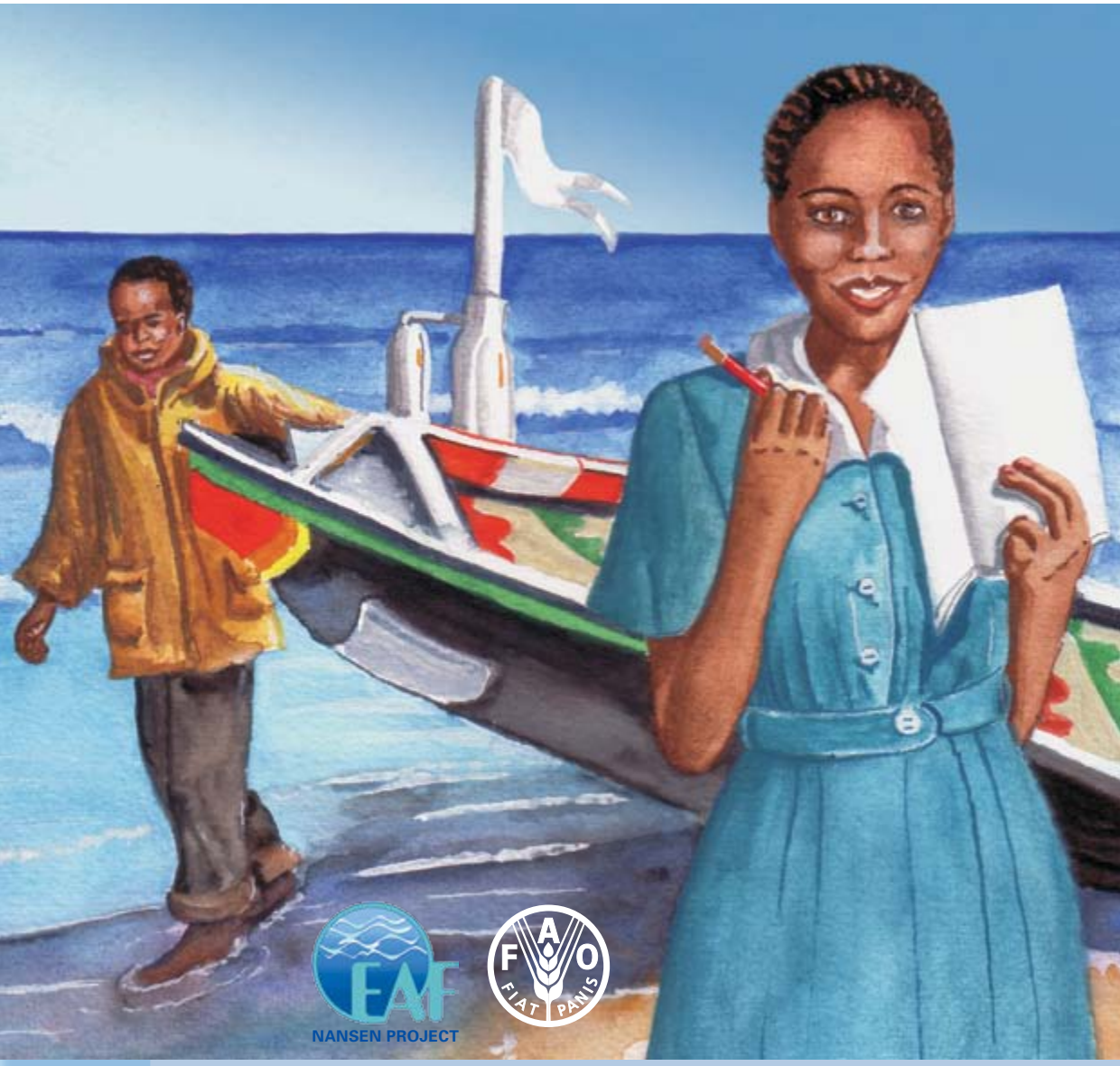
A teaching kit on the ecosystem approach to fisheries for schools in Africa

