

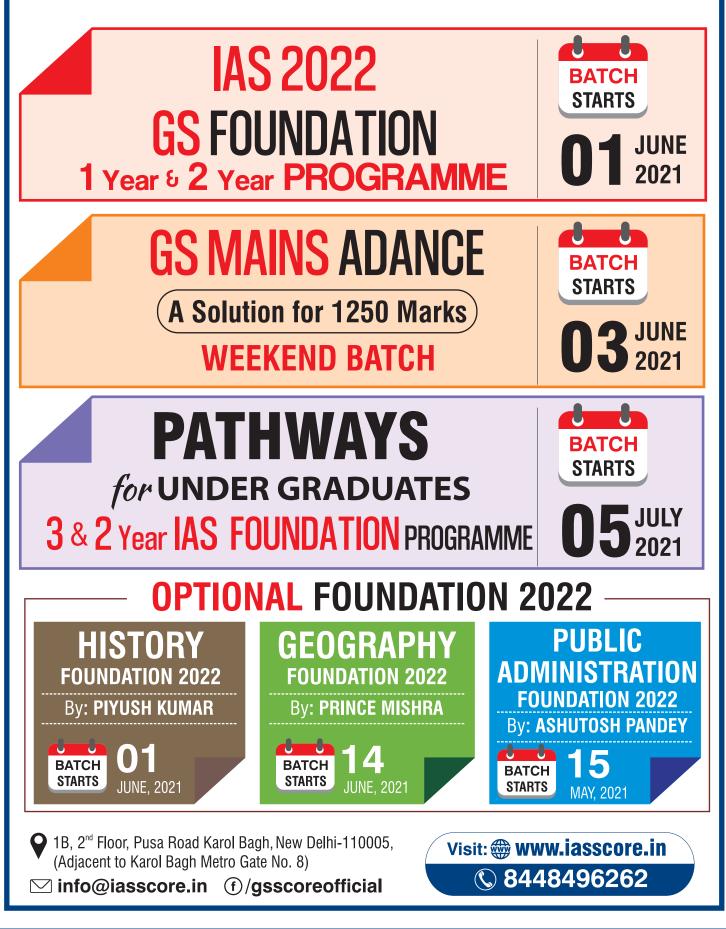
# FORTNIGHTLY COMPILATION

# 16<sup>th</sup> - 30<sup>th</sup> APRIL, 2021

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# IAS 2022 GS FOUNDATION



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# PIB (16<sup>th</sup> to 30<sup>th</sup> APRIL, 2021)

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# IAS 2022 TEST SERIES

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MAY

2021

### **1** Oxygen shortage in India

#### **CONTEXT:**

 Medical oxygen in India has been in severe shortage as the country grapples with a deadly second wave of the pandemic.

#### **ABOUT:**

- Oxygen therapy is crucial for severe COVID patients with hypoxemia when oxygen levels in the blood are too low.
- The exponential surge in India's coronavirus infections over the past few weeks has swamped the health care system, seen patients dying in ambulances and parking lots outside hospitals and overwhelmed crematoriums.
- It has also drained supplies of medical oxygen, which is vital for those who have been infected. The dire shortage has turned out to be a major challenge facing hospitals in many states across the country.
- Dozens of hospitals in a number of Indian cities and towns have run short of the gas, sending relatives of patients scrambling for oxygen cylinders, sometimes in vain.
- Current production level
- Experts say India is producing enough oxygen, at just over 7,000 tons a day.
- Most is for industrial use but can be diverted for medical purposes.
- The Indian government has now directed most of the country's supply of industrially produced oxygen toward the health care system.

#### Why is India facing an oxygen shortage?

- **Movement issue:** Amid high demand, suppliers have been ramping up capacity to be able to produce more than 9,000 tons of medical oxygen by mid-May. However, most oxygen producers are based in India's east, while the soaring demand has been in cities in the western and northern parts of the country.
- Lack of coordination: There is no centralized coordination of oxygen supply and distribution. It is completely haphazard and red tape has held back timely deliveries
- **Inadequate transport and storage capacity**: The country lacks enough transport and storage capacity. Liquid oxygen at very low temperatures has to be transported in cryogenic tankers to distributors, which then convert it into gas for filling cylinders. But India is short of cryogenic tankers.

### 2 MoU between the India and Bangladesh

#### CONTEXT:

 MoU between the India and Bangladesh on the establishment of a framework of cooperation in the area of trade remedial measures.

