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For the 4th Week

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1. Geography

1.1. Projects in News

Northern European Enclosure Dam





- Northern European Enclosure Dam (NEED) **enclosing all of the North Sea** to protect economic regions of Northern European countries from Sea-level Rise.
- **Scotland and Norway & France and England**
- **To separate the North and Baltic Seas from the Atlantic Ocean** to protect Northern Europe against Sea Level Rise

Additional Info



Grand Ethiopian Renaissance Dam



Horn of Africa





Blue Nile/White Nile

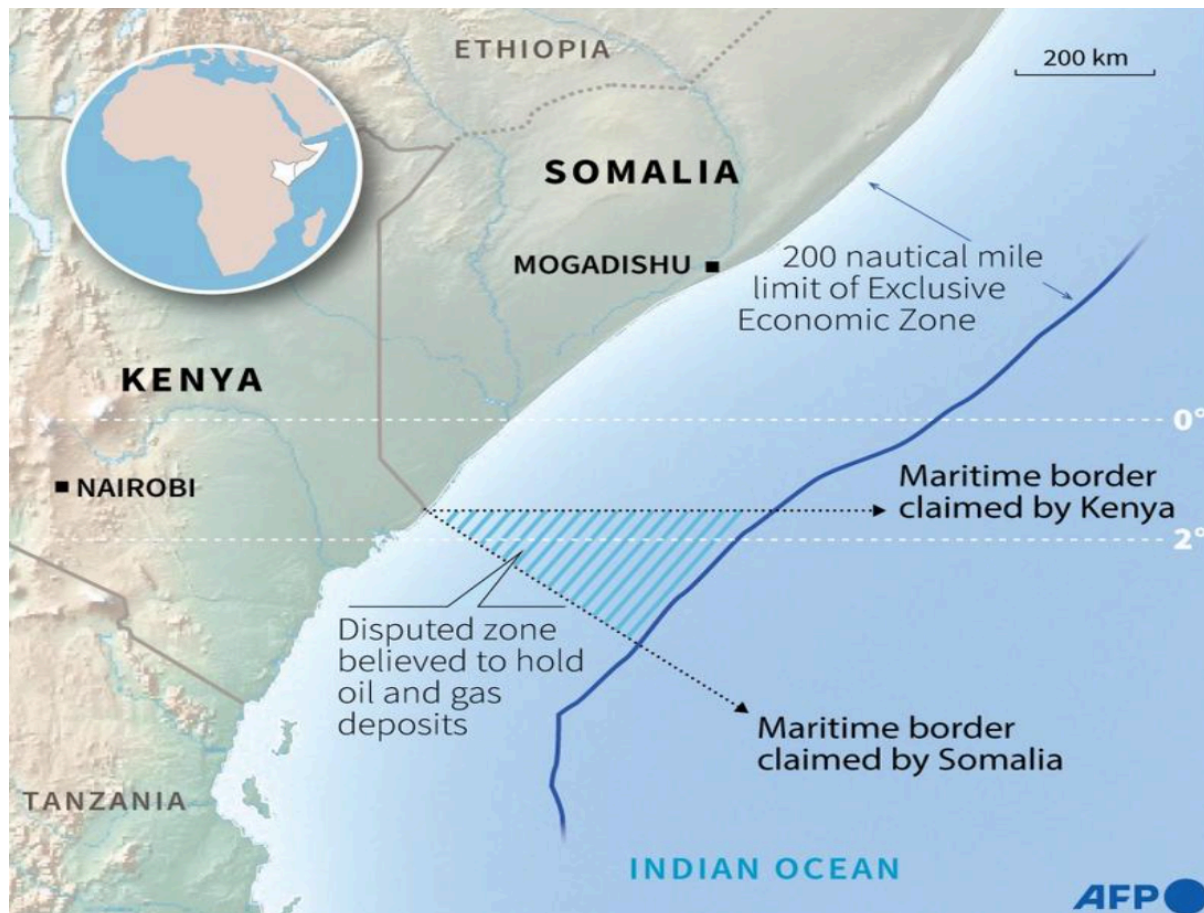


Nile River



- **Ethiopia, Sudan and Egypt** - Negotiations to resolve their dispute over the Grand Renaissance Dam hydropower project.
- Its construction was initiated in 2011 on the Blue Nile tributary of the Nile.
- **Note : Horn of Africa**

