Sustainable use of Marine Resources

What is this Action Sheet about?

This Action Sheet is about the changes people can make to manage fish populations in a more 'sustainable' way. 'Sustainable' simply means using a natural resource wisely, so that future generations can go on benefiting from it. It's not a new concept. Indeed, it is considered traditional in many cultures.

So what is the problem? The problem is that fish stocks all over the world are declining, either because they been managed badly or have not been managed at all[1].

Why is it hard to manage fish?

The tragedy of the commons

The sea is usually a common resource for coastal fishers, used by everyone. If all fishers take as much as they can, regardless of the number of fish there are, the fish will become overexploited. This is known as the 'tragedy of the commons'.

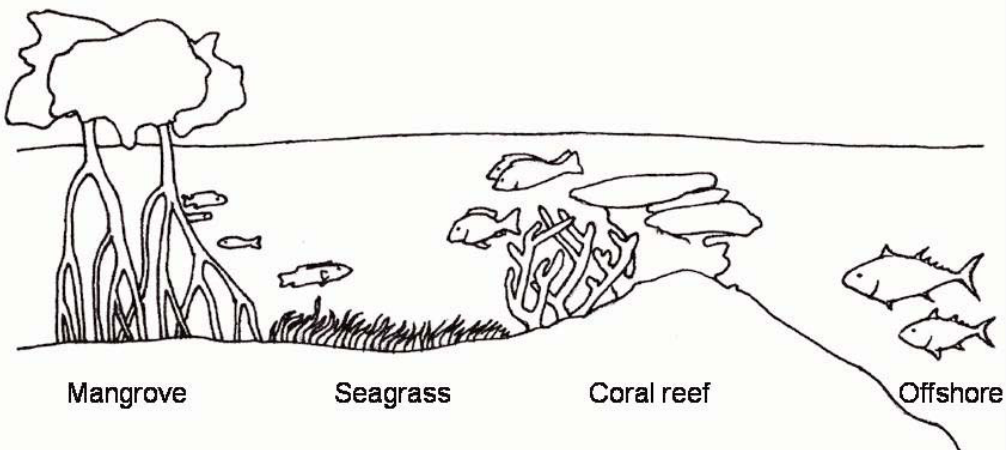
As human populations increase, more and more people are trying to catch a limited number of fish. Fishing gear is also becoming more efficient, enabling people to catch more fish with less effort. In order for fish populations to withstand or recover from such high levels of fishing, people must work together; otherwise the fish that one person conserves today may be caught by someone else tomorrow.

Healthy fish populations need healthy habitat

In order to maintain healthy fish populations, the needs of the fish themselves must be considered and provided for.

Organisms in the sea often depend on several different habitats for food and shelter in the course of their lifecycle[2]. Many species of fish start their lives in sheltered mangrove forests or seagrass beds (so-called 'nursery' grounds) and later move to the coral reefs or the open ocean.

This means that if one type of habitat is damaged e.g. mangroves, it is likely to affect organisms living in other habitats as well as the animals that depend on mangroves directly. Conversely, managing one habitat can help look after organisms found in others[2]. Marine habitats are all connected and need to be treated as different parts of the same puzzle.



Different tropical marine habitats that fish can move between

What can we do to help protect fish stocks?

Fishers are often in the sea everyday. By making some changes to fishing practices and everyday routines, small-scale fishers can minimise the damage caused to the marine environment, and help it nurture the fish they depend on.

DO NOT:

Use dynamite: This can yield high catches of fish in the short-term, but will prevent good catches in the future as it destroys the reef, which is made up of tiny animals and is an important source of food and shelter for many fish populations.

Use poison: Poisons like cyanide have a widespread impact on fish communities, affecting all the fish exposed to it, including young fish. Once the poison enters the food chain it can also affect humans.

Catch small-sized fish: These juveniles are the next generation of fish. Protecting them will help ensure there will be adult fish to catch in the future.

Use destructive fishing techniques: Dragging beach seine nets over seagrass and coral will damage them. Driving fish into fishing nets by beating coral also destroys important reef habitat. These techniques should be banned or restricted to certain areas *(see Action Sheet 71: Marine Protected Areas).*

Cause unnecessary habitat destruction: For example, walking on the reefs will break and kill coral. Swim round coral wherever possible. Where walking on the reef is unavoidable, step on dead coral or rubble instead of live coral.

DO:

Use more sustainable methods: Choosing a larger mesh size for fishing nets and traps will reduce the number of young fish in a catch. Line fishing is a more sustainable method as you can choose to return smaller fish to the sea and it doesn't damage the marine habitat.

Avoid wasting edible fish: Drying, salting and smoking fish all prevent it from spoiling as quickly, so it can be stored and used later.

