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Thiruvithancode, Kanyakumari, Tamilnadu, India.

LEMURIA RESEARCH FORUM

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CERTIFICATE

This is to certify that Dr/Mr/Mrs/Ms T. KUMDAON

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participated in the 1st International Conference of Lemuria Research Forum on "Revelations of Submerged Continent" held at MUSLIM ARTS COLLEGE, Thiruvithancode, on 13-10-2021 and presented a paper entitled Current Status of Coral reefs in the Lost Land of Lemuria. (Kumari Kandam)

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CURRENT STATUS OF CORAL REEFS IN THE LOST LAND OF *LEMURIA* (KUMARI KANDAM)

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Abstract

Coral reefs are rain forests of the sea. They are a source of food security and livelihood options for millions of people, and serve as coastal defense and tourist hot spots. Coral reefs are one of the Earth's most beautiful, ancient and complex ecosystems. They play an essential role in sustaining life in the sea as well as providing for a large coastal population through a range of ecosystem services. Covering roughly 284,300 km i.e. only 0.09 % of the total area of the world's oceans, they are comparable to tropical rainforests in biodiversity. However, they are also globally one of the most threatened ecosystems, both from natural as well as anthropogenic pressures. The Indian coastline harbours around 1% of the global reef area. They form an important part of our natural capital endowment, and are a high priority for conservation and management. The current paper presents an overview of current status of coral reefs in Lemuria (Kumari Kandam).

Key words: *Coral reefs; Threaten; Ecosystem; Indian coastline; Lemuria*

Introduction

Kumari land had occupied an area at least of about 70 million Sq.km. The continental crust which fo

rmed the Kumari Land has a density of about 2.70 g/cm3. This huge and dense land mass had gone down to an average depth of about 4,000 m into the ocean and the land is supposed to be remaining at that depth even today and had not come up. If isostasy was at work at that time, then rise of a corresponding land of that size should have occurred in the neighbouring areas. But there are no evidences available for such major uplift of land masses during the late Pleistocene – Early Holocene periods.

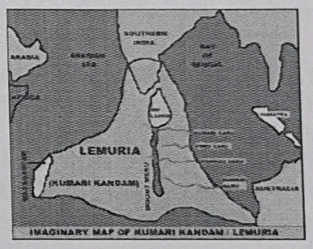
Lemuria

"Lemuria" was coined in 1864 by Philip Sclater, an English zoologist. Sclater was puzzled by the distribution of lemurs around the Indian Ocean, noting that while there are a few species in both Africa and India, there are many more in Madagascar. His explanation for their geographical spread and their concentration in Madagascar was that at some era in the past there must have been a land bridge between Africa and India, which he called Lemuria. This bridge, he suggested, has since submerged. Although now universally debunked by Western-trained scientists, Sclater's theory about the lost land of Lemuria, originally published as a short essay in a relatively unknown scientific journal, was to find a new existence in the imagination and history of a long list of academics, occultists, colonial geologists, and nationalists.

Submergence of Kumari Kandam

"Under-Sea Landslides" (Submarine Avalanches) were cited by a researcher as a probable cause for the submergence and sinking of Kumari Kandam. This aspect was discussed in detail with the cross - sections of Continent to Ocean bottom

showing different features such as Continental Shelf, Continental Slope and Abyssal Plains with sea mounts, guyots and volcanic islands etc.



It was pointed out that submarine avalanches and under-sea landslides normally occur only within the steep and unstable continental slope and not on the stable continental shelf regions. We had already shown that the lost lands in the sea will be restricted to the continental shelf. Besides, the ancient Tamils of Sangam period are reported to belong to a high level of knowledgeable civilisation and as such, they would have established their settlements, particularly the capitals of the kingdom on the stable continental shelf only and NOT on unstable steep continental slopes. Besides, it is pointed out that such submarine avalanches / landslides are localised and cannot affect a continental sized land mass.

Anthropological, genetic similarities between people of madagascar, india and australia.

The proponents of Kumari Kandam of the Anthropological linkages, genetic derivations between the aborigines of Australia, Madagascar

(Africa) and Tamilians of India, as evidences for the existence of the same ancients lived in the sunken land of Kumari Kandam. Similarities of certain words between Tamil and the dialects of the aborigines are cited as further evidence to support this theory. As per the legend, Kumari Land of the Pandiya kingdom was lost to the sea when the Tamilians of the land were using a highly evolved Tamil language which produced many classics in literature. Those people belong to well developed culture and heritage depicting an advanced civilisation. We are getting evidences of such advanced civilisation from the recent Archaeological finding at places like Adichanallur and Kizhadi etc in Tamil Nadu.

