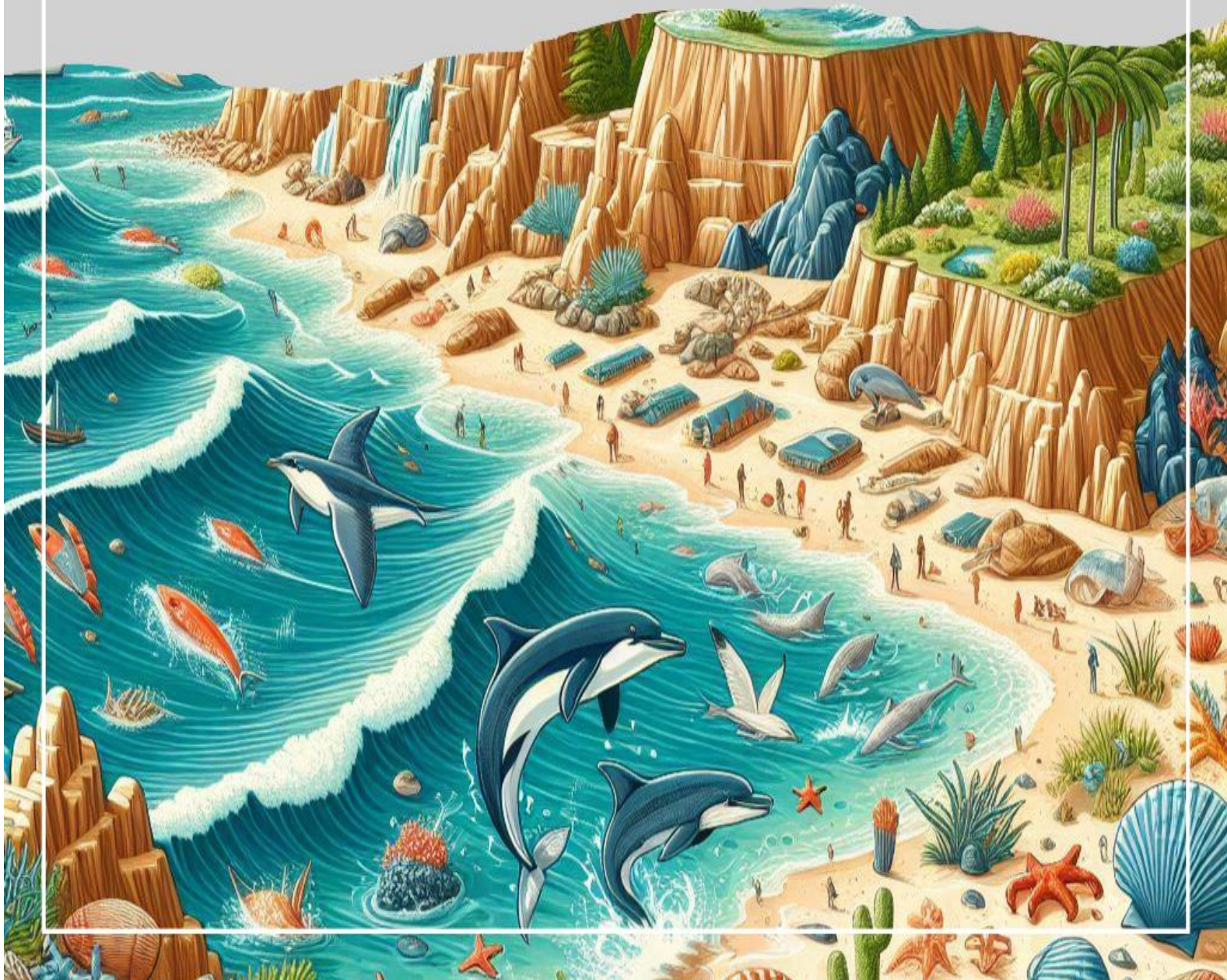


GEOSPHERE 2023-24

VOLUME - 4

ANNUAL MAGAZINE OF THE
DEPARTMENT OF GEOGRAPHY
BARASAT GOVERNMENT COLLEGE



About the Department

Barasat is a town steeped in rich cultural heritage, illuminated by the Bengal Renaissance.



Its soil has been graced by luminaries like Bankim Chandra Chatterjee, the esteemed author and composer of India's National Song, who served as the first Indian Deputy Magistrate here. Visionaries such as Ishwar Chandra Vidyasagar, Peary Charan Sarkar, and Kalikrishna Mitra spearheaded numerous social reforms in Barasat, particularly in the realm of education, with a notable emphasis on women's education. This progressive spirit led to the establishment of Bengal's first private school for girls in 1847 by Kalikrishna Mitra, with assistance from Peary Charan Sarkar.

Barasat Government College stands as a proud inheritor of this illustrious cultural legacy. Its inception, however, was borne out of a historical calamity—the partition of Bengal, which resulted in a massive influx of displaced people into the border state. With many of these uprooted individuals relying on formal education for their livelihood, the State Government, in 1950, selected Barasat as the site for a new college.

The Department of Geography at Barasat Government College was inaugurated in 1996, initially offering an Honours course

under the University of Calcutta, and later affiliating with West Bengal State University in 2008. The department's faculty are adept at teaching various branches of Geography, including Geographical Information Systems and Remote Sensing, continuing the town's

tradition of educational excellence •

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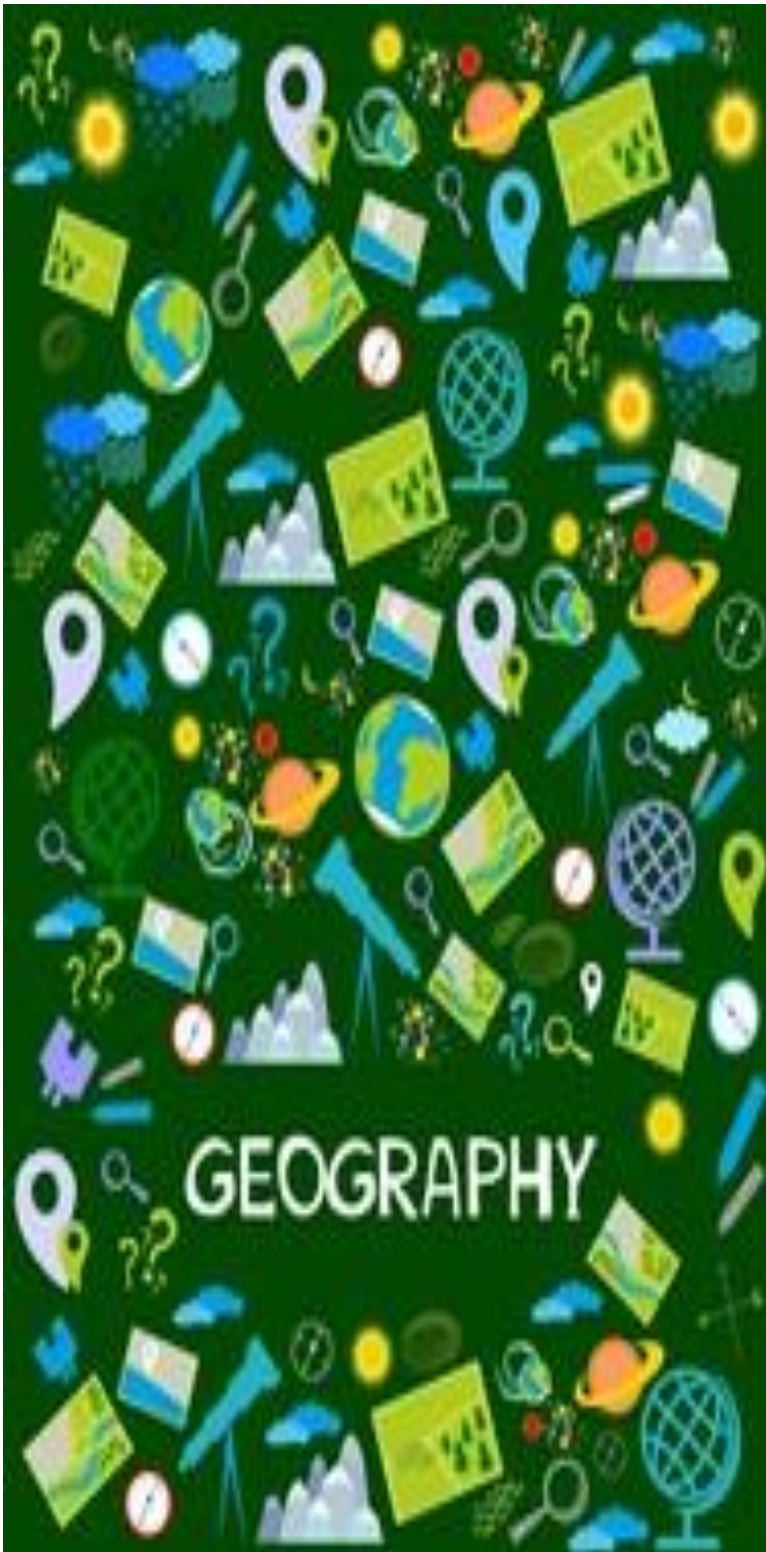
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Preface

