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THE HINDU Page 1

INDIA-BHUTAN-CHINA TRI-JUNCTION

(Syllabus: GS Paper 3 - Border Issue)

China builds ropeway, roads near tri-junction

Beijing has been improving infrastructure and arranging additional deployments along the eastern sector of LAC; officials say there is lot of activity near Doklam that saw face-off in 2017

Suhasini Haidar
Dinakar Peri
NEW DELHI

China has set up a ropeway near the Torsa Nala on its side of the India-Bhutan-China tri-junction, and is strengthening roads and other infrastructure along the entire eastern sector, according to defence sources.

In the Yangtse area of Tawang sector in Arunachal Pradesh, which saw a scuffle last week, defence officials with knowledge of the area said China had stepped up patrols some years ago to assert its claims in the area, after finding that their grazers could not move in and out. "What irks the People's Liberation Army (PLA) is that the Indian Army holds the dominating heights which give a complete view of the bowl," noted two of the sources.



Border woes: Kupup in Sikkim is the closest point to Doklam that saw a face-off between Indian and Chinese troops in 2017.



Yangtse ingress points

The Chinese usually patrol two to three times a year, before and after winter, one of the sources said, adding that there are four major ingress points in the Yangtse area which the PLA uses to enter the region. Yangtse is located 30-35 km northeast of Tawang and is at an altitude of around 17,000 feet.

The PLA has installed a ropeway close to the Torsa Nala on their side near the confluence point, and some new anchor points of the ropeway have been recently observed, said one of the sources cited above.

Officials said that there is also lot of activity near the Torsa Nala near Doklam, a location that saw a 73-day stand-off between Indian and Chinese forces in 2017.

CONTINUED ON » PAGE 12

Context: China has set up a ropeway near the Torsa Nala on its side of the **India-Bhutan-China tri-junction**, and is strengthening roads and other infrastructure along the entire eastern sector..

Tri-Junction Area

- **About**: **Doklam**, called **Donglang by China**, is an area with a high plateau and a valley, lying between China's Chumbi Valley to the north, Bhutan's Ha District to the east and India's Sikkim state to the west.
  - It has been depicted as part of Bhutan in the Bhutanese maps since 1961, but it is also claimed by China.
- **China's Claim**: China claims some parts of the **Doklam Plateau as part of its "ancient" frontier.**
  - From 1984, Bhutan and China have conducted nearly 24 rounds of dialogue to delineate the border between them and the process is still going on.
- **India and Bhutan Treaty:** Both have signed the **2007 Friendship Treaty** according to which, India serves as a virtual security guarantor of Bhutan.
  - **Indian Army and Bhutan Army** do joint patrolling at the tri-junction.



BUSINESS STANDARD

Page 3

RIGHTS ISSUE

(Syllabus: GS Paper 3 - Economy)

DMRC launches ₹7,131-cr rights issue after SC rap

Transporter asks Centre, Delhi govt to infuse equity of ₹3,500 crore each

DHRUVAKSH SAHA & BHAVINI MISHRA
New Delhi, 15 December

Delhi Metro Rail Corporation (DMRC) on Thursday launched a rights issue to raise ₹7,131 crore from its existing shareholders – the Centre and the Delhi government, which own 50 per cent of the company each – to put an end to its tussle with Reliance Infrastructure (RInfra).

The decision was taken at a meeting of the company's board on Tuesday, a day after the Supreme Court cracked the whip on the urban transporter for repeatedly failing to pay Delhi Airport Metro Express (DAMEPL), a RInfra subsidiary, ₹4,500 crore worth of arbitral award dues.

The issue will close on January 11, and DMRC has asked both its shareholders to subscribe equally to the equity share capital, which works out to ₹3,565.64 crore each.

The development comes after both the Centre and the Delhi government refused to grant the amount to the urban transporter as capital expenditure. The Delhi government refused to bail DMRC out on the grounds that it did not have budgetary provisions to release the amount sought by the firm.

"This procedure (rights issue) is necessary for the purposes of getting the equity shareholders to discharge their respective liability even though meetings have already been held in the above regard," DMRC told the apex court in an affidavit on Wednesday.

Seeking more time, the company said the two governments would incur non-budgeted financial outflows if they were to release funds for paying the dues. This would require passing an appropriation Bill.

If not granted additional time, DMRC told the court, its operations would come to a complete standstill, "which would be prejudicial to the public interest, considering that approximately 5.1 million journeys take place daily on the metro..."

The Supreme Court on Wednesday came down heavily on DMRC and the Centre, saying that the law with regard to the execution of arbitral award was no different for the government or its statutory corporations.

The court has directed the single judge Bench of the Delhi High Court, which is hearing DAMEPL's execution petition, to proceed with the execution of the award expeditiously and take it to its logical end within three months. The matter will next be heard in the Delhi High Court on December 22.