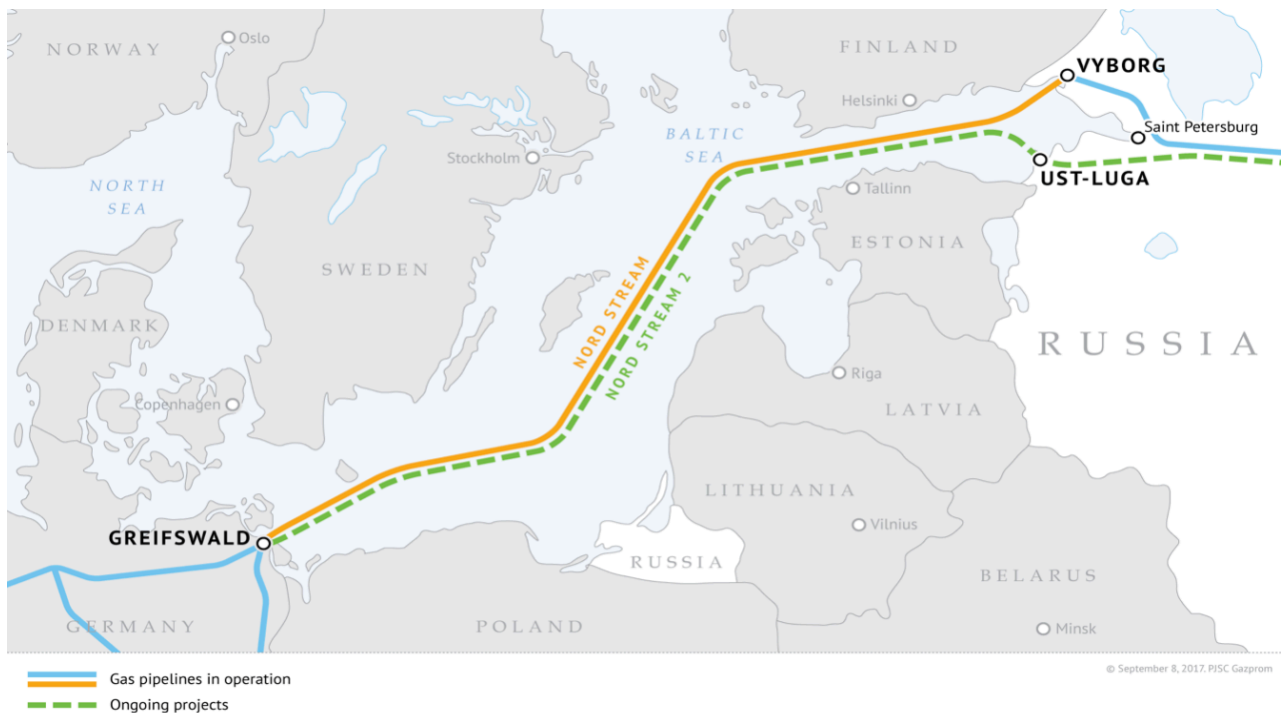
Additional Info



Nord Stream



Nord Stream 2

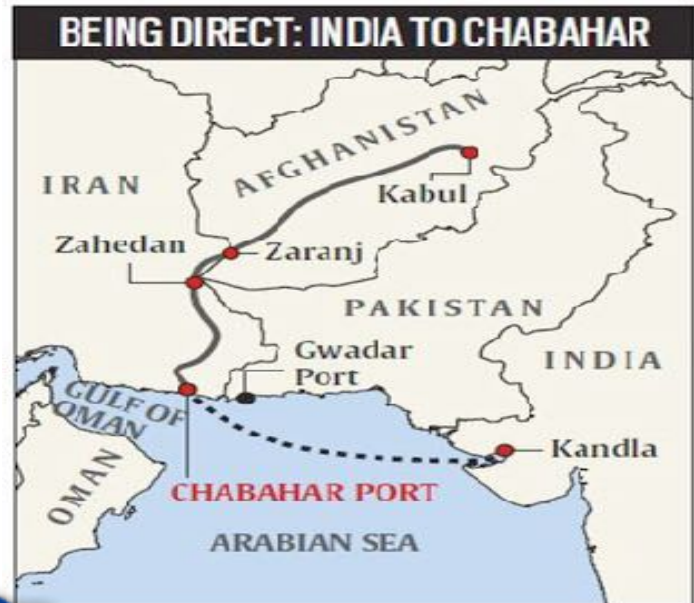


- Nord Stream is a system of **offshore natural gas pipelines in Europe, running under the Baltic Sea from Russia to Germany.**
- Nord Stream is the **longest sub-sea pipeline in the world.**
- **Significance-** key factor in securing energy security in Europe.

Chabahar-Zahedan- Zaranj

- Chabahar-Zahedan rail line, which will be extended to Zaranj across the border in Afghanistan.
- Alternate trade route to Afghanistan and Central Asia.

Additional Info



Power of Siberia



- It is a pipeline in Eastern Siberia that transports natural gas from Siberia to China (Eastern gas route)
- The proposed **Western gas route** to China is known as **Power of Siberia 2**.



- Under this pipeline project, Russia will deliver 1 trillion cubic meters of natural gas to China over the next 30 years.
- The pipeline will pass through the deltas of the Yangtze and Amur rivers of China.

Additional Info

Possible routes: Altai pipeline, Power of Siberia pipeline



Question for Practice

Consider the following pairs :

National Highway	Cities connected
1. NH 4	Chennai and Hyderabad
2. NH 6	Mumbai and Kolkata
3. NH 15	Ahmedabad and Jodhpur

Which of the above pairs is/are correctly matched?

- A. 1 and 2 only
- B. 3 only
- C. 1, 2 and 3
- D. None

2. History

2.1.5 Important Terms History + Art and Culture

Valangai and Idangai

- **Valangai or the right hand refers to a caste-based division of communities** in the Indian state of Tamil Nadu that was in vogue from **ancient times right up to the 19th** and even the early decades of the 20th century AD.
- Since India's independence, the differences have practically vanished.
- The Valangai or right-handed faction was made up of **castes with an agricultural basis while the Idangai was made of metal workers, weavers, etc. i.e. castes involved in manufacturing.**
- The Valangai faction was numerically superior to the Idangai or left-handed faction. There were 6 castes in the Idangai faction as opposed to sixty in the Valangai faction. The Valangai faction was better organized, politically, than Idangai.

Vishti

- The word **Vishti means Forced labour.**
- This term is prominently used in the **Gupta Period**, Vishti became a **source of income for the state** and was looked upon as a sort of taxation paid by the people.
- While the Kshatriyas acquired their share of the social surplus through the **force of arms in the form of taxes** (Kar, Shulka, Bali, etc.), **forced labour** (Vishti, Balutam, etc.), tithes and other privileges.

Jajmani System

- Jajmani system or Yajman system was an **economic system most notably found in villages** of India in which **lower castes performed various functions for upper castes and received grain or other goods in return.**
- It was an **occupational division of labour** involving a system of role-relationships that enabled villages to be mostly self-sufficient.

Hundi System

- Hundi/Hundee is a **financial instrument that developed in Medieval India for use in trade and credit transactions.**
- Hundis are used as a **form of remittance** instrument to transfer money from place to place, as a form of credit instrument to borrow money and as a bill of exchange in trade transactions.