It is with great pleasure that we present the departmental magazine, “GEO-SPHERE,” for the academic session 2023-24. During the pandemic, our traditional wall magazine had to adapt to an electronic format, addressing the urgent need for a new mode of presentation. After much effort, our students have successfully completed this long-awaited publication.

This edition showcases the writing ability, observational skills, hard work, and dedication of our students. It covers a wide range of topics, including both natural and manmade catastrophes. Various critical issues such as climate change, ozone layer depletion, global warming, air pollution, and deforestation are explored in different articles. We hope this academic endeavor will inspire students to enhance their knowledge, improve their writing skills, and develop their critical thinking abilities.


Lastly, I would like to extend my congratulations to all faculty members of our department for their valuable contributions in shaping this magazine and ensuring its timely publication.

Dr. Ruksanara Begum

Head, Department of Geography




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Modern Ocean : AI can reveal the secrets of the ocean

-Snigdha Das

Introduction: Despite being some of the most valuable and diverse ecosystems on the world, marine ecosystems are always under danger due to climate change and human activity. Precise and timely data regarding marine species and their numbers are essential for developing conservation and management plans. Conventional techniques for keeping an eye on marine species, such manual surveys and diver observations, are costly, time-consuming, and can have a narrow scope. These problems may be effectively solved by AI technology, especially machine learning and computer vision, which improve and automate the identification and monitoring of marine species.

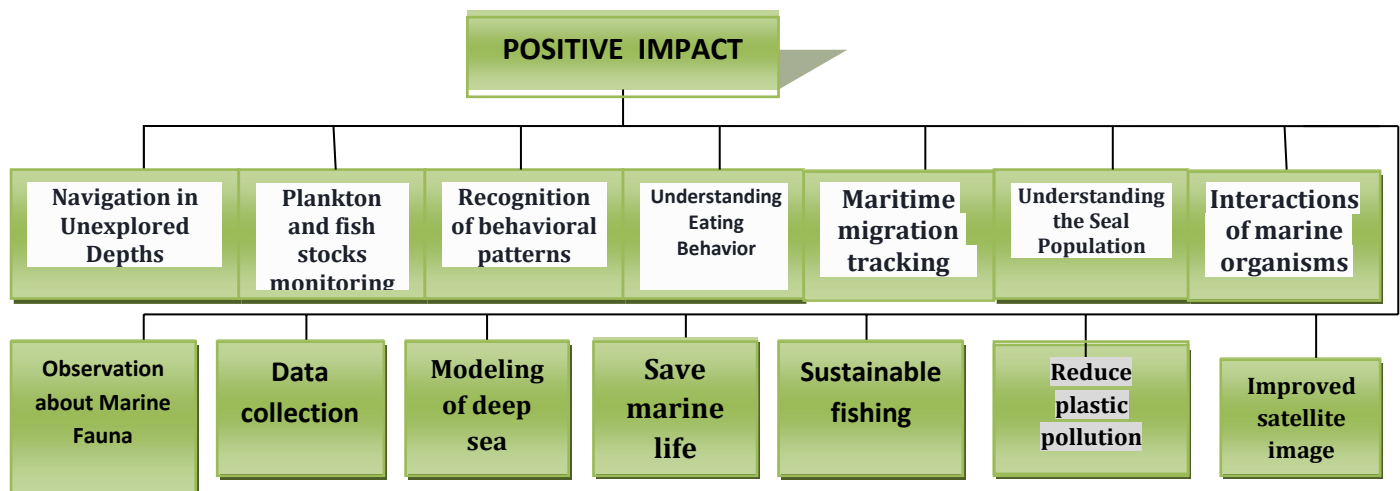
“ Not only will a healthy ocean benefit its inhabitants, but the entire human race. AI is thus the next step.”
-Megan Ray
(Women of Green)



The Challenge:

Accurate species identification and monitoring is a key barrier to marine conservation, particularly in large and remote ocean areas. Understanding species distribution, measuring ecological health, and detecting changes in population dynamics are all dependent on this. Manual identification procedures are resource intensive, error-prone, and susceptible to human prejudice.

Impact:



- **Navigation in unexplored Depths:** This is the most helpful impact of AI in Oceanography. AI provided some drones with the ability of navigate autonomously. The drones are made by sensor such as acoustic Doppler, pressure gauges and inertial measuring devices. Machine learning integrates sensor data to build real time maps of the underwater environment.

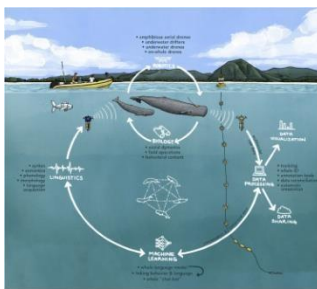


We are Thankful to this, drones perceive the environment with high sensitivity .Machine controlling AI specifically improved the equipment or ecosystems they cross, percentage of successful missions.

- **Plankton and Fish Stocks Monitoring:** in this way Artificial Intelligence helps to count fish using technology , fish stocks, monitor their size and even distinguish one type of fish from another. On the other hand AI can distinguish between individual fish species, understand the lifespan and behavior of a individual species in delineate. Also Marine biologists can better monitor Plankton with the help of AI.

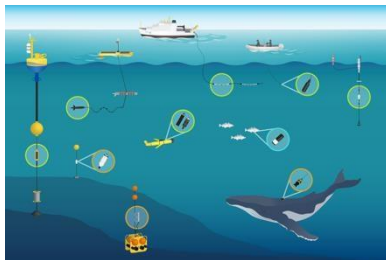


- **Recognition of Behavioral techniques:** AI can track behaviors of breeding , nesting



based on video, and also it can recognize and detect specific patterns of behavior that reaction to environment stimuli. By using hydrophones AI can track whales mating patterns.

example: during the study of penguin feeding behavior, accelerometers detected shocks that occurred when the penguins grabbed the prey. After that, Artificial Intelligence analyzes the information collected from the devices and provides an overview of the schedule of meals,



feeding, duration of meals, etc.