DMRC had previously tried to raise ₹2,700 crore through bank loans, but later informed the court that it didn't find that option viable as it would make the urban transporter fall into a debt trap.

DMRC and DAMEPL have been at odds ever since the latter pulled out of the Delhi Metro Airport Line operations due to safety issues arising from structural defects. An arbitral court ruled in favour of the RInfra firm in 2017, asking DMRC to pay the arbitral award, which was later upheld by the Supreme Court.



TIMELINE OF EVENTS

Sep '21: SC upholds arbitral award of 2017 in favour of Reliance Infra

Mar '22: The Delhi High Court directs DMRC to pay the entire amount of ₹7,200 crore

Nov 10,'22: Delhi HC grants more time to DMRC to pay remaining ₹4,500 crore

Dec 2,'22: Reliance Infra moves SC to enforce award

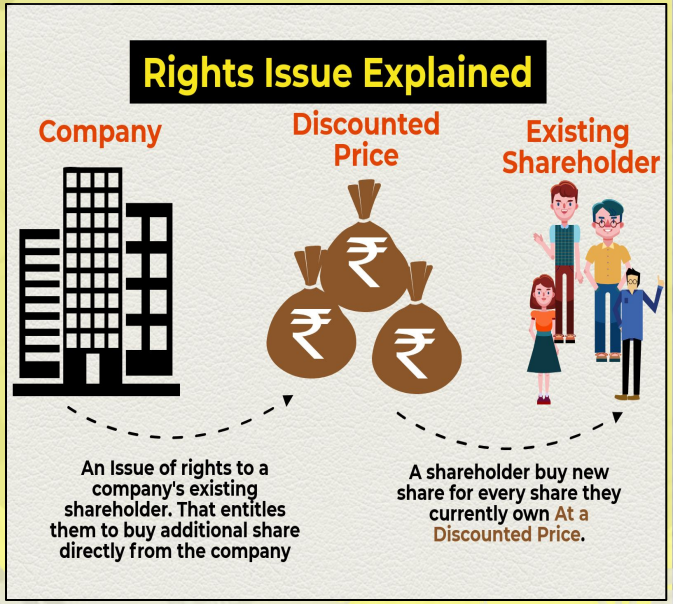
Dec 14,'22: SC gives DMRC three months to pay dues and sends matter back to Delhi HC

Dec 22, '22: Next hearing in Delhi HC

Context: Delhi Metro Rail Corporation (DMRC) **launched a rights issue** to raise ₹ 7,131 crore from its existing shareholders - the Centre and the Delhi government, which own 50 per cent of the company each - to put an end to its tussle with Reliance Infrastructure (RInfra).

Rights issue

- **About:** It is an **offering of shares made to existing shareholders** in proportion to their existing shareholding.
- **Key Features:**
  - Companies often offer shares in a rights issue **at a discount on the market price.**
  - Rights issues are used by companies seeking to **raise capital without increasing debt.**
  - Shareholders are **not obliged** to purchase shares offered in a rights issue.
- **Advantages**:
  - A company would offer a rights issue in order to raise capital which can be used to clear its debt obligations, acquire assets, or facilitate expansion without having to take out a loan from a bank.
  - Under it, there is **no requirement of shareholders' meeting** and an approval from the board of directors is sufficient and adequate.
- **Disadvantages**:
  - Raising funds through the right issue **might create pressure on the company.**
  - Value of each share may get **diluted**.
  - If the share price decreases post rights issue then investors may l**ose the holding value.**
    - **Holding value** is a value which sums the impacts of all the dividends that would be given to the holder in the future, to help them estimate a price to sell or buy assets.
  - **Stock exchanges put a restriction** on the amount on which a company can raise via the right issue.



INDIAN EXPRESS

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ASOLA BHATTI WILDLIFE SANCTUARY

(Syllabus: GS Paper 3 - Env & Eco)

Soon at Asola Bhatti sanctuary, e-cycles and golf carts on rent for visitors

EXPRESS NEWS SERVICE
NEW DELHI, DECEMBER 15

THE DELHI Forest Department is in the process of procuring electric cycles and golf carts to enable visits to the Asola Bhatti Wildlife Sanctuary.

A senior official of the forest department said the specifics on how many people would be allowed into the sanctuary at one time as well as the pathways that will be made available are still being worked out. "All of these vehicles will be electric and visitors will be able to rent them. While a final decision on the number of people that will be allowed into the sanctuary is yet to be taken, it will be a very conservative figure," the official said.

In October, Lieutenant Governor V K Saxena dedicated to the public four artificial waterfalls at the Neeli Jheel and directed officials to develop a cafeteria and public toilets besides deploying electric vehicles for visitors to the jheel as part of turning the area into an 'eco-tourism' hub. The Neeli Jheel is a lake formed in what was once a mining pit and is an important source of water for wildlife in the sanctuary, which includes leopards and hyenas.

