

# Threats information sheet



In Timor-Leste the coastal areas are growing at an exponential rate – in the years 2000 to 2005 the size of the population that lived within 10km of the coast grew about 30% faster than the global average.



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## Coastal development

- Coastal areas are increasingly being developed to exploit the economic potential of those areas. An area, west of Dili (the capital) has been chosen to be the redeveloped into the Tibar Bay Port (pictured above).
- To accommodate new developments mangroves are often cleared. Mangroves are a nutrient rich environment which many species of the coral reef use for breeding or for feeding. Mangroves also play an

important role trapping sediment coming off the land, which would be problematic for coral reefs. Seagrass is another habitat vulnerable to coastal development that is of great importance to coral reefs. Seagrass is being dredged up to create deeper channels to allow ships closer to the shore. Seagrass is important as they supply food for many of the reef animals, it will also trap much of the sediment and nutrients that would otherwise be damaging to coral reefs.

### Climate change

- In Timor-Leste climate change is increasingly becoming a concern for its population. They have already noticed hotter dry seasons, shorter and more unpredictable rainy season and more frequent rainfall events.
- Timor-Leste is a hot and humid country, the average temperature is 24 degrees Celsius with average rainfall being approximately 1500mm per year.
- Timor-Leste is vulnerable to climate change due to multiple reasons. The main vulnerability it has is due to rising sea levels. The capital Dili is only several meters above sea level. Another threat to Timor-Leste is the increasing intensity of tropical storms.

Timor-Leste is a poor nation (120 on the HDI ranking) with nearly 50% of the population living below the poverty line, it hasn't the capabilities to adequately prepare and recover from stronger tropical storms.



### Climate change and oceans

- As global temperatures increase so do sea and ocean temperatures. Coral polyps can only grow between 20-32 degrees Celsius. Scientist have discovered that coral begin to stress out even with the slightest sustained temperature change. A sustained change in sea temperature can cause corals to 'bleach'.
- Ocean acidification is an increasing issue as the oceans pH continue to decrease. Carbon dioxide is dissolved into the worlds oceans and seas, it has been estimated that 30% of all the CO<sub>2</sub> caused by human activities have been absorbed by the oceans and seas, causing a decrease in pH and thus making the seas and

oceans acidic. Reef building corals are particularly vulnerable as the increased acidity of the water can dissolve the calcium carbonate skeleton, and also reduces the amount of carbonate available for corals to use for growth and rebuilding.



### Fishing

- The type of fishing that occurs on coral reefs varies with many fishers being subsistence fishermen, however some of the practices used have devastating consequence. One of the most problematic fishing practices is using dynamite. This method is problematic and illegal as it not only kills the fish but also destroys the coral reef, which consequently means the fish that weren't killed by the dynamite are unable to reproduce, which could cause the whole ecosystem to end up collapsing.
  - Overfishing can cause several issues. Most obviously is the impact it can have on the food web of coral reefs. It can have devastating effects, as fish do not have time to recover and replenish numbers meaning eventually the species will go extinct. The loss of certain species can be a turning point for the coral reef.
- For example, if grazing fish such as Parrotfish are overfished and are no longer present on the reef algae will overgrow and smother the coral reef.
- The fish stocks of Timor-Leste are increasingly under threat from foreign fleets illegally fishing, this causes an estimated loss \$40 million annually to the Timorese economy.
  - The thoughtless dropping of boat anchors is another issue associated with fishing. Boat anchors are dropped in different locations and will cause much damage to the reef such as breaking the skeleton. When anchors are dragged that can affect huge areas in a very short period of time, and the recovery time at best is incredibly long, at least up to 50 years and that is if they recover.



### Pollution



- Microplastic particles can end up inside smaller sea creatures. As shown in the picture the copepod, a type of zooplankton, has eaten small pieces of plastic coloured with a fluorescent dye, which it has mistaken for algae.
- Corals are very sensitive to pollution and sediments. Excess sediments can create cloudy water which can block out the sun preventing the plants and animals on the reef receiving sunlight. Something that is necessary for the growth of coral reefs.
- Plastics can create a variety of issues for coral reefs and microplastics are increasingly becoming a serious issue as animals are increasingly eating the plastic therefore it enters the food web.

### Tourism

- Although incredibly important to the people and economy of Timor-Leste it causes many issues for the coral reefs. A few of the issues found in Timor-Leste are: boats anchoring on the coral reefs destroys them, scuba divers removing corals and other species for a souvenir from the reef, snorkelers standing or sitting on the reefs for photographs and them touching marine animals not realising the consequences of their actions.



### Pigs

- As the population of feral pigs increases there could be thousands of them digging for worms and snails in the dirt, they loosen the soil and consequently the dirt ends up being washed into the ocean where it settles on reefs and can smother the reef which means it is unable to access the sunlight which is integral for its survival.



### Land use



- With an increasing population the pressure on an already struggling agriculture industry means an increasing use and reliance on pesticides and fertilizers. When the area experiences heavy rainfall, those chemicals are washed off the land into the surrounding seas and can have negative impacts on coral reefs. There is evidence that the increased levels of chemicals (phosphorous) has caused a decline in the health of many coral reefs globally.

### Other issues threatening coral reefs including those in Timor-Leste are:

- Coral diseases
- Aquarium fish trade
- Increasing population
- Coral mining