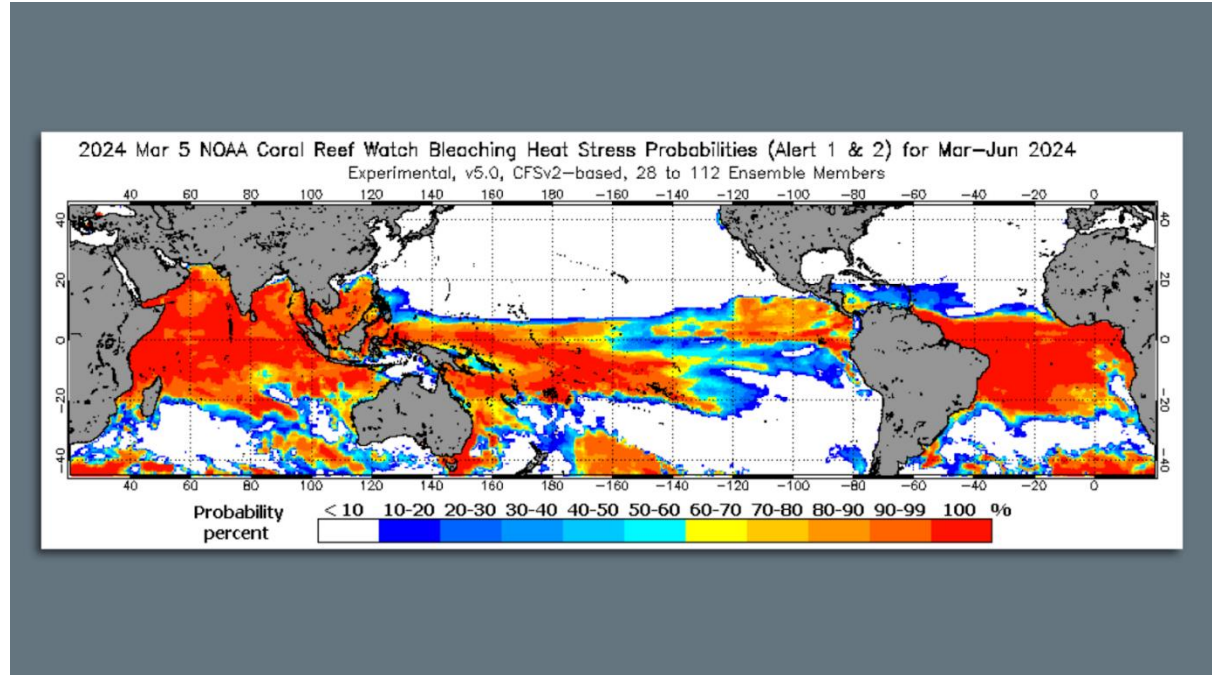


UPSC CURRENT AFFAIRS NOTES 09-03-2024

Coral Reef Watch Programme

The Coral Reef Watch programme has warned that the Earth is on the brink of experiencing a fourth global mass coral bleaching event.



About Coral Reef Watch

It is a free online tool that provides a global analysis of sea surface temperature (SST) and outlooks to identify coral reefs that are at risk of bleaching.

It is offering the world's only global early-warning system of coral reef ecosystem environmental changes.

It remotely monitors conditions that can cause coral bleaching, disease, and death; delivers information and early warnings in near real-time to our extensive and diverse user community; it uses operational climate forecasts to provide outlooks of stressful environmental conditions on coral reefs worldwide.

Its products are primarily sea surface temperature (SST)-based but also incorporate light and ocean color, among other variables.

It has been using remote sensing, modeled, and in situ data to operate a decision support system to help all stakeholders around the world prepare for and respond to coral reef ecosystem stressors, predominantly resulting from climate change and warming of the Earth's oceans.

This online tool was developed by National Oceanic and Atmospheric Administration (NOAA).

Key facts about Corals

Corals are marine invertebrates or animals not possessing a spine.

Each coral is called a polyp and thousands of such polyps live together to form a colony, which grows when polyps multiply to make copies of themselves.

Corals share a symbiotic relationship with single-celled algae called zooxanthellae.

The algae provides the coral with food and nutrients, which they make through photosynthesis, using the sun's light.

In turn, the corals give the algae a home and key nutrients. The zooxanthellae also give corals their bright colour.

Australia's Great Barrier Reef is the world's largest reef system stretching across 2,300 km.

It happens when corals experience stress in their environment due to changes in temperature, pollution or high levels of ocean acidity. Under stressed conditions, the zooxanthellae or food-producing algae living inside coral polyps start producing reactive oxygen species, which are not beneficial to the corals.

