Topics - MINDS MAPS included (Daily current affairs)-- 5th October 2024

SAURABH PANDEY
CSE

SOUTH AND THE SERVICE SERVICES SERVIC

- Landslide in kerala
- India -Srilanka Relation
- Monsoon forecasting
- What is Liquefied Natural Gas mean?
- Mains





Target Mains -2025/26 -

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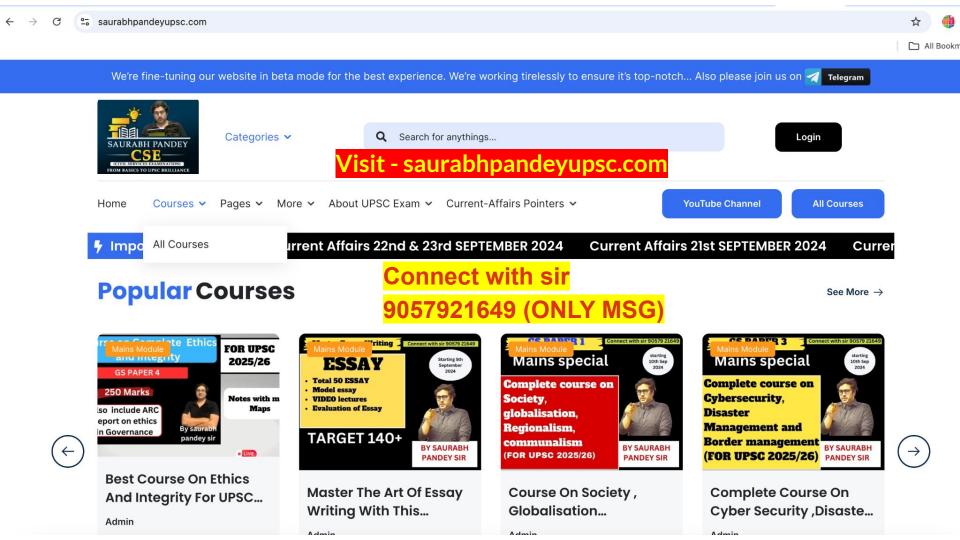
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Kerala urgently needs to identify risk zones

SAURABH PANDET

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EMPLEMENTAL SAURABEAN

FROM BASICS TO UPSE BEILLIAN

n July 30, two villages, Mundakkai and Chooralmala, in the Wayanad district of Kerala, were hit by landslides. On October 4, while noting that the disaster ranked among the deadliest in India, Chief Minister Pinarayi Vijayan said that 231 people had died and 41 remained missing. The catastrophic event has once again exposed our helplessness in the face of nature's fury. At the same time, it has raised questions about our approach to disaster management not only in the area of Wayanad that was affected this time and that has suffered a few deadly landslides over the last four decades, but for the State as a whole.

No longer relatively disaster-free

With the sea to its west and the Western Ghats to its east. Kerala used to be considered a relatively disaster-free zone. Its development activities have taken place on this premise. Settlements are distributed throughout the State, from the coastline to the steep hill slopes. Kerala is perhaps the only State where human settlements have sprung up along the coastal line. Though the forest boundary is frozen, there are encroachments by the people and for development projects. Along with settlements, roads and other infrastructure have been built with complete disregard for natural drainage and slope stability. The average population density of the parts of the Western Ghats in Kerala is well above the all-India average.

The natural advantage of being relatively disaster-free seems to be waning. In the last few decades, the intensity and frequency of disasters have increased. Kerala has three distinct geographic zones, and all three are facing disasters, especially floods and landslides. Coastal erosion, a regular phenomenon, has affected more than 250 kilometres of the total coastal length of 590 km in the State. Besides, sea surge has affected different parts of the coast. The lowlands and midlands suffer from floods. Parts of the lowlands and midlands under the wind the wind the word of the word of the World get inundated during every monsoon. The World



Srikumar Chattopadhyay

Scientist (retired), Centre for Earth Science Studies, Thiruvananthapuram



K. Soman

Scientist (retired), Centre for Earth Science Studies, Thiruvananthapuram

Once landslide susceptibility maps surrounding population centres are ready, monitoring the triggering mechanism would ensure that timely warnings are provided



Meteorological Organization described the Kerala floods of 2018 as the 'floods of the century' and attributed the disaster to climate change. Landslides in the Western Ghats are also becoming regular during every monsoon.

