

## **CURRENT AFFAIRS (02/11/2022)**

### **1) POLITY AND GOVERNANCE**

#### **TOPIC: THE C-295 AND INDIA'S AIRCRAFT**

##### **Why is it in the news?**

I) Recently, Prime Minister laid the foundation stone for **the C-295 transport aircraft manufacturing facility in Vadodara to be set up by Airbus Defence and Space and Tata Advanced Systems Limited (TASL).**

II) This is the **first time a private sector company would be manufacturing a full aircraft in the country.** This is a huge step forward for India in the global aircraft manufacturing domain.

##### **What is the C-295MW transporter?**

I) **The C-295MW is a transport aircraft of 5-10 tonne capacity which will replace the legacy Avro aircraft in the Indian Air Force (IAF) procured in the 1960s.** The Request For Proposal (RFP) was issued to global firms in May 2013 and the sole bid by Airbus and TASL was approved by the Defence Acquisition Council in May 2015. In September, 2021 the **Ministry of Defence (MoD) signed a ₹ 21,935 crore contract with Airbus Defence and Space for the acquisition of 56 C-295MW aircraft along with associated equipment.**



II) In the words of N. Chandrasekaran, Chairman of Tata Sons, with the set-up of the final assembly line in Vadodara, the Tata Group will now be able to take aluminium ingots at one end of the value stream and turn it into an Airbus C-295 aircraft for the IAF.

III) Of the 56 aircraft contracted, 16 will come in fly-away condition from Spain between September 2023 and August 2025. The remaining 40 will be manufactured here to be delivered between September 2026 and 2031 at the rate of eight aircraft per year. Nearly 240 engineers will be trained at the Airbus facility in Spain for the project.

IV) The C-295 has very good fuel efficiency and can take off and land from short as well as unprepared runways, according to Air Marshal Sandeep Singh, Vice Chief of IAF. The IAF will base its first C-295 squadron in Vadodara by converting the Avro squadron located there, as the fly-away aircraft start coming in.

V) With the procurement of these aircraft, **India has become the 35th C-295 operator worldwide.** With 285 aircraft ordered and 38 operators in 34 different countries, the aircraft has achieved more than 5,00,000 flight hours. The Navy and the Coast Guard have also expressed interest in the C-295 and it can be used in civilian roles as well as exported in the future.

VI) The C-295 is also a potential replacement for the AN-32 aircraft, the workhorse of the IAF with over 100 of them in service. According to Air Marshal Singh, AN-32s will be in service upto 2032 and beyond and that they would make a decision on its replacement in five years or so from now.

#### **In which terrains have the C295 operated across the world?**

As per Airbus, the C295 operates in the Brazilian jungles and Columbian mountains in South America, the deserts of Algeria and Jordan in the middle east and the cold climates of Poland and Finland in Europe. The aircraft has also flown in military operations in Chad, Iraq and Afghanistan.

#### **What are the roles that the C295 can perform?**

I) As a tactical transport aircraft, the C295 can carry troops and logistical supplies from main airfields to forward operating airfields of the country. It can also operate on short unprepared airstrips as it is capable of **Short Take-off and Landing (STOL)**. It can operate from short airstrips just 2,200 feet long and can fly low-level operations for tactical missions flying at a low speed of 110 knots.

II) The aircraft can additionally be used for casualty or medical evacuation, performing special missions, disaster response and maritime patrol duties.

#### **How will this affect the domestic aircraft manufacturing ecosystem?**

I) Over the last two decades, Indian companies, both public and private, have steadily expanded their footprint in the global supply chains of major defence and aerospace manufacturers supplying a range of components, systems and sub-systems.



II) For instance, Boeing's sourcing from India stands at \$1 billion annually, of which over 60% is in manufacturing, through a growing network of 300+ supplier partners of which over 25% are micro, small and medium enterprises (MSME). According to the company statement, "Boeing has the broadest and most capable engineering teams in the country with over 3,000 employees, and we're investing in a 43-acre, \$200 million centre of excellence to further grow in the years to come.

III) Tata in a **joint venture (JV)** with Boeing, manufactures aero-structures for its AH-64 Apache helicopter, including fuselages, secondary structures, vertical spar boxes fuselages and vertical fin structures for the 737 family of aircraft. It also makes Crown and Tail-cones for Boeing's CH-47 Chinook helicopters.

