EMPOWER IAS
The Power To Pursue Your Dreams

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EMPOWER IAS
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Page 07 : GS 3 : Enviroment - Environmental pollution and degradation

The impact of climate change on human health is escalating, with extreme weather events causing severe health and environmental consequences.

- Public interest litigation in India seeks to include climate change considerations in Environmental Impact Assessments (EIAs), advocating for robust legislation to mitigate climate impacts and protect vulnerable populations.

Time to make climate part of green impact reports

Ramya Kannan

If one thing is apparent from the changing weather over the last few years, it is the repeated extremes that we have encountered. Extreme heat and humidity, storms that cause severe and ruinous flooding across wide areas in urban settlements, and very cold winters. It is clear that climate change is touching human lives and our health in myriad ways. As the World Health Organisation says, "Climate change threatens the essential ingredients of good health – clean air, safe drinking water, nutritious food supply, and safe shelter – and has the potential to undermine decades of progress in global health."

Further, the WHO estimates that between 2030 and 2050, climate change is expected to cause approximately 2,50,000 additional deaths per year from malnutrition, malaria, diarrhoea and heat stress alone. The direct costs to health are estimated to be between $2 and 4 billion per year by 2030. Regions with weak health infrastructure – mostly in developing countries – will be the least able to cope without assistance to prepare and respond.

The World Bank records

According to the global climate change index, parts of Bangladesh's southern region may vanish into the ocean in a few decades, as coastal erosion has increased noticeably. GETTY IMAGES

that as the global climate crisis escalates, the devastating impact it will have on human health and well-being will also accelerate. No one anywhere around the globe is beyond its reach, though millions of people – notably women, children, the elderly, ethnic minorities, people with pre-existing health conditions, and those living in poverty – are among the most vulnerable. A recent study done in India by the faculty of Public Health at the Sri Ramachandra Institute of Higher Education and Research (SRIHER) in Chennai showed that working in extreme heat can double the risk of stillbirth and miscarriage for pregnant women, shocking researchers as they had previously underestimated the impact.

Climate footprint
It is in this context that we record a significant public interest litigation that was filed in the Madras High Court last week. The plea was filed by G. Sundarrajan of the environmental NGO Poovulagin Nanbargal. The point he makes is simple and crucial. There is no climate change component in the environmental impact assessment (EIA) – a clearance that is mandatory for large-scale construction or development projects. Quoting previous judgements on the issue, the petitioner laid out reasons why climate change should be a crucial part of any EIA before consent is

given for a large project to begin. The requirement is very simple. For instance, says Sundarrajan, if there is a plan to set up a chemical factory near a settlement, an environmental impact assessment would measure the impact of its functioning on the surrounding environment in terms of pollution of water, earth, and sound.

When one does an assessment of the impact of climate change, it is necessary to scope out the consequences of its presence, starting from day one, when construction begins, until the end of that factory's life. This will also include the carbon footprint, emissions of greenhouse gases, and impact on the health of nearby communities. It would also be necessary to prepare an Environmental Management Plan to mitigate the impact. This should be submitted as a document to the government for evaluation before a decision is ta-

ken to grant clearance.

The First Division Bench of the Madras High Court said the plea appeared to be just and called on the Centre to reply in two weeks. In its progress through the courts, this is likely to become an index case, as it stands on the cusp of the global realisation that climate change is no longer something that can be ignored or swept under the rug.

Several nations have already enacted legislation to prepare for and prevent, to the extent possible, the ills of climate change. These include the Bahamas, France, Chile, the United States, China, and Australia. As a nation that will be deeply impacted by climate change, it would be appropriate for India to enact laws that will attempt to conserve gains and prevent further environmental degradation due to human activity.
(ramya.kannan@thehindu.co.in)

Climate Footprint and Environmental Impact Assessments

- A recent public interest litigation filed in the Madras High Court emphasises the need to include climate change considerations in Environmental Impact Assessments (EIA) for large-scale projects.
- Currently, EIAs do not account for the climate change impacts of construction projects, such as carbon footprints, greenhouse gas emissions, and effects on community health.

- The petitioner argues that the EIA process should evaluate the long-term climate impact from the start of construction through the operational life of a project.
- An Environmental Management Plan should be required to mitigate the climate impacts, and this plan should be reviewed by the government before project clearance is granted.

Judicial and Legislative Developments

- The First Division Bench of the Madras High Court has responded positively to the plea, requesting a government reply within two weeks.
- The case could set a precedent for integrating climate change considerations into environmental regulation.
- Various countries, including the Bahamas, France, Chile, the United States, China, and Australia, have already enacted legislation to address climate change impacts.
- India, which is likely to face severe climate impacts, is encouraged to develop and implement laws to mitigate environmental degradation and preserve gains made in environmental protection.

Global Context and Future Directions

- The case before the Madras High Court reflects a growing global recognition of climate change as a critical issue.
- As climate change increasingly affects human health and environmental stability, comprehensive legal frameworks are necessary to address its effects effectively.
- The integration of climate change components into environmental assessments is seen as a vital step toward more sustainable development practices and better health outcomes.

What is Environmental Impact Assessment (EIA)?

- Environmental Impact Assessment (EIA) is a systematic process used to evaluate the potential environmental effects of proposed projects or activities before they are implemented.
- Originating in the 1960s and 1970s, EIA aims to predict, assess, and mitigate adverse impacts on natural environments and communities, ensuring informed decision-making and sustainable development.
- **EIA Procedure: Screening:** Determine if a project requires an EIA based on its size and potential impacts.
- **Scoping:** Identify key issues and potential impacts to be studied.
- **Baseline Data Collection:** Gather data on current environmental conditions such as air and water quality.
- **Impact Prediction:** Assess how the project will affect the environment using the collected data.
- **Mitigation Measures:** Propose strategies to minimize or avoid adverse impacts.
- **Alternatives Assessment:** Evaluate different project options to select the least harmful option.
- **Public Consultation:** Engage stakeholders and communities for their input and concerns.
- **Review and Decision-Making:** Authorities review the EIA report and decide on project approval, rejection, or conditional approval.

UPSC Mains PYQ : 2018

Ques : ''Climate Change' is a global problem. How will India be affected by climate change? How Himalayan and coastal states of India be affected by climate change?

Page 07 : GS 2 : Social Justice – Health

The voyage of Vasco da Gama in 1497 led to the global spread of tobacco, significantly impacting trade and cultures.