Landslide inventory map needed

Wayanad, located to the east of the Western Ghats bordering the Mysore plateau, is characterised by deep gorges and ravines. Like the river Sharavati, the Chaliyar also originates in the eastern side of the Western Ghats. Both these rivers cut across the mountain range and debouch into the Arabian Sea, in spite of the easterly tilt of the Wayanad-Mysore plateaus. This can be attributed to the existence of tectonic factors. A spatial correlation exists between tremors and landslides. Incidences of fractures/cracks have been reported from Wayanad and Idukki post landslides. Tremors were felt in parts of Wayanad after the July landslide as well. Recurring incidences of landslides and the huge human and economic losses call for scientific re-appraisal of the causative factors, which are now being simplified and confined to parameters such as slope, soil thickness, rainfall intensity and duration, and land use change. The ongoing debates show that there is a gap in understanding the incidence of landslides in this region.

Global research in this field calls for a nuanced approach. We need a landslide inventory map of each region/area. To finalise zones susceptible to landslides, we can prepare a landslide susceptibility map factoring in the geological set up (lithology, structure and tectonics, rock composition, physico-mechanical properties), slope, soil characteristics, hydrologic parameters, drainage and infiltration, vegetation cover, human activities such as mining and quarrying, slope alteration, and agricultural activities. Once such maps surrounding population centres are ready, monitoring the triggering mechanism (rainfall or tremors in the case of Kerala) would ensure that timely warnings of landslides are provided, and lives saved. The State and trained local self-help groups can do this together.

Due to rapid warming of the Arabian Sea, there is an increased risk of extreme weather and cyclones. The heat content of the Indian Ocean has risen rapidly since the 2008. There has been an anomalous increase of 1.2°C in summer sea surface temperatures over the last 100 years in the generally cool western Indian Ocean (Arabian Sea). This has created an environment conducive for cyclogenesis (development or strengthening of cyclonic circulation in the atmosphere) in the Arabian Sea. The impact of these changes is being felt on Kerala. In 2017, Cyclone Ockli hit the State. It was the most severe cyclonic storm to affect Kerala in recent memory.

On the whole, the 'safe operating space', a term coined by Johan Rockstrom and the group at the Stockholm Resilience Centre in the case of global environmental change, is shrinking in Kerala. The occurrence of staggered events of floods and landslides, and simultaneous landslides on either side of the hill ranges, as in Wayanad and Vilangad (Kozhikode district) this time, and at Puthumala (Wayanad district) and Kavalappara (Malappuram district) in 2019, also warrant elucidation.

A paradigm shift

Under these circumstances, there is a need for a paradigm shift in disaster management practices, which are mostly reactive, top-down, and revolve around rescue, relief, and rehabilitation. Globally, this has given way to a more proactive and comprehensive approach of addressing all aspects of a disaster cycle, such as preparedness, resilience, risk reduction, mitigation, reconstruction, recovery, response, and relief. The Sendai Framework for Disaster Risk Reduction provides guidelines for disaster risk reduction. It recognises the primary role of the State in disaster risk reduction but says that the State should share this responsibility with other stakeholders including local governments, the private sector, and communities. We need to understand the risk of disaster, strengthen disaster risk governance to manage the risk of disaster; invest in disaster risk reduction for resilience; and enhance disaster preparedness for effective response to 'build back better'.