IV) Similarly, Lockheed Martin has joint ventures with TASL in Hyderabad which has manufactured more than 180 empennages for the C-130J Super Hercules transport aircraft and delivered 157 S-92 helicopter cabins. The latter facility manufactures aerospace components for commercial helicopters and aircraft and has expanded to include aircraft engine components for aerospace industry companies as well. One of the JV's also began manufacturing complex fighter wings with over 70% of detail parts produced indigenously. **The JVs till date have clocked \$600 million worth of exports and produced over \$200 million in Indian industry revenue.**

V) The U.S. simplifying its export regulations for India, through a series of measures, has added further impetus to this. As U.S. and India pursue the Indo-Pacific strategy, India's strengths coupled with U.S. and European technology prowess can be a force for good in the world.

VI) The domestic defence manufacturing ecosystem will get a boost with the C-295 project as it will lead to the development of a strong private industrial aerospace ecosystem not only in and around Vadorara but across the country. Bengaluru and Hyderabad already have developed such aerospace and defence domains over the years. **The C-295 project is expected to create more than 15,000 skilled direct and indirect jobs across the aerospace ecosystem, with more than 125 suppliers qualified on global quality standards across India.** Manufacturing of over 13,400 detail parts, 4,600 sub-assemblies and all the seven major component assemblies will be undertaken in India, along with tools, jigs and testers.

**Is India's civil aviation sector growing?**



I) India has a much bigger footprint in civil aviation manufacturing than defence, in addition to being a major market itself. Both Airbus and Boeing do significant sourcing from India for their civil programmes.

II) According to Airbus every commercial aircraft manufactured by them today is partly designed and made in India. According to the company statement, “We buy manufactured parts and engineering services worth \$650 million every year from more than 45 Indian suppliers”. Stating that **India, which is moving ahead with the mantra of ‘Make in India’ and ‘Make for the Globe’, continues to enhance its potential by becoming a major manufacturer of transport planes, Mr. Modi said, “And I can visualise the day when the world’s biggest passenger planes will also be manufactured in India and will also carry the tag of ‘Make in India’.**

III) Since 2007, Airbus has had a wholly domestic-owned design centre here which has more than 650 engineers who specialise in high-tech aeronautical engineering and work across both fixed- and rotary-wing Airbus aircraft programmes. Airbus which has design, management and training centres in India, quoted, “Our centres have the capacity to skill more than 8,000 pilots and 2,000 engineers over the next 10 years with plans for further expansion.”

IV) Today in India, we have the world’s fastest growing aviation sector and we are about to reach the top three countries in the world in terms of air traffic, Mr. Modi said. “Crores of new passengers are going to be air passengers in the next 4-5 years... It is estimated that in the coming 10-15 years, India will need about 2000 more passenger and cargo aircraft.”

V) Another major growing area is **Maintenance, Repair and Overhaul (MRO)** for which India can emerge as the regional hub, however, the private defence sector is still nascent and a conducive and stable regulatory and policy environment will be an important enabler.

VI) This moment is akin to the automobile clusters that have emerged in the country turning India into a major exporter of cars to the world. With the right momentum, a realistic roadmap and enabling policy framework, a similar story can be scripted to make the country a hub for aircraft manufacturing.

### **TOPIC: DECENTRALISING MGNREGS**

#### **Why is it in the news?**



Recently, an internal study commissioned by the Ministry of Rural Development has advised the decentralisation of MGNREGS.

**What are the highlights of the study?**

I) The study argued for **decentralisation of the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) which will allow for more “flexibility” at the ground level.**

II) It was the report of the sixth Common Review Mission. The report surveyed seven States — Andhra Pradesh, Arunachal Pradesh, Karnataka, Nagaland, Gujarat, Jharkhand, Himachal Pradesh — and the Union Territory of Jammu & Kashmir

III) The report aimed to assess the implementation of all rural development schemes, including the MGNREGS.