- Despite its economic benefits, tobacco poses severe health risks, including cancer and cardiovascular diseases.
- It remains a major public health crisis, with ethical and economic conflicts in addressing its effects.

Vasco da Gama's toxic legacy is now a 'pandemic' that kills 8 million globally

Tobacco has profound and multifaceted effects on the body, contributing to a range of issues, including cancers, respiratory diseases, cardiovascular problems, and conditions such as diabetes, infertility, a weakened immune system, and complications in pregnancy. Its consumption can also lead to severe addiction due to the presence of nicotine

C. Aravinda

What does the voyage of Vasco da Gama have to do with a commodity that is the cause of much grief and ill health across the world? The answer, in a word, is tobacco, but the story is as follows: on July 8, 1497, began the historic voyage of Vasco da Gama. This journey reshaped global maritime routes and left an indelible mark on trade and culture. Among the myriad exchanges catalysed by this era of exploration was the introduction and dissemination of tobacco, a commodity that has since impacted societies profoundly and multifacetedly.

Tobacco has a pernicious effect on the human body, contributing to a range of health issues including various cancers (lung, mouth, throat, oesophagus, pancreas, and bladder), respiratory diseases (chronic obstructive pulmonary disease, emphysema, chronic bronchitis), cardiovascular problems (heart disease, stroke, hypertension), and other conditions such as diabetes, infertility, a weakened immune system, and complications in pregnancy. Its consumption can lead to severe addiction due to the presence of nicotine, a highly addictive substance. The pervasive nature of tobacco consumption and its severe health consequences make it a global public health crisis that requires urgent and coordinated action.

Despite its "Pan Indian" use, tobacco, originally cultivated by Native Americans, was brought to Europe in the 16th Century and, soon after, introduced to South Asia by European traders and colonisers. The Portuguese, followed by the Dutch and the British, were instrumental in spreading tobacco use. Tobacco quickly embedded itself into the cultural and social fabric of South Asian societies. Yet, it is essential to remember that smoking was alien to Indian ethos and culture. Despite the linguistic diversity in India, with as many as five linguistic families (thousands of languages), none of the Indian languages have a native or original word for "tobacco". The exception in Dravidian languages is due to the functionality – or description-related coinage – for "tobacco," and there is no literary evidence about the use of tobacco before the European arrival.

Surprisingly, the economic dimensions of the tobacco menace have not been subject to debate since the colonial era. There has not been a robust enough critique of the British Raj for tobacco. Indeed, it isn't the Kohinoor that should symbolise European exploitation, but the countless lives lost to smoking that should be the true emblem of colonial greed. The introduction of tobacco in India has left a lasting legacy of addiction and disease.

Ethical and revenue considerations

Tobacco, being a drought-tolerant, hardy crop, is economically significant to the underprivileged. Today, tobacco accounts for 2% of India's agri-exports and employs more than 45 million people. The industry is a major source of revenue through taxation and exports exceeding ₹22000 crore. However, this benefit comes at a tremendous human and financial cost. The total economic cost of smoking in India, including health expenditure and productivity losses, amounts to ₹1.82 trillion annually.

Tobacco use is responsible for over 1.2 million deaths in India each year, with smoking-related diseases accounting for the majority. Tobacco is a significant contributor to the country's cancer burden, with 27% of all cancers in India attributable to tobacco use. This aspect of colonial legacy – where tobacco was a tool of economic gain for colonial powers but a source of health devastation for local populations – deserves more attention in historical discourse.

Stacking up priorities

The contemporary landscape of tobacco research in India is marked by a conflict of priorities between two premier institutions: the Indian Council of Medical Research (ICMR) and the Indian Council of Agricultural Research (ICAR). The ICMR advocates for the elimination of tobacco to mitigate its public health impact, and investing in research and policies aimed at reducing tobacco use. In stark contrast, the ICAR focuses on increasing tobacco crop yields and employing modern genetic techniques to enhance the productivity of tobacco farmers. ICAR's Central Tobacco Research Institute (CTRI) in Rajahmundry is at the forefront of this research. The

An exhibit on the impact of tobacco consumption set up by a hospital in Mumbai. FILE PHOTO

Vasco da Gama's journey reshaped global maritime routes and left an indelible mark on trade and culture. Among the myriad exchanges catalysed by this era was the introduction of tobacco

organisation interest is to enhance tobacco productivity and commerce while ensuring the sustainability and quality of tobacco leaves and seeds. This is in conflict with ICMR's aspirations for a tobacco-free India, creating a significant policy and ethical dilemma.

However, the law is quite clear. Article 21 of the Indian Constitution guarantees the right to life and personal liberty, including the right to health, as an integral part of this fundamental right. Furthermore, the Directive Principles of State Policy (DPSP) under Articles 39(e), 39(f), 41, 42, and 47 mandate the state to work towards improving public health, ensuring social justice, and raising the standard of living. These provisions compel the state to prioritise the health and well-being of its citizens over the economic benefits of tobacco farming.

Will CRISPR make a difference?

In scientific innovation, gene editing technique CRISPR (clustered regularly interspaced short palindromic repeats) presents a potential solution to the tobacco epidemic. Researchers are using CRISPR to develop genetically-modified tobacco plants that are less harmful or harmless. This technology could potentially alter the nicotine content and other harmful substances in tobacco leaves, providing a safer alternative for consumers.

Recent studies have shown promise in using CRISPR to knock out specific genes in tobacco plants, thereby reducing nicotine content significantly. For example, targeting the transcription factor genes *ERF199* and *ERF189* resulted in an ultra-low-nicotine phenotype, with nicotine levels reaching only 2-5% of wild-type levels. Knocking out the *QPT2* gene drastically reduced nicotine production but caused severe growth inhibition, making it unsuitable for agricultural use.

Additionally, targeting all six members of the *BBL* gene family reduced foliar nicotine levels by up to 94% . These developments highlight the potential for CRISPR to create tobacco lines with dramatically reduced nicotine content. However, further characterisation is needed to ensure these modifications do not negatively impact other important agronomic traits. The collaboration between ICMR and ICAR is crucial. By working together, these institutions can develop tobacco crops that reduce health risks while maintaining economic viability.