- The Reserve Bank of India describes the Hundi as **"an unconditional order in writing made by a person directing another to pay a certain sum of money to a person named in the order."**

Murtipujakas

- Mūrtipūjaka ("image-worshipper"), also known as Derāvāsī ("temple-dweller") or Mandir Mārgī ("follower of the temple path")
- It is the largest sect of Śvetāmbara Jainism.
- They **worship the images of the Tirthankaras** and believe in its beneficial effect in cleansing karma.
- They **do not offer edible items to the images, but distribute them among those who serve in the temple.**



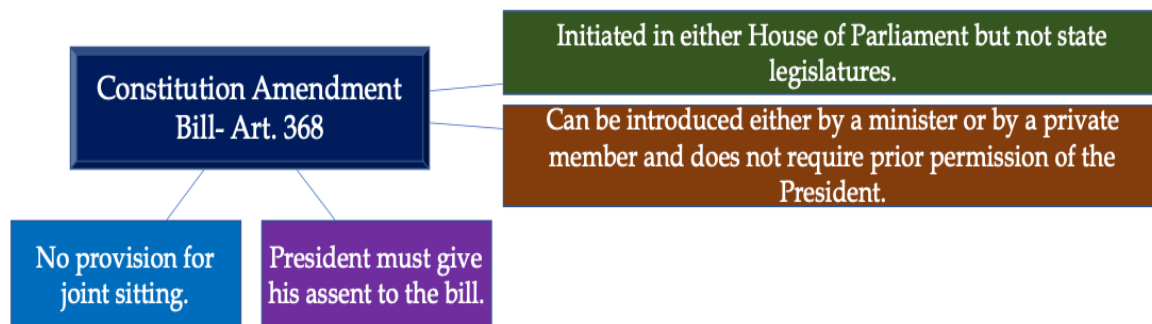
3. Polity & Governance

3.1.Types of Bills in Indian Parliament

Public Bill	Private Bill
Introduced in the Parliament by a minister.	Introduced by any member of Parliament other than a minister.
Reflects the policies of the government.	Reflects the stand of opposition parties on public matters.
Greater chance to be approved in Parliament.	Less chance of being approved in the Parliament.
Its rejection projects reduced confidence in the government and may lead to its resignation.	Its rejection has no impact on government or its popularity in the Parliament.
Its introduction requires a notice of seven days.	Its introduction in the House requires a notice of one month.
It is drafted by the concerned department in consultation with the law departments.	Its drafting is the responsibility of the concerned ministry.

Money Bill	Financial Bill I	Financial Bill II
Article 110	Article 117 (1)	Article 117 (3)
A bill is a 'money bill' only if it deals with certain matters: (a) the imposition, abolition, remission, alteration or regulation of any tax; (b) the regulation of the borrowing of money or the giving of any guarantee by the Government of India; (c) the custody of the Consolidated Fund or the Contingency Fund of India, the payment of moneys into or the withdrawal of moneys from any such fund; (d) the appropriation of moneys out of the Consolidated Fund of India; (e) declaration of an expenditure as charged on CFI or increase in such expenditure (f) the receipt of money on account of the Consolidated Fund of India or the public account of India or the custody or issue of such money or the audit of the accounts of the Union or of a State; or (g) any matter incidental to any of the matters specified in sub-clauses (a) to (f).	It contains not only any or all the matters mentioned in Article 110, but also other matters of general legislation.	It contains provisions involving expenditure from the Consolidated Fund of India, but does not include any of the matters mentioned in Article 110.
It can only be introduced in the Lok Sabha and that too on the recommendation of the president.	Same as Money Bill.	Either House of Parliament and no recommendation of the President.

Money Bill	Financial Bill I	Financial Bill II
Can only be introduced by a minister in Lok Sabha where after passage it is sent to Rajya Sabha. Powers of RS limited only to make the recommendations. It must return the bill to the Lok Sabha within 14 days, with or without recommendations and cannot reject or amend the Bill. Lok Sabha can either accept or reject all or any of the recommendations of the Rajya Sabha. If the Rajya Sabha does not return the bill to the Lok Sabha within 14 days, the bill is deemed to have been passed by both the Houses in the form originally passed by the Lok Sabha.	Ordinary legislative procedure applicable except that an amendment other than for reduction/abolition of a tax can't be moved in either House without the recommendation of the President.	Ordinary legislative procedure except that it cannot be passed by either House of Parliament unless the President has recommended to that House the consideration of the bill.
President may either give his assent to the bill or withhold his assent but can't return the bill for reconsideration of the Houses.	President can give/withhold assent or return for reconsideration.	President can give/withhold assent or return for reconsideration.
No need for Joint Sitting.	Can summon joint sitting.	Can summon joint sitting.



Special Majority of Parliament	Special Majority + Ratification by states
The provisions which can be amended by this way includes: (i) Fundamental Rights;(ii) Directive Principles of State Policy; and (iii) All other provisions which are not covered by the first and third categories.	Those provisions of the Constitution which are related to the federal structure of the polity require this method such as election of President, Supreme Court and High Courts, Lists in seventh schedule etc.
A majority of the total membership of each House and a majority of two-thirds of the members of each House present and voting. The requirement for special majority has been provided for in the rules of the Houses in all effective stages of the bill.	Require a special majority of the Parliament and also the consent of half of the state legislatures by a simple majority. There is no time limit within which the states should give their consent to the bill.

4. Economy

4.1. EverGrande Collapse

What is 'Marketised Default'

- An orderly market exit and well- managed restructuring for troubled companies.
- It shows how regulators have become adept at managing larger, more frequent and highly complex defaults.

