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MK Yadav Sir

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INDIAN EXPRESS

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GENOME SEQUENCING

(Syllabus: GS Paper 3 - Sci and Tech)

IISER Bhopal researchers conduct first genome sequencing of *jamun*

ANURADHA MASCARENHAS
PUNE, DECEMBER 5

NOT JUST Ayurveda but multiple clinical studies have shown the health benefits of jamun as an excellent source of antioxidants, iron, and vitamin C. Now, researchers at the Indian Institute of Science Education and Research (IISER Bhopal) have completed the first-ever genome sequencing of the jamun tree (Syzygium cumini), popular in India for its medicinal properties, fruit and ornamental value.

This is the first time the plant has been examined and decoded so closely. Dr Vineet K Sharma, professor, department of biological sciences told The Indian Express that this research aimed to gain new functional and evolutionary insights from the jamun genome, which could be responsible for the wide range of pharmacological properties of this species "conferred by the bioactive compounds that act as nutraceutical agents in modern medicine". A team, led by Dr Sharma, has published its findings in the journal Frontiers in Plant Science. Syzygium cumini, more commonly known as jamun, is a Myrtaceae plant family tropical tree. Fruit seed extracts of jamun have well-known anti-diabetic properties and is highly recommended in Ayurveda to treat a variety of health ailments.

To understand the genomic and evolutionary basis of the tree's medicinal values, the research team sequenced the S.cumini genome using Oxford Nanopore and 10x Genomics sequencing technologies. Jamun is the largest genome to be sequenced from the Syzygium genus.

"Taken together, it is tempting to speculate that the adaptive evolution of major plant secondary metabolism pathways in S. cumini species confers unprecedented antidiabetic, antioxidant, anti-inflammatory, and other pharmacological properties of this tree. Further, the whole genome sequence of S. cumini will facilitate future genomic, evolutionary, and ecological studies on the world's largest tree genus," Dr Sharma said.

The jamun genome has a higher number of coding genes resulting from gene duplication events compared to the other two sequenced species from this genus, which point towards a neopolyploidy event in the jamun species. This duplication of genes can allow jamun to acquire novel functions. Analyses revealed the key genes involved in facilitating the adaptive evolution of jamun. Among these, 14 genes allow for the biosynthesis of terpenoids, which are a diverse class of metabolites responsible for plant defense responses. These also contribute to the anti-oxidant and anti-inflammatory properties.

To fully explain the anti-diabetic properties of this plant, the researchers discovered the presence of glucosides, another class of metabolites that prevent the conversion of starch into sugar, and explain how the plant possesses anti-diabetic value. Jamun has various genes that make the plant rugged and improve its stress tolerance to factors like weeds and insects that induce damage, heat stress, salinity, and drought. This points to remarkable adaptive evolution in jamun.

Context: Recently, the **Bhopal-based Indian Institute of Science Education and Research** (IISER Bhopal) **achieved a significant milestone** by completing the first-ever **genome sequencing of the Jamun tree (Syzygium cumini)**, an evergreen tree popular in India for its medicinal properties.

Genome Sequencing

- **About**: Genome sequencing is the method focused on deciphering the precise order of base pairs in an individual.
- **Deciphering the Genome**: The essence of sequencing lies in the "deciphering" or reading of the genome.
- **Cost Variations**: The costs associated with sequencing vary depending on the methods used for reading or the level of accuracy emphasized in decoding the genome.
- **Need for Genome Sequencing**: Since the initial sequencing of the human genome in 2003, **it has provided a new understanding of the connection between diseases** and the distinctive genetic composition of each person.
- Over 10,000 diseases, **such as cystic fibrosis and thalassemia, have been identified** as stemming from the malfunction of a single gene.

Why Choose Jamun?

