CURRENT AFFAIRS



MAINS

- Climate crisis in North East India:
 Why are rainfall patterns changing?
- The Pandemic Induced BRI: Then, Now and What Next?
- The key to revitalising India's reservation system
- GS-III Account Aggregator System
- CS-IV Ethics of Vegetarianism:
 Human Interest Vs
 Animal Interest

PRELIMS

POLITY & GOVERNANCE

Karbi Anglong Agreement

ECONOMY

Coal based Hydrogen Production

ENVIRONMENT

- Conservation of mangroves in Odisha's Bhitarkanika
- India's 1st dugong conservation reserve to be in Tamil Nadu
- Lakshadweep launches seaweed farming units
- Manda Buffalo: Odisha
- Mesoamerica faces floristic biodiversity loss: Study
- River Bhogdoi, dying a slow death
- River Rights highlighted at IUCN World Conservation Congress

SCIENCE & TECHNOLOGY Government clears C-295 aircraft deal for IAF



- Disclaimer -

The current affairs articles are segregated from prelims and mains perspective, such separation is maintained in terms of structure of articles. Mains articles have more focus on analysis and prelims articles have more focus on facts.

However, this doesn't mean that Mains articles don't cover facts and PT articles can't have analysis. You are suggested to read all of them for all stages of examination.

CURRENT AFFAIRS ANALYST

WEEK- 2 (SEPTEMBER, 2021)

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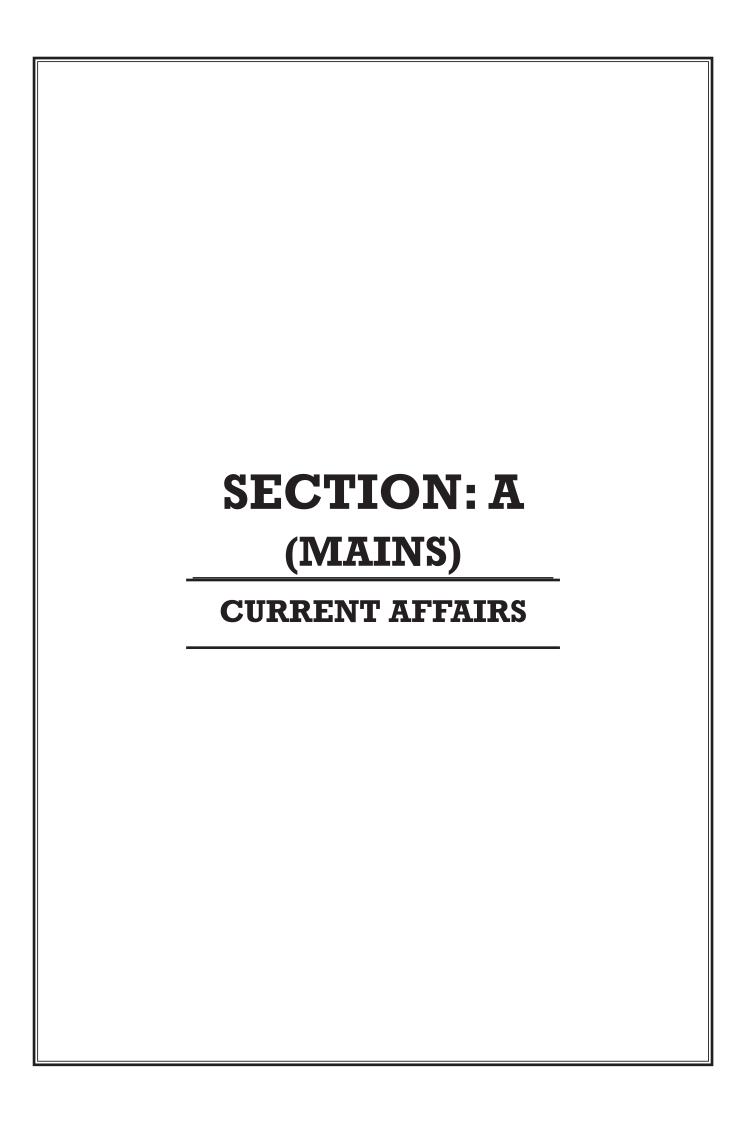
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CLIMATE CRISIS IN NORTH EAST INDIA: WHY ARE RAINFALL PATTERNS CHANGING?

CONTEXT

The weather of North East India is changing. Rainfall styles over the vicinity within the ultimate century have substantially modified, ensuing in its ordinary drying up.

What is the set pattern of rainfall in India?

- The normal date for monsoon onset over India is June 1 and for monsoon withdrawal is October
- The India Meteorological Department (IMD) closes its monsoon seasonal data on September
 The rainfall that happens after this period is post-monsoon rainfall.
- This means that for the last 10 years, India's monsoon rainfall pattern has been largely skewed.

Monsoon is said to withdraw from a region when the following criteria are met:

- Rainfall activity ceases over the area for five continuous days
- ➤ an anti-cyclone establishes in the lower troposphere around 1.5 kilometres above sea level
- moisture content reduces
- Similar criteria are followed for the declaration of monsoon withdrawal from the country. The wind patterns over the country change from southwesterly direction to a more westerly direction when the monsoon retreats.

How the pattern is changing in North East India?

- The North East India, which normally receives heavy rainfall during the monsoon months (June-September), has changed character for the worse.
- The flood-drought cycle now has begun to happen within a year, especially during the monsoon.
- The rains come in quick bursts and flood the region, followed by elongated dry periods that border on drought.

Changing of Rainfall Patterns

The India Meteorological department's recent forecast said that regular to below-normal rainfall changed into most in all likelihood to preserve over many areas of northwest and northeast India.

Weather exchange inflicting drying up of land:
 A thing of warming that affects rainfall is drying

- of the land, which increases the frequency and intensity of dry intervals and droughts. An increase in moisture and the drying up collectively alternate the rainfall patterns in unpredictable methods.
- Increased snow fall inside the Eurasian area additionally affects monsoon rainfall in North East India. Immoderate blizzard in Eurasia causes cooling of the ecosystem of the location, which triggers activities ultimately leading to a susceptible summer time monsoon season there.
- Sea floor temperatures: This changing pattern
 has additionally attributed a decrease in rainfall to
 sea floor temperatures over the subtropical Pacific
 Ocean, which vary in a cycle and every segment of
 which lasts a decade.
 - ➤ The peak comes every two decades and is referred to as the Pacific Decadal Oscillation (PDO).
 - ➤ PDO is being influenced through global warming as it decreases the difference of temperatures most of the layers of the ocean.
 - ➤ The peak of PDO will trade from 20 to twelve years, which may have an impact on the monsoon rainfall in **North East India**.

