

ENVIRONMENTAL ATLAS OF ABU DHABI EMIRATE

Lesson Plan: Mangrove Forests



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Lesson Plan Content:

This lesson plan and slide presentation is to be used in conjunction with:

- 1 x Mangrove Forests teacher briefing
- 1 x Mangrove Forests teacher fact sheet
- 1 x Mangrove Forests class work sheet

Lesson Overview:

Students will gain an understanding of the Mangrove Forest and the terrestrial and aquatic life that inhabits them.

Estimated Time Requirement:

One 60 minute session.

Learning Objectives:

Students will be able to:

- > understand how Mangrove Forests thrive in saline conditions
- > understand the Mangrove ecosystem
- > identify the animal life of the Mangrove

Skills:

This lesson plan can aid students to demonstrate:

- > Classifying skills
- > Communicating skills
- > Observing skills

Preparation prior to the lesson:

Before commencing the lesson, download and read through the teacher briefing, fact sheet, work sheet and this presentation so you are fully conversant with the content and key terms. Also, ensure that the work sheet activity is possible to undertake in your classroom environment.

Lesson Sequence:

Here is a sequence of the lesson with suggested timings:

Preparation (5mins)

Inform the students that today they are all going to learn about the Mangrove Forests and take part in some fun activity. Elicit from the students some of the things they already know about the Mangrove.

Presentation (25mins)

Using a projector to present to the class, progressively run through the slides to impart all the key points about the Mangrove Forest ecosystem.

Activity (25mins)

Having completed the presentation, undertake the participation and discussion exercise contained in the work sheet. This activity enables students to identify some of

the terrestrial and aquatic animals that live in the Mangrove ecosystem.

Assessment (5mins)

Ask students to write and/or illustrate what they did during this lesson and what they learned from their participation in the activity.

Close of Lesson

Closure: Ensure each group has correctly identified the 12 Mangrove related images.

Extending the Lesson: Encourage students to do some research at home on Mangrove Forests in the Emirate and how they are protecting our coastlines.

Source of Lesson:

Abu Dhabi Global Environmental Data Initiative.

All supporting material can be downloaded freely at: www.environmentalatlas.ae

Classroom Presentation: Mangrove Forests

What are Mangroves?

Mangroves are forests of salt-tolerant trees that grow in the shallow tidal waters of some coastal areas of the Emirate.

They require slow water currents and plenty of fine, organic sediment in which to set their roots as well as protection from high energy waves.



What lives in the Mangrove?

The muddy waters, rich in nutrients from decaying leaves and wood, are home to:

- > sponges
- > worms
- > crustaceans
- > molluscs
- > algae

The Mangroves also provide shelter for marine mammals & birds.



