

UPSC CURRENT AFFAIRS NOTES 21-03-2024

Biomining

Delhi's biomining project to clear landfill sites is likely to miss the latest deadline of 2024.

About Biomining

It is the technique of extracting metals from ores and other solid materials, typically using micro-organisms (bacteria, archae, fungi, or plants).

Biomining techniques may also be used to clean up sites that have been polluted with metals.



Process:

Valuable metals are commonly bound up in solid minerals.

Some microbes can oxidize those metals, allowing them to dissolve in water.

This is the basic process behind most biomining, which is used for metals that can be more easily recovered when dissolved than from solid rocks.

A different biomining technique, for metals which are not dissolved by the microbes, uses microbes to break down the surrounding minerals, making it easier to recover the metal of interest directly from the remaining rock.

When the metal of interest is directly dissolved, the biomining process is called “bioleaching,” and when the metal of interest is made more accessible or “enriched” in the material left behind, it is called “biooxidation.”

What metals are currently biomined?

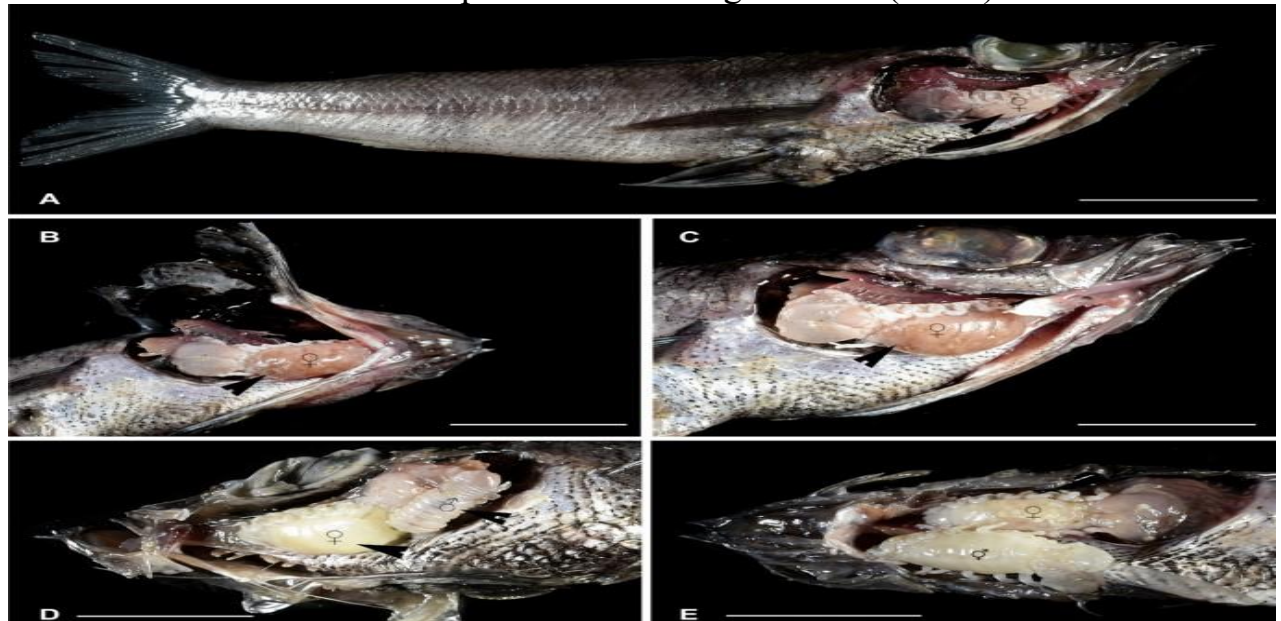
Most current biomining operations target valuable metals like copper, uranium, nickel, and gold that are commonly found in sulfidic (sulfur-bearing) minerals. Microbes are especially good at oxidizing sulfidic minerals, converting metals like iron and copper into forms that can dissolve more easily.

Compared to typical mining that uses hazardous chemicals and has a large CO₂ footprint, biomining represents an environmentally friendly alternative, producing very little (if at all) hazardous waste.

