



Urban Heat Islands

For Prelims: Urban Heat Island, Green House Gasses and Green house effects, Climate Change and its impact, NASA's Ecosystem Spaceborne Thermal Radiometer Experiment (Ecostress)

For Mains: Causes and Impact of Urban Heat island, Inter relation of the climate change, heat wave and urban heat island

Why in News?

Recently, several parts of India are experiencing severe heat waves. Urban areas and cities are the places which have higher temperatures than rural places. This phenomenon is referred to as "[Urban Heat Island](#)".

- According to experts, these temperature discrepancies are caused by variations in heating over highly urbanized and semi-urbanized areas, as well as the relative availability of open and green spaces in the surrounding areas.

What is an Urban Heat Island?

- Urban heat island may be defined as the local and temporary phenomenon in which certain pockets within a city are experiencing higher heat load than its surrounding area.
- This rise of heat basically happens due to buildings and houses of cities made up of concrete where the heat is trapped and not able to dissipate easily.
 - Urban heat island is basically induced due to trapped heat between establishments made up of concrete.
 - The temperature variation can range between 3 to 5 degrees Celsius.

Why are Cities Hotter than Rural Areas?

- It has been observed that greener localities experienced lower temperatures than non-green localities.
- Green vegetation like plants, trees and forests are prominent factors to regulate the incidences of the urban heat islands.
- Rural areas are blessed with more green cover in the form of plantations, farmlands, forests, and trees than urban areas.
- Transpiration is the phenomena which the plants carry to regulate the temperature.
- In urban areas is the basic cause of Urban Heat Island in urban areas.
 - Frequent construction of Highrise structures, roads, parking spaces, pavements, and public transportation transit lines have accelerated the incidences of urban heat islands.
- It occurs by black or any dark colored material.
 - Buildings in cities are often made of glass, bricks, cement, and concrete. All of them are dark-colored materials, which attract and absorb more heat

What are the Causes of Urban Heat Island?

- **Manifold increase in construction activities:** For building simple urban dwellings to complex infrastructures, carbon absorbing material like asphalt and concrete is needed for the expansion of cities. They trap huge amounts of heat which increases the mean surface temperatures of urban areas.
- **Dark surfaces:** Many buildings found in urban areas have dark surfaces, thereby decreasing albedo and increased absorption of heat.
- **Air conditioning:** Buildings with dark surfaces heat up more rapidly and require more cooling from air conditioning, which requires more energy from power plants, which causes more pollution. Also, air conditioners exchange heat with atmospheric air, causing further local heating. Thus, there is a cascade effect that contributes to the expansion of urban heat islands.
- **Urban Architecture:** Tall buildings, and often accompanying narrow streets, hinder the circulation of air, reduce the wind speed, and thus reduce any natural cooling effects. This is called the Urban Canyon Effect.
- **Need for mass transportation system:** Transportation systems and the unimpeded use of fossil fuels also add warmth to urban areas.
- **Lack of Trees and green areas:** which impedes evapotranspiration, shade and removal of carbon dioxide, all the processes that help to cool the surrounding air.

How can Urban Heat Islands be Reduced?

- **Increase Area Under Green Cover:** Plantation and effort to increase the area under green cover are the primary requirement to cut heat load within urban areas.
- **Passive Cooling to Reduce Urban Heat Islands:** Passive cooling technology, a widely-used strategy to create naturally ventilated buildings, can be a vital alternative to address the urban heat island for residential and commercial buildings.
 - **The IPCC report** cites ancient Indian building designs that have used this technology, which could be adapted to modern facilities in the context of global warming.
- **Other methods** of heat mitigation include using appropriate construction materials.
 - Roof and terraces should be painted in white or light colors to reflect heat and reduce the absorption.
 - Terrace plantation and kitchen gardening should be promoted.

What has NASA said about India's Urban Heat Islands?