Mangroves in Abu Dhabi

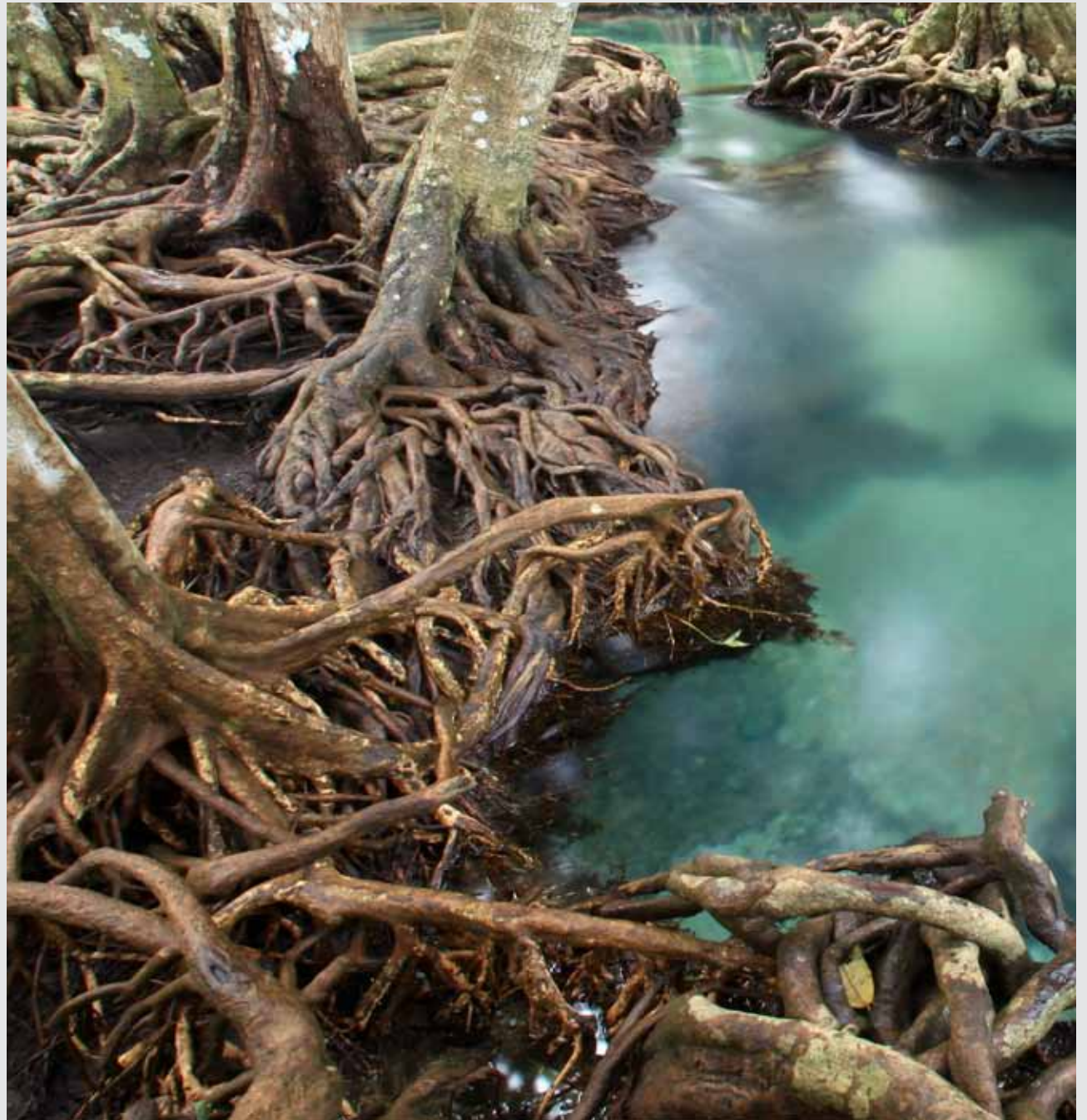
The naturally occurring species of mangrove found in Abu Dhabi, locally called 'Qurm', is the grey or white mangrove, due to the colour of the underside of its leaves.



Mangals & Mangroves

The term mangrove refers to a plant while the mangal is the plant community and habitat where mangroves thrive.