Pupil's Workbook



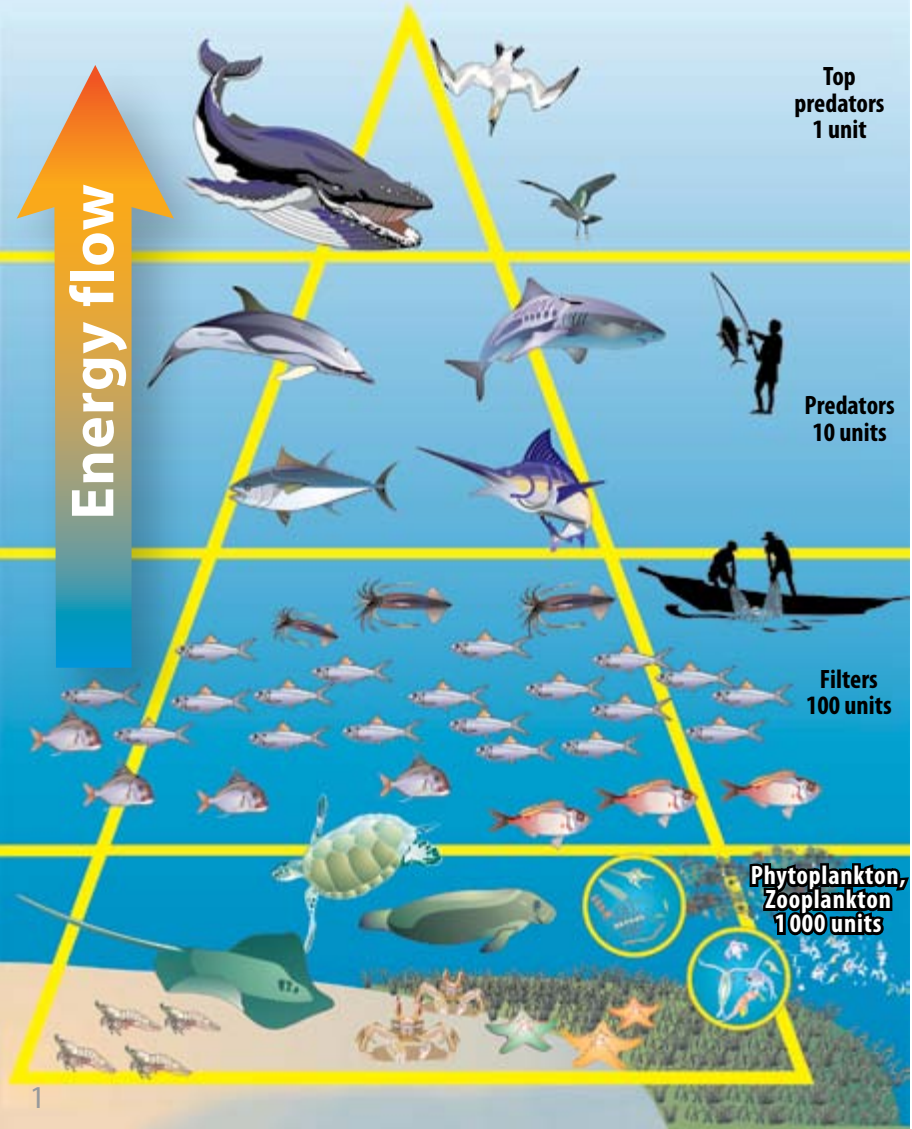
Pupil's name:

Hello, my name is Mansa. My father is a fisherman and my mother sells fish. One day I hope to become a marine biologist. In this workbook, I will share with you some of the things I have learnt about marine ecosystems and the ecosystem approach to fisheries.

Basics of marine ecosystems

An ecosystem (short for "ecological system") is made up of all the living things (e.g. plants, animals, micro-organisms) in a given place interacting with each other and their non-living environment (e.g. water, oxygen, climate, minerals). The tropic pyramid below illustrates how a marine ecosystem maintains itself and its individual parts.

The trophic pyramid

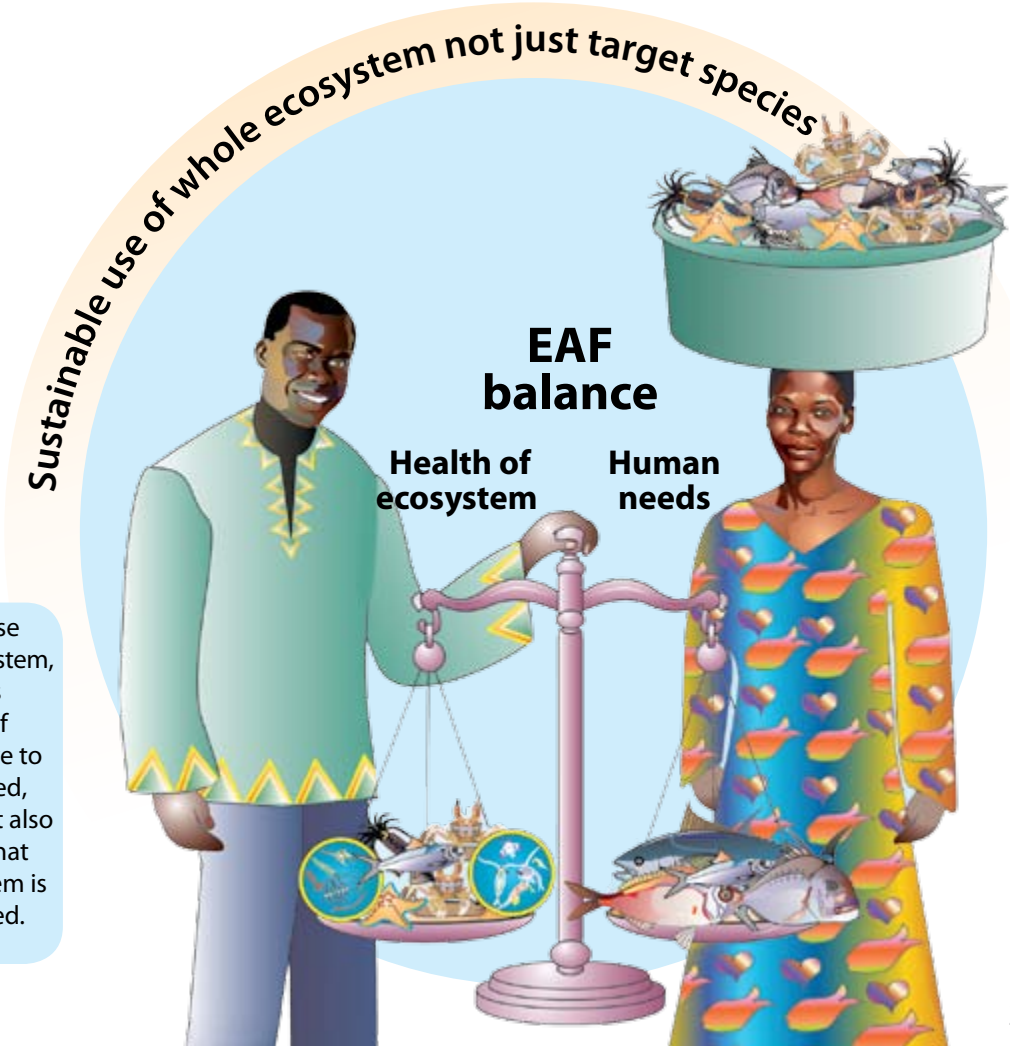


In an ecosystem, each organism has a role to play. If any part is changed (made bigger, or smaller, taken away or added to) other parts will change and the way the ecosystem works will also change.