#### **ABOUT:**

• The primary objective of the MOU is to promote cooperation between the two countries in the area of Trade Remedies, covering the broad activities related to exchange of information, undertaking



capacity building activities and activities in accordance with various provisions of World Trade Organization in the area of anti-dumping, countervailing and safeguard measures in bilateral trade between India and Bangladesh.

• The MOU seeks to foster better cooperation between the relevant authorities of both the countries so as to discourage unfair trade practices and promote rule based bilateral trading between the two countries.

## 3 Exercise 'VARUNA-2021

#### **CONTEXT:**

Recently, the 19<sup>th</sup> edition of the Indian and French Navy bilateral exercise 'VARUNA-2021' was concluded.

#### **ABOUT:**

- Exercise VARUNA has been a key enabler in building interoperability and strengthening the coordination between the two navies.
- This exercise has matured over the years with increase in scope, complexity of operations and level of participation.
- The seamless coordination, precise execution of manoeuvres, and accuracy in complex exercises characterized the conduct of Varuna-2021 and has helped further strengthen mutual confidence, inter-operability and sharing of best practices between both Navies.

# **4** Agriculture Infrastructure Fund (AIF)

#### CONTEXT:

• Agriculture Infrastructure Fund is bringing together the collective power of all stakeholders in the Agriculture ecosystem

- AIF is gaining momentum with all the right initiatives being undertaken to bring together agribusinesses & farmers, promoting cross-learnings across states & undertaking global benchmarking to build world-class agri-infra.
- The largest share of the pie is contributed by Primary Agricultural Credit Societies (PACS) (58%), agri-entrepreneurs (24%) and individual farmers (13%).
- These investments are for a wide range of projects which will unlock value for farmers across the country.
- Agriculture Infrastructure Fund will bring together the collective power of all stakeholders in the Agriculture ecosystem
- AIF has the potential to completely transform the agriculture infrastructure landscape of the country.

#### **Agriculture Infrastructure Fund**

- The Agriculture Infrastructure Fund is a medium long term debt financing facility for investment in viable projects for post-harvest management infrastructure and community farming assets through interest subvention and credit guarantee.
- The duration of the scheme is from FY2020 to FY2029 (10 years). Under the scheme, Rs. 1 Lakh Crore will be provided by banks and financial institutions as loans with interest subvention of 3% per annum and credit guarantee coverage under CGTMSE for loans up to Rs. 2 Crores.
- Eligible beneficiaries include farmers, FPOs, PACS, Marketing Cooperative Societies, SHGs, Joint Liability Groups (JLG), Multipurpose Cooperative Societies, Agri-entrepreneurs, Start-ups, and Central/State agency or Local Body sponsored Public-Private Partnership Projects.

### 5 Van Dhan Vikas Yojana

#### **CONTEXT:**

• Van Dhan Vikas Yojana is promoting and backing tribal entrepreneurship in a big way

#### **ABOUT:**

- The Van Dhan Yojana, a component of the The 'Mechanism for Marketing of Minor Forest Produce (MFP) through Minimum Support Price (MSP) & Development of Value Chain for MFP' was launched in 2018.
- Implemented by TRIFED as the nodal agency at the national level, the Van Dhan start ups is a well thought master plan for the socio-economic development of the tribal population of the country.
- An initiative targeting livelihood generation for tribal gatherers and transforming them into entrepreneurs.
- The idea is to set-up tribal community-owned Van Dhan Vikas Kendra Clusters (VDVKCs) in predominantly forested tribal districts.

### 6 E-property cards under SWAMITVA scheme

#### CONTEXT:

• The Government recently launched distribution of e-property cards under SWAMITVA scheme.

- SVAMITVA (Survey of Villages and Mapping with Improvised Technology in Village Areas) was launched by Prime Minister in April 2020 as a Central Sector Scheme to promote a socio-economically empowered and self-reliant rural India.
- The Scheme has the potential to transform rural India using modern technical tools of mapping and surveying.
- It paves the way for using the property as a financial asset by villagers for availing loans and other financial benefits.