- **Maritime Migration stalking:** Data collection on water depth, temperature and animal location by satellite tags then they go to AI and then processes data on migration routes . As a result we get future movements prediction and behavior based on tracking data.

- **Knowing about the seal population:** Colgate

University has teamed up with FruitPunch AI for Seals Challenge to improve SealNet with techniques to increase its robustness ,usability and accuracy .Based on archival photos and monitoring their populations deep learning models help ecologist and researchers to count seals.



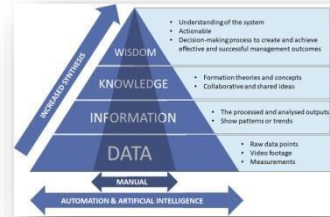
- **Reduce Plastic Pollution:** According to researchers, around 1 million seabirds and 1 lakh marine animals die due to plastic dumping every year. By using AI tools to help clean oceans by extracting plastic pollution.



- **Observation about Marine Fauna:** Marine creatures' behavior is crucial for studying undersea resources, as factors like food availability, habitat changes, human impact, and climate change influence their movements. Scientists are using AI and modern technology to predict and analyze these

animals' behavior, achieving unprecedented accuracy and monitoring species through big data sets.

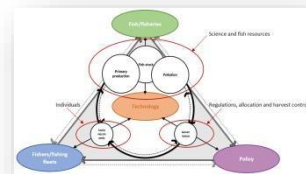
- **Data Collection:** AI-combined AUVs for computer vision generate large-scale data using convolutional neural networks to characterize biological and geological specimens. These tools help researchers understand ocean conditions by recording measurements like temperature, turbidity, pH, and salinity. AI algorithms can infiltrate the ocean and identify important areas.



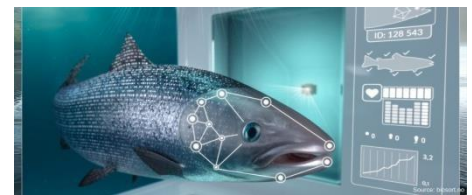
- **Modeling of Deep Sea Resource:** Seabed resource modeling has been improved using machine learning algorithms, enabling better simulation in water-based precipitation transport and seafloor restoration. Scientists developed a mathematical model for predicting cobalt-rich manganese crust distribution using AUV sensors and light profile imaging.



- **Save Marine life:** Climate change is affecting oceans, causing the extinction of sea species. Researchers are using AI to track and manage marine animals, potentially curbing illegal poaching. Flukebook.Org and OOICloud are AI-powered platforms for whale and dolphin species protection and data access for ocean research.

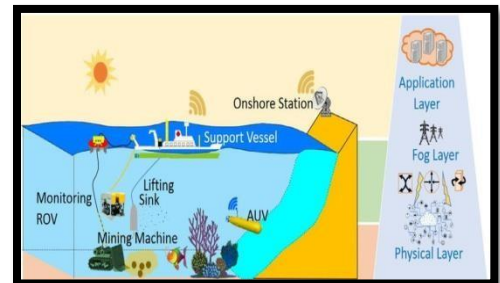


- **Sustainable Fishing:** AI enhances sustainable fishing by optimizing routes, estimating fish populations, and monitoring illegal activities. It challenges quotas without

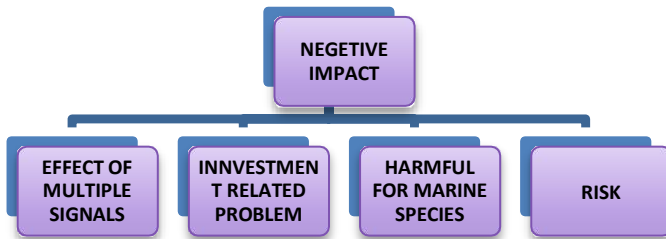
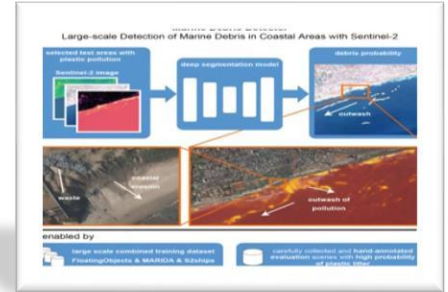


jeopardizing marine habitats, allowing businesses to catch without environmental impact.

- **Interactions of Marine Organism:** AI can aid in understanding marine organism interactions through deep learning algorithms, revealing their workings, relationships, and environmental changes. Recognizing and mitigating devastation is crucial for marine life, ensuring its survival and sustainability.

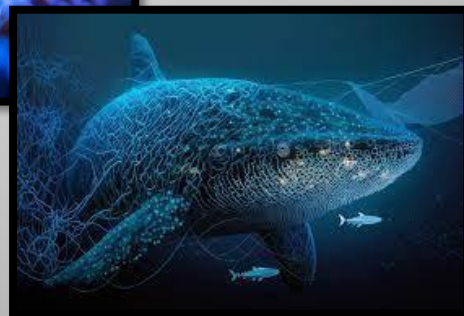


- **Improved Satellite Image:** Artificial intelligence can analyze satellite remote sensing data to detect changes in chlorophyll concentration, sea ice extent, and surface temperature, using convolutional neural networks to study climate change's impact on marine ecosystems.



Robotics with AI in oceanography pose risks like illegal operations, ineffective responses, and scalability issues.

Oceanographers must manage and control robots and AI to protect marine ecosystems, human populations, and ecosystem stability.



Conclusion: The application of artificial intelligence in marine species identification and monitoring has been found to dramatically increase conservation projects' precision, efficacy, and reach. AI technology has improved our understanding of the Great Barrier Reef's health and biodiversity, allowing us to take preemptive measures to maintain this crucial ecosystem. AI technology is predicted to play an increasingly important role in marine conservation as it advances, bringing up new opportunities for the worldwide preservation of marine species and ecosystems.

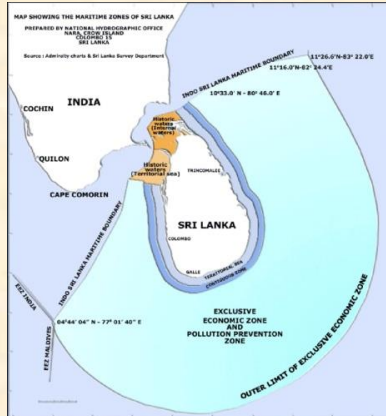
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Srilanka's Marine pollution: The harmful truth

Riya Kundu

Sri Lanka, an Island Country in South Asia, Historically Known As Ceylon and Officially the Democratic Sri Lanka. This Nation Ocean and Has a million People, Almost Texas. Sri Lanka Has a sq.km.(25330 sq.mile), sq.mile) of Land and 980 Water. Its Coastline is



Located in The Indian Ocean Population of About 20 Equal to the Population of Total Area of 65610 With 64630 sq.km (24950 sq.km (380 sq.mile) of 1340 km (830mile) long.