IV) Issue:

a) Centralised fund management: In the past few years, the fund management has been centralised instead of paying the gram sabhas an advance.

b) Delay in fund disbursement: The internal study also flagged the frequent delay in fund disbursement.

c) Wages below the market rate: The study also noted that the MGNREGS wages were far below the market rate in many States.

# For example, at present, the minimum wage of a farm labourer in Gujarat is 324.20, but the MGNREGS wage is 229.

# In Nagaland, the wage is 212 per day, which does not take into account the difficult terrain conditions.

V) Recommendations:

a) Diversification of permissible works:

# According to the study, there should be a greater diversification of permissible works instead of listing the types of permissible works.

# The broad categories of works may be listed out and flexibility should be given at ground level to select the type of works as per broad categories.

b) Paying gram sabhas an advance:

# Paying the gram sabhas in an advance will enable them to decide the work they want to undertake.

# The gram sabhas can take into account the local conditions and the community's requirement instead of chasing a target set for them.

c) Revolving fund:

To deal with the frequent delay in fund disbursement, the report suggested a "revolving fund that can be utilised whenever there is a delay in the Central funds".

### **Other Challenges faced by MGNREGS**

I) Corruption and Irregularities: Funds that reach the beneficiaries are very little compared to the actual funds allocated for the welfare schemes.

II) Discrimination: Frequent cases of discrimination against women and people from the backwards groups are reported from several regions of the country and a vast number goes unreported.

III) Non-payment of Unemployment Allowance: There is a huge pendency in the number of unemployment allowances being shown in the Management Information System (MIS).

IV) Lack of Awareness: People, especially women, are not fully aware of this scheme and its provisions leading to uninformed choices or inability to get the benefits of the scheme.

V) Poor Infrastructure Building: Improper surveillance and lack of timely resources result in poor quality assets.

VI) Non-Purposive Spending: MGNREGA has increased the earning capacity of the rural people but the spending pattern of the workers assumes significance because there is hardly any saving out of the wages earned.

### **Suggestions & way ahead**

I) Social audits: There is a need to carry out social audits as per rules and effective implementation of the delay compensation system.

II) Utilization of funds: Reasons for poor utilization of funds should be analyzed and steps must be taken to improve them. In addition, actions should be initiated against officers found guilty of misappropriating funds.

III) Raising awareness: The participation of women and backward classes must be increased by raising awareness and making it more inclusive.

IV) National Level Monitors: The frequency of monitoring by National Level Monitors (NLMs) should be increased and appropriate measures should be taken by States based on their recommendations.

### **SOME ADDITIONAL INFORMATION**

#### **MGNREGS**

Mahatma Gandhi National Rural Employment Guarantee Scheme (Mahatma Gandhi NREGS) is a demand driven wage employment Scheme. Its aim is to **provide not less than 100 days of unskilled manual work as a guaranteed employment in a financial year to every household in rural areas as per demand, resulting in creation of productive assets of prescribed quality and durability.**

#### **Features**

# Legal Right to Work: The Act provides a legal right to employment for adult members of rural households.

# Women: At least one-third of beneficiaries have to be women.

# Time-Bound Guarantee of Work: Employment must be provided within 15 days of being demanded to fail which an 'unemployment allowance' must be given.

# Decentralised Planning: Panchayati Raj Institutions (PRIs) are primarily responsible for planning, implementation and monitoring of the works that are undertaken. Gram Sabhas must recommend the works that are to be undertaken and at least 50 percent of the works must be executed by them.

# Transparency and Accountability: There are provisions for proactive disclosure through wall writings, Citizen Information Boards, Management Information Systems and social audits (conducted by Gram Sabhas).



