



A DISCUSSION ABOUT THE THREATS OF CORAL REEFS

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ABSTRACT

Coral reefs are the most diverse marine ecosystems because of their enormous levels of biological variety. Typically, they occur in tropical regions at depths of not quite 100 metres, and often correlate with large human populations in the jungle's non-industrial nations. When it comes to these people, reefs provide many resources such as foodstuffs, trade goods, construction materials, and destinations for vacation. Shockingly, many of the world's coral reefs have reached a critical stage in their condition of health. Specifically, researchers examined how climate change affects coral reefs. Climate refers to the long-term average of the weather. All climatic changes have a direct influence on Earth's biota and abiotic components, which are together called the Earth's biosphere and abiotic components. Climatic change has occurred often throughout Earth's history because of the planet's history of periodic climate changes, including five major ice ages. What's more, global warming has hastened climate change, which is a major problem. Greenhouse gases are responsible for Earth's warming because they trap heat and light from the sun, causing temperatures to rise.

Keywords: - Coral Reefs, Ecosystem, Biological, Earth, Greenhouse.

I. INTRODUCTION

Environmental, economic, and social change is being characterised by climate change, and there is no longer any reasonable uncertainty that rapid increases in atmospheric carbon dioxide and other greenhouse gases since the beginning of the Industrial Period are causing significant shifts in the Earth's physical and chemical climate. Climate change (IPCC 2007). As a result, the pace of change between cold and interglacial periods is 2–3 significant degrees faster than it has been in previous years. A lot of evidence also shows that natural structures are altering over the world. When it comes to understanding how the world's habitats will respond to rapid human climate change, coral reef biological systems have played a particularly important role. It assesses our understanding of these

developments and encourages a continuum of estimates for how important marine habitats, such as coral reefs, are likely to alter in the next several decades and centuries. As we'll see, there's now a far greater need for the global community to reduce carbon dioxide emissions at or below current levels as quickly as possible, or risk losing these vital biological systems forever.

Sixty-six percent of the population lives within 60 kilometres of the seashore. As people leave the interior and upland areas in search of a better living, this trend will only continue to grow. Coral reefs protect wide stretches of tropical shoreline from erosion and disintegration, and they are particularly important for the livelihood of a large number of people who get a major portion of their food from coral reefs and benefit from their efficiency. Despite this,



there is a lot of anxiety right now about what may happen to coral reefs and beachfront locations as a consequence of climate change. The storey of an Indonesian paper clipping illustrates the state of confusion that exists over the expected effects of global climate change and the resulting rise in ocean levels. Much of the climate change coverage in the media is grossly exaggerated, badly misinterpreted, or skewed toward one political stance or another. People in countries that are typically affected by climate change and rising sea levels are becoming more alarmed as a result of this. Low-lying coral reef islands in the Pacific and Indian Oceans are the clearest examples of this concern. Despite their concerns about the future of coral reefs, leaders and academics in the field are concerned about climate change and how humans will react to it. Because of these dangers, it's difficult to keep an eye on and plan for the future growth of coral reefs. A large part of our vulnerability stems from our misunderstanding of the relationship between coral reefs and climate.

II. CORAL REEFS

Coral reefs are the most diverse marine ecosystems because of their enormous levels of biological variety. Typically, they occur in tropical regions at depths of not quite 100 metres, and often correlate with large human populations in the jungle's non-industrial nations. When it comes to these people, reefs provide many resources such as foodstuffs, trade goods, construction materials, and destinations for vacation. Shockingly, many of the world's coral reefs have reached a critical stage in their condition of health. Despite the general trend toward reef corruption discussed in the Introduction, it has been

determined that up to 10% of the worldwide reef area has been degraded beyond recovery, with another 30% expected to go over the next 10-20 years. The reefs in Southeast Asia, East and South Asia, East Africa, and the Caribbean are the most vulnerable because of the degradation of the reefs caused by human activities, which will have immediate negative environmental and economic consequences. In the not-too-distant future, coral reefs will face another another threat. Human-caused global climate change might place fresh stress on reef systems, or it could work along with other more direct anthropogenic (human-made) pressing elements to exacerbate already existing environmental damage. As a result of these changes, the depletion of coral reefs might accelerate in previously targeted locations, including the Pacific and Indian Oceans, as well as along a substantial portion of the Australian Great Barrier Reef. As reefs near human settlements degrade, the more distant reefs have the considerable potential to fill in as refuges for coral reef biodiversity. As a result, the health and conservation of remote reefs is critical for the ecosystem as a whole. Coralline green growth like Halimeda, a green alga, and Lithothamnion endure over former reef structures formed of calcium carbonate (limestone). These corals are situated near stony (scleractinian) corals (a red alga). Large amounts of calcium carbonate are stored in the coral and green growth skeletons, and this material is what forms the coral reef's geological structures. A reef may 'grow' and remain aware of increasing water levels by making this constant proclamation. Reefs also serve as a physical haven for neighbouring beaches