The proposal for these 'eco-tourism' facilities is limited as of now, the official said. "While final preparation is yet to be done, the proposal involves walks and taking cycles through some parts of the sanctuary. No new pathways are being created, and the jungle won't be disturbed. Steps made of natural material are nearing completion close to the Neeli Jheel as a sort of viewing point... as of now, we are not allowing anything new that was not allowed earlier," the official said.



The Neeli Jheel is a lake formed in what was once a mining pit

Tender documents show that the forest department intends to purchase 60 electric cycles at an estimated cost of around Rs 39 lakh. A separate tender has been issued to hire six electric golf carts along with six drivers for a year at an estimated cost of around Rs 54 lakh. Tender documents for golf carts indicate that they are likely to be operational for around 10 hours per day for 26 days a month. A charging station will also have to be installed for the carts.

A source said cycle tracks, signages, and a few cycles were already available at the sanctuary, but prices to rent them were yet to be fixed. Private vehicles are being allowed into the sanctuary up to Neeli Jheel, the source said.

Context: The Delhi forest department's in the process of procuring electric cycles and golf carts to enable visits to the **Asola Bhatti Wildlife Sanctuary.**

Asola Bhatti Wildlife Sanctuary

- **About**: Area on the **Southern Delhi Ridge of Aravalli hill range** on Delhi-Haryana border lies in Southern Delhi as well as northern parts of Faridabad and Gurugram districts of Haryana state.
  - An area of 1 km around the Asola Bhatti Wildlife Sanctuary in Gurugram and Faridabad is an **Eco-sensitive zone.**
- **Biodiversity**: Wide variety of trees, shrubs, herbs and grasses.
  - **Large numbers of mammals**, reptiles, amphibians, butterflies and dragonflies.
  - Sanctuary comprises around 200 species of resident and migratory birds.
- **Significance**: Wildlife habitats inside the sanctuary act as a **water recharge zone for Delhi, Faridabad and Gurugram.**
  - It is contiguous to the seasonal waterfalls in Pali-Dhuaj-Kot villages of Faridabad and the sacred **Mangar Bani.**
  - Mangar Bani is a **paleolithic archaeological site** and sacred grove hill forest next to the Mangar village on Delhi-Haryana border.
  - Mangar Bani is an **important leopard habitat** and it also lies within the Northern Aravalli leopard wildlife corridor stretching from Sariska Tiger Reserve to Delhi.
- **Historical place around sanctuary**: Surajkund and Anangpur Dam (both in Haryana), Tughlaqabad Fort and Adilabad ruins (both in Delhi), Chhatarpur Temple (in Delhi).

ASOLA BHATTI WILDLIFE SANCTUARY is spread over 32.71 square kilometres and is at the end of an important wildlife corridor that starts from Sariska National Park in Alwar, Rajasthan, and passes through Mewat, Gurgaon and Faridabad in Haryana



Eco-sensitive zone

The Union government has notified an area of up to 1km around the boundary of the sanctuary in Faridabad and Gurgaon as eco-sensitive zone

Villages in eco-sensitive zone

Lakadpur (Surajkund), Pali, Mangar, Bandhwari, Gwal Pahari, Balola, GGothda Mohbtabad, Badkhal, Ankhir, Mewla Mahrajpur, Anangpur

These are banned

Commercial mining, stone quarrying and crushing units, polluting industries, discharge of untreated effluent, saw mills, brick kilns

Regulated activities

Hotels and resorts, construction, small scale non-polluting industries, felling of trees, civic infrastructure, commercial extraction of water

These are allowed

Rainwater harvesting, organic farming, cottage industries, use of renewable energy and fuels, agro-forestry, use of eco-friendly transport

LIVEMINT Page 9

AGNI-5

(Syllabus: GS Paper 3 - Defence Sector)

India test-fires Agni-V missile that can cover all of China

Agni-V intercontinental nuclear-capable ballistic missile covers over 5,400 km

Agencies
feedback@livemint.com
NEW DELHI

India on Thursday successfully test fired a long-range "Agni-V" intercontinental nuclear-capable ballistic missile, parliamentary affairs minister Pralhad Joshi said, that is expected to strengthen its deterrence against long-time rival China.

Joshi said the missile was fired on Thursday from Abdul Kalam Island off Odisha coast.

"The missile will add great value to the defence and strengthen national security to a greater extent," Joshi tweeted, citing its range of 5,400 km or more.

Ahead of the test, authorities issued a notification and declared the Bay of Bengal as a no-fly zone, said media reports, adding that its range covers almost the entire China mainland.

Fresh tensions arose between India and China following clashes between their army soldiers on 9 December along the border in Arunachal Pradesh.