What is the future weather situation for the North East location?

The future climate situations look bleak for the region.

- Increase in temp and rainfall: They display an increase in temperatures and in rainfall, in contrast with the evidence of a decrease in rainfall over the last century.
 - ➤ Various studies have projected that temperatures within the vicinity will upward thrust through 1.8-2.1 ranges Celsius by using the cease 2030.
 - ➤ Annual mean rainfall can have upward push by 0.3-3 per cent in the same length.
- In Assam, the Indian nation's most susceptible to weather alternate, models are expecting a boom in temperature of 1.7-2.0 degree Celsius among 2021-2050.



What are the results of a changing rainfall pattern?

A changing rainfall sample, specifically at some point of the monsoon season, has the subsequent impacts:

- Affects the drift of rivers: There may be a few evidence of the changing path of rivers from numerous districts in Assam which includes Lakhimpur and Dhemaji, wherein the Subansiri, Dibang (tributaries of Brahmaputra) and Brahmaputra rivers are converting publications in unexpected approaches.
 - ➤ In Arunachal Pradesh, the Papum Pare district has also been stricken by the converting course of the Dikrong River.
- Intense rainfall occasions being caused by worldwide warming trigger a cascade of activities together with elevated soil erosion along the hill slopes devoid of wooded area cover. This will

- increase the floor run-off of rivers and changes their path.
- The new courses taken by means of the rivers are frequently the historic paleo-channels that it has deserted for centuries and in which people have settled to avoid flooding.
- Quantity of snow cover and fitness of mountain springs, All this, in flip, has an impact on livelihoods, in particular agriculture and fishing, wooded area plants boom, animal and fowl habitat (and behaviour), and other ecosystem components.
- Threat to water and food security: The changing rainfall pattern in India is a huge concern as the country's water and food security is at a risk.

Conclusion

There are several factors that have an impact on the changing course of rivers. All of them act together, which makes the issue difficult to study.



THE PANDEMIC INDUCED BRI: THEN, NOW AND WHAT NEXT?

CONTEXT

The unsought impact of the pandemic has dampened the BRI ambitions to a large extent, but Beijing is still resolved to go ahead with it while trying to get the economy back on track.

• BACKGROUND:

- The pandemic and the resulting intermittent lockdowns is not only hurting the global economy but also has surfaced myriad challenges to China's mammoth BRI (Belt Road Initiative).
- It is often referred to as the New Silk Road, launched in 2013 by President Xi Jinping.

ANALYSIS:

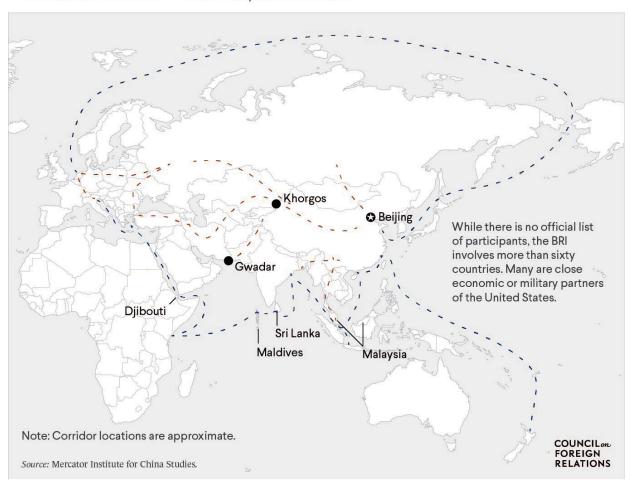
China's Plan for its Silk Road:

• The plan was two-pronged:

- ➤ Silk Road Economic Belt over the land
- ➤ Maritime Silk Road
- They are collectively known as Belt and Road Initiative or One Belt One Road project (OBOR). It is aimed to enhance the physical infrastructure for development cooperation across several countries in Asia, Europe, Africa, and even Latin America.
- It has the potential to expand China's export markets, promote the **Renminbi (RMB)** as an international currency, and the reduction of trade frictions like tariffs and transport costs.

Land and Sea Corridors of the Belt and Road Initiative

-- Silk Road Economic Belt -- 21st Century Maritime Silk Road



Role of India:

- India is trying to convince countries that BRI is a plan to dominate Asia.
- It's a geo-economics strategy to create unsustainable loans for its Indian Ocean Region neighbours.
- The USA views India as a counterweight to China's intention to dominate Asia.

Changes due to the pandemic:

- The dependency on the Chinese manufacturing sector had started to hurt global economic growth.
- A direct comparison can be made between the 2003 SARS outbreak when China used to contribute around 4 percent of global out, which has now blow up to 16 percent in 2020.
- As a result of allegations made over China for originating the SARS-CoV-2 virus and mishandling the crisis, foreign investors have started showing a shift in their manufacturing activities to countries like India, Thailand, the Philippines and Bangladesh.
- The project has started problems even before the pandemic due to unsustainable projects, contracts and loans; human rights issues related to **Uyghurs.**

Decline in Chinese investments:

- In 2020, a slump of 54.5 percent has been observed in the Chinese investments in the BRI countries if compared to the investments made in 2019.
- It has dropped to the US \$47 billion. Non- BRI countries are the ones that have witnessed a stark decline of about 70 percent in Chinese investments.

Approaching Debt Crisis for the participating nations:

- Long term debt for the participating countries, especially in the developing and underdeveloped region of Southeast Asia and Sub-Saharan Africa.
- The situation gets worsened by the additional financial burden brought by the pandemic. The outstanding debt owed to China includes—Pakistan (US \$20 billion), Angola (US \$15 billion), Kenya (US \$7.5 billion), Ethiopia (US \$6.5 billion), and Lao PDR (US \$5 billion).
- Another reason to worry about is the internal financial insecurity surrounding the participating countries which are grappling with the high public external debt and debt owed to China.

