Prelim Bits 01-04-2022 | Daily UPSC Current Affairs

New Investment Policy-2012

The Cabinet Committee on Economic Affairs has approved the proposal of the Department of Fertilizers for extension of applicability of New Investment Policy (NIP)-2012 for the three units of Hindustan Urvarak & Rasayan Ltd.

- The New Investment Policy of 2012 was proposed by the Department of Fertilisers, Ministry of Chemical & Fertilizers.
- In 2013, the Government of India approved this policy to **facilitate fresh investments in urea sector** and to make India self-sufficient.
- The policy lays down guidelines to fix gas prices and also other roadmaps for attracting investment in the urea sector.
- It provides a **structure of a floor price and a ceiling price** for the amount payable to Urea units, which will be calculated based on the delivered gas price (inclusive of charges & taxes) to respective urea units.
- The floor and ceiling price of each urea unit shall be operative with respect to the computed Import Parity Price (IPP).
- **IPP** defined for urea under the investment policy of 2008 is the average C&F price without any applicable custom duties and handling and bagging charges at the port.
    1. If the computed IPP (payable) is between the floor and the ceiling price for that gas cost, it is the IPP (payable) which will be used.
    2. If the IPP is above or below the ceiling or the floor respectively, it is the ceiling or floor price that will be acceptable as the case may be.

Reference

1. https://pib.gov.in/PressReleasePage.aspx?PRID=1808127
2. https://fert.nic.in/sites/default/files/What-is-new/Policy_Notification.NIP-201pdf
3. https://www.business-standard.com/article/economy-policy/new-investment-policy-2012-for-three-fertiliser-plants-extended-122032201368_1.html

Coral Reefs & Coral Bleaching

The management authority of Australia's Great Barrier Reef confirmed that the reef is experiencing a mass coral bleaching event.

> Australia's Great Barrier Reef is the world's largest reef system stretching across 2,300 km. It hosts 400 different types of coral, gives shelter to 1,500 species of fish and 4,000 types of mollusc.

Coral reefs

- Coral reefs are the largest living structures on the planet.
- They are large **underwater ecosystem** composed of the skeletons of colonial marine invertebrates called coral.
- **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.
- **Types** - Corals are of two types - hard corals and soft corals.
- Hard corals (hermatypic or 'reef building' corals) extract calcium carbonate from the seawater to build hard, white coral exoskeletons.
- Soft coral polyps, however, borrow their appearance from plants; attach themselves to such skeletons and older skeletons built by their ancestors.
- They also add their own skeletons to the hard structure over the years and these growing multiplying structures gradually form coral reefs.
- **Symbiotic relationship** - Corals share a symbiotic relationship with single-celled algae called zooxanthellae.
- Zooxanthellae provide 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.
- **Significance** - Coral reefs support over 25% of marine biodiversity; even as they only take up 1% of the seafloor.
- The marine life supported by reefs further fuels global fishing industries.
- Besides, coral reef systems generate $2.7 trillion in annual economic value through goods and service trade and tourism.
- Coral reefs also provide protection from storm waves.
- Dead reefs can revive over time if there are enough fish species that can graze off the weeds that settle on dead corals, but it takes almost a decade for the reef to start setting up again.

Coral Bleaching

- Bleaching happens when corals experience **stress in their environment** due to changes in temperature, pollution or high levels of ocean acidity.
- Under the stressed conditions, the zooxanthellae start producing reactive oxygen species, which are not beneficial to the corals.
- So, the corals expel the colour-giving zooxanthellae from their polyps, which expose their pale white exoskeleton, giving the corals a bleached appearance.
- This also ends the symbiotic relationship that helps the corals to survive and grow.

A 2021 study by the UN-supported Global Coral Reef Monitoring Network (GCRMN) showed that 14% of the world's coral on reefs had been lost between 2009 and 2018, with most of the loss attributed to coral bleaching.

- **Recovery** - Bleached corals can survive depending on the levels of bleaching and the recovery of sea temperatures to normal levels.
- If heat-pollutions subside in time, over a few weeks, the zooxanthellae can come back to the corals and restart the partnership.
- But severe bleaching and prolonged stress in the external environment can lead to coral death.
- **Previous events** - The first mass bleaching event had occurred in 1998 and the second one in 2002.

- However, in the past decade, mass bleaching occurrences have become more closely spaced in time, with the longest and most damaging bleaching event taking place from 2014 to 2017.
- This is due to the fact that climate change and increased global warming owing to rising carbon emissions and other greenhouse gases have made seas warmer than usual.

Reference

1. https://www.thehindu.com/sci-tech/energy-and-environment/great-barrier-reef-coral-bleaching-australia-explained/article6526196ece?homepage=true
2. https://www.livescience.com/40276-coral-reefs.html

Microplastics

A new study has found Microplastic particles in the blood samples of 17 out of the 22 persons, half of these were polyethylene tertraphthalate (PET) plastics.