Surrogate advertising

The tobacco industry has shown remarkable resilience and ingenuity in circumventing regulations to curb its influence. Despite stringent advertising bans under the Framework Convention on Tobacco Control (FCTC), the tobacco lobby has employed surrogate advertising to promote its products. This involves using brand names on non-tobacco products, sponsoring events, and promoting tobacco-related imagery in media and entertainment. Such tactics undermine public health efforts and perpetuate tobacco consumption.

There is a popular misconception that "epidemic" and "pandemic" apply exclusively to infectious diseases. However, tobacco consumption perfectly fits the existing definition of a pandemic. A pandemic is characterised by its widespread prevalence, severe consequences, and the ability to affect a significant portion of the population across multiple countries. Tobacco use meets these criteria, causing over 8 million deaths worldwide annually and affecting millions more through chronic diseases and disabilities.

The scale and severity of tobacco-related diseases, coupled with its pervasive presence across the globe, justify the classification of tobacco consumption as a pandemic.

This perspective could galvanise international efforts and resources to combat tobacco use more effectively, treating it with the urgency and coordinated action typically reserved for infectious disease outbreaks.

(Dr. C. Aravinda is an academic and public health physician. aravindaaiimsjr10@hotmail.com)

THE GIST

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Originally cultivated by Native Americans, tobacco, was introduced to South Asia by European traders. They were instrumental in spreading tobacco use in the region though smoking was alien to Indian ethos and culture

▼
The cultivation of tobacco yields over ₹22000 crore. However, this comes at a tremendous human and financial cost. The total economic cost of smoking in India, including health expenditures and productivity losses, amounts to ₹1.82 trillion annually

▼
Tobacco consumption perfectly fits the definition of a pandemic. It causes over 8 million deaths worldwide annually and affects millions more through chronic diseases. The scale and severity of tobacco-related diseases, justify classification as a pandemic

Impacts of Tobacco on Our Health

- Tobacco consumption leads to severe health problems, including various cancers (lung, mouth, throat, oesophagus, pancreas, and bladder), respiratory diseases (chronic obstructive pulmonary disease, emphysema, and chronic bronchitis), and cardiovascular issues (heart disease, stroke, and hypertension).

Introduction and Spread in South Asia

- Tobacco, originally cultivated by Native Americans, was brought to Europe in the 16th Century and later introduced to South Asia by European traders and colonisers, including the Portuguese, Dutch, and British.
- Tobacco rapidly integrated into South Asian cultures and societies, although it was initially foreign to Indian traditions.
- No native Indian language had an original term for tobacco, with its introduction marking a significant cultural shift.

Conflicting Priorities in Research

- **There is a conflict between two major institutions in India:** the Indian Council of Medical Research, which advocates for reducing tobacco use to improve public health, and the Indian Council of Agricultural Research, which focuses on enhancing tobacco crop yields and productivity.
- The Central Tobacco Research Institute, part of the Indian Council of Agricultural Research, works on increasing tobacco productivity and quality, which contrasts with the Indian Council of Medical Research's goal of a tobacco-free India, creating an ethical and policy dilemma.

Legal and Ethical Considerations

- **Article 21** of the Indian Constitution guarantees the right to life and personal liberty, including the right to health.
- Directive Principles of State Policy under **Articles 39(e), 39(f), 41, 42, and 47** mandate the state to improve public health and ensure social justice.
- These constitutional provisions necessitate prioritising public health over economic gains from tobacco farming.

Potential of CRISPR Technology

- The gene-editing technology CRISPR holds promise for addressing the tobacco epidemic by creating genetically-modified tobacco plants with reduced harm.
- Research has shown that CRISPR can significantly lower nicotine levels in tobacco plants, with specific gene modifications reducing nicotine content by up to 94%. However, further research is needed to ensure these modifications do not adversely affect other important traits.
- Collaboration between the Indian Council of Medical Research and the Indian Council of Agricultural Research is crucial to develop tobacco crops that balance reduced health risks with economic viability.

Surrogate Advertising

- Despite stringent advertising bans under the Framework Convention on Tobacco Control, the tobacco industry uses surrogate advertising to promote its products.

- Surrogate advertising includes using brand names on non-tobacco products, sponsoring events, and featuring tobacco-related imagery in media and entertainment, undermining public health efforts and perpetuating tobacco use.

Classification as a Pandemic

- Tobacco use fits the definition of a pandemic due to its widespread prevalence, severe health consequences, and impact across multiple countries.
- Tobacco causes over 8 million deaths annually worldwide and affects millions more through chronic diseases and disabilities, justifying the classification of tobacco consumption as a pandemic and highlighting the need for coordinated international efforts to combat it effectively.

UPSC Prelims PYQ : 2012

Ques : Consider the following:

1. Assessment of land revenue based on nature of the soil and the quality of crops.
2. Use of mobile cannons in warfare.
3. Cultivation of tobacco and red chillies.

Which of the above was/were introduced into India by the English?

(a) 1 only
(b) 1 and 2
(c) 2 and 3
(d) None

Ans: d)

Page : 10 : GS 2 : Indian Polity

On July 5, the Assam government instructed the Border wing of the State police not to refer cases of non-Muslims who entered India illegally before 2014 to the Foreigners Tribunals (FTs).

How do Assam's Foreigners Tribunals function?

How do these tribunals decide whether a person is Indian or not? Does the Border police play a role?

Rahul Karmakar

The story so far:

On July 5, the Assam government asked the Border wing of the State's police not to forward cases of non-Muslims who entered India illegally before 2014 to the Foreigners Tribunals (FTs). This was in keeping with the Citizenship (Amendment) Act of 2019 that provides a citizenship application window for non-Muslims – Hindus, Sikhs, Christians, Parsis, Jains, and Buddhists – who allegedly fled persecution in Afghanistan, Bangladesh, and Pakistan.

How did the FTs come about?

The FTs are quasi-judicial bodies formed through the Foreigners (Tribunals) Order of 1964 under Section 3 of the Foreigners' Act of 1946, to let local authorities in a State refer a person suspected to be a foreigner to tribunals. The FTs are currently exclusive to Assam as cases of "illegal immigrants" are dealt with according to the Foreigners' Act in other States. Each FT is headed by a member drawn from judges, advocates, and civil servants with judicial experience. The Ministry of Home Affairs told Parliament in 2021 that there are 300 FTs in Assam but the website of the State's Home and Political Department says that only 100 FTs are currently functioning, beginning with 11 established before the Illegal Migrants (Determination by Tribunals) Act of 1983 was scrapped in 2005.

What is the role of the Border police?