Human beings are an important part of the marine ecosystem. Human activities, such as fishing – especially with fishing gears that reduce the numbers of mammals and certain fish species – can harm the marine ecosystem.

The ecosystem approach to fisheries (EAF)

The ecosystem approach to fisheries (EAF) helps to plan, develop and manage fisheries to meet the needs of people today and in the future. EAF is also about finding a balance between the health of the ecological system and the benefit that humans get from it.

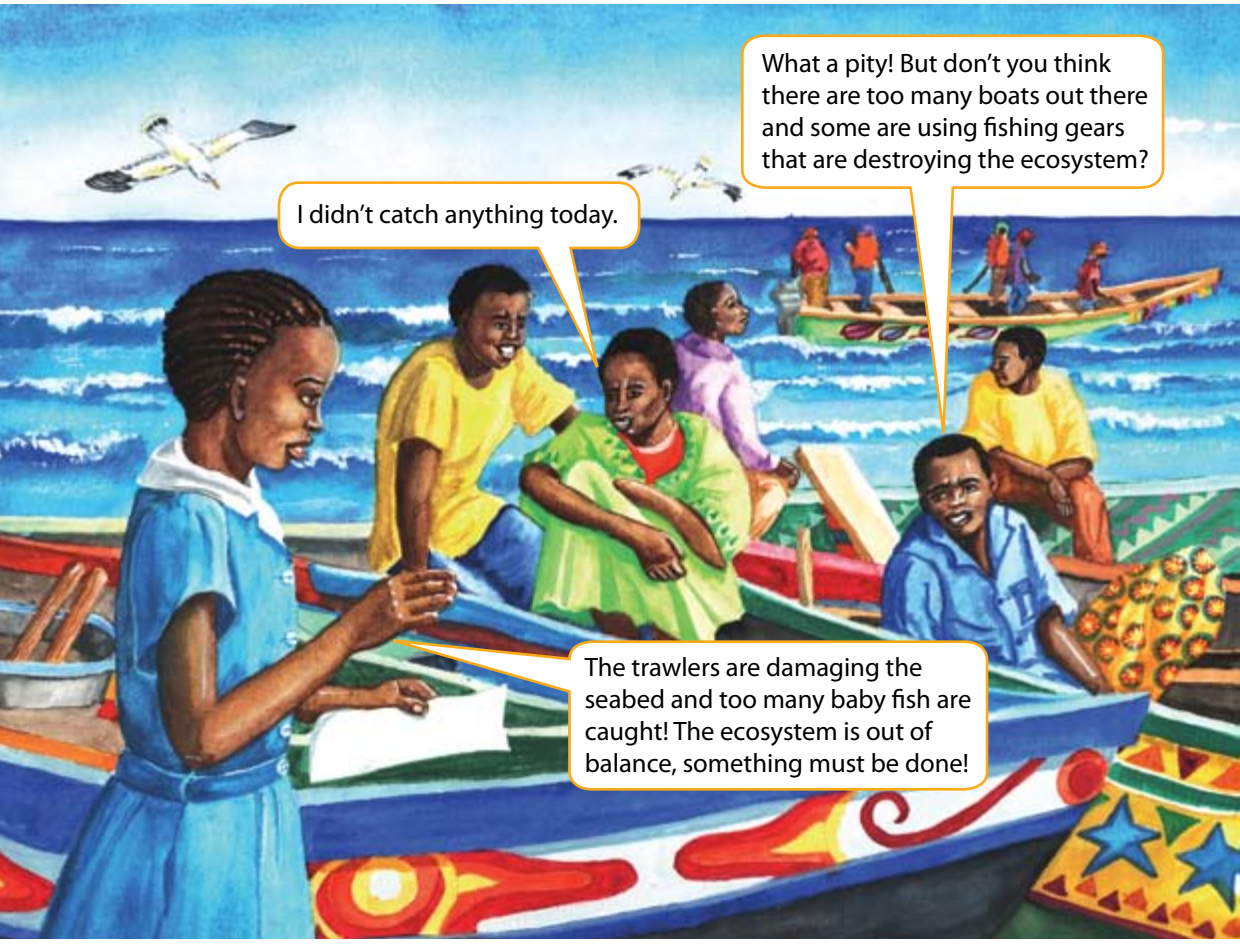


In making use of the ecosystem, the interests and needs of humans have to be considered, but we must also make sure that the ecosystem is not destroyed.

I would like to tell you what I have learnt about the five key principles of EAF.

1 Ecosystem integrity

This is a measure of the ecosystem and the ability of its different parts to work together. Changing any part of the ecosystem will change the way it works. For example, if humans take too many plants and animals out of the sea, they can seriously affect the integrity of the ecosystem.

