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GS-1

New Research on Dravidian Language:

Context:

The Dravidian [language](#) family, consisting of 80 varieties spoken by nearly 220 million people across southern and central India, originated about 4,500 years ago, a study has found.

This estimate is based on new linguistic analyses by an international team, including researchers from the Max Planck Institute for the Science of Human History in Germany, and the Wildlife Institute of India in Dehradun.

Details of Study:

- The researchers used data collected first-hand from native speakers representing all previously reported Dravidian subgroups.
- South Asia, reaching from Afghanistan in the west and Bangladesh in the east, is home to at least six hundred languages belonging to six large language families, including Dravidian, Indo-European and Sino-Tibetan.
- The Dravidian language family, consisting of about 80 language varieties (both languages and dialects) is today spoken by about 220 million people, mostly in southern and central India, and surrounding countries.
- The Dravidian language family's four largest languages — Kannada, [Malayalam](#), Tamil and Telugu — have literary traditions spanning centuries, of which Tamil reaches back the furthest, researchers said.
- Along with [Sanskrit](#), Tamil is one of the world's classical languages, but unlike Sanskrit, there is continuity between its classical and modern forms documented in inscriptions, poems, and secular and religious texts and songs.

Significance of Study:

- The study of the Dravidian languages is crucial for understanding prehistory in Eurasia, as they played a significant role in influencing other language groups.



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- Neither the geographical origin of the Dravidian language nor its exact dispersal through time is known with certainty.
- The consensus of the research community is that the Dravidians are natives of the Indian subcontinent and were present prior to the arrival of the Indo-Aryans (Indo-European speakers) in India around 3,500 years ago.
- Researchers said that it is likely that the Dravidian languages were much more widespread to the west in the past than they are today.

How reliable is the Research?

- The researchers used advanced statistical methods to infer the age and sub-grouping of the Dravidian language family at about 4,000-4,500 years old.
- This estimate, while in line with suggestions from previous linguistic studies, is a more robust result because it was found consistently in the majority of the different statistical models of evolution tested in this study.
- This age also matches well with inferences from [archaeology](#), which have previously placed the diversification of Dravidian into North, Central, and South branches at exactly this age, coinciding with the beginnings of cultural developments evident in the archaeological record.

Polar Vortex:

Why in News?

A blast of Arctic air from the polar vortex brought dangerous, bone-chilling cold to a wide swath of the United States on Tuesday, stretching from the Dakotas through Maine, with snow expected as far south as Alabama and Georgia.

The Midwest was the hardest-hit region, as temperatures plunged below zero Fahrenheit (-18°C). By nightfall the mercury was hovering at 0°F in Chicago, 7°F (minus 14°C) in Detroit and minus 21°F (minus 29°C) in Minneapolis.

What is Polar vortex?



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- The brutal blast known as the polar vortex is a stream of cold air that spins around the stratosphere over the North Pole, but whose current has been disrupted and is now pushing south into the United States.
- A **polar vortex** is an upper level [low-pressure area](#) lying near the Earth's poles.
- There are two polar vortices in the [Earth's](#) atmosphere, overlying the [North](#) and [South Poles](#).
- The bases of the two polar vortices are located in the middle and upper [troposphere](#) and extend into the [stratosphere](#).
- Beneath that lies a large mass of cold, dense Arctic air.

Rotation and Extent:

- A polar vortex strengthens in the winter and weakens in the summer due to its dependence on the temperature difference between the equator and the poles.
- The vortices span less than 1,000 kilometers (620 miles) in diameter, within which they rotate counter-clockwise in the [Northern Hemisphere](#) and in a clockwise fashion in the [Southern Hemisphere](#).
- As with other cyclones, their rotation is driven by the [Coriolis effect](#).

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Benami Property:

Why in News?

The Income Tax Department has confiscated assets worth ₹6,900 crore till now as part of its action under the [anti-benami transactions law](#).

What is a Benami Transaction?

A benami transaction is an arrangement in which a property (movable or immovable) is transferred to or held in the name of one person (benamidar) but is actually owned and enjoyed by another person (beneficial owner).



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Benami Transactions (Prohibition) Amendment Act, 2016:

Salient Features:

- The PBPT Act defines benami transactions, prohibits them and further provides that violation of the PBPT Act is punishable with imprisonment and fine.
- The PBPT Act prohibits recovery of the property held benami from benamidar by the real owner.
- Properties held benami are liable for confiscation by the Government without payment of compensation.
- An appellate mechanism has been provided under the PBPT Act in the form of Adjudicating Authority and Appellate Tribunal.
- The Adjudicating Authority referred to in section 6(1) of the Prevention of Money Laundering Act, 2002 (PMLA) and the Appellate Tribunal referred to in section 25 of the PMLA have been notified as the Adjudicating Authority and Appellate Tribunal, respectively, for the purposes of the PBPT Act.
- A Joint / Additional Commissioner of Income-tax, an Assistant / Deputy Commissioner of Income-tax and a Tax Recovery Officer in each Pr. CCIT Region have been notified to perform the functions and exercise the powers of the Approving Authority, Initiating Officer and Administrator, respectively under the PBPT Act.