The Assam Police Border Organisation was established as a part of the State police's Special Branch in 1962 under the Prevention of Infiltration of Pakistani (PIP) scheme. The organisation was made an independent wing in 1974 and is now headed by the Special Director General of Police (Border). After the liberation war of Bangladesh, the PIP scheme was renamed Prevention of Infiltration of Foreigners or PIF scheme. The Centre has sanctioned the posts of 3,153 out of the 4,037 personnel of this wing under the PIF scheme while 884 are sanctioned by the Assam government. The members of this wing are tasked with detecting and deporting illegal foreigners, patrolling the India-Bangladesh border with the Border Security Force, maintaining a second line of defence to check the entry of illegal foreigners, and monitoring people "settled in riverine and char (sandbar) areas". This is apart from referring people of suspicious citizenship to the FTs to decide whether they are Indian or not based on documents. Cases of 'D' or doubtful voters can also be referred to an FT by the Election Commission of India and people excluded from the complete draft of the National Register of Citizens (NRC) released in August 2019 can appeal to the FT concerned to prove their citizenship. Some 19.06 lakh out of 3.3 crore applicants were excluded from the NRC, whose process has been on hold.

How does an FT function?

According to the 1964 order, an FT has the powers of a civil court in certain matters such as summoning and enforcing the attendance of any person and examining him or her on oath and requiring the production of any document. A tribunal is required to serve a notice in English or the official language of the State to a person alleged to be a foreigner within 10 days of receiving the reference from the authority concerned. Such a person has 10 days to reply to the notice and another 10 days to produce evidence in support of his or her case. An FT has to dispose of a case within 60 days of reference. If the person fails to provide any proof of citizenship, the FT can send him or her to a detention centre, now called transit camp, for deportation later.

Why are some FT orders under fire?

On July 11, the Supreme Court set aside an FT order declaring Rahim Ali, a deceased farmer, a foreigner 12 years ago. The apex court called the order a "grave miscarriage of justice" while pointing out that the Foreigners' Act does not empower the authorities to pick people at random and demand that they prove their citizenship. In September 2018, an FT member in central Assam's Morigaon observed that foreigners' cases have assumed the form of an industry where everyone involved is "trying to mint money by any means". The member also noted that notices are "hung up on some trees or electric pole" without the suspected non-citizens unaware of such a case against them.

THE GIST

▼ On July 5, the Assam government asked the Border wing of the State's police not to forward cases of non-Muslims who entered India illegally before 2014 to the Foreigners Tribunals (FTs).

▼ According to the 1964 order, an FT has the powers of a civil court in certain matters such as summoning and enforcing the attendance of any person and examining him or her on oath and requiring the production of any document.

▼ The Assam Police Border Organisation was established as a part of the State police's Special Branch in 1962 under the Prevention of Infiltration of Pakistani (PIP) scheme.

About Foreigners Tribunals

- Foreigners Tribunals are quasi-judicial bodies established to determine if a person staying illegally in India is a "foreigner" or not.
- They were set up under the Foreigners (Tribunals) Order, 1964, enacted by the central government under the Foreigners Act, 1946.
- Initially, only the central government could set up these tribunals. But a 2019 amendment empowered district magistrates in all states and UTs to establish Foreigners Tribunals.
- The tribunals have the powers of a civil court to summon witnesses, require document production, and examine evidence.

Decision-Making Process of Foreigners Tribunals

- **Referral:** Individuals suspected of being foreigners are referred to FTs by local authorities or border police. This referral can be based on various factors, including lack of documentation or doubtful voter status.
- **Notice Issuance:** Upon receiving a reference, the FT issues a notice to the person alleged to be a foreigner. This notice is served in English or the state's official language.The person has 10 days to respond to the notice and an additional 10 days to submit evidence supporting their claim of citizenship.

- **Submission of Evidence:** The individual must present evidence to prove their Indian citizenship. This may include documents like birth certificates, school certificates, land records, or other official records.
- **Verification:** The tribunal examines the documents and evidence provided, and may call witnesses or seek additional information if necessary.
- **Hearing:** The FT has the authority to summon and examine the individual on oath, and to require the production of additional documents. The tribunal operates with certain powers of a civil court.
- **Judgment:** If the evidence provided is deemed insufficient to prove citizenship, the individual may be declared a foreigner. If evidence is adequate, the person is recognized as an Indian citizen.
- **Detention and Deportation:** If declared a foreigner and unable to appeal successfully, the person may be sent to a detention center (transit camp) for deportation.

Role of Border Police

- **Detection and Referral:** The Assam Police Border Organisation is responsible for detecting illegal foreigners and referring suspicious cases to FTs.
- **Patrolling and Defence:** They patrol the India-Bangladesh border, work with the Border Security Force, and maintain a second line of defense.
- **Monitoring:** They monitor people settled in riverine and char (sandbar) areas.
- **Cases of 'D' Voters:** They refer cases of 'D' (doubtful) voters to FTs as directed by the Election Commission of India.
- **NRC Appeals:** People excluded from the NRC can appeal to the FTs through this wing to prove their citizenship.

Challenges and Criticisms:

- **Supreme Court Rulings:** The Supreme Court has overturned FT orders citing grave miscarriages of justice, such as the wrongful declaration of a deceased farmer, Rahim Ali, as a foreigner.
- **Corruption and Malpractice:** Observations have been made about corruption within the system, with allegations of notices being improperly served.

Conclusion: Need to Implement stricter oversight and auditing of Foreigners Tribunals to ensure fairness and adherence to legal procedures. Regular reviews and monitoring can help prevent corruption and malpractice, ensuring that notices are properly served and tribunal processes are transparent.

UPSC Mains PYQ : 2013

Ques: How far are India's internal security challenges linked with border management particularly in view of the long porous borders with most countries of South Asia and Myanmar?

Page 15 : Prelims Fact

Ivory Coast is transitioning from an agriculture-centric economy to a major oil and gas producer, with recent discoveries of significant natural resources.

Ivory Coast tilts its economy from agriculture to mining natural resources

Agence France-Presse
ABIDJAN

The discovery of huge deposits of natural resources including oil, gas and gold in the Ivory Coast is pushing the country's economy in a new direction as it explores its underground potential.

Over the last three years, the West African country – traditionally focused on agriculture, in particular cocoa – has leaned into a new role as an oil and gas producer.

