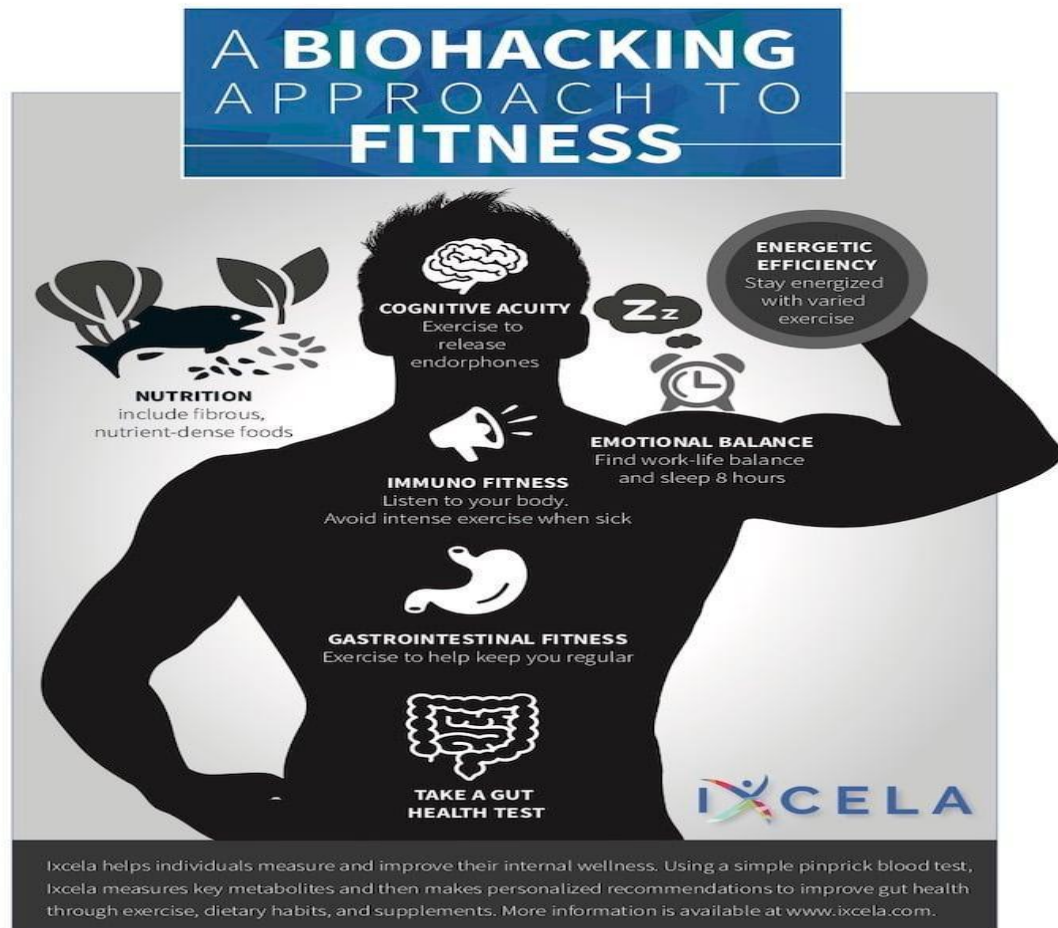# UPSC CURRENT AFFAIRS NOTES 26-11-2023

BIOHACKING

Biohacking has emerged as a wellness trend encompassing a range of techniques and practices aimed at enhancing physical, cognitive, and physiological functions.

It involves various methods, from lifestyle changes to the use of technology, with the goal of optimizing the body's performance and potentially extending life expectancy.

Understanding Biohacking

Diverse Techniques: Biohacking covers a broad spectrum of practices. Some techniques are well-established, like meditation and intermittent fasting, which

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have shown effectiveness in improving health and cognitive abilities. Others might involve more advanced or experimental approaches.

Enhancing Biology: Biohacking involves making deliberate changes to one's biology through self-experimentation and technology usage. The focus is on optimizing health, achieving personal goals, and potentially increasing life span.

Categories of Biohacking

Age Biohacking: Focuses on cellular health and regeneration to counter signs of aging. It aims to prevent or reverse the creation of damaged cells, potentially mitigating aesthetic and bodily changes associated with aging.