Defence minister Rajnath Singh said no Indian soldiers were seriously hurt and troops from both sides withdrew from the area soon afterward. A statement from the Indian army said troops on both sides suffered minor injuries.

Rahul Bedi, a defence analyst, said this was the second user test by India's Strategic Forces Command since it was inducted in 2018. The first test was carried out in 2021.

Bedi said Indian authorities did not take cognizance of the reported presence of a Chinese spy ship in the region and went ahead with the test.

India has developed a family of medium- to intercontinental-range ballistic missiles called Agni. Agni missiles are long-range, nuclear-capable, surface-to-surface ballistic missiles.

India has been steadily enhancing its overall military might in the last couple of years.

> Agni missiles are long-range, nuclear-capable, surface-to-surface ballistic missiles. India has developed a family of ballistic missiles under Agni.

It has carried out successful tests of a number of missiles during the period.In May, the extended range version of the BrahMos supersonic cruise missile was test fired from a Sukhoi fighter jet. It was the first launch of the extended range version of the BrahMos missile from a Su-30MKI aircraft. An anti-ship version of the BrahMos supersonic cruise missile was successfully test-fired jointly by the Indian Navy and the Andaman and Nicobar Command in April.

FORMIDABLE ARSENAL

SURFACE-TO-SURFACE MISSILES

Short Range Ballistic Missiles

Prithvi-I	150 km	1,000 kg
Prithvi-II	250 km	500 kg
Prithvi-III	350 km	1,000 kg
Dhanush	350 km	1,000 kg
Agni-I	700 km	1,000 kg
Shaurya	700 km	1,000 kg
Prahaar	150 km	200 kg

Intermediate Range Ballistic Missiles (IRBMs)

Agni-II	2,000 km	1,000 kg
Agni-III	3,000 km	2,000-2,500 kg
Agni-IV	4,000 km	1,000 kg

Intercontinental Range Ballistic Missiles (ICBMs)

Agni -V	5,000 km	1,500 kg ((3-10 MIRV))
Agni-VI (Under Development)	6,000	1,000 kg (10 MIRV)
Surya (Under Development)	10,000 km	1,000 kg (10 MIRV)

Km denotes the range of the missile and kg is the payload

SUBMARINE LAUNCHED BALLISTIC MISSILES

K-15 Sagarika (B-05)	750 km	500 kg
K-4	3,000 km	1,000 kg

CRUISE MISSILES

Subsonic Cruise Missiles

Nirbhay	750-1,000 km	500 kg

Supersonic Cruise Missiles

BrahMos	290 km	300 kg

Hypersonic Cruise Missiles

BrahMos-II	290 km	300 kg

AIR-TO-AIR MISSILE

Astra 80-110 km 15kg

SHORT RANGE SURFACE-TO-AIR MISSILES

Trishul	9 km	5 kg
Akash	30 km	50 kg
Maitri	15 km	10 kg
Barak-8	70 km	60 kg

ANTI-TANK GUIDED MISSILES

Nag Anti-tank guided missile
7 km 8 kg

Helina (Helicopter launched Nag missile)
7 km 8 kg

ANTI-BALLISTIC MISSILES

Prithvi Air Defence Missile
(Exo-atmospheric at 50-80 km altitude)
2,000 km DM (Proximity)

Advanced Air Defence Missile
(Endo-atmospheric at 15-30 km altitude)
150-200 km DM (Hit-to-kill)

Prithvi Defence Vehicle
(Exo-atmospheric at more than 120 km altitude)
2,000-3,000 km DM (Proximity)

DM: Detonation Mechanism

Compiled by Hemant Kumar Rout

Context: India successfully test-fired a **long-range "Agni-5" intercontinental nuclear-capable ballistic** missile that is expected to strengthen its deterrence against long-time rival China.

Agni-5

- **About**: Agni 5 is **India's long-range surface-to-surface ballistic missile,** which can hit a target with a precision that is **5,000 km away.**
  - It has been developed under the **Integrated Guided Missile Development Programme (IGMDP).**
- **Range**: This range puts almost the **entire China within the missile's target range**.
  - Though officially an **Intercontinental Ballistic Missile (ICBM)** needs a missile to have a range of at least 5,500 km, the Agni 5 is India's closest contender for an ICBM, as it can reach countries across other continents, **including parts of Africa and Europe.**
- **Capability**: The nuclear capable missile can **carry a warhead of around 1,500 kg** and has a **launch weight of 50,000 kg,** making it one of the most potent missiles in the country.
- **Key Features**: What makes Agni 5 agile is that it is a **"canisterised" missile.** It means that the missile **can be launched from road and rail platforms**, making it easier for it to be deployed and launched at a quicker pace.
  - The canisterisation, which is an encapsulated system in which the missile is stored and launched from, also **gives the missile a longer shelf life,** protecting it from the harsher climatic conditions.
  - It is a **three-stage, solid fuel** 17-metre tall, and is capable of carrying a nuclear warhead of about 1.5 tonnes.
- **History of Agni missiles**: India began testing the Agni series of missiles in **1989** with the first test for Agni 1, an Intermediate Range Ballistic Missile, with a range of around 1,000 km.
  - At that time only the US, the erstwhile Soviet Union, China, France and Israel, had IRBM technology.
  - In addition to the IRBM-capable nations, only **North Korea and the UK have ICBM technology at the moment.**

