

An ecosystem is a group of organisms and their living and non-living environments, which interact and exchange energy and matter, and are interdependent. This interdependence means that any human alterations to a single component of the ecosystem, can have large repercussions for the entire ecosystem. This can be seen ~~through~~ <sup>through</sup> investigation of Coral Reef and Rainforest ecosystem. The ultimate impact of human change depends on the magnitude and rate of change.

Coral Reef ecosystems have specific conditions required for functioning. Water temperature needs to be greater than  $15^{\circ}\text{C}$ , water levels above 50 metres deep, and salinity equal to that in open ocean waters. The human impact alters these specifications leading to negative outcomes for the ecosystem.

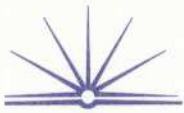
Overfishing of the reefs is of major concern, as this alters the dynamic equilibrium of the food chain. Overfishing can also lead to extinction of species, although the rate of this change is slower. In



Haiti in the Caribbean, for example, the local communities rely on fishing for income. However overfishing of the reef has completely destroyed the coral reef, and has led to the extinction of many fish. This occurred over a hundred years, however the fishing rate was never ecologically sustainable.

Similarly cyanide fishing in developing countries such as Indonesia has had a significant and quick impact to the coral reefs. The cyanide does not only affect the fish intended but all the biosphere, and remains in the water for many years. The rate of change was fast, as within days of the cyanide entering the water, the coral, algae and plankton were all affected.

Whilst these impacts were direct many human impacts also have indirect repercussions for the ecosystem. On the Great Barrier Reef (GBR) for example 81% of the reef is open to tourists. Tourism which raises \$3 billion annually has led to coral depletion in various ways. Charter yachts in the

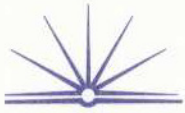


vicinity often anchor over coral causing substantial damage. Boats also discharge effluent straight into the ocean causing higher nutrient levels, less oxygen and therefore affect the fish. Tourism to the reef has occurred ~~for a substantial~~ <sup>since the early</sup> 1900s and although the rate has been slow, the increasing popularity of the GBR means that the impact has been large.

Similarly in ~~the~~ rainforest ecosystems across the world human ~~impact~~ <sup>actions</sup> have had large impacts for the ecosystem. Only two pristine areas of rainforest still exist, one in Central Africa, the other in Brazil, however the utility value of the rainforest means all areas are at risk. To date 40% of the world's rainforest has been cleared. This occurs for various reasons.

The land is often cleared for agricultural ~~prop~~ purposes, such as livestock and crop growing, under the misconception that the soil is fertile.

The soil however is highly acidic, and the top



soil is only fertile due to the high biomass, productivity and microclimate of the ecosystem. In Columbia, Peru, Venezuela, Brazil and Bolivia the countries where the Amazon is located, <sup>many</sup> ~~most~~ areas are cleared for agricultural purposes. As the soil is poor this leads to the use of fertilisers, which further depletes the ecosystem. The rate of this change is continuing, and despite efforts at reforestation, the change will continue.

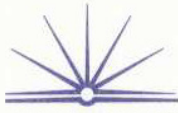
Increasing population growth is most prominent between the tropics, where rainforest ecosystems also occur. The pressure of urbanisation affects rainforests globally, through both urban sprawl leading to land clearing, and urban run-off causing increased nutrients which affect the equilibrium of the ecosystem. For example the cities of Bangkok and Jakarta both impinge on the surrounding rainforest ecosystem.

One of the largest threats to rainforests is through logging. Hardwood is a prized commodity

and often allows poor countries some cash. TNCs often enter developing countries and offer large moneys in return to the rights to their rainforests.

This occurs in Central Africa, and Indonesian rainforests. Logging leads to loss of habitat, reduction in the extent and often the biosphere exceeds the carrying capacity of the ecosystem. This ruins the ~~an~~ fragile balance of the ecosystem, and leads to the extinction of flora and fauna, reduced biodiversity, and possibly the loss of many cures for diseases.

In the Amazon rainforest some human impacts have been less detrimental. In Brazil the government has returned a substantial amount of the rainforest back to the Yanomani Indians, who are native to the area. The difference in the impact of the Yanomani's is due to an understanding of <sup>ecological</sup> bioplas~~st~~ sustainability, and a respect for nature, which has been passed through generations. Whilst the Yanomani's



continue to hunt for food, it is subsistence hunting, and hence the rate of change is significantly slower, allowing for regeneration to occur.

Human effects on the ecosystems have led to dramatic and detrimental impacts for coral reefs and rainforests. The rate of change varies, however a lack of understanding and respect for these ecosystem often leads to a quick and large change. The biosphere is often endangered, and ~~go~~ biodiversity reduced.