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Science Reporter
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MINISTRY OF SCIENCE AND TECHNOLOGY



MK Yadav Sir

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THE HINDU

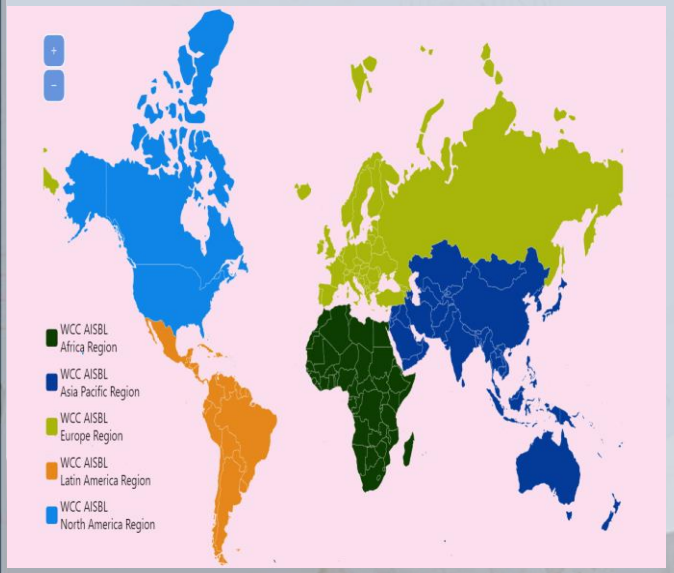
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WORLD CRAFTS COUNCIL INTERNATIONAL

(Syllabus: GS Paper 1 – Art and Culture)

Srinagar likely to be tagged as World Craft City from India

The World Crafts Council International (WCCI), a Kuwait-based organisation working on recognition and preservation of traditional crafts, has picked Srinagar for mapping its craft clusters before its final nomination as the World Craft City (WCC) from India this year. A three-member team of the WCCI is in the city to inspect craft clusters, processes involved, and the status of artisans. The final announcement about the city's inclusion is likely in the next two months. "The craft work we witnessed so far in Srinagar is flawless. The world needs to know about it," a WCCI member, told *The Hindu*.



Context; Recently, the World Crafts Council International (WCCI) selected Srinagar to map its craft clusters, paving the way for its final nomination as the World Craft City (WCC) from India this year.

World Crafts Council International (WCCI)

- **About:** It was established by Ms. Aileen Osborn Vanderbilt Webb, Ms. Margaret M. Patch, and Smt Kamaladevi Chattopadhyay at the 1st World Crafts Council General Assembly in New York on June 12, 1964.
- **Formal Constitution**: In November 2012, the organization was formally constituted as an International Association without lucrative purpose, at 17/02, rue de la Trouille, 7000 Mons, Belgium.
- **Presidential Term**: As per its Bylaws, the Presidency of the organization changes every four years.
- **Headquarters:** The current headquarters for the term (2021-2024) is located in the State of Kuwait.
- **Affiliation with UNESCO**: Since its inception, the World Crafts Council AISBL has been affiliated with UNESCO under Consultative Status for many years.
- **Mission**: Dedicated to fostering the preservation, promotion, and advancement of global craftsmanship and traditional crafts, the WCC-International aims to empower artisans, celebrate cultural diversity, contribute to sustainable development, and preserve languishing crafts from extinction.
- **Objective**: To strengthen the status of crafts in cultural and economic life, promoting fellowship among craftspersons, fostering cultural exchange, and promoting wider knowledge and recognition of craftspeople's work while respecting their diverse cultural and national backgrounds.

LIVE MINT

Page 2

SARAH
(Syllabus GS Paper 3 – Sci & Tech)

WHO's new AI-powered chatbot is giving wrong medical answers

Bloomberg
feedback@livemint.com

The World Health Organization is wading into the world of AI to provide basic health information through a human-like avatar. But while the bot responds sympathetically to users' facial expressions, it doesn't always know what it's talking about.