First, Kerala needs to work out disaster risk zones based on multiple criteria covering both physical and social components within a social ecological frame with the help of subject experts and generate a permanent database. As landslides and floods follow watershed boundaries, the disaster risk zones must be translated according to the watersheds/river basins. Second, Kerala needs the people's participation in preparing disaster risk maps. Given its experience in the People's Plan Campaign, it is important for Kerala to introduce a community-based disaster risk management in which at-risk communities are actively engaged in identifying, analysing, planning, implementing, monitoring, and evaluating disaster risk reduction initiatives. This would provide opportunities for strengthening communication, discussion, and learning within the community and between the community and the local and Central government. It would also ensure a bottom-up approach, help reduce tension and potential conflicts and pave the way to integrate disaster risk management in local level development. A quadruple helix model involving community and social organisations. academia/research institutes, the government, and business and industry may be useful.

Topic→ **Landslide** in kerala



— Landslides in Wayanad: On July 30, 2023, landslides struck the villages of Mundakkai and Chooralmala in Wayanad, Kerala, resulting in 231 deaths and 41 missing individuals as of October 4.

© Geography: Kerala is bordered by the sea to the west and the Western Ghats to the east, with settlements spread from the coastline to hill slopes.

A Settlement Patterns: It is unique in India for having human settlements along its entire coastal line, despite the frozen forest boundary and encroachments for development.

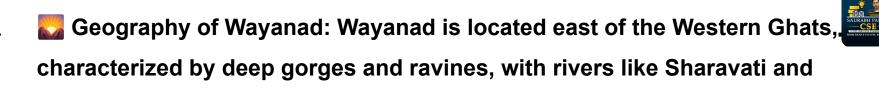
Infrastructure Issues: Development activities, including roads and infrastructure, have been constructed without consideration for natural drainage and slope stability.

Increasing Disasters: The state is experiencing a rise in the frequency and intensity of disasters, particularly floods and landslides, across its three geographic zones.

Coastal Erosion: Over 250 km of Kerala's 590 km coastline has been affected by coastal erosion, alongside issues from sea surges.

Flood Vulnerability: Lowlands and midlands are prone to flooding, with areas around Vembanad lake inundated every monsoon.

Climate Change Impact: The 2018 floods were labeled the 'floods of the century' by the World Meteorological Organization, linked to climate change.



River Flow: Both the Sharavati and Chaliyar rivers flow across the Western Ghats and empty into the Arabian Sea, despite the easterly tilt of the Wayanad-Mysore plateaus.

Chaliyar originating from this region.

Landslide Incidences: Wayanad has experienced recurring landslides, with reported tremors and fractures following these events, indicating a correlation between seismic activity and landslides.

Need for Scientific Analysis: There is a call for a scientific re-evaluation of landslide causative factors, focusing on parameters like slope, soil thickness, rainfall, and land use changes.

Landslide Susceptibility Mapping: Global research suggests creating—detailed landslide inventory and susceptibility maps to identify vulnerable zones and improve monitoring for timely warnings.

Climate Change Impact: Rapid warming of the Arabian Sea has increased the risk of extreme weather events, including floods and cyclones, with a notable rise in sea surface temperatures over the last century.

Syclone Ockhi: In 2017, Kerala was severely impacted by Cyclone Ockhi, marking one of the most significant cyclonic storms in recent history for the state



Steps needed-

Need for Paradigm Shift: Disaster management practices are currently reactive and top-down, necessitating a shift towards a proactive and comprehensive approach.

Sendai Framework: This framework provides guidelines for disaster risk reduction, emphasizing the shared responsibility between the State and other stakeholders like local governments and communities.

Mark Disaster Risk Zones: Kerala should establish disaster risk zones based on physical and social criteria, utilizing a permanent database aligned with watershed boundaries.



Community Participation: Engaging local communities in creating-disaster risk maps is crucial, leveraging past experiences like the People's Plan Campaign for effective community-based disaster management.

Bottom-Up Approach: A community-driven approach can enhance communication, reduce conflicts, and integrate disaster risk management into local development.

M Quadruple Helix Model: Collaboration among community organizations, academia, government, and industry is suggested to strengthen disaster risk management efforts.

Investment in Resilience: Emphasizing the need for investment in disaster risk reduction to build resilience and improve preparedness for effective disaster response.