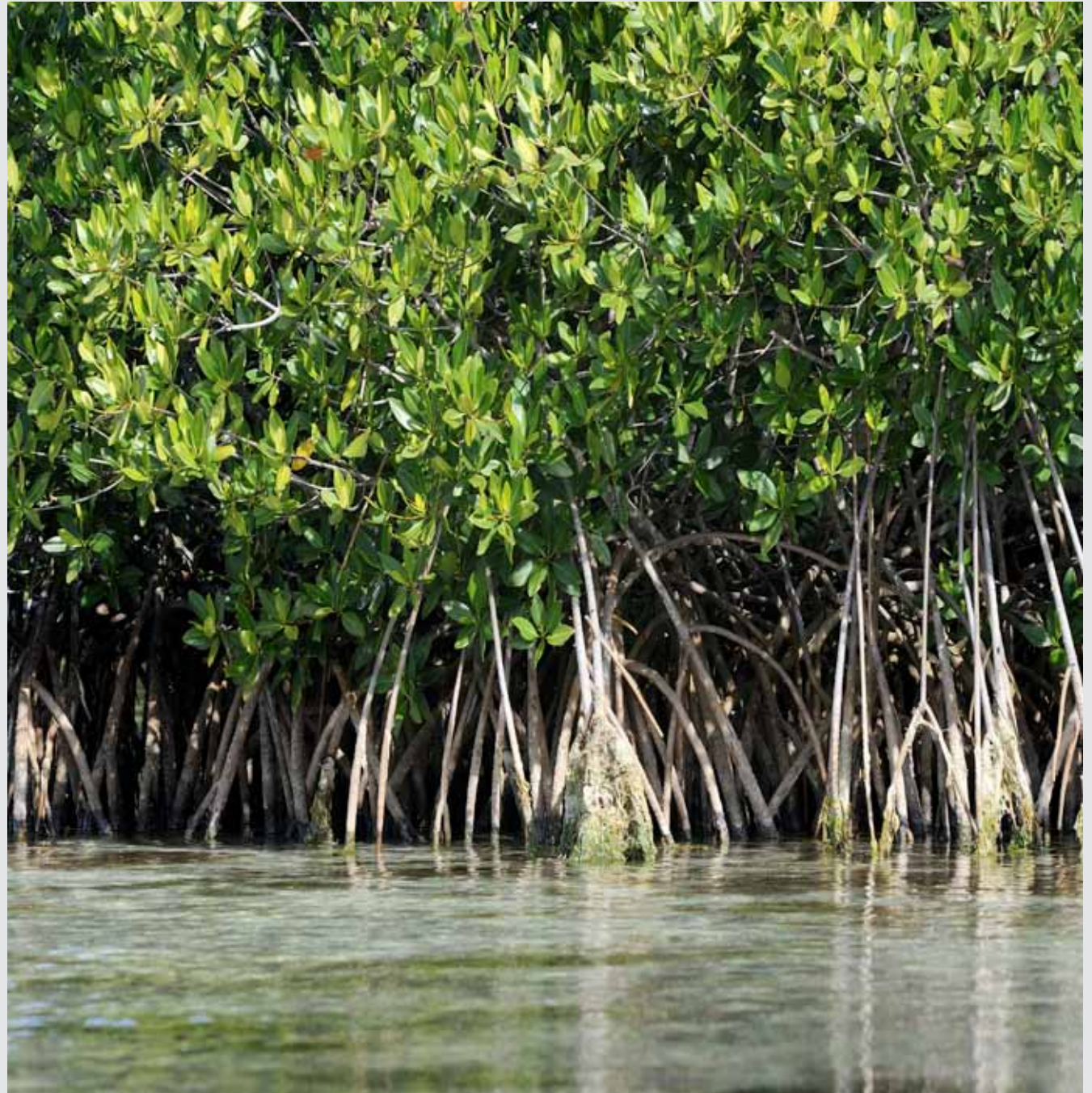
The plants in the mangal can be diverse but all have special adaptations to overcome the problems of anoxia, a lack of oxygen in the continually water-logged soil; high salinity levels and frequent inundation by the tides.



Mangrove Forests

While the Emirate may have scarce and limited areas of forest on land, it possesses significant mangrove forests around islands and sheltered coastal zones.

While some of the mangrove stands have been recently planted, the majority are naturally occurring.



Where can Mangroves be found?

Although, mangroves can be found near rivers it is most common in coastal and tidal wetlands.

While these tidal swamp forests support salt tolerant vegetation as they are regularly subject to tides, they still need fresh water to grow and survive.



Mangrove trees have special characteristics:

> Roots of mangroves are special as they not only help stabilize the tree in one of the most dynamic zones on Earth but also help take in air, water and nutrients. These trees actually breathe through their roots.

> In most mangrove trees the seed germination occurs in the tree itself - a condition known as vivipary.



A unique marine ecosystem

The mangrove forests that cover thousands of hectares of land along the UAE shoreline form an integral part of the coastal ecosystem in the UAE.