- Jamun is the **largest genome to be sequenced** from the **Syzygium genus.**
- It is tempting to speculate that the adaptive evolution of major plant secondary metabolism pathways in **S. cumini species** confers unprecedented antidiabetic, antioxidant, anti-inflammatory, and other pharmacological properties of this tree.
- The **whole genome sequence of S. cumini will facilitate future genomic**, evolutionary, and ecological studies on the world's largest tree genus

THE HINDU

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GLOBAL POSITIONING SYSTEM

Syllabus GS Paper 3 - Sci and Tech)



BUILDING BLOCKS

Understanding how the Global Positioning System (GPS) works

GPS has significantly changed our expectations of where we are and our sense of place. The major sectors which employ the technology include agriculture, construction, surveying, logistics, search and rescue, air travel, meteorology, seismology, and military operations

Vandana Mahesh

For everyday technologies have had the kind of revolutionary impact that the Global Positioning System (GPS) has. From civilians to the military, from precision scientific studies to urban planning and disaster risk estimation, GPS has significantly changed our expectations of where we are and our sense of place.

What is GPS?

The U.S. Department of Defence started the GPS programme in 1973 and launched the first satellite in 1978. The modern GPS satellite constellation consists of 24 satellites moving around the earth in six orbits. Each satellite completes two orbits in a single day. The overall programme has three main components – the space segment, the control segment, and the user segment.

The space segment, of course, consists of the 24 satellites. The six orbits they occupy are all 20,200 km above the earth, and each orbit has four satellites at all times. In this configuration, anyone on the earth will be able to 'see' at least four satellites at a time, which is a crucial requirement.

The control segment consists of a global network of ground-based control stations and antennae that track the 24 satellites, make sure their performance is as expected at all times, and transmit commands. The services provided by the GPS system are designed to meet the Standard Positioning Service (SPS) performance standard, the latest edition of which was published in April 2020. In essence, the SPS standard tells application developers and users anywhere in the world what they can expect from the GPS system. The control segment ensures these commitments are kept. The master control station is located at Schriever Air Force Base, Colorado, and the alternate master control station is at the Vandenberg Air Force Base, California. The ground antennae are in Florida (Cape Canaveral), Ascension Island, Diego Garcia Island, and Kwajalein Atoll. There are monitoring and tracking stations in Hawai'i, Alaska, New Hampshire, Washington, D.C., Colorado, and Florida in the U.S., and in Greenland, Ecuador, Uruguay, the U.K., South Africa, Bahrain, South Korea, Guam, Australia, and New Zealand.

The user segment pertains to the use of GPS in various sectors and applications. The major sectors include agriculture, construction, surveying, logistics, telecommunications, power transmission, search and rescue, air travel, meteorology, seismology, and military operations. In 2020, according to one estimate, there were 6.5 billion Global Navigation Satellite System (GNSS) devices installed worldwide. The figure is expected to rise to 10 billion by 2028.

How does GPS work?

Each GPS satellite continuously broadcasts a radio signal containing information about its location in orbit, operational status, and the time at which the signal is emitted. The signals are transmitted at the L1 (1,575.42 MHz) and the L2 (1,227.6 MHz) frequencies at 50 bits/second. The signals are encoded with code-division multiple access. This allows multiple signals to be transmitted in the same channel and for a receiver to be able to disentangle them. There are two encoding types: the coarse/acquisition mode, which civilians can use to access coarse GPS data, and the precise mode, which is encrypted and is for military use.

Being an electromagnetic signal, the radio waves travel at the speed of light. On your smartphone, a GPS receiver picks this signal up and uses it to calculate its precise distance from the satellite. The distance is equal to the speed of light times the signal's travel time. The signal's travel time is equal to the time on the receiver's clock minus the time at which the signal was emitted. If the receiver has access to signals from four satellites, it will have the information required to calculate its location in four dimensions – three of space plus one of time relative to the satellite clock – and can thus accurately triangulate its location on the ground. This informs the need for every point on the earth being able to 'see' four satellites at a time.

Some adjustments are required to ensure the measurements are as error-free as possible. For example, the satellites around the earth are in a region of weaker gravitational potential, so their onboard clocks run 38 microseconds faster than those on the ground. This is explained by the general theory of relativity. The special theory of relativity requires engineers to account for the relative velocities of the satellite and the receiver.

How do the satellites keep time?

Good timekeeping is essential to ensure the GPS system works as well as possible. For example, not adjusting for the 38-microsecond offset between the clocks on the satellites and on the ground could lead to an error of 10 km within a single day. An offset of one millisecond can lead to an error of a full 300 km. For this reason, the satellites are all equipped with atomic clocks. In 1974, the U.S. Naval Research Laboratory first launched an atomic clock into space on board the NAVSTAR NTS-1 satellite. The clocks onboard the modern-day GPS constellation are all synchronised to within just 10 nanoseconds of each other, and with reference clocks on the ground.

