

GEOGRAPHY**Interplanetary pollution**

On April 11, the Israeli spacecraft Beresheet attempted to land on the Moon, but crashed on the surface. It was carrying a number of items — including thousands of specimens of a living organism called tardigrade. The question is: did the thousands of dehydrated Tardigrades on Beresheet survive the crash? And if they did, are they now living on the Moon?

What are Tardigrades?

- The tardigrade, also known as water bear, is among the toughest and most resilient creatures on Earth.
- The tardigrade can only be seen under a microscope.
- Half a millimetre long, it is essentially a water-dweller but also inhabits land and, a 2008 study found, can survive in the cold vacuum of outer space.
- The tardigrade can endure extreme hot and cold temperature levels.
- They themselves expel water from their bodies and set off a mechanism to protect their cells, and can still revive if placed in water later. The organism is known to “come back to life” on rehydration.
- The tardigrade derives its name from the fact that it looks like an eight-legged bear, with a mouth that can project out like a tongue.
- A tardigrade typically eats fluids, using its claws and mouth to tear open plant and animal cells, so that it can suck nutrients out of them.
- It is also known to feast on bacteria and, in some cases, to kill and eat other tardigrades.

Did any of them survive the impact? If they did, what happens to them now?

- When the tardigrades were placed on the Israeli moon mission Beresheet, they were in a tun state — dehydrated, with their chubby limbs and heads retracted and all metabolic activity temporarily suspended.
- Their arrival on the moon was unexpectedly explosive; Beresheet’s crash landing on April 11 may have scattered the microorganisms onto the lunar surface.
- But as long as the tardigrades remain on the moon, their chances of spontaneously awakening are low. Without liquid water, the tiny creatures will remain in a tun state, and while there’s evidence of ice on the moon, liquid water is nowhere to be found.
- Even if the lunar tardigrades did somehow encounter liquid water while still on the moon, without food, air and a moderate ambient temperature, they wouldn’t last very long once they revived.

What’s the concern now? Are we polluting the moon’s atmosphere?

- Scientists have yet to find any evidence that the moon ever hosted living organisms(other than visiting astronauts and microbial hitchhikers from Earth) that could be threatened by microscopic invaders. However, contamination could carry serious consequences for missions to planets where life might yet be found.
- There is already a fairly sizeable amount of debris from redundant spacecraft and litter left behind by astronauts. As more missions are planned to the moon, eventually with human passengers and perhaps even settlements, we must learn to clean up as we go along. Otherwise, we are going to have the sort of crisis that we are seeing on Earth with the outcry about environmental damage from plastics.

Beresheet:

- Israel’s First Lunar Lander- Beresheet— was launched on board Falcon 9.
- Beresheet attempted to become the first Israeli spacecraft, and the first privately-operated mission, to land on the Moon.
- So far, only three other nations have carried out controlled “soft” landings on the moon – the United States, the former Soviet Union and China.

GOVERNANCE- WELFARE SCHEMES, E-GOVERNANCE, SERVICES ETC.**School Fagadaba(Make education better)**

Manipur government has launched a scheme called “School Fagadaba” (Make education better). The objective of the scheme is to ensure better infrastructure, quality education and overall improvement of government schools to make them model schools.

- The government will also install biometric attendance machines in government schools to ensure the presence of teachers at their posting places.
- Under the scheme, one High or Higher Secondary School in each Assembly Constituency will be selected. Once a teacher is posted in these schools, he or she would stay there for at least 3 years.

INDIAN ECONOMY

Green Channel for Mergers and Acquisitions

The Competition Commission of India has introduced a green channel route for clearing certain categories of mergers and acquisitions.

- The Competition Law Review Committee in its report suggested a slew of measures to improve insolvency resolution process.
 - One of the key recommendations was the creation of a “Green Channel” for automatic approval of certain M&A deals, including those under the Insolvency and Bankruptcy Code (IBC).
- The green channel concept — recommended by the high level panel that reviewed the competition law — would allow for an automatic system for speedy approval of combinations, subject to certain conditions.
- The 'Green Channel' would allow automatic approval for certain M&A agreements based on specified criteria and pre-filing consultation.
- The concept of a Green Channel, akin to those in countries like Singapore, Australia, New Zealand, Malaysia and Indonesia, is a step towards improving ease of doing business.

