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# DAILY NEWS DIARY

Of

**04.07.2022**

# FOR PRELIMS AND MAINS

Warm Greetings.

- DnD aims to provide every day news analysis in sync with the UPSC pattern.
- It is targeted at UPSC – Prelims & Mains.
- Daily articles are provided in the form of Question and Answers
- To have a bank of mains questions.
- And interesting to read.
- Providing precise information that can be carried straight to the exam, rather than over dumping.

# INDEX

# GS 1

## ❖ GEOGRAPHY

**Q) Analyse the issues and measurement process of Earth quakes. Explain the magnitude of Earthquake in Afghanistan.**

**Context:**

Recently a powerful earthquake of magnitude 5.9 on the Richter scale struck a remote town in Afghanistan, killing over a thousand and injuring many more.


**Earthquakes:**

- According to the theory of plate tectonics, the Earth's crust and upper mantle are made of large rigid plates that can move relative to one another.
- Slip on faults near the plate boundaries can result in earthquakes.
- The point inside the Earth where the earthquake rupture starts is called the focus or hypocentre.
- The point directly above it on the surface of the Earth is the epicentre.

**Seismic Waves:**

- Any elastic material when subjected to stress, stretches in a proportional way, until the elastic limit is reached.
- When the elastic limit is crossed, it breaks.
- Similarly, the Earth also has an elastic limit and when the stress is higher than this limit, it breaks.
- Then there is a generation of heat, and energy is released. Since the material is elastic, the energy is released in the form of elastic waves.
- These propagate to a distance determined by the extent of the impact. These are known as seismic waves.

**Earthquake in Afghanistan:**

1. Afghanistan is earthquake-prone because it's located in the mountainous Hindu Kush region, which is part of the Alpide belt — the second most seismically active region in the world after the Pacific Ring of Fire.
2. The Alpide belt runs about 15,000 kilometers, from the southern part of Eurasia through the Himalayas and into the Atlantic.
3. Along with the Hindu Kush, it includes a number of mountain ranges, such as the Alps, Atlas Mountains and the Caucasus Mountains.
4. Additionally, the Earth's crust is especially lively in Afghanistan because it is where the Arabian, Indian and Eurasian tectonic plates meet.
5. The boundary between the Indian and Eurasian plates exists near Afghanistan's border with Pakistan.

**How are earthquakes measured?**

- Earthquakes are measured by seismographic networks, which are made of seismic stations, each of which measures the shaking of the ground beneath it.
- In India, the National Seismological Network does this work.
- It has a history of about 120 years and its sensors can now detect an earthquake within five to ten minutes.

**Issues with Earthquake measurement:**

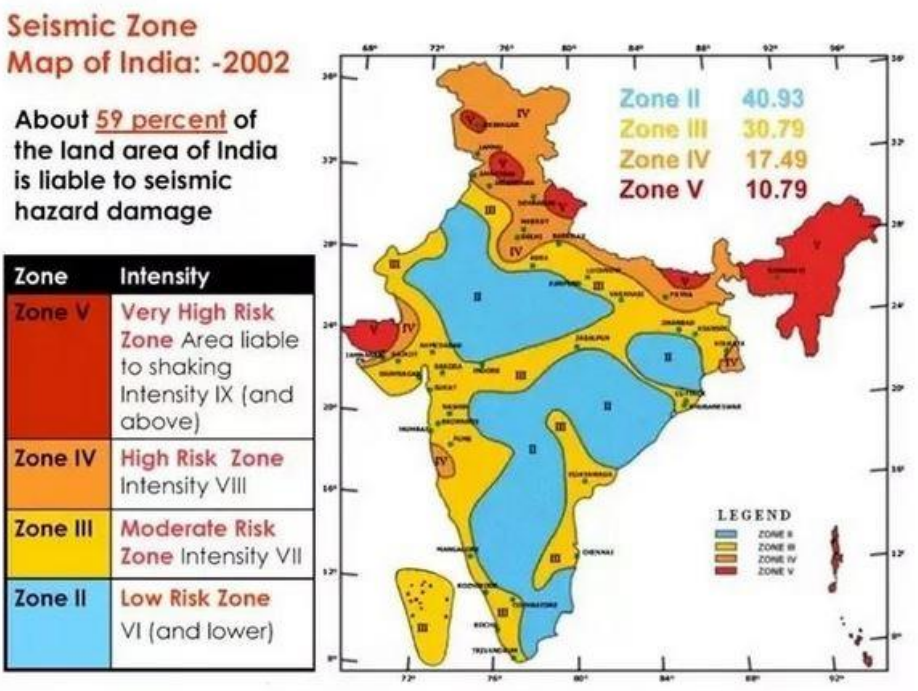
- Everywhere, the wave parameters are measured, not the total energy released.
- There is a direct relationship between the quantum of energy released and the wave amplitude.
- The amplitude of the wave is a function of the time period of the wave.
- It is possible to convert the measured wave amplitude into the energy released for that earthquake.
- This is what seismologists call the magnitude of the earthquake.