Pritzker Architecture Prize

Japanese architect Riken Yamamoto was declared winner of the 2024 Pritzker Architecture Prize.

**The
Pritzker
Architecture
Prize**





About Pritzker Architecture Prize

It is the highest international award in the field, which is sometimes referred to as the “Architecture Nobel” and “the profession’s highest honor.”

The prize has been awarded every year since its founding in 1979.

It is awarded to a living architect/s for significant achievement.

It was established by the Pritzker family of Chicago through their Hyatt Foundation.

Objective: To honour a living architect whose built work demonstrates talent, vision and commitment, who has produced consistent and significant contributions to humanity and the built environment through the art of architecture”.

The laureate receives \$100,000 and also a bronze medallion.

Works of Riken Yamamoto

Yamamoto is the ninth laureate from Japan.

His famous works are the Hiroshima Nishi Fire Station (2000) has a transparent façade and glass walls and floors that allow passersby to look inside.

The Koyasu Elementary School (2018), spacious, open terraces not only make

India AI MISSION

The Union Cabinet's approval of the India AI Mission marks a significant step towards addressing India's deficiency in AI computing hardware.

With an allocated budget of Rs 10,372 crore over the next five years, the mission aims to subsidize private companies in establishing AI computing capacity within the country.

Subsidizing Private Companies: The government will provide financial support to incentivize private entities to set up AI computing infrastructure.

Promoting Investments: Approval of the mission blueprint is expected to attract investments in AI infrastructure, encouraging the establishment of data centers by private firms.

Support for Startups: The initiative will provide startups access to computing resources, enabling them to develop and test generative AI models locally.



Challenges Addressed

High Costs: Acquiring computing capacity for AI development is costly, especially for smaller businesses. The mission aims to alleviate this financial burden by providing subsidies.

Access Barriers: Limited access to advanced computing hardware impedes the progress of AI innovation in India. The mission seeks to democratize access to such resources.

Competitive Disadvantage: Currently, startups in India lack the computing resources enjoyed by their counterparts in countries like the United States. The IndiaAI Mission aims to level the playing field.

Comparison with Global Practices

Example of Perplexity AI: Startups like Perplexity AI in the US benefit from access to computing capacity offered by companies like Nvidia. The IndiaAI Mission seeks to replicate this model in India.

Significance of Compute: Computing capacity is crucial for AI development, alongside algorithmic innovation and data sets. However, it is often the most challenging element to procure, especially for smaller businesses.

India's Plan for AI Computing Capacity

Objectives:

Establishing Computing Capacity: The IndiaAI Mission aims to set up AI computing infrastructure comprising more than 10,000 GPUs (Graphics Processing Units).

Foundational Models Development: Additionally, the mission intends to develop foundational models with a capacity of over 100 billion parameters. These models will be trained on datasets covering major Indian languages and targeted towards priority sectors such as healthcare, agriculture, and governance.

Key Features:

Selection of Advanced GPUs: Priority will be given to selecting the most advanced GPUs for the computing infrastructure.

Public-Private Partnership (PPP) Model: The implementation of AI compute infrastructure will be carried out through a PPP model, with 50% viability gap funding provided by the government.



Viability Gap Funding: Companies setting up data centers can apply for viability gap funding from the government to cover a portion of the infrastructure costs. This funding aims to bridge the gap between project costs and revenue expectations.

Flexibility in Capacity Expansion: If computing prices decrease, private entities are required to increase compute capacity within the same budgeted amount to meet growing demand.

Financial Allocation:

A total outlay of Rs 10,372 crore has been allocated for the IndiaAI Mission. Of this, Rs 4,564 crore is earmarked specifically for building computing infrastructure.

Implementation Process:

The implementation process involves issuing tenders inviting companies to establish data centers.

Companies applying for funding will need to demonstrate their plans and budgetary requirements for setting up the computing infrastructure.

Government's Role:

The government plays a facilitating role by providing financial support and creating an enabling environment for the establishment of AI computing infrastructure.

Through this initiative, the government aims to accelerate the development and adoption of AI technologies in priority sectors, fostering innovation and economic growth.

Proposals Beyond Hardware in IndiaAI Mission

Financing DeepTech Startups: The government will provide financing to deeptech startups at various stages of growth, allocating approximately Rs 2,000 crore towards this initiative. This funding aims to support the development and scaling up of innovative AI technologies and solutions.