India mooted its own Indian Regional Navigation Satellite System in 2006, later rechristened Navigation with Indian Constellation (NavIC)

An atomic clock takes advantage of a simple but profound fact. The atoms of all elements have some number of electrons around the nucleus. Each of these electrons can have a specific amount of energy, no more and no less. Imagine these amounts of energy to be steps on a staircase. An electron can occupy only these particular steps; it can't have some energy in between two steps. The size of these steps is the same for all atoms of a given element. For example, all caesium atoms in the universe have the same jump size between steps 2 and 3.

When radiation containing the exact amount of energy these electrons require to jump between two states – called the resonant frequency – is supplied, the electrons absorb it and jump. If too much or too little energy is supplied, fewer electrons will jump. So scientists begin with a radiation source and keep fine-tuning it to the frequency that causes the maximum number of electrons to jump. Once they have the frequency, they use it to measure time. For example, if it is 50 Hz, then one second will have passed when the radiation has completed 50 cycles. This is how an atomic clock works. Simply put, the electron tell the source which frequency is 'correct'. The scientists can check the frequency at regular intervals to make sure that the source producing it isn't drifting off and losing/gaining time.

Do other countries have GNSS?

According to the U.S. Space-based Positioning, Navigation, and Timing Policy, the GPS system will cooperate with the operation of other GNSS. Such systems are currently operated by Australia, China, the European Union, India, Japan, South Korea, Russia, and the U.K. Of these, Russia's GLONASS, the E.U's Galileo, and China's BeiDou systems are global. Officials of the U.S. government and their counterparts in other countries meet regularly to ensure their technologies are compatible with each other. There is also an International Committee on GNSS, operating under the United Nations Office of Outer Space Affairs. According to its website, it "promotes voluntary cooperation on matters of mutual interest related to civil satellite-based positioning, navigation, timing, and value-added services".

India moved its own Indian Regional Navigation Satellite System in 2006, later rechristened Navigation with Indian Constellation (NavIC). Its space segment consists of seven satellites: three in geostationary orbits and four in geosynchronous orbits. As of May 2021, the minimum number of satellites (four) could facilitate ground-based navigation. The master control facilities are located in Hasan in Karnataka and Bhopal in Madhya Pradesh. The NavIC satellites use rubidium atomic clocks and transmit data in the L5 (1,176.45 MHz) and the S (2,492.028 MHz) bands, with newer satellites also transmitting in the L1 band. They include a messaging interface that can receive messages from control stations and transmit them to specific areas, like warning fishers about being close to international borders, etc. India also operates the GPS-Aided Geo Augmented Navigation (GAGAN) system, which was developed by the ISRO and the Airports Authority of India. According to the ISRO website, GAGAN's primary purpose is "safety-of-life civil aviation applications catering to the Indian airspace" and for providing "correction and integrity messages for GPS".

Context: Recently, few everyday technologies have had the **revolutionary impact that the Global Positioning System (GPS) has, transforming everything from civilian** use to military operations, precision scientific studies, urban planning, and disaster risk estimation, significantly altering our sense of place and expectations of location.

Global Positioning System (GPS)

- **About**: The U.S. Department of Defence initiated the GPS program in 1973.
- **First Satellite**: It was launched as part of the program in 1978.
- **Composition**: The modern GPS satellite constellation comprises 24 satellites.
  - These satellites move around the Earth in six orbits.
- **Satellite Orbits and Configuration**: The satellites in the GPS constellation are positioned in six orbits.
  - Each orbit, located 20,200 km above the Earth, is occupied by four satellites.
- **3 Main Components of GPS Program**: The GPS program is structured into three main components: the space segment, the control segment, and the user segment.
- **Space Segment:** The space segment encompasses the 24 satellites forming the GPS constellation.

How does GPS work?

- **GPS Satellite Broadcasting**: Each GPS satellite continuously broadcasts a radio signal that contains information about its location in orbit, operational status, and the emission time of the signal.
- **Code-Division Multiple Access**: The signals are encoded using code-division multiple access, allowing multiple signals to be transmitted in the same channel, and enabling a receiver to disentangle them.
- **Encoding Types**: **Coarse/Acquisition Mode**, which civilians can use to access basic GPS data.
- **Precise Mode**: Encrypted and reserved for military use.