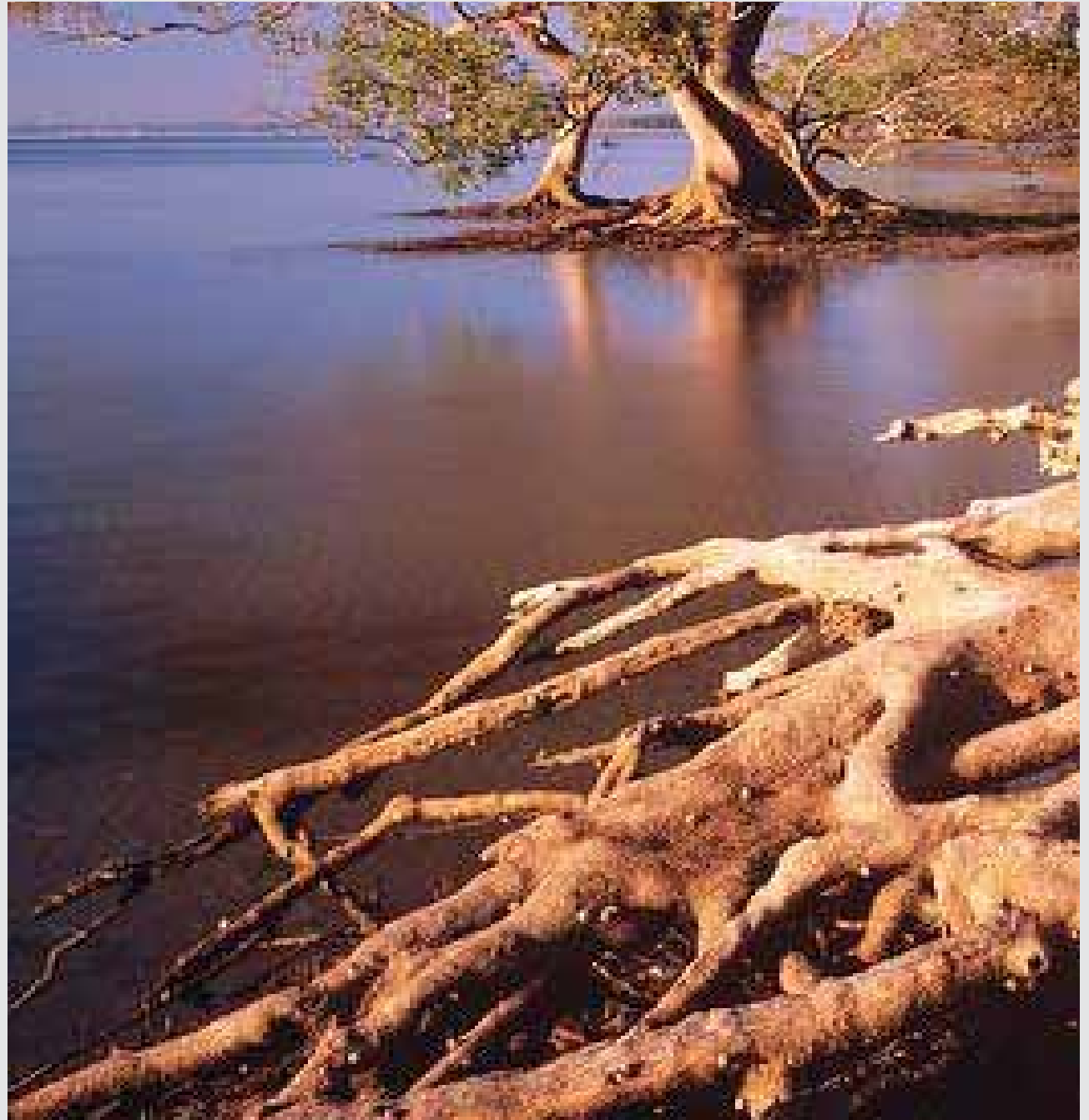
Importance of the Mangrove Forest

Preventing the coastline erosion caused by waves and ocean currents.



Importance of the Mangrove Forest

Storing more planet warming carbon dioxide than almost any other ecosystem on Earth.



Importance of the Mangrove Forest

Supporting a complex aquatic food web and a unique habitat.



