



Current Affairs for UPSC IAS Exam – 14 June 2021

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[Innovations for Defence Excellence challenge](#)

Context:

Defence Minister has approved the budgetary support of Rs. 500 crore to Innovations for Defence Excellence (iDEX) challenge under the Defence Innovation Organisation (DIO) for the next five years.

Relevance:

Prelims, GS-III: Internal Security Challenges

Dimensions of the Article:



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1. Defence India Startup Challenge (DISC)
 2. Innovations for Defence Excellence (iDEX)
 3. Other Related Initiatives:

Defence India Startup Challenge (DISC)

- iDEX-DIO had launched the Defence India Startup Challenge (DISC) to address problems faced by the Armed Forces, DPSUs & OFB.
- The Defence India Startup Challenge (DISC) has been launched under the Ministry of Defence in partnership with Atal Innovation Mission.
- The program aims at supporting Startups/MSMEs/Innovators to create prototypes and/or commercialize products/solutions in the area of National Defence and Security.

Defence Innovation Organization (DIO)

- Defence Innovation Organization (DIO) is a Non-Profit Organisation (NOPO) established under Section 8 of the Companies Act 2013.
- The founding members are Hindustan Aeronautics Limited (HAL) and Bharat Electronics Limited (BEL).

Innovations for Defence Excellence (iDEX)

- Innovations for Defence Excellence (iDEX) is an initiative taken by the government, launched in 2018, to contribute towards modernization of the Defence Industry.
- iDEX aims to promote innovation and technology development in Defence and Aerospace by engaging Industries (which includes MSMEs, start-ups, individual innovators, R&D institutes & academia).
- iDEX will provide the engaging industries with funding and other support to carry out Research & Development.
- iDEX will be funded and managed by Defence Innovation Organization (DIO), and will function as the executive arm of DIO.
- iDEX has partnered with leading incubators in the country to provide hand holding, technical support and guidance to the winners of iDEX challenges.



Main objectives of iDEX

1. To frame 'corporate Venture Capital' models for Indian Defence needs thereby identifying emerging technologies, connecting innovators with military units, facilitating co-creation of new and appropriate technologies and so forth into weapon systems used by Indian Armed Services.
2. To deliver military-grade products thereby solving the critical needs of the Indian defence set-up by developing or applying advanced technologies.
3. To devise a culture of innovation in the Indian Defence and Aerospace by engaging startups and innovators for co-creation and co-innovation.

Other Related Initiatives:

1. Defence Industrial Corridors: To support the growth of the Defence sector and enhance manufacturing capacity in the sector, two Defence Industrial Corridors are being set up in India, one in Uttar Pradesh and another in Tamil Nadu.
2. Strategic Partnership (SP) Model: It identifies a few Indian private companies who would initially tie up with global Original Equipment Manufacturers (OEMs) to seek technology transfers to set up domestic manufacturing infrastructure and supply chains. It is a part of Defence Acquisition Procedure (DAP) 2020. Under DAP 2020, the Ministry of Defence (MoD) has also notified a 'positive indigenisation list' of 108 items.
3. Artificial Intelligence in Defence: N Chandrasekaran Task Force was set up in 2018 to study implications of AI in national security. Defence Artificial Intelligence Project Agency (DAIPA) was created in March, 2019. DAIPA aims for greater thrust on Artificial Intelligence (AI) in Defence, formulation of an AI roadmap for each Defence PSU and Ordnance Factory Board to develop AI-enable products.

-Source: The Hindu

[PRABANDH portal to track out-of-school children](#)

Context:



- The Ministry of Education launched an online module to compile data on out-of-school children.
- To track down such children, the ministry has developed an online module for compiling the data of out-of-school children identified by each state/UT and their mapping with special training centres (STC) on the PRABANDH portal.

Relevance:

Prelims, GS-II: Social Justice (Issues Related to Education, Government Initiatives and Welfare Scheme)

Dimensions of the Article:

1. About the education Ministry's Online module
2. Samagra Shiksha

About the education Ministry's Online module

- Through the module, the government will facilitate age-appropriate admissions of children in the age group of 6-14 years and those belonging to socially and economically disadvantaged groups.
- Also, for out of school children in the 16-18 years age group, financial assistance will be provided for the first time in the session 2021-22, to continue their education through open/distance learning mode.

About PRABANDH Portal

- PRABANDH (PROject Appraisal, Budgeting, Achievements and Data Handling System) is a step towards leveraging technology to increase efficiency and manage the implementation of a centrally sponsored integrated scheme for schooling- Samagra Shiksha.



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- It is to have transparency and accuracy in the System w.r.t Approvals, Releases, Financial Status.
 - Also streamline the Financial Management System, to enable more accurate assessment of actual requirement of funds for implementation.

