

# Safety Equipment in Artisanal Maritime Fishing in Gabon: Between Adaptation and the Weight of Socio-Cultural Logics at the Libreville Artisanal Fishing Center (CAPAL)

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## Abstract

Maritime safety equipment allows to prevent and minimize the risks inherent to navigation at sea. However, in the artisanal maritime fishery in Gabon, fishermen are confronted with the major difficulty of the inaccessibility of protective tools to carry out fishing trips in all peace of mind. The absence of equipment to help maritime navigation poses the problem of insecurity in which the various artisanal fishermen work, often victims of numerous accidents at sea. This article aims at highlighting the difficulties of accessibility, by the fishermen, of all the conventional protection tools recommended by the administrations. In fact, the methodology used is based on the consultation of official reports and publications on the subject, field observations and semi-structured interviews with 110 actors. The results obtained reveal, on the one hand, a plethora of conventional protective equipment required of fishing vessels. On the other hand, they reveal the high cost of safety equipment which creates, among the professionals concerned, a reluctance to acquire all of the said tools and forces the interested parties to associate them very often with the traditional procedures for rescue at sea.

## Keywords

Safety at Sea, Artisanal Fishermen, Fishing Site, Fishing Rites and Traditions

## 1. Introduction

In Gabon, the fisheries sector presents the classic characteristics of a developing country, with reference to its institutional capacities in terms of research, moni-

toring, control, and management. Indeed, according to COMHAFAT (2013), despite the significant fishing potential, it made up of varied resources and high commercial values, production remains limited by inefficient capacities. For a large part of the population, the sea remains a fundamentally unknown, unpredictable, and intrinsically hostile space (Buti & Cabantous, 2018), especially since, unlike the continent, the marine environment is difficult to move, control and tame by man. Hence the need for adequate equipment to secure navigation, especially fishing trips. However, safety requires the acquisition of suitable equipment, to reach the fisheries that are often far from the coast. The equipment protects both fishermen and their boats and fishing gear.

In terms of artisanal sea fishing, the acquisition of safety equipment is very uncertain, because fishermen mainly use precarious equipment, which is limited to the strict minimum, i.e., the vest and the medicine box, however, about natural factors, including storms, swells, the beating of the tides, fishermen without protective equipment work in risky conditions. Similarly, although small-scale fishing is one of the most representative activities of the Gabonese maritime space, other uses such as river-sea transport, the exploitation of hydrocarbons and the conservation of biodiversity cause conflicts of cohabitations (Bignoumba & Lembe, 2019). Indeed, these various activities make travel in the maritime domain more complex and increase the risk of insecurity, particularly collisions with industrial ships and floating objects, in a context where maritime signalling is faulty and artisanal fishermen are rarely holders of navigational aids.

Maritime safety equipment is understood here as being a device worn or held by fishermen, to protect themselves in case of distress. This equipment makes it possible to secure the canoe as well as the crew on board and the cargo. Maritime safety is “the set of standards to which boats are subject, the regulations to which the maritime company must obey, and the measures which govern navigation at sea or in port areas” (Odier, 1999: p. 1). This comprehensive definition concerns both the technical requirements of the boat and the legal provisions applicable to the maritime company and the rules of navigation at sea or in port areas. However, it excludes the human factor from maritime safety, whereas the safety of a ship or a canoe is not limited solely to technical devices to deal with any failure (Clostermann, 2014). Every boat is operated by men who can make mistakes. The crew’s attitude towards risk and their ability to handle the canoe should be considered during navigation (Andeme Mve, 2020).

This article aims to understand the logic that prevents sea fishermen from acquiring all the conventional protection tools recommended by the administrations. Thus, judging by the many dangers involved, we can ask ourselves what are the reasons that justify the reluctance of artisanal fishermen, from the Centre de Pêche Artisanale de Libreville (CAPAL), to obtain all the safety equipment recommended by authorities? From this question, two hypotheses result: the first shows that the diversity of the equipment required, and their high acquisition costs make the various tools for helping maritime safety inaccessible. The second reveals that the attachment to rites and beliefs does not encourage arti-

sanal fishermen to take more precautions at sea.