Jaishankar meets Dissanayake, pledges India's support for economic recovery



The External Affairs Minister is the 'first high-level foreign dignitary' to visit Sri Lanka after the leftist leader assumed office; the leaders discuss key issues such as India's security interests, fisheries conflicts, and the political settlement of Sri Lankan Tamils; they extend invitations for bilateral visits

Meera Srinivasan COLOMBO

xternal Affairs Mixternal Affairs Mi-nister S. Jaishankar on Friday met Sri Lanka's newly elected President Anura Kumara Dissanavake in Colombo and pledged India's "full support" to the island nation's economic recovery and growth. His discussions with the Sri Lankan leadership covered India's security interests, the persisting fisheries conflict, and the pending political settlement of Sri Lanka's Tamils, according to official statements issued by both sides.

Mr. Jaishankar, on behalf of Prime Minister Narendra Modi, extended an invitation to Mr. Dissanayake to visit India at a mutually convenient date. Mr. Dissanayake, too, extended an invitation to Mr. Modi to visit Sri Lanka, the President's office said.

The visit assumes significance, coming barely a fortnight after Sri Lankans elected leftist leader Mr. Dissanayake as their new President, the first to be held after the country's 2022 economic crisis. Sri



Sri Lankan president Anura Kumara Dissanayake and External Affairs Minister S. Jaishankar during their meeting on Friday. AP

Lanka's Ministry of Foreign Affairs said Mr. Jaishankar was the "first high-level foreign dignitary" to visit Sri Lanka after Mr. Dissanayake assumed office.

'Full support'

"Dr. Jaishankar reaffirmed India's full support for Sri Lanka's economic rehabilitation, highlighting India's commitment to assisting in tourism, investment, electricity, energy services, and the dairy industry. He emphasised that Sri Lanka could leverage India's vast market to boost its economic recovery," the presidential media division said

following the meeting, adding that Mr. Dissanayake expressed his appreciation for India's support – totalling nearly \$4 billion – when the island nation faced a crushing financial meltdown two years ago.

Mr. Jaishankar highlighted ongoing India-backed initiatives in the field of energy production and transmission, fuel and LNG supply, solar electrification of religious places, connectivity, digital public infrastructure, health and dairy development. He highlighted that they would contribute to economic sustainability and

provide new streams of revenue, the External Affairs Ministry said in a statement.

The readouts from both

sides did not mention the controversial Adani power project in Sri Lanka's Northern Province, which is currently mired in a court battle following stiff opposition from locals and environmentalists. Mr. Dissanayake had in the past questioned its approval, outside of a tender process, and the former government's power purchasing agreement with the company, which he contended was not in Sri Lanka's favour. However, New Delhi's statement following Friday's meeting said Mr. Dissanayake referred to the "potential of export of renewable energy to India, which could help reduce production costs in Sri Lanka and create additional resourc-

es".

Collaboration in the island's vital tourism sector was discussed, with Mr. Jaishankar offering to expand the flow of Indian

tourists.
Mr. Jaishankar discussed matters of India's security interest in the region. Across meetings, the Sri Lankan leadership assured the top Indian official that they were mindful of India's security concerns and would not allow their territory to be used in a manner inimical to India's security interests, the statements indicated.

Mr. Jaishankar reiterated India's support for "the aspirations of all communities, including Tamils, for equality, justice, dignity, peace while maintaining the unity, territorial integrity and sovereignty of Sri Lanka".

The full and effective implementation of the 13th Amendment of its Constitution and the early conduct of Provincial Council elections will facilitate these objectives, the statement said.

Mr. Dissanayake who, according to this office discussed "areas of mutual interest, including fisheries and promoting national unity" with Mr. Jaishankar, promised in his poll manifesto to deliver a political settlement to the Tamils through a new Constitution. His government has said efforts would begin af-

ter the parliamentary elections.

Release of fishermen

Mr. Jaishankar also raised concerns pertaining to Indian fishermen who are detained in Sri Lanka. "He pressed for their early release, as well as of their boats, and reconsideration of the heavy fines imposed on them," the Indian statement said.