Other countries and their navigation system:

- **Global:** Russia's Global Navigation Satellite System **(GLONASS),** China's **BeiDou** Navigation Satellite System, and the European Union's **Galileo.**
- **Regional:** Japan's **Quasi-Zenith Satellite System (QZSS**) and India's Indian Regional Navigation Satellite System **(IRNSS) or NavIC**

PIB Dec 5

PM GATI SHAKTI SCHEME
(Syllabus: GS Paper 2 – Govt Schemes)

61st Network Planning Group Meeting under PM GatiShakti

Context: Recently, the **61st Network Planning Group (NPG) meeting was convened** in New Delhi to mark **two years of the PM GatiShakti National Master Plan (NMP),** with Special Secretary (Logistics), Department for Promotion of Industry and Internal Trade (DPIIT), presiding over the session.

PM Gati Shakti National Master Plan framework

- **Background:** It was announced by the Prime minister of India in August 2021 and was launched in October 2021.
- **Aim:** It is the first National Infrastructure Masterplan**. The National Master Plan for Multi-modal Connectivity** is essentially **a digital platform** to bring 16 Ministries includes Railways and Roadways and others.
  - To boost economic growth (Shakti) through infrastructure building.
  - To improve the productivity of industries and employment opportunities.
  - It is considered to be the government's integrated approach to developing modern railways, roadways, waterways and airways.
- **Method:** It **breaks the inter-ministerial silos and to integrate** the planning of infrastructure projects related to road, rail, air and waterways etc.
  - **Integration:** It incorporates the infrastructure schemes of various Ministries and State Governments like Bharatmala, Sagarmala, inland waterways, dry/land ports, UDAN etc.

Pillars of PM Gati Shakti:

- PM Gati Shakti is based on six pillars: **Comprehensiveness, Prioritization, Optimization, Synchronization, Analytical, and Dynamic.**

TIMES OF INDIA

Dec 5

SEED FUND SCHEME
(Syllabus: GS Paper 3 – Agriculture)

Space regulator IN-SPACe launches seed fund scheme for startups to promote space-tech

Context: Recently, the Indian National Space Promotion and Authorization Centre (IN-SPACe) announced the launch of a seed fund scheme.

Seed Fund Scheme

- **About:** It is a **part of IN-SPACe's efforts to provide a special thrust** to enhance the space activity capabilities of the nation with the active participation of the start-ups
- **Designed:** To support Indian **space start-ups that aim to develop innovative space products and services**, thereby improving the quality of life for people and communities in India and around the world.
- **Financial assistance**: The **scheme has the provision of providing financial assistance** of up to Rs 1 crore in addition to mentorship support, training and networking opportunities
- The scheme will **provide opportunities for NGEs that leverage space technology** for societal benefits to graduate to the next level, as per the statement.

Indian National Space Promotion and Authorization Center (IN-SPACe):

- **Established in:** June, 2020.
- **Type of Body:** An autonomous body, under DOS.
- **Objective:** To act as a **single window nodal agency** for enabling and regulating space activities and usage of ISRO facilities by **Non-Government-Private-Entities (NGPEs).**

PIB

Dec 4

CYBER SURAKSHIT BHARAT INITIATIVE

(Syllabus: GS Paper 3 – Internal Security)

NeGD, MeitY organises 40th Chief Information Security Officers' Deep Dive Training Programme under Cyber Surakshit Bharat Initiative

Context: Recently, NeGD (National e-Governance Division), under the Ministry of Electronics and Information Technology (MeitY), **organized the 40th Chief Information Security Officers' Deep Dive Training Programme** as part of the Cyber Surakshit Bharat Initiative.

- The purpose of the program is to spread awareness, build capacity as well as enable Government departments on steps that need to be taken to create a cyber resilient eco system.