Golden Age

Golden Age, or satya yuga (3.891 million bce): The most recent Golden Age started in 3.9 million BCE and ran to the beginning of the Silver Age. In the Golden Age, the Earth remains in constant communication with beings of different planets and planes of existence. Many of the semi-divine races maintain homes and even cities or states on the Earth. The Earth is far more fertile, lush, clean, vibrant and energized, so that all people can obtain whatever they need just from natural resources. Gems, jewels, coral and precious metals and stones of all kind are available in abundance and used widely. People are generally eighteen to twenty feet in height and remain extremely powerful throughout their lifetime.

Coral reefs

Coral reefs are one of the Earth's most beautiful, ancient and complex ecosystems. They play an essential role in sustaining life in the sea as well as providing for a large coastal population through a range of ecosystem services. Covering roughly 2 284,300 km i.e. only 0.09 % of the total area of the world's oceans, they are comparable to tropical rainforests in biodiversity (Spalding *et al.*, 2001).

Coral reefs are known to have a highly restricted distribution and mostly found within shallow tropical and subtropical waters, with maximum diversity between 10 to 30 meters below o o the surface, and within 25 N and 25 S latitudes. Globally, presence of coral reefs corresponds to the distribution of shallow, submarine platforms within the tropics, concentrated towards the three major ocean basins, i.e. Atlantic, Pacific and Indian. About 90.9% of world's reef area is found within the Indo-Pacific region with only 7.6% and 0.5% in the Atlantic-Caribbean and Eastern Pacific regions, respectively. Distribution amongst countries is highly skewed, with Indonesia and Australia alone accounting for 35% of the world's reef area *(ibid).*

Status of coral reefs in the Gulf of Mannar

The coral reefs in the Gulf of Mannar are formed around the 21 islands located between Rameswaram and Tuticorin. The islands and the surrounding shallow water areas covering 2 560 km were declared as Marine National Park in 1986. The coral reefs were exploited heavily during 1960-2000, mainly for construction materials, the lime industry and for ornamental purposes. Though the reef areas were declared as a Marine National Park, there is no physical boundary and so, effective protection is very difficult and challenging. In addition, the destructive fishing practices by the traditional and commercial fisher folk, using various gears such as shore seine, push net and trawl net, enhanced the pressure on the reefs. Also the discharge of domestic sewage and effluents from the industries are rapidly depleting the water quality. The 2004 tsunami along with other conservation initiatives also helped in the complete halt of coral mining and reduction in other destructive fishing practices. There were major studies in the Gulf of Mannar and a comprehensive assessment of coral distribution and abundance was carried out during 2003-05 and documented that the live 2 coral cover was about 37% and the degraded reef area about 32 km . Various conservation, management and enforcement mechanisms helped to enhance the live coral cover after 2005 due to the reduced disturbances to the substrates near the reef areas around all islands. There is good coral recruitment around all islands and an increase of about 5% live coral cover has been observed in the last 4 years since 2005.

Coral reefs in the Andaman and Nicobar Islands

Coral reefs of the Andaman and Nicobar Islands cover an area of about 1020 km i.e. 6% of the total continental shelf of these islands. The corals of these islands are in the form of fringing, patchy and barrier reefs. There are as many as 228 scleractinian species belonging to 58 genera and 18 families. The common genera contributing to the reef formation in these islands are *Acropora, Montipora, Pocillopora, Porites,*

Goniopora, Favia, Echinopora, Fungia, Milleporina and *Heliopora*. The earthquake and the consequent tsunami which struck these islands in December 2004 caused vast devastation of coral reefs leading to geomorphological changes, resulting in uplifting and exposure of reefs in the northern Andaman Islands and submergence of southern Nicobar Islands.

The listing of coral species has continued since Matthai (1924), who listed coral species from the Andaman based on collections in the Indian Museum in Calcutta. Pillai (1983) listed 135 coral species from this region. Turner *et al.* (2001) listed

197 species within 58 genera. The latest status report (Wilkinson, 2000) lists 203 hard coral species occurring in these islands. The faunal studies other than on corals have also been carried out at different reef locations of the Andaman and Nicobar Islands. More than 1200 fish species have been recorded around Andaman and Nicobar (Rajasuriya *et al.,* 2002).

