

GEOGRAPHY**Effects of global warming on El Niño in the 21st Century**

A new study, published in Journal Nature, has thrown some light on the effects of global warming on El Niño in the 21st Century.

Highlights of the study:

- As per the study, though the theater of action for El Niño is the tropical Pacific Ocean, its global reach costs the global community tens of billion dollars each time. El Niño may impact weather phenomenon across the world. For Eg: The eagerly-awaited winter rain and snow storms over California did not occur over California during the latest extreme El Niño.
- The study notes that strong El Niños and extreme weather events associated with such strong El Niños will increase in the coming decades. This should serve as a warning to the countries on all continents that suffer from these extreme weather events.
- However, available data is not sufficient to say with confidence how the tropical Pacific has responded to global warming till now. It is unclear if the impact of global warming on El Niño can easily be extracted considering its intrinsic tendencies and the fact that it depends on so many factors that are not easily predictable.
- In this context, it is imperative that models be held to very stringent standards on their performance of El Niño behaviour during historic periods, especially the 20th century, as a test of their reliability for future projections.
- This would also be necessary for projecting other events such as droughts and floods. For example, droughts over India are closely tied with El Niño and any projections of how droughts will respond to global warming will depend on how models perform in their historic depiction of El Niños as well as monsoons and how reliably they can project El Niño response to global warming.

Need of the hour: Develop strong and accurate models to study El Niño and effects of global warming on it. This would also be necessary for projecting other events such as droughts and floods.

El Nino: El Nino is a climatic cycle characterized by high air pressure in the Western Pacific and low air pressure in the eastern. In normal conditions, strong trade winds travel from east to west across the tropical Pacific, pushing the warm surface waters towards the western Pacific. The surface temperature could witness an increase of 8 degrees Celsius in Asian waters. At the same time, cooler waters rise up towards the surface in the eastern Pacific on the coasts of Ecuador, Peru, and Chile. This process called upwelling aids in the development of a rich ecosystem.

ENSO and La Nina : ENSO is nothing but El Nino Southern Oscillation. As the name suggests, it is an irregular periodic variation of wind and sea surface temperature that occurs over the tropical eastern Pacific Ocean. ENSO affects the tropics (the regions surrounding the equator) and the subtropics (the regions adjacent to or bordering the tropics). The warming phase of ENSO is called El Nino, while the cooling phase is known as La Nina.

Causes El Nino:

- El Nino sets in when there is anomaly in the pattern. The westward-blowing trade winds weaken along the Equator and due to changes in air pressure, the surface water moves eastwards to the coast of northern South America.
- The central and eastern Pacific regions warm up for over six months and result in an El Nino condition.
- The temperature of the water could rise up to 10 degrees Fahrenheit above normal. Warmer surface waters increase precipitation and bring above-normal rainfall in South America, and droughts to Indonesia and Australia.

Effects of El Nino:

- El Nino affects global weather. It favours eastern Pacific hurricanes and tropical storms. Record and unusual rainfall in Peru, Chile and Ecuador are linked to the climate pattern.
- El Nino reduces upwelling of cold water, decreasing the uplift of nutrients from the bottom of the ocean. This affects marine life and sea birds. The fishing industry is also affected.
- Drought caused by El Nino can be widespread, affecting southern Africa, India, Southeast Asia, Australia, and the Pacific Islands. Countries dependent on agriculture are affected.
- Australia and Southeast Asia get hotter.

- A recent WHO report on the health consequences of El Nino forecasts a rise in vector-borne diseases, including those spread by mosquitoes, in Central and South America. Cycles of malaria in India are also linked to El Nino.

CONSTITUTION AND POLITY

Difference between a full Budget and an interim Budget and Vote on Account:

The government has presented its last Budget ahead of the elections. Conventionally, a government at the end of its term has gone in for a vote on account rather than a full Budget. Therefore, experts are divided over the issue. While few are in favour of a full budget, others oppose it on the ground that this is an election year and the government has already presented 5 full budgets.

Constitutional Provisions: Article 112, which deals with the Budget, has officially named the document as “Annual Financial Statement”. Article 266 of the Constitution of India mandates that Parliamentary approval is required to draw money from the Consolidated Fund of India. Besides, Article 114 (3) of the Constitution stipulates that no amount can be withdrawn from the Consolidated Fund without the enactment of a law (appropriation bill).