Energy Biohacking: Involves managing stress and ensuring proper rest and sleep to conserve energy. Stress relief techniques are essential to prevent exhaustion and maintain overall energy levels.

Diet and Nutrition Biohacking: Includes managing dietary habits, such as optimizing what, how, and when to eat. Practices may involve food customization for optimal cellular nutrition, supplements for blood sugar, metabolic efficiency, and intermittent fasting.

Biohacking in Sports

Performance Enhancement: Athletes often explore biohacking methods to gain an advantage in training and performance. Techniques like high-intensity interval training (HIIT) can increase brain neuroplasticity, potentially enhancing cognitive abilities and physical performance.

Popularity and Influence

Social Media Impact: Biohacking has gained popularity on social media platforms, with millions of views on hashtags related to the subject. It attracts Millennials and Generation Z, interested in scientific health research and open to experimenting with innovative health techniques.

Components of Biohacking

Nutrition and Diet Optimization:

Focuses on personalized nutrition, dietary changes, and supplementation to enhance energy levels, mental clarity, and overall health.

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Includes practices like intermittent fasting, ketogenic diets, or specific macronutrient ratios tailored to individual needs.

Physical Enhancement:

Incorporates exercise routines, strength training, and specific physical activities to improve strength, endurance, flexibility, and overall fitness.

May involve tracking metrics such as heart rate variability, sleep patterns, and recovery rates for optimal performance.

Cognitive Enhancement:

Involves practices aimed at boosting mental performance, memory, focus, and cognitive abilities.

Techniques may include meditation, brain training exercises, nootropics, or neurofeedback.

Technology Integration:

Utilizes wearable devices, health trackers, and biofeedback mechanisms to monitor and manage various bodily functions.

Biohackers often use apps or devices to track sleep, exercise, nutrition, and physiological parameters like heart rate or glucose levels.

DIY Biology and Genetic Modification:

Some biohackers engage in DIY biology, experimenting with genetic engineering, bioinformatics, and biotechnology at home or in community labs.

The focus might be on genetic modifications, gene editing, or exploring biological processes using accessible tools and resources.

Health Optimization and Longevity:

Aims to promote longevity and delay aging by adopting lifestyle changes, supplements, or therapies targeting cellular health and rejuvenation.

Involves exploring regenerative medicine, anti-aging strategies, and exploring new medical technologies.

Community and Knowledge Sharing:

Biohacking communities often share knowledge, experiences, and best practices through online forums, meetups, and social media platforms.

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Collaboration and sharing information among biohackers drive innovation and collective learning.

Ethical Considerations and Risks

Ethical Concerns: There are ethical considerations regarding DIY biology, genetic experimentation, and unregulated use of technology in biohacking.

Health Risks: Unsupervised biohacking practices can pose health risks if not conducted under expert guidance.

Regulatory Challenges: The field faces challenges concerning regulation and oversight due to the rapidly evolving nature of biohacking.

PM SHRI SCHEME

The Union Education Minister launched the Pradhan Mantri Schools for Rising India (PM SHRI) scheme in Odisha, with the aim of developing thousands of schools across the country.

Pradhan Mantri Schools for Rising India (PM SHRI) scheme in Odisha

In the first phase, the PM SHRI scheme will be implemented in 63 institutes out of 97 Central Schools and Jawahar Navodaya Vidyalayas run by the Centre in Odisha.

For the fiscal year 2023-24, the Centre has sanctioned Rs 50.8 crore for Odisha's schools run by the Centre. Of this amount, Rs 12.7 crore has already been released in the first instalment.

The union minister mentioned that the PM SHRI scheme will be implemented in the state with a total budget of more than Rs 120 crore.

The Odisha government is yet to sign Memorandums of Understanding (MoUs) with the Department of School Education and Literacy of the Ministry of Education for the implementation of the PM SHRI scheme.

Pradhan Mantri Schools for Rising India (PM SHRI) scheme

The PM SHRI scheme is a centrally sponsored scheme launched by the Ministry of Education in September 2022.

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The scheme aims to develop 14,500 schools across the country into exemplary schools, showcasing the implementation of the National Education Policy 2020 (NEP 2020). These schools will offer leadership to other schools in the neighbourhood and provide high-quality education in an equitable, inclusive, and joyful school environment.