## 2. Presentation of the Study Area

CAPAL (Figure 1) is one of the twenty landing sites listed along the Gabonese coast. It is in the 5th arrondissement of the Gabonese capital, Libreville, precisely in the Oloumi district. The CAPAL is a fine example of the safety equipment used by artisanal fishermen. Built on a 6-hectare site and commissioned in 2011, this modern infrastructure is dedicated to the landing and marketing of fish products. The dynamism of this fishing centre can be read through the diversity of its landing stages which force the affiliated fishermen to unload their catches there. Moreover, the General Directorate of Fisheries and Aquaculture (DGPA) has made it an approved site to better control the fishing activity in terms of actors, production, and marketing.

The CAPAL allows fisheries actors to practice in a favourable environment, with adequate and secure conditions for the landing, storage, preservation, and marketing of catches. On the said site, fishermen, traders, and others are thus offered storage space for equipment (canoes, engines, nets, lines, coolers, etc.) and for supplying ice and fuel.

## 3. Methodological Approach

The methodology adopted in this article is based on the consultation of official reports and writings relating to the question. The official texts, in this case the International Convention for the Safety of Life at Sea of 1974 (SOLAS) and the Community Code of the Merchant Navy of the CEMAC of 2012 were necessary to master the safety rules specific to certain categories of ships and traditional craft. The writings of Odier (1999) made it possible to identify the notions of

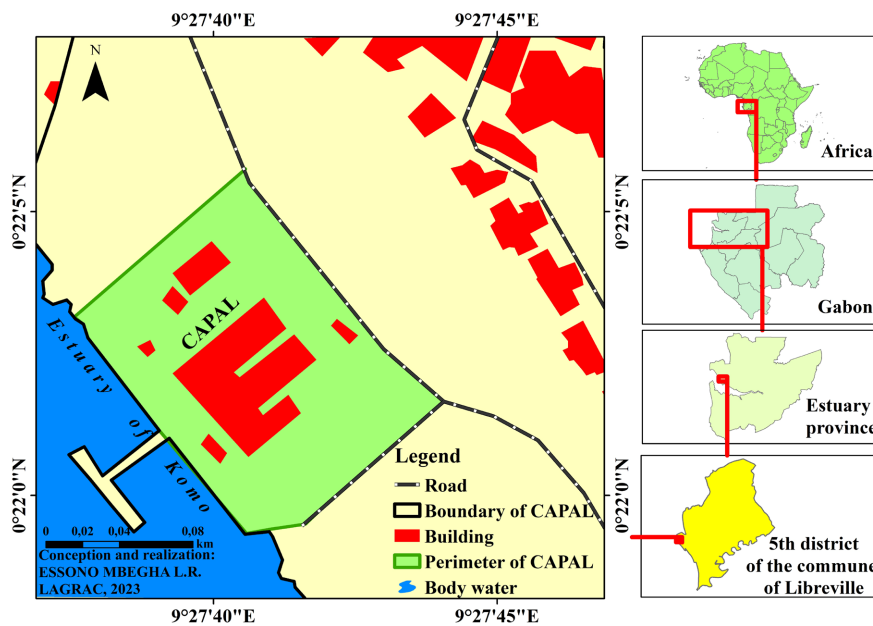


Figure 1. Location of CAPAL.

equipment and maritime security and, those of [Bignoumba and Lembe \(2019\)](#) to understand the structuring of the Gabonese maritime domain, through the delimitation of fishing zones and the different uses at sea. The text by [Ota \(2007\)](#) provided us with information on socialization as a driving force for the transmission of fisheries knowledge.

In addition to the documentary work, the analysis was supported by fieldwork which took place from October 2020 to June 2021. The field trips gave rise to direct observations and semi-structured interviews carried out with a hundred fishermen and a dozen agents and officials of public administrations, those of the DGPA, the General Directorate of the Merchant Navy (DGMM) and the Directorate of Seafarers, Navigation and Safety Maritime (DGMNSM). Similarly, interviews with fishermen elucidated their view of possible risks; those carried out with the administrative authorities showed the need to arm themselves with safety equipment during fishing trips. Field visits also made it possible to immortalize the main equipment used by CAPAL fishermen and to photograph the extent of the damage recorded.

The present study is organized around the results which relate to the diversity of maritime safety equipment and a discussion which highlights the socio-cultural practices of artisanal fishermen for assistance at sea, the risks incurred and the need to improve their working conditions.