Vote on account: A vote on account essentially means that the government seeks the approval of Parliament for meeting expenditure — paying salaries, ongoing programmes in various sectors etc — with no changes in the taxation structure, until a new government takes over and presents a full Budget that is revised for the full fiscal.

The reasoning is that there is little time to get approvals from Parliament for various grants to ministries and departments, and to debate these as well as any provisions for changes in taxation. More importantly, the reasoning is that it would be the prerogative of the new government to signal its policy direction, which is often reflected in the Budget.

Difference between Full Budget and Vote on Account:

- Full Budget deals with both expenditure and revenue side but Vote-on-account deals only with the expenditure side of the government’s budget.
- The vote-on-account is normally valid for two months but full budget is valid for 12 months (a financial year).
- As a convention, a vote-on-account is treated as a formal matter and passed by Lok Sabha without discussion. But passing for budget happens only after discussions and voting on demand for grants.

Interim Budget: An Interim Budget is not the same as a ‘Vote on Account’. While a ‘Vote on Account’ deals only with the expenditure side of the government’s budget, an Interim Budget is a complete set of accounts, including both expenditure and receipts. An Interim Budget gives the complete financial statement, very similar to a full Budget.

The President’s address to both Houses of Parliament

The President’s address to the joint sitting of Parliament at the beginning of the Budget Session every year is a Constitutional requirement.

Some Facts about President’s Address:

- Article 87(1) of the constitution says the President shall address both Houses of Parliament assembled together and inform Parliament of the causes of its summons: At the commencement of the first session after each general election to the House of the People and at the commencement of the first session of each year
- The Address at the beginning of the first session each year takes place at the time and date notified for the commencement of the session.
- Half an hour after the President has finished speaking, the two Houses assemble separately in their respective Chambers for the transaction of formal business.

First Amendment:

- Originally, the Constitution required the President to address both Houses of Parliament at the commencement of “every session”.
- This requirement was changed by the First Amendment to the Constitution — PM Nehru argued in Parliament that it was too cumbersome process to have the President, complete with the entire paraphernalia that his office carries, address the Houses every time.

Importance of Presidents Address

- The President’s speech essentially highlights the government’s policy priorities and plans for the upcoming year.
- It highlights various development works and commitment to social justice by the government.

- The Indian President has the power to send messages not only on legislative matters but also 'otherwise'.
- It is drafted by the Cabinet, and provides a broad framework of the government's agenda and direction.

INTERNATIONAL AFFAIRS- BILATERAL, GROUPINGS, ORGANISATIONS

Africa Centre for Climate and Sustainable Development

The Africa Centre for Climate and Sustainable Development was inaugurated by the Italian Prime Minister Giuseppe Conte at Rome. The centre has been opened by the Italian government in association with the United Nations Development Programme (UNDP) and the Food and Agricultural Organization (FAO).

Mandate:

- The centre would facilitate coordination among the G7 and African countries on common initiatives in Africa to achieve the goals set by the Paris Agreement and the 2030 Agenda.
- The Centre would contribute towards addressing the needs of Africa by providing a platform for G7 countries to steer their cooperation to contrast environmental degradation and promote sustainable economic growth in the region.
- The centre will provide a fast-track, demand-driven mechanism for African countries to access grant resources that support policies, initiatives, and best practices on climate change, food security, access to water, clean energy, and accelerating progress on the Sustainable Development Goals (SDGs) in Africa.
- The centre would be hosted by UNDP which would utilize its extensive country office network and programmatic hubs, and global expertise and knowledge, to enable the African countries to access the resources available through it.

No Indo-Nepal pact on tigers yet

Though India and Nepal had agreed to collaborate on conducting the tiger census in their countries in 2018, they've yet to sign an agreement on sharing detailed assessments of the numbers. It was expected that both countries would arrive at an agreement to be signed during the ongoing conference on Global Tiger Recovery Programme.

Adjoining transitions

- The Chitwan National Park in Chitwan and Parsa Wildlife Reserve of Nepal are adjacent to the Balmiki Tiger Reserve in Bihar.
- Likewise, Nepal's Bardia National Park adjoins India's Katarniaghat Wildlife Sanctuary, while the Shuklaphant National Park in Nepal adjoins India's Dudhwa Tiger Reserve.

Avoiding double count

- Nepal already publicized the results of its tiger census last September — 235, and this represents an 18% rise from the 198 tigers in 2013.
- However, India needs details on the locations of these tigers, which are captured via camera traps, to be sure that some tigers found on the border are not double-counted.