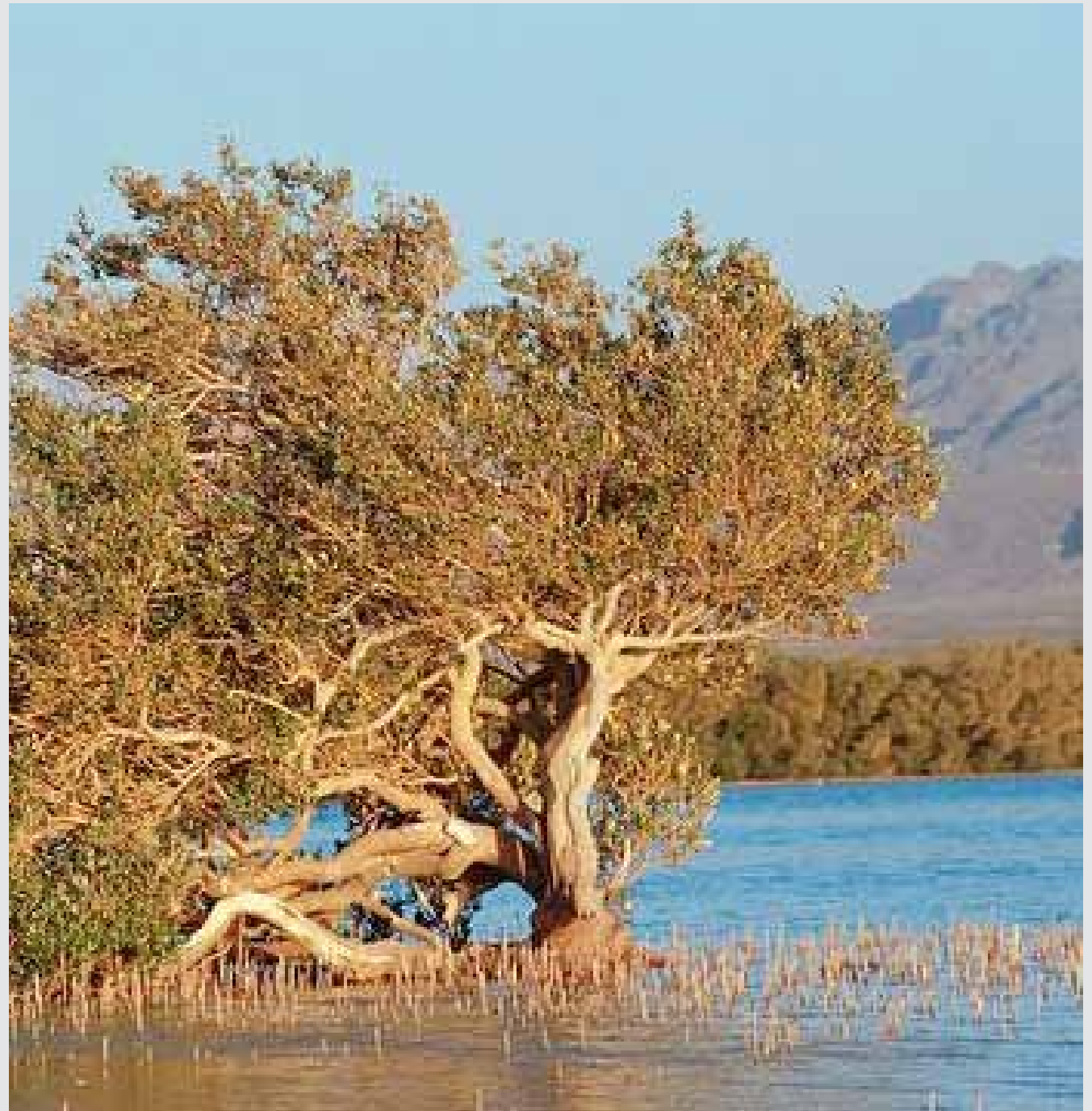
Importance of the Mangrove Forest

Acting as a fish nursery and being a rich source of fish, shellfish, oysters, shrimp and other crustaceans such as crabs.



