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Investigating the main causes of Munroe Island in Kerala sinking

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Abstract:

The Munroe Isle of Kollam district is laccustrine in origin because the river Kallada and Ashtamudi Lake caused silt to be deposited there during the formation process. The archipelago consists of 8 smaller islands. The fear of rising water levels has been present on the island recently. The main problem that the people of this island suffer is flooding and the subsequent sinking (3 to 4 metres). About 400 families have left the island as a result of a lack of housing and daily income.

The new study found numerous causes for Munroe Island's sinking, including rising sea levels, climate change, and poor farming practises. procedures, etc. The data for this study came from a variety of scientific studies, daily newspapers, Panchayath documents, as well as information and assistance from the local population. To learn the main causes of the island's sinking from the people of Munroe island, who are the direct victims of this phenomenon, a direct field visit and questionnaire survey using a random sampling approach and distributed to 100 houses were done.The sunken portions of Munroe Thuruth were discovered using Geographic Information System (GIS) technologies (QGIS, Google Earth).

Introduction

Over 100,000 islands on Earth support 20% of the world's biodiversity, according to the 2015 Expert Committee Report.Due to their size, shape, and level of isolation, many of these islands have unique environmental and cultural characteristics. Because of their unique landscapes, exotic species, and natural beauty, islands have always piqued people's interest. Islands are home to some of the planet's most active volcanoes, tallest sea cliffs, purest oceans, and rare and gorgeous plants and animals. Island nations make up 47% of the world's the population of the entire planet, and numerous nations have islands within their borders. Islands are diverse defined habitats, ranging from tiny, isolated atolls and low-lying islands to large island states.An island or isle is any portion of subcontinental land that is encircled by water.

Due to their size, shape, and level of isolation, many of these islands have unique environmental and cultural characteristics CSE study report.

Islands are consequently especially susceptible to the effects of global climate variability, including the increase in sea surface temperature and sea level that follows. Kerala's islands stand out because they enhance the attractiveness of the state's natural surroundings. Munroe Thuruthu has been chosen as the study area.It's a collection of islands in the Kollam district. High tides are currently putting the island in danger of being submerged.

2015 Expert.The main goal of the study is to identify the significant causes of the sinking of the Isles of Munroe and to provide the best actions to lessen or mitigate the problem in the study region. The study identified several key causes for the island's sinking, including poor farming practises, climate change, recent construction projects, etc. This study intends to highlight the difficulties in achieving sustainability, the value of quantitative research in evaluating current scenarios, and the contribution of policymaking to bettering the situation in India.Current Sustainable Development Issues.Both primary and secondary data are incorporated into the study.Field surveys and questionnaires are the most typical primary data sources. interviews and surveys.

To learn more about the current state of the island, a field survey is conducted. The public, village officials, and Panchayat officials can all be contacted in an interview to gather information. Secondary data sources include reports from expert committees, newspapers, journals, channels, non-governmental organisations, and census reports.A topographical map is used to represent the map and the features on the map.The Ashtamudi backwater system in the Kollam district contains a number of islands collectively referred to as Mundrothuruth Island or Munroe Island. Munroe Island is situated where the Kallada River and Ashtamudi Lake meet.

Colonel John Munroe, a citizen of the former princely state of Travancore, is honoured with the area's name.Eight smaller islands make up this island.Munroe Island is a typical backwater island settlement in Kerala.Between the latitudes of 8° 59' 37.6" N and 76° 36' 35.9" E, the island is situated. Mundrothuruth's administration 9599 people live in the village, with 4636 males and 4963 women. 2001-2011census.The island draws visitors because of its natural beauty and abundance of interconnecting waterways. Both contemporary and conventional aqua farms practise aquaculture. In the raised area of the island, settlements are dotted with coconut gardens, and mixed crops make up the majority of the land use.