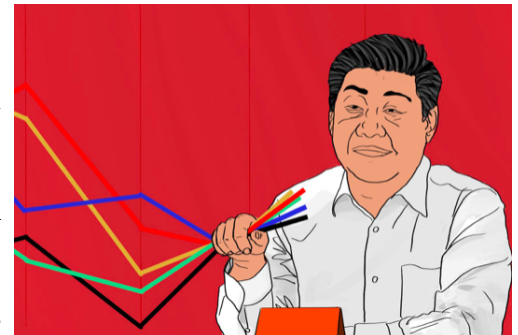
How is EverGrande Related

- EverGrande is China's biggest and most indebted developer.
- The company is the world's most indebted property firm with \$300bn in liabilities.
- The company is on the verge to default on both yuan- and dollar- denominated interest payments.



How is this a Big Deal?

- Evergrande's distress has been roiling markets around the globe and dragging down other weak developers.
- Major indices in Europe, Asia and America have fallen as Evergrande's situation appeared to worsen.
- Yields on the bonds of a number of struggling Chinese developers have soared.



Other Important Impacts

- Shares of other developers are collapsing by nearly 90% on fears that they, too, would fail to repay bonds due.
- Several financial institutions with high exposure to the property sector have suffered falls in their market value.
- The price of iron ore has fallen below \$100 per tonne on September 20th for the first time in a year on fears that Chinese homebuilders will construct fewer properties.

One Important Takeaway

- Several financial institutions wThe company has relied on ever-increasing costly short-term debts.
- The business model relies on borrowing money to develop properties and selling them years before they are completed to generate cash from buyers' deposits.
- Chinese government regulators are stepping up their campaign against leverage.

- Authorities are constricting developers' capacity to accumulate debt, limit liability-to-asset ratios, net debt-to-equity ratios and mandating levels of cash that are at least equivalent to short-term debt.

Impact on Banking Sector

- China's banking sector has lent heavily to developers in recent years.
- Thus, it would mean higher NPAs.
- Defaults would eat into banks' overall capital-adequacy ratios.

Impact on Shadow Banking

- About 45% of its interest-bearing liabilities in the first half of 2020 were from trusts and other shadow lenders, which are opaque and typically charge higher rates, compared with just 25% for bank loans.

Impact on Offshore Bonds

- Chinese developers are the largest issuers of dollar-denominated bonds traded in Hong Kong, and among them Evergrande is the single largest issuer.
- Many other developers' yields will shoot up above 30% !!!

What is Chinese Government's Stance

- The crackdown on developer debt is not an isolated event but one of several campaigns Xi Jinping is using to remould the country.
- A sweeping clampdown on internet-technology companies has wiped out more than \$1trn in shareholder value since early this year.
- These changes, along with the goal of improving housing affordability and ridding the property market of speculation, have been encapsulated by Mr Xi in the phrase "common prosperity".

Chinese Government's Reshaping the Economy

- The government is unyieldingly cracking down on leverage.
- China's property sector accounts for 20-25% of its economy.
- An extended campaign against developer debt could significantly lower China's growth prospects.

5. Environment

5.1. Man & Biosphere Reserves Part - 2

Biosphere Reserves - MAB

- India has 12 internationally recognised BRs.
 - ✓ Nilgiri
 - ✓ Gulf of Mannar
 - ✓ Sunderbans
 - ✓ Nanda Devi
 - ✓ Nokrek
 - ✓ Pachmarhi
 - ✓ Similipal
 - ✓ Achanakmar-Amarkantak
 - ✓ Great Nicobar
 - ✓ Agasthyamala
 - ✓ Khangchendzonga
 - ✓ Panna

Gulf Of Mannar Biosphere Reserve

- It covers an area of 10,500 km² of ocean, 21 islands and the adjoining coastline.
- The islets and coastal buffer zone include **beaches, estuaries, and tropical dry broadleaf forests, while the marine environments** include seaweed communities, sea grass communities, coral reefs, salt marshes and mangrove forests.
- It is the **first Marine Biosphere Reserve** in the South and South East Asia.
- In India, the Gulf of Mannar region in **Tamil Nadu** is one of the **four major coral reef areas** and the others are Gulf of Kutch in Gujarat, Lakhsadweep and Andaman and Nicobar islands.
- It supports **several globally important species** such as the critically endangered Dugong dugon (sea cow), all protected sharks, including **whale shark**, sea **horses**, **green and hawksbill sea turtles**, **dolphins** and **sea cucumbers** and **several endemic species of Balanoglossus**, sea grass, crabs and mangroves.

Sea Cow

- One of the four surviving species in the Order Sirenia.
- There were only about 200 dugongs in the **Gulf of Mannar in Tamil Nadu, the Andaman and Nicobar Islands and the Gulf of Kutch in Gujarat.**
- India has signed non-legally binding Memorandums of Understanding (MoU) with CMS on the conservation and management of SiberianCranes (1998), Marine Turtles (2007), Dugongs (2008) and Raptors (2016).
- It is protected in India under **Schedule I of the Wild (Life) Protection Act, 1972.**
- The **Tamil Nadu State government announced last week that a 500-sq km dugong conservation reserve will soon be set up in the Palk Bay.**



A dugong photographed underwater



Consider the following animals

1. Sea cow
2. Sea horse
3. Sea lion

Which of the above is/are mammal/mammals?

- A. 1 only
- B. 1 and 3 only
- C. 2 and 3 only
- D. 1, 2 and 3

PYQ 2015

With reference to 'dugong', a mammal found in India, which of the following statements is/are correct

1. It is a herbivorous marine animal.
2. It is found along the entire coast of India
3. It is given legal protection under Schedule 1 of the Wildlife (Protection) Act, 1972.

Select the correct answer using the code given below.

