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Navigation and Seamanship in Fishing Activities: Essential Skills for Safe and Efficient Fishing Operations

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INTRODUCTION

Fishing is an important livelihood activity that supports food security, employment and economic development in coastal communities. However, fishing at sea involves numerous risks, including unpredictable weather, rough waves, equipment failure, navigational errors and collisions with other vessels. In this challenging environment, navigation and seamanship are two fundamental skills that determine the safety, efficiency and success of fishing operations.

Navigation refers to the process of determining a vessel's position, planning its route and maintaining a safe course from the departure point to the fishing ground and back to port. Seamanship, on the other hand, encompasses the practical knowledge and skills required to operate, handle and maintain a vessel safely under different sea conditions. These skills are closely interconnected and are essential for both traditional small-scale fishers and operators of modern mechanized fishing vessels.

The Food and Agriculture Organization of the United Nations (FAO) emphasizes that navigation safety, vessel preparedness, personal protection and emergency response are important components of fishing safety (FAO, 2019). Developing these competencies can help reduce preventable accidents, protect human lives and improve the overall efficiency of fishing operations.

1.2 Understanding Navigation in Fishing Operations

Navigation is much more than steering a fishing vessel in a particular direction. It involves position fixing, route planning, chart interpretation, monitoring weather conditions and maintaining awareness of surrounding marine traffic. Accurate navigation helps fishers reach productive fishing grounds, avoid underwater hazards and return safely to their landing centres.

1.3 Traditional and Modern Navigation Techniques

Traditional fishers have long relied on their knowledge of coastal landmarks, prevailing winds, ocean currents, wave patterns and the positions of celestial bodies. This experience-based knowledge remains valuable, particularly in small-scale fisheries where access to sophisticated electronic equipment may be limited. However, traditional methods should be supplemented with reliable navigation instruments wherever possible.

Modern fishing vessels commonly use the following technologies:

- **Magnetic compass:** Indicates direction and provides a basic means of navigation when electronic systems fail.
- **Global Positioning System (GPS):** Helps determine the vessel's geographical position, speed and direction of movement.
- **Electronic chart plotter:** Displays the vessel's position on a digital nautical chart and helps monitor the planned route.
- **Radar:** Helps detect nearby vessels, coastlines and certain navigational hazards, particularly in darkness or reduced visibility.
- **Automatic Identification System (AIS):** Provides identification and movement information for appropriately equipped vessels and supports situational awareness.
- **Communication equipment:** Very High Frequency (VHF) radio enables communication with other vessels, port authorities and maritime rescue services.

According to FAO, a compass or satellite-based positioning system provides an important foundation for navigation, while the additional equipment required depends on vessel size, operating area and applicable regulations (FAO, 2022).

Nevertheless, electronic instruments should never be treated as infallible. GPS signals can be disrupted, electronic charts may contain limitations, and equipment can fail because of electrical or mechanical problems. Therefore, responsible fishers should maintain a lookout, cross-check their position using available methods and understand how to navigate safely if electronic systems become unavailable.

1.4 Route Planning and Fishing-Ground Selection

Effective navigation begins before a fishing vessel leaves the harbour. The skipper should identify the intended fishing grounds, estimate the journey duration, assess fuel requirements and examine weather forecasts, tides and local navigational warnings.

Route planning should consider water depth, submerged obstructions, reefs, shipping lanes, restricted areas and the vessel's operating limitations. Fishing grounds should be selected using appropriate information about target species, seasonal distribution, fishing regulations and previous catch records.

A properly planned route can reduce unnecessary steaming time and fuel consumption while allowing more time for fishing. However, the shortest route is not always the safest. The skipper should be prepared to alter the route or postpone departure when weather, sea state or vessel conditions become unsuitable.

1.5 Seamanship: The Foundation of Safe Vessel Handling

Seamanship is the practical ability to manage a vessel, its machinery, equipment and crew under changing operational conditions. In fishing activities, it includes boat handling, rope and knot work, anchoring, mooring, deck operations, stability management, emergency response and communication.

1.6 Vessel Handling and Stability

Fishing vessels frequently operate in environments where waves, wind and currents can change rapidly. Good seamanship requires the skipper to understand how these forces influence the vessel's movement and manoeuvrability. Speed and heading should be adjusted according to the sea state, visibility, traffic and vessel characteristics.

Vessel stability is particularly important during fishing operations. Heavy catches, shifting gear, water entering the deck, uneven loading and lifting operations can increase the risk of excessive rolling or capsizing. Fish, fuel, ice and fishing gear should be distributed and secured appropriately, while free-surface water and unnecessary deck obstructions should be controlled.