**Richter magnitude scale:**

- ✓ This is a measure of the magnitude of an earthquake and was first defined by Charles F. Richter of the California Institute of Technology, U.S., in 1935.
- ✓ The magnitude of an earthquake is the logarithm of the amplitude of the waves measured by the seismographs.
- ✓ Richter scale magnitudes are expressed as a whole number and a decimal part, for example 6.3 or 5.2.
- ✓ Since it is a logarithmic scale, an increase of the whole number by one unit signifies a tenfold increase in the amplitude of the wave and a 31-times increase of the energy released.

**How are zones designated?**

Based on seismicity, intensity of earthquakes experienced, and geological and tectonic qualities of a region, countries are divided into several zones. In India, for example, there are four zones, designated Zone II-Zone V. Among these, Zone V is the most hazardous and Zone II the least hazardous.




**Prediction of Earthquakes:**

1. Since parameters of the earthquake are unknown, it is near impossible to predict an earthquake.
2. The problem with earthquakes is that they are heavily dependent on the material property, which varies from place to place.
3. If there are elastic waves propagating through a material, there are two kinds of waves — the primary wave which reaches first, and the second one called the secondary wave, which is more destructive.
4. If it is known that the amount of energy released is extremely high, trains and power grids can be shut down and the damage minimised.
5. This has worked in some locations, but not on a large commercial basis.

***Source: The Hindu***

# GS 2

## ❖ INTERNATIONAL RELATIONS

**Q) Explain the apprehensions on Russia's ability to uphold Defence cooperation with India.**

**Context:**

As the war in Ukraine stretches over four months with no end in sight, it has given rise to apprehensions on Russia's ability to adhere to timely deliveries of spares and hardware to India.


**Major chunk of India's strategic arms:**

- Russia has provided some of the most sensitive and important weapons platforms that India has required from time to time including nuclear submarines, aircraft carriers, tanks, guns, fighter jets, and missiles.
- According to one estimate, the share of Russian-origin weapons and platforms across Indian armed forces is as high as 85%.
- Russia is the second-largest arms exporter in the world, following only the United States.
- For Russia, India is the largest importer, and for India, Russia is the largest exporter when it comes to arms transfer.

**Present status of defence cooperation:**

- When the war began, Indian armed forces had stocks of spares and supplies for eight to ten months and the expectation was that the war would end quickly.
- However, as it stretches on with no clear endgame, there are apprehensions on Russia's ability to adhere to the timelines for both spares as well as new deliveries.
- Armed forces are looking at certain alternative mitigation measures and identifying alternate sources from friendly foreign countries.
- However, in the long term, this is also an opportunity for the private industry to step up production and meet the requirements.

**Impact of the war:**

- While some timeline lapses and shipping delays were possible, there would not be any dent on the Army's operational preparedness along the borders.
- In addition, the armed forces have also made significant emergency procurements since the standoff in Eastern Ladakh and have stocked up on spares and ammunition.
- However, Russia has assured India that it would adhere to delivery timelines.
- Since the war sees no end, Russian industry would be caught up in replenishing the inventories of their own armed forces.

- Between 2000 and 2020, Russia accounted for 66.5% of India's arms imports.
- Russia's share in Indian arms imports was down to about 50% between 2016 and 2020, but it still remained the largest single importer.

**Status of India's deals with Russia:**

- The defence trade between India and Russia has crossed $15 billion since 2018, in the backdrop of some big deals including the $5.43 billion S-400 long range air defence systems.
- Other major contracts currently under implementation are construction of four additional stealth frigates in Russia and India,
- There is a licensed production of the Mango Armor-piercing fin-stabilised discarding sabot (APFSDS) rounds for the T-90S tanks as also additional T-90S tanks, AK-203 assault rifles among others.

