Manual on Good Practices to Improve the Marine Products from the Subsistence Fishery Sector in the Asia Pacific Region

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Manual on Good Practices to Improve the Supply Chain of Marine Products from the Subsistence Fishery sector in the Asia Pacific Region

Oceans and Fisheries Working Group

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Foreword

Small-scale fisheries are highly dynamic, labour intensive and usually not integrated with local marketing arrangements. Small-scale fishers, their families and communities are critically dependent on fish for their food and livelihood security and are extremely vulnerable to external pressures and shocks.

Products originating from subsistence or small-scale fisheries require good handling practices along the supply chain, since up to 30% of the catch in some cases, is lost due to poor handling practices.

Therefore, proper management and efficiency throughout the core of the supply chain can increase the economic growth of the fishery communities, open new job positions for women and strengthen food security; consequently, we will need fewer marine resources contributing to the conservation of the fish stock.

The aim of this manual is to facilitate the improvement of the catch condition of subsistence fishers (aiming at food security) by reducing economic losses and overfishing by the deterioration of fish products that were not properly handled, achieving that consumers receive high-quality products.

A Stakeholders Workshop of APEC Economies took place in Lima, Peru from the 1 to 4 May 2016, with the aim of deciding the contents and format of this publication.

The workshop recommended that:

- The target audience would be the subsistence fisheries segment.
- The key topic would be the application of good fish handling principles to catching, landing and transport to the 1st point of sale.
- The contents do no aim to set the final level for subsistence Fishers, just the initial level.
- Each economy will be free to add up and transform what they require to adapt it to their needs.
- The manual will be delivered to the fisherfolk via the extension offices or the authorities.
- The manual will be delivered in draft pdf for guidance and as an “InDesign” software file bundle as to be easily translated, adapted and printed by the different APEC economies
- The economies can add Chapters, but hopefully, maintain the present minimal content.
- As the “target” audience may have little formal education, the way to engage them is via “cartoon” type illustrations and an informal language to present the key messages in the text.
- The “cartoon” part is to be based on a fishers’ “family” setting and with examples of good and bad practices.
- Illustrations would be in black and white to facilitate printing, and also to be used as “colouring book” by the children in the fishers’ households.
- Fish Handling message would be presented under four simple pillars:
  
  - Keep it clean
  - Keep it cold
  - Treat it gently
  - Move it fast


How to use this manual

The manual is intended for use as a training aid to help introduce and explain post-harvest fishing topics to subsistence fishermen and others actors in the coastal fisheries value chain. To support this aim, the manual presents as much information as possible in a visual form, for the benefit of fisherfolk whose literacy may be limited. For the same reason, the text has been kept as simple and non-technical as possible.

In compiling this manual, we have split the many interwoven aspects of post-harvest and fishing into a series of individual topics. Each covered in “chapters” intended to convey the information and practices relevant to that particular subject. We have tried to be comprehensive in the coverage of each topic.

Since there is a vast variety of fishers cultures and practices among the APEC membership, we tried to present the range of options or opinions on subjects.

The manual has a structure of separate but consecutive chapters, as to allow for training delivery in an integral programme or by chapters.

Each chapter has guiding text to be used as “aide memoir” by trainers and illustrations for each concept, as to convey the message without relying only on written words.

Chapter 1 deals with the basics of good fish handling and is general to all other chapters
Chapter 2 deals with good fish handling at the time of capture and harvesting.
Chapter 3 deals with good fish handling at the landing.
Chapter 4 deals with good fish handling during transport.
Chapter 5 deals with good fish handling at point of sale and the prior importance of these practices
Chapter 6 deals with very basics of traceability at all stages
Chapter 7 deals with the very basics of the importance of the ecosystems approach to fishing.

The pages of each chapter present the contents in a “graphic narrative” with the key concepts of the chapter supported by minimal text and examples of common good and bad practices.