Samagra Shiksha

- Samagra Shiksha is an integrated scheme for school education extending from pre-school to class XII to ensure inclusive and equitable quality education at all levels of school education.
- It subsumes the three Schemes of Sarva Shiksha Abhiyan (SSA), Rashtriya Madhyamik Shiksha Abhiyan (RMSA) and Teacher Education (TE).
- The main emphasis of the Scheme is on improving the quality of school education by focussing on the two T's – Teacher and Technology.
- The Scheme is being implemented as a **Centrally Sponsored Scheme**. The fund sharing pattern for the scheme between Centre and States is at present in the ratio of 90:10 for the North-Eastern States and the Himalayan States and 60:40 for all other States and Union Territories with Legislature. It is 100% centrally sponsored for Union Territories without Legislature.
- The vision of the Scheme is to ensure inclusive and equitable quality education from pre-school to senior secondary stage in accordance with the Sustainable Development Goal (SDG) for Education.
- SDG-4.1: Aims to ensure that all boys and girls complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes.
SDG 4.5: Aims to eliminate gender disparities in education and ensure equal access to all levels of education.

-Source: Indian Express

[EnVision mission to Venus](#)

Context:



Following NASA's footsteps, the European Space Agency (ESA) announced that it has selected EnVision as its next orbiter that will visit Venus sometime in the 2030s.

Relevance:

Prelims, GS-III: Science and Technology (Space Technology)

Dimensions of the Article:

1. About Venus
2. Difference between Earth and Venus
3. What is EnVision?
4. Why are scientists interested in studying Venus?
5. Which missions did NASA announce?

About Venus

- Venus is the second planet from the sun and the hottest planet in the solar system with a surface temperature of 500C – high enough to melt lead.
- The planet's thick atmosphere has cranked the surface pressure up to 90 bars.
- A single Venusian rotation takes 243.0226 Earth days. That means a day lasts longer than a year on Venus, which makes a complete orbit around the sun in 225 Earth days.
- The Venusian planetary core has a diameter of about 4,360 miles (7,000 km), comparable to Earth's core.
- Venus is one of just two planets that rotate from east to west. Only Venus and Uranus have this "backwards" rotation.
- For those on Earth, Venus is the second-brightest object in the sky after the moon. It appears bright because of its thick cloud cover that reflects and scatters light.

Difference between Earth and Venus

- But while Venus, which is the second closest planet to the Sun, is called the Earth's



twin because of their similar sizes, the two planets have significant differences between them.

- For one, the planet's thick atmosphere traps heat and is the reason that it is the hottest planet in the solar system, despite coming after Mercury, the closest planet to the Sun. Surface temperatures on Venus can go up to 471 degrees Celsius, which is hot enough to melt lead, NASA notes.
- Further, Venus moves forward on its orbit around the Sun but spins backwards around its axis slowly. This means on Venus the Sun rises in the west and sets in the East. One day on Venus is equivalent to 243 Earth days because of its backward spinning, opposite to that of the Earth's and most other planets. Venus also does not have a moon and no rings.

What is EnVision?

- EnVision is an ESA led mission with contributions from NASA. It is likely to be launched sometime in the 2030s. The earliest launch opportunity for EnVision is 2031, followed by 2032 and 2033. Once launched on an Ariane 6 rocket, the spacecraft will take about 15 months to reach Venus and will take 16 more months to achieve orbit circularisation.
- The spacecraft will carry a range of instruments to study the planet's atmosphere and surface, monitor trace gases in the atmosphere and analyse its surface composition. A radar provided by NASA will help to image and map the surface.
- EnVision will follow another ESA-led mission to Venus called 'Venus Express' (2005-2014) that focussed on atmospheric research and pointed to volcanic hotspots on the planet's surface. Other than this, Japan's Akatsuki spacecraft has also been studying the planet's atmosphere since 2015.

Why are scientists interested in studying Venus?

- At the core of the ESA's mission is the question of how Earth and Venus evolved so differently from each other considering that they are roughly of the same size and composition.
- Venus is the hottest planet in the solar system because of the heat that is trapped by its thick cloud cover.
- Further, scientists speculate about the existence of life on Venus in its distant past and the possibility that life may exist in the top layers of its clouds where temperatures are less extreme.
- In 2020, a team of scientists reported that they had found phosphine gas (a chemical produced only through biological processes) in the atmosphere of Venus that triggered excitement in the scientific community that some life forms might be supported by the planet.



Which missions did NASA announce?

Both missions called DAVINCI+ and VERITAS are part of the space agency's Discovery Program, which began in 1992 to give scientists the chance to launch some missions that use fewer resources and have shorter developmental times. The two selections are a part of the ninth Discovery Program and were made from proposals submitted in 2019.