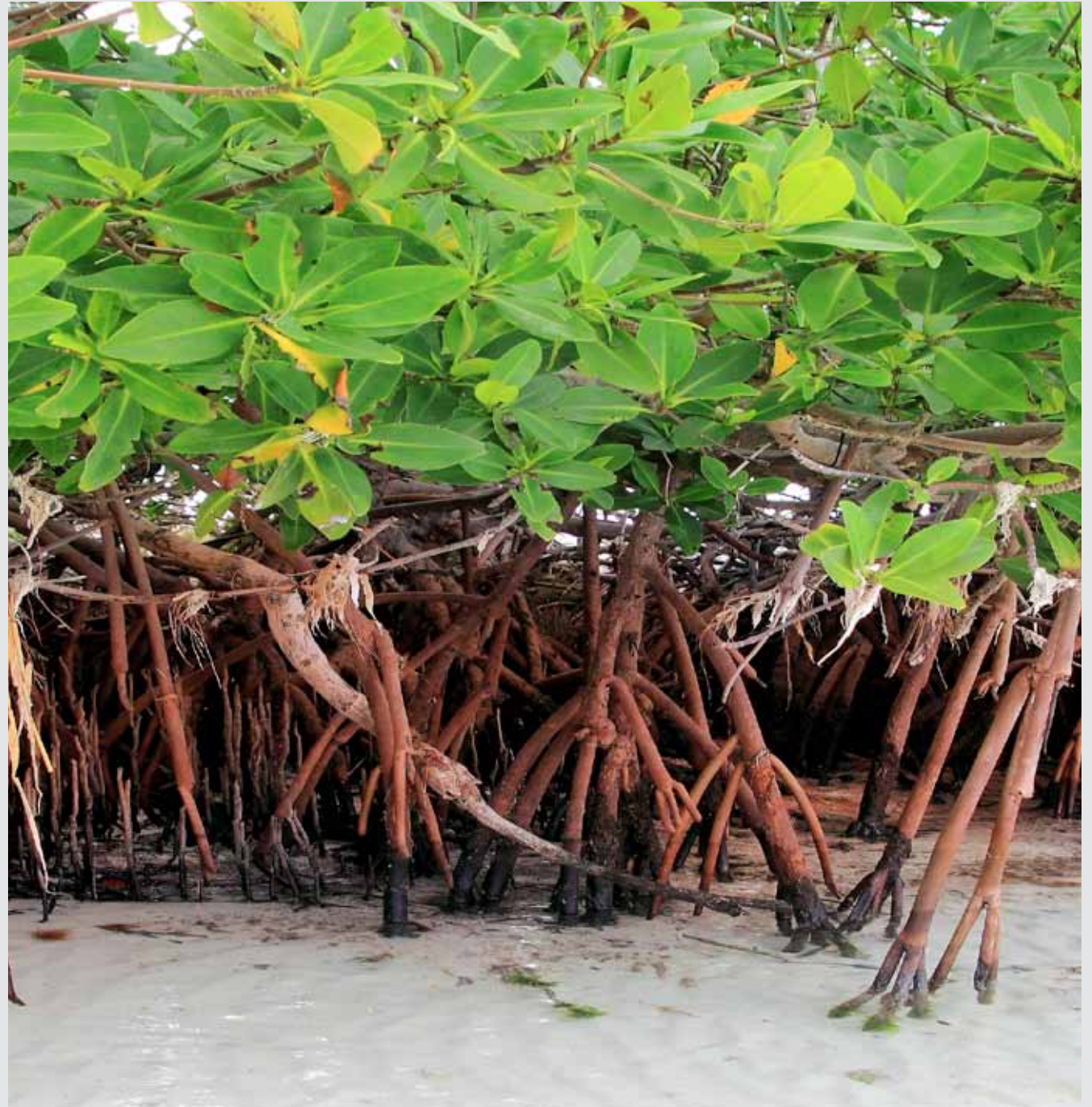
Importance of the Mangrove Forest

Being frequented by many birds, mammals and snakes who all feed on the marine resources available within the Mangroves.



Importance of the Mangrove Forest

Serving as rookeries or nesting areas for many species of birds.