- A. 1 and 2
- B. 2 only
- C. 1 and 3

D. 3 only

Whale Shark

- Tropical oceans and warm temperate oceans. Pelagic.
- The whale shark is the biggest fish and shark in the world.
- IUCN Status - **Endangered**
- The Whale Shark also receives international protection due to its inclusion in **Appendix II** of the Convention in International Trade in Endangered Species of Fauna and Flora (CITES).
- Appendix I listing the UN Convention on Migratory Species in 2017.
- It was in 2001 that, in a conservation attempt, whale sharks were included in **Schedule I of the Wildlife (Protection) Act of India, 1972**, rendering the capture and killing of the fish a cognisable offence.



Sea Cucumber

- It is an example of **marine invertebrates that constitute a class within the phylum Echinodermata**.
- It is an integral part of the **coral ecosystem**.
- IUCN Red List -Brown Sea Cucumber (Endangered), Blackspotted Sea Cucumber (Least Concern), etc.
- Wildlife Protection Act, 1972 - Schedule I.
- The **Lakshadweep Islands administration** has announced the creation of the world's first conservation area – 239 sq. km – for endangered sea cucumbers.



A sea cucumber (*Actinopyga echinites*), displaying its feeding tentacles and tube

Dolphins

- Important Dolphins Found in India
 - ✓ Gangetic dolphin
 - ✓ Indus River Dolphin
 - ✓ Irrawaddy Dolphin
- Gangetic dolphin IUCN Status: Endangered
- Indus River Dolphin IUCN Status: Endangered
- Irrawaddy Dolphin IUCN Status: Endangered

Gangetic Dolphins

- National Aquatic Animal of India
- They are locally known as **Susu** which refers to the noise the dolphin is said to make when it breathes.
- Wildlife (Protection) Act, 1972: **Schedule I**
- CITES: **Appendix I**
- It is among the **four freshwater dolphins** in the world and the other three are:
 - ✓ The 'Baiji' now likely extinct from the Yangtze River in China,
 - ✓ The 'Bhulan' of the Indus in Pakistan, and
 - ✓ The 'Boto' of the Amazon River in Latin America.
- These four species live only in **rivers and lakes**.
- They prefer deep waters, in and around the confluence of rivers.
- They can only live in freshwater and are essentially blind (It is also called a blind dolphin because it doesn't have an eye lens and uses echolocation to navigate and hunt.)
- The Bihar government is setting up **India's first observatory for the Gangetic dolphins in Bhagalpur district**.
- The observatory is constructed at Vikramshila Gangetic Dolphin Sanctuary (VGDS).



Green turtle – less sharp and prominent than the Hawksbill.

PYQ 2015

Which one of the following is the national aquatic animal of India?

- A. Saltwater crocodile
- B. Olive ridley turtle
- C. Gangetic dolphin
- D. Gharial

Hawksbill And Green Turtle

- The Hawksbill turtle is listed as **Critically Endangered** and Green Turtle is listed as **Endangered** on the IUCN Red List of Threatened Species.
- They are protected in Indian Wildlife Protection Act of 1972, under **Schedule I**.

Nokrek Biosphere Reserve

- The **Nokrek Biosphere Reserve** is located in the **northeast of India on the Tura Range**, which forms part of the Meghalaya Plateau (average altitude: 600 metres).
- The entire area is mountainous and **Nokrek is the highest peak of the Garo hills**, rising up 1,412 metres.
- The north of the reserve embraces rather **gently undulating hills**, while **steep slopes characterize the south**.
- The biosphere reserve contains major rivers and streams that form a perennial catchment system.
- Examples include the **Ganol, Dareng and Simsang rivers**, of which the latter is the longest and largest.
- The Simsang originates in the north of the Biosphere Reserve, the Dareng from the southern peaks, and the Ganol flows westward into the Brahmaputra River, which supplies water to numerous towns.
- **Evergreen and semi-evergreen deciduous forests** dominate the landscape: 90% of the Nokrek Biosphere Reserve is covered by evergreen forest.
- Some patches of **bamboo forest** can also be found in the lower altitudes, and a remarkable variety of **endemic Citrus spp.** can also be found in the reserve, especially *Citrus indica* (Indian wild orange).
- The key fauna of the Nokrek is the **Red Panda**.
- In addition, the reserve is home to other unique and endangered animals, such as **tigers, leopards, elephants, Pig-tailed macaque, stump-tailed macaque, Gaur, Clouded leopard and Hoolock gibbons**; the latter are the most endangered apes in India and therefore receive special protection.



Red Panda

- The red panda (*Ailurus fulgens*) is a mammal species native to the eastern Himalayas and southwestern China.
- Despite its name, it is not closely related to the giant panda.
- It thrives best at 2,200-4,800m, in **mixed deciduous and conifer forests** with dense under stories of bamboo.
- It is a solitary animal, mainly active from dusk to dawn, and is largely sedentary during the day (both nocturnal and crepuscular)

- It is also called the lesser panda, the red bear-cat, and the red cat-bear.
- About 5,000-6,000 red pandas are estimated to be present in four Indian states – Arunachal Pradesh, Meghalaya, Sikkim and West Bengal.
- It is the state animal of Sikkim.
- It is listed as **Endangered** on the IUCN Red List.
- International trade is strictly regulated through its listing in **Appendix I** of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), while in India, the species is protected under **Schedule I** of the Wildlife (Protection) Act, 1972.



Clouded Leopard

- Named after cloud shaped pattern on its skin.
- It is listed as Vulnerable on the IUCN Red List.
- It is the **State animal of Meghalaya**.
- **Clouded Leopard National Park of Tripura** is India's first dedicated wildlife park to Clouded Leopards, located inside the the Sipahijola Wildlife Sanctuary.
- **Dampa tiger reserve in Mizoram** has the highest density of clouded leopards in Southeast Asia, according to a study by researchers from India and the UK.



Gaur/Indian Bison

- It is a bovine native to South and Southeast Asia.
- It is the largest species among the wild cattle.
- The Western Ghats and their outflanking hills in southern India constitute one of the most extensive extant strongholds of gaur, in particular in the **Wayanad – Nagarhole – Mudumalai – Bandipur complex**.
- IUCN Red list - **Vulnerable**
- **Schedule I** of Wildlife Protection Act. 1972.