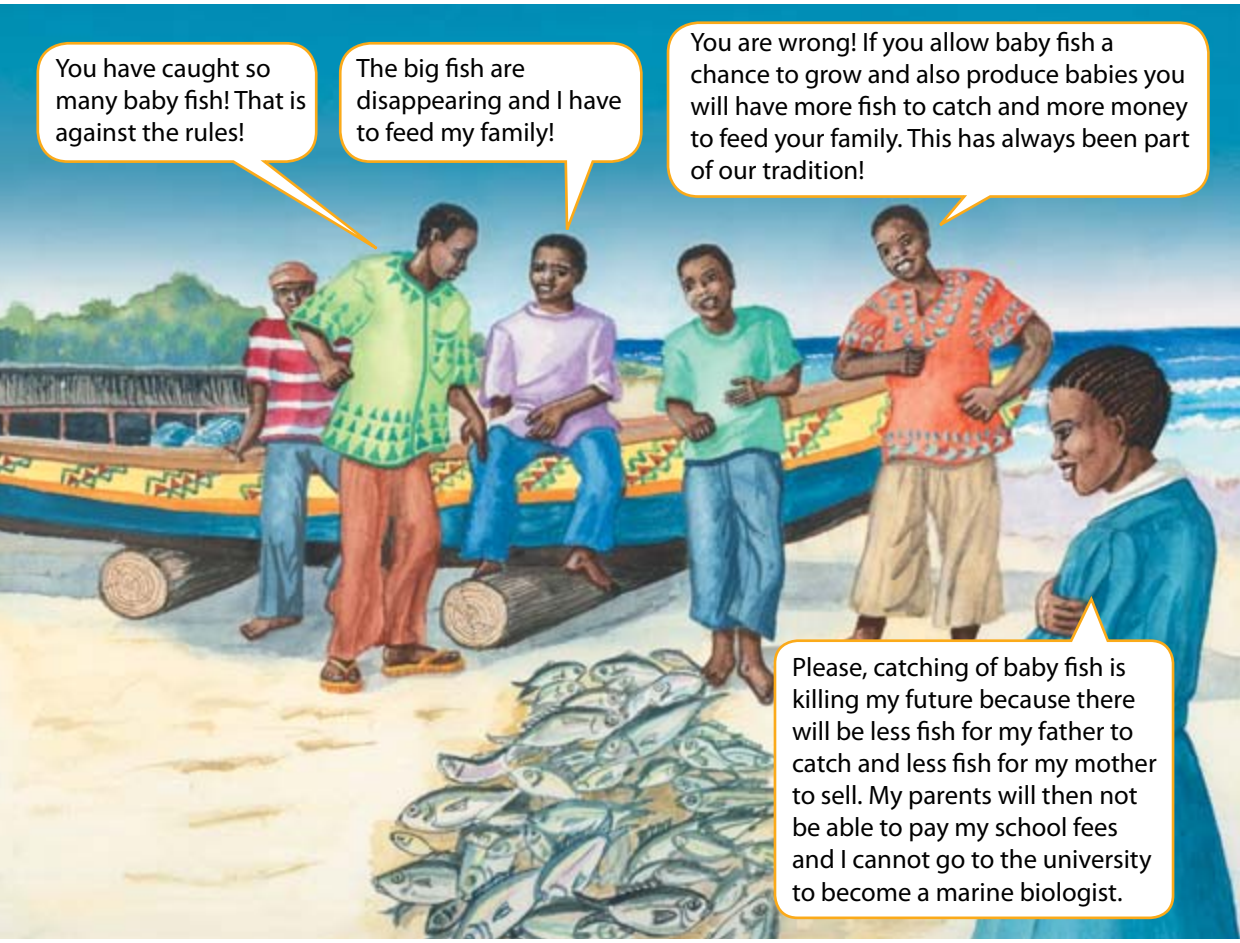


Understand the different parts of the marine ecosystem and the way they work together. Discuss the following questions and write your answers in the space provided at the back of your workbook:

1. What happens to the animals and plants when a trawler drags a heavy net through the food chain?
2. What happens when artisanal canoes or industrial fishing vessels catch lots of small fishes like sardines or sardinellas which are the food of big fishes and seabirds?
3. What happens to the food chain when fishers use methods that catch most of the big fishes?
4. What happens to the food chain when some fishers use explosives (like dynamite) that kill lots of fish and destroy the valuable habitat or living space for fishes and other marine organisms? Also think about the danger to the life of the fishers.
5. How can you promote the reduction of damage to non-target species or to the ecosystem?

2 Precautionary approach and respect for rules

Something must be done to save the fish and their environment even if we do not have full scientific knowledge. The right measures to prevent permanent or serious environmental damage and overfishing must be applied. For example we must avoid catching baby fish. A baby fish is one that has not had the chance to reproduce (have babies) at least once.