The illustrations are based on a fisherfolk family along with different “characters’ representing fish, bacteria and enzymes. The fisher guides the explanations to his family and colleagues along the manual.

The illustrations are in black and white to facilitate printing, but also to be used as “colouring book” and encourage the children in the fishing families to keep the manual in their households.

Predictably, it has proven impossible to avoid overlap altogether. However, we hope that the cross-references in the text will enable trainers and trainees to follow a given theme through the manual, independently of the mode and time of training delivery.

Disclaimer

Reference to persons in any particular gender is understood to include persons of the opposite gender unless otherwise stated, or made explicit by the context.
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As the fisherman pulled in his catch, his children ran up to him. “Dad, Dad, can you tell us about the most important things about catching fish?”
There are 4 important rules about fish handling.

I'll tell you about them, and how these apply to catching, landing, transporting and selling fish.
The 4 Rules of Fish Handling

As soon as the fish dies, it begins to break down and rot

What makes it rot is **Bacteria** that starts to multiply in minutes and start eating the fish and spreading around

And there is the **Enzymes**, which also make the fish rot. They normally break down the food in the fish’s stomach, but they start breaking down the fish instead once it’s dead
The best way to slow down Bacteria and Enzymes, is by making them feel cold.

As soon as you catch the fish, the initial rule is to **KEEP IT COLD** as quick as possible otherwise it will start to break-down very fast.

Ice well the fish or store it in a cold place to reduce the bacteria’s multiplication and the enzyme’s activity.
The colder the fish, the longer it will stay fresh and the fresher it will taste

Can you recover the good quality of the fish once is warm by putting it in ice?

“Unfortunately not, once they are spoiled, nothing makes them better again”
The next rule is to keep **EVERYTHING CLEAN**

“Everything the fish touches, including people, must be kept very clean. Your boat, fishing gear, equipment and even the fishers”

“The cleaner the boat, the fish baskets and bins, the cleaner the ice and the fishers, the longer the fish will stay fresh and the fresher it will taste”

Make sure that the fuel and oil don’t mess up the boat and ruin the fish
The most important rule of cleaning: We cannot clean with dirty stuff!

Use clean water for washing and keep everything clean. Use brush, detergent and desinfectant if it possible.

Use clean ice in clean fish containers and keep it iced.

Don’t wash the fish in dirty seawater, and don’t keep it in dirty places.
We need to make sure that

Also all the fish guts, bait and rotting fish must be keep as far away as possible from fresh fish, to avoid cross-contamination

And you must be clean and on good health to work with fish, otherwise you'll infect the fish and make people sick

Insects, pests, domestic animals and birds can also infect you or the fish, and make people sick. So we have to keep them away from fresh fish
The next rule we must remember is to **BE GENTLE** with the fish

If you’re a good fisher, you should treat your fish with respect and care from catching to selling.
The fourth rule to remember is to ‘BE QUICK’

To avoid bacteria and enzymes damaging the fish, ice it and transport it quickly.

If you’re low on ice, you need to transport it quickly.
If you can’t be quick you’ll need lots of ice.

Make sure that you don’t leave the fish untended for longer that strictly necessary.
Make sure that the transporter does not ruin the fish by not icing it or leaving it for long time in the truck.
Catching the Fish
Chapter 2

“It doesn’t matter how you catch fish, the 4 Rules of Fish Handling always apply”

It could be fishing from a boat somewhere, spearfishing or from the shore. Lets see how they work in different situations
“Can you remember the rules?”

Keep it Clean

Move it Fast

Treat it Gentle

Keep it Cold
“How to keep your boat CLEAN”

Keep the boat clean with clean water, a scrubbing brush and detergent/desinfectant mix.

Clean equipment means less bacteria and enzymes, and that means better fish.

“Separate bait or old fish from new fish” The bacteria in the old fish or bait will spoil the new fish if they’re together in the same place.