- **NASA** has observed that higher incidences of heat islands in urban parts of Delhi is occurring.
 - Temperatures were significantly higher in the urban part of Delhi than in surrounding farm areas.
- The image was acquired by **NASA's Ecosystem Spaceborne Thermal Radiometer Experiment (Ecostress)**, which revealed a massive red spot over Delhi and smaller red patches around neighboring cities Sonapat, Panipat, Jind, and Bhiwani.
 - Ecostress is a radiometer-equipped device that was sent to the [International Space Station](#) in 2018 by NASA.
 - Ecostress is primarily responsible for assessing the temperature of plants, as well as knowing their water requirements and the influence of the climate on them.
- These red patches in the data of Ecostress indicated greater temperatures i.e., incidents of urban heat islands, whereas the rural areas surrounding cities had lower temperatures.

[Source: IE](#)

Twin Cyclones

For Prelims: Madden-Julian Oscillation, Rossby Wave, Cyclones

Why in News?

Recent satellite images have Captured Twin Cyclones **in the Indian Ocean region**, one in the northern hemisphere and one in the southern hemisphere, named cyclone Asani and cyclone Karim respectively.

What are Cyclone Karim and Asani?

- Karim is classified as a **category II hurricane**, with a wind speed of 112 kilometers per hour (kmph).
- Asani remains a **Severe Cyclonic Storm over the Bay of Bengal**, with wind speeds of 100-110 kmph gusting to 120 kmph.
- Both were formed in the **Indian Ocean region**.
- Both cyclones **originated in the same longitude and now drifting apart**.
- Cyclone Karim has **created a path in the open seas west of Australia**.
- The name **Karim was given by the South African country Seychelles**. The name Cyclone Asani was suggested by Sri Lanka.

What are Twin Cyclones?

- The interplay of the wind and the **monsoon system** combined with the Earth system produces these synchronous cyclones.
- The twin tropical cyclones are caused by what are called **equatorial Rossby waves**.
 - **Rossby waves are huge waves in the ocean with wavelengths of around 4,000-5,000 kilometres.**
 - Rossby waves are named for famous meteorologist Carl-Gustaf Rossby who was the first to explain that **these waves arose due to the rotation of the Earth**.
- This **system has a vortex in the northern hemisphere and another in the southern hemisphere**, and each of these is a mirror image of the other.
- The vortex in the **north spins counterclockwise and has a positive spin, while the one in the southern hemisphere spins in the clockwise direction and therefore has a negative spin**.
- Both have a **positive value of the vorticity which is a measure of the rotation**.
- Very often **twin cyclones are formed from these Rossby waves**.

How do Cyclones Form?

- When the vorticity is positive in both Northern and Southern hemispheres, as is the case with Rossby waves, the air in the boundary layer, which is moist, is lifted slightly.
- That is **enough to set off a feedback process**.
- When the air is lifted slightly, the water vapour condenses to make clouds. As it condenses, **it lets out the latent heat of evaporation**.
- The atmosphere warms, this parcel of air rises, and positive feedback is set off by this process. The warmer parcel of air can rise further because it is lighter than the surrounding air, and it can form deeper clouds. Meanwhile, moisture comes in from both sides. This leads to the formation of a cyclone if certain conditions are present.
- The ocean's surface temperature has to be 27 degrees or warmer; the wind shear in the atmosphere must not be too high.
 - For example, if you have westerly winds at the lower level and easterly winds at the upper level, if the difference between them is too high, **cyclones will not form**.
 - But **if the difference is modest, cyclones will still form**.
- There will be a big, tall vortex with all sorts of clouds inside. Once they are stronger, they will spin

faster and faster and organise themselves into the big storms.

Will the Two Cyclones Necessarily Move to Different Hemispheres?

- Yes, once formed they will generally move west. In the Northern Hemisphere, they will have a slightly northerly component of motion, while in the southern hemisphere they usually have a slightly southern component to their movement.
- So, this means that in the northern hemisphere the cyclone is moving north and west, while the southern one is moving south and west.

Does Madden-Julian Oscillation (MJO) Give Rise to Twin Cyclones?