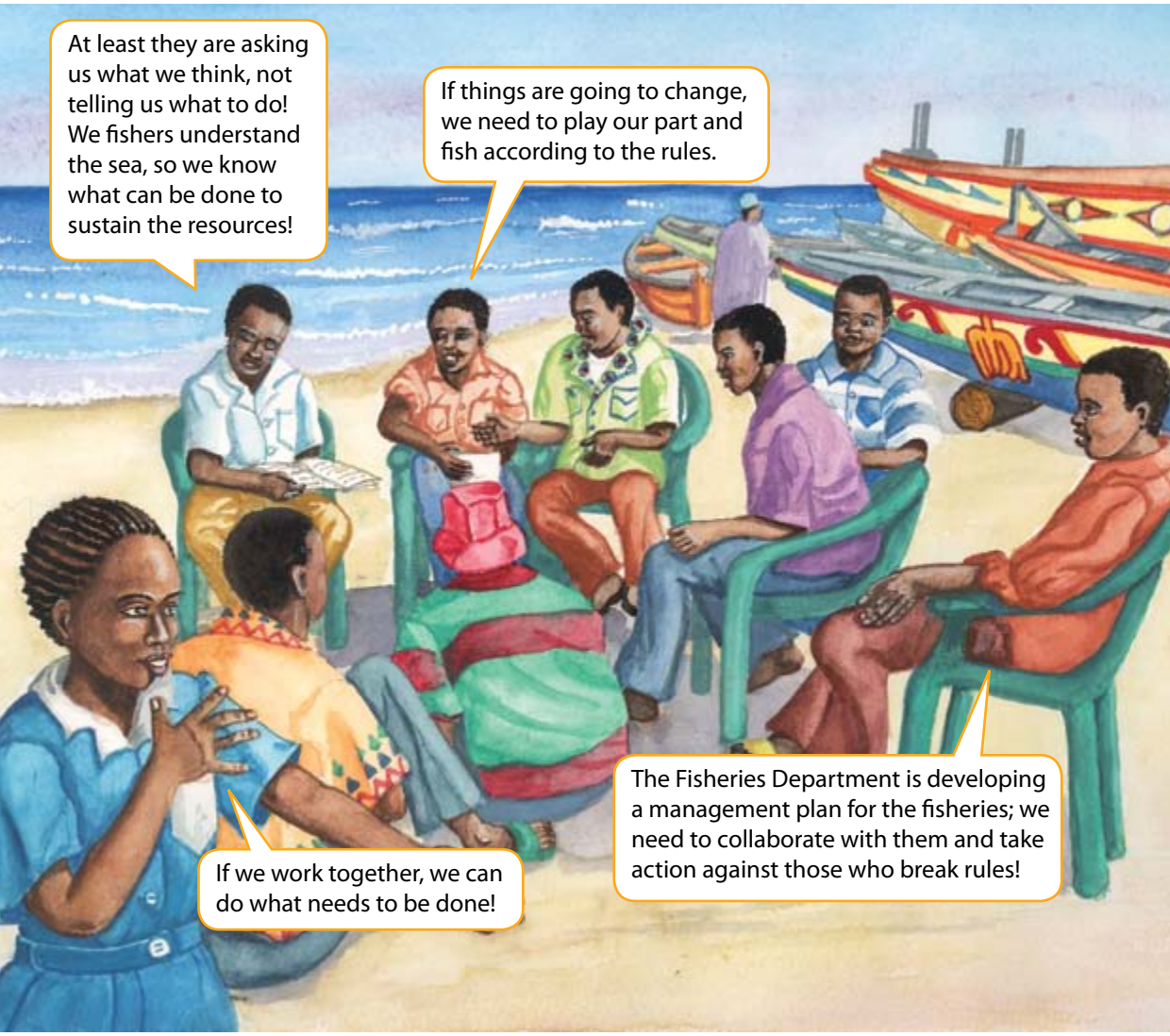


Understand the difference between good and bad fishing practices and their effects on the ecosystem. Study and discuss the two pictures in the EAF-Nansen poster. Then answer the following questions and write your answers in the space provided at the back of your workbook:

1. What does the seabed look like on each side?
2. What kind of boats are there?
3. What human activities are there?

3 Broadening stakeholder participation in the management of natural resources

Rules are most effective when the people who are expected to follow them have an opportunity to discuss them, understand them and agree to follow them. For example, fishers and fishing communities should play an important part in drawing up the rules that affect the type and amount of fish they are allowed to catch; the times that they can catch them; and areas in which they are allowed to fish.



Listen to a Fisheries Officer's experience.

Invite an officer from the local office of the Fisheries Department and interview him/her.