IndiaAI Datasets Platform: A dedicated platform, the IndiaAI Datasets Platform, will be established to enhance the quality, accessibility, and utilization of non-personal datasets for AI innovation. The platform will host high-quality AI-ready datasets, facilitating research and development in AI applications.



IndiaAI Innovation Research Centre: The government will set up the IndiaAI Innovation Research Centre to focus on the development and deployment of large foundational models. This includes indigenous Large Multimodal Models and domain-specific foundational models. An allocation of close to Rs 2,000 crore has been earmarked for this center.

Support for Education and Research: Financial support will be provided to 4,000 BTech, 400 MTech, and 600 PhD candidates focusing on AI in premier educational institutions. This initiative aims to nurture talent and expertise in AI research and development, contributing to India's innovation ecosystem.

Alignment with Government's Overall Policy

Economic Development through Electronics Manufacturing: The announcement of the IndiaAI Mission aligns with the government's broader policy objectives, particularly in the area of electronics manufacturing. Recent approvals for chip projects worth Rs 1.26 lakh crore, including the establishment of commercial fabrication plants, demonstrate India's commitment to developing its semiconductor industry as a key economic driver.

Stimulating Innovation and Research: By investing in AI infrastructure, financing startups, and supporting education and research initiatives, the government aims to stimulate innovation and research in the AI sector. These efforts are integral to India's strategy for fostering technological advancement and enhancing competitiveness in the global AI landscape.

Global Best Practices: The IndiaAI Mission draws inspiration from global best practices, such as the European Commission's initiatives to enable access to hardware for AI development. By providing funding, infrastructure, and supportive policies, the government seeks to create an enabling environment for AI innovation and entrepreneurship in India.

Regulatory Landscape for AI in Different Countries

India: The IT Ministry in India issued an advisory requiring generative AI companies deploying "untested" systems to seek government permission. However, this move faced criticism and raised questions about its legal basis. The government clarified that the advisory was not applicable to startups, highlighting the need for clearer regulations and frameworks to address AI-related risks.

European Union: The EU reached a deal on its AI Act, which includes safeguards on AI use within the EU. These safeguards aim to protect consumers and address concerns about AI's impact on society. Clear guardrails have been

established for AI adoption by law enforcement agencies, and consumers are empowered to file complaints against perceived violations.

United States: The White House issued an Executive Order on AI, offering a template for AI regulation that could serve as a blueprint for other countries. This Executive Order builds on the foundation laid by the AI Bill of Rights released in October, which outlines principles for the ethical and responsible use of AI technology. These initiatives reflect the growing recognition of the need for regulatory frameworks to ensure the safe and ethical development and deployment of AI systems.

Key Aspects of AI Regulation

Ethical and Responsible Use: Regulations aim to ensure that AI technologies are developed and deployed in an ethical and responsible manner, with safeguards to protect individuals' rights and interests.

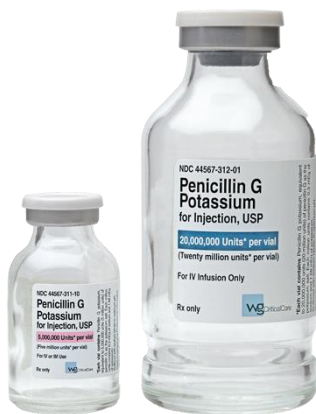
Transparency and Accountability: Regulations often require transparency in AI systems, including clear explanations of how they operate and accountability mechanisms to address potential biases, errors, or harms.

Consumer Protection: Measures are implemented to protect consumers from potential risks associated with AI, such as data privacy violations, discrimination, or misinformation.

Law Enforcement and National Security: Regulations address the use of AI in law enforcement and national security contexts, balancing security needs with individual rights and civil liberties.arning the arts — dance, music, painting but also encourage students to interact.

PENICILLIN G

The Union Health Minister recently announced that India is set to revive domestic production of Penicillin G by mid-2024.





Details:

India to restart the manufacturing of Penicillin G, a key antibiotic, after a gap of three decades. The last manufacturing plants in India shutdown their operations in the 1990s.

Subsidized Chinese Competition: China has implemented a number of policies to support its pharmaceutical industry, including tax breaks, subsidies for research and development, and cheap loans. This has allowed Chinese companies to produce drugs at a lower cost, making it difficult for Indian companies to compete on price.

India Shift towards Formulations: When cheaper Active Pharmaceutical Ingredients (APIs) became available from China, Indian manufacturers responded with a strategic shift. They focused their efforts on formulations, which involved importing the bulk APIs and turning them into finished medications that are ready for patients to use.