SARAH, short for Smart AI Resource Assistant for Health, is a virtual health worker that's available to talk 24/7 in eight different languages to explain topics like mental health, tobacco use and healthy eating. It's part of the WHO's campaign to find technology that can both educate people and fill staffing gaps with the world facing a health-care worker shortage.

WHO warns on its website that this early prototype, introduced on 2 April, provides responses that "may not always be accurate." Some of SARAH's AI training is years behind the latest data. And the bot occasionally provides bizarre answers, known as hallucinations in AI models, that can spread misinformation about public health.

SARAH doesn't have a diagnostic feature like WebMD or Google. In fact, the bot is programmed to not talk about anything outside of the WHO's purview, including questions on specific drugs. So SARAH often sends people to a WHO website or says that users should "consult with your health-care provider."

WWW.WHO.INT/CAMPAIGNS/S-A-R-A-H



WHO warns on its website that some of SARAH's responses "may not always be accurate".

"It lacks depth," Ramin Javan, radiologist and researcher at George Washington University, said. "But I think it's because they just don't want to overstep their boundaries and this is just the first step."

WHO says SARAH is meant to work in partnership with researchers and governments to provide accurate public health. The agency is asking them for advice on how to improve the bot and use it in emergency health situations. But it emphasizes its AI assistant is still a work in progress.

"These technologies are not at the point where they are substitutes for interacting with a professional or getting medical advice from an actual trained clinician or health provider," Alain Labrique, the director of digital health and innovation at WHO, said.

SARAH was trained on OpenAI's ChatGPT 3.5, which used data through September 2021

SARAH was trained on OpenAI's ChatGPT 3.5, which used data through September 2021, so the bot doesn't have up-to-date information on medical advisories or news events. When asked whether the US Food & Drug Administration has approved the Alzheimer's drug Lecanemab, for example, SARAH said the drug is still in clinical trials when in fact it was approved for early disease treatment in January 2023. Even the WHO's own data can trip SARAH up. When asked whether hepatitis deaths are increasing, it could not immediately provide details from a recent WHO report until promoted a second time to check the agency's website for updated statistics. The agency said it's checking on whether there's a lag in updates.

And sometimes the AI bot draws a blank. None of this is unusual in the early days of AI development. In a study last year looking at how ChatGPT responded to 284 medical questions, researchers at Vanderbilt University Medical Center found that while it provided correct answers most of the time, there were multiple instances where the chatbot was "surprisingly wrong."

Context: The World Health Organization (WHO) recently launched SARAH, short for Smart AI Resource Assistant for Health to provide basic health information through a human-like avatar.

SARAH (Smart AI Resource Assistant for Health)

- **About**: It is an AI enabled bot to provide basic health information through a human-like avatar.
  - It is a virtual health worker that's available to talk 24/7 in eight different languages to explain topics like mental health, tobacco use and healthy eating.
- **Launched by:** WHO under it's part of the campaign to find technology that can both educate people and fill staffing gaps with the world facing a health-care worker shortage.
  - WHO says SARAH is meant to work in partnership with researchers and governments to provide accurate public health.

Drawbacks:

- It provides responses that "may not always be accurate.
- SARAH doesn't have a diagnostic feature like WebMD or Google.
- SARAH was trained on OpenAI's ChatGPT 3.5, which used data through September 2021, so the bot doesn't have up-to-date information on medical advisories or news events.

DTE Apr 18

WORLD HERITAGE DAY 2024

(Syllabus: GS Paper 1 – Art and Culture)

World Heritage Day 2024: Survival accuses UNESCO of being complicit in illegal eviction, abuse of indigenous people

unveiling their findings in a **new report released on World Heritage Day 2024.**

World Heritage Day 2024

- **About**: This day is celebrated annually on the 18th of April.
- **Also known as**: International Day for Monuments and Sites
- **Objective**: To pay tribute to and ensure the protection of our cultural heritage.
- **Theme**: 'Discover and Experience Diversity'
- **History**: The International Council on Monuments and Sites (ICOMOS) instituted World Heritage Day in 1982.
  - The United Nations Educational, Scientific and Cultural Organization (UNESCO) officially endorsed the date during its 22nd General Meeting in 1983.