“Keep fuel away from your fish to avoid spoiling your catch” “Buyers will pay less money for fish smelling like fuel.”
Taking good care of your equipment

Keep a cleaning set, use it with clean seawater, scrubbing brush and detergent/desinfec tant mix

Once is well cleaned, drying it under sunlight is a good way to kill any remaining bacteria

If you run out of detergent, at least clean your stuff with clean seawater, and a clean scrubbing brush

Make sure your containers are well maintained and adequate for the fish you catch
Fish kept in the bottom of the boat can cause a number of problems

- Spikes and teeth of thrashing fish can cause you injury.
- Slime and blood from fish makes the boat slippery and dangerous.
- Thrashing fish hit themselves against frames or hard items, cutting, bruising and lowering the quality of the fish.
- Any dirty or contaminated things your handle risk falling on good fresh fish and ruining it.
How to keep your fish COOL onboard

The fish needs to “feel” cold when you touch it

Try to have as much ice as fish you are trying to catch

The best way to carry ice is in an insulated container

Plastic Chiller Bins work well in all types of boats, in big boats you can use old fridges or chest freezers, but they are more dangerous to handle, harder to clean and rust away very quickly
The cooler you keep your fish the longer it will last

But not all icing works the same

Flake or small ice is best. The small pieces to surround the fish closer, so it’s better cooled

You can smash the big pieces of ice into smallers inside a bag to avoid loosing ice and making it dirty

Big blocks of ice don’t cool as well ones and damage the fish

Reusing old dirty ice is not a good idea as it contaminates the “new” fish
Layer the fish and the ice, so there is always ice on top and below the fish. If the top layer has melted or the ice shifted, repack the fish.

**Good Icing practices**

**What can be done if you have no access to ice?**

- Get the guts and gills out and rinse it well in clean seawater.
- Store the fish in shaded area of the boat away from the sun.
- If the fish are too big, put a clean thick wet cloth over them and keep it wet.
Be GENTLE with the fish in the boat

Don’t gaff the fish on the body.
Don’t stand on the fish.
Don’t squash the fish under heavy objects

Be QUICK moving the fish out of the boat
The less time bacteria and enzymes have, the better the catch will be.
If you cannot be cold with fish, then definitely be quick!

Don’t leave the fish unattended on the deck of the boat for too long.
Unload the fish as quick as possible after fishing.
Many fishers catch other species, but do it from the shore. The 4 rules apply to them too and what they’re catching.

**Prawns and Shrimp**
Can spoil quickly and loose their fluids, which reduces their value and flavour

- **Be Quick and Keep Cool**
  Cool them down quickly with ice because prawns spoil quickly

- **Be Gentle**
  Because they damage easily and loose value. Broken ones spoil faster

- **Be Clean**
  The cleaner the ice and the containers the longer and fresher they will last

**Lobsters**
Lobsters have more value when alive, putting them in ice will kill them, but is important to keep them cool and hydrated

- **Keep them Cool**
  By wrapping them into a tight damp cloth
Many fishers catch other species, but do it from the shore. The 4 rules apply to them too and what they’re catching.

**Octopus**
Are very delicate because they don’t have a rigid bony skeleton

**Be Gentle**
Minimise physical damage, the skin breaks easily

**Be Clean**
When your gut it, clean it and cut it

**Keep Cold**
Once dead keep it iced as they spoil fast

**Shellfish**
Harvest only come from clean places. If the water smell foul is better for you to cook them, and don’t eat them raw

**Be Clean**
Don’t harvest after big rains if cattle is nearby

**Be Gentle**
Don’t throw them. They should be alive

**Keep Cold**
Keep them in a damp place without sunlight
Landing the Fish
Chapter 3

It doesn’t matter where or when you unload your fish, the 4 rules are important:

- **Keep it Clean**
- **Move it Fast**
- **Keep it Cold**
- **Treat it Gentle**
**Best Practices**

Landing should only commence once all the equipment and people are ready.