Ore is a deposit in Earth’s crust of one or more valuable minerals. The most valuable ore deposits contain metals crucial to industry and trade, like copper, gold, and iron. Metals are often associated with particular ores. Aluminum, for example, is usually found in the ore called bauxite.

Brucethoa ISRO

Researchers recently named a new species of deep-sea isopod discovered off the Kerala coast after the Indian Space Research Organisation (ISRO).



About Brucethoa ISRO

It is a new species of deep-sea isopod discovered off the Kollam coast, Kerala. The tiny fish-parasitic crustacean, belonging to the genus *Brucethoa*, was recovered from the base of the gill cavity of the Spinyjaw greeneye, a marine fish.



It is the second species within this genus to be documented in India.

It has been named *Brucethoa* ISRO in honour of the Indian space agency's successful space missions.

Females of the species tend to be larger than males. Females grow to about 19 mm in length and 6 mm in width, while males are smaller at around half the size.

Isopods are an order of invertebrates (animals without backbones) that belong to the greater crustacean group of animals, which includes crabs and shrimp.

Scientists estimate that there are around 10,000 species of isopods (all belonging to the order "Isopoda").

They also live in many different types of habitats, from mountains and deserts to the deep sea, and they are distributed worldwide.

Features:

They are one of the most morphologically diverse of all the crustacean groups, coming in many different shapes and sizes and ranging from micrometers to a half-meter in length.

Isopods often do not look alike, but they do have common features. For example, all isopods have two pairs of antennae, compound eyes, and four sets of jaws.

The body of all isopods consists of seven segments, each with its own pair of walking legs.

Isopods have a short abdominal section composed of six segments, called "pleons," and one or more of these segments is fused into a tail section.

About half of the known species of isopods live in the ocean. Others live in coastal and shelf waters, moving around on the seafloor or living in plants.

Most are free-living, but a number of marine species are parasitic on other animals.

Crustaceans (make up a very large group of the Arthropods which include the crabs, lobsters, crayfish, shrimp, krill, barnacles, brine shrimp, copepods, ostracods and mantis shrimp. They are invertebrates with a hard exoskeleton (carapace), a segmented body that is bilaterally symmetrical, more than four pairs of jointed appendages. Crustaceans are found in a wide range of habitats - most are free-living freshwater or marine animals, but some are terrestrial (e.g. woodlice), some are parasitic (e.g. fish lice) and some do not move (e.g. barnacles)

World Happiness Report 2024

Finland has once again claimed the title of the world's happiest country for the seventh consecutive year, according to the annual UN-sponsored World Happiness Report released recently.



About World Happiness Report

The annual World Happiness Report is a partnership of Gallup, the Oxford Wellbeing Research Centre, the UN Sustainable Development Solutions Network (SDSN), and the World Happiness Report's Editorial Board.

It is based on global survey data from people based on people's own assessments of their happiness, as well as economic and social data.

The report considers six key factors: social support, income, health, freedom, generosity, and the absence of corruption.

It assigns a happiness score based on an average of data over a three-year period.

Highlights of World Happiness Report 2024

The Nordic nations continue to dominate the top rankings. Finland topped the list for the seventh year in a row.

The other top 10 countries are Denmark, Iceland, Sweden, Israel, Netherlands, Norway, Luxembourg, Switzerland, and Australia.

Out of the 143 countries surveyed, Afghanistan remained at the bottom of the list.

For the first time in over a decade, the United States and Germany have slipped out of the top 20 happiest nations, landing at 23rd and 24th place, respectively. The report underscores a change wherein the happiest countries no longer include any of the world's most populous nations. Only the Netherlands and Australia, both with populations exceeding 15 million, are present in the top 10. Where does India stand?

India is ranked 126th on the list, the same as last year, in the happiness index. Older age is associated with higher life satisfaction in India.

The report said that older Indian men, particularly those in higher age brackets, presently married, and those with an education, tend to report greater life satisfaction compared to their counterparts.

However, older women in India report lower life satisfaction than older men. Satisfaction with living arrangements, perceived discrimination, and self-rated health emerged as the top three predictors of life satisfaction.

NILGIRI FORESTS

Forest fires have become a major threat in South India, particularly in areas like the Nilgiris. They pose a severe threat to biodiversity, ecosystems, and human communities.