Hoolock Gibbons

- Western Hoolock gibbon (*Hoolock hoolock*) is the only gibbon (apes in the family Hylobatidae) found in India, according to the analysis.
- In northeast India, the hoolock is found south of Brahmaputra and the North Bank areas and east of the Dibang Rivers.
- Western - **Endangered**
- Eastern - **Vulnerable**
- **Schedule 1** of the Indian (Wildlife) Protection Act 1972.



Nanda Devi Biosphere Reserve

- It is dispersed across **three districts of Uttarakhand viz. Chamoli, Pithoragarh, and Bageshwar.**
- **Nanda Devi Biosphere Reserve**, located in the Himalayan Mountains in the northern part of the country, includes as core areas the Nanda Devi and Valley of Flowers National Parks, which are one World Heritage site.
- Nanda Devi National Park has remained more or less intact because of its **inaccessibility.**
- The Valley of Flowers National Park is renowned for its meadows of **endemic alpine flowers and outstanding natural beauty.**
- The valley is situated in a very remarkable area, **the conjunction point of Western and Eastern Himalayas.**
- These Parks includes the catchment of **Alaknanda River and its tributaries** including Rishi Ganga, Dhauri Ganga, Pushwapati and Khiri Ganga.
- Together they encompass a **unique transition zone between the mountain ranges of the Zaskar and Great Himalaya.**
- The alpine vegetation of the reserve majorly comprises herbaceous species and scrub communities such as *Rhododendron campanulatum*, *R. anthopogon*, and *Salix denticulata*.
- The percentage of **native and endemic species** is high in comparison to non-native species in reserve.



- Several **endangered mammal species** find refuge in the Nanda Devi Biosphere Reserve such as snow leopard, Himalayan black bear, brown bear, musk deer and bharal/blue sheep.

Rhododendron

- Found mainly in Eastern Himalayas, Western Himalayas and Nilgiris.
- The cold, moist slopes and deep valleys of the eastern Himalayas form a conducive habitat for the luxuriant growth of Rhododendron species
- **State tree of Uttarakhand** and its blooming in the Garhwal Himalayas is celebrated as 'Phool Sankranti', a festival of flowers.
- The studies on the **flowering cycle** have revealed that they are prominent indicators of climate change.
- Rhododendrons are used in **local medicines** against colds, coughs and chronic bronchitis and diarrhoea.
- The **endemic R. wattii from Dzukou hills of Manipur and Nagaland** is one of the most critically endangered species in India, with only a few adult trees remaining in their natural habitat.

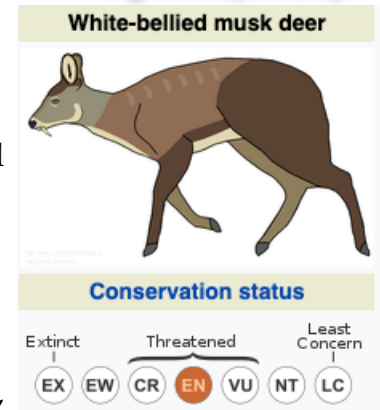
Snow Leopard

- In India, the snow leopards are found in **Ladakh, Jammu and Kashmir, Sikkim, Uttarakhand, and Arunachal Pradesh.**
- It is an **indicator of the health of India's mountains.**
- Rarely seen so also **known as ghosts of the mountains.**
- IUCN Red List of the Threatened Species - **Vulnerable**
- Wildlife (Protection) Act 1972 - Schedule I
- Convention on International Trade of Endangered Species (CITES) - **Appendix I**
- Convention on the Conservation of Migratory Species of Wild Animals - **Appendix I**
- **International Snow Leopard Day** is observed on 23rd October.
- It came into being on 23rd October, 2013, with the adoption of the Bishkek Declaration by 12 countries on the conservation of snow leopards.
- The 12 countries included, India, Nepal, Bhutan, China, Mongolia, Russia, Pakistan, Afghanistan, Kyrgyzstan, Kazakhstan, Tajikistan, and Uzbekistan.
- **Global Snow Leopard and Ecosystem Protection Programme (GSLEP)**



Musk Deer

- State animal of Uttarakhand.
- In northern India such as in Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Sikkim and Arunachal Pradesh.
- It inhabits **high alpine environments** above altitudes of 2,500 m.



Himalayan Brown Bear

- North-western and central Himalaya, including India, Pakistan, Nepal, the Tibetan Autonomous Region of China and Bhutan.
- IUCN Red List - **Least Concern**
- CITES - **Appendix I**
- Indian Wildlife (Protection) Act of 1972 - **Schedule I**

Population	Countries	Degree of isolation	Population size (mature adults)	Population area (km ²)	Population trend	Red List Category	Red List Criteria
Western China (mostly Qinghai-Tibetan Plateau)	China	complete	6,300 (3,465)	2,400,000	unknown	LC	
Himalaya Mountains	Nepal, India, Pakistan	<1 F/gen, male connectivity with China (Tibet) possible	130-220 (72-121)	35,000	unknown	EN	D
Hindu Kush Mountains	Pakistan	complete	15-30 (8-17)	4,300	unknown	CR	D