# 7 Subsidy policy for Urea produced through Coal Gasification

#### **CONTEXT:**

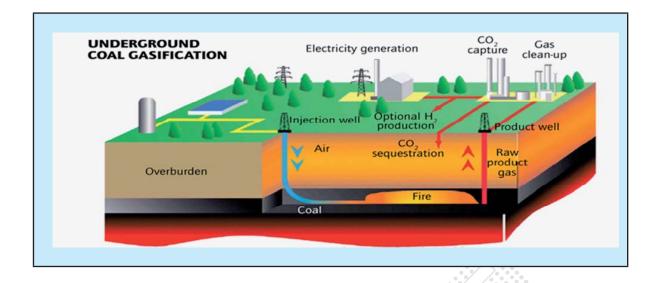
• The Cabinet Committee on Economic Affairs, has given its approval for the proposal of the Department of Fertilizers for the formulation of exclusive subsidy policy for Urea produced through coal gasification route by Talcher Fertilizers Limited (TFL).

#### **ABOUT:**

- Considering the strategic energy security and urea self-sufficiency of the country, looking into the country's vast coal reserves, it has been decided go ahead with Talcher Fertilizer Limited plant based on coal gasification technology.
- The project shall improve availability of fertilizer to farmers thereby boosting development of eastern region and will save transport subsidy for supply of urea in eastern part of the country.
- It would assist in reducing Urea imports to the tune of 12.7 LMT per annum leading to savings in foreign exchange.
- The project will also give a boost to 'Make in India' initiative and Atma Nirbhar' campaign and would help development of infrastructure like roads, railways water, etc. providing major boost to economy in the eastern part of the country including promoting ancillary industry.
- The project will also provide new business opportunity in form of ancillary industries in the catchment area of the project.
- Coal gasification plants are strategically important as coal prices are non-volatile and coal is abundantly available.
- Talcher plant shall also reduce dependence on important Natural Gas for production of urea leading to reduction in LNG import bill.
- The gasification process adopted in Talcher unit is a Clean Coal Technology giving negligible SOx, NOx and free particulate emissions as compared to directly coal fired processes.

#### **Coal gasification:**

- Coal gasification is the process of producing syngas—a mixture consisting primarily of carbon monoxide (CO), hydrogen (H2), carbon dioxide (CO2), natural gas (CH4), and water vapour (H2O)—from coal and water, air and/or oxygen.
- ➤ Historically, coal was gasified to produce coal gas, also known as "town gas". Coal gas is combustible and was used for heating and municipal lighting, before the advent of large-scale extraction of natural gas from oil wells.
- In current practice, large-scale coal gasification installations are primarily for electricity generation, or for production of chemical feedstocks. The hydrogen obtained from coal gasification can be used for various purposes such as making ammonia, powering a hydrogen economy, or upgrading fossil fuels.
- Alternatively, coal-derived syngas can be converted into transportation fuels such as gasoline and diesel through additional treatment, or into methanol which itself can be used as transportation fuel or fuel additive, or which can be converted into gasoline.



# Agreement on 'Cities combating plastic entering the Marine Environment

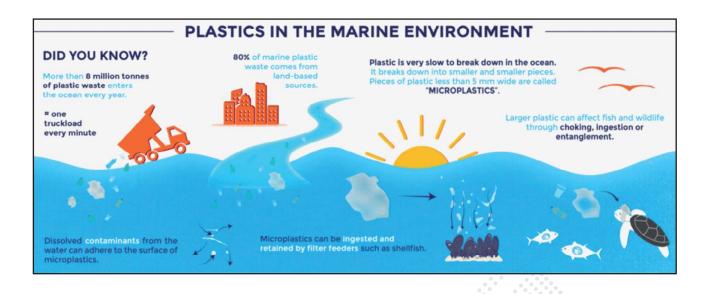
#### **CONTEXT:**

• India and Germany sign agreement on 'Cities combating plastic entering the marine environment'.

#### **ABOUT:**

8

- This project is envisaged under the contours of the Joint Declaration of Intent regarding cooperation in the field of 'Prevention of Marine Litter' signed between Republic of India and Federal Republic of Germany in 2019.
- The project, aimed at enhancing practices to prevent plastic entering the marine environment, will be undertaken at the national level, select states (Uttar Pradesh, Kerala and Andaman & Nicobar Islands) and in the cities of Kanpur, Kochi and Port Blair for a period of three and a half years.
- Marine litter threatens ecosystems and adversely affects fishery and tourism industries around the globe. In addition to negative economic impact, it affects public health with increased concerns about micro-plastic and risk of particles entering the food chain.
- In recent times, the level of plastic waste that has accumulated in our oceans and marine ecosystems through the increasing production and use of durable synthetic materials has alarmed the public and policy makers alike.
- It is estimated that 15-20% of all plastics are entering oceans via riverine ecosystems of which 90% are contributed by 10 of the world's most polluting rivers. Two of these river systems are located in India, namely Ganga and Brahmaputra.
- Whilst accurate data on plastic waste and marine litter in particular is largely unavailable for most parts of the country, this project will support the Swachh Bharat Mission-Urban's implementation with special focus on preventing plastic litter entering the rivers and water bodies at source.
- The new project is envisaged to be another successful collaborative effort under the Indo-German Bilateral Development Corporation working on sustainable urban transformation.