Key features of the PM SHRI scheme

Holistic and Multidisciplinary Education: The schools will provide holistic and multidisciplinary education, focusing on developing students' cognitive, affective, and social skills.

Experiential Learning: The schools will emphasize experiential learning, using hands-on activities and projects to make learning more engaging and meaningful.

Technology Integration: The schools will integrate technology into the learning process to enhance teaching and learning effectiveness.

Inclusive and Equitable Education: The schools will provide inclusive and equitable education, ensuring that all students have access to quality education regardless of their background or ability.

Teacher Development: The schools will focus on teacher development, providing teachers with the training and resources they need to implement NEP 2020 effectively.

Selection of PM SHRI schools

The PM SHRI schools are selected from existing schools managed by the Central Government, State/UT Governments, local bodies, or private institutions.

The schools will be selected based on their academic performance, infrastructure, and potential for transformation.

Implementation of the PM SHRI scheme

The PM SHRI scheme is implemented through the existing administrative structure available for Samagra Shiksha, KVS, and NVS. The other autonomous bodies would be involved on a specific project basis as required.

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Expected outcomes of the PM SHRI scheme

- Improved learning outcomes for all students.
- Increased access to quality education for all children.
- Enhanced teacher effectiveness.
- Strengthened school leadership.
- Development of exemplary schools that showcase the implementation of NEP 2020.

Lachit Borphukan

Recently, the Prime Minister of India paid tribute to Lachit Borphukan on Lachit Diwas.

About Lachit Borphukan:

He has been revered in Assam as the warrior who defeated Mughal armies in the Battle of Saraighat in 1671.

He was commander of the Ahom armies during the battle of Saraighat and fought on the banks of the Brahmaputra in Guwahati.

He was a brilliant military commander.

He was chosen as one of the five Borphukans of the Ahom kingdom by King Charadhwaj Singha and given administrative, judicial, and military responsibilities.

Borphukan preferred guerrilla tactics, which provided an edge to his smaller but fast-moving and capable forces.

He died a year after the Battle of Saraighat from a long-festering illness.

Key points about the AHOM Kingdom

The Ahom kings ruled large parts of what is now known as Assam for nearly 600 years, from the early 13th century to the early 19th century.

This was a prosperous, multi-ethnic kingdom that spread across the upper and lower reaches of the Brahmaputra valley, surviving on rice cultivation in its fertile lands.

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The Ahoms engaged in a series of conflicts with the Mughals from 1615-1682, starting from the reign of Jahangir until the reign of Aurangzeb.

Amplifi 2.0 Portal

Recently, the Union Ministry of Housing and Urban Affairs launched the Amplifi 2.0 portal.

About the Amplifi 2.0 Portal:

Amplifi (Assessment and Monitoring Platform for Liveable, Inclusive, and Future-Ready Urban India) portal aims to provide data on Indian cities.

It is making raw data from Indian cities available on a single platform for academics, researchers, and stakeholders to help data-driven policymaking.

Currently, 258 urban local bodies (ULB) have been on-boarded, and data for 150 cities is available on the portal.

It provides data on a range of information for several cities, including, for example, the total diesel consumption and the number of samples tested for water quality.

What is the Urban Outcomes Framework 2022?

It has been developed for the Ministry by the National Institute of Urban Affairs and PwC India.

It shifts the focus from the indices to the data with a comprehensive list of indicators.

With this, data across 14 sectors is streamlined to increase focus on data collection, and disaggregated data can be analysed by domain experts.

The initiative also provides the opportunity to create new frameworks on open data.

The 14 sectors are — demography, economy, education, energy, environment, finance, governance, health, housing, mobility, planning, safety and security, solid waste management, and water and sanitation.