Committee submits report on replacing I-T Act with Direct Tax Code

Government had constituted a committee to draft a new direct tax law to replace the existing Income Tax Act, 1961. The committee was headed by Akhilesh Ranjan. It has submitted its report to the government.

The objective of the task force was to draft direct tax laws in line with the norms prevalent in other countries, incorporating international best practices and keeping in mind the economic needs of the country.

Key Proposals: The key proposals made by the committee includes

- 25% corporate tax rate for all companies
- Restructuring of slabs for personal income-tax
- Incentives for promoting startups
- Settling of tax disputes through mediation and
- a shorter and simpler direct tax law.

Other Proposals:

- The task force has also suggested to bring the gist of numerous judicial pronouncements made since 1961 in one place for easy reference. This could improve the ease of doing business and reduce the compliance burden as well as tax disputes.
- The committee has also proposed amendments in Section 147 and Section 148 of the I-T Act which empowers the tax officer to reopen assessment cases based on predefined criteria.
- The task force has also recommended that tax assessment proceedings be made faceless and an option be allowed to the public to seek clarifications on tax matters from Central Board of Direct taxes (CBDT).
- The committee has also proposed the use of Artificial Intelligence (AI) in the tax-compliance and administration process.

ISSUES RELATED TO INTERNAL SECURITY AND DISASTER MANAGEMENT

Nicotine as Class A Poison

Karnataka has amended Poisons (Possessions and Sale) Rules 2015 by notifying nicotine as Class A poison. The move aims at strengthening the enforcement of the ban on production and sale of electronic cigarettes.

Background

- In August 2018, the Union Health Ministry had instructed all the States to put a ban on the sale of e-cigarettes and other Electronic Nicotine Delivery Systems (ENDS) under their jurisdiction.
- Though Karnataka had banned the sale and production of e-cigarettes in June 2016, but illegal sale and smuggling of nicotine cartridges and e-cigarettes is rampant in the State.

Nicotine

- Nicotine is a plant alkaloid that contains nitrogen, which is found in several types of plants, including the tobacco plant and can also be produced synthetically.
- Nicotine is both a sedative and a stimulant.
- Nicotine is used as a direct substance in e-cigarettes and the content ranges up to 36 mg/mL. Although regular cigarettes too have nicotine, but it ranges between 1.2 to 1.4 mg/mL.
- Chewing or snorting tobacco products usually releases more nicotine into the body than smoking.

Harmful Effect of Nicotine

- Nicotine on direct application in humans causes irritation and burning sensation in the mouth and throat, increased salivation, nausea, abdominal pain, vomiting and diarrhea.
- It also increases pulse rate and blood pressure.

National Maritime Domain Awareness Project

Raksha Mantri visited the Information Management and Analysis Centre (IMAC) and Information Fusion Centre – Indian Ocean Region (IFC-IOR) located at Gurugram. The two centres function under the National Maritime Domain Awareness (NMDA) Project.

About NMDA project

- The NMDA project was launched in accordance with the vision of PM on SAGAR (Security and Growth for All in the Region).
- The IMAC monitors movement of more than 120,000 ships a year passing through the Indian Ocean.
- The cargo carried by these ships account for 66 per cent of world crude oil, 50 per cent of container traffic and 33 per cent of bulk cargo.
- Thus, IMAC performs a very crucial role in collecting shipping information, analysing traffic patterns and sharing the inputs with the user agencies.
- IFC-IOR is a collaborative initiative by the Indian Navy in coordination with partner nations and multi-national maritime agencies to enhance Maritime Domain Awareness and Maritime Security.
- The Centre is likely to host International Liaison Officers from the partner nations in the near future.