# 9 The National Climate Vulnerability Assessment Report

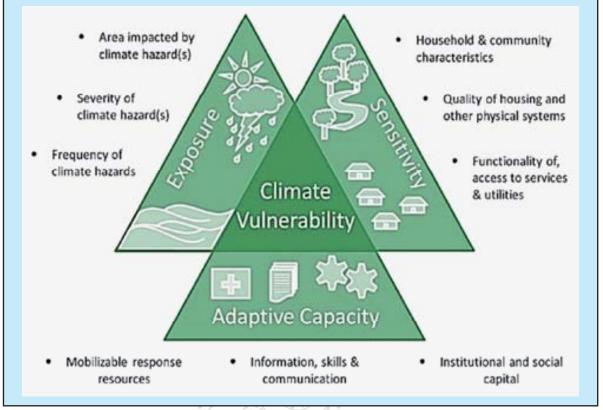
#### CONTEXT:

 The National climate vulnerability assessment report released recently, has identified Jharkhand, Mizoram, Orissa, Chhattisgarh, Assam, Bihar, Arunachal Pradesh, and West Bengal as states highly vulnerable to climate change.

- National climate vulnerability assessment identifies eight eastern states as highly vulnerable.
- These states, mostly in the eastern part of the country, require prioritization of adaptation interventions.
- The assessments undertaken with the active involvement and participation of States and Union Territory governments and hands-on training and capacity-building exercises have identified vulnerable districts. Among all states, Assam, Bihar, and Jharkhand have over 60% districts in the category of highly vulnerable districts.
- Vulnerability scores in all districts in India lies in a very small range. It shows that all districts & states are somewhat vulnerable with respect to current climate risk in India.
- The assessment will help Policymakers in initiating appropriate climate actions. It will also benefit climate-vulnerable communities across India through development of better-designed climate change adaptation projects.
- In a developing country such as India, vulnerability assessment is considered as an important exercise to develop suitable adaptation projects and programmes.
- While climate vulnerability assessments for various states and districts already exist, the states and districts cannot be compared to each other as the framework used for assessments are different, thereby limiting decision-making capabilities at the policy and administrative levels. This necessitated an assessment using a Common Vulnerability Framework.

#### Climate change vulnerability:

 Vulnerability (to climate change) is defined as "the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes.



# **10** Scientific Expedition to Antarctica

#### CONTEXT:

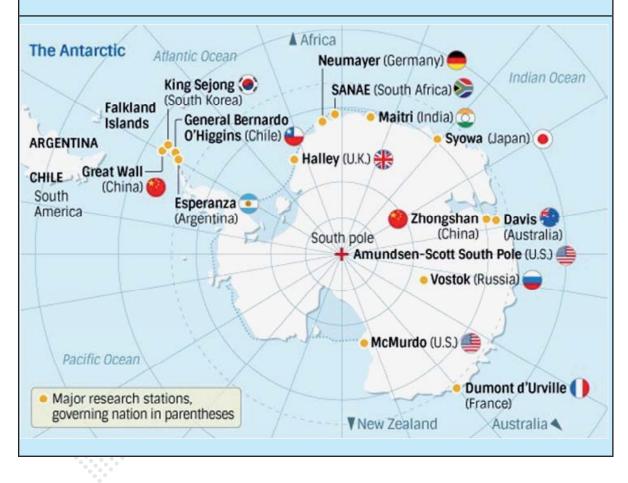
 India marks four successful decades of scientific endeavoring Antarctica with the return of the 40th Scientific Expedition to Antarctica.

- The 40<sup>th</sup> Scientific Expedition to Antarctica (40-ISEA) hosted by the Ministry of Earth Sciences successfully returned to Cape Town after completing a journey of ~12 thousand nautical miles in 94 days, including stopovers.
- This achievement concludes four successful decades of India's scientific endeavour in the continent of peace and cooperation.
- The 40-ISEA comprised Indian scientists, engineers, doctors, and technicians, who began their journey from the Mormugao Port of Goa to Antarctica on January 07, 2021.
- The 40-ISEA was conducted under innumerable challenges due to the persisting Corona virus pandemic. Necessary measures were taken to keep the Antarctic free of coronavirus.