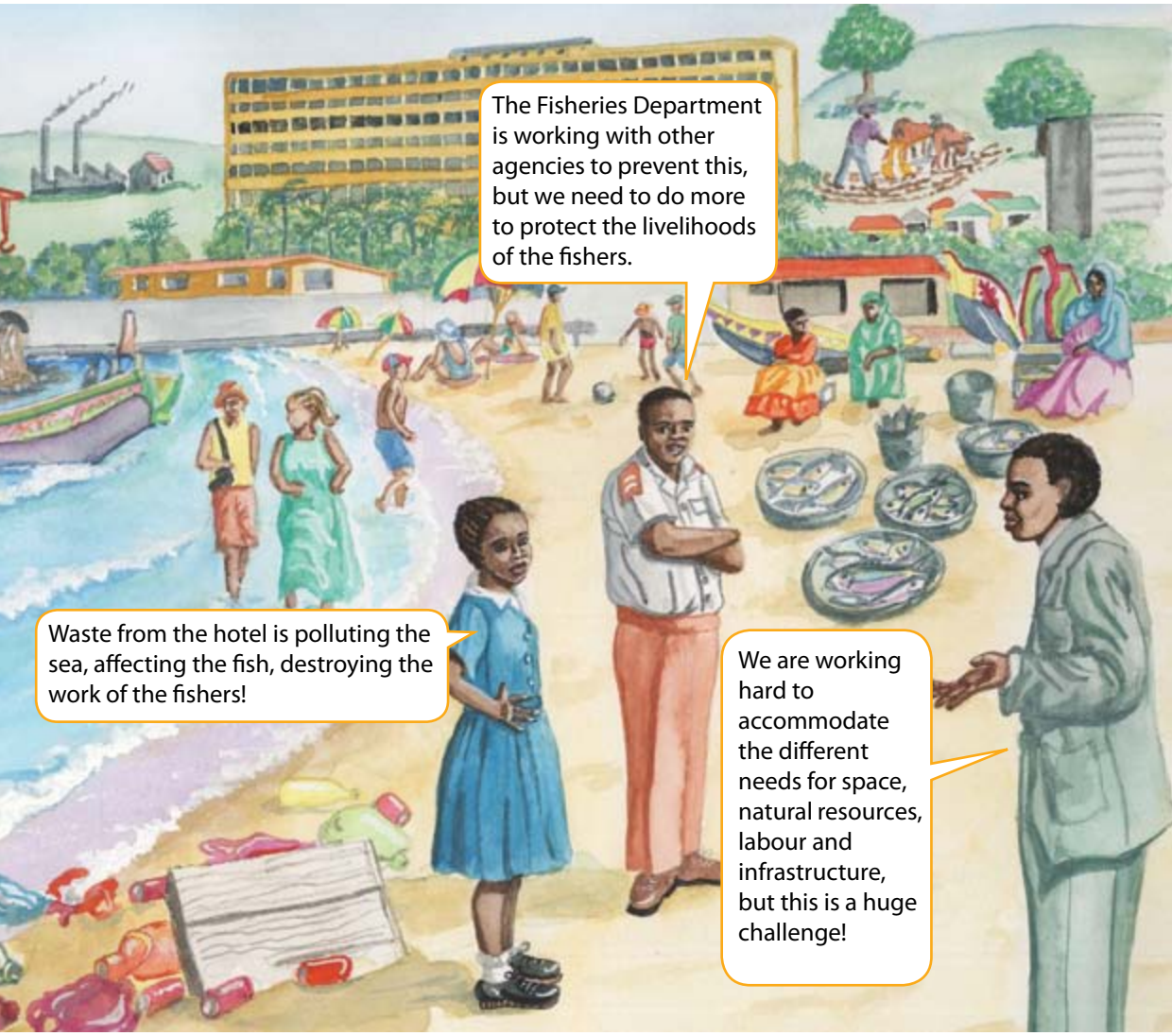
What does the Department do? What are the tasks of the officer?

What are the major difficulties in the Department's work to protect the marine ecosystem and how does the Department try to overcome them?

Write down what you have learnt from the Fisheries Officer in the space provided at the back of your workbook.

4 Promoting sectoral integration and safeguarding livelihoods

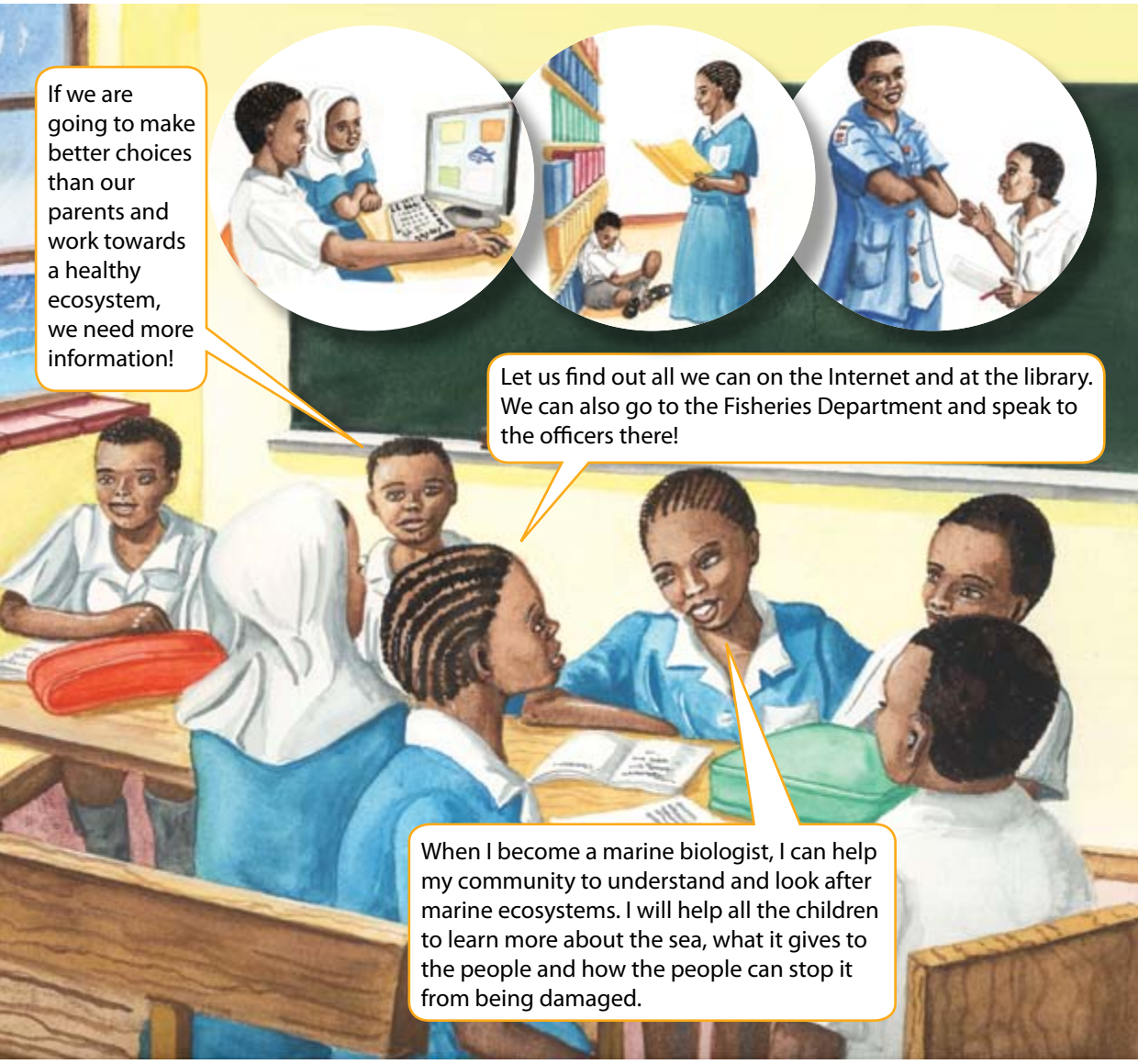
In an ecosystem approach to fisheries, the fisheries management agency and other agencies that look after activities that have an impact on fisheries, or are affected by fisheries, have to talk to each other, work together and make decisions together. For example, if big hotels near the coast are not careful about the way they operate, they can pollute or damage the marine environment and cause fishers to lose their livelihoods.