DAVINCI+

- DAVINCI+ is short for 'Deep Atmosphere Venus Investigation of Noble gases, Chemistry, and Imaging' and is the first US-led mission to the planet's atmosphere since 1978. It will try to understand Venus' composition to see how the planet formed and evolved. This mission also consists of a descent sphere that will pass through the planet's thick atmosphere and make observations and take measurements of noble gases and other elements.
- Significantly, this mission will also try to return the first high resolution photographs of a geological feature that is unique to Venus. This feature, which is called "tesserae" may be comparable to Earth's continents, NASA says. The presence of tesseraes may suggest that Venus has tectonic plates like Earth.

VERITAS

- The second mission called VERITAS is short for 'Venus Emissivity, Radio Science, InSAR, Topography, and Spectroscopy' and will map the planet's surface to determine its geologic history and understand the reasons why it developed so differently from Earth.
- VERITAS will orbit Venus with a radar that will help to create a three dimensional reconstruction of its topography which might be able to tell scientists if processes such as plate tectonics and volcanism are still active there. This mission will also map the emissions from Venus's surface that may help in determining the type of rocks that exist on Venus—a piece of information that is not exactly known yet. It will also determine if active volcanoes are releasing water vapour into the atmosphere.



[MSP hiked for mandated Kharif Crops](#)

Context:

In a bid to encourage crop diversification, the Central Government has hiked the Minimum Support Price (MSP) for Paddy, Pulses and Oilseeds (for all mandated Kharif Crops).

Relevance:

GS-III: Agriculture (Agriculture Pricing), GS-II: Social Justice (Welfare Schemes)

Dimensions of the Article:

1. What is Minimum Support Price (MSP)?
2. Why is there a need for MSP?
3. What are the issues related to MSP?
4. Three Kinds of Production Cost
5. Significance of MSP Hike
6. Issues with Hike

What is Minimum Support Price (MSP)?

- Minimum Support Price is the price at which government purchases crops from the farmers, whatever may be the price for the crops.
- Commission for Agricultural Costs & Prices (CACP) in the Ministry of Agriculture recommends MSPs for 23 crops. These include 14 grown during the kharif/post-monsoon season (see table) and six in rabi/winter (wheat, barley, chana, masur,



mustard and safflower), apart from sugarcane, jute and copra

- CACP consider various factors while recommending the MSP for a commodity like cost of cultivation, supply and demand situation for the commodity; market price trends (domestic and global) and parity vis-à-vis other crops etc.
- MSP seeks to:
 - Assured Value: To give guaranteed prices and assured market to the farmers and save them from the price fluctuations (National or International).
 - Improving Productivity: By encouraging higher investment and adoption of modern technologies in agricultural activities.
 - Consumer Interest: To safeguard the interests of consumers by making available supplies at reasonable prices.

Why is there a need for MSP?

- The MSP is a minimum price guarantee that acts as a safety net or insurance for farmers when they sell particular crops.
- The guaranteed price and assured market are expected to encourage higher investment and in adoption of modern technologies in agricultural activities.
- With globalization resulting in freer trade in agricultural commodities, it is very important to protect farmers from the unwarranted fluctuation in prices.

What are the issues related to MSP?

- Low accessibility and awareness of the MSP regime: A survey highlighted that, 81% of the cultivators were aware of MSP fixed by the Government for different crops and out of them only 10% knew about MSP before the sowing season.
- Arrears in payments: More than 50% of the farmers receive their payments of MSP after one week.
- Poor marketing arrangements: Almost 67% of the farmers sell their produce at MSP rate through their own arrangement and 21% through brokers.
- According to NITI Aayog report on MSP, 21% of the farmers of the sample States expressed their satisfaction about MSP declared by the Government whereas 79% expressed their dissatisfaction due to various reasons. Although, majority of the farmers of the sample States were dissatisfied on MSP rates, still 94% of them desired that the MSP rates should be continued.

Three Kinds of Production Cost



- The CACP projects three kinds of production cost for every crop, both at state and all-India average levels.
- 'A2': Covers all paid-out costs directly incurred by the farmer in cash and kind on seeds, fertilisers, pesticides, hired labour, leased-in land, fuel, irrigation, etc.
- 'A2+FL': Includes A2 plus an imputed value of unpaid family labour.
- 'C2' It is a more comprehensive cost that factors in rentals and interest forgone on owned land and fixed capital assets, on top of A2+FL.
- CACP considers both A2+FL and C2 costs while recommending MSP. CACP reckons only A2+FL cost for return.
- However, C2 costs are used by CACP primarily as benchmark reference costs (opportunity costs) to see if the MSPs recommended by them at least cover these costs in some of the major producing States.
- The Cabinet Committee on Economic Affairs (CCEA) of the Union government takes a final decision on the level of MSPs and other recommendations made by CACP.