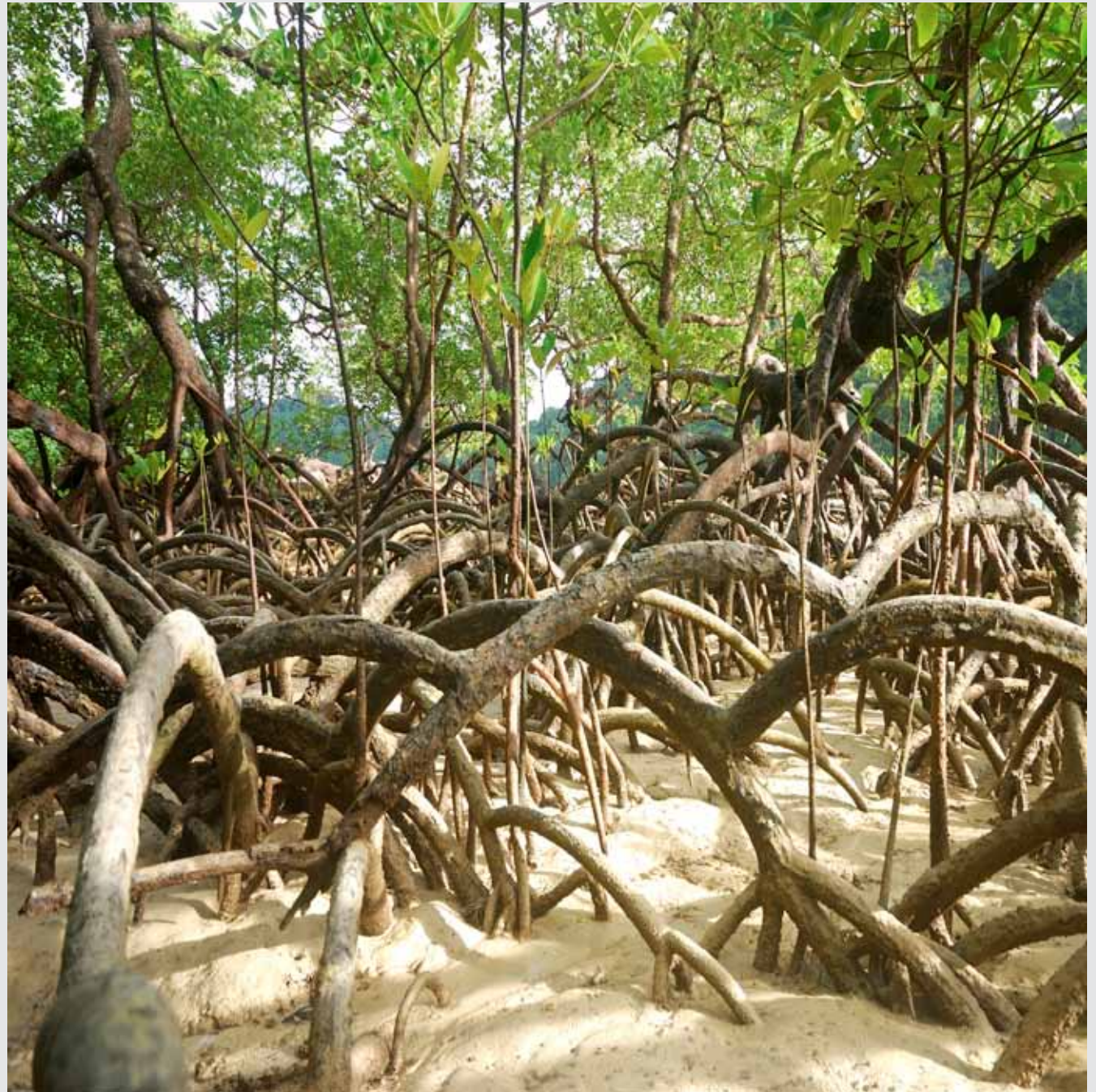
Importance of the Mangrove Forest

Protecting and stabilizing low lying coastal lands against strong wave action, winds and floods.



Importance of the Mangrove Forest

Mangrove trees act as a sink absorbing pollutants from sewage and water wastes.



