

Mitigating the Impacts of Long-line Fisheries on Seabirds and Sea Turtles: SEAFDEC Operating Guidelines

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This set of operating guidelines for long-line fisheries aims to encourage long-liners in the Southeast Asian region to consider eco-friendly operations in long-line fishing. The guidelines cover the factors that could help mitigate the impacts of long-line fisheries on sea birds and sea turtles from the development of the fishing gear, concerns on the reduction of incidental catch of sea turtles and seabirds, and safety at sea for long-liners.

Long-line fishery, one of the most conservative methods of harvesting fish could be of two major types, namely: bottom set long-line and pelagic or drift-long-line. In the Southeast Asian region many countries such as the Indonesia, Malaysia, Philippines, Thailand and Vietnam have been practicing long-line fishing in varying methods depending on the fishers' experiences in terms of fishing and fish handling techniques.

In commercial-scale fishing, the use of long-line technology such as long-line for tuna, sharks and billfishes, catching the most quantity of fish in the least amount of time, is already a thing in the past. These days, issues on resources conservation and management have been included in the focus of the commercial-scale fishing industry. Specifically, addressing conservation concerns and adopting sustainable harvesting practices now take the priority over increased harvests. Towards this goal, a number of projects have been implemented by SEAFDEC under the ASEAN-SEAFDEC collaborative mechanism that aimed to promote responsible fishing technology and practices, and sustainable fisheries in the Southeast Asian region. On the other hand, innovative long-liners are now exerting extra efforts to meet this goal by modifying their vessels, fishing methods, and gear to concentrate only on the target species and eliminate harvesting by-catch and incidental catches.

Development of the Long-Line Fishing Gear

Prior to the development of long-line fisheries, pelagic fishes were caught by hand-line, rod and reel, and harpoon. Long-lining combines the quality afforded by "one-at-a-time-handling" fishing methods with the conservation and efficiency of the "hook-and-line" method. A long-line fishing gear consists of a continuous mainline supported by float lines, with regularly spaced leaders that end with the baited hooks. The original gear consisted of a heavy

nylon mainline with 1,000 to 3,000 hooks spaced at depths between 50-250 m along a sea stretch of 15 to 40 nautical miles. Fishing effort focused across vast geographic areas where large pelagic fishes such as tuna, billfishes, sharks and other commercially important species aggregate.

Recently, the gear has been enhanced to consist of monofilament mainline with the main objective of reducing drag and visibility. The length of the float lines and leaders has also been increased to maximize the fishing depths, but the number of hooks has been reduced to prevent tangles. Such modifications are aimed to decrease by-catch from the fishing operations.

The long-line fishing gear of today has many conservation benefits. The spacing between each long-line hook and the reduced number of hooks are meant to minimize the capture rate of non-target species. Smaller hooks and monofilament leaders allow sharks to bite the line, but enable some large spawning stock species such as swordfishes to break off. Additionally, the lighter and longer monofilament gear allows greater movement of the captured fish resulting in higher survival rates. Many fishes are harvested alive and fresh so the marketable species can be processed quickly to provide high-quality fishery products.



Reducing Incidental Catches of Seabirds and Sea Turtles

Seabirds

Referring to the seabirds' distribution areas as also foraging, breeding and migrating areas, long-line fishing boats operating south of 30oS are encouraged to follow the guidelines in **Box 1** to reduce incidental catch of seabirds.

Box 1. Guidelines to reduce incidental catch of seabirds from long-line fishing

- (1) bird scaring line (tori-pole/streamer) or tagging along such impediments as buoys or wooden board on the sea surface where the baits are sunk in order to avoid seabirds from taking the baits from the hooks.
- (2) Every effort should be made to release the birds caught alive on the vessels and, if possible, remove hooks so that birds would not be harmed.
- (3) Dumping of offal is prohibited while the long-lines are being set while dumping of offal during the hauling should also be avoided. If necessary, discharge of such offal materials should take place only on the opposite side of the vessel from where the long-lines are hauled.
- (4) One or more of the following measures should also be applied, taking into consideration the situation the gathering of the seabirds and the sea conditions:
 - (a) Line-setting should be done between nautical dusk on one day and before nautical dawn on the following day;
 - (b) In installing baits, use weighted branch line or cone which sink as fast as possible after line setting;
 - (c) Use automatic bait casting machines, if possible; and
 - (d) Only properly thawed baits should be used.

Sea Turtles

Billfish Long-line Fisheries

The swimming layer of sea turtles is from the sea surface to 80 m depth water. Thus, sea turtles also stay in the same layer as some pelagic fishes. Fishing operations such as billfish long-lining should therefore consider the guidelines in **Box 2** to reduce incidental catch of sea turtles.

Tuna Long-line Fisheries

For tuna long-line fisheries, the most important thing to do in order to reduce incidental catch of sea turtles is to deploy the first and last hooks of the basket into water depth of more than 80 m to avoid the sea turtles' swimming layer.