- The MJO is a **large cluster of clouds and convection**, about 5,000-10,000 kilometers in size.
- It is **composed of a Rossby wave and a Kelvin wave**, which is a type of wave structure that we see in the ocean. On the eastern side of the MJO is the Kelvin wave, while on the western, trailing edge of the MJO is the Rossby wave, again with two vortices on either side of the equator.
- However, **not all tropical cyclones are born from the MJO**. Sometimes it's just a Rossby wave with two eddies on either side.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Q. Consider the following statements: (2020)

1. Jet streams occur in the Northern Hemisphere only.
2. Only some cyclones develop an eye.
3. The temperature inside the eye of a cyclone is nearly 10°C lesser than that of the surroundings.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 and 3 only
- (c) 2 only
- (d) 1 and 3 only

Ans: (c)

Exp:

- Jet Stream is a geostrophic wind blowing horizontally through the upper layers of the troposphere, generally from west to east, at an altitude of 20,000 - 50,000 feet. Jet Streams develop where air masses of different temperatures meet. So, usually surface temperatures determine where the Jet Stream will form. Greater the difference in temperature, faster is the wind velocity inside the jet stream. Jet Streams extend from 20° latitude to the poles in both hemispheres. **Hence, statement 1 is not correct.**
- Cyclones are of two types, tropical cyclone and temperate cyclone. The center of a tropical cyclone is known as the 'eye', where the wind is calm at the center with no rainfall. However, in a temperate cyclone, there is not a single place where winds and rains are inactive, so the eye is not found. **Hence, statement 2 is correct.**
- The warmest temperatures are found in the eye itself, not in the eyewall clouds where the latent heat occurs. The air is saturated only where convective vertical motions pass through flight level. Inside the eye, the temperature is greater than 28°C and the dewpoint is less than 0°C. These warm and dry conditions are typical of the eyes of extremely intense tropical cyclones. **Hence, statement 3 is not correct.**

India's First 5G Testbed

For Prelims: 5G, start-ups, Communication technology (4G, 5G)

For Mains: Uses of 5G, Challenges for 5G Rollout in India

Why in News?

Recently, Prime Minister **inaugurated the country's first 5G testbed** that will enable **start-ups** and industry players to test their products locally, thereby reducing dependence on facilities abroad.

What is the Significance of this Step?

- It was an important step towards self-reliance in the direction of critical and modern technologies in the **telecom sector**.
 - The **5G testbed** had been set up at a **cost of about Rs. 220 crore**.
 - In the **absence of a 5G testbed**, **startups** and other industry players were **required to go abroad to test and validate their products** for installation in a 5G network.
- India's own **5G standard had been made in the form of 5Gi** which would **play a big role in bringing 5G technology** to the villages of the country.
 - **5Gi** is basically a Made in India 5G standard created through a collaboration between IIT Hyderabad and Madras (Chennai).

What is 5G Technology?

- **About:**
 - 5G is the **5th generation mobile network**. It is a new global wireless standard after 1G, 2G, 3G, and 4G networks.
 - It **enables a new kind of network** that is designed to connect virtually everyone and everything together including machines, objects, and devices.
 - Internet speeds in the **high-band spectrum of 5G has been tested to be as high as 20 Gbps (gigabits per second)**, while, in most cases, the maximum internet data speed in 4G has been recorded at 1 Gbps.
 - In India, **Satcom Industry Association-India (SIA)** has voiced concerns over the Government's plan to include the **Millimetre Wave (mm Wave) bands** in the 5G spectrum auction.
- **Significance:**
 - 5G technology would also **bring positive changes in the governance of the country**, ease of living and **ease of doing business**.
 - This would **boost growth in every sector** like agriculture, health, education, infrastructure and logistics.
 - This will also **increase convenience and create many employment opportunities**.

What are the Challenges for 5G Rollout in India?

- **Low Fiberization Footprint:** There is a **need to upgrade fibre connectivity across India**, which at present connects only 30% of India's telecom towers.
 - For an efficient 5G India launch and adoption, this number has to double.