Discuss the ways in which the authorities could take action to protect the marine ecosystem.
Write an essay describing what you would do if you were the president of your country.
What would you like your country to be like in the future?
What rules would you establish so that people act correctly to maintain a healthy ecosystem?

5 Improve research and access to information for conservation and management

The ecosystem approach to fisheries helps to identify the information that is most important for managing a fishery, and helps the authorities to decide how much time, effort and money to put into gathering this information. For example, it can help to decide how to gather information about an artisanal fishery and an industrial fishery.

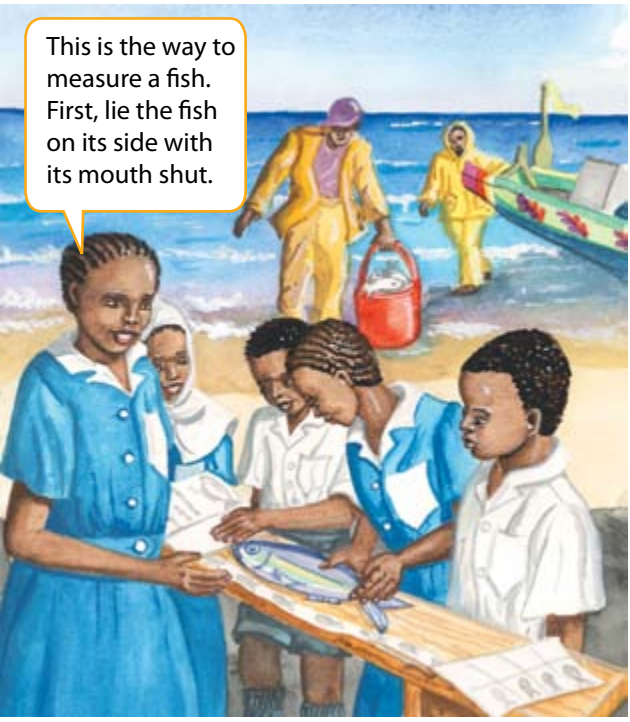


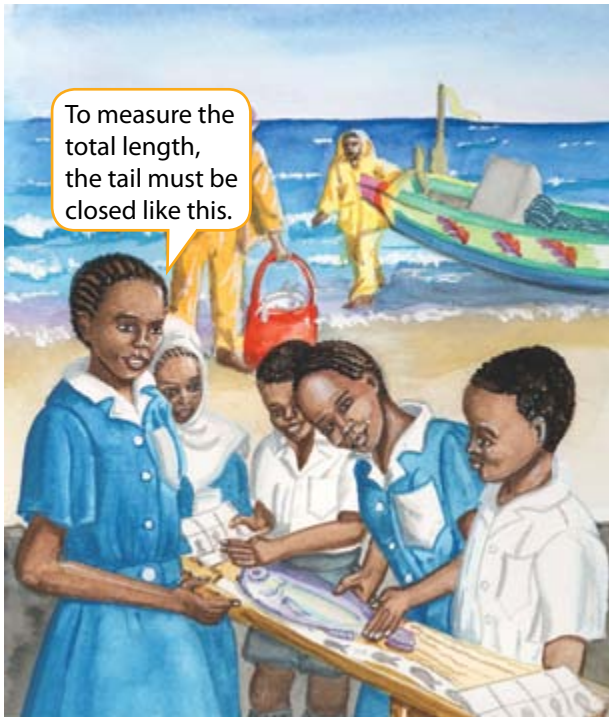
Use modern communication tools to get more information. If it is available to you, the Internet offers a variety of information about marine research. For example, check the following :

- EAF-Nansen project website
- Websites of marine research institutions
- FAO Fish Finder project website
- YouTube (videos)
- Website of the local Fisheries Department

