



Manual on hygienic ice production for the small-scale fisheries sector in Timor-Leste

Module 2

Introduction to basic catch handling principles for the small-scale fisheries sector

Regional Fisheries Livelihoods Programme for South and Southeast Asia (RFLP)

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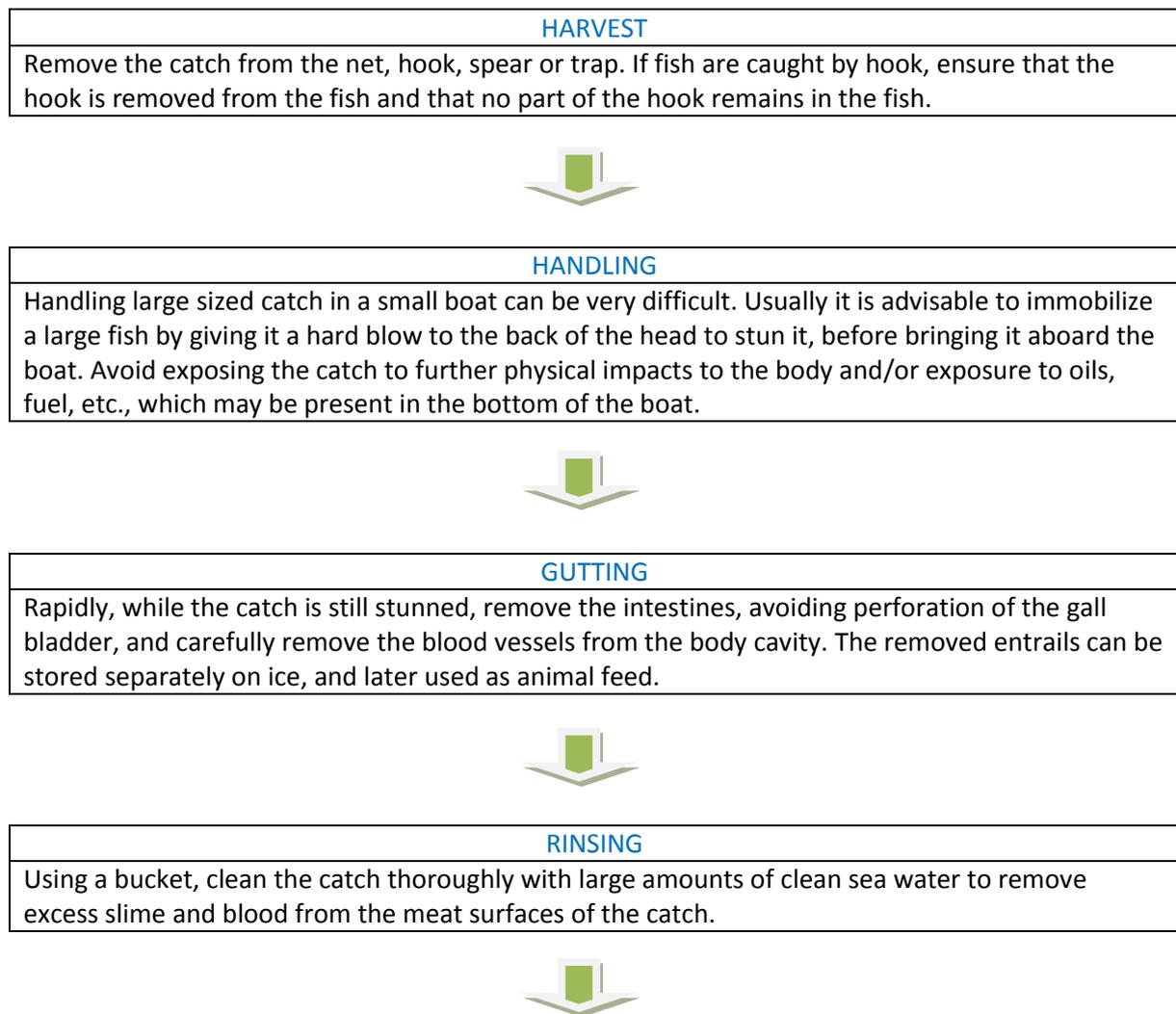
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Introduction

Improper aquatic catch handling at sea by small-scale fishers can result in exterior and/or interior tissue damage, bacterial spoilage, deteriorating product quality, reduced sale price and catch value, and in extreme cases aquatic products being sold that are unsafe for human consumption. Proper catch handling techniques consist of simple, easily applicable actions that fishers can adopt to increase the quality, life and value of their aquatic product. This document provides information on correct on-board catch handling and lists the preparations and equipment required.

Sequence

The diagram below illustrates the step-by-step actions to be taken by fishers.