- **‘Make in India’ Hardware Challenge:** The ban on **certain foreign telecom OEMs (original equipment manufacturer)** upon which most of the 5G technology development depends, presents a hurdle in itself.
- **High Spectrum Pricing:** India’s 5G **spectrum** pricing is several times costlier than the global average.
 - This will be of detriment to India’s cash-strapped telcos.
- **Choosing the Optimal 5G Technology Standard:** The tussle between the homegrown 5Gi standard and the global 3GPP standard needs to be concluded in order to hasten 5G technology implementation.
 - While 5Gi brings obvious benefits, it **also increases 5G India launch costs** and interoperability issues for telcos.
 - 3GPP is a **collaborative Project Agreement between telecommunications industry partners (Organizational Partners)** for formalizing global mobile 3G wireless systems based on radio access technologies and Global System for Mobile Communications (GSM) specifications.

Way Forward

- The country **needs to encourage and boost its local 5G hardware manufacturing** at an unprecedented rate if it needs to realise the 5G India dream.
- **Rationalisation of this spectrum pricing is needed** so that the government generates adequate revenue from the auction without hampering implementation plans for 5G in India.
- **5G can be deployed at different band spectrums** and at the low band spectrum, the range is much longer which is helpful for the rural areas.

[Source: TH](#)

Endosulfan

Why in News?

The Supreme Court has slammed the Kerala government for doing “virtually nothing” for Endosulfan pesticide exposure victims.

- The court said the **State’s inaction was “appalling” and amounted to a breach of the apex court’s 2017 judgment**, which had ordered the State to pay Rs 5 lakh each to the victims in three months.
- Five years since the judgment, the court has realised that **only eight out of 3,704 victims have been paid compensation.**
- The SC has banned the **manufacture, sale, use, and export of endosulfan throughout the country**, citing its harmful health effects in 2015.

What is Endosulfan?

- Endosulfan is an **organochlorine insecticide** which was first introduced in the 1950s and is commonly known by its trade name **Thiodan.**
- It is linked to **a slew of grave medical conditions, such as neurotoxicity, physical deformities, poisoning and more.**
- It is sprayed on crops like **cotton, cashew, fruits, tea, paddy, tobacco etc. for control of pests** such as whiteflies, aphids, beetles, worms etc.
- Endosulfan is listed under both the **[Rotterdam Convention on the Prior Informed Consent](#)** and the **[Stockholm Convention on Persistent Organic Pollutants.](#)**

What are the Impacts of Endosulfan?

Environment:

- Endosulfan in the environment gets accumulated in food chains leading to higher doses causing problems.
- If Endosulfan is released to water, it is expected to absorb to the sediment and may bioconcentrate in aquatic organisms.

Humans And Animals:

- The endosulfan ingestion results in diseases ranging from physical deformities, cancer, birth disorders and damage to the brain and nervous system.

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APRIL 29, 2011

- Global consensus reached on adding endosulfan to list of banned substances and phasing it out as an agrichemical
- Use of endosulfan banned by Stockholm Convention on Persistent Organic Pollutants
- Under pressure from pesticide firms, India sought remission on the ban for 10 years

MAY 13, 2011

Supreme Court of India issues temporary ban on production, storage and sale of endosulfan

WHAT IS ENDOSULFAN ?

It is a widely-banned pesticide with hazardous effects on human genetic and endocrine systems.

HAZARDOUS EFFECTS

- Delayed reproductive development (late sexual maturity)
- Sensory Loss
- Neurotoxicity
- Long-range contamination
- Endocrine disruption (stunting of hormones)
- Bioaccumulation (substance does not leave body)
- Autism

NEUROTOXIC

"Endosulfan blocks the inhibitory receptors of the CNS, disrupts the ionic channels and destroys the integrity of the nerve cells. – report of fact-finding mission"

USES

Sprayed on crops like cotton, cashew, fruits, tea, paddy, tobacco etc. for control of pests in agriculture such as whiteflies, aphids, beetles, worms etc.

KASARGOD DISASTER

From the mid-70s, Kerala villages used aerial spraying of endosulfan on 4,600-ha. cashew nut plantation. Locals reportedly experienced illnesses, palsies and deformities

The infographic features a central illustration of a person in silhouette spraying a field. A diamond-shaped hazard symbol with the word 'POISON' is shown. A circular diagram connects various hazardous effects. A quote from a fact-finding mission describes the neurotoxic mechanism. A box details the Kasargod disaster in Kerala. The background shows a landscape with green hills and a blue sky.

