

ECONOMY**1. India's Manufacturing Sector**

India's manufacturing sector relies on foreign countries, and it's time to put a figure on India's exposure to global value chains

Effect of reliance on global supply chains, especially China on India's manufacturing sector

- **Rising Trade Deficit:**
 - India's industrial sector trade deficit with China reached \$84.4 billion in 2022, a 27% increase from 2021, highlighting growing reliance.
- **Complex Global Value Chains:**
 - India's dependence on China is more intricate due to global value chains; parts and components are often sourced from multiple countries.
- **High Look-Through Exposure to China:**
 - On average, 23% of India's foreign-sourced manufacturing inputs are indirectly from China, revealing a deeper reliance than apparent at first glance.
- **Increased Dependence Over Time:**
 - India's reliance on Chinese inputs has risen sharply from 5% in 2000 to 23% in 2022, indicating growing vulnerability.
- **Critical Sectors Affected:**
 - Key Indian sectors like basic metals, transport, and electrical equipment are significantly dependent on foreign, especially Chinese, inputs.

Research method used to analyze a country's dependence on foreign supplies in the manufacturing sector

- **Replicating Baldwin's Study:**
 - The analysis follows the methodology used by Richard Baldwin et al., focusing on the interdependencies in manufacturing sectors.
- **Utilizing OECD Input-Output Tables:**
 - The research employs input-output tables from the Organization for Economic Cooperation and Development (OECD) to track the flow of products between countries.
- **Measuring Face-Value Exposure:**
 - This aspect considers the direct origins of intermediate products used by a country's manufacturing sector, like India's electronics sector sourcing from Vietnam.
- **Assessing Look-Through Exposure:**
 - This deeper analysis identifies the original sources of these intermediate products, such as Vietnamese suppliers relying on Chinese inputs, revealing indirect dependencies.

Way forward

To reduce dependency, India should diversify its manufacturing inputs, source from various countries, and possibly attract foreign investment. This approach would mitigate risks evident from the high trade deficit and growing indirect reliance on China, as seen in sectors like metals and transport equipment.

ENVIRONMENT**Rise of ocean temperatures****About**

The ocean's surface temperature is rising to record levels, mainly due to human activities like burning fossil fuels.

Current state of ocean temperatures

- In February 2024, the global sea surface temperature was 21.06°C, the highest since 1979.
- It surpassed the previous record of 20.98°C set in August 2023. Since March 2023, temperatures have been exceptionally high.

Factors contributing to the rise of ocean temperatures

- **Human Activities:** Since the 19th century, burning fossil fuels has released large amounts of greenhouse gases, significantly contributing to global warming.

- Greenhouse Gas Absorption: About 90% of the extra heat trapped by greenhouse gases is absorbed by the oceans, steadily increasing their temperatures.
- El Niño: This weather pattern, causing abnormal warming of waters in the equatorial Pacific Ocean, contributes to both ocean and global temperature rises.
- Reduced Sahara Dust: Less dust blowing off the Sahara Desert means less shading over the Atlantic, leading to increased sunlight absorption and higher ocean temperatures.

Concerns related to the rise of ocean temperature

- Impact on Marine Ecosystems: Warmer oceans lead to increased stratification, disrupting the mixing of water layers. This affects marine life, especially the population of phytoplankton, crucial for marine food webs.
- Coral bleaching: These have doubled in frequency between 1982 and 2016, causing intense coral bleaching, which harms coral reproduction and increases vulnerability to diseases.
- Changes in Marine Behavior: Warming oceans alter the migration patterns of aquatic animals.
- Intensification of Storms: Warmer oceans contribute to more frequent and severe storms. They increase evaporation rates and heat transfer, leading to stronger winds, heavier rainfall, and more flooding when storms reach land.
- Historical Data Point: Record sea surface temperature of 21.06°C in February 2024, illustrating the ongoing warming trend.