STORAGE

Carefully place the catch in a dedicated catch storage area, taking extreme care not to cause physical damage to the catch.



CHILLING

Ice the catch as quickly as possible. Put 30 mm of ice at the bottom of the storage box and put the catch on top. Cover the catch with ice. There should be approximately 60 mm of ice on top of the catch and 30 mm at the sides.

If using chilled sea water (CSW) place the catch carefully into the solution of ice and seawater, ensuring complete submersion.

Check for ice melt at intervals of a maximum of 1 hour, and replenish with ice as necessary.



TRANSPORT

When returning from the fishing grounds to the landing site, check for ice melt as described above, and keep the ice uniformly distributed over the catch. If the weather conditions are rough, take measures to prevent the catch from moving around inside the storage area, to avoid damage.



HANDLING

Upon arrival at the landing site, the catch should first be registered specifying the vessel name, the species, and the weight and thereafter graded. Use the utmost care and treat the catch with respect to avoid causing physical damage to the flesh, which at this time may have entered the rigor mortis stage. Avoid contaminating the catch with dust, dirt or un-potable water, and keep it chilled at all times by applying ice as directed in the section on CHILLING above.

Store the catch in thermally insulated boxes e.g. CoolMan or similar containers with tight fitting lids, to reduce the impact of warmer air temperatures on the catch, as well as protecting the catch from contact with, and contamination by flies, other insects, rats, mice and birds.

At this stage catch intended for private consumption, will be separated from catch destined for brokers, often going through a registered auctioning process.



SALE

Proper handling and icing of the catch allows it to be marketed over several days, without compromising quality or food safety.

Key elements in proper fish handling

Gutting

It is important to remove the intestines from the catch because they contain bacterial flora and digestive tract fluids which cause body cells to breakdown after death.

Intestine removal is therefore a key step in prolonging product life and ensuring product quality. Extreme care should be taken when removing the intestines to avoid puncturing the gall bladder, as its contents can make the catch inedible.

Rinsing

Slime and blood contain proteins which can provide a fertile medium for enzyme activity and rapid bacterial growth. After gutting, thoroughly rinse the catch with either clean sea water or potable fresh water to remove any excess slime and blood from the exterior and interior catch surfaces.

Handling

During every stage of catch handling, avoid or minimize exposure to:

- Physical impacts, which may lead to external and/or internal muscle tissue damage or bleeding of the product flesh.
- Chemical impacts, such as exposure to oil, fuel, dust, chemicals etc.
- Biological impacts, from un-potable water, unclean surfaces and equipment, airborne germs, dust, debris, flies, insects, rodents and other pests.
- Thermal impacts from prolonged exposure to the sun and wind, and hot surfaces in close proximity to working machinery and lights.

Storage

It is important to arrange adequate storage space and conditions for the catch from harvest throughout every handling stage along the supply chain, until the catch reaches the consumer.

In most fishing boats, it is possible to incorporate a suitably sized fish hold, or a removable cooler box.

A fixed fish hold can be made in a boat using polyurethane foam (PU) or other insulation material, which is then covered by polyester resin coating, or RPG, (fiber glass). The catch storage area should be designed with dimensions that allow for unrestricted storage of the average catch length, height and width and the average catch volume, plus an additional 50 % space for ice application.

Once the catch is properly stored it will not move significantly even under adverse weather conditions during a fishing trip, which moreover prevents any additional physical impact.

Chilling

The chilling process should be initiated immediately after the catch has been caught or harvested, gutted and cleaned.

It is important to slow down the growth rate of any bacteria and enzyme reactions by rapidly cleaning and lowering the temperature of the catch, using ice.

Chilling is achieved either by direct icing or by use of chilled sea water (CSW), which is a mixture of ice and pure sea water. Direct icing is more convenient for large specimens. Smaller sized catch like sardines, scads, etc., are often caught in larger catch volumes and are more conveniently chilled using CSW, as it is impractical to gut and clean each individual fish.

Depending on the catch size, thickness and fat content of the flesh, the temperature should be reduced rapidly from the prevailing sea water temperature to approximately 0 °C in a matter of minutes. The catch temperature should reach 0 °C within 30 minutes when exposed to CSW.

It is important to replenish ice in both chilling systems to compensate for ice melt.

Photo series



The cleaned stomach cavity of a gutted fish.

Fish are normally covered in slime and blood after gutting, which must be rinsed off prior to storage.

This fish has been prepared for storage by inserting ice chunks inside the stomach cavity, to speed up temperature decline of the flesh.



Proper storage of rinsed and gutted catch.

Ensure that the body is straight when stored. For direct icing, place approximately 30 mm of ice on the bottom of the storage box, and fill the stomach cavity with ice before stowing the catch. There should be 30 mm of ice around the box sides and a minimum of 60 mm of ice on top of the catch.