Three discoveries of oil deposits were made in September 2021, July 2022 and February this year, revealing huge reserves estimated at six billion barrels.

The discoveries give the country the potential to become a net exporter by the end of the decade.

The first deposit, called Baleine, is already up and running, operated by Italian company Eni.

It aims at supplying 2,00,000 barrels per day by 2026, and 200 million cubic feet per day of gas.

The Minister of Mines, Oil and Energy, Mamadou Sangafowa Coulibaly, said the country could now have the chance of joining the OPEC group of oil-producing countries.

The number of mining permits and projects has tripled since 2012 while research permits have increased from 120 to nearly 200 over the period.

Mr. Sangafowa Couliba-ly said the tax revenues generated are already 20 times higher than they were in 2012, at 372 billion CFA francs.

"The western half and the northeast of our country are full of strategic and critical minerals," said the Minister. "The Ivorian economy is diversifying into everything related to raw materials," said Cedrick Sehe, president of CAMP2E, an organisation that promotes mining in the country.

In May, the country's largest gold deposit was discovered in the west, with the potential to be the third-largest mine in West Africa.

Lithium, manganese, nickel and even coltan – a precious ore used to make electronic devices – have also been found in Ivorian soil. "These minerals are particularly sought after because they are part of energy transition policies," Serge Parfait Dioman, an engineering expert in the oil and energy industries, said.

In a sign of its changing role, Ivory Coast will host the SIREXE conference – its first international mining industry exhibition –

New route: Pipelines under construction to transport natural gas from platforms off the coast of Jacqueville in Ivory Coast. FILE PHOTO

this November and December.

But some have cautioned that the country could fall into the "raw materials curse", where a focus on extracting an abundance of resources can end up having negative impacts on the economy. Mr. Parfait Dioman countered that "the more diversified your raw materials are, the less risk you have of falling into this trap".

Environmental risks
Experts have also issued warning about the risk of environmental damage.

Eni has said it plans to make the Baleine field the first "carbon-neutral" operation in Africa. But while this aim is linked at its own

operations it does not mention the significant amount of indirect emissions linked to its value chain. Eni does however pledge to be carbon-neutral worldwide by 2050, in both direct and indirect emissions.

Last year, the Institute for Security Studies also noted a risk of increased deforestation. The country has already lost nearly 90% of its forest cover in half a century.

Fears have also been raised over the toxicity of chemicals used in extraction processes. In June the Cavally river in the west of the Ivory Coast was polluted by cyanide discharges after an incident in the Ity gold mine.

- The country is expanding its mining sector, hosting international industry events, but faces environmental challenges and risks associated with resource extraction and deforestation.
- **Economic Diversification:** Ivory Coast is shifting from its traditional agricultural focus, especially on cocoa, to become a significant oil and gas producer.
- **Resource Discoveries:** Recent discoveries include large oil reserves (six billion barrels) and significant deposits of gold, lithium, manganese, nickel, and coltan.

- **International Engagement:** The country will host its first international mining industry exhibition, SIREXE, in November and December.
- **Environmental Concerns:** Risks include potential deforestation, pollution from mining operations, and indirect emissions. Efforts are underway to address these issues, with goals for carbon-neutral operations.

Ivory Coast

- Ivory Coast, officially known as Côte d'Ivoire, is a West African country bordered by Liberia, Guinea, Mali, Burkina Faso, and Ghana, with a coastline along the Atlantic Ocean.
- Its capital city is Yamoussoukro, while Abidjan is its largest city and economic hub.
- The country is known for its diverse culture, tropical climate, and economic activities including cocoa and coffee production, which are major exports.
- Ivory Coast has a rich history influenced by various ethnic groups and has experienced periods of political instability.
- It is a member of the United Nations, African Union, and Economic Community of West African States.

UPSC Mains PYQ : 2013

Ques : Which one of the following pairs a correctly matched?
Geographical feature and region

(a) Abyssinian Plateau – Arabia
(b) Atlas Mountains – Northwest Africa
(c) Guiana Highlands – Southwest Africa
(d) Okavango Basin – Patagonia

Ans : b)

Location In News : Davis Strait

A microcontinent has been recently discovered in the Davis Strait, between Canada and Greenland.

About the newly discovered Microcontinent:

- The discovery was made around the Davis Strait, a large stretch of water located between Canada's Baffin Island and Greenland.
- The strait was formed millions of years ago when the tectonic plates between the two islands shifted, reconfiguring the Earth's crust.
- This resulted in the formation of a thick continental crust in the ocean, which has now been declared a newly discovered primitive microcontinent.
- It has been named the Davis Strait proto-microcontinent since it formed owing to the tectonic evolution of the strait in the region.
- The microcontinent is 19–24 km thick thinned continental crust and is surrounded by two narrow bands of thin (15–17 km) continental crust.

Key Facts about Davis Strait:

- Also known as the northern arm of the Atlantic Ocean, the Davis Strait is situated north of the Labrador Sea amidst southwestern Greenland and southeastern Baffin Island in Nunavut, Canada.

- It separates the depths of northern Baffin Bay from the southern Labrador Sea and forms an important part of the Northwest passage route going through the Canadian Arctic Archipelago and connecting the Atlantic and Pacific Oceans.
  - Baffin Bay is situated between Baffin Island and Greenland's west coast.
  - Defined as a marginal sea of the Arctic Ocean, it is also considered a small sea of the North Atlantic.
  - It is not navigable during the winter months due to the thick ice cover, floating icebergs and heavy fog.
- The Davis Strait is approximately 400 miles (650 km) north to south and 200 to 400 miles wide.
- It has a water depth ranging from 1000 to 2000 metres, and is comparatively shallower than the southern Labrador Sea.
- The Davis Strait is home to complex geological formations such as underwater basins and ridges that were created due to the strike-slip faulting along the Ungava fault Zone around 45 to 62 million years ago.
- It triggered plate tectonic movements in the Labrador Sea and the Baffin Bay, leading to the formation of the Strait.
- Two different ocean currents are active in the Davis Strait, with contrasting temperatures leading to varying concentrations of ice on the eastern and western sides of the Strait.
  - From the shores of Greenland, the western Greenland current carries comparatively warmer waters towards the east, while the Labrador current pushes iceberg-filled water southward along the Canadian coast, the Labrador Sea, and subsequently the Atlantic.
  - Ice conditions reflect this flow regime, with heavy ice movement and icebergs along the western shore contrasting sharply with more open water along the Greenland side.