A combination of natural and man-made factors is the primary driver of forest fires in South India. A major human cause of forest fires is the burning of trash, campfires, and abandoned cigarettes. Natural sources such as lightning strikes can contribute to the start of flames.

Forest fires have significant environmental and ecological consequences

Loss of Biodiversity: Fires destroy critical habitats for wildlife, displacing and potentially eradicating many species. This has the potential to upset entire food chains and ecosystems, thus impacting the region's natural balance.

Soil Erosion: When forests are burned, wind and rain cause the exposed soil to lose its topsoil covering. This erosion affects the land's fertility and ability to store water, resulting in desertification and lower agricultural productivity in the long run.

Air pollution: The smoke from the fires emits toxic toxins and particulates into the environment, contributing to respiratory issues including asthma and bronchitis. These pollutants can also travel long distances, affecting air quality in remote areas. In addition, fires can degrade air quality by diminishing the forest's ability to absorb CO₂, a greenhouse gas that contributes to climate change.

Challenges

Climate Change: Rising global temperatures, shifting precipitation patterns, and stronger winds are all predicted to contribute to more frequent and intense forest fires in the future. These changes will result in drier conditions, making forests more prone to fires, and extreme weather events such as heatwaves will make it easier to start fires.

Limited resources: Forest departments are frequently underfunded and understaffed, which limits their ability to efficiently patrol forests, take preventive measures, and respond swiftly to fires. A lack of advanced firefighting equipment and technology further hinders their operations.

Human Behaviour: Wildfires may be greatly triggered by intentional or unintentional acts of burning. Accidental fires can be started by dropped cigarettes, incorrectly extinguished campfires, or agricultural activities such as burning crop leftovers. Intentional fire can be used to clear land for cultivation or grazing, or it might be motivated by personal hatred. Educating the public about responsible forest management and the dangers of wildfires is critical to preventing human-caused fires.



Combating Forest Fires

Public awareness campaigns: Educate the public about responsible forest management and the risk of wildfire. This can be done by implementing instructional programmes in schools and communities, distributing information booklets and posters, and using social media platforms to raise awareness.

Forest Management Practices: Implement measures such as controlled burns to minimise fuel loads and establish firebreaks to help prevent unintentional fires. Encourage the planting of fire-resistant trees in appropriate regions.

Investing in Resources: Empower forest departments with improved technology for early fire detection, such as satellite monitoring systems and drones.

Firefighters should be equipped with advanced firefighting equipment such as fire engines, hoses, and personal protection gear. Educate firemen on complex firefighting procedures.

Strengthening enforcement: Increase the penalties for intentional fire and offences of forest fire protection legislation. Law enforcement authorities should collaborate closely with forest departments to patrol woods, prohibit unlawful activity, and apprehend those who break fire safety rules.

Nilgiri Biosphere Reserve

The Nilgiri Biosphere Reserve was formed in 1986 in the Nilgiri Mountains of the Western Ghats and extends into Tamil Nadu, Karnataka, and Kerala. It includes the protected areas:

Mudumalai National Park, Mukurthi National Park, Sathyamangalam Wildlife Sanctuary in Tamil Nadu.

Nagarhole National Park, Bandipur National Park, both in Karnataka.

Silent Valley National Park, Aralam Wildlife Sanctuary, Wayanad Wildlife Sanctuary, and Karimpuzha Wildlife Sanctuary in Kerala.

Its distinct ecosystems range from tropical and subtropical moist broadleaf forests to dry broadleaf forests, supporting a wide variety of flora and wildlife.

The region receives 500 to 7,000 millimetres of rainfall per year, which helps to sustain its diverse ecosystem.

The Nilgiri Biosphere Reserve has around 3,700 plant species, including 132 unique flowering plants. The shola forest sections are adorned with stunted evergreen trees, and tall trees serve as nesting places for enormous honey bees.

The protected area is home to a number of rare bird species, including the Asian elephant, Bengal tiger, and Indian leopard. It also provides a habitat for a

variety of amphibians and reptiles, making a substantial contribution to India's amphibian and reptile biodiversity.