Way forward

To mitigate the impacts of rising sea surface temperatures, urgent action to reduce greenhouse gas emissions is vital. The oceans have absorbed 90% of excess heat, exacerbating marine ecosystem damage and intensifying storms. Reducing emissions can slow these trends, as emphasized by the World Meteorological Organisation's reports.

HEALTH**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

- 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.

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.

India's position

- 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

PRELIM FACTS**1. Gulf of Tonkin**

Vietnam urges respect for international law after China sets a baseline in the Gulf of Tonkin.

About Gulf of Tonkin:

- It is a shallow, crescent-shaped body of water located in the northwest part of the South China Sea.
- It is known as “Beibu Gulf” in Chinese and “Bac Bo Gulf” in Vietnamese.
- The gulf is bordered by the northern coast of Vietnam to the west and northwest, China’s Guangxi Zhuang Autonomous Region to the north, and the Leizhou Peninsula and Hainan Island to the east.
- The Gulf of Tonkin receives water from multiple rivers, primarily the Red River (referred to as the Yuan River in Chinese), along with several smaller rivers.
- It connects to the South China Sea through its southern mouth and the Hainan Strait (Qiongzhou Strait) to the northeast.
- In Northern Vietnam, the primary ports along the gulf are Haiphong and Ben Thuy. In China, the major port is Beihai (Pakhoi).
- The Gulf of Tonkin incident in 1964 increased U.S. involvement in the Vietnam War.

2. Great Indian Bustard

- The Great Indian Bustard (*Ardeotis nigriceps*), the State bird of Rajasthan, is considered India’s most critically endangered bird.
- It is considered the flagship grassland species, representing the health of the grassland ecology.
- Its population is confined mostly to Rajasthan and Gujarat. Small populations occur in Maharashtra, Karnataka and Andhra Pradesh.
- The bird is under constant threats due to collision/electrocution with power transmission lines, hunting (still prevalent in Pakistan), habitat loss and alteration as a result of widespread agricultural expansion, etc.
- Protection Status:
 - IUCN red List: Critically Endangered
 - Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES): Appendix 1
 - Wildlife (Protection) Act, 1972: Schedule I

3. The Gibraltar Strait

The scientists have predicted the ‘Ring of Fire’ Subduction Zone beneath the Gibraltar Strait.

About

- Subduction zones are the regions where tectonic plates collide and one plate is thrust beneath another, descending into the Earth’s mantle at rates of 2-8 centimetres per year.
- The process of subduction is driven by the temperature difference between the subducting slab and the surrounding asthenosphere, as the colder oceanic lithosphere has, on average, a greater density.

Strait of Gibraltar

- It is a narrow waterway separating Europe from Africa and connecting the Mediterranean Sea to the Atlantic Ocean.
- Until the opening of the Suez Canal in 1869, the Strait of Gibraltar served as the only access point to the Mediterranean Sea.
- Borders: It is bordered by Spain and the British Overseas Territory of Gibraltar in the north, and by the African country of Morocco and the Spanish exclave of Ceuta in the south.
- It is about 58 km long and has a width of about 13 km at its narrowest point.
- Its depth ranges from 300 to 900 metres, and it forms a significant gap between the high plateau of Spain and the Atlas Mountains of Northern Africa.

4. Plastic Waste Management (Amendment) Rules, 2024

The Ministry of Environment and Forests (MoEF) has introduced a new set of amendments to India's Plastic Waste Management (Amendment) Rules, 2024.

About

- It defines biodegradable plastics as not only capable of degradation by biological processes in specific environments such as soil, landfill but also as materials that do not leave any microplastics.
- Rules specify that the makers of disposable plastic ware can label them as biodegradable only when they do not leave any microplastics behind.
- Biodegradable plastic involves plastic goods being treated before they are sold.
- When discarded, the material is expected to decompose naturally over time though there are no tests yet to determine if such plastics completely degrade.
- Compostable plastics, on the other hand, do degrade, but require industrial or large municipal waste management facilities to do so.
- Biodegradable plastic and compostable plastic are projected as the two broad kinds of technological fixes to India's burgeoning problem of plastic waste pollution.