The issue with tree planting schemes

The exploitation of forest resources due to uncontrolled and unsustainable practices has degraded forest landscapes. The World Bank estimates that the world has lost about 10 million square kilometres of forests since the start of the 20th century. The emphasis on forest restoration approaches to bring such degraded ecosystems back to their earlier state was the main purpose of declaring the decade of 2021-2030 as a Decade of Ecosystem Restoration by the United Nations. This targeted the restoration of 350 million hectares of degraded land to generate $9 trillion in ecosystem services and sequester an additional 13 gigatons-26 gigatons of greenhouse gases from the atmosphere.

As one of the proven methods to support and sustain biodiversity, tree planting is an undisputed, most appealing and popular approach, and with spectacular potential, to address climate-related crises and other environmental challenges. This includes biological carbon sequestration as a mechanism to store and remove carbon dioxide from the atmosphere. This is one reason to consider a mass-scale drive of tree planting as a silver bullet to tackle the challenges of climate change globally, by governmental and non-governmental organisations including individuals. Keeping this indispensable role of trees in maintaining the ecological balance, the then Indian Agriculture Minister, K.M. Munshi, launched the *Van Mahotsava* ('festival of trees') programme in July 1950. Since then, India has been religiously celebrating this programme of tree planting, annually, in the first week of July. To some extent, these efforts have been successful not only in motivating people but also in bringing tangible results that include improving the forest area.

Fancy drives, catchy slogans
In recent years there has been a spurt in tree planting in the name of special drives by various agencies, including governments, which is a welcome sign for environmental conservation.

Mohan Chandra Pargaien

a former Indian Forest Service officer, Hyderabad, Telangana

In tackling the many problems, adequate finances, active community participation and technical considerations need to be prioritised

With catchy slogans, glamorous drives and headline-grabbing campaigns, these programmes of tree planting, both globally and at a national level, have attracted huge media attention and the involvement of people including various organisations to fulfil their objectives. Be it a single day of a planting drive in various Indian States, the "One Trillion Project" of the World Economic Forum, the "Great Green Wall of China", the "10 Billion Tree Tsunami" of Pakistan or the "Bonn Challenge" to restore 150 million hectares of degraded and deforested landscapes by 2020 and 350 million hectares by 2030, many of these drives may seem welcome. But they have been criticised for limited community participation, a lack of adequate post-planting measures and for promoting monoculture, thereby proving less effective for carbon sequestration and biodiversity development.

The problem with such drives
The neglect of ecology and locality with little involvement of people in various tree planting programmes has been a major concern of environmentalists and scientists in recent years. In a study led by Joseph Veldman it was found that except for deforested areas, tree planting in certain locations such as grasslands and animal habitat destroys plant and animal habitats and can damage ecosystems, increase wildfire intensity and exacerbate global warming. Similarly, William Bond and colleagues, in their study, expressed scepticism in considering grasslands as deforested and degraded lands for selecting them for tree planting by rehabilitation; these lands are highly productive and biodiverse, supporting many livestock and people.

Planting saplings alone does not fulfil the multifarious expectations unless we have provision for adequate post-planting measures and monitoring of tree growth – which we hardly find in the majority of tree-planting drives, more specifically in those programmes which are not supported by the government. Contrary to popular belief, tree planting only is not a

cost-effective climate solution when compared to another more rewarding approach of restoration and other alternative low-cost approach such as tree islands which involves planting in small patches or islands.

India's challenges
In 2023, in a joint address with United States President Joe Biden, the Prime Minister, Narendra Modi, said at the White House that 'India is the only G20 country that has fulfilled its commitments under the Paris Agreement'. And in a written reply in the Rajya Sabha, in February 2024, the Union Minister of State for Environment, Forest and Climate Change, Ashwini Kumar Choubey, said that 'India has achieved an additional carbon sink of 1.97 billion tonnes of CO_2 equivalent'. In India, nearly 10 million hectares of its forests are under encroachment, nearly 27.5 crore of people are dependent on forests for subsistence and nearly 5.7 million hectares of forest land have been lost for non-forestry purposes since Independence. These are challenges that pose problems for India's initiatives to restore 26 million hectares of degraded forests by 2030 and to improve forest cover using steps that include tree planting.

India's remarkable policy changes, in recent times, to tackle the challenges of forestry and restoration approaches are also being affected by these inherent problems. In the background of the criticism of mass planting drives, we need to introspect these strategies, giving much required space to adequate finances, active community participation and technical considerations. These have not been given priority. Along with public awareness campaigns, social media, and incentivised community participation, such reoriented innervations and strategies can help to bring changes in the ecological systems of our forests, and with increasing numbers, also help to create resilient forests that have diverse capacities and capabilities.

The views expressed are personal

GS Paper 03 : Environment – Environmental pollution and degradation

PYQ: (UPSC CSE (M) GS-1 2020) Examine the status of forest resources of India and its resultant impact on climate change. (150 words/10m)

Practice Question Discuss the significance of the United Nations Decade of Ecosystem Restoration (2021-2030) in addressing the challenges of forest degradation and biodiversity loss. How can tree planting initiatives contribute to this goal, and what are the potential pitfalls of these initiatives?

(150 w/10m)

Context

+ The uncontrolled exploitation of forest resources has led to significant degradation of forest landscapes worldwide.
+ In response, the United Nations declared 2021-2030 as the Decade of Ecosystem Restoration, aiming to restore 350 million hectares of degraded land and enhance global efforts in forest conservation and biodiversity through initiatives like mass tree planting.

Introduction

+ **Degraded Forest Landscapes:** The exploitation of forest resources due to uncontrolled and unsustainable practices has degraded forest landscapes.
+ **World Bank Estimates:** The World Bank estimates that the world has lost about 10 million square kilometers of forests since the start of the 20th century.
+ **Ecosystem Restoration:** The emphasis on forest restoration approaches led to the United Nations declaring 2021-2030 as the Decade of Ecosystem Restoration.
+ **Initiative Targets:** This initiative targets the restoration of 350 million hectares of degraded land to generate $9 trillion in ecosystem services and sequester an additional 13 gigatons to 26 gigatons of greenhouse gases from the atmosphere.