VALMIKI TIGER RESERVE

Valmiki Tiger Reserve (VTR) utilised rainwater harvesting and artificial waterhole creation to reduce wildlife conflicts caused by water scarcity while also improving conservation efforts and community interactions.



About Valmiki Tiger Reserve (VTR)

Valmiki National Park located in Bihar's West Champaran District, is the state's only national park.

It shares a boundary with Nepal's Chitwan National Park to the north and Uttar Pradesh to the west.

The forest area, formerly known as Bhainsa Lotan, was once owned by the Bettiah Raj and Ramanagar Raj until the early 1950s. Later, it was declared a Wildlife Sanctuary in 1978 and eventually established as Valmiki National Park in 1990.

Cliffs, ridges, gorges, hills, streams, valleys, dense woods, open woodlands, grasslands, marshes, and riverine fringes all contribute to the park's varied scenery.

It is located in the Gangetic Plains biogeographic zone, which includes both the Bhabar and Terai tracts.

It is home to a diverse range of wildlife, including the Bengal tiger, Indian rhinoceros, Asiatic elephant, Asiatic black bear, Indian leopard, wild dog, wild water buffalo, and numerous deer, langurs, monkeys, and birds. The tiger population in the reserve has increased significantly over the years.

The park has a wide variety of flora types divided into several forest types, which range from Bhabar-Dun Sal Forest to Wetlands. It is home to many tree species, including Sal, Karam, Asan, Bahera, Asidh, Simal, Satsal, Piyar, Mandar, Banjan, Bhelwa, Harra, Boderia, and Chir Pine. The grasslands are ornamented with plants such as munj, Kans, Elephant grass, Narkat, Vitiveria zizanioides, and Imperata cylindrica.

The dominant Tharu community, along with other scheduled tribes like Oraon, Munda, Lohra, and Bhuiya, live in the region. Festivals like Rama Navami are celebrated by the Tharu people, who maintain cultural ties with the Tharus of Nepal.

World Forest Day

World Forest Day, also known as International Day of Forests, is celebrated on March 21 each year.



About World Forest Day

It is celebrated every year to remind people of the significance of forests and trees in our lives.

The day aims to respect and promote the value of a wide range of forests.

Countries are encouraged to take part in regional, global, and local drives to set up a scope of forest and tree-related campaigns, like planting campaigns.

The Food and Agriculture Organization of the United Nations (FAO) and the United Nations Forum on Forests are the coordinators of the International Day of Forests.

It is observed on March 21 every year.

History:

In 1971, the General Assembly of the European Confederation of Agriculture proposed that we should celebrate a day dedicated to forests.

March 21 was chosen as World Forestry Day by the United Nations as it coincides with Vernal Equinox and Autumn Equinox in northern and southern hemispheres.

The theme for this year is - Forests and Innovation: New Solutions for a Better World.

International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE)



The 41st Steering Committee Meeting of the International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE), is being hosted by India in New Delhi during March 18 – 22, 2024.

All about IPHE

The International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE) is an inter-governmental cooperative initiative founded in 2003 consisting of 24 countries.

The IPHE works with the member countries and leaders in the hydrogen fuel and fuel cell industry in order to further develop and implement those technologies.



The International Partnership for Hydrogen and Fuel Cells in the Economy was founded in 2003 to help create cooperation between different governments in developing hydrogen fuel cell technology.

The IPHE contains two central groups: the Education & Outreach Working Group and the Regulations, Codes, Standards, & Safety Working Group.

In July 2005, the G8 Summit endorsed the IPHE in its plan of action on climate change, clean energy, and sustainable development and identified it as a means of cooperation to develop clean energy technologies.

The United States was the chair of the IPHE from 2003 to 2007 and 2018 to 2021.

Member Countries

The IPHE consists of 24 member countries. The United Arab Emirates was the most recent country to join in 2022.

Australia

Austria

Belgium

Brazil

Canada

Chile

China

Costa Rica

European Commission

France

Germany

Iceland

India

Italy

Japan

Republic of Korea

Netherlands

Norway

Republic of South Africa

Singapore

Switzerland

United Arab Emirates

United Kingdom

United States