**Deferred deals in downtime:**

- There are several big deals deferred by the Defence Ministry as part of the review of all direct import deals.
- This is in conjunction with efforts to push the 'Make in India' scheme in defence.
- Russian deals have also been deferred including the one for 21 MiG-29 fighter jets for the Indian Air Force (IAF) along with the upgradation of 59 existing Mig-29 jets.
- This also includes the deferment of the manufacture of 12 SU-30 MKI aircraft by Hindustan Aeronautics Limited (HAL).

**Status of payments:**

- ✓ While India continues to remain Russia's largest arms buyer with a major chunk of legacy hardware from Russia and the Soviet Union, the volume of imports has reduced in the last decade.
- ✓ With Russia being shut out of the global SWIFT system for money transfers, India and Russia have agreed to conduct payments through the Rupee-Rouble arrangement.
- ✓ With several big-ticket deals including the S-400 under implementation, there are large volume of payments to be made.

***Source: The Hindu***

# GS 3

## ❖ ECONOMY

**Q) Explain the significance and functioning of the National Investigation Agency (NIA).**

**Context:**

The National Investigation Agency (NIA) has taken over the probe into the terrible beheading of a person in Udaipur by Jihadi radicalists.

**NIA:**

Headquartered in Delhi, the NIA has its branches in Hyderabad, Guwahati, Kochi, Lucknow, Mumbai, Kolkata, Raipur, Jammu, Chandigarh, Ranchi, Chennai, Imphal, Bengaluru and Patna. It is a central agency mandated to investigate all the offences affecting:

1. Sovereignty, security and integrity of India.
2. Friendly relations with foreign states.
3. Offences under the statutory laws enacted to implement international treaties, agreements, conventions and resolutions of the United Nations, its agencies and other international organisations.

The offense includes terror acts and their possible links with crimes like smuggling of arms, drugs and fake Indian currency and infiltration from across the borders. The agency has the power to search, seize, arrest and prosecute those involved in such offences.

**When did the NIA come into being?**

1. In the wake of the 26/11 Mumbai terror attack in November 2008, which shocked the entire world, the then United Progressive Alliance government decided to establish the NIA.
2. In December 2008, former Union Home Minister P. Chidambaram introduced the National Investigation Agency Bill.
3. The agency would deal with only eight laws mentioned in the schedule and that a balance had been struck between the right of the State and duties of the Central government to investigate the more important cases.
4. The agency came into existence on December 31, 2008, and started its functioning in 2009. Till date, the NIA has registered 447 cases.

**How wide is NIA's jurisdiction?**

The law under which the agency operates extends to the whole of India.

It also applies to:

a. Indian citizens outside the country;
b. Persons in the service of the government wherever they are posted;
c. Persons on ships and aircraft registered in India wherever they may be;
d. Persons who commit a scheduled offence beyond India against the Indian citizen or affecting the interest of India.

**How does the NIA take up a probe?**

- ✓ As provided under Section 6 of the Act, State governments can refer the cases pertaining to the scheduled offences registered at any police station to the Central government (Union Home Ministry) for NIA investigation.
- ✓ After assessing the details made available, the Centre can then direct the agency to take over the case.
- ✓ State governments are required to extend all assistance to the NIA.
- ✓ Even when the Central government is of the opinion that a scheduled offence has been committed which is required to be investigated under the Act, it may, suo motu, direct the agency to take up/over the probe.

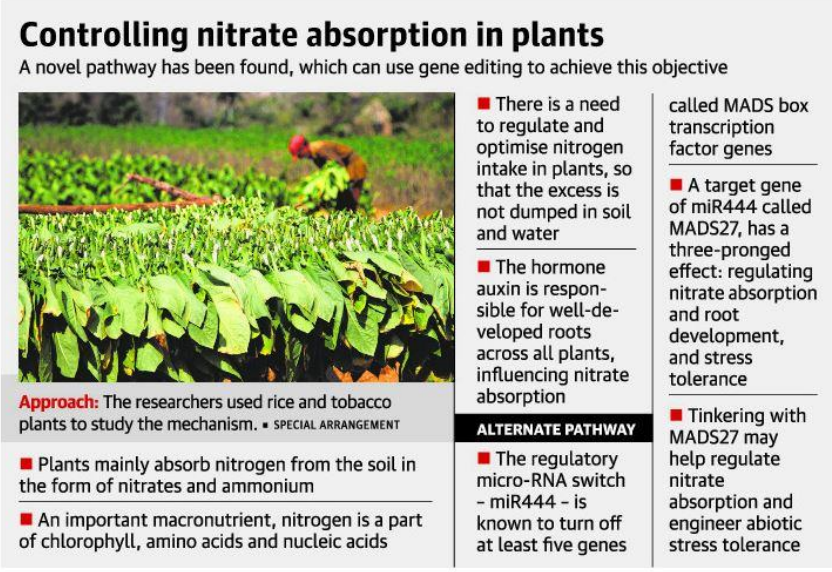
***Source: The Hindu***

## ❖ SCIENCE & TECHNOLOGY

**Q) How does MADS27 control nitrate absorptions in plants?**

**Context:**

Researchers led by those from the National Centre of Biological Sciences, Tata Institute of Fundamental Research, Bengaluru (NCBS-TIFR), have found a new pathway that regulates nitrate absorption in plants.