- The Republic of Congo, Djibouti, and Lao PDR have the highest Chinese debt-to-GNI (Gross national product) ratio.
- The 70 percent control of Hambantota port in Sri Lanka is leased to China for 99 years, strengthens its 'debt-trap diplomacy'.
- It is expected that many countries are going to approach China for debt relief to bring the pandemic under control.

What is the future holding in its hands?

- 27 European Union members are strategizing new global connectivity, characterised as "a geostrategic and global approach to connectivity" for the EU to tackle BRI.
- The European Union (EU) has approved the "EU Strategy for Cooperation in the Indo-Pacific", highlighting its strategic focus and actions with an aim towards "regional stability, security, prosperity and sustainable development".
- These are sending strong signals of BRI alternatives.
- The Build Back Better World (B3W) Initiative for global infrastructure development by G7 nations, to counter China's BRI. It will focus on four key areas: climate, health, digital technology and gender.
- It is aimed at catalysing infrastructure development in low and middle-income countries.

Hurdles on its face:

- High competition and saturation in Chinese domestic markets, and the emergence of India as one of the largest potential markets.
- Indian markets are extremely similar to that of the Chinese markets, and this has led the Chinese investors to believe that there is ample scope to succeed if the scale economies are harnessed adequately in India.
- The labour costs in China have also plummeted in the last three decades which has made 'offshoring' necessary for various sectors to keep product prices competitive in the global markets.
- In the mid of pandemic and given the slump in its economic growth, further adding the criticism that it is facing from the global community aggravates the situation.
- Corruption, lack of financial transparency, unfair loan conditions, fears of debttraps, and negative social and environmental impacts are the other problem that this mega-infra project is embroiled with.

Possibilities for China:

 BRI partners have already started asking for debt relief, and chances look slim that they are going





borrow heavily for mega infrastructure projects anytime soon. Shrinking capital will require Beijing to cut on BRI projects, and **healthcare investment** (China's Health Silk Road) may be more costeffective in reaching partner countries.

- Its competitors, including India, are trying to contest its public health outreach. It is not hidden that countries in South Asia do not have an alternative to China when it comes to building their healthcare sector. The success of **China's Health Silk Road** will depend on how quickly it can roll it out in the subcontinent.
- It can also share advances in gene-based research in biomedical technology and collaborate on

telemedicine. Real-time communication will be required, which opens opportunities for Chinese companies offering 5G services.

CONCLUSION:

It is clear that China is having a tough time while battling against the changing geo-economic and geopolitical equations. The fate of BRI will now be an outcome of multitudes of factors. If China still goes with the BRI, it needs a steadier approach with a focus on the healthcare infrastructure, which could help China to regain credibility to the BRI.





THE KEY TO REVITALISING INDIA'S RESERVATION SYSTEM

CONTEXT

Recent, central government's decision to introduce bookings for some Class for Backward Classes (OBCs) for the National Eligibility cum Entrance Test (NEET) has sparked controversy over the class census and brought controversy over prominence.

Problems with the current policy of reservation

With the placement of seats in political and governmental institutions, it was envisaged that the parties who have reached so far will be able to secure a place in power-sharing and decision-making. This disability removal strategy has not changed the balance of life expectancy in many groups in our unique society.

What are the problems?

Updated problem

- ➤ The report of the **Justice G. Rohini Commission** on the classification of OBCs based on data from the past five years on central government functions and the acceptance of OBCs in tertiary institutions highlights this problem.
- ➤ The commission concluded that 97% of OBC's average profits would be 25% lower.
- ➤ 983 OBC communities 37% of the total have zero representation in central government services and admission to secondary universities.
- ➤ Also, the report states that only 10% of OBC communities receive 24.95% employment and admission.
- ➤ Clearly, to assume that the evils of all the minority groups in each sector are the same is misguided.
- As a result, the distribution of booking ratings has severely hampered the political projects of the southern coalition.

Lack of data

- ➤ There is a great need for accurate information on the socio-economic status of the various social groups.
- ➤ Although section-based bookings have been the most important factor in promoting high social mobility we do not have sufficient

- information on the achievement and attainment of this policy measure.
- We do not know how liberating it is to make castes constantly tied to traditional sources of income and unable to see the new opportunities offered by the opening up of the economy.
- ➤ What is urgently needed is a way to deal with this lacuna and make the system more responsive and responsive to the needs of the parties.

What needs to be done?

Since all classification will lead to renewal and division over time, two things are needed.

- Evidence-based policy option: We need to develop a variety of content-sensitive, evidence-based options that can be used to meet the specific needs of specific groups.
- **Institution:** We need an institution similarly the Equal Opportunities Commission of the United States or the United Kingdom can do two important but related things:
 - ➤ Indicate the reduction of data relevant to the socio-economic census of the various communities.
 - Research the performance of employers and educational institutions on a fair and equitable basis and issue codes of conduct in various fields.
- This will facilitate policy formulation and monitoring at the institutional level.
- Similar recommendations were made over the past decade in the recommendations made by the expert committee of the **Equal Opportunity Commission (2008)** in its comprehensive report to the Department of Minor Affairs.

Conclusion

As evident, a socio-economic caste-based census becomes a necessary precondition to initiate any meaningful reform in the affirmative action regime in India.



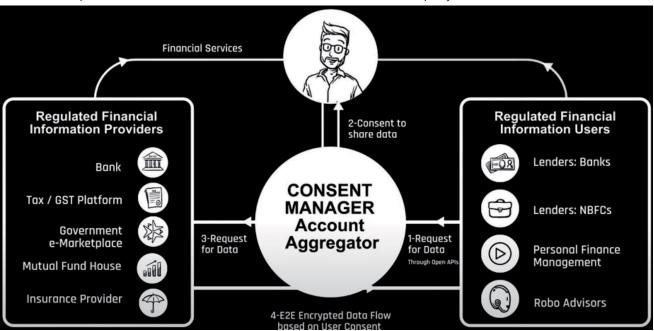
ACCOUNT AGGREGATOR SYSTEM

CONTEXT

Recently, State Bank of India, ICICI Bank, Axis Bank, IDFC First Bank, Kotak Mahindra Bank, HDFC Bank, IndusInd Bank and Federal Bank have joined the Aggregator Account (AA) network) which will enable customers to easily access and share their financial information.

