

Coral Reef Ecology.

Coral Reefs are the beautiful creation of Nature which is brinded with the most striking hue and colours and the highest biodiversity of the Globe hence they are referred to as the rainforest of the Ocean.

Coral Reef is a Mound of $CaCO_3$, dolomite and Sand-Silt Clay, materials which is known as Bio-herb or the largest biological house of the Planet as it harbours a ^(Biodiversity) variety of Marine life.

Coral reefs are constructed by Polyps esp. the Hexamorphic (Crown makers) sea anemones (fluffy) anemones (without bones) these polyps secrete lime from Ca^{2+} outershell to protect their bodies.

These Polyps are Immobile panthos. 3-5 inches in size they catch food from Ca^{2+} tentacles to catch food.

With the death of the 1st generation of Coral Polyps the 2nd generation form a line of it or layer above it. or in front of it.

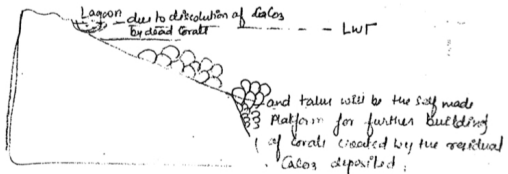
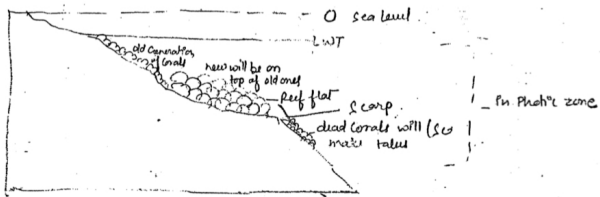
The Pelation of such $CaCO_3$ formation form the reef structure which become a boxed abode of million of other species including oysters, lobsters, gastropods, stratospores, fish, reptiles, burrowing animals and uncountable varieties of algae esp. Cyno-bacterium (Blue-green algae) and Zooxanthalum.

The Geographical Condition for Ca^{2+} growth:

1. Wide Continental Shelf - In excess of 75 km. the Ca^{2+}
2. The Slope angle of shelf shall be less than 0.5° .
3. Shallow depth of Water - AIC to Murray 65 metres or 33 Fathoms. is the most suitable depth where the Sun rays are active however upto 100 metres corals can grow in the epipelagic zone.



4. Corals can grow only upto the low water. H₂O because exposure to the aerial processes is detrimental for its existence.
5. The salinity shall be Moderate 31-37‰ greater salinity can cause burn and lower salinity can produce nutrient deficiency.



→ Corals will be more toward the sea.

6. Temp. of the Water shall be more than 21° upto 27° they cannot survive in cold water because cold water having higher dissolving capacity. ∴ the CaCO₃ are eroded rapidly and eventually the corals must die.
7. They can not survive along the river mouth.
 - (a) River water reduces the salinity
 - (b) they form turbidity current and sedimentation



8. Along the Western margins of the Continent corals are absent because they are marked by Cold Currents and Cold-upwelling zone the East side.
9. The Coast line where Current and Tides are strong the Corals cannot survive because the first generations itself will be uprooted & toppled by the sea.
10. Those Coastline which have stagnant water or worthy water (not active) where sea waves are not active the Corals cannot survive they only survive where the sea waves are oxygenating the H₂O and bringing nutrients from the far sea.
11. Those coast line which are emergent type have either absence of coral or zone of dead corals but submergent Coast with absence of signs of subsidence have highly proliferated growth.

Types and Structure of Corals Reef.

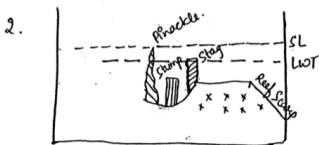
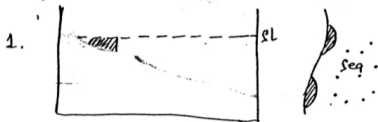
1. Patch Reef - Initial reef which grows along coast line also under favourable condition has linear and 11 growth they exist attach to the Coast line upto the depth of 10m.
ex → Rameshwaram, Chellika lake, Western Andaman.
2. Stag & Stump Reef - They are found in Lagoon they are remnants of old reef structure which could not be dissolved most of the Corals are dead stage are higher than low water tide and stumps are lower than LWT.
they are vertical structure the angular ones are called Coral Penacles
3. Fringing reef - They are adjacent to the Coast line but very often separated by a lagoon these shallow and narrow lagoon is called the boat channel. which is

Connected to a open sea by a narrow stream channel. and its general width is 500m-2km the depth of Lagoon is hardly 6m. upper part is called the Reef flat and the sea-ward slope is called the Reef scarp.

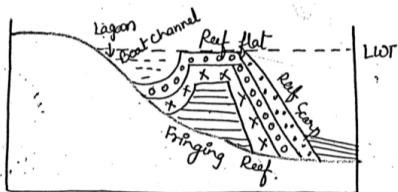
Ex → Culf of Mannar, Florida, Rameswaram.

4. The Barrier Reef :- Largest Reef structure, the Lagoon is shallow but wide and Lagoon has several features like stag, stump, penackals and the Patch Reef. Live coral zone and dead coral zone can be easily demarkated the Reef flat is extremely wide with a no. of ridges on it the Reef scarp forms an angle of 45° the talus zone composed of the Reef fragments are ahead of the Reef which forms new platform for the expansion of the Reef structure, the most noticeable ex- Great Barrier Reef, Australia. located off the coast of Queensland. width 2500 km and length 1900 km It is the largest biological structure of world.

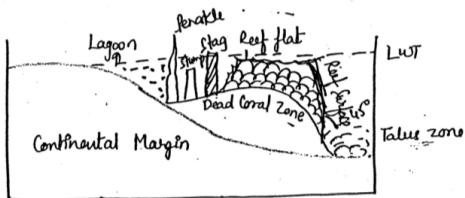
Since such reefs are barrier to navigation they are called Barrier Reef



3.



4.



5. Atoll - Atoll are circular or angular structures where most of the corals are dead and the sea waves have accumulated sand and silt which forms the unique soil type then atolls are marked by vegetation and sometime even by human habitation they are \div into 3 types.

(A) True Atoll - when circular atoll formation encircles a lagoon than it is called true Atoll.

(B) Island Atoll - when the lagoon has an island and enclosed by Reef structure.

(C) Atoll Island - when the Reef structure surrounding a lagoon is under heavy sedimentation that eventually fills up the entire lagoon.

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(A) True Lagoon



(B) Island Atoll



(C) Atoll Island

The theories of atoll formation.

Theory No-1. - Atoll to Murray Atolls can be formed above (over) the 'crater of Submarine Volcanos.

Theory No-2 Atoll to Darwin atoll are formed due to Subsidence of Island and the vertical growth of the Reef.

Theory No-3 Atoll to take during the ice-age 2myA when the sea level fluctuated by 33-38 fathoms the sea mounds and the ridges became expose to the wave erosion which created circular platforms, over which the atolls have grown he also suggested that some of the peaks of the islands must have been eroded and toppled in the Ocean, leaving a circular platform where the atolls later on developed.

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