Key Points highlighted by Survival international

- Many UNESCO World Heritage Sites are situated on land that was once inhabited by indigenous peoples.
- The report identifies six UNESCO World Heritage Sites occupying land stolen from indigenous communities, with three located in Africa and three in Asia.
- The listed sites include Ngorongoro Conservation Area, Kahuzi-Biega National Park, Odzala-Kokoua National Park, Kaeng Krachan Forest Complex, **Kaziranga National Park**, and Chitwan National Park.
- Survival International highlights that all six sites are plagued by serious and ongoing human rights violations related to conservation efforts.

Significance

- It serves to increase awareness among local communities regarding the importance of preserving our cultural heritage.
- The day fosters cultural exchange among people from various regions and backgrounds, promoting knowledge sharing about their respective histories and traditions.
- ICOMOS collaborates with UNESCO globally to mark this day, organizing events that attract tourists and enthusiasts passionate about history.

AIRBORNE VIRUS

(Syllabus: GS Paper 3 – Sci and Tech)

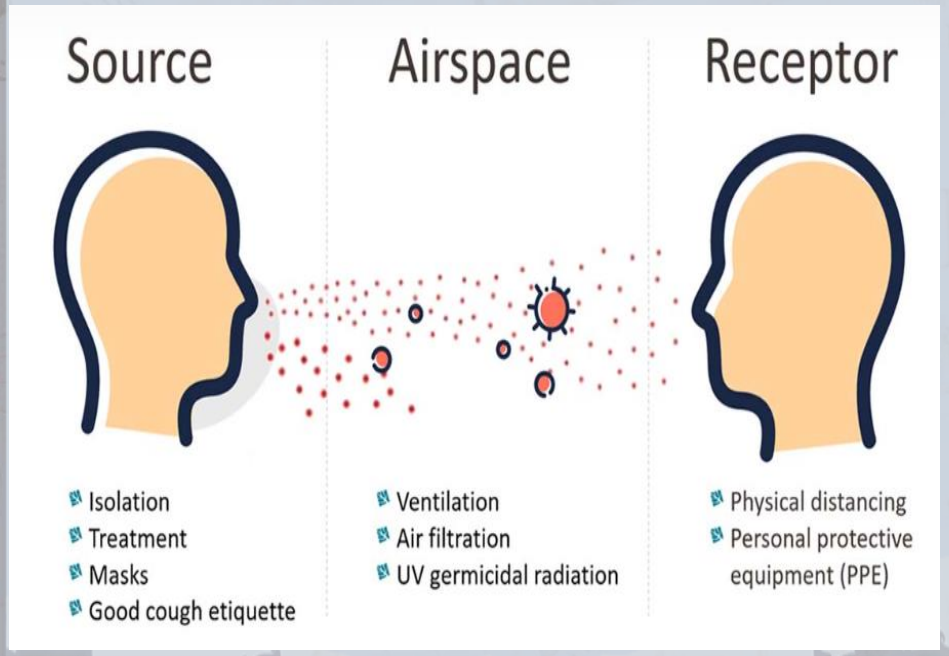
100 scientists take two years to rename airborne viruses

Airborne viruses will be called "pathogens that transmit through the air" under new terminology the World Health Organization (WHO) hopes will end a scientific rift that hampered the early response to covid-19. After two years of consultations involving over 100 scientists, a WHO-led working group agreed to the term to describe diseases caused by infectious particles that typically multiply in the respiratory tract and spread from the nose and throat of an infected person while they breathe, speak, sing, cough or sneeze.

While the discussion may seem trivial, it carries important economic and public health consequences. How pathogens transmit determines what control measures are most effective at preventing their spread. As covid erupted in early 2020, the WHO maintained for months that the fast-spreading virus wasn't airborne—delaying recommendations for mask-wearing and indoor ventilation, and frustrating aerosol scientists who believe the misguided advice cost lives. BLOOMBERG



The discussion carries important economic and public health consequences. REUTERS



Context: Airborne viruses will be called "pathogens that transmit through the air" under new terminology the World Health Organization hopes will end a scientific rift that hampered the early response to Covid-19.