What is an Account Aggregator (AA)?

- AA is a framework that facilitates the distribution of financial information in real time and blindly (AA data flow encrypted) between regulated entities (Banks and NBFCs).
- The RBI (Reserve Bank of India) in 2016 approved the AA as a new component of NBFC (Non-Banking Financial Companies), whose main responsibility is to facilitate the transfer of user financial data with their explicit consent.
- AAs enable data flow between financial information providers (FIPs) and financial information users (FIUs).
- The structure of AA is based on the Data Empowerment and Protection Architecture (DEPA) framework.
 - ➤ DEPA is an organization that allows users to securely access their data and share it with third-party users.



Issues with India's current financial system

- India's financial system today involves many hassles for consumers –
 - sharing physical signed and scanned copies of bank statements
 - running around to get documents notarized or stamped
 - having to share personal username and password to give a financial history to a third party

How is AA different from Aadhaar eKYC data sharing, and other platforms?

 Aadhaar eKYC and CKYC allow sharing of four 'identity' data fields only for KYC purposes (such as name, address, gender, etc.).

- Similarly, credit bureau data only show loan history and credit score.
- The AA network allows sharing of transaction data or bank details from savings/deposit/current accounts.

It's Significance

- For Consumers: The AA framework allows customers to access a variety of financial services from a number of providers on a single site depending on the consent process, where consumers can choose which financial data to share and which organization.
- Less physical Interaction: It allows users to control who gets access to their data, track and access its own traffic and reduce the risk of leaks on the move.



- Banking: As an addition to India's digital infrastructure, it will allow banks to access the flow of approved data and verified data. This will help banks reduce transaction costs, which will enable them to offer low-size ticket loans and products and services tailored to their customers.
- Minimize fraud: AA reduces fraud associated with virtual data by introducing secure digital signatures and end-to-end data sharing encryption.

Way forward

Going forward, a large number of Small and Medium Enterprises (SMEs) can be reached outside the

portable branches and will change the inflow of credit. As we delve deeper into this, the opening of banks works surprisingly well as India is not well-kept when it comes to debt and other financial products. Significant pressure will arise from information and acquisition at the ecosystem level.

The AA framework can be expanded to manage data from other domains as well, such as health-related data and telecom. However, if licensed entities are to be approved it is important to have a data privacy framework as the RBI currently aims to protect only financial data within its mandate.





ETHICS OF VEGETARIANISM: HUMAN INTEREST VS ANIMAL INTEREST

CONTEXT

Many of us consume meat and to maintain the balance of demand-supply, animals are being raised. For centuries the people are divided about the merits and demerits of vegetarianism, but there is another dimension to it, which deals with the Ethics of Vegetarianism.

BACKGROUND:

- Eating animals is often criticised on the grounds of ecology and health, but in this article, we shall be touching upon the Human-Interest Vs Animal-Interest.
- Less than a billion humans are vegetarian and have a dietary consumption pattern that excludes
- They are various reasons for them being vegetarian: because it's healthy, their parents make them vegetarian, because they don't have a taste for the
- But there are some, who are vegetarian on moral grounds.

ANALYSIS:

Arguments for moral vegetarianism

- Contemporary arguments for moral vegetarianism are based around the wrongness of producing meat and move to conclusions about the wrongness of consuming it.
- But the argument fails to bind the two ends of the narrative.
- Moral vegetarianism is the view that it is morally "wrong" to eat meat.
- They are two moral problems that arise due to eating animals:
 - Wrongness in raising animals for selfconsumption, and
 - Wrongness in doing the same process, if carried out humanely.

Do Animals Have Rights?

- Rights are meaningless without the corresponding duty. Every being who bears rights has a corresponding duty that needs to be discharged towards others who have rights.
- To exercise rights, requires a rational mind, competent enough to differentiate between right and wrong to be held responsible for its actions.
- It is argued that can animals be expected to understand rules laid by humans?

- In ancient times people used to punish the animals for wrongs committed by them, but as the reasoning for rationality evolved, it is realised that punishing animals was wrong. It was also taken into account they are incapable of comprehending.
- At present, legal safeguards are in place to penalise pet owners for causing damage due to negligent handling of their pets. It requires going further deep to understand the nature of rights that animals bear.

Laws and constitutional provisions that **Protect Animals in India**

- The Indian Penal Code (IPC) 1860 Section 428 and 429 of the IPC provides for punishment of all acts of cruelty such as killing, poisoning, maiming or rendering useless of animals.
- **Prevention of Cruelty to Animals Act 1960**
- the Wildlife Protection Act 1972
- Article 51-A (g): It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife, and to have compassion for living creatures.
- Article 48-A poses a duty on the state to protect, safeguard and improve the forests and wildlife of the country.

Nature of Animal Rights and how to look at it?

- The principle of equality does not necessarily require subjecting animals and humans to equal or identical treatment.
- On the contrary, it requires equal consideration of interests. It is very important to make this distinction while talking about animal rights. It must be noted that we can only give equal consideration where we have similar interests.
- An example of similar interests could be: All animals can suffer from pain as humans do. So, we are morally obligated to consider all of it while considering their rights.
- If we assume that a similar quantum of pain is being felt by the animals, then the status of the animal should be one of equality.



Only prejudice gives us an excuse to deny others the rights that we expect or reserves for ourselves.

Animal Rights and Personhood:

Legal personhood is the capacity to possess at least one right, and in the eyes of the judiciary, the one who possesses at least one legal right is a legal person.



Animal rights pyramid

Animal personhood is meant to fill the void in the workings of animal rights. The point of conferring legal personhood on animals is to protect them from humans.

Additional Information: The High Court of Punjab and Haryana is the second High Court in India to confer personhood to animals after the High Court of Uttarakhand. In so doing, the Court acknowledged that the concept of legal personhood has evolved with scientific discovery, evolving standards of morality, and human experiences to not only include all humans, but also nonhumans. The court has recognized all animals in the animal kingdom, including avian and aquatic species, as legal entities.