Among All the Most Polluted Coastal Areas of the World, The Coastal Part of Sri Lanka is One of Them .The Word “ Pollution” Describes The Occurrence And The Inputs Of Wastes and The Impact of This Wastes On The Environment. Thus the Presence of Such Wastes in The Sea Causes Marine Pollution. “ The introduction by man, or indirectly , of substances or energy to marine environment resulting in deleterious effects such as: hazards to health, hindrance to marine activities, impairment of the quality of seawater various uses and reduction of amenities”



directly the human for (UN

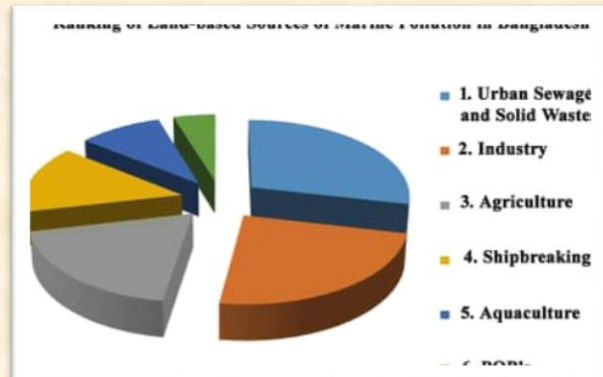
definition). Because of Having Development IN Tourism and Urbanization Happening in Coastal Areas, Recently Sri Lanka Engaging With Lot of Marine Pollution.

Marine Pollution Can be Occurred Due to Several Reasons. It Generally Can be Devided into Two Major Parts-

- Land base Marine Pollution.
- Ships Transportation Marine Pollution.

Causes of Land base Marine Pollution

- Land Run Off (Surface run off, Urban run off and Polluted run off).
- Urban and Domestic Debris (Plastic glasses, Polythene, Cigarette Butts , Medical Wastes ETC.)
- Industrial Debris (Heavy Metals, Polychlorinated biphenyls, inorganic Matters, Toxins)
- Agricultural Debris(Heavy Metals-Cr, Hg, Cd, Organic Matters, Nutrients- N,P)
- Tourism
- Off-shore Installation



Causes of Ships Transportation Marine Pollution:

- Designated dumping grounds at sea(dredged spoil, old munitions , sewage sludge, fly ash, oil based drilling mud)
- Oily discharges from ballast water and bilge water during routine ship operations and illegal dumping of solid waste
- Accidental Spills carrying hazardous substances, oil, gas etc.



This reasons Also Affect On The Marine Life :

Plastic Pollution:

The predominant composition of marine debris found on Sri Lanka beaches was



plastics, accounting for over 80% of the total Sri Lanka. Sri Lanka itself is a leading contributor to marine litter with generating more than 1.5 million plastic waste each year. Plastics often contain additives making them stronger, more flexible and durable. However, many of these additives can extend the life of products, even if they become litter, with some estimates ranging to at least 400 years to break down.

Effects Of Marine Pollution:



- The increased concentration of chemicals, such as nitrogen and phosphorus, in the coastal ocean promotes the growth of algal blooms, which can be toxic to wildlife and harmful to humans.

- The pollution of lakes in Sri Lanka leads to algal blooms, which reduces the oxygen content and has negative consequences on fish populations.

- Sea animals are frequent victims of ocean oil pollution. When the oil gets into seabird feathers, they may not be able to fly or feed their young.
- Microplastic pollution is one of the main causes of rapidly declining fishing stocks along the Sri Lanka coast.



Prevention:

- In Sri Lanka, the Marine Pollution Prevention Act NO. 35 of 2008 is the national legislation to prevent and control marine pollution.
- Choose nontoxic chemicals and dispose of herbicides, pesticides and clearing products properly.

Day by Day Sri Lanka is Getting More Vulnerable To The Global Problem Of Pollution, Which Pose Environmental, Economy and Public Health Threats in the short Term , Sri Lanka Must Co operate With Local

Municipalities to Encourage More Efficient Pollution Management, With Long Term Goals Of Moving Toward a Gradual Fade out of Pollution.

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Balancing Beauty and Burden: The problems of Overtourism on Amalfi coast, Southern Italy

Kangana Debnath



OVERVIEW

The Amalfi coast is a UNESCO World Heritage Site. This status protects its ancient marine and agricultural heritage as well as its unique architecture, with many colourful and traditional towns built into the cliffsides. It boasts 50km of colossal beauty and myriad stories. It is a tourist destination located in Campania, a region in the southern part of Italy. The tourist boom of this place occurred at the end of eighteenth century thanks to the Grand Tour travellers. The discovery of Amalfi Coast was due to the building of the new carriage way and to the cultural change in the concept of beauty and land-scape



GEOGRAPHY

The Amalfi Coast is situated along the Mediterranean Sea, with geographical coordinates approximately between 40.6°N latitude and 14.6°E longitude. It is located to the southeast of Naples and west of the Cilento Coast. The Tyrrhenian Sea along the Amalfi Coast is known for its clear blue waters, marine biodiversity, and numerous grottoes and coves. The Amalfi Coast's geography is defined by its dramatic cliffs, terraced landscapes, and stunning coastal scenery.

> THE AMALFI COAST HAS CONFLICTING ASPECTS THAT CHARACTERISE ITS TOURISM DEMAND. IT HAS SEVERAL RESOURCES AS STRENGTHS, BUT AT THE SAME TIME IT HAS SOME WEAKNESSES THAT IMPACT NEGATIVELY ON THE TOURISM INDUSTRY.

STRENGTHS	WEAKNESSES
Natural resources	Lack of infrastructure
Cultural resources	Lack of organisation
Location	Lack of cooperation
Landscape	Seasonality of demand
Multi-type destination	

> HOWEVER, ITS POPULARITY HAS LED TO SIGNIFICANT CHALLENGES, ESPECIALLY DUE TO OVERTOURISM. IT HAS IMPACTED ON THE DESTINATION IN THREE CATEGORIES: ECONOMIC, SOCIO-CULTURAL AND ENVIRONMENTAL; ALL OF THESE ARE INTERRELATED AND INFLUENCE EACH OTHER. THE MAIN IMPACT IS CAUSED BY THE VISITOR'S VOLUME DURING CERTAIN MONTHS OF THE YEAR.

> CAUSES OF OVERTOURISM:

- 1. Global Tourism Boom:** Increased travel due to affordable air travel and digital platforms like Airbnb.
- 2. Social Media Influence:** Heavy promotion of the Amalfi Coast's scenic beauty on social media.
- 3. Cruise Ship Tourism:** Growth of cruise tourism causing sudden influxes of visitors.
- 4. Lack of Regulation:** Insufficient measures to control tourist numbers and manage activities.

>Consequences of overtourism: Overtourism on Amalfi coast has led to several significant consequences, impacting the environment, local communities, and the overall quality of the tourist experience.

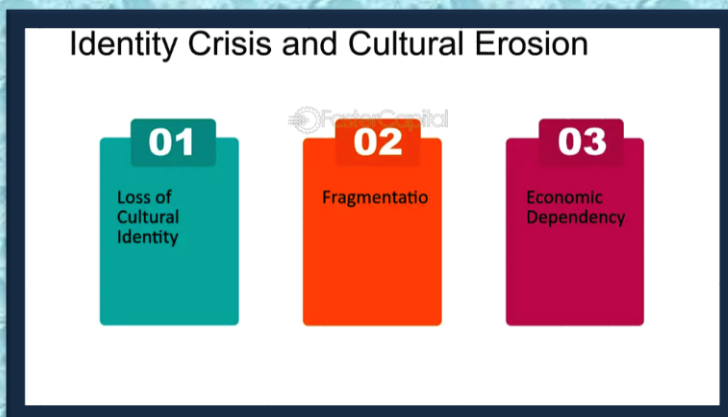
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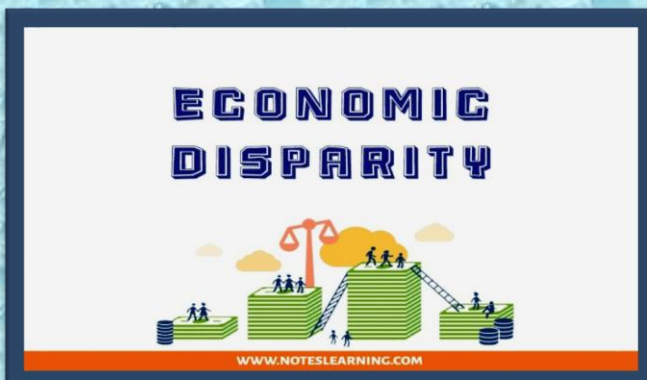
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>SOLUTIONS AND RECCOMENDATIONS :

1.Executing The travel industry Covers: Present cutoff points on the quantity of guests permitted during top seasons to forestall stuffing.