## **4. Results: A Variety of Safety Gear Recommended for Anglers**

This section is a diagnosis of the safety equipment recommended and used by CAPAL fishermen.

### **4.1. The Different Equipment Recommended for the Safety of Fishermen at Sea**

In Gabon, there is a variety of equipment recommended to fishermen for their safety at sea. [Article 192 of the International Convention for the Safety of Life at Sea of 1974 \(SOLAS\)](#) and the [Community Merchant Navy Code of the CEMAC of 2012](#), laying down specific safety rules for certain categories of pleasure craft and traditional boats stipulate that: “The competent maritime authority sets the safety standards to be complied with by boats of traditional construction and motorized canoes. For all boats of this type transporting passengers for national or inter-State navigation needs, their passenger capacity must be determined and rules equivalent to those of the International Concerning safety equipment, the absence of a lamp, for example, is a real handicap for units that work at night. It is with this in mind that the Department of Seafarers, Navigation and Maritime Safety, through the maritime stations, has established a conventional list of mandatory safety equipment for canoes. The equipment required is classified into two groups: rescue equipment and that dedicated to dewatering and fire-fighting ([Table 1](#)).

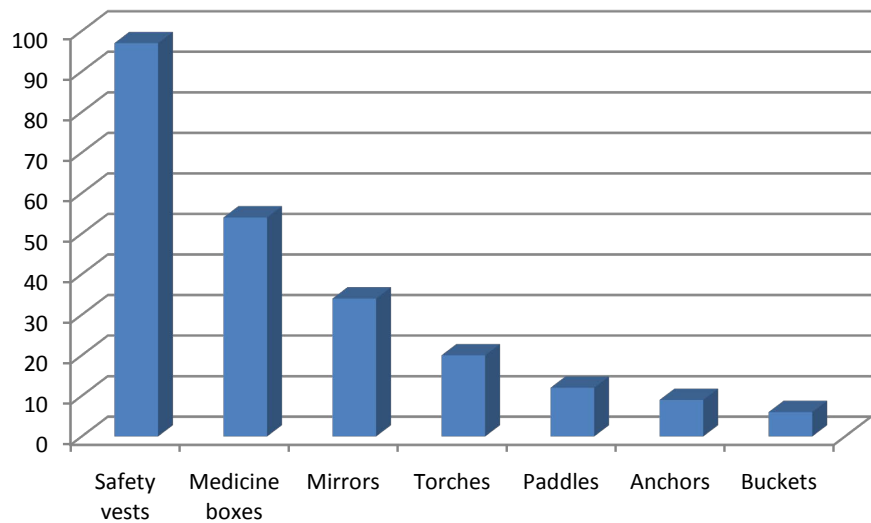
**Table 1.** Safety equipment strongly recommended by the DGMNSM.

Types of equipment	Compositions
<b>Rescue equipment</b>	Safety vest
	Emergency tiller
	Paddles
	Medicine box
	Signalling and distress device (Lamp, waterproof torch, mirror)
	Circuit breaker et engine spark plugs
<b>Dewatering and fire-fighting equipment</b>	Chain and anchor
	Bucket
	Scoop or shovel
	Towing line
	Mooring cleat or cock and fairlead

DGMNSM, 2021.

Lifesaving equipment concerns all emergency equipment intended to save lives or prevent injuries at sea. This group mainly includes life jackets, emergency tiller, paddles, medicine box, lamp, the waterproof torch, the mirror, the circuit breaker, the engine spark plugs, the chain and the anchor. The draining and fire-fighting equipment consists of all the equipment intended to empty the canoe in the event of water intrusion and to extinguish fires if there is a fire. They are essentially composed of the bucket, the bailer, the towing rope or mooring cock and the fairlead. The diversity of safety equipment forces CAPAL fishermen to ignore certain tools to favour only those that they consider to be essential (Figure 2).