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IEA's Report "The Future of Rail"

Why in News?

Minister of Railways & Coal, Shri Piyush Goyal launched the report "The Future of Rail" of International Energy Agency (IEA) at an event here today.

About the Report:

- "The Future of Rail" the first-of-a-kind report analyses the current and future importance of rail around the world through the perspective of its energy and environmental implications.



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- The report reviews the impact of existing plans and regulations on the future of rail, and explores the key policies that could help to realise an enhanced future rail.
- This first ever global report has a focus on India, elaborating on the unique social and economic role of rail in India, together with its great enduring potential, to show how India can extend and update its networks to harness rail at a scope and scale that is unparalleled.

Backgrounder:

- The IEA is an inter-governmental organisation that works to ensure reliable, affordable and clean energy for its 30 member countries and 8 association countries.
- Its mission is guided by four main areas of focus: energy security, economic development, environmental awareness and engagement worldwide.

India and IEA:

- India and the International Energy Agency (IEA) have benefited from a long, on-going bilateral relationship and cooperation in a broad range of area.
- These include energy security, statistics, energy efficiency, market analysis for oil, gas, electricity, renewables, system integration and implementation agreements for enhanced technologies.
- India has been the focus of many recent IEA analyses and reports for instance through the special focus chapter on the Indian Power sector of the Energy Technology Perspectives (ETP) publication and the World Energy Outlook (WEO).
- High level policy dialogues have been further intensified over the last few years including a statement of intent on data and research cooperation, and a memorandum of understanding on clean energy research and development tracking.
- IEA has also held workshops and training programmes in India on energy data training, energy efficiency, strategic petroleum reserves, and the integration of renewables into the grid.

Regional testing laboratory of CPRI



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Why in News?

Shri R K Singh, Union Minister of State (IC) for Power and New & Renewable Energy, Government of India laid the foundation stone of Regional testing laboratory of Central Power Research Institute (CPRI) at Nashik, Maharashtra today.

Benefits:

- Manufacturers in the western region will be greatly benefited as they can test their products close to their manufacturing units.
- This would reduce the turnaround time and overhead cost.
- This shall help the power utilities in the country to install reliable and quality equipment in the power system network.

Why is it Needed?

- Electrical Equipment plays a vital role in the Power System Network right from Generation, Transmission & Distribution.
- Such electrical equipment needs to be tested and certified as per the national and international standards.
- Electricity demand in the country has increased rapidly and is expected to rise further in the years to come.
- In order to meet the increasing demand for electricity in the country, massive addition to the installed generating capacity is required.
- This leads to growth of electrical industries and development of indigenous products.
- Keeping this in view, Government of India has sanctioned establishing Research and Testing facilities in the western region at Nashik at an outlay of Rs 115.3 Cr.

About CPRI :

- To cater to the testing needs, CPRI, Autonomous body under Ministry of Power, Govt of India serves as an Independent third party testing laboratory.
- CPRI has been serving for the past five decades in the field of Testing and Certification, Research, Consultancy, Third Party Inspection services, Training & Vendor Analysis.



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Effect of Sonar on Whales:

Why in News?

Scientists have long known that some beaked whales beach themselves and die in agony after exposure to naval sonar, and now they know why: the giant sea mammals suffer decompression sickness, just like scuba divers.

The explanation was laid out on Wednesday by 21 experts in the *Royal Society journal Proceedings B*.

How does it affect?

- Evolution has turned whales into perfectly calibrated diving machines.
- The heart rate slows, blood flow is restricted, oxygen is conserved.
- So how could they wind up with nitrogen bubbles poisoning its veins, like a scuba novice rising too quickly to the surface?
- Short answer: beaked whales — especially one species known as Cuvier's — get really, really scared.
- "In the presence of sonar they are stressed and swim vigorously away from the sound source, changing their diving pattern.
- The stress response, in other words, overrides the diving response, which makes the animals accumulate nitrogen,.
- One type of sonar developed in the 1950s — mid-frequency active sonar (MFAS), — in particular, throws these whales off balance.
- It is used today by Navies.

Evidences:

- The most deadly episode, in 2002, saw 14 stranded in the Canary Islands during a NATO naval exercise.
- Outwardly, the whales showed no signs of disease or damage: they had normal body weight, and no skin lesions or infections.
- Internally, nitrogen gas bubbles filled the veins, and their brains were ravaged by haemorrhaging.



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- Autopsies also revealed damage to other organs, as well as to the spinal cord and central nervous system.
- As with altitude sickness, reactions — in humans, and probably in whales — to nitrogen bubbles in the blood vary in type and intensity.
- A 2003 study in Nature on the link between sonar and whale deaths led Spain to ban naval exercises around the Canary Islands in 2004.