2.Advancing Slow time of year the travel industry: Support the travel industry during the slow time of year to spread the guest load all the more equitably consistently.

3.Practical Vehicle Arrangements: Create and elevate reasonable transportation choices to lessen gridlock and ecological effect.

4.Upgraded Guideline and Authorization: Fortify guidelines on vacationer exercises and implement consistence to safeguard normal and social legacy.

5.Local area Commitment: Include nearby networks in the travel industry arranging and decision-production to guarantee that their requirements and concerns are tended to.

6.Vacationer Instruction: Teach sightseers about manageable travel rehearses and the significance of regarding neighborhood societies and conditions.



>Conclusion: The Amalfi Coast allure as a top travel destination is undeniable, but the challenges posed by overtourism require urgent and coordinated efforts to ensure it's sustainability. By understanding the causes and consequences of overtourism and implementing effective solutions, it is possible to preserve the beauty and cultural richness of Amalfi coast for future generations while maintaining the quality of life for it's local residents.

● **Refernces:**

- Academic journals and article on overtourism and sustainable tourism practices.
- Ravello, 2014, Some challenges facing the tourism industry: a focus on the Amalfi Coast, Centro Universitario Europeo per I beni culturali.
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STATUS AND DIVERSITY OF FLORA AND FAUNA OF ANDAMAN & NICOBOR ISLANDS

-Kaishali Samadder

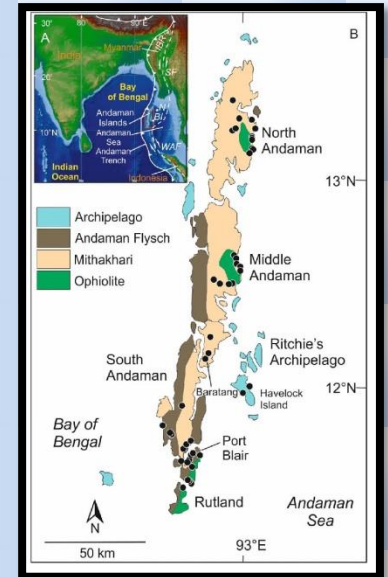
Andaman & Nicobar Islands , a group of 572 islands and islets ,represents one of the richest repositories of biodiversity in the whole of South and South - East Asia both in terms of flora and fauna .These islands are located in the lap of Bay of Bengal , off the eastern coast of India . The Andaman group of islands is separated from the Nicobar group by a 150 km wide under sea deep channel situated at 10 N latitude , called Ten degree channel.

Among all the states and Union Territories of India ,

GENERAL INFORMATION

- **Location:**
- **Latitude: 6 45 N and 13 41 N**
- **Longitude: 92 12 E and 93 57 E**
- **Total Geographical Area: 8249 sq.km.**
- **Total Coastline: 1962 km**
- **Number of Islands:572**
- **Climate :Tropical**
- **Annual Rainfall: 3000mm**
- **Total Forest Cover: 7615 sq.km.**

several non-indigenous angiospermic species , besides many



the Union Territory of Andaman & Nicobar Islands is unique because of the tropical humid climate and insular nature with no contiguity of land with rest of country .These islands have the tropical 54% area under evergreen forest. Classified to be one of the 12 biogeographical zones in India , these islands have a biodiversity profile of over 5500 animal species , 2000 indigenous and

cryptogamic species and more than 2200 plant species , of which about 200 are endemic in three important natural ecosystems – the forest ecosystem , the marine ecosystems and the mangrove ecosystem.

- **FLORA** - Andaman & Nicobar Islands boast a mix of tropical rain forest and mangroves , with the latter playing a important role in protecting the coastline and supporting marine life. In the northern part of Andaman , lush wet evergreen forest prevail . The middle of Andaman boasts moist deciduous forests , while epiphytic vegetation , primarily ferns and orchids , dominates the southern part of Andaman islands . The northern area of Nicobar islands are predominantly barren , covered by grasslands , whereas tropical forests dominate the central and southern islands of Nicobar group.



- **Tropical Rain Forests** : Andaman & Nicobar Islands are known for their pristine tropical rain



forest .These islands are more than 92% Covered with luxuriant forests .Important tree species are Badam , Padauk , Black chuglum , White chuglum , sea



mahua, Choori etc.



- **Mangrove Vegetation:**

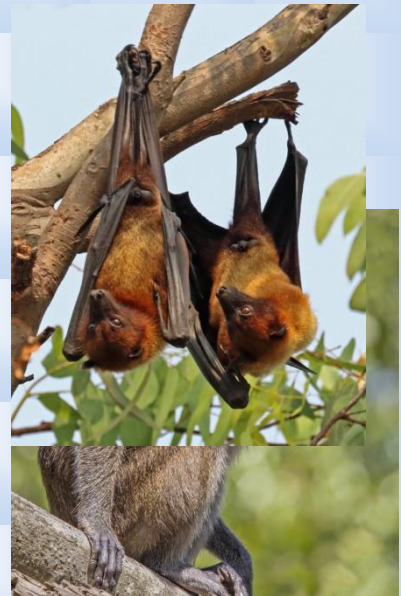
Mangrove forests are another important feature of Andaman & Nicobar islands . They eventuate on the seaward fringes and on the sides of the creeks , occupying 966 sq.km.

area . Main mangrove species are *Avicennia officinalis* , *Rhizophora mucronata* , *Ceriops tagal* , *Bruguiera conjugate* , *Excoecaria* sp. etc. Mangroves protect the shoreline from soil erosion and serve as reservoir of organic matter to support marine life of these coastal area .

- **FAUNA** – Andaman & Nicobar island’s fauna is as diverse as its flora , with a significant number of species being endemic to the region . Out of more than 9100 species recorded in the Islands , 1032 are endemic .



- Mammals** : About 50 varieties of forest mammals are found to occur in these islands , some of them are endemic . common mammals found here are



Andaman wild pig , Elephant , Andaman masked palm civet , Andaman horse-shoe bat , whale , Dolphin , Dugong , Lesser short nosed bat , Crab eating macaque , Nicobar tree shrew etc. The Andaman wild palm civet are notable endemics .

- Reptiles & Amphibians** : The number of reptiles is also crazy here. The Andaman cobra and Nicobar monitor lizard are notable reptiles , besides



those Salt water crocodile , Water monitor lizard , Reticulate python , Sea snakes etc. The islands host several endemic amphibian



species , like the Andaman crayfish frog.

- **Birds** : Over 270 birds are recorded , of which 14 are endemic .



drongo etc .

