

LESSON NOTES

Subject: Basic Science

Year/Level: 10

Week 14

Strand	1 : LIVING THINGS AND THE ENVIRONMENT
Sub Strand	1.3 : BIODIVERSITY, CHANGE AND SUSTAINABILITY
Content Learning Outcome	Research the importance of the marine ecosystem and investigate man's activities that have influenced the resources of the different communities of this ecosystem and describe measures taken to conserve them.

1) Tourist Attractions

- Natural resources and coral reef is an important tourist attraction.
- Large number of tourist travel across the Pacific to dive and see the coral reefs
- Healthy coral reef ecosystems and other marine habitats directly support the tourism industry by providing:
 - ❖ attractions for beachgoer
 - ❖ divers
 - ❖ snorkelers
 - ❖ recreational fishing sector
- generates income both on nationally and privately
- Tourism industry:
 - ❖ largest business sector as it provides foreign exchange for the country.
 - ❖ encompasses many different areas, so it also creates jobs in many different areas, for example:
 - ✓ hotels
 - ✓ restaurants
 - ✓ car rental agencies
 - ✓ tour companies
 - ✓ service stations
 - ✓ souvenir shops
 - ✓ sports equipment rentals.
 - ❖ tourism allows local people an opportunity for:
 - economic and educational growth
 - a chance to experience other cultures
 - ❖ tourism generated income can be used to:
 - better education
 - improve infrastructure,
 - fund conservation efforts
 - promote more responsible tourism.

2) Source of Income

- Employment services in the:
 - fishing industries
 - tourism sector
 - timber industry
 - seaweed farming
 - pearl farming
 - aquaculture
- provides income for local fisherman selling along the road or in the market place
- Pharmaceutical compounds derived from marine algae and invertebrates (organisms without backbones)
- Landowners benefit from leasing out their island or land for tourism
- Development of the fisheries sector include:
 - export of an expanded variety of fresh fish
 - cultured seaweed and other marine products such as:
 - ✓ giant clams
 - ✓ cultured black pearls
 - ✓ tuna.
- Locals selling souvenirs and handcrafts for tourists.
- Generate foreign currency for the nation through tourism and fishing industries.
- mined for:
 - ✓ minerals (salt, sand, gravel, and some manganese, copper, nickel, iron, and cobalt can be found in the deep sea)
 - ✓ drilled for crude oil.

3) Source of Food

- Ocean is an important source of food and other resources.
- 5% of the protein consumed by world populations comes from the sea
- 16% of the total world's protein with higher percentages occurring in developing nations.
- provides food in the form of:
 - ✓ fish
 - ✓ shellfish (clams, oysters, and bivalves)
 - ✓ beach-der-mer
 - ✓ molluscs
 - ✓ lobster
 - ✓ crabs
 - ✓ seaweed
 - ✓ octopus.
- also provides food for other marine organisms and birds.

Human Impact on Marine Environment

▪ Direct pollution by:

✓ Sewage:

- coastal towns and cities have used the oceans as convenient place to dispose of sewage
- More than half of the world's sewage ends up in the ocean.
- **Causes poisoning in humans:**
 - ✚ Raw sewage carries bacteria that contaminate the water, making shellfish unfit to eat and cause illness in swimmers.
 - ✚ Sewage whether treated or untreated are rich in nutrients especially nitrates and phosphates. Some come from organic matter, the rest from soap powders and detergents.
 - ✚ When nutrients enter the water, they cause nutrient enrichment or eutrophication.

- ✚ This, in turn causes the rapid growth of algae, creating algal blooms over the surface of the water, which affect marine food web.
- ✚ As algae die, they are decomposed by millions of bacteria that rob the water of its oxygen.
- ✚ Algal blooms are common in shallow waters or lagoons in which there is no or little current to spread the pollution.
- ✚ This causes shellfish poisoning in humans and high death rate of clams

- ✓ Rubbish
- ✓ radioactive waste.

▪ **Indirect changes:**

- ✓ atmospheric pollution is causing global warming and raises ocean temperatures.
- ✓ natural changes, such as El Nino effects that produce an unusually high sea surface temperature over the eastern tropical and equatorial Pacific Ocean.

- Many coral reefs are threatened by the dumping of wastes from nearby tourist areas and by drilling for underlying oil deposits.
- For many years, coastal towns and cities have used the oceans as convenient place to dispose of sewage and general rubbish. As human population grows, so has the pollution in the seas.
- Most shallow coastal waters, such water is thoroughly mixed by the currents and winds so the pollution affects all marine life.

▪ **Slash and burn agriculture:**

- ✓ causes soil erosion, as heavy rainfall washes excessive amount of soil into rivers and out to sea.
- ✓ This reduces sunlight and chokes coral polyps.

✓ **Fertilisers/Pesticides:**

- used by farmers.
- soluble in water, so they drain from the fields and into the rivers, eventually washing into the sea.
- sprayed onto crops and the pest animals that they kill also end up in the sea becoming incorporated into the food chain.
- may be very low in water, but they are taken up into the bodies of planktons which are eaten by fish and other herbivores.
- Carnivores then eat the herbivores.
- Each time it becomes more concentrated in the animal's tissues.
- animals that are worst affected are the top predators:

✚ sharks

✚ whales

✚ tuna

✚ sea gull and many others have died from pesticide poisoning.

- **Plastics:** marine animals often die from either becoming entangled in the plastic or from eating it.

- **Oil spills:**
 - ✓ covers the ocean surface and when washed up onto shorelines coating the sand and rocks.
 - ✓ kills the animals straight away as they cannot breathe.
 - ✓ Birds are unable to fly as oil clog their feathers and when they try to clean their feathers they swallow the oil and die.
 - ✓ Sea seals lose their protective insulation and freeze to death.
- **Coral reefs:**
 - ✓ damaged by:
 - diving
 - snorkeling
 - anchoring of boats
 - litters and sewage

ACTIVITY:

1) Describe 3 ways of how the tourism industry helps communities in Fiji.

- a) _____

- b) _____

- c) _____

2) Briefly explain how raw sewage dumped into the ocean leads to poisoning in humans that consume shellfish.

3) Explain how oil spillage leads to the death of a bird.

...STAY SAFE... 