Unload the catch quickly to avoid the fish sitting out in the heat. Avoid the hottest part of the day.

*Be Quick and Keep Cool*

Don’t leave your fish in the onboard storage any longer than necessary. If you need to leave it longer, check it regularly and add more ice if needed. Unload the fish box and then transfer the fish later into the next iced place.
Here is where you depart from your hard caught fish, so make sure that the people receiving it respect the 4 rules

Be Gentle and Keep it Clean
Good cleaning of everything, including fish boxes is vital after use. Rinse, scrub with detergent/desinfectant and rinse well with fresh water before adding fish or ice.

Keep it Clean
Ensure that there are no insects, pests, domestic animals in the landing site. And if they are, make sure that they don’t get to the fish or come to the boat.
With the transport, you also need to be clean, cold, gentle and fast, just like when catching and landing fish!

- **Keep it Clean**
- **Move it Fast**
- **Keep it Cold**
- **Treat it Gentle**
**Keep it Clean**

Good cleaning of everything that touches the fish is really important. Rinse, scrub with detergent/desinfectant and rinse well with fresh water before loading fish or ice.

**Keep it Cold**

Ice the fish like if it was in a boat to avoid temperature fluctuations. This is especially important if the fish is in transport for a long time.
Treat it Gentle
If the truck is open all the fish should covered or in boxes and the load tied up.
Drive slowly if the roads are bumpy to avoid damaging the fish

Move it fast
You should not be driving faster than allowed! But don’t waste time either!
Here is where the effort that you have done so far with the 4 rules will pay back, as you have good fish to sell.
Cleanliness from catching the fish through to selling, avoids unnecessary bacterial contamination and keeps the fish smelling fresher for a better price.

Keeping the fish cold from catching through to selling, slows the bacterial and enzymes activity, keeping the fish fresher for a better price.
People don’t like buying warm fish from messy and smelly fish stalls

People like fresh looking fish from nicely organised fish stalls.
Traceability of the Fish
Chapter 6

No one really likes paper work...

But is important to keep record of what and how much your caught, to whom you sold it.

Or what fish you brought, from whom, how it was stored and who and when you sold the fish to.

Records could protect you from being short paid. Giving you the ability to identify what fish people brought and who supplied you.

If someone the accuses you of doing something wrong, you can prove you didn’t do it.

<table>
<thead>
<tr>
<th>Who caught that fish?</th>
<th>Where it was caught?</th>
<th>When was it caught?</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Fish on boat" /></td>
<td><img src="image" alt="Location" /></td>
<td><img src="image" alt="Clock" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Was iced and how long was it stored?</th>
<th>When and where was it landed?</th>
<th>Quality and temperature when landed?</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Ice chest" /></td>
<td><img src="image" alt="Landing site" /></td>
<td><img src="image" alt="Thumbs up" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Who transported it and to where?</th>
<th>Quality and temperature when delivered?</th>
<th>Who bought it and then sold it?</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Van" /></td>
<td><img src="image" alt="Quality check" /></td>
<td><img src="image" alt="Store" /></td>
</tr>
</tbody>
</table>
Ecosystem - What fish to catch?
Chapter 7

*Is important to understand the life cycles of fish.*

We need to ensure that we have fish next year, so we may need to throw the smaller fish back into the water alive, so they can grow up and reproduce. We can keep the big ones that have already reproduced.

If we don’t take care, we can get to overfishing, which is a situation where we catch too much fish and such fast pace than they cannot naturally replenish. Otherwise, we take out more fish than the fish can naturally reproduce.

Fishermen want to make a living by catching and selling fish, as do the fish sellers. Consumers want to eat fish, but also want to preserve the ecosystem, which in turn wants to sustain itself.

If everyone takes care only of their interests and ignores everyone else, then no one wins, and we all lose.

Only by knowing the facts about when and how much fish we can take out of the sea and still have enough left to sustain the fish population, we all will have fish in the future for our families.
Notes