Human Interests versus Animal Interests:

- Even if many of us don't believe in animals having rights, still it cannot be denied that animals have certain important interests that should not be violated.
- Then arises the conflict between the human interest in eating meat and the basic animal interest of staying alive. And it is found that human interest has not got enough weightage, because we don't need to eat meat to stay alive.
- Whereas the animal interest to stay alive is classified as basic, because if they cease to live the rest of other interests also get ceased. It's a clear violation of animal's rights.

Violated Rights:

The moment we accept that animals have rights, then the act of raising and killing them for food is morally wrong.

Irrespective of how humanely the animal has been treated, it will a moral wrong to raise them for killing and consumption.

Violated Interests:

- As we have discussed that even the most humane of the rearing practice cannot violate the most basic of animals- of staying alive.
- Modern agricultural practices often leave animal interest unattended. For example: to eat a natural diet; to live in its habitat; to remain free from pain and fear, etc.

Arguments against eating Animals:

Rights-based argument:

- ▶ It makes non-violation of rights as its basis. It does not give weightage to the consequences of eating animals.
- Raising animals for consumption and using them as a mean to gratify human, that does not treat them respectfully as ends in themselves. Therefore, animal eating is wrong.
- Those who respect rights and accept the same for animals should be vegetarian.

Consequentialist Argument:

- > It is based on the outcomes of action and only concerned with the consequence of eating animals. An action can be good or bad depending on the outcome only.
- Raising and killing animal is cruel and will result in goodness in the world.
- If everyone is vegetarian, then there will be no demand for meat. If the demand ceases to exist then the total goodness of the world will be higher.

Virtue Argument:

- ▶ It considers the motivation and character of a person as an important factor to decide if the act is good or bad.
- Virtuous people exhibit virtues as they have traits like kindness; generosity; and compassion.
- People who participate in animal cruelty, and behave selfishly are far from being virtuous people.

• CONCLUSION:

The dichotomy of right or wrong view of meat is unproductive, the black and white strategy hasn't gotten many people to become a vegetarian. It is crucial to advance the research on plant-based and cellular meat, as it has unrealised prospects to reduce the suffering of animals.



No rights can be absolute. Like human rights, overseeing animal rights is a must. Finding a middle ground between the interests of animals and the safety or well-being of humans is important. Animal abuse has to stop. The intellectual superiority of humankind cannot be the criteria to supersede the living rights of another species. The co-existence of all life forms is essential to prevent an imbalance in our ecosystem.

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KARBI ANGLONG AGREEMENT

• CONTEXT:

In a bid to end decades of violence in Karbi Anglong in Assam, a tripartite agreement among five insurgent groups of Assam, the Centre and the state government was signed.

About Karbi Anglong

- Karbi-Anglong in Assam's largest district in terms of area.
- It is home predominantly to a tribal and ethnic population comprising members of Karbi, Bodo, Kuki, Dimasa, Hmar, Garo, Rengma Naga, Tiwa, and Man communities.
- Karbis make up more than 46 per cent of the district's population of close to 10 lakh people per the 2011 Census.

Major issues of the group

- The Karbis are a major ethnic group of Assam, dotted by several factions and splinters.
- The history of the Karbi group has been marked by killings, ethnic violence, abductions and taxation since the late 1980s.
- Insurgent groups of Karbi Anglong district like People's Democratic Council of Karbi Longri (PDCK), Karbi Longri NC Hills Liberation Front (KLNLF), etc. originated from the core demand of forming a separate state.
- Some of the other demands of the militant groups are
 - Inclusion of some areas into Karbi Anglong Autonomous Council (KAAC)
 - Reservation of seats for Scheduled Tribes
 - More powers to the council
 - Inclusion of Karbi language in the Eighth Schedule
 - Financial package of Rs 1,500 crore

What is in the agreement?

- The agreement grants greater devolution of autonomy to the Karbi Anglong Autonomous Council.
- **Cultural protection:** It provides protection to the language, culture and identity of the region and reservation to the Karbi people.
- Karbi Welfare Council: Under the agreement, the Assam government will set up a
 Karbi Welfare Council for focused development of Karbi people living outside the KAAC
 area.
- **Consolidated fund for development:** The consolidated fund of the state would be augmented to supplement the development of the region.
- **Special development package:** A special development package of Rs 1000 crore over five years will be provided for projects there.

Autonomous District Council

ADCs are bodies representing a district to which the Constitution has given varying degrees of autonomy within the state legislature.

Groups includes in Agreement

- The insurgent groups which signed the peace accord include:
 - Karbi Longri North Cachar Hills Liberation Front





- People's Democratic Council of Karbi Longri
- United People's Liberation Army
- Karbi People's Liberation Tigers faction

COAL BASED HYDROGEN PRODUCTION

• CONTEXT:

Recently, a Task Force and an Expert Committee have been constituted by the Ministry of Coal to prepare the roadmap for coal-based hydrogen production.

About Task Force on coal-based hydrogen production

- It is constituted under the Chairmanship of Additional Secretary Coal Shri Vinod Kumar Tiwari.
- The **broad terms of reference** of the Task Force are as follows:
 - Identification of role to be played by each stakeholder Ministry
 - Coordination with Stakeholder Ministries
 - Monitoring of activities towards achieving coal based Hydrogen production and usage
 - Setting up sub committees to achieve the objective
 - To coordinate with Coal Gasification Mission and NITI Aayog

About Expert Committee on coal-based hydrogen production

- The Expert Committee is set up under the chairmanship of Shri R.K. Malhotra.
- The broad terms of reference of Expert Committee are as follows:
 - Identifying experts in India and co-opting as members
 - Desk based review of progress in hydrogen technology and also review ongoing research projects in Hydrogen technology
 - Coordinate with various national/international technology institutions in hydrogen
 - Prepare a road map for coal based Hydrogen production and usage including economic viability, environmental sustainability and policy enablers required
 - Identifying activities for implementation of coal based hydrogen production and usage
 - Assisting Task force in implementation of Coal based Hydrogen production and usage

Need for Coal-based Hydrogen Production

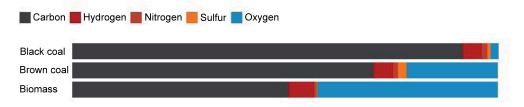
- Coal is an important source of hydrogen making (brown hydrogen) along with the production of natural gas (grey hydrogen) and renewable energy (green hydrogen) through electrolysis.
- The **surplus solar power is used to electrolyze water** into hydrogen and oxygen in case of renewable energy (green hydrogen).
- Globally, 73 MT Hydrogen is used for **refining**, **ammonia making** and other pure use and about 42 MT is used for **Methanol**, **steel making** and other mixed uses.
- The experts believe that the cost of hydrogen produced from coal can be cheaper and less sensitive to imports when compared with hydrogen production through electrolysis and Natural Gas respectively.
- The Indian Coal Reserve could become a great source of hydrogen when the carbon



monoxide and carbon dioxide formed during coal to hydrogen process are trapped and stored in an environmentally sustainable manner (CCS and CCUS).