For many years, war-affected Sri Lankan Tamil fishermen have been urging fishermen in Tamil Nadu to refrain from using the bottom-trawling fishing method that is known to severely deplete the marine ecosystem. However, the Indian fishermen, from Tamil Nadu's coastal districts, are frequently arrested by Sri Lanka for fishing illegally in the country's territorial waters, that too using the destructive fishing method. A total of 50 Indian fishermen from Mayiladuthurai, Pudukkottai, and Nagapattinam were released on Friday. They would be repatriated from Sri Lanka to Tamil Nadu later this week, the Indian High

Commission said.

Topic→ **India** -**Srilanka Relation**



India's Support for Sri Lanka: Dr. Jaishankar reaffirmed India's commitment to assist Sri Lanka's economic rehabilitation, focusing on tourism, investment, energy services, and the dairy industry.

Financial Aid: India has provided nearly \$4 billion in support to Sri Lanka during its financial crisis two years ago, as acknowledged by Sri Lankan officials.

Finergy Initiatives: Ongoing India-backed projects include energy production, fuel supply, solar electrification, and health development, aimed at enhancing economic sustainability in Sri Lanka.

Tourism Collaboration: Discussions included expanding Indian tourist inflow to Sri Lanka, which is vital for the island's economy.



Security Concerns: Sri Lankan leadership assured India that their territo

would not be used against India's security interests, addressing regional security matters.

m Political Aspirations: India supports the aspirations of all communities in Sri Lanka, including Tamils, for equality and justice, emphasizing the need for the implementation of the 13th Amendment and Provincial Council elections.

Fishermen's Release: Dr. Jaishankar raised concerns about detained Indian fishermen in Sri Lanka, advocating for their release and addressing the issue of heavy fines imposed on them.

Summary: Dr. Jaishankar's visit to Sri Lanka focused on economic support, energy initiatives, tourism collaboration, and addressing security and fishermen's issues, while emphasizing the need for political inclusivity-

The other monsoon

Better modelling of the impact of northeast monsoon is essential



ndia's southwest monsoon has ended on an optimistic note, with 8% more rain than anticipated. Reassuringly, the rainfall forecast by the India Meteorological Department (IMD), particularly since July, was accurate. Monsoon clouds continue to prevail over the country but given the centrality of rainfall to the Indian economy, focus has already shifted to the 'other monsoon', the northeast monsoon. It is named so because of the direction in which the winds exit from the land mass into the sea. Following the withdrawal of the southwest monsoon in mid-October, the northeast monsoon is characterised by a reversal of winds that brings rain to parts of coastal Andhra Pradesh, Tamil Nadu, Kerala, and parts of southern Karnataka. For Tamil Nadu, the northeast monsoon is the main source of rainfall, The northeast monsoon brings in only about 11% of India's annual rainfall. The IMD has forecast that this year's post-

monsoon rainfall is likely to be 'above normal' or about 12% over the historical average. Because of its limited spread and quantity, the northeast monsoon does not get as much attention as the southwest monsoon. However, it significantly affects the productivity of rice and maize in Tamil Nadu and Andhra Pradesh, Records show that in vears of deficiency, there was a considerable decrease in agricultural production in the region. The northeast monsoon rainfall, averaged over the five subdivisions where it is predominant, has a variation of almost 25%, exceeding that of the southwest monsoon rainfall (10%). This translates into years of massive deluge followed by dry spells. In 2015, Chennai experienced a deluge during the northeast monsoon, resulting in significant loss of life and property. In 2019, the city faced severe water shortage. If this year's forecast holds, it will be the second consecutive year of a normal northeast monsoon. Expectations are high that a La Nina, or cooling of the equatorial central Pacific, will support this. However, most global models have struggled to forecast the timing of La Nina this year. Thanks to improved forecast systems, the northeast monsoon is less neglected than before. Nevertheless, more focus is needed on modelling its impact regarding urban flooding. Climate change uncertainty makes such

prognosis essential, and disaster management agencies in States must develop credible strategies to incorporate these buffers into budgets.

Topic→ **Monsoon forecasting**



Southwest Monsoon Success: India's southwest monsoon ended with 8% more rainfall than expected, with accurate forecasts from the IMD since July.