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Carbon Dioxide Removal

According to the Emissions Gap report, delaying greenhouse gas (GHG) emissions reduction will further increase the future dependence on carbon dioxide removal (CDR) from the atmosphere.
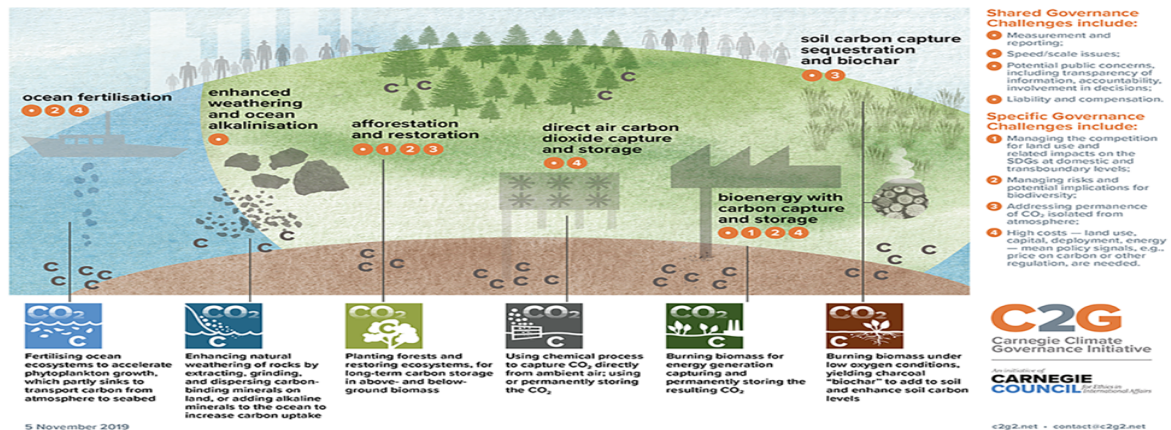
About Carbon Dioxide Removal:

It is using technologies, practices, and approaches to remove carbon dioxide from our atmosphere through deliberate and intentional human actions.

This includes traditional methods like afforestation as well as more sophisticated technologies like direct air carbon capture and storage (DACCS).

What are the different CDR methods?

Biochar

It is the substance produced by burning organic waste from agricultural lands and forests in a controlled process called pyrolysis.

Although it resembles common charcoal in appearance, the production of biochar reduces contamination and is a method to safely store carbon.

Pyrolysis involves the burning of wood chips, leaves, dead plants, etc. with very little oxygen, and the process releases a significantly small quantity of fumes.

Biochar is a stable form of carbon that cannot easily escape into the atmosphere.

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Bioenergy with carbon capture and storage (BECCS)

It involves bioenergy production, often through combustion to generate electricity or heat.

The resulting CO_2 emissions from this combustion are captured and stored underground, preventing them from contributing to the greenhouse effect.

It sequesters photosynthetically fixed carbon as post-combustion CO_2.

Direct air carbon capture and storage (DACCS)

It extracts CO_2 directly from the atmosphere at any location.

This captured CO_2 is then permanently stored in deep geological formations or used for other applications.

It uses electricity to remove CO_2 from the air.

Enhanced rock weathering

It involves pulverising silicate rocks to bypass the conventionally slow weathering action.

The resultant product, usually a powder, has a higher reactive surface area, which is then spread on agricultural lands for further chemical reactions.