Figure 2 shows all the safety equipment used by CAPAL fishermen. Indeed, out of a workforce of 100 boats surveyed, it appears that the most representative equipment on board the canoes is the vest and the medicine box, which are found respectively with 97 and 54 naval tools questioned. However, only 34 canoes have a mirror, 20 a torch, 12 paddles, 9 anchors and 6 buckets. The high use of vests is explained by this statement by Abdoulaye, a fisherman from CAPAL who said that “with that, if there is a problem with the canoe, the fishermen do not enter the water”. According to his colleague Aby, also a CAPAL fisherman, “if no one has the vest, the brigade issues a fine”. These comments show that fishermen are aware of the danger at sea and that the vest remains the flagship equipment on which the nautical brigade generally focuses. In addition to this equipment, the fishermen are equipped with gadgets such as the rocket, the lifebuoy, the suit, the compass, and the telephone to prevent dangers. The rocket, for example, is very useful in the event of an accident. The lifebuoy can be used to rescue a shipwrecked person and the telephone to notify relatives of any damage.



**Figure 2.** The main safety equipment used by CAPAL fishermen. Source: Field data, 2021.

In short, the field data made it possible to realize the number of boats that use safety equipment and those that venture out to sea without taking the necessary precautions (**Table 2**).

**Table 2** shows that almost all the canoes registered with CAPAL do not have all the recommended safety equipment. Of the 100 canoes surveyed, only 2 meet the standards since they have more than half of the required tools, which remains very insignificant. Of the 100 canoes visited, 22 are armed only with lifejackets and medicine boxes. 15 canoes only have lifejackets and 13 are equipped with lifejackets and mirrors. Fishermen justify their choices by referring to the expensive cost of protective equipment and consider that they can protect themselves at sea using traditional techniques.

#### **4.2. Costs of Equipment Deemed Excessive and Socio-Cultural Constraints as a Barrier to the Acquisition of Maritime Safety Equipment**

It is true that in the past, the practice of artisanal fishing for purely subsistence needs did not require any particular and sophisticated equipment. Today, with the evolution of the sector and the considering of security measures, the costs related to the activity of fishing have increased and many fishermen favour joint ownership of the means of production.

Interviews with fishermen revealed that 70% of fishermen do not own canoes. These are sponsored by individuals or fishmongers. To have a canoe, a fisherman must pay about 600,000 for the Gabonese canoe, 2,000,000 CFA for the large canoe dedicated to the purse seine and 8,000,000 for the fiberglass canoe. Also, he must provide an estimated sum of 3,500,000 CFA francs to acquire a 40 horsepower engine or 2,300,000 CFA francs for a 15-horsepower engine (**Table 3**). In view of the high costs paid for the purchase of basic equipment, it is difficult to be an owner or a fishing master. In fact, individuals and fishmongers

**Table 2.** Variation of equipment from one canoe to another.

Safety equipment	Number of canoes
Safety vest	15
Safety vest and medicine boxes	22
Safety vest and mirror	13
Safety vest, mirror and medicine boxes	11
Safety vest, bucket and paddles	1
Medicine boxes	2
Safety vest, paddles, bucket, seaux, medicine boxes	2
Safety vests, lamps, anchors, paddles, chains	4
Mirror, medicine box	1
Torches, vests, medicine boxes	4
Safety vests, anchors, torches, medicine boxes	5
Safety and torch	4
Safety vest Mirrors, vest, paddles	2
Safety vest, first aid kits, torches, mirrors	2
Safety vest, torch, mirror, compass, fire extinguisher	2
Safety vest, glove, mirror, suit, torch, medicine box	1
Safety vest, medicine box, bucket	1
Safety vest, first aid kit, bucket, torch, lamp, mirrors, paddles, candles, anchors, emergency tiller, tow line, bailer, mooring line	2
Safety vest, paddles, glove, torch, telephone	2
Safety vest, first aid kit, fire extinguishers, rocket	4
<b>Total</b>	<b>100</b>

Source: Field data, 2021.

**Table 3.** Estimated costs of basic equipment in the artisanal marine fishery.

Fishing equipment	Specificity	Amount CFA francs
<b>Canoes</b>	Canoes Gabonese	900,000
	Fiberglass canoes monoxide	8,000,000
	Canoes of the rotating seine (tiré-tiré)	2,000,000
<b>Engine</b>	40 horsepower engines	3,500,000
	15 horsepower engines	2,300,000
<b>Filets</b>	Bale of 40 - 50 - 60 mm mesh	170,000
	Bale of 80 - 90 mm mesh	400,000

Source: CAPAL Statistics Service, 2021.

provide traditional fishermen with rental equipment, in return for a fee equivalent to 1/3 of the profits for individuals and the exclusive sale of all production

for fishmongers. and managers of fishmongers. Also, apart from the fishermen paid by the share, those who are in an illegal situation, work on behalf of the owners of the canoes without remuneration. In return, they receive support for their daily needs and costs related to the establishment of their residence permit.