#### India's expedition to Antartica:

- ► The Indian Antarctic Program is a multi-disciplinary, multi-institutional program under the control of the National Centre for Polar and Ocean Research, Ministry of Earth Sciences, Government of India.
- It was initiated in 1981 with the first Indian expedition to Antarctica. The program gained global acceptance with India's signing of the Antarctic Treaty and subsequent construction of the Dakshin Gangotri Antarctic research base in 1983, superseded by the Maitri base from 1989.
- ➤ The newest base commissioned in 2012 is Bharati, constructed out of 134 shipping containers. Under the program, atmospheric, biological, earth, chemical, and medical sciences are studied by India, which has carried out 30 scientific expeditions to the Antarctic as of 14 October 2010.



# **11** SpO2 based Supplemental Oxygen Delivery System

#### **CONTEXT:**

 DRDO develops SpO2 based Supplemental Oxygen Delivery System: A boon in current COVID-19 pandemic

#### **ABOUT:**

- Developed by Defence Bio-Engineering & Electro Medical Laboratory (DEBEL), Bengaluru of DRDO, the system delivers supplemental oxygen based on the SpO2 levels and prevents the person from sinking in to a state of Hypoxia, which is fatal in most cases, if sets in.
- Since the system is indigenously developed for operation in field conditions, it is unique with its dual qualities of being robust & cheap and is already in bulk production with the industry.
- The system is a boon in the current pandemic as it can be used in the household for moderate Covid patients for Oxygen flow therapy with flow controlled at 2/5/7/10 lpm flow.
- The automatic usage has huge advantage in the household, as the oximeter would give an alarm for lower SpO2 value.
- It will automatically increase/decrease the O2 flow based on SpO2 setting which can be auto adjusted at 2, 5, 7, 10 lpm flow rate. The optimal O2 flow rate conserves the O2 resources/O2 management and greatly increases the endurance.
- With its availability and simple to use facility by a common person, the system shall greatly reduce the workload and exposure time of doctors and paramedics to monitor the SpO2 levels of the patient.

#### **Pulse Oximetry**

- Pulse oximetry measures the amount of oxygen being carried in your blood, as a percentage. The measurement is taken at the finger using a Pulse Oximeter.
- This measurement is known as the Sp02 the saturation of peripheral oxygen and it is an estimate of the Sa02 – the saturations of arterial oxygen.

# **12** Technology for Recycling Aluminium Scrap

#### CONTEXT:

 A team of Scientists has developed a cost-effective technology to recycle aluminum scraps efficiently minimizing material losses in the process, which can be used by small and medium scale industries.

- The new technology increases the purity and quality of recycled aluminium melt.
- The technology involves washing the basic inputs assorted aluminium scraps (mixed), drying and preheating, removal of basic impurities in melting furnace, degassing in nitrogen atmosphere and addition of alloying elements in holding furnace, filtering (refining) and pouring the metal into the mold.
- Three problems are addressed during the process.
- Separation of iron and silicon materials, preventing the loss of magnesium and adding of other elements like chromium, strontium, zirconium and so on to improve the mechanical properties under the prescribed limits.
- The conversion rate in the existing technology is 54% and with the new technology developed, the conversion rate has been increased by 70% to 80% depending on various cases of scraps dealt with.



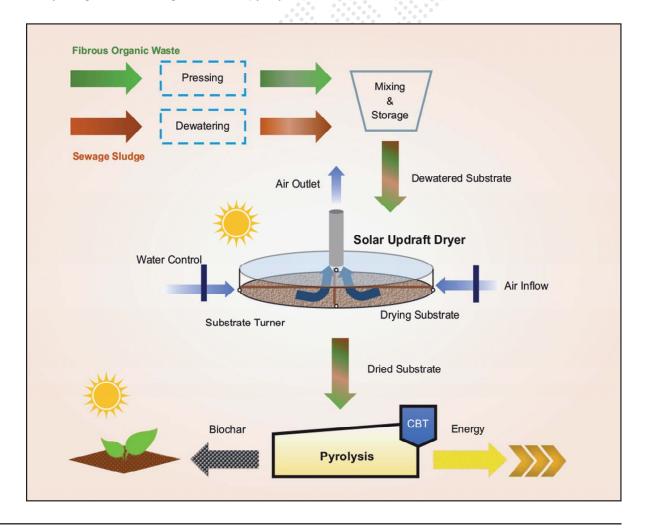
# **13** Integrated Solar Dryer and Pyrolysis pilot plant

#### **CONTEXT:**

• Recently, the foundation stone of the Integrated Solar Dryer and Pyrolysis pilot was laid in Chennai.