Northeast Monsoon Significance: The northeast monsoon, which follows the southwest monsoon, is crucial for regions like Tamil Nadu and Andhra Pradesh, providing about 11% of India's annual rainfall.

Post-Monsoon Forecast: The IMD predicts this year's post-monsoon rainfall to be about 12% above the historical average, indicating a potentially favorable agricultural season.

FAGRICUltural Impact: The northeast monsoon significantly influences rice and maize productivity, with historical data showing decreased agricultural output during deficient years.

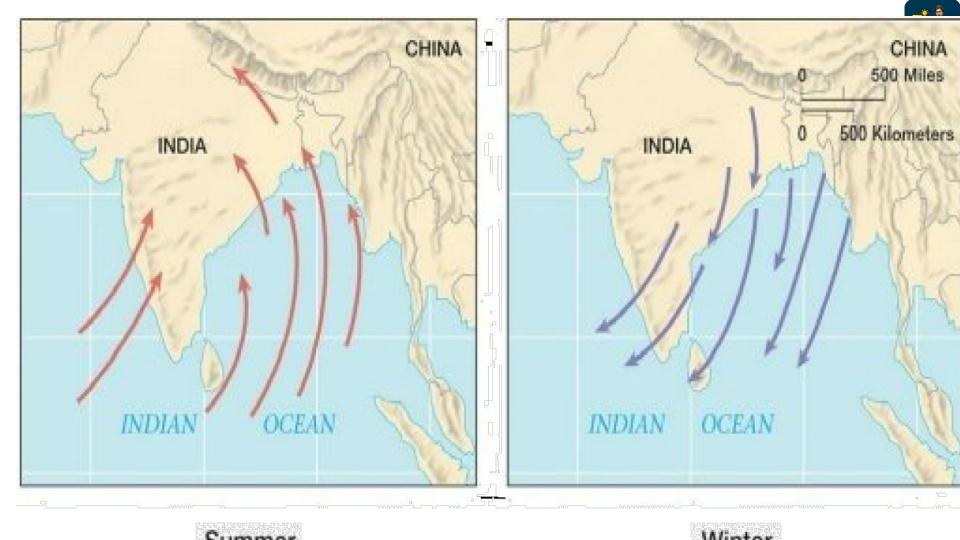


variation of nearly 25%, leading to extreme weather patterns, including severe floods and droughts.

Historical Events: Notable past events include the 2015 Chennai deluge and the 2019 water shortage, highlighting the northeast monsoon's potential for disaster.

Need for Improved Forecasting: Enhanced forecasting systems are now in place, but there is a call for more focus on urban flooding impacts and disaster management strategies due to climate change uncertainties.

Summary: India's monsoon season shows promising rainfall patterns, with the northeast monsoon playing a critical role in agriculture and



For a cause





Activists from climate action group Ocean Rebellion take part in a performance using liquid natural gas in London on Friday. Their aim is to expose how many companies are 'hoodwinking International Maritime Organisation delegates by falsely claiming LNG is a green fuel'. AFP

_ Topic→ What is Liquefied Natural Gas mean?



1.1 Definition

Liquefied natural gas primarily consists of methane (approximately 90%) composition). The process of deep refrigeration (approximately -162°C) is used to liquefy natural gas into LNG, making it easier to store and transfer to the point of use. In various regions of the world, LNG is currently recognized as a clean and environmentally friendly fuel, widely utilized.

1.2 What does liquified natural gas look like?

Colorless, odorless, lightweight, and readily soluble in air, liquefied natural

gas has a flame temperature of roughly 1880°C when burnt.

When compared to gasoline and oil, LNG has the advantage of being able to

totally burn without leaving any residue, which makes machinery and equipment safer, reduces wear and tear, necessitates less maintenance, and extends life.

LNG has 2.4 times the capacity of compressed natural gas (CNG) once it has been liquefied. At typical circumstances (1 atm, 15 °C), LNG only takes up around 1/600th of the total volume of natural gas.