Some important species are Emerald dove , White-bellied sea eagle , Crested serpent eagle , Nicobar parakeet , Andaman teal , Nicobar pigeon , Green imperial pigeon , Andaman wood pigeon , Andaman



- **Marine Life** : These islands have 1962 km long coastline . There are more than 1200 species of fish ,



such as Clownfish , Giant trevally , Blue fin trevally , Coral trout ,



Green jobfish , Wahoo , Dandus , Dorado , Surmai etc , 350 species of

echinoderms , 1000 species of molluscs such as Charonia tritonis , Chambered





other organisms.

nautilus etc and many more . More than 200 species of corals have been recorded , such as Acropora , Fungia , Porites Heliopora, Favia etc. These coral reefs are important breeding and nursery ground for fish and many

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GOA COASTAL ECOSYSTEM

BY : ARGHYA DEEP DAS

INTRODUCTION -Marine and coastal ecosystems are important habitat with a distinct structural diversity and flow of energy. The salt marshes , mangroves, wetland, estuaries and bays form the main area of coastal ecosystem with high biodiversity Goa's 103 km coastline is blessed with the most enchanting beaches lapped by the Arabian Sea.



BIOLOGICAL DIVERSITY OF GOA-

Marine biodiversity shows different trends in different geographical areas. Recent taxonomic research in India has brought to light the higher number of marine species in each group in which are many unidentified.



Fig-Biological diversity

Table: Estimated Indian marine faunal biodiversity

Taxa	No. Species	Taxa	No. Species	Taxa	No. Species
Porifera	512	Rotifera	47	Sipunculs	41
Cnideria	1385	Mollusca	3400	Bryozoa	272
Pelyclad	46	Annelida	510	Pisces	3267

Source: Zoological survey of India,2017

COASTAL MARINE DIVERSITY OF GOA -Goa is home to a beautiful fringing reef found around Grande island, an uninhabited island located three nautical miles offshore. The reef is home to a sunken wreck, hard and soft corals and myriad diverse species of reef fish, with occasional visits by Olive Ridley turtles.

✚ **PHYTOPLANKTON**-Phytoplankton are the autotrophic components of the plankton community and a key part of ocean and freshwater ecosystems

✚ **BENTHOS**-the community of organisms that live on, in, or near the bottom of a sea, river, lake, or stream, also known as the benthic zone.

✚ **MARINE FISHERIES**-Goa produced about 127 thousand metric ton of fish



Fig- Phytoplankton



Fig-Benthos

during financial year 2018. There are 224 species of fishes recorded from Goa coast.

✚ **ZOOPLANKTON**-Zooplankton is a mass of very small animals that float in water and are eaten by sea creatures. Zooplankton forms a critical part of the food chain.

✚ **SEAGRASSES**-Seagrasses are the only flowering plants which grow in marine environments. Seagrasses evolved from terrestrial plants which recolonised the ocean 70 to 100 million years ago.

✚ **MANGROVES**-Goa has coastal wetland area of 8486 ha (MOEF,2011) and mangrove our important component of wet land vegetation. There are 15 species of mangrove recorded in Goa



Fig- Seagrasses



Fig-Mangroves

MANAGEMENT AND CONCLUSION - Management strategies should focus on protecting sensitive habitats such as mangroves, dunes, and coral reefs, as well as regulating human activities such as fishing, tourism, and development to minimize negative impacts.

At last we need monitoring of the ecosystem's health, including water quality, biodiversity and habitat integrity. This data can inform management decisions aimed at preserving or restoring the ecosystem.

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Lakshadweep

Flora and Fauna

BY

'SUPARNA AICH'

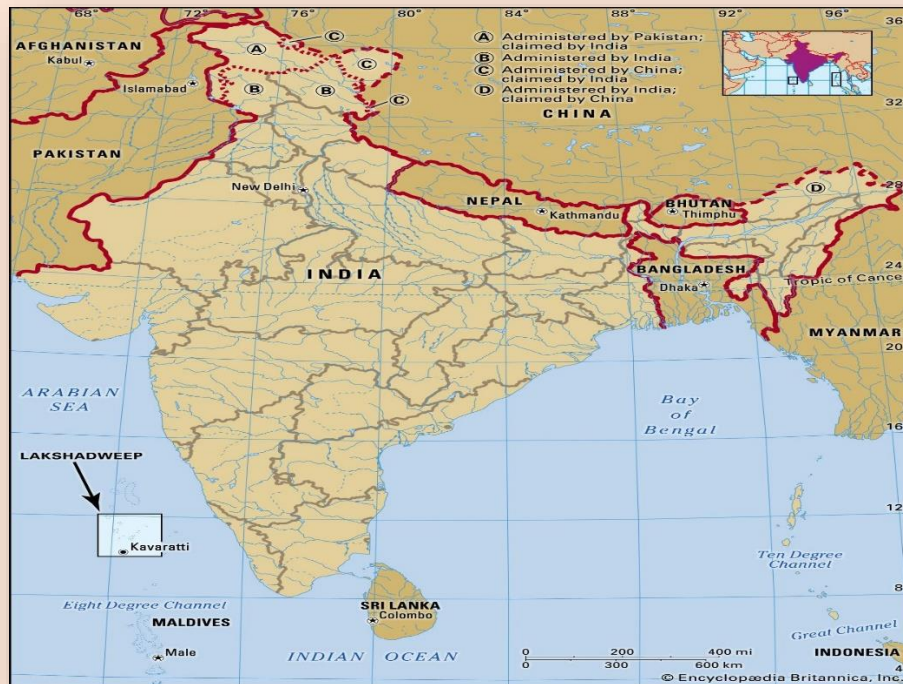


INTRODUCTION

Lakshadweep, the group of 36 islands is known for its exotic and sun-kissed beaches and lush green landscape. The name Lakshadweep in Malayalam and Sanskrit means 'a hundred thousand islands'. "The natural landscapes, the sandy beaches, abundance of flora and fauna and the absence of a rushed lifestyle enhance the mystique of Lakshadweep.

LOCATION

Lakshadweep is located between 8° – 12° 13" North latitude and 71° – 74° East longitude, 220 to 440 Kms. away from the coastal city of Kochi in Kerala, in the emerald Arabian sea. Considering its lagoon area of about 4,200 Sq.kms, 20,000 Sq.kms of territorial waters and about 4 lakhs Sq.kms. of economic zone, Lakshadweep is a large territory.



CLIMATE

Lakshadweep consists of 36 Islands, only 10 of them inhabited. The islands are characterized by pristine white Sandy beaches, coral reefs and shallow lagoons. The climate is tropical, with warm temperatures and high humidity throughout the year.



FLORA

The flora of Lakshadweep is primarily composed of coconut palms, which are extensively cultivated on the Islands. Other common plant species include pandanus, breadfruit, screw pine and various species of mangroves. The Islands also support a variety of flowering plants, shrubs and creepers. The natural flora falls under littoral or strand vegetation. Three different varieties of sea grass are seen adjacent to the beaches. They are known as *Thalassia hemprichii*, *Syringodium isoetifolium* and *Cymodocea isoetifolia*. The grasses considerably help prevent erosion of lagoon beaches. The flora in the union Territory of Lakshadweep includes Banana, colocasia, Drumstick, wild almond. Coconut is the only crop of economic importance in Lakshadweep.

VEGETATION

Vegetation in the islands consists of shallow rooted plants and deep rooted trees. The shallow rooted vegetation which includes grasses, crops and shrubs obtain their moisture requirements from the soil moisture zone .Some of shrubs plants like scaevola keonigii,colophyllum inophyllum,casuarina equisetifolia are unevenly grown throughout the islands . Coconut trees are the major deep rooted vegetation on the islands of Lakshadweep.