#### **ABOUT:**

- The pilot is part of the Indo-German project 'Pyrasol' launched to transform urban organic waste into biochar and energy in smart cities.
- The project will ultimately lead to technology development for the joint processing of Fibrous Organic Waste (FOW) and Sewage Sludge (SS) of Indian smart cities into hygienic and highly valuable biochar associated with energy recovery, carbon sequestration and environmental improvement.
- The project focuses on managing and organising collection, treatment, and disposal systems of urban wastes in Indian Smart Cities as well as in other urban centres with an integrated and interactive approach.
- Through this Pyrasol project, simple and robust processing technologies for urban organic waste will be combined in a synergetic manner and further developed to improve sanitation and welfare, supply regenerative energy, convert waste into products and reduce the carbon footprint of smart cities by an innovative organic waste drying system using the solar natural chimney effect followed by a high efficient single-chamber pyrolysis.



<sup>10</sup> **GSSCORE** 

## **14** Python-5 Air to Air Missile

#### **CONTEXT:**

• DRDO conducts maiden trial of Python-5 Air to Air Missile.

#### **ABOUT:**

- Tejas, India's indigenous Light Combat Aircraft added the 5th generation Python-5 Air-to-Air Missile (AAM) in its air-to-air weapons capability.
- The Python- is currently the most capable air-to-air missile in Israel's inventory and one of the most advanced AAMs in the world.
- As a beyond-visual-range missile, it is capable of "lock-on after launch" (LOAL), and has full-sphere/ all-direction (including rearward) attack ability.
- The missile features an advanced seeker which includes an electro-optical and image infrared homing seeker which scans the target area for hostile aircraft, then locks-on for terminal chase.
- With a total of eighteen control surfaces and careful design, the resulting missile is supposed to be as maneuverable as any other air-to-air missiles with thrust vectoring nozzles.
- The Python-5 was first used in combat during the 2006 Lebanon War, when it was used by F-16 Fighting Falcons to destroy two Iranian-made Ababil UAVs used by the Hezbollah.

#### Air-to-air missile (AAM):

- An air-to-air missile (AAM) is a missile fired from an aircraft for the purpose of destroying another aircraft. AAMs are typically powered by one or more rocket motors, usually solid fueled but sometimes liquid fueled.
- Ramjet engines, as used on the Meteor (missile), are emerging as propulsion that will enable future medium-range missiles to maintain higher average speed across their engagement envelope.

### **15** Clues to explosion mechanism of supernovae

#### CONTEXT:

 Study by Indian Astronomers provides clues to explosion mechanism of supernovae that are key measure of cosmological distances.

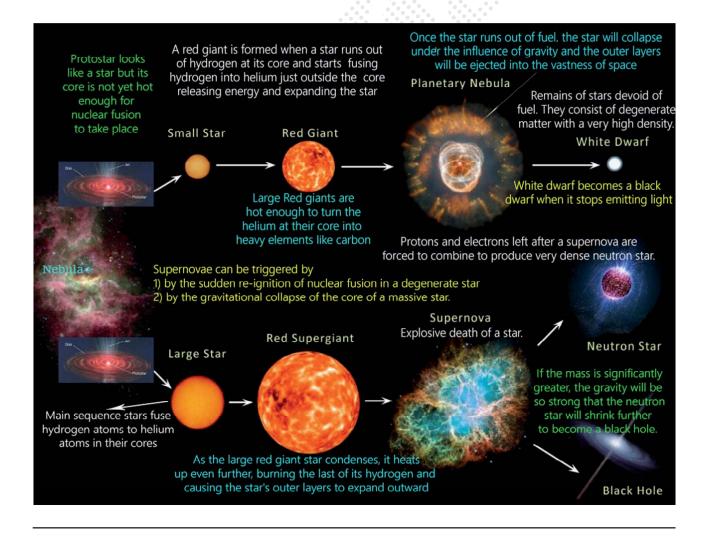
- In 2011, the Nobel Prize was awarded to three scientists for discovering that the Universe is expanding at an ever-accelerating rate through observations of distant supernovae.
- Now a team of Indian astronomers observing such distant supernovae have narrowed down the
  possible mechanisms of explosion of such supernovae which provide key measures of cosmological
  distances.
- Their detailed study of a supernova called SN 2017hpa, a particular type of supernovae called I a supernova, which exploded in 2017 helped narrow down the explosion mechanism of the supernovae by observations of unburned carbon in the early phase spectra.
- The explosive death of a star as a supernova is one of the most spectacular and catastrophic events in the Universe.