Adopting a common methodology

- India's tiger census is huge and spans a vast area.
- However, both (countries) are sovereign and so data sharing must be on equal terms.
- Prior to beginning its census, India had also signed agreements with Bhutan and Bangladesh regarding sharing tiger numbers and conducting surveys using a common methodology.
- Both these countries had already shared data with India.

Indian Count

- Officially, India had 2,226 tigers as of 2014.
- An ongoing census is expected to reveal an update to these numbers.
- 25-35% of India's tigers now lived outside protected reserves.

ENVIRONMENT- CONSERVATION, BIO-DIVERSITY AND ISSUES

Cow urine may be adding to global warming:

A recent study says that cow urine may be adding to global warming.

- The urine from the ruminant is a source of nitrous oxide emissions (N₂O), a gas that is 300 times more powerful than carbon dioxide.
- Most times, when cow urine is used in degraded pastures, N₂O emissions are tripled.
- The cattle and livestock are a significant source of methane, a greenhouse gas, and therefore a contributor to global warming, is well-known. However, the role of cow urine is less understood.

Concerns for India:

- Dung and urine are commonly mixed together for manure in Indian fields. Since, India also hosts the world's largest livestock population, as well as significant tracts of degraded land, the findings may have a bearing on nitrogen emissions from Indian fields.
- A 2012 satellite study by the Indian Space Research Organisation (ISRO) said that about 30% of India's geographical area (or about 96.4 million hectares) is degraded.
- Degraded pastures not only affect food security and the livelihood of farmers today, but affect the livelihood of future farmers because they emit more gases that cause global warming.
- Degraded grasslands emitted more N₂O than healthy pastures because the vegetation in the latter took up some of the reactive nitrogen compounds and only the leftovers were emitted.

Airpocalypse III Report

There are 139 Indian cities that breach air pollution standards but are not included in the Centre's National Clean Air Programme (NCAP), says a report by Greenpeace. The NCAP was launched by the government earlier this month and is a Rs. 300 crore initiative to reduce particulate matter (PM) pollution by 20-30% in at least 102 cities by 2024.

Highlights of Airpocalypse III

- Airpocalypse III, as the Greenpeace report is titled, analyses air pollution data of 313 cities and towns for the year 2017.
- Of these 313 cities, 241 (77%) had PM₁₀ levels beyond the National Ambient Air Quality Standards (NAAQS).
- While 102 of these cities were included in the NCAP, the remaining 139 cities were left out.
- That's because the government's list of 102 cities relied on average pollution data until 2015, whereas Airpocalypse III used data updated up to 2017.

Action plan under NCAP

- The 102 cities, identified as hotspots of pollution, were asked to submit a plan for how they would address the problem.
- Broadly, the plans include increasing the number of monitoring stations, providing technology support, conducting source apportionment studies, and strengthening enforcement.
- As part of the NCAP, cities have been given a specified number of days to implement specific measures such as "ensuring roads are pothole-free to improve traffic flow and thereby reduce dust" (within 60 days) or "ensuring strict action against unauthorized brick kilns" (within 30 days).
- It doesn't specify an exact date for when these obligations kick in.

Fault-line in NCAP

- Even if the NCAP were to be able to reduce pollution by 30% by 2024, 153 cities would still be left with pollution levels exceeding the NAAQS, the report said.
- Of the 139 cities that have not been included in the non-attainment list under the NCAP, there are several cities that have a population of more than 1 million, and PM levels (recorded in 2017) above NAAQS.
- Since the data for 2017 was available when NCAP was finalised, it would have made more sense to update the non-attainment list to include all such cities in the final NCAP.

SCIENCE AND TECHNOLOGY- EVERYDAY SCIENCE, SPACE, NUCLEAR, DEFENCE ETC**ISRO launches Human Space Flight Centre in Bengaluru**

ISRO, recently, has launched the Human Space Flight Centre in Bengaluru.

Human Space Flight Centre (HSFC)

- The HSFC, the hub of ISRO's future manned missions, was inaugurated at ISRO headquarters in Bengaluru.
- Announced on August 15 2018, the country's first crewed mission is set to happen by 2022, the 75th year of Independence.
- HSFC shall be responsible for the implementation of Gaganyaan project — which involves mission planning, development of engineering systems for crew survival in space, crew selection and training and also pursue activities for sustained human space flight missions.
- HSFC will take the support of ISRO centres to implement the first developmental [crewed] flight.