Ocean alkalinity enhancement

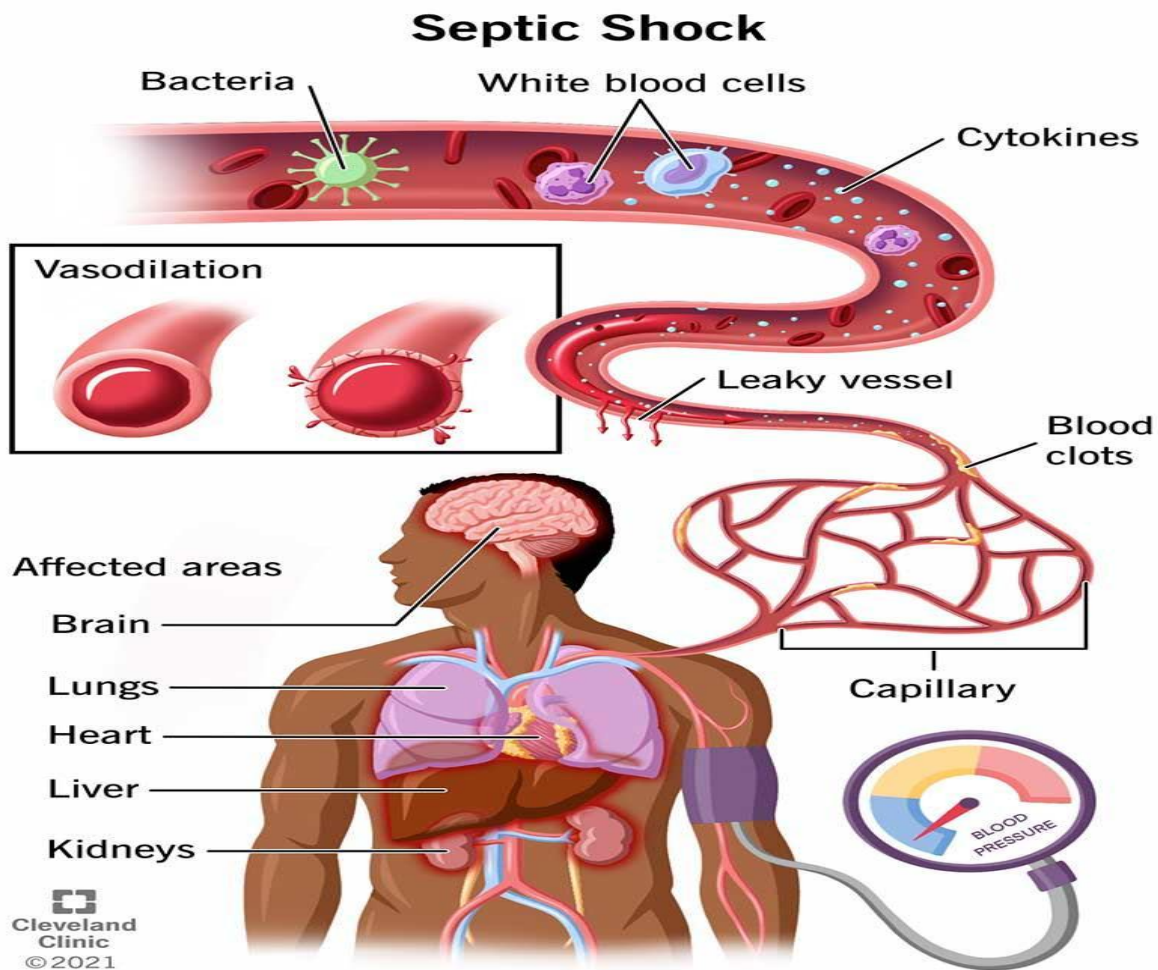It involves adding alkaline substances to seawater to accelerate this natural sink.

SEPSIS

Context: A study from the University of Manchester has found that people from deprived backgrounds, those with existing health conditions, and those with learning disabilities are at a much higher risk of dying from sepsis.

Details

The study from the University of Manchester highlights the significant impact of social and health disparities on the risk of sepsis-related mortality.

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Key points from the Study

Socioeconomic Disparities: Individuals from more deprived socioeconomic backgrounds are found to be twice as likely to die from sepsis within 30 days. This emphasizes the importance of addressing social determinants of health in sepsis prevention and treatment.

Septic Shock

Bacteria   White blood cells   Cytokines

Vasodilation

Leaky vessel

Blood clots

Affected areas

Brain

Lungs

Heart

Liver

Kidneys

Capillary

BLOOD PRESSURE

Cleveland Clinic ©2021

Vulnerable Populations: The study identifies specific groups with higher vulnerability to sepsis:

People with learning disabilities are almost four times more likely to develop sepsis.

Individuals with liver disease have about three times greater risk.

Patients with stage 5 chronic kidney disease have more than six times the risk.

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Those with cancer, brain disease, immunosuppressive conditions, and those who have received multiple courses of antibiotics are also at higher risk.

Awareness and Diagnosis Challenges: The study emphasizes the challenges in diagnosing sepsis, particularly as its symptoms may overlap with other illnesses. This highlights the need for increased awareness among healthcare professionals to ensure early diagnosis and treatment.

Antibiotic Use: The researchers note a correlation between exposure to multiple courses of antibiotics and an increased risk of sepsis. The reasons for this association are not fully understood, but potential factors include adverse effects on gut bacteria, increased susceptibility to infection, or underlying differences in immune status or comorbidities.

NHS Challenges: The study comes in the context of challenges within the National Health Service (NHS), including delays in diagnosing and treating sepsis, poor communication, and missed opportunities for follow-up care. The NHS has been urged to improve sepsis awareness and response.

Call for Action: The study suggests that the findings should guide health professionals worldwide in diagnosing sepsis earlier and initiating treatment sooner. Understanding the social and health factors that contribute to sepsis risk can help address health inequalities.