ECONOMIC TIMES

Page 2

ADJOURNMENT SESSION IN THE PARLIAMENT

(Syllabus: GS Paper 2 - Polity & Governance)

Rajya Sabha Sees First Set of Adjournments in this Session

SMOOTH FUNCTIONING AFTERWARDS 3 disruptions in zero hour; Oppn didn't raise China issue

RakeshMohan.Chaturvedi
@timesgroup.com

New Delhi: The Rajya Sabha faced adjournments for the first time on the seventh day of this winter session with the Opposition forcing breaks thrice during zero hour on Thursday to press for suspension of business and discussion on important issues.

The Congress and other Opposition parties protested from their seats and staged walkouts during the first hour on the last three working days. There were no protests for the rest of the day. Incidentally, the Opposition members appear to have given up their demand for a discussion on the Chinese intrusion in Tawang, Arunachal Pradesh, after raising it on Wednesday and staging a walkout.

Soon after the House met for the day on Thursday, deputy chairperson Harivansh announced that he has received seven notices for suspension of listed business to discuss under Rule 267. These were by Raghav Chadda (AAP), Pramod Tiwari, Akhilesh Prasad Singh, L Hanumanthaiah (all Congress), Priyanka Chaturvedi (Shiv Sena), Jebi Mather Hisham, Syed Nasir Hussain (both Congress) and Priyanka Chaturvedi (Shiv Sena).

The issues they wanted a discussion on were the government's attempt to interfere in the appointments to the higher judiciary; misuse of CBI, ED and other government agencies; situation arising out of the farmers' strike; and subversion of the democratic system and threatening of the electoral process.

Harivansh maintained that Chairman Jagdeep Dhankhar had ruled on December 8 that when a member demands suspension of business, he/she should state which rule has to be suspended to hold this discussion. Since this was not stated in any of the notices submitted, and since these are with the Chairman for consideration, the members should cooperate in running the House.

Derek O'Brien (TMC) argued that Rule 267 has been applied only thrice since the Narendra Modi government was formed — on the issue of demonetisation (Nov 16, 2016), the farmers' suicides (April 2015) and the attack on the secular fabric of the country (December 2014). On all three occasions, the notices under Rule 267 were not linked to any rule for suspension of business. "The common rule for accepting any Rule 267 notice is Rule 29... which is about the List of Business and clearly states that the prerogative to change the list of business is with him (Chairperson)," he said.

Chaturvedi mentioned Rule 37 along with Rule 29 and said it is the discretion of the Chair to permit a debate.

The Opposition members protested against the Chair's ruling Harivansh adjourned the proceedings for 15 minutes. However, the Opposition continued its protest when the House met again and there was a second adjournment for another 15 minutes. With Bhubaneswar Kalita in the Chair, the House met again. As protests continued, the House was adjourned for the third time.

The Opposition did not disrupt proceedings during Question Hour and the House functioned smoothly.

20 Names Recommended for HC Judges Returned to SC Collegium: Govt in Parl



NEW DELHI: The government has "referred back" 20 names recommended for appointment as HC judges to SC collegium, Parliament was informed on Thursday. "Against 331 vacancies, 147 proposals received from various high courts were at various stages of processing between the government and the Supreme Court collegium," he said in a written response to a question in the Rajya Sabha. - PTI

Context: The **Rajya Sabha faced adjournments** for the first time on the seventh day of this winter session with the Opposition forcing breaks thrice during zero hour to press for suspension of business and discussion on important issues.

Adjournment session

- **About**: A sitting of **Parliament can be terminated by adjournment or adjournment sine die** or prorogation or dissolution (in the case of the Lok Sabha).
  - An adjournment **suspends the work in a sitting for a specified time**, which may be hours, days or weeks.
  - It o**nly terminates a sitting and not a session** of the House.
  - It **does not affect the bills** or any other business pending before the House and the same can be resumed when the House meets again.
- **Adjournment Sine Die**: Adjournment sine die means **terminating a sitting of Parliament for an indefinite period.**
  - When the House is adjourned without naming a day for reassembly, it is called **adjournment sine die**.
- **Nodal Authority**: The power of adjournment as well as adjournment sine die **lies with the presiding officer of the House.**
  - He can also call a sitting of the House before the date or time to which it has been adjourned or at any time after the House has been adjourned sine die.