Significance of MSP Hike:

- The added focus on nutri-rich nutri-cereals is to incentivise its production in the areas where rice-wheat cannot be grown without long term adverse implications for groundwater table.
- Concerted efforts have been made over the last few years to realign the MSPs in favour of oilseeds, pulses and coarse cereals to encourage farmers shift to larger areas under these crops and adopt best technologies and farm practices, to correct demand - supply imbalance.

Issues with Hike:

- This increase seems modest keeping in mind the cultivation costs - particularly on account of diesel used for powering tractors, irrigation pumps and harvester combines - have gone up.
- Some increases, especially for maize, did not even keep pace with inflation.
- Further, absence of assured procurement means farmers have no incentive to cultivate them.
- The announcement comes at a time when farm unions have been demanding legislation to guarantee MSP for all farmers for all crops, and a repeal of three contentious farm reform laws.



[Rare earth metals at the heart of China-U.S. rivalry](#)

Context:

At a time of frequent geopolitical friction among the three powers of China, U.S. and Europe – U.S. and Europe want to avoid this scenario by investing in the market for 17 minerals with unique properties that today are largely extracted and refined in China.

Relevance:

GS-I: Geography (Distribution of Key Natural Resources, Mineral & Energy Resources), GS Paper-II: International Relations (India and its Neighborhood)

Dimensions of the Article:

1. What are REMs?
2. Heavy dependence
3. Rare Earth Minerals Reserves – India Ranks 3rd in the World

What are REMs?

- The rare earths minerals (REM) are a set of seventeen metallic elements. These include the fifteen lanthanides on the periodic table in addition to scandium and yttrium that show similar physical and chemical properties to the lanthanides.
- The REMs have unique catalytic, metallurgical, nuclear, electrical, magnetic and



luminescent properties. While named 'rare earth', they are in fact not that rare and are relatively abundant in the Earth's crust.

Strategic importance of REMs:

- They have distinctive electrical, metallurgical, catalytic, nuclear, magnetic and luminescent properties.
- Its usage range from daily use (e.g., lighter flints, glass polishing mediums, car alternators) to high-end technology (lasers, magnets, batteries, fibre-optic telecommunication cables).
- Even futuristic technologies need these REMs (For example high-temperature superconductivity, safe storage and transport of hydrogen for a post-hydrocarbon economy, environmental global warming and energy efficiency issues).
- Due to their unique magnetic, luminescent, and electrochemical properties, they help in technologies perform with reduced weight, reduced emissions, and energy consumption; therefore give them greater efficiency, performance, miniaturization, speed, durability, and thermal stability.

Heavy dependence

- In 2019, the U.S. imported 80% of its rare earth minerals from China, the U.S. Geological Survey says.
- The EU gets 98% of its supply from China, the European Commission said last year.
- Amid the transition to green energy, in which rare earth minerals are sure to play a role, China's market dominance is enough to sound an alarm in western capitals.
- Rare earth minerals, with names like neodymium, praseodymium and dysprosium, are crucial to the manufacture of magnets used in industries of the future, such as wind turbines and electric cars. And they are already being used in consumer goods such as smartphones, computer screens and telescopic lenses.
- In 2021 the U.S. Senate passed a law aimed at improving American competitiveness that includes provisions to improve critical minerals supply chains.
- U.S. aims to boost production and processing of rare earths and lithium, another key mineral component, while "working with allies to increase sustainable global supply and reduce reliance on competitors," Deputy Director of the National Economic Council in 2021.
- The best hope for boosting American production can be found at the Mountain Pass mine in California.
- Once one of the major players in the sector, the mine suffered as China rose and ate up its market share, aided by Beijing's subsidies.
- China is expected to remain dominant for some time to come, but experts say that if



recycling is scaled up, “20 to 30% of Europe’s rare earth magnet needs by 2030 could be sourced domestically in the EU from literally zero.”

Rare Earth Minerals Reserves – India Ranks 3rd in the World

- India has the third-largest reserves of rare earth minerals in the world. Due to radioactivity of monazite sands, Indian Rare Earths Ltd under the Department of Atomic Energy is the sole producer of rare earth compounds.
- Globally, China has a monopoly over rare earth, after USA’s recede in this industry due to high environmental and health concerns.
- China had once, almost shivered the Japanese economy by halting the export of rare earth elements.
- India is also blessed with some crucial rare earth minerals like zirconium, neodymium etc., available in plenty in monazite sands.
- This could contribute to Indian export markets if utilized properly. However, owing to various reasons such as cost reduction due to high production (economies of scale) in China, lack of demand in the domestic market, lack of domestic processing technologies, the production of rare earth minerals has depleted over years.
- Most of the products that use rare earth minerals as raw materials are imported. Despite rare earth minerals having high value add the potential for export growth, inadequate processing technologies have made India suffer.

-Source: The Hindu