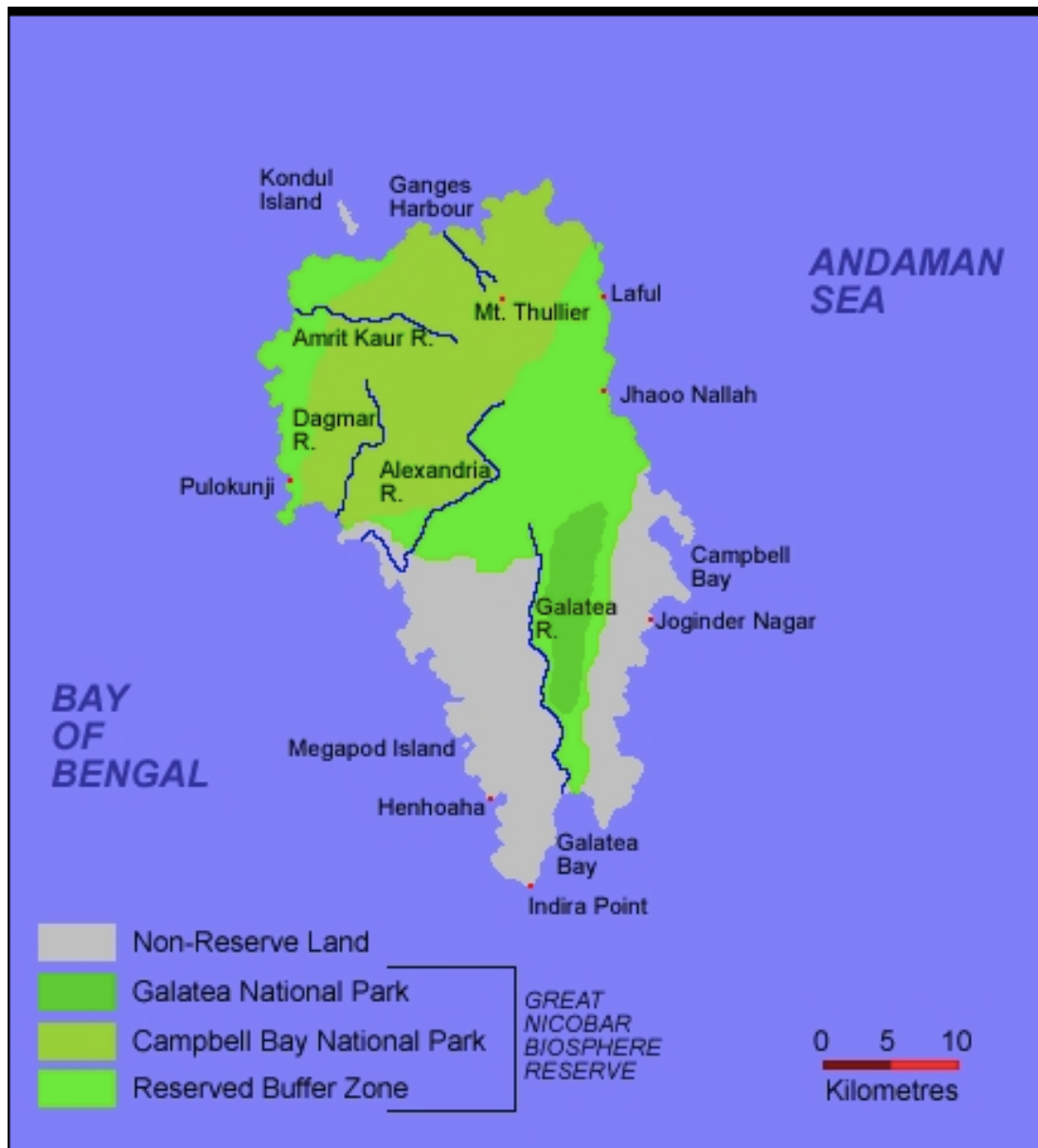
Blue Sheep/Bharal

- Native to the **high Himalayas**.
- Found in **India, Nepal, Bhutan, Tibet, and Pakistan**.



Great Nicobar Biosphere Reserve

- It encompasses a **large part (some 85%)** of the island of Great Nicobar, the largest of the **Nicobar Islands** in the Indian Union
- Territory of Andaman and Nicobar Islands.



Great Nicobar Biosphere Reserve

- It incorporates two National parks of India, the larger Campbell Bay National Park on the northern part of the island, and Galathea National Park in the southern interior.
- The environment is classified as **tropical and subtropical moist broadleaf forests biome**.
- **Species of fauna** in the reserve include: Nicobar scrubfowl (a megapode bird), the edible-nest swiftlet, the **Nicobar long-tailed macaque**, **saltwater crocodile**, **Andaman water monitor**, **giant leatherback sea turtle**, etc.

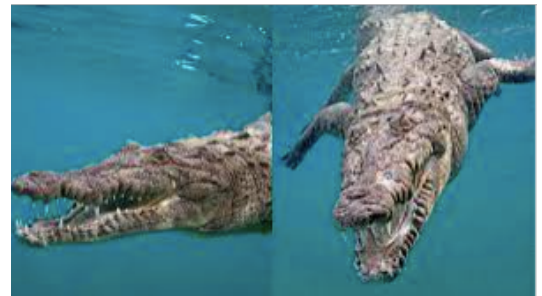
Giant Leatherback Turtle

- **Galathea Bay** is an iconic nesting site in India of the enigmatic **Giant Leatherback**, the world's largest marine turtle – borne out by surveys done over three decades.
- The largest of the seven species of sea turtles on the planet and also the most long-ranging, Leatherbacks are **found in all oceans** except the Arctic and the Antarctic.
- Within the **Indian Ocean**, they nest only in **Indonesia, Sri Lanka and the Andaman and Nicobar Islands** and are also listed in **Schedule I** of India's Wildlife Protection Act, 1972, according it the highest legal protection.
- IUCN status: **Vulnerable**



Saltwater Crocodile

- Saltwater crocodiles, known as 'salties', are native to eastern India, **South-East Asia and Northern Australia**.
- Also called **estuarine crocodile** is found in Inland lakes, swamps and marshes as well as coastal brackish waters and tidal sections of rivers.
- The Indian government launched its conservation effort, **Project Crocodile**, in **1975**.
- Saltwater crocodiles, like tigers and rhinoceroses, were given 'Schedule 1' protection under the new Wildlife Protection Act.
- Found in coastal areas of **Odisha, WB and TN**.
- Their status is **Least concern** in IUCN Red List.
- Citing the growing number of crocodile attacks on tourists, the administration of Andaman and Nicobar islands had last year requested the central government to delist the saltwater crocodiles (or salties as they are referred to) from **Schedule 1 of the Wildlife Protection Act, 1972**.