The percentage cover of live corals has been estimated for the islands in the Mahatma Gandhi Marine National Park (Kulkarni *et al.,* 2001) and North Reef, Cinque Island, Twin Islands reef, West Rutland Island, Tarmugli Island, Flat Island, South Button, Outram Island, Henry Lawrence, Minerva ledges and Neil Islands (Turner *et al.,* 2001). These studies also listed
the species wise distribution for these reef areas. In addition, Kulkarni *et al.* (2001) covered several ecological parameters in their study, which included sedimentation, terrestrial zone influence and other anthropogenic factors.

Coral reefs of Lakshadweep

The Lakshadweep coral reefs are the only atoll reefs in Indian waters. As a result of the 1998 bleaching event, the live coral cover around all these islands decreased drastically, to about
10% or less. Following this, the Lakshadweep Administration initiated several measures towards conservation and recovery of the corals around these islands. The sustained surveys of all islands during the last 5-7 years have shown that the recovery in general has led to a near-doubling of the live coral cover post-bleaching, with Bitra, Agatti and Kiltan reefs having now more than 40% live coral cover. Based on their current status, three reefs could be regarded as very good, four reefs as good, and the remaining four as satisfactory.

Bio-physical monitoring of coral reefs using the universally followed Line Intercept Transect method (English *et al.,* 1997) was carried out on yearly basis around all the selected islands. The reefs of the present study area in Lakshadweep are of the atoll type. Atoll type reefs are the rarest among the reef types and are found in very few countries. The 10 inhabited islands (Agatti, Androth Chetlat, Kiltan, Kalpeni, Amini, Kadmat, Kavaratti, Bitra and Minicoy) and two uninhabited islands (Bangaram and Suheli) were selected to assess the coral status. Coral reefs of the Lakshadweep islands are recovering well after bleaching in 1998; however it is always wise to reduce the stress to the coral reefs.

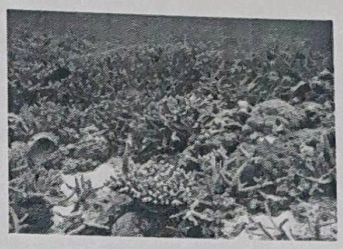
Threats to coral reefs

Bleaching

Mass bleaching of corals observed in the reefs of the Indo-Pacific coincided with the El Nino event in 1997-98. Reports of bleaching from the Andaman Islands revealed that the Little Andaman Island reef was severely affected and the live coral cover in Dugong creek was only 12.0% (Jeyabaskaran, 1999).

Sedimentation

Almost all the reefs fringing mainland India and the Islands are affected by sedimentation, due to developmental activities along the coast, as well as natural causes. Damage due to freshwater runoff has been observed in the semienclosed area in a channel near Mahatma Gandhi Marine National Park and also farming practices have been cited as reason for siltation in Hut Bay area of Little Andaman Island (Venkataraman, 2003).



Pollution

The fringing reefs of the Islands have experienced eutrophication through untreated sewage disposal and runoff from farm lands. Coral mortalities have also been observed in and around Port Blair (Venkataraman, 2003), which may be associated with pollution; increasing vessel traffic in these islands is also posing considerable threat from oil pollution.

Tidal/Tsunami waves

The tidal/tsunami waves are becoming a potential threat as they damage the coral reef framework and especially the branching corals; clogging of reef areas with garbage wastes and deposition of sand and mud on the reef surface, which leads to mass mortality, are the other main threats.

Tourism

Tourism creates large amount of solid wastes and their inappropriate disposal and leaching of toxic substances leads to coral destruction.

Conclusion

The current review has clearly indicated that several aspects still remain under researched
such as long term qualitative and quantitative reef assessments on overall biodiversity and related ecosystem processes and taxonomically extended surveys of sessile organism that could highlight the environmental conditions in the reef systems. The knowledge on ecosystem services is a major gap area that limits understanding of the impacts of overall degradation on human well-being. The various drivers and pressures on reef systems are also very poorly understood and quantified. Comprehensive knowledge base systems are critical to conservation and management. Currently, the understanding of the ecosystem services of corals is quite limited. More focused research is required on biodiversity and ecosystem services of coral reefs, including an understanding of the ways human well-being is being affected by declining services.

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