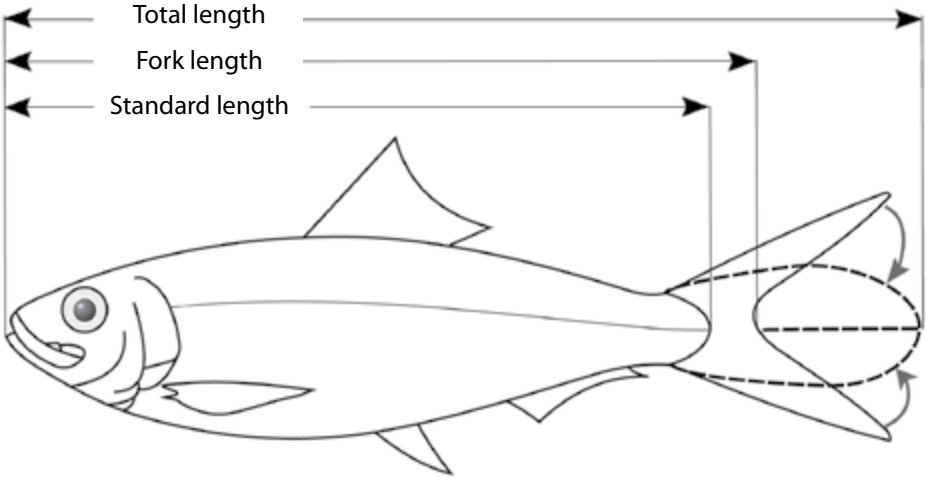
Field work at the landing site

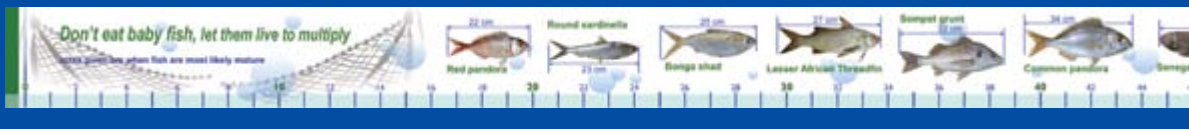
Let us visit a landing site near our school and find out more about fishing and the fishes.





A. Measurement must be taken with the fish lying on its side and the mouth shut.
B. For measurement of total length, the tail must be closed as shown.





Fish species on the fish ruler

Scientific name: *Sardinella aurita*
Common English name: Round sardinella
Common French name: Sardinelle ronde
Local names: Yaboi mereg (Wolof);
Yai Boyoo (Mandinka)

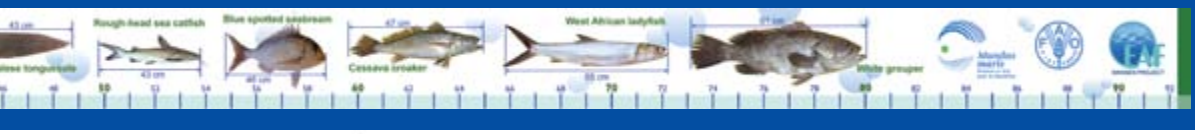
Scientific name: *Ethmalosa fimbriata*
Common English name: Bonga shada
Common French name: Ethmalose d'Afrique
Local names: Kobeu (Wolof);
Chaalo (Mandinka)

Scientific name: *Galeoides decadactylus*
Common English name: Lesser African threadfin
Common French name: Petit capitaine
Local names: Cekéém, Thiekem (Wolof)

Scientific name: *Pomadasys jubelini*
Common English name: Sompat grunt
Common French name: Grondeur sompat
Local names: Koron xadr (Wolof); Krodoz (Mandinka)

Scientific name: *Pagellus bellottii*
Common English name: Red pandora
Common French name: Pageot à tache rouge
Local names: Doctor (Mandinka)

Scientific name: *Pagellus erythrinus*
Common English name: Common pandora
Common French name: Pageot commun
Local names: Yuufuuf, Tikki (Wolof);
Doctor (Mandinka)



Scientific name: *Pagrus caeruleostictus*
Common English name: Bluespotted seabream
Common French name: Pagre à points bleus
Local names: Warange (Wolof);
Nyarr Nyee (Mandinka)

Scientific name: *Cynoglossus senegalensis*
Common English name: Senegalese tonguesole
Common French name: Sole-langue sénégalaise

Scientific name: *Arius latiscutatus*
Common English name: Rough-head sea catfish
Common French name: Mâchoiron de Gambie
Local names: Kunkelengo (Mandinka);
Kongh (Wolof)

Scientific name: *Pseudotolithus senegalensis*
Common English name: Cassava croaker
Common French name: Otolithe sénégalais
Local names: Feute (Wolof); Sindo (Mandinka)

Scientific name: *Epinephelus aeneuss*
Common English name: White grouper
Common French name: Mérou blanc
Local names: Thiof (Wolof);
Choo-foo (Mandinka)

Scientific name: *Elops lacerta*
Common English name: West African ladyfish
Common French name: Banane,
Guinée d'Afriqe occidentale
Local names: Salan-ngo (Mandinka)

Fish measurement table

	Type of fish	Quantity	Length (cm)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Write down what you have learned!

1. Ecosystem integrity

1.

2.

3.

4.

5.

2. Precautionary approach and respect for rules

1.

2.

3.

Write down what you have learned!

3. Broadening stakeholder participation in the management of natural resources

1.

2.

3.

4. Promoting sectoral integration and safeguarding livelihoods

5. Improve research and access to information for conservation and management

This workbook forms part of a *Teaching kit on the ecosystem approach to fisheries for schools in Africa* which seeks to enhance the capacity of future generations to play an active role in the sustainable management of Africa's fisheries.

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