Sepsis

Sepsis is a life-threatening condition that occurs when the body's response to an infection injures its tissues and organs. It can lead to shock, multiple organ failure, and death.

It is a serious medical condition that can be fatal. However, early diagnosis and treatment can improve the chances of survival.

It can be caused by any type of infection, including bacterial, viral, fungal, or parasitic infections. The most common infections that lead to sepsis are pneumonia, urinary tract infections, and skin infections.

Symptoms of sepsis can vary depending on the severity of the infection and the individual's overall health. Some common symptoms of sepsis include Fever, Rapid heart rate, Rapid breathing, Confusion, Disorientation, Skin rash, Low blood pressure, and Pain.

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Risk factors for Sepsis

Weakened immune system: People with weakened immune systems, such as those with cancer, HIV/AIDS, or diabetes, are more likely to develop sepsis.

Young age: Children under the age of 1 year are at higher risk of sepsis.

Older age: Adults over the age of 65 are also at higher risk of sepsis.

Chronic illness: People with chronic illnesses, such as chronic obstructive pulmonary disease (COPD), kidney disease, or heart disease, are at higher risk of sepsis.

Diagnosis of sepsis

Diagnosing sepsis can be difficult because the symptoms can be similar to those of other illnesses.

Doctors will typically ask about medical history, perform a physical exam, and order laboratory tests.

Blood tests can measure levels of white blood cells, platelets, and other substances that can help to diagnose sepsis.

Treatment of sepsis

Treatment for sepsis depends on the severity of the infection and the individual's overall health.

Antibiotics are used to treat the infection that is causing sepsis.

Fluids are given to help maintain blood pressure and organ function.

Vasopressors are medications that help to constrict blood vessels and increase blood pressure.

Oxygen therapy is given to help improve oxygen levels in the blood.

Surgery may be needed to remove infected tissue or to drain an abscess.

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EXERCISE SURYA KIRAN- XVII

The Joint Military Exercise SURYA KIRAN, in its 17th edition, is a significant biennial event held alternatively in India and Nepal.

Details

The recent exercise, scheduled from November 24th to December 7th, 2023, is being conducted in Pithoragarh, Uttarakhand.

It involves the participation of the Nepal Army contingent from the Tara Dal Battalion and the Indian Army contingent, led by a Battalion from the KUMAON Regiment.

Objectives and Focus Areas

Enhancing Interoperability: The primary aim of SURYA KIRAN is to improve interoperability between the Indian and Nepalese troops. It focuses on refining combat skills, operational capabilities, and strengthening coordination in challenging terrains.

Combat Training: The exercise emphasizes jungle warfare techniques, counter-terrorism operations in mountainous regions, and humanitarian assistance and disaster relief operations as per the United Nations Charter.

Technology Integration: It includes training on the employment of drones, counter-drone measures, and aviation aspects. Additionally, it emphasizes environmental conservation efforts during military operations.

Cultural Exchange and Best Practices: SURYA KIRAN serves as a platform for soldiers from both countries to exchange ideas, share experiences, and

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understand each other's operational procedures, fostering deeper military ties and mutual understanding.

Real Estate Investment Trusts (REITs)

The SEBI Board recently approved amendments to the SEBI (Real Estate Investment Trusts) Regulations 2014 (REIT Regulations) to create a new regulatory framework for small and medium REITs.

Real Estate Investment Trusts (REITs)

About Real Estate Investment Trusts (REITs):

A REIT is a company that owns and typically operates income-producing real estate or related assets.

They pool money from the investors and invest it in commercial real estate projects.

These may include office buildings, shopping malls, apartments, hotels, resorts, self-storage facilities, warehouses, and mortgages or loans.

Unlike other real estate companies, a REIT does not develop real estate properties to resell. Instead, a REIT buys and develops properties primarily to operate them as part of its own investment portfolio.

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REITs provide a way for individual investors to earn a share of the income produced through commercial real estate ownership without actually having to go out and buy commercial real estate.

In general, REITs specialise in a specific real estate sector. However, diversified and speciality REITs may hold different types of properties in their portfolios, such as a REIT that consists of both office and retail properties.

Most REITs are publicly traded like stocks, which makes them highly liquid (unlike physical real estate investments). REITs are like shares that are listed on the stock exchange, which means you can buy or sell them anytime on the exchange.

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