In Gabon, in terms of maritime safety, artisanal fishermen receive no support from the administration for the purchase of safety equipment. They do not receive any aid from the Merchant Navy and the DGPA. In addition to the cost of acquiring fishing equipment, the bill increases with the purchase of recommended safety equipment. During our investigations, we noted that for the purchase of safety equipment from an approved operator, such as Yamaha Gabon, fishermen must pay an amount exceeding one million CFA francs (Table 4).

In view of the many charges related to both the purchase of fishing equipment and safety equipment presented in Table 4 and Table 5, it appears that 62% of

**Table 4.** Estimated costs for a seine fishing unit (in CFA francs).

Material	Quantity	Unit price	Cost incl.VAT
<b>Basic equipment</b>			
Canoes of the rotating seine (tiré-tiré)	1	2,000,000	<b>2,000,000</b>
40 horsepower engines	1	3,500,000	<b>3,500,000</b>
Bale of 40 - 50 - 60 mm mesh	1	170,000	<b>170,000</b>
<b>Total</b>			<b>5,670,000</b>
<b>Security equipment</b>			
Safety vest 150N, ISO12402-3, 70 - 90 kg	12	29,202	<b>350,424</b>
Emergency tiller	1	28,840	<b>28,840</b>
Telescopic paddles 156,242 cm	6	18,807	<b>112,842</b>
Anchor light on pole 54 cm	1	25,840	<b>25,840</b>
Navigation light 12 v	1	26,849	<b>26,849</b>
Torch 5 AA; Waterproof ABS	1	11,218	<b>11,218</b>
Signal Mirror 7 × 7 cm	1	2126	<b>2126</b>
Medicine box	Package	15,000	<b>15,000</b>
Engine circuit breaker	1	2126	<b>2128</b>
Galvanized anchor - 6 kg	1	42,017	<b>42,017</b>
Anchor rope 30 m	1	332,020	<b>332,020</b>
Bucket 91 for scooping	1	19,681	<b>19,681</b>
Scoop or shovel 135 × 190 mm	1	2143	<b>2143</b>
Mooring box inox 316, L: 120 mm; W: 195 mm; H: 120 m	1	38,924	<b>38,924</b>
<b>Total</b>			<b>1,010,052</b>
<b>Total global</b>			<b>6,680,052</b>

Source: YAMAHA Gabon, 2020.



**Table 5.** Nationality of fishermen interviewed at CAPAL.

Nationality	Workforce	%
Gabonese	18	18%
Ghanaian	12	
Nigerian	29	
Santomean	17	82%
Beninese	22	
Togolese	2	
<b>Total</b>	<b>100</b>	<b>100%</b>

Source: Field data, 2020.

fishermen believe that the practice of fishing in Gabon is “very expensive “. It requires substantial financial means to afford the required fishing and safety equipment. Around 12% think the costs are “very high”, while 26% say the prices charged are “affordable”.

In addition to the exorbitant costs they pay, the fishermen are overwhelmed by the controls “deemed excessive” of which they are victims at sea. Remember that Gabon is in the Gulf of Guinea, a maritime territory very rich in fisheries resources and hydrocarbons notably. It in fact attracts covetousness and makes it a risk zone for acts of insecurity at sea (robbery, piracy, illegal immigration, multifaceted trafficking, etc. in this case) (Ndjambou, Lembe, & Nyinguema, 2019). The latest act is the attack of May 4, 2020, off Cocobeach, in Gabonese territorial waters. This was behind the kidnapping of six crew members of two trawlers.

Thus, with a view to improving the security of its maritime domain, dedicated to ensuring the protection of people and property, Gabon, through its Defense and Security Forces as well as its surveillance bodies deployed at sea has, he was led to strengthen the surveillance of his maritime territory. The related checks are carried out, among others, by the nautical brigades of the National Gendarmerie, the National Police, the National Agency for National Parks, the National Navy, the General Directorate of Documentation, and Immigration (DGDI) and the Directorate General of the Merchant Navy. All these administrative entities check the documents related to the canoe and the crew members. In practice, the Direction Générale de la Marine Marchande examines maritime safety equipment, the National Agency for National Parks (ANPN) ensures that fishermen carry out their activities far from spawning and nursery areas, the National Navy protects waters under national jurisdiction.