What is the Rotterdam convention 1998?

- The convention aims to promote cooperation and responsibility sharing measures amongst

different countries dealing with trade in hazardous chemicals and pesticides.

- PIC, Prior Informed Consent is the main feature of the convention and is legally binding on the party members.
- PIC facilitates information exchange about nature and trade-related information amongst the party members.
- The Convention creates obligations for the implementation of the Prior Informed Consent (PIC) procedure.

What is Stockholm convention 2001?

- The convention aims to reduce the concentration of persistent organic pollutants (POPs) which are chemical substances that not only remain in the atmosphere for longer periods but also possess the ability to bio-accumulate.
- The convention listed 12 POPs as 'dirty dozen'.

[Source: TH](#)

INS Surat and frigate INS Udaygiri

Why in News?

Recently, the Defence Minister launched the **Indian Navy destroyer warship INS Surat and frigate INS Udaygiri in Mumbai.**

What is INS Surat?

- **About:**
 - 'Surat' is the **fourth ship of Project 15B Destroyers** which heralds a significant makeover of the **P15A (Kolkata Class) Destroyers.**
 - The **first ship (Visakhapatnam) of this class was commissioned in 2021.** The **second (Mormugao)** and **third (Imphal)** ships have been launched and are at different stages of outfitting/ trials.
- **Named After:**
 - It is **named after the commercial capital of the state of Gujarat** and also the second largest commercial hub of western India after Mumbai.
 - Surat city has a rich maritime & ship building history and vessels built at the city in the 16th and 18th centuries were known for their longevity (of more than 100 years).
 - The ship Surat has been **built using the Block construction methodology.**
 - This methodology includes **hull construction at two different geographical locations** and has been joined together at MDL, Mumbai.

What is Project 15B?

- **Project-15B:**
 - These ships are **amongst the most technologically advanced Guided Missile Destroyers** of the world, with state-of-the-art weapon/sensor package, advanced stealth features and a high degree of automation.
 - In 2011, the deal to build four warships -- **Visakhapatnam, Mormugao, Imphal, and Surat** -- was signed under the Project-15B programme worth Rs 29,643.74 crore.
 - However, the final cost escalated to Rs 35,000 crore.

- All four ships have been **christened after cities from four corners of the country** and the induction of ships will be completed by 2024.
- **Features of the P-15B Ships:**
 - These ships are equipped with [BrahMos supersonic cruise missiles](#) and long-range **Surface-to-Air Missiles (SAM)**.
 - The ship has **several indigenous weapons systems** like medium range Surface-to-Air Missile (SAMs), indigenous torpedo tube launchers, anti-submarine indigenous rocket launchers and 76-mm super rapid gun mount.

What is INS Udaygiri?

- **About:**
 - It is the **third ship of [Project 17A](#) frigates**.
- **Named After:**
 - The ship 'Udaygiri' is **named after a mountain range in the state of Andhra Pradesh**.
 - 'Udaygiri' is the **reincarnation of erstwhile 'Udaygiri'**, the Leander Class ASW Frigate, which saw numerous challenging operations in its illustrious service to the country spanning over three decades from 1976 to 2007.
- **Progress under P17A:**
 - Under the P17A program, **a total of seven ships, with 04 at Mazagon Dock Limited (MDL), Mumbai and 03 at GRSE are under construction**.
 - **Various novel concepts and technologies** like Integrated Construction, Mega Block Outsourcing, Project Data Management/ Project Lifecycle Management (PDM/PLM) etc have been adopted for the first time in indigenous Warship Design and Construction in this project.

What is Project 17A Frigates?

- **About:**
 - **Project 17A frigates** are follow-on of the **P17 Frigates (Shivalik Class)** with improved stealth features, advanced weapons and sensors and platform management systems.
 - A total of **seven ships are being constructed**, four at Mazagon Dock Shipbuilders (MDL), Mumbai and three at **Garden Reach Ship Builders Limited (GRSE), Kolkata**.
- **Features:**
 - The main advanced stealth features of P-17A pertain to the **smaller Radar cross-section of the ship** achieved through the use of a special super structure shape which reduces radar wave reflections.
 - Another important feature is regarding the **ship's low acoustic noise emanating from propellers**, operating machinery like Diesel Generators etc., which helps sonars on other ships to detect its presence.
 - Such **stealth features play an important role in improving the ship's survivability** in any hostile environment during operations.