Airborne Virus

- **About**: these are bacteria or viruses that are most commonly transmitted through small respiratory droplets.
- **Types of Air-borne Disease**: Influenza, Common Cold, Mumps, Chicken Pox, Measles · Tuberculosis, Whooping Cough, Diphtheria etc.
- **Transmission:** Aerosolized particles from infected individuals spread through coughing, sneezing, breathing, and talking, facilitating easy transmission.
- **Surface Contamination**: Some airborne pathogens can survive on surfaces for a short period, leading to potential transmission through contact with contaminated surfaces.
- **Stability of Airborne Viruses**: While airborne viruses are generally unstable outside the host body, caution is necessary as infected body fluid droplets can still transmit infections.
- **Treatment:** Unlike some other diseases, airborne viruses often lack specific medications for treatment, emphasizing the importance of preventive measures and early intervention with antiviral drugs like Tamiflu in certain cases.

DTE Apr 18

UN Women
(Syllabus: GS Paper 2 – Social Issues)

War's toll on women: UN Women report sheds light on Gaza's water, sanitation and hygiene crisis

Context: Gaza is currently grappling with a humanitarian crisis, particularly affecting women and girls, as highlighted in a recent UN Women report, "Scarcity and Fear," which underscores the dire repercussions of restricted access to water, sanitation, and hygiene services.

UN Women

- **About**: It is the United Nations entity devoted to promoting gender equality and empowering women globally.
- **Global Advocacy**: It serves as a global advocate for the rights and well-being of women and girls worldwide.
- **Accelerating Progress**: Established to expedite progress in meeting the needs of women and girls on a global scale.
- **Setting Standards**: UN Women assists UN Member States in establishing and upholding global standards for achieving gender equality.
- **Collaboration and Support:** It collaborates with governments and civil society to develop laws, policies, programs, and services aimed at effectively implementing these standards.
- **Coordination Role**: UN Women coordinates and promotes the UN system's efforts in advancing gender equality globally.
- **Integration with 2030 Agenda**: It ensures that gender equality is central to the Sustainable Development Goals (SDGs) and advocates for a more inclusive world through its work.
- **Focusing on four strategic priorities**:
    - Women lead, participate in and benefit equally from governance systems
    - Women have income security, decent work and economic autonomy
    - All women and girls live a life free from all forms of violence
    - Women and girls contribute to and have greater influence in building sustainable peace and resilience, and benefit equally from the prevention of natural disasters and conflicts and humanitarian action.

BUSINESS STANDARD

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VARIABLE REVERSE REPO RATE

(Syllabus: GS Paper 3 – Economy)

RBI conducts 2-day VRRR as liquidity surplus nears ₹1 trn

ANJALI KUMARI
Mumbai, 16 April

The Reserve Bank of India (RBI) conducted a two-day variable rate reverse repo (VRRR) auction on Tuesday as the liquidity surplus in the banking system neared ₹1 trillion.

The liquidity in the system was in a surplus of ₹98,920 crore on Monday, according to the latest data by the central bank. Consequently, the weighted average overnight money market rates fell to 6.34 per cent on Tuesday, against 6.42 per cent on Monday. The weighted average overnight call rate fell below the repo rate to 6.48 per cent, against 6.51 per cent on Monday. The repo rate currently stands at 6.50 per cent.

"Banks were parking funds in the standing deposit facility (SDF), and the call rate had fallen below the repo rate, which is the reason why the RBI came up with the auction," said a dealer at a state-owned bank. "They have said numerous times that they want to keep the overnight rates near the repo rate," he added.

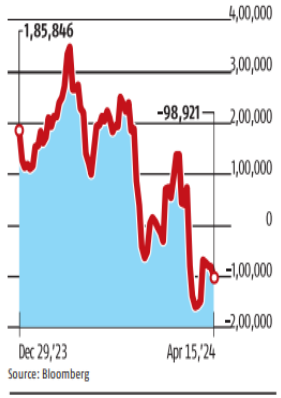
Banks parked ₹32,576 crore, against the notified amount of ₹50,000 crore at a weighted average rate of 6.49 per cent at the auction. Market participants see the liquidity to prevail in a surplus mode in the current month.