TIMES OF INDIA

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INS MORMUGAO

(Syllabus: GS Paper 3 - Defence Sector)

Boost for Navy: Desi destroyer to be commissioned on Sunday

Rajat.Pandit@timesgroup.com



The 7,400-tonne Mormugao is packed with advanced weapons like BrahMos supersonic cruise missiles and rocket launchers

New Delhi: India's maritime combat power is set to get another major boost with the commissioning of an indigenous guided-missile destroyer as INS Mormugao this weekend amidst the ongoing attempts by China for grabbing strategic space in the Indian Ocean Region (IOR).

The 7,400-tonne Mormugao, named after the historical port city of Goa, will be commissioned by defence minister Rajnath Singh in Mumbai on December 18, on the eve of the Goa Liberation Day.

The warship is packed with advanced weapons like the BrahMos supersonic cruise missiles, whose range is being extended from 290-km to 450-km, the 70-km MRSAM (medium-range surface-to-air missile) system, torpedo and rocket launchers, and different gun systems as well as a wide array of radars and sensors.

"Her induction will further boost the Navy's blue-water capability in terms of reach, mobility and flexibility in the IOR and beyond," an official told **TOI**.

Mormugao is the second of the four Visakhapatnam-class destroyers being built at MDL under Project-15B at an overall cost of Rs 35,800 crore.

The first such destroyer was commissioned as INS Visakhapatnam in November last year, while the third and fourth, Imphal and Surat, will follow suit in 2023-2024.

"The four 163-metre long destroyers are among the most potent warships to be built in India. They have a high level of indigenisation at around 75%, with enhanced stealth features, and are equipped to fight under the NBC (nuclear, biological and chemical) warfare environment," he added.

Propelled by four powerful gas turbines, in a combined gas and gas (COGAG) configuration, these warships are capable of achieving speeds in excess of 30 knots.

But the 130-warship Indian Navy, with around 230 aircraft, helicopters and drones still has a long way to go. China is building vessels at an astonishing rate to further add to what is already the world's largest Navy with 350 warships and submarines.

Context: India's maritime combat power is set to get another major boost with the commissioning of an indigenous guided-missile destroyer as **INS Mormugao** this weekend amidst the ongoing attempts by China for grabbing strategic space in the Indian Ocean Region (IOR).

INS Mormugao

- **About:** Mormugao is the **second of the four Visakhapatnam class destroyers** being built at MDL under Project-15B.
  - The **first such destroyer was commissioned as INS Visakhapatnam** in November last year, while the third and fourth, Imphal and Surat, will follow suit in 2023-2024.
  - It is named after the historical port city of Goa, Mormugao.
- **Design and Manufacture**: The ship is designed by the **Warship Design Bureau,** the Indian Navy's in-house organisation and built by Mazagon Dock Shipbuilders Ltd in Mumbai.
- **Key Features**: The warship is packed with advanced weapons like the **BrahMos supersonic cruise missiles,** whose range is being extended from 290 km to 450-km, the 70-km **MRSAM (medium-range surface-to-air missile) system**, torpedo and rocket launchers, and different gun systems as well as a wide array of radars and sensors.

Project 15B

- **About**: Under this project, a **total of four warships** have been planned namely, **Visakhapatnam, Mormugao, Imphal and Surat.**
- **Origin**: In 2009, the **Defence Acquisition Council (DAC) approved** of the procurement of four 6,800-tonne destroyers - classified as "Project-15B", as a complement to the Kolkata-class destroyers, which was then under construction.
  - Contract for these ships was signed in 2011.
- **Features**: P-15B Ships are equipped with **long range Surface-to-Air Missiles (SAM) and BrahMos supersonic cruise missiles.**
  - It is also equipped with various indigenous weapons systems like medium range SAMs, anti-submarine indigenous rocket launchers, indigenous torpedo tube launchers and 76-mm super rapid gun mount.

PIB

Dec 16

EXERCISE SURYA KIRAN-XVI

(Syllabus: GS Paper 3 - Internal Security)

INDO NEPAL JOINT TRAINING EXERCISE "SURYA KIRAN -XVI" TO COMMENCE AT NEPAL ARMY BATTLE SCHOOL, SALJHANDI (NEPAL)

Context: The **16th Edition of Indo-Nepal joint training Exercise "SURYA KIRAN-XVI"** between India and Nepal will be conducted at Nepal Army Battle School, Saljhandi (Nepal), from 16 - 29 December 2022.

- The two armies shall be sharing the experiences gained during the conduct of **various counter-insurgency operations** over the years in their respective countries.
- The joint exercise would **focus on evolution of combined drills for planning and conduct of tactical operations** at unit level in counter terrorism operations and disaster response mechanism in general and role of armed forces in management of disaster.