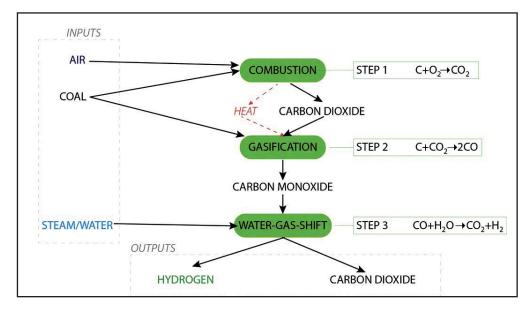
Composition of Coal

- It is a mixture of two components i.e.
 - Carbon-based matter (the decayed remains of prehistoric vegetation); and
 - Mineral matter (which comes from the ground from which the coal is dug).
- The carbon-based matter is composed of five main elements i.e. carbon, hydrogen, oxygen, nitrogen and sulfur.



Process involved in production in coal-based hydrogen

- The process of coal-based production of hydrogen starts with partial oxidation which
 implies that some air is added to the coal, which generates carbon dioxide gas through
 traditional combustion.
- The air is added to coal to make some heat for the **gasification reaction and the partial oxidation** also makes its own gasification agent i.e. carbon dioxide.
- **Carbon dioxide** reacts with the rest of the carbon in the coal to **form carbon monoxide** which is an **endothermic gasification** reaction but no hydrogen is produced yet.
- Carbon monoxide in the gas stream is now further reacted with steam and results in generation of hydrogen and carbon dioxide.
 - The hydrogen can then be run through an on-site fuel cell to generate high-efficiency electricity.





Why Brown Coal is preferred for gasification?

The main reason for giving preference to brown coals for gasification over black
coals is its high oxygen contentwhich makes it chemically stable and therefore
easier to break apart during the gasification reaction.

What is Carbon Capture and Storage?

- It involves the **capture of carbon dioxide (CO2) emissions** from industrial processes, such as steel and cement production, or from the burning of fossil fuels in power generation.
- It is then **transported from where it was produced**, via ship or in a pipeline, and stored deep underground in geological formations.
- There are **three steps** to the CCS process:
 - ➤ **Capture:** the CO2 is separated from other gases produced in industrial processes, such as those at coal and natural-gas-fired power generation plants or steel or cement factories.
 - ➤ **Transport:** the CO2 is then compressed and transported via pipelines, road transport or ships to a site for storage.
 - ➤ **Storage:** finally, the CO2 is injected into rock formations deep underground for permanent storage.

What is Carbon Capture, Utilization, and Storage (CCUS)?

- It encompasses methods and technologies to **remove CO2 from the flue gas** and from the atmosphere.
- It is followed by **recycling the CO2 for utilization** and determining safe and permanent storage options.
- It involves the **capture of CO2 from large point sources**, including power generation or industrial facilities that use either fossil fuels or biomass for fuel.

CONSERVATION OF MANGROVES IN ODISHA'S BHITARKANIKA

© CONTEXT:

German government agency, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), will conserve mangrove and biodiversity of Odisha's Bhitarkanika National Park, India's second-largest mangrove forest.

About the project

- The project aims to support implementation of livelihood-oriented conservation and restoration activities and train community members in alternative sustainable livelihoods.
- The given ecosystem-based sustainable livelihood measures will be adopted—such as
 - mangrove restoration
 - sustainable fisheries
 - handicraft-based activities
 - science-led horticulture
- The project is supported by **International Climate Initiative (IKI)** of German Federal Ministry for the **Environment, Nature Conservation and Nuclear Safety (BMU).**



What are Mangroves?

- Mangroves are special types of trees and shrubs that are known to thrive in saline and low oxygen conditions.
- These forests are critical habitats for a variety of wildlife and aquatic creatures.
- Mangrove forests only grow at tropical and subtropical latitudes near the equator because they cannot withstand freezing temperatures.
- The roots also slow the movement of tidal waters, causing sediments to settle out of the water and build up the muddy bottom.
- Mangrove forests stabilize the coastline, reducing erosion from storm surges, currents, waves, and tides.
- India has about 3% of the total Mangrove cover in South Asia.
- West Bengal (2,112 sq km) and Gujarat (1,177 sq km) are the top 2 states with the highest cover.

Major Mangroves forests in India

- Sundarbans Mangrove Forest, West Bengal
- Bhitarkanika Mangroves, Odisha
- Godavari-Krishna Mangroves, Andhra Pradesh
- Gulf of Kutch Mangroves, Gujarat
- Mangroves of Thane Creek, Maharashtra
- Pichavaram Mangroves, Tamil Nadu
- Chorao Island Mangroves, Goa
- Baratang Island Mangroves, Andaman

Bhitarkanika Indian Wildlife Sanctuary

- Spread in a vast are of 672 Kms Bhitarkanika Indian Wildlife Sanctuary Orissa is the 2nd largest Mangrove ecosystems of India.
- The National park is essentially a network of creeks and canals which are inundated with waters from rivers Brahmani, Baitarani, Dhamra and Patasala forming a unique ecosystem.
- It is the breeding place for the endangered salt water crocodiles which are the prime attractions of the sanctuary.
- The Gahirmatha Beach which forms the boundary of the sanctuary in the east is the largest colony of the Olive Ridley Sea Turtles.

INDIA'S 1ST DUGONG CONSERVATION RESERVE TO BE IN TAMIL NADU

OCONTEXT:

The Tamil Nadu State government announced that a 500-sqkm dugong conservation reserve will soon be set up in the Palk Bay.