"There is ample liquidity in the system, it should remain in the surplus at least in this month," said a money market dealer at a state-owned bank. "There might be some crunch because of the elections," he said.

The liquidity has largely remained in surplus in April, as compared to the previous months in the current calendar year.

RBI AT WORK

Net liquidity injected by central bank (₹ cr)



Source: Bloomberg

Context: Recently, the Reserve Bank of India conducted a two-day variable rate reverse repo (VRRR) auction as the liquidity surplus in the banking system approached Rs 1 trillion.

Variable Reverse Repo Rate (VRRR)

- **About**: It is a monetary tool used by central banks to manage liquidity within the banking system.
- **Implementation**: Since January 2021, RBI has employed VRRR auctions, intensifying the frequency to 14 days in August 2021.
- **Future Directions**: In December, RBI hinted at utilizing longer-term VRRRs without disclosing specifics on size and maturity, signifying its pivotal role in liquidity management.
- **Focus**: RBI indicates a shift towards using VRRR auctions as its primary liquidity management operation.

Significance

- **Liquidity Absorption**: Given surplus liquidity estimated at Rs 9.5 lakh crore in October 2021, VRRR serves as a crucial tool alongside reverse repo rates to absorb excess funds effectively.
- **Long-term Solutions**: Long-term VRRR options offer potential avenues for liquidity management, with the possibility of increasing auction sizes and tenors.
- **Impact on Banking Products**: Banks incentivized by long-term VRRR may offer higher interest rates on fixed deposits, potentially influencing returns on short-term products like overnight and liquid funds.

Variable Repo Rate

- **About**: It comes into play when the RBI aims to inject liquidity into the economy, but banks show reluctance to borrow from the RBI at the Repo Rates. This scenario usually occurs when interest rates in the economy are already low.
- **Purpose:** The VRR allows banks to borrow from the RBI at a rate determined by the market, typically lower than the Repo Rate (but not less than the Reverse Repo Rate). This borrowing can extend beyond a one-day duration.

FINANCIAL EXPRESS

Page 2

PM UJJWALA YOJANA

(Syllabus: GS Paper 2 – Govt Schemes)



103 million households get Ujjwala Yojana benefits

PNG connections still a far cry from target

ARUNIMA BHARADWAJ
New Delhi, April 18

THE GOVERNMENT UNDER its flagship Pradhan Mantri Ujjwala Yojana has been able to extend the benefits of the clean cooking fuel to 103.3 million households between the start of the scheme and the end of 2023-24, according to data from the Petroleum Planning and Analysis Cell.

Sales of domestic liquified petroleum gas (LPG) by the state-owned oil marketing companies stood at 26.21 million tonne in 2023-24, from 25.38 MT in 2022-23.

"LPG has had good growth after 2014, when the Ujjwala scheme came. The jump in consumption from 29 MT is because of the scheme reaching all places... people are enjoying the benefits and comfort," said a member of the Petroleum and Natural Gas Regulatory Board, who did not wish to be identified.

The government now expects to extend the benefit to 103.5 million households under the scheme by 2025-26.

The government had launched the scheme back in 2016 with an aim to provide cooking fuel to poor households while discouraging the use of traditional kitchen fuels, including cow dung cakes and firewood which are more polluting.

Last year in August, the government had announced a price cut of ₹200 per cylinder in LPG prices for all domestic consumers and decided to expand the scheme with additional 7.5 million connections. In October 2023, the government again hiked the subsidy for PMUY consumers by ₹100, taking it to ₹300 per cylinder. In March this year, Prime Minister Narendra Modi announced a cut of ₹100 per LPG cylinder while encouraging the use of LPG cylinders.

After realising the success of the Ujjwala scheme with an increased consumption of LPG, up by 3.8% on year at 29.6 MT in FY24, the government is now shifting its focus on increasing the penetration of piped natural gas (PNG) across the country.