5. Global Methane Tracker 2024

The International Energy Agency's Global Methane Tracker 2024 indicates that methane emissions from fuel usage in 2023 were nearly at their highest level on record, representing a slight increase compared to 2022.

About:

- In 2023, methane emissions from fossil fuels totaled close to 120 million tonnes (Mt).
- Major methane emissions events increased by over 50% in 2023 compared to 2022..
- These events included more than 5 million metric tons of methane emissions from significant fossil fuel leaks globally.
- One prominent incident was a major well blowout in Kazakhstan that lasted over 200 days.
- Nearly 70% of methane emissions from fossil fuels come from the top 10 emitting countries.
- The United States is the largest emitter of methane from oil and gas operations, closely followed by Russia.
- China is the highest emitter of methane in the coal sector.

6. Project Gaia

The European Central Bank, the Bank for International Settlements, the Bank of Spain, and the Bundesbank of Germany introduced Project Gaia.

About

- Project Gaia aims to help analysts search corporate climate-related disclosures and extract data quickly and efficiently using artificial intelligence (AI).
- The Project integrated Large Language Models (LLMs) into an application and leveraged it for data extraction.
- A large language model (LLM) is a type of artificial intelligence (AI) algorithm that uses deep learning techniques and massively large data sets to understand, summarize, generate and predict new content.

7. Operation Indravati

India launched 'Operation Indravati' to evacuate its nationals from Haiti.

About

- Haiti is a country on the island of Hispaniola in the Caribbean Sea, east of Cuba and Jamaica, and south of The Bahamas.
- Haiti has been witnessing violence for over two years since the July 2021 assassination of President Jovenel Moise.
- Now various armed groups launched coordinated attacks on key installations in Haiti in an attempt to force the resignation of the country's de facto leader Prime Minister Ariel Henry.

ANSWER WRITING

Q. Explain the causes behind the occurrence of marine heat waves. Discuss the ways in which they can affect the marine ecosystems and cause economic losses.

A marine heat wave is defined as when seawater temperatures exceed a seasonally-varying threshold for at least 5 consecutive days. Marine heat waves can be caused by a whole range of factors, such as:

- El Niño: The increase in marine heat waves (MHWs) is due to rapid warming in the Indian Ocean and strong El Niño events. El Niño-induced marine heat waves can push many sensitive fisheries to a breaking point.
- Ocean currents: The most common drivers of MHWs include ocean currents, which can build up areas of warm water and air-sea heat flux or warming of the ocean surface from the atmosphere. Further, winds can enhance or suppress the warming in MHWs.
- Global warming: Around 90 per cent of the warming caused by greenhouse gas emissions is absorbed by the oceans leading to rise in sea surface temperatures and thus, increasing the frequency and intensity of MHWs.
- Geographical factors: When surface winds are weaker than normal, it leads to less evaporation over the oceans and warm waters. Further, the presence of fewer clouds over the oceans lets more sunlight in and heats up the oceans, producing record-breaking MHWs.
- MHWs have the potential to devastate marine ecosystems and cause economic losses, including the following:
 - Degrade the marine ecosystem and loss of biodiversity: MHWs impact marine organisms that are highly adapted to specific water temperatures. MHWs have been associated with the mass mortality of marine invertebrates and may force species to change behaviour.
 - For example, some fish increase their metabolism in warm waters so much that they burn energy faster than they can eat, and they can die.
 - Coral bleaching: Marine heat waves lead to rapid heat-induced mortality of coral colonies as well as coral skeleton dissolution, thus devastating the coral ecosystem.
 - Harmful algal bloom: A marine heat wave promotes blooms of harmful algae, which can release toxins that can be harmful to marine life and can lead to widespread marine mortalities.
 - Impact on the fisheries sector: MHWs cause habitat destruction like sea grass destruction, loss of kelp forests, etc. thereby adversely affecting the fisheries sector.
 - Economic loss due to the impact on the Indian monsoon: The rise in MHWs over the Indian Ocean is leading to reduction in monsoon rainfall over Central India, thus leading to low crop production.
 - Socio-economic impacts: Coral bleaching caused by a marine heat wave can reduce the aesthetic appeal of coral reefs, which discourages tourism in the area and thus, impacts the livelihood of coastal communities.
 - MHW can increase the intensity and frequency of extreme events such as cyclones. For example, Amphan turned into a super cyclone, primarily fuelled by a strong MHW on its way.