- *Salting:* Large containers, like those made as dustbins, can be used for salting. Make a few drainage holes in the bottom and place layers of fish and salt on top of each other until the container is full. Leave the fish in the bin for 2 or 3 days before taking it out for drying. Before eating the salted fish it has to be soaked in water for a minimum of 12 hours, changing the water at least twice[3].
- *Sun-drying:* Fish can be sun-dried on elevated racks made of chicken wire or woven reed mats mounted on poles erected on the ground. This protects the fish from animals and some insects, increases drainage of water away from the fish and reduces contamination from dust and dirt. Shade the racks to protect the fish from rain and heat direct from the sun. Fish needs to be dried outside for about a week[4].
- *Fish smoking:* Fish can be smoked in different ways, which vary in the amount of fuel and time they need. The Chorkor oven was developed in Ghana and appears to be fuel and time efficient[4,5].
- *Fresh fish handling:* Insulated fish containers can be made for storing live fish on boats to allow fishermen to make longer trips. Insulating containers can be constructed from locally available materials[6].

Monitor fishing methods and catches: The only way to know whether a resource is being used sustainably is to know how many fish there are now and how many there were before. Signs of overfishing are if fish catches or sizes are declining, or if some types of fish have disappeared. Are many different types of fish caught today compared with 10 years ago? If fish catches or sizes are declining, or if some types of fish have disappeared.

Establish protected areas or closed seasons: Providing a refuge where fish can mature and reproduce can help prevent fish stocks declining. See Action Sheet 71: Marine Protected Areas.

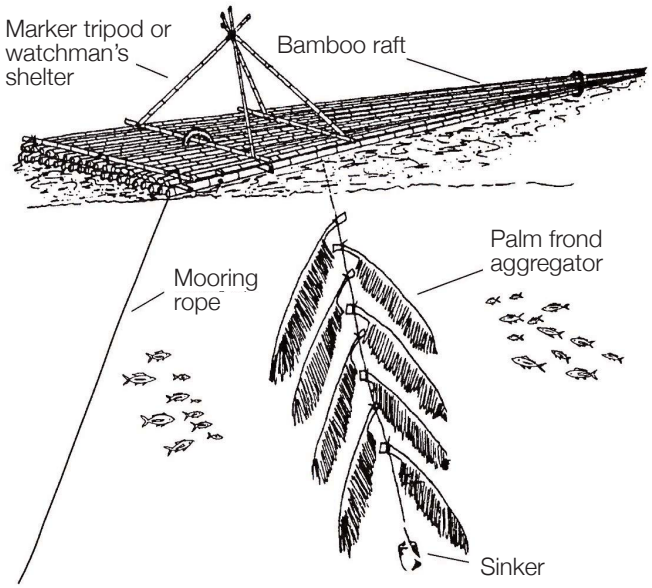
Women in West Africa smoking fish on a Chorkor oven. This image is reproduced with kind permission from the FAO (www.fao.org).

Manage resources in an integrated way: Many different types of people use and rely on the marine environment. These factors can all have negative effects where they are not managed. Coastal resources should ideally be managed to take all these uses into account.

Community action

In many African countries, fisher communities are now working with the government to help develop better management strategies. This is known as co-management. Even in the absence of a formal framework, forming local groups or fishing associations is often the first step to finding solutions. Groups of fishers have in some cases united to find funding for largerscale projects, such as:

- *Mariculture:* The practise of farming marine organisms is widespread, from algae to shrimps to fish. These can be fruitful when they are well-planned and where there is an export market.
- *Tourist activities:* Many local people benefit from the beauty and interest of their marine environment through tourist activities, for instance by building boardwalks through mangrove forests.
- *Fish aggregating devices:* FADs are physical structures that can be placed in the sea to attract fish to them. They can be simple structures anchored in shallow water to attract smaller bait-fish, to be caught by line fishing *(see Figure 3 below)*. FADs can also be placed offshore to attract larger species such as tuna. These are usually funded by government bodies and other agencies as they require a large amount of capital to be set up, and motor boats and long-line equipment once they are in place[7].



A simple bamboo fish aggregating device (Image: South Pacific Commission Fish Aggregating Device (FAD) Manual7)

Acknowledgements

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6. UN Atlas of the Oceans: Fisheries and Aquaculture: handling. www.oceansatlas.org/servlet/CDSServlet?status=ND0xODE1JjY9ZW4mMzM9KiYzNz1rb3M~

7. Anderson J, Gates PD. South Pacific Commission Fish Aggregating Device (FAD) Manual. Volume 1: Planning FAD Programmes. www.spc.int/coastfish/Fishing/FAD1_E/Pages1-7FAD1English.pdf

For more information

Western Indian Ocean Marine Science Association (WIOMSA) has online fact sheets on many topics including FADs, tourism and fishing, www.wiomsa.org

Food and Agriculture Organisation (FAO), www.fao.org

- FAO telefood special fund gives grants (average $7,000) for community projects: website: www.fao.org/food/english/ email: telefood@fao.org
- Sustainable Fisheries Livelihoods Programme W. Africa. www.sflp.org/
- FAO Technical Publications are available at fi-library@fao.org

World Fish Center (previously ICLARM): produces a range of resources on fisheries www.worldfishcenter.org.

Secretariat for Eastern African Coastal Area Management (SEACAM), produces useful theme sheets www.coastalzones.gov.mz

Fisheries Management Science Programme provides guidelines, manuals and software: www.fmsp.org.uk/