#### **MGNREGS Contribution to SDGs**

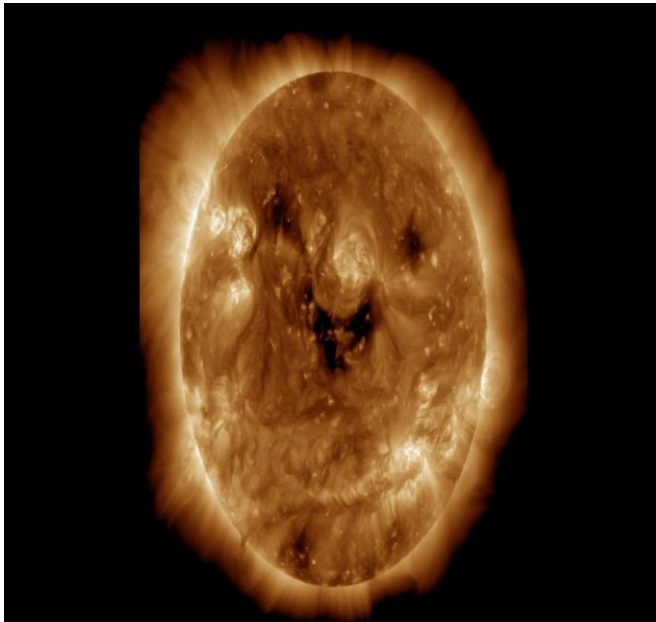
## **2) SCIENCE AND TECHNOLOGY**

### **TOPIC: CORONAL HOLES**

#### **Why is it in the news?**

I) Recently, the @NASASun Twitter handle shared an image of the sun seemingly 'smiling'. Captured by the **NASA Solar Dynamics Observatory**, the image has dark patches on the sun's surface resembling eyes and a smile.

II) **NASA explained that the patches are called coronal holes, which can be seen in ultraviolet light but are typically invisible to our eyes.**



#### **What are coronal holes?**

I) **These are regions on the sun's surface from where fast solar wind gushes out into space. Because they contain little solar material, they have lower temperatures and thus appear much darker than their surroundings. Here, the magnetic field is open to interplanetary space, sending solar material out in a high-speed stream of solar wind.**

II) **Coronal holes can last between a few weeks to**

**months.**

III) **The holes are not a unique phenomenon, appearing throughout the sun's approximately 11-year solar cycle.** They can last much longer during solar minimum – a period of time when activity on the Sun is substantially diminished.

#### **What do they tell us?**

I) "These 'coronal holes' are important to understanding the space environment around the earth through which our technology and astronauts travel," NASA had said in 2016 when coronal holes covering "six-eight per cent of the total solar surface" were spotted.



II) While it is unclear what causes coronal holes, they correlate to areas on the sun where magnetic fields soar up and away, without looping back down to the surface as they do elsewhere.

III) Scientists study these fast solar wind streams because they sometimes interact with earth's magnetic field, creating what's called a geomagnetic storm, which can expose satellites to radiation and interfere with communications signals.

### **What happens during a geomagnetic storm?**

I) According to the US government agency National Oceanic and Atmospheric Administration, **geomagnetic storms relate to earth's magnetosphere – the space around a planet that is influenced by its magnetic field.**

II) When a high-speed solar stream arrives at the earth, in certain circumstances it can allow energetic solar wind particles to hit the atmosphere over the poles. Such geomagnetic storms cause a major disturbance of the magnetosphere as there is a very efficient exchange of energy from the solar wind into the space environment surrounding earth.

III) In cases of a strong solar wind reaching the earth, the resulting geomagnetic storm can cause changes in the **ionosphere, part of the earth's upper atmosphere.** Radio and GPS signals travel through this layer of the atmosphere, and so communications can get disrupted.

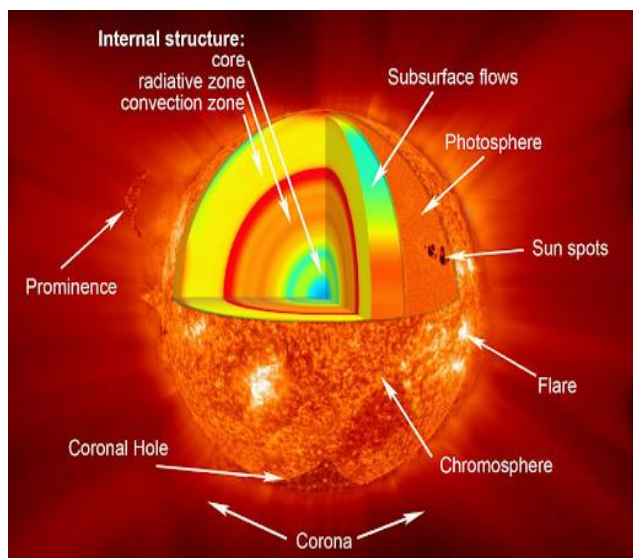
### **SOME ADDITIONAL INFORMATION**

#### **Anatomy of the Sun**

# **The Sun's Core** - Energy is generated via **thermonuclear reactions** creating extreme temperatures deep within the Sun's core.