Cyber Surakshit Bharat Initiative

- **About:** This initiative was conceptualised with the mission to spread awareness about cyber-crime and build capacities of Chief Information Security Officers (CISOs) and frontline IT officials, across all government departments.
- **Launched**: In 2018
- **Nodal Ministry**: Ministry of Electronics and Information Technology (MeitY)
- The CISO training is the first-of-its-kind partnership between the Government and industry consortium under Public Private Partnership (PPP) model.
- **Objectives**: To create awareness about the various cyber-attacks and crimes that take place.
  - Offer a comprehensive insight into relevant solutions.
  - Discuss frameworks, guidelines, and policies pertaining to cybersecurity.
  - Exchange best practices to derive lessons from both successes and failures.

ALL INDIA RADIO

Dec 5

INDIA INTERNET GOVERNANCE FORUM
(Syllabus: GS Paper 2 – Governance)

'India Internet Governance Forum 2023' to discuss public policy issues related to Internet in New Delhi

Context: The 'India Internet Governance Forum 2023' was recently held in New Delhi

India Internet Governance Forum 2023

- **About:** The event aims to address key issues, including building a secure, trusted, and resilient cyberspace for Bharat.
- **Established**: In 2021.
- **Held**: New Delhi.
- **Theme**: Moving Forward – Calibrating Bharat's Digital Agenda.
- **Association with UN Internet Governance Forum**: The India Internet Governance Forum is closely associated with the UN Internet Governance Forum, reflecting a global perspective.
    - The initiative is aligned with international efforts to govern and address internet-related issues.
- **Support**: IIGF is supported by a 14-member multi-stakeholder committee representing various sectors, including government, civil society, industries, the technical community, think tanks, and industry associations.

HINDUSTAN TIMES Dec 5

CITIZENSHIP OF INDIA

(Syllabus: GS Paper 2 – Polity)

Share data of B'deshi migrants given Indian citizenship: SC to govt

Abraham Thomas
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Solicitor general told SC that the govt is working on it and will share the records in a day or two. HT ARCHIVE

NEW DELHI: The Supreme Court on Tuesday sought data from the Union government on Bangladeshi immigrants who availed citizenship of India under Section 6A of the Constitution Act in Assam, saying there was no material before it to indicate the number between January 1966 and March 1971 was so great that it impacted the demographic and cultural identity of the north-eastern state.

A five-judge Constitution bench headed by chief justice of India (CJI) Dhananjaya Y Chandrachud on Tuesday started hearing a clutch of petitions challenging the validity of Section 6A, which was inserted into the Citizenship Act of 1955 in 1985 as a special provision to deal with the citizenship of people covered under the Assam Accord — a tripartite agreement that All Assam Students' Union (AASU) signed with the Assam government and Rajiv Gandhi-led Union government, to preserve and protect the cultural, linguistic and social identity of Assam.

"We must bear in mind that if the Parliament were to merely grant amnesty to a group of illegal immigrants it would have been a different situation. We must be careful that we are looking at a period frozen in time. What the amendment does is that it freezes citizenship at March 25, 1971. It was clearly a one-time measure," said the bench, also comprising justices Surya Kant, MM Sundresh, JB Pardiwala and Manoj Misra.

The court was responding to senior advocate Shyam Divan, who appeared for one of the petitioners, All Assam Ahom Sabha, challenging Section 6A as violative of Articles 14 (right to equality), 21 (right to life) and 29 (right to protection of interests of minorities) of the Constitution. Divan argued that the introduction of Section 6A led to proliferation of illegal migrants in Assam, thus distorting the ethnic, demographic, social, cultural and economic profile of the state.

The bench said, "We cannot deny that Section 6A is deeply connected with our history. India had played a very vital role in the liberation of Bangladesh..."

The court was of the view that India was as much a part of the war as Bangladesh was. "This was not just looked at by Parliament as illegal migration as it is interwoven in our history," it said.

To this, Divan argued that if such was the case, Assam should not have been singled out and a uniform law should have applied to all states bordering the then East Pakistan.

Agreeing with Divan that the problem raises a "significant" issue, the bench said, "No doubt there is infiltration... The initial burden of proof is on you to show that as regards quantum of infiltration, Assam is equally placed with other border states."

The court noticed that under Section 6A, the certificate of being a foreigner by a foreigner tribunal was required for registration before July 16, 2013. The bench asked solicitor general Tushar Mehta to provide data on registrations. It said, "How many people took citizenship using this provision. Practical operation of Section 6A came to a close on July 16, 2013. If very few got it, then obviously they are illegal migrants."