About India's first dugong conservation reserve

 The 500 sq.km of the biodiversity-rich waters in the Palk Bay on the southeast coast of Tamil Nadu is to become India's first dugong conservation reserve.



The reserve will span the northern part of the Palk Bay from Adiramapattinam to Amapattinam.

What are Dugongs?

- Dugongs are sea cows or sirenia. It is a species of **sea cow**.
 - These animals are called 'sirenias', since their mammary glands and nursing habits are similar to those of humans.
- Location: They are found throughout the warm latitudes of the Indian and western Pacific Oceans. In India, dugongs are seen in the Gulf of Mannar, Gulf of Kutch, Palk Bay, and the Andaman and Nicobar Islands.
- **Conservation status:**
 - Vulnerable- the IUCN Red List
 - Protected in India under Schedule I of the Wild (Life) Protection Act, 1972
- Diet: The dugong is herbivorous. It primarily grazes on sea grasses and therefore spends most of its time in seagrass beds.
- Dugongs are an important part of the marine ecosystem and their depletion will have effects all the way up the food chain.

Threats for dugong

- Hunting for meat and oil.
- By-catch: Dugongs are often incidentally caught in nets, targeting fish and sharks. This by-catch leads to a high number of mortality because of insufficient oxygen supply.
- Habitat disturbance in a form of water pollution, which leads to destruction of seagrass beds that are the main food source for these animals.
- Human activities such as the
 - destruction and modification of habitat
 - pollution
 - rampant illegal fishing activities, vessel strikes
 - unsustainable hunting or poaching
 - unplanned tourism
- Loss of seagrass beds due to ocean floor trawling.

Steps Taken for Conservation

- The Government of India has been a signatory to the **CMS since 1983.**
- India has signed non-legally binding Memorandums of Understanding (MoU) with CMS on the conservation and management of-
 - Dugongs (2008)
 - Siberian Cranes (1998)
 - Marine Turtles (2007)
 - Raptors (2016)
- In February 2020, India hosted the 13th Conference of Parties (CoP) of the Convention on the Conservation of Migratory Species of Wild Animals (CMS), an environmental treaty under the aegis of the **United Nations Environment Programme (UNEP).**



Population number

According to the WWF (World Wildlife Fund), the overall Dugong population is estimated to be about 85,000 animals, living in waters of northern Australia, from Shark Bay (Western Australia) to Moreton Bay (Queensland).

LAKSHADWEEP LAUNCHES SEAWEED FARMING UNITS

CONTEXT:

After fisheries, coconut and tourism, the Lakshadweep administration has prioritized seaweed farming as the next major engine of economic development.

What is Seaweed farming?

- The simplest and most common cultivation method is to attach pieces of seaweed to rope lines or nets that are suspended in the sea, often near the coast.
- They hang on wooden stakes or on a floating wooden framework dug down into the seabed.

About Seaweeds

- Seaweeds are fast-growing algae.
- They utilise energy from sunlight, and take up nutrients and carbon dioxide from the seawater.
- Seaweed is consumed in several countries, especially in East Asian countries.
- It is also used in food additives, medicine, fertiliser and cosmetic goods and to combat beach erosion.

Key-highlights of the new initiative

- Launched under the guidance of premier marine research body Central Marine Fisheries Research Institute (CMFRI) headquartered in Kochi.
- The initiative is in line with a study conducted by CMFRI which found immense potential for quality seaweeds in pollution-free lagoons for high-end utilisation like pharmaceuticals, food and nutraceuticals.
- It is planning a production of about 30,000 tonnes worth ₹7.5 million in a year.
- In line with the new plan, a farming demonstration of seaweeds was launched in nine inhabited islands.

Important species to be involved in the plan

- Indigenous red algae
- Gracilaria edulis
- Acanthophora spicifera

What is need of farming?

Farming helps in more production

- Experimental farming was conducted in the islands of Kiltan, Chetlah Kadmath, Agatti and Kavaratti with good results.
- The island has a potential of producing nearly 30,000 tonnes of dry seaweed per year worth ₹7.5 million by farming only 1% (200 ha) of its 21,290 ha of lagoon area (inhabited islands only).





MANDA BUFFALO: ODISHA

© CONTEXT:

The Manda buffalo has been recognised as the 19th unique breed of buffaloes found in India by the *National Bureau of Animal Genetic Resources (NBAGR)*.

About Manda Buffalo

- Habitat: The buffalo are found in geographical distribution to hill ranges of Eastern Ghats and plateau of Koraput region.
 - Both male and female of this breed are used for ploughing in their native habitat.
- Characteristics: Manda have ash grey and grey coats with copper-coloured hair.
 - The lower part of the legs up to elbow is light in colour with copper-colored hair at the knee.

Speciality of the Breed

- Resistant to parasitic infections
- Less prone to diseases
- Can live, produce and reproduce at low or nil input systems

Other recognized breeds

- NBAGR already received a recognition of
 - ▶ One breed of sheep, Kendrapada
 - ➤ Two breeds of buffalo Chilika and Kalahandi
 - ➤ Four breeds of cattle Binjharpuri, Motu, Ghumusari and Khariar

Significance of Recognition

- With the national recognition, efforts will be made by the Centre and State for conservation of the unique buffalo genetic resource.
- The conservation projects are in force for all the indigenous breeds in the State.
 - **Binjharpuri cattle semen production** and its use through **artificial insemination** is a remarkable achievement in the country in the field of conservation.

National Bureau of Animal Genetic Resources (NBAGR)

- ICAR-NBAGR, Karnal is the nodal agency for the registration of newly identified germplasm of livestock and poultry of the country.
- NBAGR undertakes the responsibility of evaluating, certifying and conserving the rich and varied germplasm resources available in the country and whose genetic base is shrinking fast.

MESOAMERICA FACES FLORISTIC BIODIVERSITY LOSS: STUDY

© CONTEXT:

Mesoamerica, where several important crops such as maize, beans, squash, chilli peppers and vanilla originated, is witnessing a decline in their wild relatives, according to a study published recently.