Recent Trends of Special Conservation Drives:

+ **Increased Initiatives:** There has been a surge in global and national tree planting drives, such as the "One Trillion Project" by the World Economic Forum, Pakistan's "10 Billion Tree Tsunami," China's "Great Green Wall," and the "Bonn Challenge" to restore degraded landscapes.
+ **High Media Attention:** These drives often feature catchy slogans and glamorous campaigns that attract substantial media attention and public involvement.
+ **Annual Events:** India celebrates Van Mahotsava annually in July, aiming to promote tree planting and environmental conservation.

Importance of Tree Planting

+ **Proven Method:** Tree planting is a proven method to support and sustain biodiversity and address climate-related crises and environmental challenges.
+ **Carbon Sequestration:** It includes biological carbon sequestration, a mechanism to store and remove carbon dioxide from the atmosphere.

- **Tackle Climate Change:** Mass-scale tree planting is seen as a potential solution to tackle climate change globally, endorsed by both governmental and non-governmental organisations.
- **Ecological Balance:** Recognizing the role of trees in maintaining ecological balance, India launched the Van Mahotsava ('festival of trees') program in July 1950.
- **Planting Program:** India has celebrated this tree planting program annually in the first week of July, which has successfully motivated people and improved forest areas.

Issues Associated with These Drives:

- **Limited Community Participation:** Many programs lack significant involvement from local communities, affecting their effectiveness and sustainability.
- **Post-Planting Measures:** Insufficient focus on post-planting care and monitoring hinders the success of tree planting efforts.
- **Monoculture Risks:** Some drives promote monoculture, which can be detrimental to biodiversity and carbon sequestration.
- **Ecological Impact:** Inappropriate tree planting in non-deforested areas like grasslands or animal habitats can damage ecosystems, increase wildfire risk, and exacerbate global warming.

Post-Planting Measures and Alternative Approaches

- **Measures and Monitoring:** Planting saplings alone does not meet expectations without adequate post-planting measures and monitoring of tree growth.
- **Government Support:** Many tree-planting drives, especially those not supported by the government, lack these provisions.
- **Cost-Effective Climate Solution:** Contrary to popular belief, tree planting is not always a cost-effective climate solution compared to other approaches such as restoration and tree islands, which involve planting in small patches or islands.

India's Accountability and Challenges Toward Environmental Goals:

- **Achievements:** India claims to have fulfilled its Paris Agreement commitments and achieved an additional carbon sink of 1.97 billion tonnes of CO2 equivalent.
- **Encroachment and Loss:** Approximately 10 million hectares of Indian forests are under encroachment, and about 5.7 million hectares have been lost for non-forestry purposes.
- **Dependence on Forests:** Nearly 27.5 crore people rely on forests for subsistence, highlighting the importance of sustainable management.

- **Restoration Goals:** India aims to restore 26 million hectares of degraded forests by 2030, but faces challenges such as encroachment and the need for effective tree planting strategies.

Way forward:

- **Community Involvement:** Need to foster local participation in tree planting drives by involving communities in planning, execution, and ongoing maintenance.
- **Monitoring and Maintenance:** Try to implement robust post-planting monitoring and care systems to ensure the survival and growth of planted trees.
- **Policy and Strategy Improvements:** To address criticism of mass planting drives, India needs to prioritize adequate financing, active community participation, and technical considerations in forestry and restoration strategies.

History of Van Mahotsav

- Van Mahotsav or 'Forest festival' is an annual one-week tree-planting festival in India.
- The history of Van Mahotsav Day goes back to July 1947.
- It was first organized by the Punjabi botanist, M.S. Randhawa.
- According to the IUCN, deforestation and forest degradation contribute around 12% of global greenhouse gas emissions and the total area occupied by primary forests in India has decreased by 3.6%.

Forest landscape restoration

- Typically, governments have relied on afforestation and reforestation as a means of establishing trees on non-treed land.
- These strategies have now evolved, and the focus now is on forest landscape restoration.
- Landscape restoration is the process of regaining ecological functionality and improving human welfare across deforested or degraded forest landscapes.
- Forest landscape restoration seeks to involve communities in the process of designing and executing mutually advantageous interventions for the upgradation of landscapes.
- Nearly 2 billion hectares of degraded land in the world (and 140 million hectares in India) have scope for potential restoration as forestland.
- A crucial aspect of the landscape restoration process is to ensure the diversity of the species while planting trees.

- Natural forests with diverse native tree species are more efficient in sequestering carbon than monoculture tree plantations.
- Planting diverse species is also healthier for local communities and their livelihoods, and has positive impact on the quality of the forests.

Importance of forest landscape restoration

- Forests are integral in regulating ecosystems, influencing the carbon cycle and mitigating the effects of climate change.
- Annually, forests absorb roughly 2.6 billion tonnes of carbon dioxide (CO2). This absorption includes nearly 33% of the CO2 released from burning of fossil fuels.
- Forests are a boon for local communities and their livelihoods by functioning as a resource base for goods and services.
- According to the World Resources Institute, forest ecosystems enrich soil fertility and water availability, enhancing agricultural productivity, and in turn the rural economy.
- Tree planting prevents erosion and stems flooding.
- Sustainable forest crops reduce food insecurity and empower women, allowing them to gain access to more nutritional diets and new income streams.
- Agroforestry lessens rural-to-urban migration and contributes to an increase in resources and household income.
- Planting trees is deeply linked to the 'holistic' well-being of all individuals, the community, and the planet.

Programmes carried out in India

- The span 2021-2030 is the UN Decade on Ecosystem Restoration, emphasizing efforts to restore degraded terrestrial ecosystems including forests.
- In 2011, the Bonn Challenge was launched with a global goal to restore 150 million hectares of degraded and deforested landscapes by 2020 and 350 million hectares by 2030.
- India joined the Bonn Challenge in 2015, pledging to restore 26 million hectares of degraded and deforested land by 2030.
- An additional carbon sink of 2.5 billion-3 billion tonnes of CO2 equivalent through forest and tree cover is to be created by 2030.
- Other Indian government programmes are,
  - The Compensatory Afforestation,
  - The National Afforestation Programme,

