3.1 **Accessing the fish resources**

In accordance with the Fisheries Management and Development Act (Government of Sierra Leone, 1988), the state is the *de jure* owner of the Sierra Leone EEZ fisheries resources, and all the implied property rights (exploitation, management, exclusion and alienation) have been bestowed upon the Department of Fisheries. Of these rights, only the exploitation rights are formally accessible to artisanal fishers. As authorized resource users, fishers are expected to have a relatively high tendency to over-use the resource (Schlager & Ostrom, 1993), particularly in the absence of any effective fisheries management authority.

Despite the absence of exclusive territorial rights over any marine fishing grounds, fishers perceive fish stocks as a gift from "God" to all citizens, hence a public good, which is held in trust by the state. Consequently, they consider themselves as "co-owners" of the inshore fishes, hence the automatic right to fish, which they can share with non-village members without reference to the state authority. This stock supply function is indicative of the free nature of the resource and of the absence of any need for direct stock management and alienation, and to exercise exclusion right. This zero user cost, non-reflective of the scarcity value of the fish resources, coupled with the implied open-access, are therefore expected to increase the likelihood of exploiting the stocks beyond their economic and biological sustainable limits. By foregoing the resource rent (by default or otherwise), the state is supportive of the fishers's perception of the free good nature and co-ownership of the fisheries resources. This diverged interpretation of access to the fish resources is a latent source of fisher-state conflict, which is expected to surface with its cost and benefit implications, should the state decide to claim the resource rent. This sort of *de facto* resource "co-ownership" is therefore not conducive to efficient resource use.

3.2 **Managing inshore fisheries**

Concerned for the conservation of the fish stocks in order to ensure fishing employment and incomes, affordable local fish supply and to a limited extent revenue, the state attempts to regulate the inshore fisheries by excluding the industrial fishing fleet, and the use of undersized-meshes, chemicals and dynamite. Regulatory enforcement is, in practice, minimal and ineffective, due mainly to its

relatively high cost and the disregard of any contributions from the fishers except the implementation of the measures. The adoption of these measures is consequently minimal.

The artisanal fishers perceive resource supply as a function of the willingness of "God" to replenish stocks, ignoring any impacts of fishing mortality on stock abundance. Fishers, therefore, appease "God" by abstaining from fishing for at least one day a week in order to induce stock abundance. Concerned about equitable access to the fish resources and the resultant gear conflicts, fishers pursue spatial and temporal arrangements for different gears. They also charge outsiders landing fees. Fishers's self-regulation, enforced by social pressure, the fear of the consequences of antagonizing "God", and less frequently by the use of fines, is therefore relatively cheap. Fishers are therefore disinterested in the state regulatory measures, which they consider incompatible with their perceived management problem, hence their desired objectives. Besides their inability to cope with fisheries expansion (Lawson & Robinson, 1983), these non-fishing days are limited by the spatial variation of the week non-fishing day according to the dominant village religion. To economize on enforcement costs, individual village authorities monitor landings rather than entry into the fisheries, consequently certain fishers fish during non-fishing days only to land their catch at other localities not affected by the ban on fishing.

The use of restrictions on mesh sizes, and fishing gears and day as instruments for improving stock abundance is therefore not only limited, but can also contribute to the inefficient use of labour and capital. As the entry of these productive resources into the fisheries is not restricted either directly or by the level of exploitation, it can contribute to overfishing, hence to social losses, given the positive alternative uses of these productive resources.

4 Towards improving inshore fisheries management

Fishers access the inshore fish resources as *de jure* authorized users, but have also acquired *de facto* rights to grant landing permission to non-members, to self-regulate in accordance with their perceived problem, and to extract the resource rent. Perceiving themselves as *de facto* "co-owners" of fish resources whose supply is infinite and free, fishers consider stock alienation and exclusion amongst themselves irrelevant, thereby rendering the resource highly susceptible to over-exploitation. The overlapping of the roles of state and local fisheries management authorities is not contributing to stock improvement, as is evident in the ineffectiveness of the regulatory instruments in place. Inshore fisheries management can therefore be improved by integrating the two management authorities, thereby minimizing the diffused nature of the property rights over the fish resources and also ensuring the examination of the free access problem. For this, the state should;

- acknowledge the local fisheries management authority and its perceived management role and
- enable the local management authority to improve fishers's understanding of the finite and renewable characteristics of the fish resources and the need for controlling exploitation levels, and for extracting the resource rent
- and the local authority should accept the *de jure* state ownership of the fish resources and its authority for overall fisheries management, especially when dealing with the issues of external fisheries relations.

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