Nicobar Long Tailed Macaque

- They are found in **tropical rainforests** characterized by warm, humid climate and heavy seasonal rainfall.
- It is found in the three southernmost islands (viz. Great Nicobar, Little Nicobar and Katchal) of the Andaman and Nicobar archipelago, India.
- They are also known as '**crab-eating macaques**'.
- The Nicobar long-tailed macaques is listed as '**Vulnerable**' as per IUCN Red list.



Khangchendzonga Biosphere Reserve

- The **Khangchendzonga Biosphere Reserve in Sikkim** is surrounding the **world's third highest peak Mount Khangchendzonga**.
- It is located bordering **Nepal, Tibet (China)** and in **close proximity of Bhutan**.
- **First "Mixed Heritage" site of India.**
- Numerous lakes and glaciers, including the 26 km long **Zemu Glacier** are a part of the Biosphere reserve.
- Holy river - **Rathong Chu**.
- Known for rare orchids and endangered **red panda, snow leopard, etc.**



6. Science & Technology

6.1.GM Crops in India

- Bt cotton remains the only GM crop allowed to be **cultivated in the country**.
- Developed by **US giant Bayer-Monsanto**, it involves insertion of two genes viz 'Cry1Ab' and 'Cry2Bc' from the **soil bacterium Bacillus thuringiensis** into cotton seeds.
- This modification codes the plant to **produce protein toxic to Heliothis bollworm (pink bollworm) thus making it resistant to their attack**.
- The commercial release of this hybrid was sanctioned by the government in 2002.

HTBt cotton

- Herbicide tolerant Bt (HtBt) cotton
- Addition of 'Cp4-Epsps' gene from another soil bacterium, *Agrobacterium tumefaciens*
- by the US giant Bayer Monsanto.
- Not cleared by GEAC

Reason

- Farmers are not able to spray glyphosate on normal cotton because the chemical does not distinguish between the crop and weed, but the herbicide tolerant Bt (HtBt) cotton remains unaffected by glyphosate.

Rules of Environmental Protection Act 1989

- Legally, sale, storage, transportation and usage of unapproved GM seeds is a punishable offence under the Rules of Environmental Protection Act 1989.

Seed Act of 1966 and the Cotton Act of 1957

- Also, **sale of unapproved seeds can attract action** under the Seed Act of 1966 and the Cotton Act of 1957.
- The **Environmental Protection Act** provides for a jail term of five years and a fine of Rs 1 lakh for violation of its provisions, and cases can be filed under the other two Acts.
- No person shall use glyphosate except through Pest Control Operators," said a draft notification issued by the Ministry of Agriculture

What is glyphosate?

- Glyphosate is an **herbicide**. It is applied to the leaves of plants to kill both broadleaf plants and grasses. The sodium salt form of glyphosate is used to regulate plant growth and ripen specific crops.
- Glyphosate was first registered for use in the U.S. in 1974.

Bt brinjal

- Major brinjal producing states include: West Bengal (30% production share), Orissa (20%), and Gujarat and Bihar (around 10% each)
- Bt brinjal incorporates the *cry1Ac* gene expressing insecticidal protein to confer **resistance against (Fruit & shoot borer)FSB**.
- The *cry1Ac* gene is sourced from the soil bacterium *Bacillus thuringiensis* (Bt).
- When ingested by the FSB larvae, the **Bt protein is activated in the insect's alkaline gut and binds to the gut wall**, which breaks down, allowing the Bt spores to invade the insect's body cavity. The FSB larvae die a few days later.
- Bt Brinjal was developed by the Maharashtra Hybrid Seeds Company (**Mahyco**).
- Mahyco also generously **donated the Bt brinjal technology to the Tamil Nadu Agricultural University (TNAU), Coimbatore and University of Agricultural Sciences (UAS), Dharwad**.
- Mahyco also donated the technology to public research institutions in the Philippines and Bangladesh.

GM MUSTARD

Barstar-Barnase system

- Problem with mustard is that its flowers contain both female and male reproductive organs, making the plants largely self-pollinating.
- When the egg cells of one plant cannot be easily fertilised by the pollen grains from another, the scope for developing hybrids through crossing of parents from divergent genetic pools is restricted.
- This is where GM technology comes in.
- Using this technology, the **Delhi University scientists bred DMH-11, a GM hybrid obtained from crossing an Indian mustard variety, Varuna ('Barnase' line), with Early Heera-2 ('Barstar')**.
- DMH-11 has reported a roughly 30% yield advantage over the Varuna 'check' variety in the bio-safety research level field trials carried out between 2010-11 and 2014-15.

GEAC

- The Genetic Engineering Appraisal Committee (GEAC) functions in the Ministry of Environment, Forest and Climate Change (MoEF&CC).

Chairman- Special Secretary/Additional Secretary, Ministry of Environment, Forest and Climate Change (MoEF&CC); Co-Chairman - Representative of Department of Biotechnology.

Members: Representative of concerned Agencies and Departments, namely, Ministry of Industrial Development, Department of Biotechnology and the Department of Atomic Energy.

The functions of GEAC as prescribed in the Rules 1989 are as follows:

To appraise activities involving large scale use of hazardous microorganisms and recombinants in research and industrial production from the environmental angle.

To appraise proposals relating to release of genetically engineered organisms and products into the environment including experimental field trials.

The committee or any persons authorized by it has powers to take punitive action under the Environment Protection Act.