[Source: PIB](#)

Eklavya Model Residential Schools

Why in News?

Recently, the Ministry of Tribal Affairs has laid the foundation stone for the construction of Eklavya Model Residential School (EMRS) in Nashik, Maharashtra.

- The proposed EMR School aims to make quality education accessible to tribal students in remote tribal hinterlands of Nashik.

What are EMRS?

▪ About:

- EMRS is a **scheme for making model residential schools for Indian tribals (ST-Scheduled Tribes) across India**. It started in the year 1997-98.
- The Eklavya Model Residential School in Shinde (Nashik) has been planned by the Ministry Tribal Affairs **to give impetus to quality education in nearby tribal areas**.
- The EMR School follows the **CBSE curriculum**.
- Eklavya Model Residential Schools are being developed **to impart quality education to tribal students, with an emphasis on not only academic education but all-round development of tribal students**.
- At present, **there are 384 functional schools spanned across the country established at par with Navodaya Vidyalaya** with focus on special state-of-the-art facilities for preserving local art and culture besides providing training in sports and skill development.

▪ Coverage:

- As per existing EMRS Guidelines of 2010, at least one EMRS is to be set up in each Integrated Tribal Development Agency (ITDA) / [Integrated Tribal Development Project \(ITDP\)](#) having 50% ST population in the area.
- As per the budget 2018-19, **every block with more than 50% ST population and at least 20,000 tribal persons, will have an Eklavya Model Residential School** by the year 2022.

What are the Objectives EMRS?

- Comprehensive physical, mental and socially relevant development of all students enrolled in each and every EMRS.
- Seek to empower students to be change agents, beginning in their school, in their homes, in their village and finally in a larger context.
- Focus differentially on the educational support to be made available to those in Standards XI and XII, and those in standards VI to X, so that their distinctive needs can be met.
- Support **the annual running expenses in a manner that offers reasonable remuneration** to the staff and upkeep of the facilities.
- Support **the construction of infrastructure that provides** education, physical, environmental and cultural needs of student life.

What are the Legal Provisions for STs?

- Protection of Civil Rights Act, 1955 against Untouchability
- [Scheduled Castes and the Scheduled Tribes \(Prevention of Atrocities\) Act, 1989](#)
- Provisions of the Panchayats (Extension to the Scheduled Areas) Act, 1996
- [Scheduled Tribes and Other Traditional Forest Dwellers \(Recognition of Forest Rights\) Act, 2006](#)

What are the other Initiatives Related to Scheduled Tribes?

- TRIFED.
- [Digital Transformation of Tribal Schools.](#)
- [Development of PVTGs.](#)
- [Pradhan Mantri Van Dhan Yojana.](#)

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Q. Consider the following statements about Particularly Vulnerable Tribal Groups (PVTGs) in India: (2019)

1. PVTGs reside in 18 States and one Union Territory.
2. A stagnant or declining population is one of the criteria for determining PVTG status.
3. There are 95 PVTGs officially notified in the country so far.
4. Irular and Konda Reddi tribes are included in the list of PVTGs.

Which of the statements given above are correct?

- (a) 1, 2 and 3
(b) 2, 3 and 4
(c) 1, 2 and 4
(d) 1, 3 and 4

Ans: (c)

Exp:

- In 1973, the Dhebar Commission created Primitive Tribal Groups (PTGs) as a separate category, who are less developed among the tribal groups. The Commission stated that more developed and assertive tribal groups take a major chunk of the tribal development funds, because of which PVTGs need more funds directed for their development. In this context, in 1975, the Gol initiated to identify the most vulnerable tribal groups as a separate category called Primitive Vulnerable Tribal Groups.
- 75 tribal groups have been categorized by Ministry of Home Affairs as Particularly Vulnerable Tribal Groups (PVTGs). PVTGs reside in 18 States and the Union Territory of Andaman and Nicobar Islands. **Hence, statement 1 is correct and statement 3 is not correct.**
- The criteria followed for determination of PVTGs are a pre-agriculture level of technology, a stagnant or declining population, extremely low literacy, and a subsistence level of the economy. **Hence, statement 2 is correct.**
- Irular (Tamil Nadu) and Konda Reddi (Andhra Pradesh) tribes are included in the list of PVTGs. **Hence, statement 4 is correct**

Source: PIB

National Startup Advisory Council (NSAC)

Why in News?