The government needs to build research capacity to monitor MHWs, understand their impact, and predict future heat wave events. Also, it is necessary to invest in nature-based solutions alongside ambitiously reducing fossil fuel based emissions.

MCQs

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| 1. Where is the Gulf of Tonkin located | (d) West Bengal |
| (a) Barents sea | 3. India launched 'Operation Indravati' to evacuate its nationals from |
| (b) South China Sea | (a) Haiti |
| (c) Mediterranean sea | (b) Ghana |
| (d) Andaman Sea | (c) Ukraine |
| 2. The Great Indian Bustard is the state bird of | (d) Gaza |
| (a) Odisha | 4. With reference to xenotransplantation, consider the following statements: |
| (b) Rajasthan | |
| (c) Gujarat | |

1. Xenotransplantation involves the transplantation of cells and tissues from one part of the body to another in the same person.
 2. CRISPR-Cas9 technology can be used under the Xenotransplantation process.
- Which of the statements given above is/are incorrect?
- (a) 1 only
 - (b) 2 only**
 - (c) Both 1 and 2
 - (d) Neither 1 nor 2
5. Consider the following statements about the Gibraltar Strait
 1. It is a narrow waterway separating Europe from Africa.
 2. It connects the Mediterranean Sea to the Atlantic Ocean.
 3. It forms a significant gap between the high plateau of Spain and the Atlas Mountains of Northern Africa.

How many of the statements given above are correct?

 - (a) Only one
 - (b) Only two
 - (c) All three**
 - (d) None
 6. Consider the following statements about World Happiness Report 2024
 1. The report considers six key factors: social support, income, health, freedom, generosity, and the absence of corruption.
 2. Finland topped the list for the seventh year in a row.
 3. India is ranked 126th on the list, the same as last year.

How many of the statements given above are correct?

 - (a) Only one
 - (b) Only two
 - (c) All three**
 - (d) None
 7. Consider the following statements about Asbestos
 1. Asbestos is a generic term for a group of six silicate minerals with similar but distinct properties.
 2. It is non-flammable even at very high temperatures and is extremely flexible and durable.
 3. India is by far the world's second largest asbestos producing country.

How many of the statements given above are correct?

 - (a) Only one
 - (b) Only two**
 - (c) All three
 - (d) None
 8. Which one of the following organisations established the World Water Assessment Programme (WWAP)?
 - (a) UNESCO**
 - (b) WHO
 - (c) UNEP
 - (d) UNICEF
 9. Consider the following statements about Lianas
 1. Lianas are plants with long, flexible, climbing stems that are rooted in the ground.
 2. Lianas are referred to as structural or mechanical parasites.
 3. They have lower carbon sequestering capacity compared to trees.

How many of the statements given above are correct?

 - (a) Only one
 - (b) Only two
 - (c) All three**
 - (d) None
 10. Consider the following statements about Global E-waste Monitor 2024
 1. It is an annual report published by World Economic Forum and UNEP
 2. According to 2024 report, India and China generated the highest amount of e-waste per capita in 2022

Which of the statements given above is/are incorrect?

 - (a) 1 only
 - (b) 2 only
 - (c) Both 1 and 2
 - (d) Neither 1 nor 2**