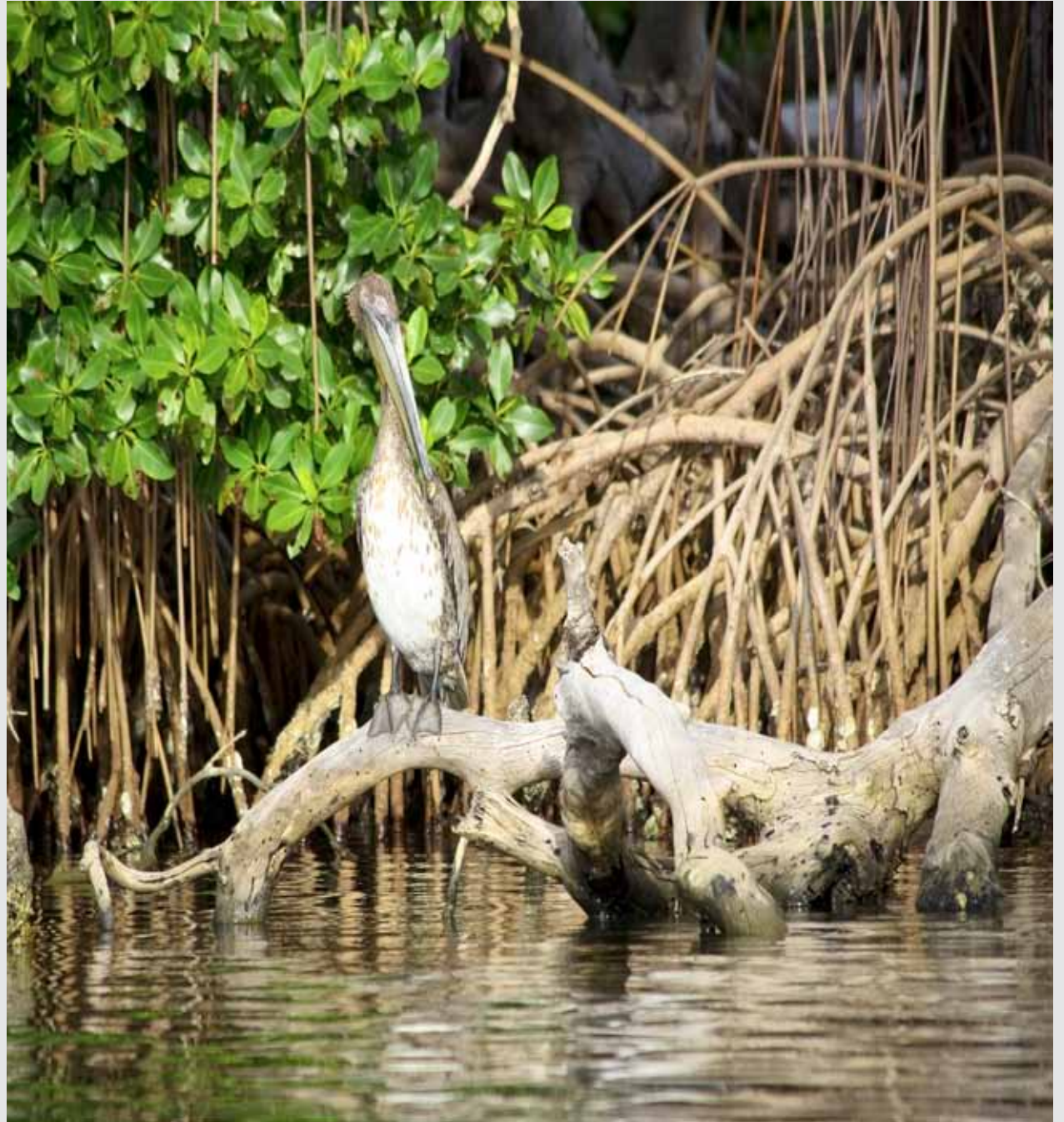
Threats to the Mangroves include:

- > reclaiming mangrove areas - coastal development, dredging and land filling activities.
- > being used for commercial production of food - fish and shrimp.
- > dumping wastes - using Mangroves as dump sites.
- > over logging - timber and fuel wood.
- > over grazing by camels and other livestock.
- > pollution; for example oil and other industrial pollutants.



Protecting our coastline

With massive root systems, mangrove trees protect coastlines by absorbing and dissipating the force of large waves and storm surges, which can cause coastal erosion, property damage and even loss of life.



Breathing underwater

Mangroves have a unique appearance with numerous respiratory or prop roots protruding all around, often many metres away from the trunk of the tree.

These root like structures are basically 'breathing tubes' or snorkels covered by pores or lenticels, allowing oxygen transport within the plant.



Natural desalination

Because of the excessive salt in their habitat, grey mangroves secrete salts directly from two glands at the base of each leaf.

It is not unusual to see the leaves covered by salt crystals, hence the name grey or white mangrove.



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