The region to the west of the railroad track is primarily low-lying and

features many water bodies, tidal creeks, and natural species, primarily mangrove, along the banks. In the past, the region engaged in widespread coir retting activities, which are now only practised in a relatively small number of places.Analysis of the Causes of the Sinking of the Island The results of the current investigation show that the island Munroe was flooded for a variety of causes. The main causes of the island's flooding are discussed below. Issue Associated with the Buildup of Sediments

According to the residents of the island of Munroe, the 1996 Kallada irrigation project and the 2008 Munroe IsleKSSP Study Report were both negatively impacted.Munroe Island is a delta region that developed as a result of the biological deposition of loose, unconsolidated materials by Ashtamudi Lake and the Kallada River.This kind of material might deteriorate quickly.The abundantly flowing Kallada River shielded the isle before the construction of Tenmala dam by adding additional sediments during the time of high tide. But the condition altered due to the construction of Tenmala Dam, which stood as a barrier to the flood water carrying sediments. For maintaining the stability of the island continuous accumulation of sediments by Kallada river and Ashtamudi lake is to be needed. Most of the respondents opinioned that they detected the problem of inundation, sinking and shrinking of island after the commencement of Thenmala Dam for the purpose of Kallada irrigation project. The sediment deposits were not possible as the water flow decreased considerably in the Kallada Rive. Thus certain part of the isle slowly merged with the water and total area of the isle decreased. It is said that the Kallada Irrigation Project brought no benefit to isle.

Tsunami effects from 2004:

The physiographic structure of the island was severely damaged in 2004 when a tsunami devastated the Kerala coast. The Arabian Sea's neighbouring continental shelves saw their base sediments blown away by the powerful waves.This causes the sea's water carrying capacity in these areas to grow, which has a negative impact on Munroe Island during its tides.The power and inflow of tidal water increased as a result of this phenomena, speeding up soil erosion and tidal flooding.Before the tsunami, the island was only affected by tides twice a year.On the other side, eight times a year, tsunamis bring about tidal flooding, and the water remains for weeks.

Changing Climate

According to several 2017 study findings, melting polar ice contributed to rising ocean levels, which finally caused a sizable portion of land to become submerged. Hindusthan Times, 22 November 2017. Mumbai and Kochi are expected to suffer from this issue first.However, the locals assert that Munro Island was the first place to be flooded.

According to the records, the region sunk up to 1 metre between 1996 and 2006 and up to 3 to 4 metres between 2006 and 2016 as a result of the higher level. of seawater The houses' walls showed no evidence of damage, but the increased water level caused the interior of the residences to be flooded with water, inflicting damage to the building's equipment, furnishings, etc. According to a research by Kerala Sasthra Sahithya Parishad, Munroethuruthu was sinking as a result of rising sea levels brought on by climate change. In the recent past, the Arabian Sea experienced a significant rise in sea surface temperature and a huge number of low pressure belts as a result of global warming.

The creation of cyclones and widespread rainfall in Kerala's coastal and interior regions are caused by these severe low pressure belts. The island's heavy rainfall exacerbated the flood situation and The process of additional sinking was expedited.The sediments can also be washed away by this the physiography, ecosystem, and demographic makeup of the study area are all more at risk as a result of the rise in sea level brought on by global warming and the greenhouse effect.

Ineffective Agricultural Practices

Munro Island's crops was widely destroyed, which accelerated the devastation. The islanders started a variety of prawn and oyster farming operations in order to make a better living. Totally damaged were the coconut plantations on the island.For the coconut plants, a technique for dispersing sediments existed.Due to the devastation of coconut plantations, this practise was abandoned.

Since biotic contents are separated from locations where sediments and coconut fibre residue have accumulated, these areas are free of biotic contents. sediments are dispersed for the coconut plants. But the destruction of coconut plantations forced an end to this practise. These areas became submerged under the lake as a result of the separation of biotic contents from those areas filled with the deposition of sediments and residue of coconut fibre.

Air flow was improved and the biotic separation process moved more quickly when ponds were dug for oyster production.Soil erosion was hastened by the tillage of the ground for farming.For the sake of the coconut plants, silt is scattered.

However, this practise had to halt because of the loss of coconut plantations. The separation of biotic contents from those areas filled with the deposition of sediments and residue of coconut fibre caused these areas to become drowned beneath the lake. When ponds were dug for oyster production, air movement was improved and the biotic separation procedure progressed more swiftly.Tillage of the land for cultivation accelerated soil erosion. Rail lines and bridges provide additional strength for its destruction.

More than 62 trains and hundreds of heavy vehicles pass through this island without taking environmental concerns into account.The Kallada River and Ashtamudi Lake's soil is eroded as a result of the tremor brought on by trains and other moving vehicles.