and tidal ponds, as well as a source of food, shelter, and material for reef plants and critters and human populations alike. Infinitesimal zooxanthellae, which contain the creature tissue, provide a huge portion of the coral's nourishing needs via photosynthesis, which is a distinctive feature of reef-building corals. When free-living and cooperative green growth coexist together, they provide natural elements that shape the cornerstone of the local region's developed way of life. This interaction may be seen as a microcosm of the larger reef local area. Coral reefs are living, changing ecosystems that include organisms and plants that all partake in the mineral growth. Because of this adaptability, there is a great deal of variety and complexity. Additionally, since reefs can only live at the air-ocean interface in warm seas and are often found near the ocean-land interface, their environmental context makes them vulnerable. It's likely that shifts in ocean and atmospheric conditions, as well as changes on landmasses that interact with the water, will have a significant impact on the reef ecosystem.

III. THE THREATS TO CORAL REEFS

The world's coral reefs have been decimated to the point that an estimated 20% of its ecological, economic, and aesthetic value has been lost (Wilkinson, 2004). Another 24% are at high danger of collapse, but a further 26% are at risk of long-term deterioration as a result of human activities. If destruction continues at its present rate, 70 percent of the world's coral reefs would be gone by the year 2050. One of the world's most endangered ecosystems is the coral reef system found in Southeast Asia.

1) Overexploitation (Over-fishing):

- **For food**

"Long periods of over-fishing by humans have emptied globe expanses of giant fish, whale and other enormous marine species, annihilating coastal conditions," says a new research. In the next 50 years, the global human population is expected to double, bringing with it an ever-expanding need for life's most basic necessities like food. One-fifth of the world's population gets all of its protein from fish. Fishing has grown in popularity over the last 50 years, and fish production must increase by a factor of two in the next 25 years in order to keep pace with the growth in demand and population.

- **For the aquarium exchange**

As a side hobby, maintaining marine aquariums has grown in popularity in recent years. It's estimated that between 1.5 and 2 million people throughout the world have saltwater aquariums. As a result, aquarium markets are receiving more than 800 distinct varieties of reef fish, several coral species, and a variety of spineless invertebrates. Fish and stony corals are mostly found in Philippine and Indonesian reefs. The United States of America is the world's largest exporter.

- **For the knickknack exchange**

Overexploitation for doodads and knickknacks puts several species at jeopardy. More than 5000 different kinds of molluscs are prepared or used crudely to construct doodads and knickknacks; over 40 different kinds of coral are also traded for this purpose; and innumerable sea stars, sea imps, sand dollars, and their relatives are also exchanged. For the knickknack exchange are also used as many as 32 different kinds of fish or fish

parts, such as seahorses, porcupine fish, sharks' teeth, and the 'noses' of sawfish.

- **For restorative purposes**

There is also an overexploitation of species for medicinal reasons, mainly in traditional medicine. There are several species that are over-collected for Traditional Chinese Medicine, such as sea horses and pipefish (TCM). Marine bio prospecting is another another emerging threat. For the most part, coral reefs are easily accessible, and they are home to a vast variety of stationary, delicate-bodied organisms that are armed with a variety of chemicals as defensive weapons.

- **Dangerous fishing rehearses**

Dangerous fishing practises as handbag seining, fine-net fishing, 'moxy' nets, cyanide fishing, and impact fishing are often associated with overfishing because they result in unavoidable injury. However, in South and Southeast Asia, they have been declared illegal. Toxic substances (such as cyanide) are used to put fish to sleep so they may be harvested for the live fish market. Such a poison has an effect on the target species, as well as any nearby living things.

2) Coral mining (Overexploitation/Habitat Destruction):

In South and Southeast Asia, corals are mined for limestone and construction materials (overexploitation/habitat destruction). The reef is harmed and coral is destroyed as a result of this interaction, resulting in immediate extinction but also unwanted side effects such as sand disintegration and sedimentation. The Maldives harvest 20,000m³ of coral per year for development materials, according to a study conducted in the early 1990s. South and Southeast Asian countries are particularly prone to coral mining.