In its manifesto for general elections, the BJP said it will extend PNG connections across the country while expanding LPG connections under the Ujjwala Yojana. The move is expected to aid in realising the government's target of increasing the share of natural gas in the energy mix from 6.8% at present to 15% by 2030.

According to the data by PPAC, domestic PNG connections as of February stood at 12.56 million. The government has targeted 125 million PNG connections by 2030, based on the minimum work programme targets of city gas distribution companies, it informed Parliament last year.

"PNG is facing a bit of difficulty because it has to replace LPG which is already subsidised," the PNGRB member said. "Wherever PNG is possible and they are using domestic gas, it makes sense to connect all places to PNG. But it is not happening because LPG is also an alternative which people are comfortable with."

"Entities that have LPG are not able to realise its benefits. But we are advocating that this is to be done," the official said. "If PNG is directly being transported to homes, the government does not need to give the kind of subsidy (like on LPG), so the subsidy burden will get reduced."

A SUCCESS STORY

- Govt expects to extend the benefits to 103.5 mn households by 2025-26
- LPG sales by the OMCs stood at 26.21 MT in FY24, against 25.38 MT in FY23
- Centre keen on increasing penetration of piped natural gas
- PNG is facing a bit of difficulty because it has to replace LPG which is already subsidised

Context: Recently, the government, through its flagship Pradhan Mantri Ujjwala Yojana, has extended clean cooking fuel benefits to 103.3 million households as of the end of 2023-24, as per Petroleum Planning and Analysis Cell data.

PM Ujjwala Yojana

- **Launched**: May 2016.
- **Ministry**: Ministry of Petroleum and Natural Gas.
- **Objective:** To make clean cooking fuel such as LPG available to the rural and deprived households that were otherwise using traditional cooking fuels such as firewood, coal, cow-dung cakes, etc.
- **Target**: LPG connections to 5 crore women members of BPL households.
- **Expansion**: The scheme was expanded in April 2018.
- **Beneficiaries**: Women beneficiaries from 7 more categories- SC/ST, PMAY, AAY, Most backward classes, tea garden, forest dwellers, and Islands.
- **Expansion of Beneficiaries**: About 10.27 crore beneficiaries are set to benefit from the continuation of the Pradhan Mantri Ujjwala Yojana (PMUY).
- **Subsidy Structure**: Initially, a targeted subsidy of ₹200 per cylinder for up to 12 refills annually was provided to PMUY consumers.
  - In October 2023, the subsidy was increased to ₹300 per cylinder for the same refills per year.
- **Increased Consumption**: The average LPG consumption among PMUY consumers has risen by 29% from 3.01 refills in 2019-20 to 3.87 refills (till January 2024) pro-rated for 2023-24.
  - All PMUY beneficiaries are eligible for the targeted subsidy based on their increased consumption.

Data of Petroleum Planning & Analysis Cell (PPAC)

- **Domestic PNG Connections in India**: As of February, domestic PNG connections in the country reached 12.56 million according to PPAC data.
- **Government's Target**: The government aims for 125 million PNG connections by 2030, encompassing both rural and urban areas.
- **Regional Disparities**: Haryana and Himachal Pradesh exhibit the lowest number of PNG connections, with only 48 households having access to piped gas in the entire region.
- **Regions with No Connections**: Six regions reported no PNG connections at all, including Jammu and Kashmir, Telangana, Karnataka, Puducherry, Maharashtra & Madhya Pradesh, Chhattisgarh, and Uttar Pradesh.

BUSINESS STANDARD

Page 3

MISLEADING ADVERTISEMENTS

(Syllabus: GS Paper 3 – Economy)



MISLEADING AD CASE

Ramdev not off the hook: SC

BHAVINI MISHRA
New Delhi, 16 April

The Supreme Court on Tuesday said it will deliberate whether it will accept the apology of Patanjali Ayurved's founder Baba Ramdev and its managing director Acharya Balkrishna for running misleading advertisements disparaging allopathy.

The court has given them a week's time to issue a public statement.

"We are not saying we will forgive you. We cannot be blind to your earlier history, we will think about your apology," the bench of Justices Hima Kohli and Ahsanuddin Amanullah said. "You are not so innocent that you were completely unaware of what was going on in court. At this moment, we are not saying they are off the hook," Justice Kohli said.