EXERCISE SURYA KIRAN

- **About**: Exercise **"SURYA KIRAN"** is conducted **annually/bi-annually** between India and Nepal.
  - It started in 2011.
- **Objectives**: To **enhance interoperability in jungle warfare** & counter terrorism operations in mountainous terrain and HADR under UN mandate.



DST Dec 16

MIOCENE EPOCH

(Syllabus: GS Paper 1 - Geography)

Fossil lizards and snakes indicate climate of Late Miocene hominid locality of Haritalyangar, Himachal Pradesh, India

Context: Remains of fossil lizards and snakes have been discovered recently from a **late Miocene hominid locality of India (dated 9.1 Million Years) in Haritalyangar, Himachal Pradesh, i**ndicating a seasonally wet sub-humid to semi-arid climate in the area with mean annual temperature of around 15–18.6°C during that period.

- It was similar to condition in the area today.

Miocene Epoch

- The Miocene epoch is a **major division of the geologic timescale** and extends from about 23.03 to 5.332 million years before the present.
- It is the **first geological epoch** of the Neogene Period and extends from about 23.03 to 5.333 million years ago (Ma).
- The Miocene is **preceded by the Oligocene and is followed by the Pliocene.**
- As Earth went from the Oligocene through the Miocene and into the Pliocene, the **climate slowly cooled towards a series of ice ages.**
- The Miocene boundaries are **not marked by a single distinct global event** but consist rather of regionally defined boundaries between the warmer Oligocene and the cooler Pliocene Epoch.
- The **apes first evolved,** arose, and diversified during the early Miocene (Aquitanian and Burdigalian Stages), becoming widespread in the Old World.
- By the end of this epoch and the start of the following one, the **ancestors of humans had split away from the ancestors of the chimpanzees** to follow their own evolutionary path during the final Messinian Stage (7.5–5.3 Ma) of the Miocene.
- As in the Oligocene before it, **grasslands continued to expand** and forests to dwindle in extent.
- In the seas of the Miocene, **kelp forests made their first appearance** and soon became one of Earth's most productive ecosystems.
- The **plants and animals of the Miocene were recognizably modern.** Mammals and birds were well-established. Whales, pinnipeds, and kelp spread.
- The Miocene is of particular interest to geologists and paleoclimatologist as major phases of the geology of the **Himalaya occurred during the Miocene**, affecting monsoonal patterns in Asia, which were interlinked with glacial periods in the northern hemisphere.

System	Series	Stage	Age (Ma)
Quaternary	Pleistocene	Gelasian	younger
Neogene	Pliocene	Piacenzian	2.588–3.600
		Zanclean	3.600–5.332
	Miocene	Messinian	5.332–7.246
		Tortonian	7.246–11.608
		Serravallian	11.608–13.65
		Langhian	13.65–15.97
		Burdigalian	15.97–20.43
		Aquitanian	20.43–23.03
Paleogene	Oligocene	Chattian	older

DTE

Dec 16

METHANE EMISSION

(Syllabus: GS Paper 3 - Env & Eco)

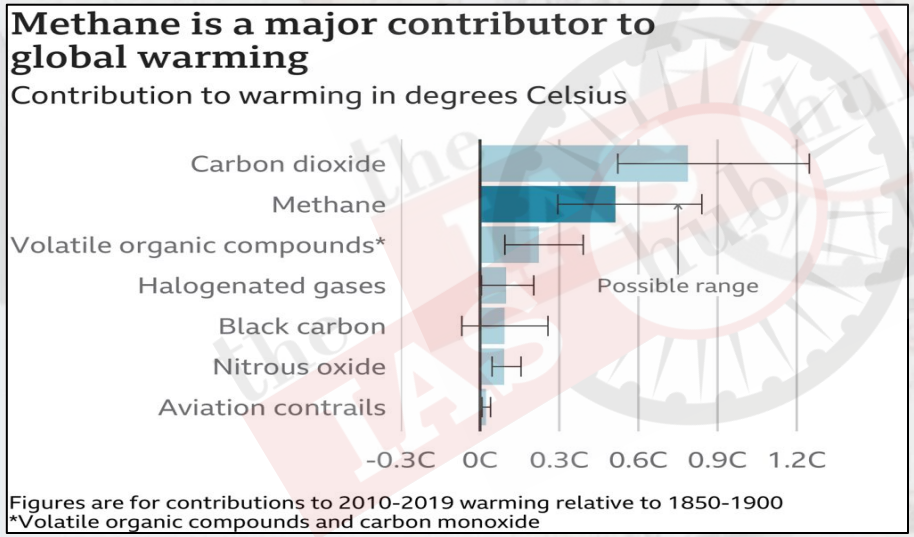
Why did methane emissions spike in 2020? Study offers answers

More than half of methane growth can be attributed to lower hydroxyl sink

NEXT NEWS >

By Rohini Krishnamurthy
Published: Thursday 15 December 2022





Context: Global methane emissions reached roughly 15 parts per billion (ppb) in 2020 from 9.9 ppb in 2019, the study published in the journal Nature noted.