- Type Ia supernovae are the result of explosions of white dwarfs that exceed their mass beyond the Chandrasekhar limit through accretion of matter. Their homogeneous nature makes them extremely good standardizable candles to measure cosmological distances.
- However, the explosion mechanisms which create these supernovae (SNe), and the exact nature of their progenitor systems (star which is at the origin of a supernova phenomenon) are still not yet clearly understood.
- While most SNeIa are homogeneous, a good fraction of these events show diversity in both their light curve as well as spectral properties.

#### Supernova:

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- > A supernova is a powerful and luminous stellar explosion.
- This transient astronomical event occurs during the last evolutionary stages of a massive star or when a white dwarf is triggered into runaway nuclear fusion.
- The original object, called the progenitor, either collapses to a neutron star or black hole, or is completely destroyed.
- The peak optical luminosity of a supernova can be comparable to that of an entire galaxy before fading over several weeks or months.



### **16** Cosmic Rays Produce Antimatter

#### **CONTEXT:**

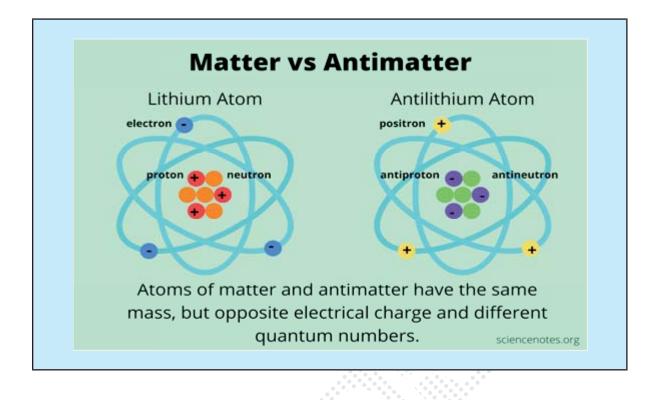
 Cosmic rays propagating through Milky Way interact with matter producing excess antimatter counterpart of electron

#### **ABOUT:**

- High energy particles are generally lower in number in the cosmic universe. But the excess number of high energy particles of the antimatter counterpart of the electrons, called positrons have intrigued scientists for long. Now they have found an explanation for this mystery.
- Over the years astronomers have observed an excess of antimatter counterpart of the electron or positrons having an energy of more than 10 giga-electronvolts, or 10 GeV. For an estimate, this is the energy of a positively charged electron accelerated across a 10,000,000,000 volt battery.
- Positrons with energy more than 300 GeV, however, are lower in comparison to what astronomers expect. This behaviour of positrons between 10 and 300 GeV is what astronomers call the 'positron excess'.
- Researchers from the Raman Research Institute (RRI), Bengaluru, an autonomous institution of the Department of Science and Technology have resolved the mystery in a new study published in the Journal of High Energy Astrophysics.
- Their proposal is simple cosmic rays while propagating through the Milky Way galaxy interact with matter producing other cosmic rays, primarily electrons and positrons.
- The Milky Way consists of giant clouds of molecular hydrogen. They are the seats of the formation of new stars and can be as massive as 10 million times the Sun's mass. They can extend up to 600 light-years, the distance that would take light 600 years to travel.
- Cosmic rays, produced in supernovae explosions propagate through these clouds before they reach the Earth.
- Cosmic rays interact with molecular hydrogen and can give rise to other cosmic rays.
- As they propagate through these clouds, they decay from their original forms and intermix, lose their energy by energising the clouds, and may also get re-energised.
- The researchers from RRI studied all these astrophysical processes via a code they set up on the computer, using a publicly available code.

#### **Antimatter:**

- In modern physics, antimatter is defined as matter that is composed of the antiparticles (or "partners") of the corresponding particles of "ordinary" matter.
- Minuscule numbers of antiparticles are generated daily at particle accelerators—total production has been only a few nanograms(ng)—and in natural processes like cosmic ray collisions and some types of radioactive decay, but only a tiny fraction of these have successfully been bound together in experiments to form anti-atoms.
- No macroscopic amount of antimatter has ever been assembled due to the extreme cost and difficulty of production and handling.
- ► Theoretically, a particle and its anti-particle (for example, a proton and an antiproton) have the same mass, but opposite electric charge, and other differences in quantum numbers. For example, a proton has positive charge while an antiproton has negative charge.