**Nitrogen in plant nutrition:**

- Nitrogen is one of the most important macronutrients needed for development of a plant.
- It is a part of chlorophyll, amino acids and nucleic acids, among others.
- It is mostly sourced from the soil where it is mainly absorbed in the form of nitrates and ammonium by the roots.
- Nitrates also play a role in controlling genome-wide gene expression that in turn regulates root system architecture, flowering time, leaf development, etc.
- Thus, while a lot of action takes place in the roots to absorb and convert nitrogen into useful nitrates, the absorbed nitrates in turn regulate plant development apart from being useful as a macronutrient.

**MADS27:**

The gene MADS27, which regulates nitrate absorption, root development and stress tolerance, is activated by the micro-RNA, miR444, therefore offers a way to control these properties of the plant. The researchers studied this mechanism in both rice (monocot) and tobacco (dicot) plants.

**Regulatory switches:**

- In addition to this route, several gene regulatory switches that regulate nitrate absorption and root development, such as the micro-RNA, miR444, are known in monocot plants, such as rice.
- The micro-RNA 'miR444' is specific to monocots.

- When this is not made, its target, MADS27, is produced in higher abundance, and it improves biosynthesis and transport of the hormone auxin, which is key for root development and its branching.
- This regulatory miR444 switch is known to turn off at least five genes called MADS box transcription factor genes.
- The speciality of the MADS box transcription factors is that they function like switch boxes of their own.
- They bind to their favourite specific DNA sequences and they switch the neighbouring genes "on."

**Importance of the discovery:**

- ✓ Presence of nitrates is important for the plant development and also for grain production.
- ✓ However, the overuse of nitrates in fertilizers, for instance, can lead to the dumping of nitrates in the soil which leads to accumulation of nitrates in water and soil.
- ✓ This accumulation adds to soil and water pollution and increased contribution to greenhouse gases.
- ✓ Also, since the whole process of nitrate absorption takes place in the roots, a well-developed root system is needed for this to take place optimally.
- ✓ At one level, it is known that the hormone auxin is responsible for well-developed roots across all plants.
- ✓ A number of genes are known to help with auxin production, improved nitrate transport and assimilation in plants.

**Significance of MADS27:**

- The MADS27 transcription factor has a three-pronged effect on the plant.
- First, it regulates nitrate absorption by switching "on" proteins involved in this process.
- Second, it leads to better development of the roots by regulating auxin hormone production and transport.
- Finally, and somewhat surprisingly to the researchers, it helps in the abiotic stress tolerance by keeping the main stress player proteins "on."

***Source: The Hindu***

**Q) Which of the following statements with regard to the Ramagundam solar power plant is incorrect?**

a) It is India's largest floating solar power plant.

b) It comprises only a transformer.

c) It is powered with advanced technology and environment friendly features.

d) The project spreads over 500 acres of its reservoir.

## Hey from Yesterday –

**Q) Which of the following statements with regard to the "Varroa" is incorrect?**

a) It is an external parasite mite.

b) It attacks and feeds on cotton plants.

c) It is found mostly in European countries

d) The disease caused by these mites is called varroosis.

**Answer: b**

**Explanation:**

- Australia is racing to protect honey bees after the discovery of a mite that has ravaged hives around the world.
- About Varroa: Varroa destructor is an external parasitic mite that attacks and feeds on the honey bees Apis cerana and Apis mellifera. The disease caused by the mites is called varroosis. The Varroa mite can reproduce only in a honey bee colony. It attaches to the body of the bee and weakens the bee by sucking fat bodies.
- Heavy infestations with the varroa mite cause a range of maladies among European honey bees that weaken and reduce populations, leading to colony death. The parasite does not affect smaller, stingless native bees.
- Bees are some of the most important pollinators, ensuring food and food security, sustainable agriculture, and biodiversity.

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