Drug Price Controls: Indian government's price controls on essential medicines have further decreased the profit margins for domestic manufacturers. These price controls are often set below the production cost for essential drugs, making it difficult for Indian companies to make a profit on these medications. This discourages investment in research and development, as companies may be less likely to invest in new drugs if they cannot recover their costs through higher prices.

What are Active Ingredients?

Active ingredients are the essential components in medications that produce the desired effect on the body. They are like the key that unlocks a specific biological process in the body, triggering a healing response or symptom relief.

Active ingredients can be man-made chemicals, called Active Pharmaceutical Ingredients (APIs), or natural substances derived from plants, animals, or even microbes.

Active ingredient can also be called active substance, referring to the component in a medication that has a direct healing effect.

Inactive ingredients are called excipients, they are fillers, binders, and other materials that help deliver the active ingredient effectively. They play a key role in ensuring the medication reaches the target site in the body at the right dose and dissolves or releases at the desired rate.



Significance of the Initiative

The COVID-19 pandemic exposed the vulnerabilities of depending on other countries for key medicines. Disruptions in global supply chains during the pandemic highlighted the need to have a strong domestic API manufacturing sector. A strong domestic API industry is essential for safeguarding public health and national security.

India is prioritizing self-reliance in the production of essential drugs to reduce its dependency on foreign suppliers and safeguard the nation's health security. By restarting domestic Penicillin G production, India is taking a significant step towards achieving self-sufficiency in antibiotics.

Production Linked Incentive (PLI) Scheme

The PLI scheme was launched by the government to boost domestic manufacturing of essential drugs and active pharmaceutical ingredients (APIs).

It provides financial incentives to companies that set up and scale up API manufacturing facilities in India. These incentives can take the form of direct subsidies or tax breaks.

It makes domestic production of Penicillin G and other essential drugs more competitive with cheaper imports.

By providing financial assistance, the PLI scheme aims to create a level playing field for domestic manufacturers and encourage them to invest in API production.

It can help to create a stronger and more resilient supply chain for essential medicines in India. By reducing dependency on imports, India can ensure a continuous supply of critical drugs at affordable prices, even during global disruptions.

Penicillin G

Benzylpenicillin, also known as penicillin G, is a powerful antibiotic used to treat a wide range of bacterial infections. It's particularly effective against Pneumonia, Strep throat, Syphilis, Tetanus.

Due to limited oral bioavailability, it is primarily taken via injection.

It is produced by fermentation of *Penicillium chrysogenum*, involving fermentation, recovery, and purification.

RIVER HOOGHLY

Hooghly River, also known as Bhagirathi-Hooghly, Ganga and Kati-Ganga runs approximately for 260-kilometre as a distributary of the Ganges River in West Bengal.

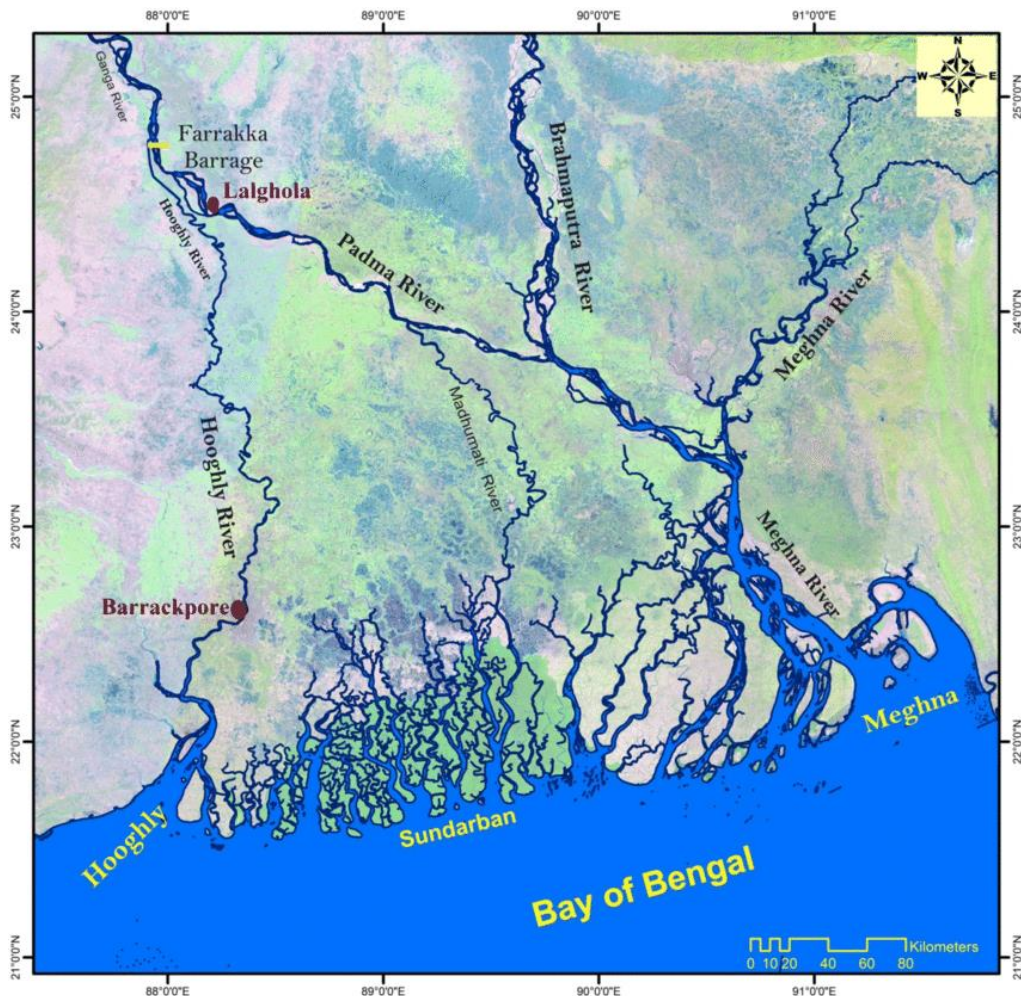
It is formed in Murshidabad, where Ganga splits into two parts – while the part flowing through Bangladesh is called the Padma.