The court said it will take up the matter again on April 23, after recording an undertaking by Patanjali's counsel Mukul Rohatgi that they (Ramdev and Balkrishna) will take some steps to redeem themselves.

"You cannot degrade allopathy. You do your own work. You should not point fingers at others... Law is equal for everyone," said Justice Amanullah.

The apex court has asked Patanjali founder Baba Ramdev to issue a public statement within a week

"You were in the know that your lawyers gave an undertaking in court (to not make statements against other forms of medicine). Tomorrow you will say you were not aware of it. You are a multi-crore company and you have a legal team. You are not so innocent," Justice Kohli said.

Context: Despite recently tendering an "unqualified and unconditional apology," the Supreme Court maintains that Patanjali Ayurved's Managing Director and cofounder, also a self-styled yoga guru, are still "not off the hook" for promoting misleading advertisements of their ayurvedic products.

Misleading Advertisements

- **Definition:** Under the **Consumer Protection Act, 2019**, misleading advertisement" in relation to any product or service, means an advertisement, which—
  - Falsely describes such product or service; or
  - Gives a false guarantee to, or is likely to mislead the consumers as to the nature, substance, quantity or quality of such product or service; or
  - Conveys an express or implied representation which, if made by the manufacturer or seller or service provider thereof, would constitute an unfair trade practice; or
  - Deliberately conceals important information.

Guidelines for Prevention of Misleading Advertisements and Endorsements for Misleading Advertisements, 2022: It define "bait advertisement", "surrogate advertisement" and clearly provides what constitutes as "free claim advertisements".

- **Bait Advertisement:** "Bait advertisement" means an advertisement in which goods, product or service is offered for sale at a low price to attract consumers;
- **Surrogate Advertisement**: "Surrogate advertisement" means an advertisement for goods, product or service, whose advertising is otherwise prohibited or restricted by law, by circumventing such prohibition or restriction and portraying it to be an advertisement for other goods, product or service, the advertising of which is not prohibited or restricted by law.
- **Online Consumer Reviews:** The **Bureau of Indian Standards (BIS)** has notified framework on 'Online Consumer Reviews Principles and Requirements for their Collection, Moderation and Publication'.
- **Objective:** For safeguarding and protecting consumer interest from fake and deceptive reviews in e-commerce.
  - The standards are voluntary and are applicable to every online platform which publishes consumer reviews.
  - The guiding principles of the standard are integrity, accuracy, privacy, security, transparency, accessibility and responsiveness.

SPACE, a premier testing & evaluation hub for sonar systems for Indian Navy, set up by DRDO, inaugurated in Kerala

Context: Recently, the Secretary of Defence (R&D) and Chairman of DRDO inaugurated the state-of-the-art **Submersible Platform for Acoustic Characterisation and Evaluation (SPACE)** at the Underwater Acoustic Research Facility in Kulamavu, Idukki, Kerala.

SPACE

- **Origin**: Established by the Naval Physical & Oceanographic Laboratory of DRDO.
- **Objective:** Designed as a premier testing and evaluation hub for sonar systems for the Indian Navy.
- **Composition**: Comprises a floating platform and a submersible platform.
- **Applications of the SPACE**:
- **Sonar System Evaluation**: Enables comprehensive testing of sonar systems for the Indian Navy.
- **Scientific Package Deployment**: Facilitates quick deployment and recovery of scientific packages, including sensors and transducers.
- **Survey and Data Collection**: Allows for surveying, sampling, and data collection of various parameters across different depths using modern instrumentation.

Sonar

- **About**: It stands for Sound Navigation and Ranging, a tool utilizing sound waves for ocean exploration.
- **Applications of Sonar:** Scientists employ sonar for various purposes including developing nautical charts, locating underwater hazards, identifying objects in water, and mapping the seafloor.
- **Importance in Oceanography**: Sonar is crucial in oceanography due to the ability of sound waves to travel further in water compared to radar and light waves.