Colocasia



Drumstick flower



Coconut Tree



Wild almond fruit

LAKSHADWEEP FAUNA

Lakshadweep, a group of islands located in the Arabian sea off the South Western coast in India, is known for its diverse marine ecosystem. The islands are home to the white variety of flora and fauna both on land and in the surrounding waters. Here are some of the notable fauna found in Lakshadweep:

•Land Fauna:

The richness of fauna in a region is generally dependent on the reachness of Laura and the diversity of habitats in the area, offering optimum conditions for their food safety and propagation. But due to the poor soil, limited land area, meagre variety of natural vegetation, absence of forests and freshwater habitats, the land fauna associated with the terrestrial ecosystems as seen elsewhere is largely missing on these islands.



Land fauna

•Reptiles:

Reptiles comprises of the wall- lizards,or house -geckos Hemidactylus frenatus and Gekko smithi ,the garden lizards,the skink Mabuya carinata,the worm -snake Typhlop d braminus and the wolf -snake Lycodon travancoricus.

•Insects:

Indigenous land invertebrate fauna of these islands consists of the soil -living protozoans,nematodes,earthworms,terrestrial isopods,crabs , hermit crabs,insects ,mites,and spiders .Mosquitoes are quite common in many of these islands . The beetles, cockroaches, butterflies, grasshoppers, trips, flies,ants and white-ant are the next abundant groups of insects on this archipelago

•Birds:

The Islands of Lakshadweep attract a variety of bird species, including both resident and migratory birds. Some common resident birds include the white-bellied sea eagle, herons, egrets, and terns. Migratory birds such as gulls, sandpipers, and plovers visit the islands during their annual migrations.

•Mammals:

There are no native mammals as such on these islands. Domestic cattle, particularly the goats and the poultry birds are common in all the inhabited islands.

•Marine Fauna:

Lakshadweep is renowned for its diverse marine life, with vibrant coral reefs and a wide range of marine species. The coral reefs of Lakshadweep are home to numerous species of fish, Turtles ,and other marine organisms .Some popular marine species found here are parrotfish , angelfish, butterfly fish, sea cucumbers and surgeonfish .



Common cat



Sea cucumber



Parrot fish



Melon butterfly fish



Brown Noddy



Sooty Tern

CONSERVATION EFFORTS

Due to the ecological significance of Lakshadweep conservation efforts are in place to protect its flora and fauna. The Lakshadweep administration along with various organisations, focuses on coral reef conservation, turtle conservation and preservation of mangrove ecosystems. These efforts aim to maintain delicate balance of the Islands ecosystems and protect their biodiversity.

CONCLUSION

Lakshadweep is a Paradise of biodiversity, with its uniflora and fauna both on land and in the surrounding waters. The Islands offer a stunning environment for the nature lovers, researchers and eco tourists. It is essential to continue the conservation efforts to ensure the long term survival of the diverse species found in Lakshadweep.

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TAR-BALL POLLUTION ON THE BEACHES OF ALIBAUG (MAHARASHTRA)

Name – Indrajit Gayen.

Introduction

A coastline is defined as the line where land and water surfaces meet (border each other). India has approximately 8110km long coastline (Gujrat,Goa,Odisha, West Bengal,etc).In this report, coastline of Alibaug beach(Raigad District),which is Maharashtra state was studied.The Latitude and Longitude of Raigad District in decimal is 18.5158 N and 73.1822 E, Alibaug is the District Headquarter of Raigad.From last few years,Raigad District becomes the main tourist place.In recent years,due to tourist activities like routine ship maintenance,underwater drilling operations,and destructive fishing operations,more than thousand liters of oil spill problems was observed.

In the present paper,beaches in Alibaug region,such as kihim,Nagaon,Akashi,Revas were selected for identifying the effect of tar-ball pollution on Alibaug beaches.



Figure 1. Map showing beaches in India

The beaches in Alibaug don't have the problem of an oil spill and pollution of tar-balls up to 2009. But because of collision between two ships namely, MSC CHITRA, and MV KHALIJIA in 2010, tar-balls have appeared on the beaches of Alibaug up to 2013.

1. Formation process of tar-balls

The main factor responsible for formation of marine tar is contact of released oil with atmosphere. Some sources like oil transportation from the ships, drilling operation, etc. have led to the entry of oil in marine environment. Then under weathering process, tar-balls were formed.



Figure 2. Tar-balls

2. Types of tar-balls

Marine tar-balls can be classified as Pelagic or Benthic. Pelagic tar-balls are those which float on the sea surface. While Benthic tar-balls are observed on the sea floor.



Figure 3(a) Pelagic tar-balls (b) Benthic tar-balls

3. Effects of tar-balls of our health

Some people are especially sensitive to chemicals, including the hydrocarbons found in crude oil and petroleum products. They may have an allergic reaction or develop rashes even from brief contact with oil. Present a greater health hazard than the smeared tar-ball itself.



Figure 4. Effects of tar-balls

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A CASE STUDY ON IMPACT OF TAR-BALL POLLUTION ON THE BEACHES ON ALIBAUG (MAHARASHTRA).

Understanding Tar-ball (PDF, 463KB): The information on this web page is available as a PDF.

TORCH LAKE SANDBAR A HIDDEN GEM

- BY ANANYA MONDAL



Introduction :

Capture the reader's attention with an enticing description of Torch Lake Sandbar. Paint a picture of crystal-clear waters, soft sand, and a vibrant summer atmosphere. (e.g., Imagine a refuge where turquoise water meets sugar-white sand, creating a picture-perfect summer escape. This idyllic scene isn't a tropical paradise; it's Torch Lake Sandbar, a hidden gem nestled in the heart of Michigan's Antrim County.



A Rich History

- Briefly delve into the history of Torch Lake Sandbar. While its exact formation process might be unclear, geological evidence suggests it's a natural accumulation of sand and glacial till deposited over time.
- Local legends often attribute its formation to Native American folklore, but documented historical records are scarce.



A Paradise for WaterEnthusiasts

- Highlight the various water activities enjoyed at Torch Lake Sandbar. Mention kayaking, paddleboarding, swimming, and even snorkeling (if water clarity allows) due to the pristine conditions.



Boating Bonanza

- Discuss the role of boats in the Torch Lake Sandbar experience. Mention people anchoring their boats near the sandbar for easy access, enjoying picnics on board, or participating in friendly boat races.



A Family-Friendly Atmosphere

Emphasize the family-friendly nature of Torch Lake Sandbar. Mention the shallow water areas perfect for young children, the ample space for picnics and games like frisbee or volleyball, and the overall laid-back and welcoming vibe.

ENVIRONMENTAL RESPONSIBILITY & CONCLUSION

TREADING LIGHTLY: RESPONSIBLE SANDBAR PRACTICES

Address the environmental concerns of enjoying a natural wonder like Torch Lake Sandbar. Discuss responsible practices such as minimizing waste by packing out all trash, respecting wildlife by maintaining a safe distance from nesting birds or fish, and avoiding damage to the delicate ecosystem by anchoring responsibly and not disturbing the natural vegetation on the sandbar.



A SUMMER TRADITION

Conclude by summarizing the unique appeal of Torch Lake Sandbar. Emphasize its role as a summer tradition for Michiganders and tourists alike, a place for creating lasting memories with family and friends.

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THREATS TO THE COASTAL ZONE

(NAME- SHRABANI PRAMANIK)

INTRODUCTION: A Coastal zone is a connected area where all hazardous activities occurs to a large extent from other location, it can be by human or natural. These dangerous disasters in the sea and coastal zone has proven more frequent in the past, as they are happening now and as the natural and human changes are happening very fast so that there will be more examples on it in the future, which can be considered as a severe threats to the coastal zone.