# **The Radiative Zone** - Energy moves slowly outward, taking more than 1,70,000 years to radiate through this layer of the Sun.

# **The Convection Zone** - Energy continues to move toward the surface through convection currents of the heated and cooled gas.



# **The Chromosphere** - This relatively thin layer of the Sun is sculpted by magnetic field lines that restrain the electrically charged solar plasma. Occasionally larger plasma features, called prominences, form and extend far into the very tenuous and hot corona, sometimes ejecting material away from the Sun.

# **The Corona** - The ionized elements within the **corona (or solar atmosphere)** glow in the x-ray and extreme ultraviolet wavelengths. Space Instruments can image the Sun's corona at these higher energies since the **photosphere (lowest layer of the solar atmosphere)** is quite dim in these wavelengths.

# **Coronal Streamers** - The outward flowing plasma of the corona is shaped by magnetic field lines into tapered forms called coronal streamers, which extend millions of miles into space.

# **Sunspots**- Areas that appear dark on the surface of the Sun. They appear dark because they are cooler than other parts of the Sun's surface.

### **3) ENVIRONMENT AND BIODIVERSITY**

#### **TOPIC: BEFORE COP27, A STATUS CHECK**

##### **Why is it in the news?**

I) The annual **United Nations Climate Change Conference (COP27)** to be held in the Egyptian resort town of Sharm el-Shaikh amid fresh reminders that the window for meeting climate goals is closing fast.

II) Latest assessments suggest that current action plans of countries to meet climate goals are falling woefully short. And yet, no major win is expected at the conference, as, amid a deepening energy crisis and prevailing economic gloom, there is little appetite among countries to scale up climate action.

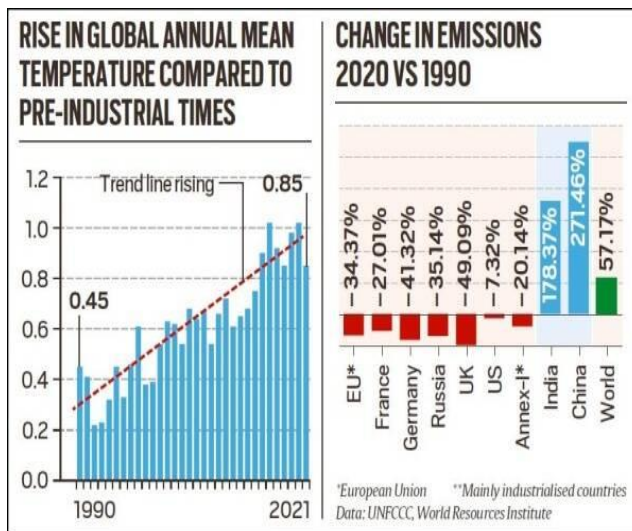
III) These annual conferences have been the main driver of the global fight against climate change. However, the response so far has not been commensurate to the enormity of the challenge. Remedial actions have been slow and incremental, while the impacts of global warming have been unfolding at a very rapid rate.

##### **Emissions still rising**

I) It's been at least two-and-a-half decades since the world decided to restrain its greenhouse gas emissions. In absolute terms however, the

annual global emissions are still rising, now touching almost 50 billion tonnes of carbon dioxide equivalent (see graph). In the decade between 2010 and 2019, the global emissions grew by over one per cent on an average. This is significantly slower than the growth in the previous decade, of about 2.6 per cent, but for meeting climate targets, is not good enough.

II) Moreover, even if the growth in emissions is halted immediately, or is made to decline, it does not solve the problem. This is because the warming of the planet is the result of accumulated emissions in the atmosphere and not the current emissions. **Carbon dioxide, the main greenhouse gas, remains in the atmosphere for about 100 years**, so that the effect of any immediate decline in emissions would have an impact only after several decades.