SAGAR (Security and Growth for All in the Region) Programme

- SAGAR is a term coined by PM Modi in 2015 during his Mauritius visit with a focus on blue economy.
- It is a maritime initiative which gives priority to Indian Ocean region for ensuring peace, stability and prosperity of India in Indian Ocean region.
- The goal is to seek a climate of trust and transparency; respect for international maritime rules and norms by all countries; sensitivity to each other's interests; peaceful resolution of maritime issues; and increase in maritime cooperation.
- It is in line with the principles of Indian Ocean Rim Association.

ENVIRONMENT- CONSERVATION, BIO-DIVERSITY AND ISSUES

Environment Clearance

The government is working to limit procedural delays to reduce the time for environment clearance to 60 days.

Background

- To meet the ambitious goal of \$5-trillion economy, the government intends to increase investment by fastening the process of environmental clearances to businesses.
- As claimed by Environment Minister, environmental clearances usually took around 640 days before 2014, which has been reduced to 108 days.

Environmental Clearance Process

The process of granting of environment clearance includes:

- Specifying Terms of Reference(ToR).
- Preparing Environmental Impact Assessment (EIA) report.
- Holding Public Consultation.

India - Largest Emitter of Sulphur Dioxide

According to a report by Greenpeace (an environmental Non-Governmental Organization), India is the largest emitter of Sulphur Dioxide (SO₂) in the world, contributing more than 15% of global anthropogenic emissions.

- The primary reason for India's high emission output is the expansion of coal-based electricity generation over the past decade.
- According to the Report, five of the top ten SO₂ emission hotspots from coal/power generation industry across the world are in India.
 - The major SO₂ emission hotspots in India are Singrauli in Madhya Pradesh, Neyveli and Chennai in Tamil Nadu, Talcher and Jharsuguda in Odisha, Korba in Chhattisgarh, Kutch in Gujarat, Ramagundam in Telangana and Chandrapur and Koradi in Maharashtra - as detected by the NASA OMI (Ozone Monitoring Instrument) satellite.
- The vast majority of coal-based power plants in India lack Flue-Gas Desulfurization (FGD) technology to reduce air pollution.
 - Sulfur dioxide in flue gas from fossil-fuel power plants can be controlled by means of an absorption process called Flue Gas Desulfurization (FGD).
 - FGD systems may involve wet scrubbing or dry scrubbing.
 - In wet FGD systems, flue gases are brought in contact with an absorbent, which can be either a liquid or a slurry of solid material. The sulfur dioxide dissolves in or reacts with the absorbent and becomes trapped in it.
 - In dry FGD systems, the absorbent is dry pulverized lime or limestone; once absorption occurs, the solid particles are removed by means of baghouse filters.
- Hotspots Across the World: The largest sulphur dioxide emission hotspots have been found in Russia, South Africa, Iran, Saudi Arabia, India, Mexico, United Arab Emirates, Turkey and Serbia.
 - Air pollutant emissions from power plants and other industries continue to increase in India, Saudi Arabia and Iran.
 - In Russia, South Africa, Mexico and Turkey, emissions are currently not increasing — however, there is not a lot of progress in tackling them either.
 - Of the world's major emitters, China and the United States have been able to reduce emissions rapidly by switching to clean energy sources. China, in particular, has achieved success by dramatically improving emission standards and enforcement for sulphur dioxide control.
- Individual Hotspots across the World: The Norilsk smelter site in Russia continues to be the largest anthropogenic SO₂ emission hotspot in the world. Singrauli in Madhya Pradesh is at number five.

Lemru Elephant Reserve (LER)

Chhattisgarh government has announced the setting up of Lemru Elephant Reserve(LER). The reserve is aimed at minimizing human-elephant conflict and destruction of property in addition to providing a permanent habitat for the elephants.

- The reserve will be set-up as per the report and recommendations of Special High-Power Technical Committee(SHPTC) which was constituted by the Government of India.
- The report stated that LER would provide a huge protected area for the conservation of wild elephants where the elephants will get an abundant amount of water, food and other facilities.
- The Government of India had launched the project Elephant in the year 1992 as a Centrally Sponsored Scheme. The objectives of project include (a)to protect elephants,their habitat & corridors (b)to address issues of man-animal conflict and (c)welfare of captive elephants.