The Effects of the Island's Flooding:

Salinity, shrinkage, and sinking

A combination of natural and man-made factors are causing the island to contract and sink. Munroe Island's actual elevation, which was 3

metres above mean sea level before the 2004 tsunami, was estimated to have decreased to 5 to 1 metres after the disaster. The island is sinking mostly as a result of mining and extensive construction projects. Small islands' extinction has also been connected to sinking.These little islands were once inhabited by humans, but they are now deserted. People are leaving these tiny islands because it is more difficult for them to survive due to the saline water that has engulfed the area.The island is shrinking, which is connected to the process of sinking.As a result of their continual submersion in water and sinking, the dwellings of Mundrothuruth developed damp walls and fissures.

Loss of Biodiversity:

Numerous natural and man-made factors, including tourism, development, pond dredging for pisciculture, and other factors, contribute to the destruction of the diverse mangrove ecosystems and their rich flora and fauna.Natural habitats for many plants and animals were greatly destroyed as a result of sinking, shrinkage, and suffusion. Many plant species will eventually become extinct as a result of all these factors in the eradication of different plants' and animals' natural habitats.Many plant species will eventually become extinct as a result of all these factors.

Results and Recommendations:

Saltwater intrusion, salinity, shrinkage, sinking, and salinity are all frequent issues here. The daily lives of the islanders are impacted by these issues in a number of different direct and indirect ways.Munroe Island frequently experiences flooding.Due to the unfavourable weather, the islanders who lived in the wet areas abandoned their homes.The westernmost parts of the island are where the problems are most obvious.
The Kidapram north, south, Pattamthuruth, Pezhumthuruth, and the water-logged portions of Nenmeni in the eastern section are the most perplexed locations.There are more vacant homes due to a multitude of factors. ecological problems.

Munro Island can be viewed as the state of Kerala's first victim of global warming. This claim is not refuted by any studies or reports. The survey approach yielded the following recommendations for the sustainable life of islands and islanders, as well as solutions to the problems found in the study area:

Establishing mangroves:

Mangrove plants can lessen erosion along the shoreline.As a result, it helps to keep the island safe from flooding and fish spawning.The ability of the mangrove to hold silt and aid in collection is its most important characteristic.

Lightweight roofing:

The island is experiencing a sinking sensation.
Implement weightless roofing or construct one-story homes to avoid the effect of sinking that was exacerbated by heavy weighted roofs.

Floating residence:

A popular sight in Western nations are floating homes.
These homes are significant because they are constructed of lightweight materials and float in water. Because it resembles our houseboats, we can manage it when there is a flood or a rise in the water's level. The construction of floating homes can be a valuable tactic in flood-prone locations.

Electric bathroom:

The use of electric or e-toilets reduces open defecation and allows for the conversion of wastes into gases that can be utilised for cooking and energy.

Program for watersheds

It is possible to recommend a watershed programme to enhance the effective management of current water flow channels and enable the quality of drinking water through proper management.

6. Silt control

The Kallada Dam's structure prevents the proper silt deposition from occurring. Due to the declining stability, this causes the land to be lowered. By collecting the silt along the water system's banks using the right techniques, the soil can be strengthened.

land improvement:

Proper management can improve a piece of land.Biological manures can be used for cultivation during agricultural and aquaculture activities to ensure correct execution.Avoid dumping trash in the ground or the waternbecause this region is landlocked.

Limit the Buildings:

Avoid building roadways that restrict water's ability to flow freely and eliminate obstructions that serve as barriers for water's ability to recede.Munroe Island is home to a number of brand-new resorts and tall skyscrapers.This could result in further sinking.

Industrial Agriculture:

Utilize scientific cultivation techniques to stop soil erosion.These farmers use outdated farming techniques.Utilizing modern tools and adapting scientific crop rotation plans can go some way toward

Conclusion:

Infrastructure, environmental, occupational, demographic, livelihood, and other challenges affect the island.People are directly impacted by the effects of these problems.
Therefore, effective management is essential to maintaining the island's population; otherwise, it will disappear into the Kallada River and

Ashtamudi Lake after fifteen or twenty years.Due to a lack of housing and daily income, more than 400 families abandoned the island.Now that many families are ready to leave the island,In a few years, Munro Island will no longer be visible on Kerala's map if the current trend holds.

A population's culture, its relics, and the unique natural beauty would be permanently submerged under water.

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