- This increase occurred despite the COVID-19 lockdown, which brought the world to a standstill.
- In 2020, **methane emissions from human activities** decreased by 1.2 teragrams (Tg) per year.

Key Points

- Methane has **more than 80 times the warming power of carbon dioxide** over the first 20 years of its lifetime in the atmosphere.
- The **common sources of methane** are oil and natural gas systems, agricultural activities, coal mining and wastes.
- Nitrogen oxide enters the atmosphere from exhaust gases of cars and trucks as well as electrical power generation plants.
- Nitrogen oxide (NOx) can **impact methane levels.**
- In the troposphere - the upper part of the atmosphere - NOx combines with ozone to form **hydroxyl radicals.**
- These radicals remove 85 percent of methane annually from the atmosphere.
- Hydroxyl radicals in the troposphere react with methane to form **water and CO2.**
- **Less nitrogen oxide pollution** means less hydroxyl and more methane.

Methane

- Methane accounts for about **a fifth of global greenhouse gas (GHG) emissions** and is about 25 times as potent as carbon dioxide in trapping heat in the atmosphere.
- Methane is **short-lived,** compared with carbon dioxide.
- Methane is **emitted from a variety of anthropogenic (human-influenced)** and natural sources.
- The human sources include **landfills, oil and natural gas systems, agricultural activities** as well as livestock rearing, coal mining, stationary and mobile combustion, wastewater treatment, and certain industrial processes.
- **Sources of methane can be harnessed for energy** and in principle reduce dependence on energy sources that emit high carbon dioxide.
- **India is the third largest emitter of methane,** primarily because of the size of its rural economy and by virtue of having the largest cattle population.

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Dec 16

RAMPHAL

(Syllabus: GS Paper 3 - Env & Eco)



ICRISAT intern awarded for developing bio-insecticide from 'ramphal' leaves

Extracts from its leaves may be useful against three destructive pests — Pod borer, Green peach aphid and fall armyworm — with a mortality rate of 78-88%

NEXT NEWS >

By Arya Rohini
Published: Thursday 15 December 2022

International Crops Research Institute for the Semi-Arid-Tropics (ICRISAT)

- ICRISAT is a **non-profit** agricultural research organization.
- HQ : **Hyderabad**, Telangana.
- It was **founded in 1972** by a consortium of organizations convened by the Ford and the Rockefeller Foundations.
- Its charter was signed by the **Food and Agriculture Organization (FAO) and United Nations Development Programme (UNDP).**
- It has several **regional centres** around globe- Niamey (Nigeria), Nairobi (Kenya) and research stations Bamako (Mali), Bulawayo (Zimbabwe).
- Since its inception, I**ndia has granted special status to ICRISAT** as a UN Organization operating in the Indian Territory making it eligible for special immunities and tax privileges.

Context: A high school student from FIITJEE Junior College, Hyderabad, won the third prize at the International Science and Engineering Fair in the United States - the world's largest pre-college science fair - for developing a cost-effective bio-insecticide from the l**eaves of bullock's heart tree (Annona reticulata), popularly known as ramphal.**

Key Points

- Extracts from different parts of this plant have t**raditionally been used to cure conditions** including dysentery and pediculosis (louse infestation).
- Extracts from its leaves may be **useful against three destructive pests** - **Pod borer, Green peach aphid and fall armyworm** - with a mortality rate of 78-88 per cent, the research claimed. All these pests are known for incurring crop losses to farmers.
- **Pod borer (Helicoverpa armigera)** alone may cause losses worth more than $300 million (over Rs 24 billion) annually.
- **Green peach aphid (Myzus persicae)** causes 38-42 percent yield loss in various crops and fall armyworm (Spodoptera frugiperda) causes 21-53 per cent losses in the absence of pest management.
- The **fall armyworm** impact on Indian agriculture was considerable. So much so that the country had to import maize to meet the poultry and animal feed industry's demand after the pest destroyed its maize crop in 2018.

Annona reticulata

- **About**: It is a **small deciduous or semi-evergreen tree** in the plant family Annonaceae and part of the Annonas group.
  - It is best known for its fruit, called **custard apple**, a common name shared with fruits of several other species in the same genus: **A. cherimola and A. squamosa.**
  - Other English common names include ox heart and bullock's heart.
- **Distribution**: Possibly a native of the **Caribbean and Central America,** Annona reticulata is now **pantropical**.
  - It is cultivated and naturalized in many tropical places including Southeast Asia, Taiwan, India, Pakistan, Australia, and Africa.
  - In India, the species has migrated from **initial cultivation into the wild.**

THANK YOU!

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