3) Residue, supplement and chemical contamination:

There are several threats to coral reefs, but one of the greatest is human activity that alters either the marine environment or the temperature on land. Some construction projects result in an increase in freshwater spillover, which causes a large amount of sediment to be washed into the sea. However, bad agricultural and land use practises reinforce this cycle, causing excessive sedimentation. Soil naturally washes into streams. Upland activities such as logging, land transformation, stream modifications (dams and redirections), and street construction greatly increase the disintegration of the land.

4) Marine based contamination:

Marine pollution, including as oil spills, the discharge of counterbalance water, and the offloading of hazardous trash from ships, are all harming the area's coral reefs in some way. Fouling-resistant base paints used on ships create toxic mixes that harm corals and other marine life. Most people are familiar with oil pollution, which is one of the more common forms of contamination mentioned above. Oil has a negative impact on the coral's life cycle. Minor oil spills, such as those caused by the discharge of stabiliser water, maritime traffic, and the cleaning of transport engines, are common in the area's oceans.

5) Irresponsible tourism

Numerous countries in the region rely heavily on the tourism sector for their economic success. For example, the Maldives' marine and beachfront vacation sector is the country's largest employer and accounts directly for 20% of GDP. Its broader effects help provide 74% of public salaries, and the industry employs about

40% of the country's workforce. Travel may be a beneficial economic worker when done in a regulated and sustainable manner, and it can serve as a drive for governments to devote resources to monitoring coral reef ecosystems in order to maintain bringing in traveller revenue. Nevertheless, when poorly supervised, the tourism sector has both immediate and indirect negative effects on coral reefs. When people swim or dive or float on the reef, they may cause immediate physical damage, while overexploitation of coral species for food, aquaria, or souvenirs for the traveller market threatens the long-term viability of those species.

IV. WHAT IS BEING DONE TO CONSERVE CORAL REEFS?

Coral reefs are under jeopardy due to human activity, as 20 percent of the world's coral reefs have been destroyed.

- **Establishment of marine protected areas:**

Protected areas for coral reefs are an important part of the overall strategy to keep them healthy (MPAs). Regardless of the kind of MPA, maritime environments are protected from unrestricted human use in all MPAs. The most notable restriction is that MPAs are designated as 'no-take' areas, which prohibit the taking of any marine species for the purposes of study, education, or entertainment. Some MPAs have a particular purpose in mind and are monitored by the government (for instance, for amusement, for the safeguarding of a verifiable site or as a shelter for a specific animal varieties to rise).

- **Prevention of over-harvesting through legislation:**

Certain animal populations are protected by law from over-harvesting by enacting

species insurance regulations at the local level. Some countries, including India and Sri Lanka, have legislation protecting some species of coral, molluscs, and echinoderms. While marine vertebrates get the majority of this insurance, there are a few exceptions.

- **Checking:**

A good administration methodology requires a thorough understanding of coral reefs. Patterns of heavy use and the health of the reefs can only be assessed by checking. Coral reef conservation groups may be found all around the globe. GCRMN coordinates efforts to improve coral reef ZOOLOGY via information exchange and limit building, and works closely with Reef Check and ReefBase.

- **Building mindfulness:**

Increasing awareness of the importance of coral reefs, their variety, and the services they provide may go a long way toward protecting these fragile ecosystems. The greatest way to enable coral reef customers to modify their behaviour is to practise mindfulness at the local level.

V. CONCLUSION

Several tropical and subtropical nations' economy depend on the coral environment, which offers a broad range of benefits to millions of people throughout the globe. Human and natural disturbances have had varying degrees of influence on reef ecosystems across the globe, although reefs themselves are a major tourist destination. Globally, the state of coral reefs is a cause for worry. Coral death is on the rise, but so is coral development, which has plummeted dramatically. Coral calcification has slowed by 15%–30% as a result of these efforts. Increased thermal stress has resulted in declines of up to 78% since



1990, and estimations forecast additional decreases of up to 92% by 21003. Reefs' structural complexity, on the other hand, has plummeted, and many reefs have already been affected by or are at risk of phase shifts. While coral coverage in the Caribbean has decreased by 1.4 percent per year since 1977, it is still much higher than the Great Barrier Reef's decline rate, which has accelerated dramatically since 2006 to 1.51 percent per year. Because of climate change, tropical reefs' hard coral cover has declined significantly during the previous several decades. Because of a combination of global and local-scale human impacts (e.g. pollution, sedimentation, coastal development, and overfishing), the survival of coral reefs is in jeopardy, and this comes on the heels of the world's longest, widest-ranging, and potentially most damaging coral bleaching event ever, caused by a strong El Nio/La Nia and ocean warming. Climate change would most likely cause coral reefs to decrease even if global temperature is kept to 2 degrees Celsius over pre-industrial levels.

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