However, the fishermen castigate abusive treatments and fines inflicted by these different administrations; they even declare that they are often required to pay exorbitant and sometimes unjustified amounts for offenses relating to the lack of a valid residence permit and fishing in national parks. These offenses often result in the confiscation of all fishing equipment, cargo, and the payment of fines of up to one million CFA francs. In view of all these acts, fishermen admit,

for example, to venturing into the sea without precautions insofar as they are unable to possess all the required safety equipment and all the necessary documentation. As a result, they run the risk of always being verbalized.

Socio-cultural constraints, to which artisanal fishermen remain attached, are another reason that leads them to do without the required safety equipment. Indeed, one of the specific features of artisanal maritime fishing in Gabon is the broad domination of the activity by fishermen from West Africa (**Table 5**).

Interviews with 100 fishermen show that 82% are of foreign origin and only 18% of Gabonese nationality. The strong anchoring in religious convictions and traditional fishing rites testifies to the common practices within communities of fishermen from West African countries. Indeed, these come from territories with a strong maritime culture in which small-scale maritime fishing is very dynamic (**Bignoumba, 1998**). Ghana and Nigeria are excellent examples of the existence of fishing communities that have very often resorted to supernatural or divine forces. In the Gabonese camps where the nationals of these two States live, the reproduction of the said habits is visible by the presence of places of worship and the use of ex-voto paintings for the decoration of the boats and on which the reference to god is very remarkable (**Lembe, 2014**) (**Figure 3**).

The CAPAL fishing community remains strongly rooted in socio-cultural practices which seem to guarantee both safety at sea and the prosperity of the activities. Indeed, very often, the fishermen wear distinctive external signs such as the feather on the head to “protect themselves from the misfortunes of the sea” (Photo 1), the bracelets of cowries around the kidneys, which are a token of magic or of “gris-gris”. Several names or slogans referring to god are retained, this is the case of “divine grace”, “Noah’s Ark”... These different names testify to the strong belonging of the group to a supernatural force. This then results in the choices made by the fishermen and the combinations of methods used to ensure safety when they set sail (**Figure 4**).

**Figure 4** attests to the strong anchoring of artisanal fishermen to the socio-cultural practices of their origin. The Beninese community, for example, practices

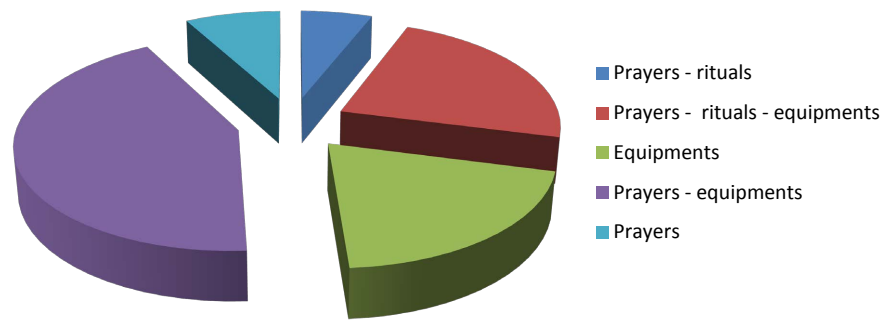


Photo 1: Wearing a feather for protection



Photo 2: Name of the canoes referring to a deity

**Figure 3.** Symbols of attachment to religious beliefs and traditional rites. Photo credit: **Andeme Mve, 2020**.



**Figure 4.** Combinations of protection methods at sea. Source: Field data, 2020.

Maboueya, which is a ritual consisting in slaughtering a rooster to spill its blood on the canoe. This practice, reserved only for experienced fishermen who want to go to sea, guarantees fruitful fishing. Thus, of the 100 fishermen questioned, 20 only use safety equipment as a means of protection at sea. The other 80 are satisfied either with rites and rituals or combine tradition and modernism. Barely 6 of them devote themselves to prayer and rituals, 23 to prayer, rituals, and safety equipment, 43 have recourse to prayer and equipment, only 8 to prayer. The most cautious combine the two modes of protection, i.e., traditional, and conventional. However, those whose ancestral practices remain the only safe option do not necessarily recommend the use of modern maritime safety equipment. For this category, the knowledge acquired through extremely arduous experiences is the symbol of the prestigious skills of the fisherman (Ota, 2007). However, resignation to conventional safety equipment causes many accidents at sea.