Mehta told the court that the government is working on this data and will be able to share it with the bench in a day or two. The hearing will resume on Wednesday.

Context: Recently, the Supreme Court requested data from the Union government regarding Bangladeshi immigrants who acquired Indian citizenship under **Section 6A in Assam**.

Citizenship of India

- **About:** Citizenship encompasses the concept of being a full and equal member of a political community, with a shared political identity and entitlement to specific rights.
- **Important Points for Indian Citizenship**
  - **Constitutional Measures**: Articles 5-11 in Part II of Indian Constitution regulates the citizenship in India.
  - **Legislation**: The Citizenship Act of 1955 is the legal framework governing the various aspects of citizenship.
  - **Acquisition of citizenship**: Through various means such as **birth, descent, registration, naturalization, and incorporation of territory**.
  - **Termination and deprivation of citizenship**: By renunciation, termination and deprivation.
  - **Adoption**: It came into being on 26th November, 1949.
  - **Jurisdiction**: Citizenship is a subject that falls under the exclusive jurisdiction of the Parliament. **Single Citizenship** for whole of India.

Assam Accord (Section 6A)

- **About:** Signed between GoI, Assam Govt. and All Assam Students' Union (AASU) in 1985, that ended the 6 year long agitation.
- **The parties agreed that:**
  - All people who had entered Assam prior to **January 1, 1966**, would be deemed as citizens.
  - Those who came between **January 1, 1966** and **March 25, 1971** were eligible for citizenship after registering and living in the State for 10 years.
  - Those entering after March 24, 1971, were to be **deported.**

LIVEMINT

Dec 5

EXCHANGE RATE

(Syllabus: GS Paper 3 – Economy)

Rupee falls 8 paise to close at 83.37 against the US dollar

Context: Recently, the **Indian rupee experienced an 8 paise decline** against the US dollar due to a rebound in the greenback in international markets.

Exchange Rate

- **About**: An exchange rate represents the value of one nation's currency in comparison to the currency of another nation or economic zone.
- **Types**: Free-floating and Fixed.
- **Free-Floating**: Free-floating exchange rates fluctuate based on the dynamics of the foreign exchange market, experiencing rises and falls in response to market changes.
- **Fixed**: In contrast, fixed exchange rates are tethered or pegged to the value of another specific currency.

How is the exchange rate determined?

- The market supply and demand determine floating rates.
- A currency's value in relation to another currency is determined by how much demand there is compared to supply.

Role of Reserve Bank of India (RBI)

- **Monitoring foreign currency markets** and intervening when necessary.
- Relaxing **restrictions on foreign ownership of government bonds** and increasing borrowing limits for businesses to attract foreign currency inflows.
- **Proposing rupee settlement methods** to reduce the demand for US dollars in international trade.

OMAN

(Syllabus: GS Paper 1 – Geography)

India and Oman Begin Talks on Free Trade Pact

Kirtika.Suneja@timesgroup.com

New Delhi: India's exports to Oman could soon get duty concessions with the two sides having begun talks for a free trade agreement.

Mineral fuels, inorganic chemicals, compounds of precious metals and iron and steel are India's top exports to Oman while oil, fertilisers and plastics are the top imports.

Officials said that the negotiations will be fast tracked and the pact could be on similar lines as the one with the UAE. India's exports to Oman in April-September FY24 were $2 billion and imports were $2.1 billion.

"Discussions have started and the agreement would be a comprehensive one," said an official. The government has identified petroleum products, gems and jewellery, engineering products, pharmaceuticals, cement and ceramic products, ready made textiles, and footwear as some goods with scope for trade with Oman.

India could also push for fast tracking the approval for Indian pharma products that are already registered by the US Food and Drug Administration (USFDA), UK drug regulator MHRA and European Medicines Agency, similar to a provision in its trade pact with the UAE. Both Oman and the UAE are part of the Gulf Cooperation Council with which India aims to ink a trade pact. Besides duty concessions, the commerce and industry ministry is also analysing non-tariff barriers and product-specific rules as part of the India-Oman Comprehensive Economic Partnership Agreement (CEPA) negotiations.



Context: **India's exports to Oman could soon get duty concessions** with the two sides having begun talks for a free trade agreement.

- Mineral fuels, inorganic chemicals, compounds of precious metals and iron and steel are India's top exports to Oman while oil, fertilisers and plastics are the top imports.