**SCIENCE AND TECHNOLOGY- EVERYDAY SCIENCE, SPACE, NUCLEAR, DEFENCE
ETC****Biosimilar Medicine for Cancer**

Pharma major Dr. Reddy's Laboratories Ltd has launched 'Versavo (bevacizumab)', a biosimilar of Roche's Avastin in India. The drug is for the treatment of several types of cancers.

- A biosimilar is exactly what its name implies — it is a biologic that is "similar" to another biologic medicine (known as a reference product).
 - Biologics or biological products are medicines made from living organisms through highly complex manufacturing processes and must be handled and administered under carefully monitored conditions.
 - Biologics are used to prevent, treat or cure a variety of diseases including cancer, chronic kidney disease, diabetes, cystic fibrosis, and autoimmune disorders.
- Biosimilars are highly similar to the reference product in terms of safety, purity and potency, but may have minor differences in clinically inactive components.
- India is one of the leading manufacturers of similar biologics. India developed a new guideline in 2012 for the pre- and post-marketing approval of similar biologics. The guidelines also address the regulation of manufacturing process as well as quality, safety, and efficacy of similar biologics

ODISHA DEVELOPMENT**Odisha Establishes Separate Directorate For Minor Minerals**

Odisha government has set up a Directorate of Minor Minerals to prevent their illegal lifting. The new directorate with all necessary technical capacity will look after the scientific and sustainable management of the resources.

Functions:

- Among its main functions, the directorate will identify source of minor minerals in a scientific manner and prepare mining and environmental management plans as per the applicable laws.
- The directorate will function under the administrative control of revenue and disaster management department in view of augmenting the revenue of the state from these resources and will administrate the Odisha Minor Mineral Concession Rules, 2016 as amended from time to time
- The directorate will ensure prevention of illegal quarrying and lifting of minor minerals such as sand, ballasts, chips and gravel of ordinary stones, river shingles, pebbles and rock fines generated from stone crushers.
- There will be a director in the rank of additional secretary, either an IAS or an OAS cadre officer.

QUOTE OF THE DAY

If you can't stop thinking about it, don't stop working for it.

DAILY ANSWER WRITING PRACTICE

Qns: Discuss the challenges associated with pollution due to the thermal power plants in India. Suggest some measures to tackle these challenges.

19 Feb, 2019 GS Paper 3 Bio-diversity & Environment

Answer :

Thermal Power plants are massive contributors to the environmental pollution. These are the largest emitter of mercury and a typical power plant emits 90 % of its mercury into the air and 10 percent on land.

- Air Pollution
 - From point source: Particulates matter, Gaseous emission - Sulphur dioxide, oxides of nitrogen, carbon monoxide, carbon dioxide, Hydrocarbon.
 - From non-point source: Transportation of coal, Loading/unloading of fuel, Coal storage yard, Fly ash handling & Transportation, Coal storage yard
- Water pollution: Plant Effluent, Coal Handling Plant Dust Suppression, Ash handling, Effluent from oil handling and transformer areas, Power House and Turbine Area Effluent.
- Land Degradation: Untreated air and water pollutants from coal power plants affect the water and the flora and fauna of adjoining areas making them unfit for living or livelihood activities
- Noise Pollution: Regular exposure to such high noise levels emanating from power plants from the usage of equipment like boilers, turbines and crushers, affects people working in the plants.
- India's coal use represents just over 54% of the present energy mix, and the fuel will continue to retain a high share of the overall generation.

Challenges associated with pollution due to the thermal power plants:

- Efficiency of Indian power plants: India's thermal power plants still are inefficient and also one of the most polluting in comparison to the other industrial countries. Increasing the efficiency and adaptability of such plants is a challenge.
- Pollution-control technology: India lacks in most advanced technology for thermal power plants. This is due to lack of scientific and technology research environment.
- Huge investment cost: The exact investment needed by a plant would depend on the combination of upgradation and new installation required which in turn would depend on existing abatement technology, actual emissions, applicable norms and age of the plant. The challenge is to identify the right instruments to fund the entire exercise.
- Power for all: There is a twin challenge, meeting the target of pollution control and the wider social objective of extending electricity access to the unreached.
- Re-use of power plant byproducts like Fly Ash, Sulphur content is not done to its full potential etc. There could be a positive spin-off from sulphur-removal, since it can yield commercially significant quantities of synthetic gypsum.
- Health Impacts: These pollutants make severe impacts on the health, cause respiratory ailments and affect well-being of people. To achieve a healthy environment for all living being is the most challenging.