## 5. Discussion: From the Risks Incurred to the Improvement of the Safety Conditions of Fishermen at Sea

This section shows the damage suffered by fishermen without the recommended safety equipment and suggests ways of thinking to enable stakeholders to work in complete peace of mind during their trips.

### 5.1. Sea Fishing Trips Subject to Various Risks

Fishing has always been considered a dangerous profession insofar as man exercises it in a territory that is difficult to tame. The absence of security tools therefore increases the possibility of risks. Out of 100 fishermen interviewed at CAPAL, 43 have already been victims of at least one accident at sea, while 57 have never suffered any damage. Even if the number of victims is below the average, it is still considerable. Overall, the accidents recorded are caused by non-compliance with safety rules and natural factors. The lack of safety equipment on board canoes is the main cause of accidents (Table 6). Many fishermen venture out to sea without taking major precautions, thereby jeopardizing fishing trips.

The lack of safety equipment is by far the leading risk factor at sea. In 2020, 43

**Table 6.** The main causes of accidents for fishermen at sea 2020.

Accidents recorded	Cause of accidents	Workforce	Total
<b>Lack of safety equipment</b>	Collision with other machines	25	<b>33</b>
	Engine failure	4	
	Capsizing of the canoe	4	
<b>Natural factors</b>	Strong winds	4	<b>10</b>
	Strong waves	2	
	Storms	4	
<b>Total</b>		<b>43</b>	<b>43</b>

Source: Field data, 2020.

accidents were recorded, 33 of which were caused by the lack of safety equipment and 10 by climatic hazards. Regarding safety equipment, the absence of a lamp, for example, is a real handicap for units working at night. Without light, they cannot light up and signal themselves to other users who frequent the sea at night. In 2020, out of 33 accident cases relating to equipment failure, 25 were due to collisions with tugs. Indeed, some sleepy fishermen, while waiting to remove their nets from the water, end up finding themselves in front of boats or tugboats. This is the fate suffered by Ben and his teammates who, “one night in May 2020 around 3 a.m., were hit by a tugboat, leaving them in the water with a damaged canoe” (Figure 5). The DGMNSM points out that at night, “the tugs which very often use autopilot to allow the pilot to rest during the journey, end up hitting the boats of the fishermen”.

The absence of engine spare parts and canoe draining equipment such as the seal and the bailer (in the event of water intrusion) also cause fear among many fishermen, particularly if there is water intrusion in the canoe. Similarly, if fishermen do not have paddles, spare spark plugs and mirrors, in the event of an engine failure, they will have difficulty reaching shore and issuing distress signals.

In addition to poor equipment, natural factors are also responsible for accidents at sea. It should be remembered that fishing boats, which are mostly made by hand, in wood or planks, have difficulty withstanding the force of swells, waves and storms. These factors damage the boats and leave visible impacts on the sides, below and in the canoe (Figure 6: Photo 3 and Photo 4).

Moreover, the non-respect of harvesting areas by artisanal and industrial fishermen constitutes a real danger for them. If the former is authorized to carry out their activities in the zone between zero and 3 nautical miles equivalent to 5.556 kilometers, the latter, on the other hand, must exercise their beyond the band dedicated to artisanal fishermen. Unfortunately, there is competition for the same fishing territories and for the same species in a context where the formal limits are not always visible and materialized (Bignoumba & Lembe, 2019). Hence the risk of collusion, because based on their skills and their technical means,



**Figure 5.** Combinations of protection methods at sea. Photo credit: *Andeme Mve, 2020.*



Photo 3: Wave cracks



Photo 4: Wave impact

**Figure 6.** Impact of natural factors. Photo credit: *Andeme Mve, 2020.*

all fishermen are not equal (Luce, 2001). Artisanal fishermen are generally more impacted, which is why it is necessary to find mechanisms to secure their working conditions.