WHAT IS COASTAL ZONE?

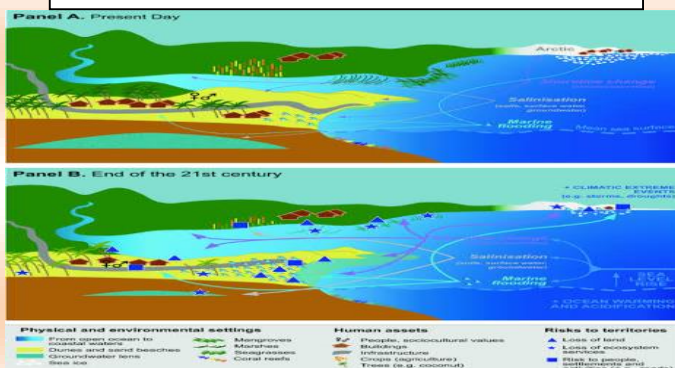
A Coastal zone is an area of seashore that inter connects land and sea, and is bounded by a fined coastline.

WHAT IS THREATS?

“Threats” typically refer to potential danger or harmful situations, that could negatively impact individuals organizations or systems.

REASONS OF THREATS TO THE COASTAL ZONE

SEA LEVEL RISE



COASTAL EROSION



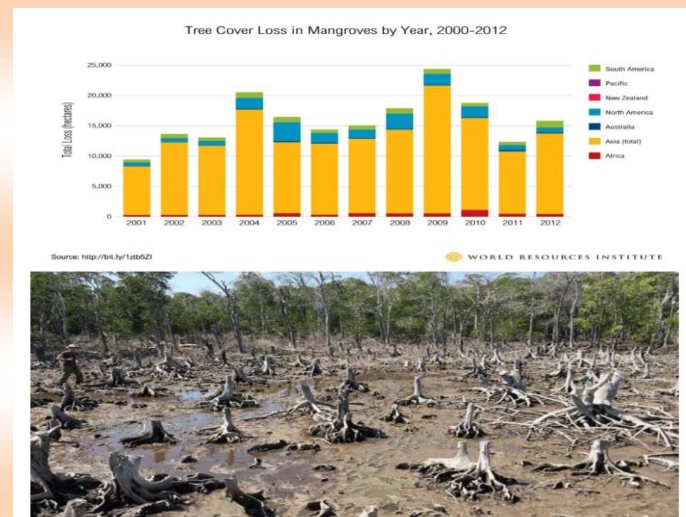
POLLUTION



TOURISM



MANGROVE LOSS



URBANIZATION



- OVERFISHING
- INVANSIVE SPECIES

AREAL EXAMPLES OF COASTAL THREATS

1. Japan Tsunami ,2004
2. Kiribati , Maldievs sinking due to sea level rise
3. Digha Coastal Erosion

4. Kamilo Beach pollution [Plastic Basin]
5. Newfoundland Overfishing

IMPACT OF THREATS TO THE COASTAL ZONE

A. Natural Impacts:

(i) **CYCLONE** : Due to the absence of mangroves, ocean generate cyclones have a greater impact on coastal zone



Fig : Cyclone

(ii) **FLOOD**: Climate Change related sea level rise in excess water flooding the coastal zone , which is a threats for the coastal zone.



Fig: Flood

(iii) **TSUNAMI**: Tsunami are giant waves caused by earthquake or volcanic eruption under the sea , that creates most severe threats for coastal zone .



Fig : Tsunami

(iv) **CORAL BLEACHING** : when water is too warm,corals will expel the algae living in their tissues causing the coral to turn completely white .



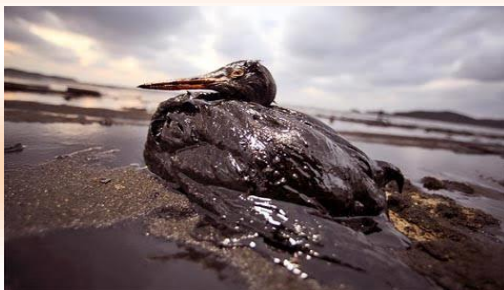
Fig: Coral Bleaching

B. Human impacts

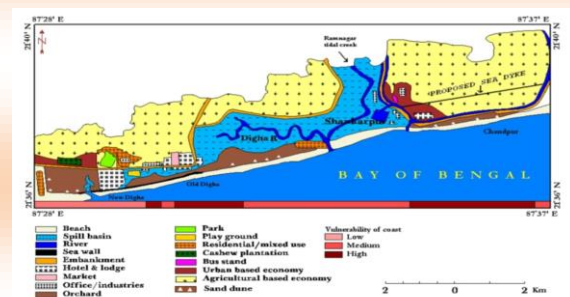
(i)SEA WATER INTRUSION INTO THE COASTAL AQUIFER: seawater intrusion in the coastal aquifer causes salinisation of fertile soil in low-lying parts of the inland coastal zone. These areas can therefore become unsuitable for agriculture

(ii)COASTAL ECOSYSTEM INTERRUPTION: Humans, animals, and other ocean habitats are primarily affected by the harmful changes in climate.

(iii) HARMFUL MARINE LIFE



(iv) HUMAN VULNERABILITY



CONCLUSION

Finally it can be said that the coastal zone is one of the main focus of all the threats of the world. Keeping these threats in mind, we should make a sustainable development.

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Discovering the Charms of Maui's Coastal Beauty

-Shayeri Chatterjee



Maui Coastline

Maui, known as the "Valley Isle," is the second-largest island in Hawaii, is renowned for its stunning coastal beauty, diverse landscapes, and rich cultural heritage. From pristine beaches and lush rainforests to towering volcanic peaks and cascading waterfalls, Maui offers a paradise for travelers seeking adventure, relaxation, and cultural immersion.

Highlights of Maui's Coastal Beauty

1. Wailea Beach : A luxurious retreat known for its soft sand and clear waters.
2. Road to Hana : A scenic drive that winds along the eastern coast, offering breathtaking



Road to Hana



Wailea Beach

views and access to hidden waterfalls.

3. Molokini Crater: A crescent-shaped, partially submerged volcanic crater ideal for snorkeling and diving.

Exploring the Road to Hana

This 64-mile stretch of highway offers numerous stops where you can experience the island's beauty up close.

Key Stops:

- Twin Falls: The first accessible waterfalls along the route, perfect for a refreshing dip.
- Wai'anapanapa State Park: Famous for its black sand beach, lava tubes, and coastal trails.
- Hana Town: A quaint town offering a glimpse into traditional Hawaiian life, with local shops and eateries.



Molokini Crater



Snorkeling at Molokini Crater

Snorkeling at Molokini Crater

Molokini Crater is a marine sanctuary and one of Maui's top snorkeling destinations. The clear waters and vibrant coral reefs attract snorkelers and divers from around the world.

What to Expect:

- Marine Life: Spot colorful fish, sea turtles, and occasional reef sharks.
- Visibility: Often exceeds 150 feet, making it an ideal spot for underwater photography.

Whale Watching

From December to April, Maui's coastal waters become a playground for migrating humpback whales. These majestic creatures travel from Alaska to Hawaii to breed and give birth, offering spectacular whale-watching opportunities.

Kapalua Bay: A quieter spot with a chance to see whales from the shore.



Kapalua Bay

Conclusion

Maui's coastline is a tapestry of natural beauty, adventure, and cultural richness. From the serene beaches of Wailea to the rugged beauty of the Road to Hana, and the underwater wonders of Molokini Crater, Maui offers something for every traveler. Maui's coast is a destination that promises unforgettable experiences.

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