FAO, the International Labour Organization (ILO) and the International Maritime Organization (IMO) provide guidance on the construction, equipment and safe operation of fishing vessels, including recommendations addressing stability and protection of fishing crews (FAO/ILO/IMO, 2012).

1.7 Fishing Gear Handling and Deck Safety

Fishing activities such as trawling, gillnetting, longlining and purse seining involve different gear-handling requirements. Crew members must understand the correct operation of winches, net haulers, ropes, wires and lifting equipment. Poor coordination during gear deployment or hauling can cause entanglement, crushing injuries and loss of vessel stability.

Clear communication between the skipper and crew is essential during these operations. Decks should be kept as clear as practicable, moving machinery should be operated by trained personnel, and crew members should remain outside dangerous line-of-pull zones. Appropriate personal protective equipment, including suitable footwear, gloves and lifejackets where required, should be used.

Good seamanship also includes routine inspection and maintenance of hulls, steering systems, engines, fuel lines, electrical installations and safety equipment. Identifying defects before departure is generally safer and less costly than dealing with equipment failure at sea.

1.8 Collision Avoidance and Maritime Rules

Fishing vessels share marine space with cargo ships, passenger vessels, recreational boats and other fishing vessels. Understanding the International Regulations for Preventing Collisions at Sea, 1972 (COLREGs), is therefore essential.

The COLREGs establish international rules covering lookout, safe speed, assessment of collision risk, action to avoid collisions, navigation lights, shapes and sound signals. These rules apply according to the circumstances and vessel classifications involved; a vessel engaged in fishing does not automatically have priority over every other vessel (IMO, 1972).

Fishers should maintain a proper lookout using sight, hearing and all appropriate available means. They must assess whether another vessel presents a collision risk and take timely, substantial action when required. Navigation lights and day shapes must be displayed as applicable, and special attention should be given to vessels whose fishing gear may restrict their manoeuvrability.

Restricted visibility, heavy rain, darkness and congested fishing grounds demand increased vigilance. Electronic aids can support collision avoidance, but they do not replace the responsibilities of the skipper and crew.

1.9 Weather Awareness and Emergency Preparedness

Weather conditions are among the most important factors affecting fishing safety. Strong winds, high waves, thunderstorms, poor visibility and rapidly changing sea conditions can make navigation and gear handling dangerous. Before departure and throughout the trip, fishers should monitor reliable weather forecasts, marine warnings and changes in local conditions.

A vessel should carry appropriate life-saving appliances, first-aid supplies, fire-extinguishing equipment, communication devices and other safety equipment required for its operating area. Crew members should know how to use this equipment and understand the procedures for man-overboard incidents, fire, flooding, engine failure and abandonment of the vessel.

In an emergency, the skipper should assess the situation, raise an appropriate distress alert using available communication systems and follow the instructions of maritime rescue authorities. Emergency contacts, vessel identification details and the planned voyage should be communicated to responsible persons before departure. FAO's safety guidance for small-scale fishers highlights the importance of pre-trip checks, navigation safety and survival procedures (FAO, 2019).

1.10 The Way Forward: Training, Technology and a Culture of Safety

Improving navigation and seamanship requires a combination of practical training, reliable technology and responsible decision-making. Fisheries departments, training institutions, fishing cooperatives and maritime authorities can contribute by organizing regular safety programmes covering navigation instruments, COLREGs, weather interpretation, vessel stability, first aid and emergency communication.

Digital navigation tools and mobile applications can improve access to weather information and navigational assistance. However, technology is most effective when fishers understand its limitations and can operate essential equipment correctly. Regular drills, maintenance schedules, updated nautical information and compliance with applicable safety requirements should form part of routine fishing operations.

Particular attention should be given to small-scale fishers, who may have limited access to formal training, communication equipment and emergency support. Practical, locally relevant training in regional languages can help translate technical safety guidance into everyday fishing practices.

CONCLUSION

Navigation and seamanship are indispensable components of safe, responsible and productive fishing activities. Navigation enables fishers to plan routes, locate fishing grounds and avoid hazards, while seamanship ensures the safe handling of vessels, machinery, fishing gear and crew. Together, these skills can reduce avoidable accidents, improve operational efficiency and protect livelihoods.

The future of fishing depends not only on modern vessels and advanced technology but also on the knowledge, preparedness and judgement of the people operating them. A successful fishing trip is not measured by the catch alone; it is also measured by the safe return of every fisher to shore.

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