III) As a result, the average global temperatures have risen faster in the last one decade than anytime earlier (see graph). This trend is only likely to accelerate in the coming years. Recent data suggest that the annual mean temperature of the world is already higher by more than one degree Celsius from pre-industrial times. Some of the monthly means are higher by over 1.1 degree Celsius.

### **Response inadequate**

I) The response in terms of emission cuts has been inadequate. The rich and industrialised countries, which were the main polluters and hence mainly responsible to bring down emissions, have not met their collective targets. Developing countries like China or India, which were not major emitters till sometime back, have seen their emissions rise steeply.

II) As a bloc, the European Union has done relatively better on climate goals, with the United Kingdom, which is struggling with an economic downturn right now, halving its emissions from 1990 levels. The United States, the world's leading emitter till it was overtaken by China in the mid-2000s, has been a major laggard, cutting its emissions by only about 7 per cent from 1990 levels.

III) **China's emissions have risen by almost four times, and India's by about three times, during this period.**

IV) **Current global emissions are more than 50 per cent higher than in 1990.**

### **World headed to 2.8-degree warming**

I) The overall climate objective is to ensure that the rise in global temperatures does not go beyond 2 degrees compared with pre-industrial times. Preferably, it needs to be restricted within 1.5 degree Celsius.

II) Latest assessments suggest that if climate action is not immediately scaled up, the world is likely to become warmer by about 2.8 degree Celsius by the end of the century.

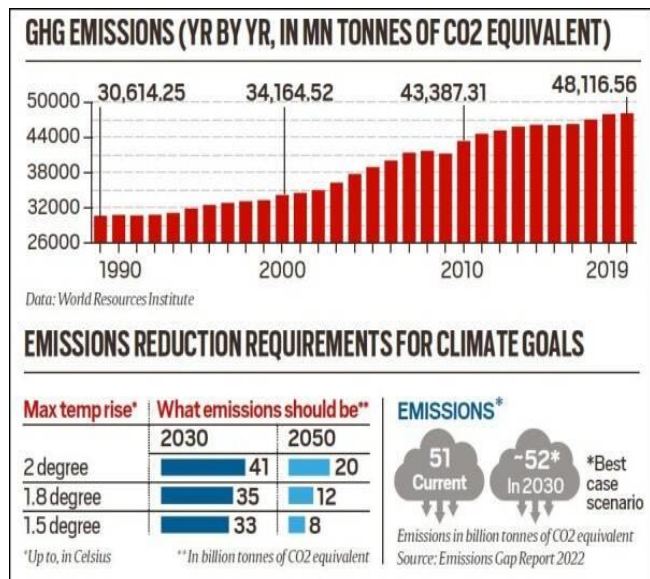
III) For a realistic chance to keep global warming within 1.5 degree Celsius, annual emissions would need to drop from the current level of about 50 billion tonnes of CO2 equivalent to about 33 billion tonnes by 2030 and 8 billion tonnes by 2050, according to the newest Emissions Gap Report. Even for meeting the 2-degree target, emissions have to come down to about 41 billion tonnes by 2030 and 20 billion tonnes by 2050.

IV) This would require drastic action from all the major emitters, and looks unlikely right now. In the last one year, just about 25 countries have strengthened their 2030 climate action plans, with minimal potential to bend the emission curve.

### **Impact of Ukraine War**

I) The energy and economic crisis caused by the Ukraine war is threatening to undo even the small gains made. Already, the consumption of fossil fuels has gone up. Countries have begun to secure more and more of traditional fossil fuels to deal with the uncertainty in the energy markets.

II) The impact of the war — which shows no signs of ending — is likely to be felt for a long time, slowing down progress on climate action by several years.





### **Dim expectations from Sharm el-Shaikh**

I) Though there would be usual calls for the need to urgently scale up climate action, the Sharm el-Shaikh meeting is unlikely to deliver anything concrete. Many countries, including India, had increased their climate pledges at the Glasgow meeting last year, and it would be unrealistic to expect them to do more this time.

II) The impact of the war in Ukraine is likely to dominate the discussions in Egypt. Occurrence of frequent climate disasters — like the historic flooding in Pakistan — is expected to result in renewed demands for a loss and damage framework, through which affected countries can seek compensation for the damages caused by extreme events.