## 5.2. Securing the Working Conditions of Sea Fishermen

Many fishermen find it difficult to familiarize themselves with safety equipment at sea. It is therefore necessary for them to work in close collaboration with the administrations specialized in securing maritime activities. Indeed, the integration of issues relating to work safety at sea in the objectives of fisheries management is a non-existent approach at the DGPA. This administration is currently limited to biological and economic management of the sector. In other words, the actions carried out place greater emphasis on sustainable exploitation and economic viability. Security issues are very rarely mentioned now. Regarding sustainability itself, several actions are carried out through the establishment of a legal framework that considers fisheries access plans (fishing authorization, fisherman's card, registration of canoes, etc.) and stock management (regulation of fishing gear, biological rest periods, etc.). In other words, even at the administrative level, the safety of fishermen is not a crucial subject. However, if the fi-

sherman, the main player in the fisheries sector, continues to carry out a high-risk activity, it is very likely that accidents will intensify over the years. In Senegal, for example, shipwrecks due to the power of currents and waves are frequent and cost the lives of many fishermen who refuse to wear life jackets.

Raising fishermen's awareness is an undeniable asset for a better approach to maritime safety issues. The DGMNSM could, for example, organize exchange sessions with fishermen and set up billboards and advertising panels within CAPAL with images and awareness-raising messages. Fishermen could urge each other to respect safety standards to be aware of the dangers involved. As CAPAL is made up of 82% foreign fishermen, half of whom are English-speaking (Table 5), awareness campaigns in the respective languages of the communities are preferred: English for Ghanaian and Nigerian fishermen and Portuguese for those from Sao Tome and Principe. Language is an effective way to convey a message and it shows the interest given to the problem. Activities of this type had been initiated by the DGPA as part of raising awareness on the use of horsehair nets (mono filament). Today these capture devices that destroyed marine fauna and flora have been largely replaced by so-called biodegradable cotton nets. CAPAL and community leaders could be called upon to develop spots with messages in vernacular languages broadcast regularly on one or two screens to challenge each fisherman on safety measures at sea.

It is also necessary to consider the socio-cultural know-how of the fishermen. Over the years, the latter "acquire knowledge and skills through their direct experience of fishing at sea, but also thanks to the more experienced fishermen, who pass on to them traditional and collective knowledge" (Ota, 2007: p. 24). This traditional knowledge remains limited in terms of security and must, on the other hand, contribute to strengthening conventional methods of security. Combining traditional know-how and modern safety equipment would guarantee serene work at sea. And serenity would only be effective if all sea users work in safety, hence the need to implement a system of reliable demarcations (beacons) to reduce spatial competition and collisions.

## 6. Conclusion

This work focused on the safety of artisanal fishermen in CAPAL. Its objective was to understand the reasons that lead fishermen to be indifferent to the safety equipment required to protect themselves during their fishing trips. Exchanges with fishermen and administrative agents have shown that the plethora of recommended equipment and the prices charged constitute a barrier to the accessibility of maritime safety aid tools. Also, the strong anchoring in rites and beliefs does not sufficiently motivate fishermen to take more precautions.

The results of the fieldwork also revealed that only 2 CAPAL fishermen have all the recommended safety equipments. Similarly, the accidents recorded are caused both by the lack of safety equipment and by natural factors. However, non-compliance with safety rules on board canoes is the main cause of accidents

at sea.

To minimize the risk of accidents, it is important to secure the working conditions of sea fishermen insofar as many people find it difficult to familiarize themselves with safety equipment at sea. It is therefore necessary that fishermen work in close collaboration with the administrations specialized in securing maritime activities. This collaboration involves the integration of issues relating to work safety at sea in the objectives of fisheries management, an approach that has not yet existed at the DGPA, which is limited to biological and economic management of the sector. In other words, the actions carried out place greater emphasis on sustainable exploitation and economic viability. Safety issues for workers and their boats are currently only very rarely mentioned.

Thus, the consequences that follow show that fishermen work in dangerous conditions that deserve special attention. This is the reason why, despite having knowledge of the marine environment, in view of the dynamism they demonstrate, artisanal fishermen should nevertheless adopt new safety equipment to protect themselves at sea, because this is not incompatible with their beliefs and ancestral rites of fishing. These conclusions open new perspectives to be considered in the fisheries sector to combine resource sustainability requirements with the improvement of working conditions.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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