Some actions/steps suggested by NITI Aayog can be used to tackle the above challenges:-

- Expedite strategic decommissioning of old and inefficient power plants: These inefficient power plants should be replaced by efficient super-thermal plants or with power generators that are based on renewable energy.
- Upgrade efficient thermal power plants to meet the requirements of dynamic operation:
- Push rooftop solar and distributed generation
- Ensure high grade low polluting coal to the power plant: Availability and usage of high grade coal will allow power plants to operate at a high efficiency point.

Conclusion

- In the first half of 2015, the Ministry of Environment, Forest and Climate Change (MoEFCC) issued drafts of stricter norms for emissions and water consumption for coal-based thermal power sector. However implementation of such norms will be a key in reducing the pollution.

DAILY CURRENT AFFAIRS MCQ

1. Consider the following statements:
 1. Recently, the Maharashtra government has notified nicotine as Class A poison.
 2. Class A poison are comparatively less toxic chemicals which even in very high quantities as gas or vapor in air are not harmful.
 3. Nicotine is a plant alkaloid that contains nitrogen, which is found in several types of plants, including the tobacco plant.

Which of the statements given above is/are correct?

 - (a) 1 only
 - (b) 1 and 2
 - (c) 3 only**
 - (d) 1, 2 and 3
2. Consider the following statements:
 1. A new report of Greenpeace finds that India is the largest emitter of Sulphur Dioxide (SO₂) in the world.
 2. The primary reason for India's high emission output is the expansion of smelting industries over the past decade.
 3. Flue-Gas Desulfurization (FGD) technology can control the Sulfur dioxide air pollution..

Which of the statements given above is/are correct?

 - (a) 1 only
 - (b) 1 and 2
 - (c) 1 and 3**
 - (d) 2 and 3
3. Consider the following statements:
 1. Recently, Sun Pharma has launched 'Versavo (bevacizumab)', a biosimilar of Roche's Avastin in India.
 2. The drug can be used for the treatment of several types of cancers.
 3. Biosimilars are highly similar in clinically inactive components of the reference product but may have minor differences in terms of safety, purity and potency.

Which of the statements given above is/are correct?

 - (a) 1 and 2
 - (b) 2 only**
 - (c) 2 and 3
 - (d) 1, 2 and 3
4. Who among the following headed the committee to review the Direct taxes submitted its report to government?
 - (a) Y V Reddy
 - (b) N K Singh
 - (c) Akhilesh Ranjan**
 - (d) Bimal Jalan
5. Consider the following statements with reference to the Tardigrates.
 1. The tardigrade can only be seen under a microscope.
 2. The tardigrade can endure both extreme hot and cold temperature levels.
 3. Tardigrades are taken to the moon the on an experimental basis in the Chandrayaan-2 Mission.

Which of the statements is/are correct?

 - (a) 1 and 2
 - (b) 1 and 3
 - (c) 2 and 3**
 - (d) 1, 2 and 3
6. Sometimes seen the news, Beresheet is a/an
 - (a) Spacecraft**
 - (b) Missile
 - (c) Super Computer
 - (d) Mobiil Application
7. Which of the following state government has launched a scheme called "School Fagadaba" (Make education better).
 - (a) Bihar
 - (b) Manipur**
 - (c) Mizoram
 - (d) Meghalaya
8. Recently in in news, the Green Channel Concept is related to which of the following?
 - (a) Space Routes
 - (b) Forest Conservation
 - (c) Insolvency Resolution**
 - (d) Mountain Highways
9. Lemru Elephant Reserve(LER) is a proposed Elephant reserves of which state?
 - (a) Manipur
 - (b) Sikkim
 - (c) West Bengal
 - (d) Chhatisgarh**