Recently, the Minister of Commerce and Industry launched the **NavIC Grand Challenge at National Startup Advisory Council (NSAC) meeting.**

- **NavIC Grand Challenge** is aimed at promoting adoption of NavIC as geo-positioning solution, a key proponent for digital Atma Nirbharta.

What is NSAC?

- **About:**
 - It was constituted by the [Department for Promotion of Industry and Internal Trade \(DPIIT\)](#).
 - It **advises the government on measures needed** to build a strong ecosystem for nurturing innovation and startups in the country to drive sustainable economic growth and generate large scale employment opportunities.
- **Composition of the Council:**
 - **Chairman:** Minister for Commerce & Industry.
 - **Convener of the Council:** Joint Secretary, Department for Promotion of Industry and Internal Trade.
 - **Ex-officio Members:** Nominees of the concerned Ministries / Departments / Organisations not below the rank of Joint Secretary.
 - **Non-official members,** to be nominated by the Central Government, from various categories like founders of successful startups, veterans who have grown and scaled companies in India, persons capable of representing the interests of investors into startups, etc. The term of the non-official members will be for a period of two years.

What are the Functions of NSAC?

- **Suggests measures to foster a culture of innovation** amongst citizens and students, promote innovation in all sectors of the economy across the country.
- **Suggests measures to facilitate public organisations** to assimilate innovation with a view to improving public service delivery, promote creation, protection and commercialization of intellectual property rights.
- **Suggest measures to make it easier to start, operate, grow and exit businesses** by reducing regulatory compliances and costs, promote ease of access to capital for startups.

What is the Status of Start-ups in India?

- **About:**
 - Today, India is the **third largest start-up ecosystem globally** (by number of start-ups) with more than 15,000 start-ups established in 2020, up from 5000 in 2010.
 - The underlying enablers of this startup ecosystem include smartphone and internet penetration, [cloud computing](#), [application programming interfaces \(APIs\)](#), and a national payments stack in place.
 - Additionally, amid the [Covid-19 pandemic](#), **India has witnessed more number of Unicorn startups** (startups having valuation of over USD1 billion) in just 2021 than it did in the period 2011-20.
 - However, **still there are many challenges** (Building and Scaling an Indian Startup, Diversity and the Digital Divide, Complex Regulatory Environment) that act as a hindrance in realising the true potential of startups in India.
- **Other Related Initiatives:**
 - [Ranking of States on Support to Startup Ecosystems:](#) It is an evolved evaluation tool **aimed to strengthen the support of States and UTs** to holistically build their startup ecosystems.
 - **SCO Startup Forum:** The first-ever [Shanghai Cooperation Organisation \(SCO\)](#) Startup Forum was launched in October 2020 to develop and improve startup ecosystems collectively.
 - **Prarambh:** The 'Prarambh' Summit aims to provide a platform to the startups and young minds from around the world to come up with new ideas, innovation and invention.
 - [Startup India Seed Fund Scheme:](#) It aims to provide financial assistance to startups for proof of concept, prototype development, product trials, market entry, and commercialization.

- **Fisheries Startup Grand Challenge:** The Department of Fisheries, Ministry of Fisheries, Animal Husbandry & Dairying In association with Startup India, the Ministry of Commerce and Industry inaugurated the Fisheries Startup Grand Challenge.
- **National Startup Awards 2021:** It aims to **recognize and reward outstanding Startups and ecosystem enablers** that are building innovative products or solutions and scalable enterprises, with high potential of employment generation or wealth creation, demonstrating measurable social impact.

Source: PIB

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