> It is not yet clear if these microplastics can cross over from the blood stream to deposit in organs and cause diseases.

- Microplastics are tiny bits of various types of plastic found in various places - the oceans, the environment, and now in human blood.
- They are ubiquitous pollutants found almost everywhere on earth.
- The name is used to differentiate them from “macroplastics” such as bottles and bags made of plastic.
- There is no universal agreement on the size that fits this bill.
- However, the U.S. National Oceanic and Atmospheric Administration (NOAA) and the European Chemical Agency define microplastic as **less than 5mm in length**.
- **Related Links** - Microplastics, Global Treaty on Plastic Pollution, Microplastics in the Atmosphere, Microplastic Pollution in Ganga

Reference

1. https://www.thehindu.com/sci-tech/science/detecting-microplastics-in-human-blood/article65267369.ece?homepage=true
2. https://www.smithsonianmag.com/smart-news/microplastics-detected-in-human-blood-180979826/
3. https://www.theguardian.com/environment/2022/mar/24/microplastics-found-in-human-blood-for-first-time
4. https://oceanservice.noaa.gov/facts/microplastics.html

Variable Refresh Rates

Google is testing support for Variable Refresh Rates (VRR) in the Chrome OS 101 Dev Channel.

- **Refresh rate** is the number of times a display is capable of refreshing in a second. It is measured in hertz (Hz).
- The higher the refresh rate, the better the quality of viewing experience.
- Displays with over 120 Hz can deliver a smoother and more comfortable viewing experience.
- This is necessary while playing video games or watching videos.
- **Variable Refresh Rates** (VRR) is also termed as dynamic refresh rate or adaptive refresh

rate.
- It supports a wide range of refresh rates, allowing its refresh rate to change in real-time based on the frames-per-second (FPS) rate coming from a source device such as a gaming console.
- It allows your screen to adjust how often it refreshes the image to match the frame rate from your console or PC.
- **Working** - VRR is designed to **eliminate syncing issues** that arise when the refresh rate of a display does not match with the FPS of the content from a source device.
- Issues such as screen-tearing, judder (wobbling effect) and lag are common when refresh rate and FPS are not synchronised.
- VRR screen technology can improve gaming experience in both console and PC-based gaming.
- In mobile devices, a VRR solution can improve the gaming experience of users by keeping up with intense gameplay and also save battery power.

Reference

1. https://www.thehindu.com/sci-tech/technology/role-vrr-tech-flawless-game-experience/article65264625.ece?homepage=true
2. https://www.t3.com/features/variable-refresh-rate-vrr-explained

Genome-editing Technology

The Central Government paved the way for easy introduction of genome edited crops. The genome-edited crops are different from genetically-modified crops.

- A decade ago, scientists in Germany and the US discovered a technique which allowed them to 'cut' DNA strands and edit genes.
- For agriculture scientists this process allowed them to bring about desired changes in the genome by using Site Directed Nuclease (SDN) or Sequence Specific Nuclease (SSN).
- Nuclease is an enzyme which cleaves through nucleic acid - the building block of genetic material.
- The highly effective clustered regularly interspaced palindromic repeat (CRISPR)-associated proteins based systems allow for targeted intervention at the genome sequence.
- This tool has opened up various possibilities in plant breeding. This tool can now edit genome to insert specific traits in the gene sequence.
- **Categories** - Depending on the nature of the edit that is carried out, the process is divided into three categories - SDN 1, SDN 2 and SDN 3.
- SDN1 introduces changes in the host genome's DNA through small insertions/deletions without introduction of foreign genetic material.
- In the case of SDN 2, the edit involves using a small DNA template to generate specific changes.
- Both these processes do not involve alien genetic material and the end result is indistinguishable from conventionally bred crop varieties.
- But, the SDN3 process involves larger DNA elements or full length genes of foreign origin which makes it similar to Genetically-modified organisms (GMO) development.

Difference between Gene-edited Organisms & GMO

- Genetically-modified Organisms involves modification of the genetic material of the host by introduction of a foreign genetic material.
- In the case of agriculture, soil bacteria is the best mining source for such genes which are then inserted into the host genome using genetic engineering.
- The basic difference between genome editing and genetic engineering is that while the former

does not involve the introduction of foreign genetic material, the latter does.
- In the case of agriculture, both the techniques aim to generate variants which are better yielding and more resistant to biotic and abiotic stress.
- Before the advent of genetic engineering, such variety improvement was done through selective breeding which involved carefully crossing plants with specific traits to produce the desired trait in the offspring.
- Genetic engineering has not only made this work more accurate but has also allowed scientists to have greater control on trait development.

Reference

https://indianexpress.com/article/explained/everyday-explainers/what-is-genome-editing-technology-how-is-it-different-gm-technology-7846402/