About Mesoamerica

- The term Mesoamerica is derived from the Greek and means "Middle America."
- It refers to a geographical and cultural area which extends from central Mexico down through Central America, including the territory which is now made up of the countries of Guatemala, Belize, Honduras, and El Salvador.
- It is therefore seen as partly in North America, and encompassing a large part of Central America.

Key-highlights of the Study

- Some 224 plants closely related to maize, potato, beans, squash, chilli pepper, vanilla, avocado, husk tomato and cotton were analysed in the study.
 - They found that 35 percent of these wild species were threatened with extinction, according to the International Union for the Conservation of Nature (IUCN).
- The potato is the third most important food crop in the world after rice and wheat in terms of human consumption.
- More than a billion people worldwide eat potato, and global total crop production exceeds 300 million metric tonnes.
- The wild plant groups at highest risk of extinction are **Vanilla** with all eight species in the region listed as 'endangered' or 'critically endangered' on the IUCN Red List of Threatened Species.
- It is followed by **cotton (Gossypium)** 92 per cent of its species are at risk and avocado (Persea) — 60 percent of its species are threatened.
- Two groups related to maize, Zea and Tripsacum, are 44 per cent and 33 per cent threatened respectively.
- Thirty-one percent of bean species, one out of four chilli pepper species, 23 per cent of potato species, 12 percent of husk tomato species and nine per cent of squash **species** are further threatened with extinction.
- The study noted that at least 16 wild crops included in it, had been used to breed food crops that were more resilient to the changing climate, extreme weather and other threats.

The paper, titled Extinction risk of Mesoamerican crop wild relatives, was published in the journal Plants, People, Planet.

What led to their decline?

- conversion of wild habitats into farms
- shift from traditional to mechanised agriculture
- use of pesticides and insecticides
- invasive species
- contamination from genetically-modified crops
- over-collection and logging

RIVER BHOGDOI, DYING A SLOW DEATH

© CONTEXT:

The rampant coal mining in Nagaland, coupled with waste discharge from tea estates and encroachment have been sounding death knells for River Bhogdoi in Assam.



About the river

- River Bhogdoi is one of the south bank tributaries of the mighty river Brahmaputra.
- It originates from Mokokchung in Nagaland where it is also known as Tsujenyong nullah.
- The total catchment area of the inter-state river (flowing between Assam and Nagaland) is 1,545 square kilometres and travels 160 kilometres before joining Dhansiri river near its confluence with Brahmaputra.

In 2019, the Union Ministry of Environment, Forest and Climate Change declared Bhogdoi as one of the most polluted rivers in Assam and 351st among the polluted rivers in the country.

Reasons behind the situation

- Massive encroachments along the river bank
- Laxity of administration in keeping a check on encroachments
- Disposing of human excreta and cremating dead bodies
- Water pollution
- Biological Oxygen Demand (BOD)
 - Biochemical oxygen demand is the amount of oxygen consumed by bacteria and other microorganisms while they decompose organic matter under aerobic conditions.
 - The high BOD (Biological Oxygen Demand) indicates low water quality and less oxygen for aquatic life.

Brahmaputra River

- Brahmaputra River is a long transboundary river in the Continent of Asia.
- It flows through the
 - Tibet Autonomous Region of China
 - ➤ India
 - Bangladesh
- The river originates in the Lake Manasarovar region close to Mount Kailash and finally drains into the Bay of Bengal.

RIVER RIGHTS HIGHLIGHTED AT IUCN WORLD CONSERVATION CONGRESS

© CONTEXT:

In the ongoing International Union for the Conservation of Nature (IUCN) World Conservation Congress, in Marseille, France, the issue of 'right of rivers' was highlighted.

Universal Declaration of the Rights of Rivers

- The press conference also marked approximately one year since the formal launch of the **Universal Declaration of the Rights of Rivers**.
- The declaration is a civil society initiative to define the basic rights to which all rivers are entitled, according to a note by non-profit, *International Rivers*.



Rights of rivers

- The rights of rivers mean that the ecological causes and conditions making up the natural habitat are to be protected to maintain a river's identity and integrity.
- The concept pushes for a healthy relationship respecting the river as an ecosystem.

Recognition of rights

- In the one year since the declaration, rights have been recognised or declared for the
 - Boulder Creek watershed in the United States
 - the Magpie river in Canada
 - waterways in Orange County in the US
 - the Alpayacu river in Ecuador
 - the Paraná river and its wetlands in Argentina
- Some 1,700 individuals and 211 organisations from over 40 countries have pledged support to the declaration.

Recognized rivers

- The rights to recognise river as living entities rather than mere human property started in 2008. That year, **Ecuador** became the first country to constitutionally recognize the **Rights of Nature.**
- In 2017, a treaty agreement between the **Whanganui Iwi (a Māori tribe)** and the New Zealand government recognised the **Whanganui river** as a legal person
- Also in 2017, a Constitutional Court decision in Colombia recognised the rights of the Atrato river.
- A court in Uttarakhand recognised the Ganga and Yamuna rivers as legal persons with rights. This was later stayed.

GOVERNMENT CLEARS C-295 AIRCRAFT DEAL FOR IAF

O CONTEXT:

To provide a major fillip to the transport fleet of the Indian Air Force, the Cabinet Committee on Security (CCS) cleared procurement of 56 transport aircraft from Airbus.

What is C-295MW?

- C-295MW is a transport aircraft of 5-10 tonne capacity with contemporary technology.
- All aircraft will be installed with the indigenous Electronic Warfare Suite.
- It has a rear ramp door for quick reaction and para-dropping of troops and cargo.
- The fleet will replace the **Avro aircraft** of the Air Force, which are **British-origin twinengine turboprop**, military transport and freighter with a 6-tonne freight capacity.
- Its dimensions are smaller than the IAF's fleet of C-130Js, C-17s and IL-76s, C-295s.

Key-highlights of the project

- 16 aircraft will be delivered in flyaway condition from Spain within 48 months of signing of the contract.
- The remaining 40 aircraft will be manufactured in India by the **TATA Consortium** within 10 years of signing the contract.





- This is the first project of its kind in which a military aircraft will be manufactured in India under technology transfer by a private company.
- Cost: It is expected to cost close to \$3bn.
- Incidentally, this is the first defence contract the **European firm Airbus** has signed with India since the 1960s despite being in the country for over five decades.



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