1.3 How is liquified natural gas produced?

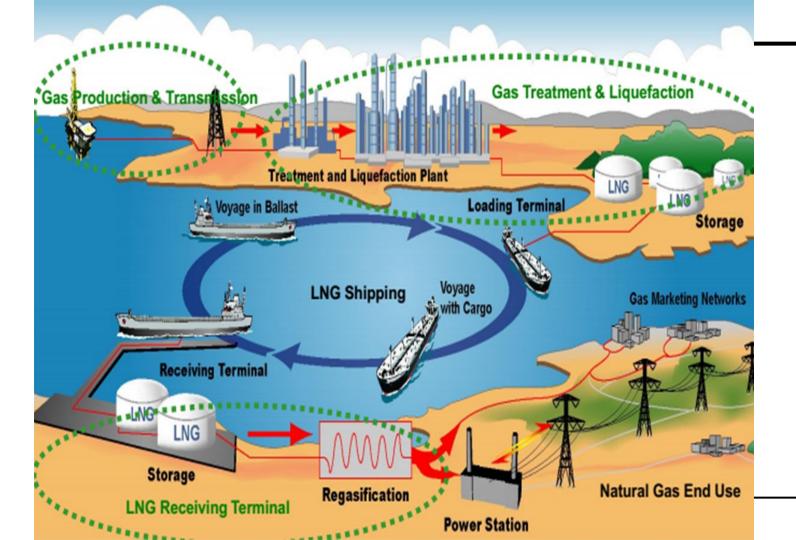


Natural gas will first be transported to refineries following extraction in order to be cleaned and processed before being converted into liquefied natural gas (LNG). Non-hydrocarbon substances are eliminated during this process, most often Carbon Dioxide and Hydrogen Sulfide.

The natural gas will be cooled to a temperature of -162 degrees Celsius to cause it to liquefy once all impurities have been eliminated.

Liquefied natural gas (LNG) will then be poured into storage tanks with unique construction to stop leakage.





the following are some of the most widespread uses for LNG in life and



 Using LNG as a substitute for coal in thermal power stations' combustion chambers.

business:

- Using LNG as a combustion fuel for heating and drying systems in homes and food processing facilities.
- Using LNG in the transportation sector as a substitute for gasoline and diesel.
- Using LNG as a clean energy source for residences or homes in isolated or island locations, etc.
- Using LNG as fuel in heavy sectors including ceramics, metallurgy, and brickmaking...

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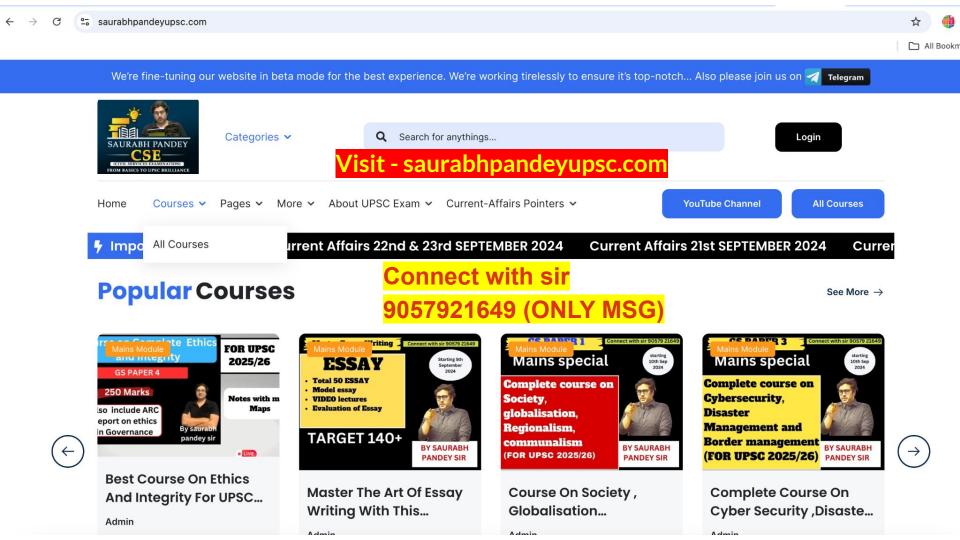
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