Haldi, Ajay, Damodar, and Rupnarayan are the rivers that feed the lower reaches of the Hooghly.

Another man-made bifurcation of the river upstream is situated at Farakka. This supplies the Hooghly with adequate water even in the dry season.

The Hooghly’s majority of water comes from the Farakka Feeder Canal instead of natural water.

The other part is the Hooghly, which flows through a heavily industrialised area of West Bengal.



The Hooghly river is silted up above Kolkata, and the river flows to the west and south to the estuary of Rupnarayan and then south and southwest to enter the Bay of Bengal through a 32 km-wide estuary.

The important cities near the Hoogli River are Jiaganj, Azimganj, Murshidabad, and Baharampur.

Lifeline for Kolkata, transportation route for goods and people, historical trade route, cultural and ecological resource.

The Ganga - Bhagirathi - Hooghly river system between Haldia (Sagar) and Allahabad (1620 km) was declared as National Waterway-1 (NW-1) in 1986.

Challenges associated with the river: Changing course, frequent floods, pollution from industrial effluents and sewage.

The Hooghly River faces pollution challenges due to industrial and domestic waste discharge.

Recent development

Prime Minister Narendra Modi inaugurated a metro train service between Howrah Maidan and Esplanade in Kolkata, marking the opening of India's first under-river tunnel.

The 4.8-km tunnel between Howrah Maidan and Esplanade includes a 1.2-km section, positioned 30 meters below the Hooghly River, establishing it as the country's first transportation tunnel beneath a significant river.

Parrot Fever

In a recent outbreak parrot fever has claimed the lives of five individuals across Europe this year.

About Parrot Fever

It is also known as psittacosis.





It is caused by the bacterium *Chlamydophila psittaci* (*C. psittaci*).

The bacteria can infect many mammals including dogs, cats and horses but most often infects birds.

It primarily affects birds but can be transmitted to humans through inhalation of contaminated particles from feathers or droppings.

The disease is more common in people who come into close contact with birds — such as poultry workers, veterinarians and pet-bird owners.

Humans can catch psittacosis by inhaling airborne particles containing *C. psittaci*, but human-to-human transmission of the disease is very rare, with only a handful of cases ever reported.

Symptoms: Includes fever, headache, muscle pains, coughing, difficulty breathing, and symptoms resembling pneumonia.

Severe cases may lead to complications such as myocarditis or other neurological symptoms.

Treatment: Treatment typically involves antibiotics, such as doxycycline or tetracycline, administered orally for two to three weeks.

Supportive care, including over-the-counter medications for symptomatic relief and maintaining proper hygiene practices, is also crucial for recovery.

A virus is a microscopic infectious agent that can only replicate within the living cells of a host organism. Viruses are considered obligate intracellular parasites because they lack the cellular machinery necessary for carrying out metabolic processes and reproduction on their own. Instead, they rely on the host cell's machinery to replicate and produce new viral particles.