# **17** India's Organic food products exports

#### **CONTEXT:**

• India's Organic food products exports rise by more than 50 per cent in 2020-21.

- The growth in organic products has been achieved despite logistical and operational challenges posed by the COVID19 pandemic.
- Oil cake meal has been a major commodity of the organic product exports from the country followed by oil seeds, fruit pulps and purees, cereals & millets, spices & condiments, tea, medicinal plant products, dry fruits, sugar, pulses, coffee, essential Oil etc.
- India's organic products have been exported to 58 countries including USA, European Union, Canada, Great Britain, Australia, Switzerland, Israel, South Korea .
- Organic products are currently exported from India only if they are produced, processed, packed and labelled as per the requirements of the National Programme for Organic Production (NPOP).
- The NPOP certification has been recognised by the European Union and Switzerland which enables India to export unprocessed plant products to these countries without the requirement of additional certification.
- The equivalency with EU also facilitates export of Indian organic products to the United Kingdom even in the post Brexit phase.
- In order to facilitate the trade between major importing countries, negotiations are underway with Taiwan, Korea, Japan, Australia, UAE, New Zealand for achieving Mutual Recognition Agreements for exports of Organic products from India.

#### National Programme for Organic Production (NPOP)

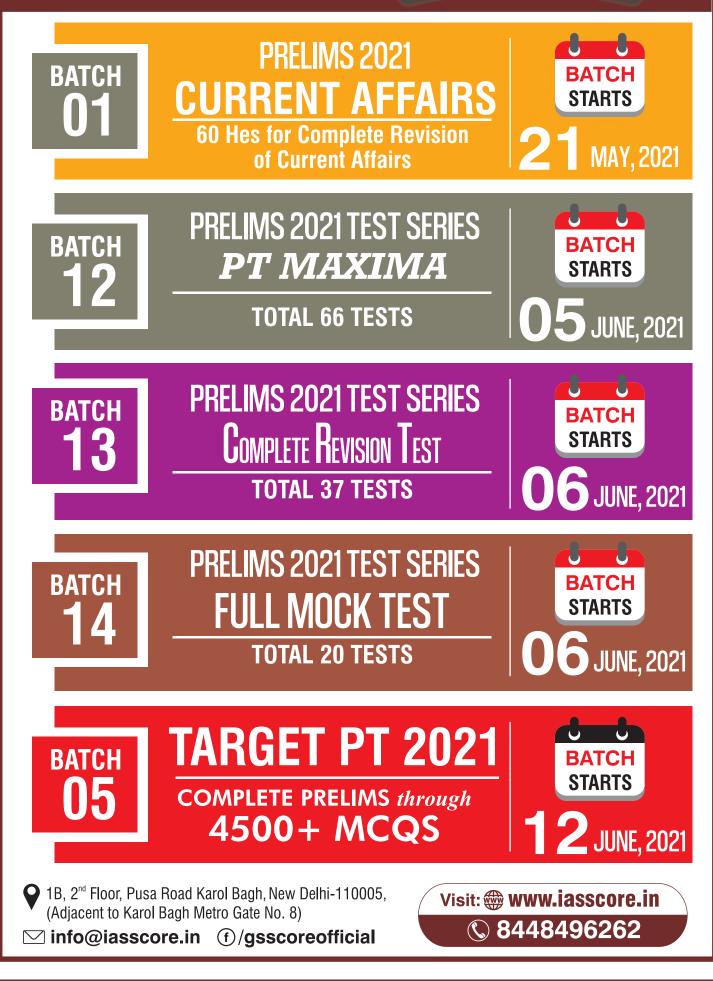
- With the growing demand for organic food in national and international markets, it became necessary to ensure that the agricultural products labeled as "organic" comply the basic standards of organic production and entire production process is verified by independent certification agencies.
- The National Programme for Organic Production (NPOP) launched during 2001 was the first such quality assurance initiative by the Government of India under Ministry of Commerce and Industry.
- ► The NPOP not only provided the institutional framework for accreditation of certification agencies and operationalization of certification programme through its accredited certification bodies but also ensures that the system effectively works and is monitored on regular basis.
- NPOP has also been recognized by the Food Safety Standard Authority of India (FSSAI) for trade of organic products in the domestic market. Organic products covered under the bilateral agreement with NPOP need not to be recertified for import in India.





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