Safety at Sea for Long-Liners

Work at sea has never been without danger, and the fishing industry has a long and growing roll of crew losing their lives at sea in the performance of fishing operations. Fortunately, the loss of lives in most types of fishing is now very much less frequent than it was a few years ago. However, there

are no technological advances that can fully eliminate the forces of the sea and other natural dangers which the fishing vessel crew should face. It is also not quite possible to eliminate the human errors or those from the tools used in the fishing activity, and it is also impossible to make the fishing vessels and fishing gear completely accident proof. Fishing has, in many countries, already become a highly developed industry employing complex machinery, and such development necessitates the introduction and expansion of safety measures similar to those that apply to other major industries. The high accident rates that continue to affect the fishing industry despite mandatory safety schemes and approaches, have encouraged safety practitioners to propose that a more holistic approach to safety and health culture in the fishing industry should be engendered. Developing safety and health awareness as well as promoting sensitization of the fishing communities taking into account the cost of neglecting safety and health issues should also be advocated.

Safety Assessment

The skipper and other crew members of a vessel are most familiar with the fishing vessel, the machinery including the deck machinery and the gear used during the fishing operations. They are also most aware of the hazards that can occur and can anticipate when, where and how these are liable to happen. By analyzing the possible hazards, the crew can play a vital role in suggesting preventive actions to reduce or eliminate such risks. This process can be better achieved through the initiatives of the fishing vessel owners by properly introducing the proper fishing procedures with

Box 2. Guidelines to reduce incidental catch of sea turtles from long-line fishing

- (1) Circle hook size 18/0 with minimum offset (0-10o) which could significantly reduce the rate of hook ingestion by sea turtles should be used instead of the traditional J hook to reduce sea turtles' interaction in the pelagic long-line fishing.
- (2) De-hooker and line cutter device should be available on long-line fishing vessels. De-hooker and line cutter facilitate the quick and efficient release of hooked and entangled sea turtles, thereby increasing their chance of post release survival.
- (3) Understanding and ability to quickly comprehend each step of the procedures to handle the hooked sea turtles which hauled aboard would greatly help in minimizing sea turtles mortality.
- (4) One or more of the following measures should be applied, taking into account the situation where sea turtles are found in the fishing ground.
 - (a) Avoid unintentional catch of sea turtles by reducing the time the hooks are in the water during daytime; and
 - (b) Use mackerel as bait instead of squid.

the assistance of competent authorities. The procedures could include safety assessment and shipboard or shore side safety aspects. However, the competent authorities should ensure that assistance is also provided to crewmembers while undertaking safety assessment where literacy levels preclude the preparation of written reports.

Insurance Policies

Insurance can contribute to the improvement of safety on fishing vessels by highlighting on the factors that cause accidents. The insurers can financially analyze their business to reduce the costs and by doing so, identify the type of accidents that are occurring and where they are encountering financial losses. By reducing the premiums paid for fishing vessels that undertake specific safety precautions, the insurers can thereby provide an incentive for improving the safety of the fishing industry.

Therefore, it follows that it is the duty of those who employ crewmembers, to ensure that fishing vessels are adequately covered by insurance policies or other financial securities to protect the crew of such vessels and the interests of the crew, to indemnify third parties against loss or damage and to protect their own interests. In particular, they should ensure for example, that the crew are adequately covered for such risks as illness, personal injury, death, wages and shipwreck unemployment indemnity, loss or damage to the effects of a crewmember as well as needs for medical examination, as the case may be. The competent authorities on their part should therefore facilitate access to insurance by companies and persons as well as associations who employ crewmembers in the fishing industry.

Safety in Fishing Operation and Fish Handling

Certain measures developed by SEAFDEC (**Box 3**) should be considered to ensure safety in fishing operations as well as in fish handling.

Box 3. Measures to ensure safety in fishing operations and fish handling

- (1) The skipper should ensure that a sharp look-out on all fishing operations is kept at all times and signals which are positive and clearly understood are used.
- (2) Many accidents are caused by the failure of running gear when under tension. Fishing gear should therefore be in good order and all parts of the hauling gear, hoisting gear and related equipment should be checked before use.
- (3) Baskets, tubs or reels of lines should be adequately secured so that they do not spill or overturn in bad weather. Lines should be coiled carefully and the hooks safely arranged, so that the lines run freely without snags when being laid out. When baiting the hooks or handling lines, crewmembers should at all times take particular care not to injure their hands, and that the hooks do not snag in their clothes. Loose scarves or loose sleeves should not be worn. Crewmembers not directly involved in setting or hauling the lines should keep away from the immediate vicinity of the moving lines, and should handle the glass floats of a line carefully to avoid getting cuts from any broken glass. In setting the lines by hand the crewmember in charge of joining the lines should confirm to the thrower that the next part is connected properly and ready for use. If abnormal constrains occur when the line is being set, which could not be corrected by slowing the vessel's speed, the crew should stand well clear of the line or the line should be cut.
- (4) Crew hauling the line hauler should avoid getting their hands caught by the mainline or branch lines. Other crewmembers should stand clear of the hauler at all times. The crewmember operating the hauler should be able to control it quickly and easily. When potentially dangerous fishes are biting or are accidentally hauled on board, they should be killed before they reach the deck, and the hook should not be removed until the fish is dead.
- (5) When setting the long-line with a line thrower, the skipper should adjust the speed of the vessel to be consistent with the capability of the line-setting mechanism.
- (6) As line storage reels may suddenly reverse when long lines are being set, the crew should be aware of such possibility and avoid having their hands caught, and should take care that they are not injured by floats and branch lines coming back on deck.
- (7) In gutting, washing and stowing the catch in ice, the crew should be familiar with the proper handling of different species of fish to avoid hand injuries from the teeth or sharp spines of certain species. Pricks and cuts from fish spines should be bled and treated without delay as some species could cause poisonous wounds which could be painful and troublesome.

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