Oman

- **About**: Oman, country occupying the southeastern coast of the Arabian Peninsula at the confluence of the Persian Gulf and Arabian Sea.
- **Bounded by**:
  - Southwest - Yemen
  - South and East - Arabian Sea
  - North - Gulf of Oman
  - Northwest - United Arab Emirates
  - West - Saudi Arabia.
- **Capital**: Muscat
- Mountain Ranges: North (Al-Hajar) and southeast coast (Qara or Dhofar Mountains)
- **Gulf of Oman**: It also known as the Gulf of Makran or Sea of Makran, forms the only entrance to the Persian Gulf from the Indian Ocean.
- **Bordering Countries**: It is bordered by Pakistan and Iran in the north, by the United Arab Emirates in the west and by Oman in the south.

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INDIA - KENYA TIES

(Syllabus: GS Paper 2 – IR)

India announces $250m agri aid to boost ties with Kenya

TIMES NEWS NETWORK



Kenyan President William Ruto with Prime Minister Narendra Modi before their meeting at the Hyderabad House in New Delhi

New Delhi: India and Kenya looked to boost defence, maritime and connectivity ties as PM Narendra Modi held talks with visiting President William Ruto and announced a new $250 million line of credit to help the east African country improve its agriculture sector. The two countries also signed five agreements and issued a vision document for maritime cooperation in the Indian Ocean.

The government confirmed that it had also raised the issue concerning two Indian nationals, one of them a well-known media professional, who went missing from Nairobi last year in July. Kenya is yet to officially confirm if the local media reports claiming they were killed for assisting the social media campaign of the president are true. The government said that the Indian high commission continues to monitor developments related to the case and remains in touch with Kenyan authorities.

Significantly, the meeting saw Kenya offering, in line with local laws, to provide land to Indian companies and institutions for cultivation of crops, including millets, in the coastal African country.

"The Government of India undertook to encourage Indian companies for investment in the sector, including in equipment and technology on mutually agreed terms. Both sides noted that enhancing bilateral agricultural cooperation would increase bilateral trade and contribute to food security in Kenya," said a joint statement issued after the meeting.

Modi said that India and Kenya were unanimous that terrorism was the most serious challenge to humanity and that they decided to increase mutual cooperation in the field of counter-terrorism. Looking to intensify defence cooperation, the leaders agreed to continue working towards expanding training exchanges, including deputation of Indian experts, in Kenyan defence institutions. Both sides also called for increasing cooperation between the defence industries, ship visits and periodic exchange of high-level visits from both sides, according to the joint statement.

The government also confirmed that the environment ministry has sought cheetahs from Kenya and that Kenyan authorities are considering the request. "I am glad that Kenya has decided to join the Global Biofuels Alliance, Big Cat Alliance and International Solar Alliance. We will be able to strengthen the global efforts for conservation of big cats," said Modi.

Context: Recently, **India and Kenya strengthened defense, maritime, and connectivity bonds** as the Indian PM held talks with the Kenyan President, announcing a $250 million credit line for agriculture.

- The **Government of India undertook to encourage Indian companies for investment** in the sector, including in equipment and technology on mutually agreed terms.

Kenya

- **About**: It is a country in East Africa.
- **Capital**: Nairobi
- **Bordered by**: South Sudan to the northwest, Ethiopia to the north, Somalia to the east, Uganda to the west, Tanzania to the south, and the Indian Ocean to the southeast.
- The **headquarters of UN-Habitat is located** at the United Nations Office in Nairobi, Kenya.
- **Indian Diaspora in Kenya**: Kenya hosts a substantial minority of Indians and Persons of Indian Origin, tracing their ancestry to laborers brought by the British for the construction of the Uganda Railway.
- **Historical Connection**: The Indian community in Kenya has historical roots tied to British-led projects, particularly the construction of the Uganda Railway.
- **International Cooperation**: Kenya and India actively engage as members in various international forums such as the United Nations, Non-Aligned Movement, Commonwealth of Nations, G-77, G-15, and the Indian Ocean Rim Association for Regional Cooperation.
- **Diplomatic Collaboration**: The two nations frequently collaborate and cooperate on shared interests within these international fora, fostering diplomatic ties and mutual understanding.

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