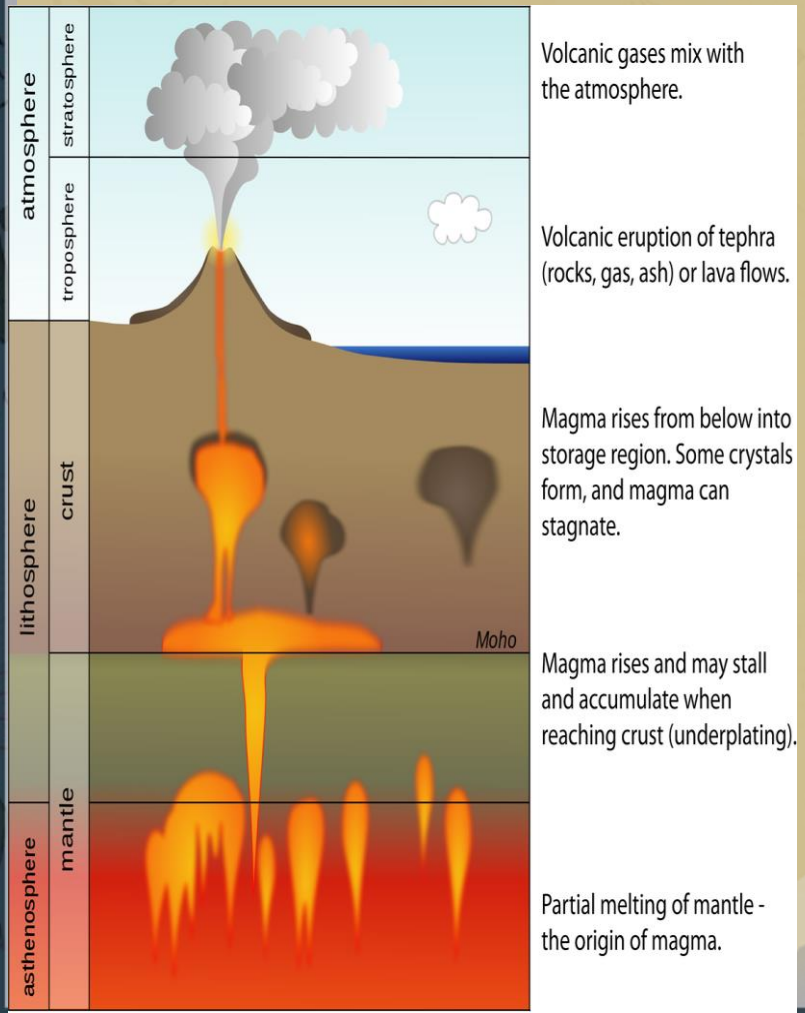
HINDUSTAN TIMES

Apr 18

MOUNT RUANG

(Syllabus: GS Paper 1 – Geography)

Indonesia's volcano eruption triggers tsunami alert, thousands told to evacuate: 10 points



Context: Recently, a tsunami alert was issued in Indonesia following multiple eruptions of the Ruang mountain volcano, sending ash and lava thousands of feet into the sky.

Mount Ruang

- **About:** It is located in the North Sulawesi Province, prone to regular volcanic activity.
- **Geological Structure**: Stratovolcanoes like Mount Ruang are characterized by their conical shape and steep slopes.
- **First Eruption:** 1808

Volcanic Eruptions

- **About**: It is an opening in the earth's surface that allows magma, volcanic ash, and gases to escape. They form at tectonic plate boundaries or hotspots.
- **Process of Eruption**: Volcanic eruption occurs when gas and/or lava are released from a volcano, sometimes explosively, due to pressure buildup.
- **Environmental Benefits**: Volcanoes offer environmental benefits such as fertile soils, hydrothermal energy, and valuable minerals due to volcanic activity.
- **Hazards Associated**: Volcanic hazards include ash clouds, gases, lahars (mud flows), landslides, lava flows, and pyroclastic flows (hot gas currents).
- **Deadly Consequences**: Volcanic eruptions can be deadly, causing population displacement, food shortages, and significant loss of life.

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