- o The National Mission for Green India (Green India Mission),
- o The Nagar Van scheme and
- o The Forest Fire Prevention and Management Scheme, etc.
- There is a spotlight on youth via the Green Skill Development Programme for youth who aspire to attain employment in the environment and forest sectors.
- State governments are not far behind either, a case in point being Telangana, which has initiated a large-scale tree planting programme called Telanganaku Haritha Haram.
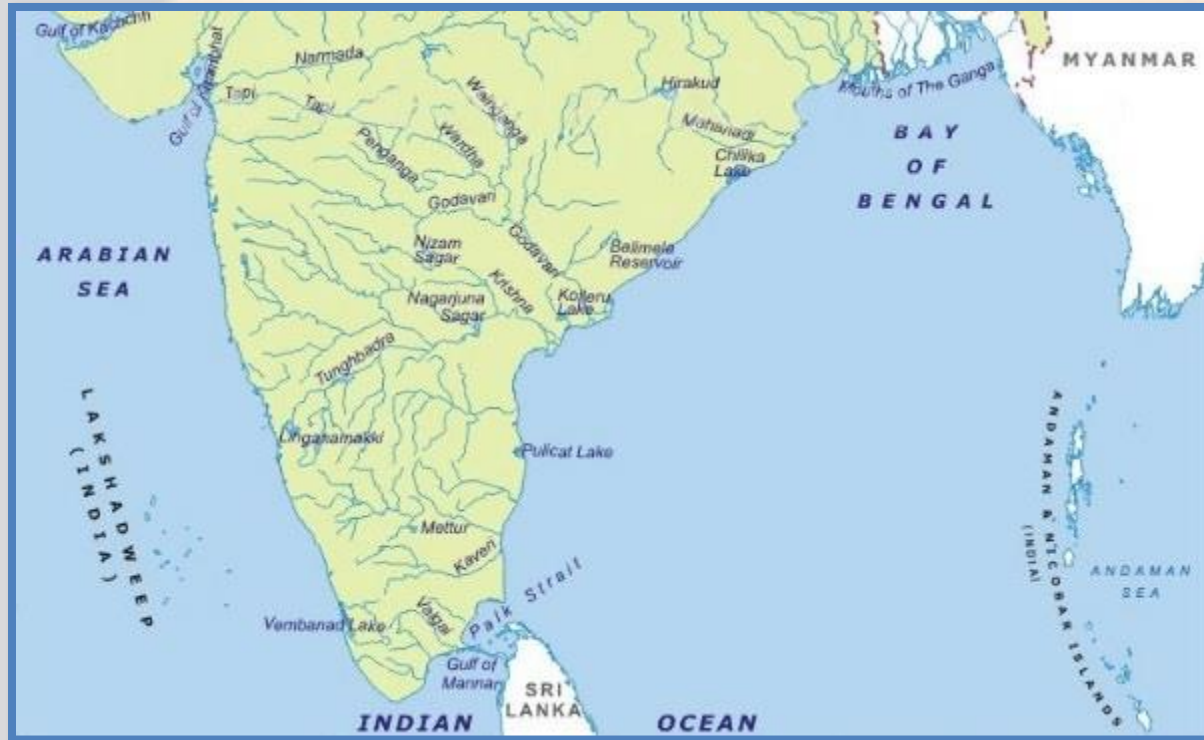
Hurdles in India

- Forest restoration in India faces hurdles in terms of the identification of areas for restoration, and financing.
- There is a lack of importance accorded to research and scientific strategies in tree planting, stakeholders' conflicts of interest, etc.

Way forward

- To be successful, forest landscape restoration must be implemented proactively.
- Strengthening landscapes and forest ecosystems to be durable and adjustable in the face of future challenges and societal needs is a must.
- The restoration of natural forest ecosystems can be strengthened through participatory governance by engaging stakeholders, as in the Punjab example.
- Vulnerable forest-dependent communities should be factored in, and any effort should be tailored to the local socio-economic context and landscape history of a region.

Mapping : The Peninsular River System

Peninsular River - Evolution

- Three important geological occurrences in the distant past shaped Peninsular India's current drainage networks.
- During the early tertiary era, the western flank of the Peninsula began to sink, resulting in its submergence beneath the sea.
- In general, it has disrupted the river's symmetrical layout on both sides of the original watershed.
- The Himalayas were upheaved when the peninsular block's northern flank was subjected to subsidence and trough faulting.
- The Narmada and Tapi rivers run across faults, filling the original fractures with sediment.
- As a result, alluvial and deltaic deposits are scarce in these rivers.
- During the same era, a little tilt of the peninsular block from northwest to south-eastern imparted orientation to the whole drainage system towards the Bay of Bengal.

Smaller Rivers of India flowing towards West

+ The rivers that feed into the Arabian Sea have very short courses.
+ These west-flowing rivers will eventually reach the Arabian Sea.

Sabarmati River

+ One of India's most major west-flowing rivers is the Sabarmati.
+ It starts in the Aravalli Range in Rajasthan's Udaipur District and finishes at the Arabian Sea's Gulf of Khambhat after travelling 371 kilometres through Rajasthan and Gujarat.
+ The Aravalli hills border the basin on the north and north-east, the Rann of Kutch on the west, and the Gulf of Khambhat on the south.
+ The Watrak, Wakal, Hathmati, Harnav, and Sei rivers are the major tributaries.

Mahi River

+ Western India is home to the Mahi River.
+ It starts in Madhya Pradesh and flows through Rajasthan's Vagad region before entering Gujarat and emptying into the Arabian Sea.
+ The Aravalli hills surround it on the north and north-west, the Malwa Plateau on the east, the Vindhyas on the south, and the Gulf of Khambhat on the west.
+ Mahi is a major interstate west-flowing river in India.
+ Som is a right bank tributary of Mahi river.
+ Anas and Panam rivers are the tributaries of Mahi on the left bank.

Dhandhar River

+ Its origins may be traced back to Jamnagar's Lalpur district.
+ The main fluvial sedimentary facies of the Late Pleistocene deposits in the Dhadhar River basin have preserved palaeo-drainage signals and may serve as an important link between the sub-humid Narmada basin in the south and the semi-arid Mahi basin in the north.
+ Vishwamitri, Jambuo, Dev, and Surya rivers are significant tributaries of the Dhadhar river.

Sharavati River

+ The Sharavati River flows through the Indian state of Karnataka.
+ It begins in the Western Ghats and goes northwest for 60 miles (100 kilometres) to Honavar on the Arabian Sea.

- Ambuthirtha is a mountain in Shimoga District, Karnataka, India, near the village of Thirthahalli. It is the source of the Sharavathi River.
- The river basin of the Sharavati is extensively wooded.
- Nandihole, Haridravathi, Mavinahole, Hilkunji, Yennehole, Hurlihole, and Nagodihole are the river's principal tributaries.

Bharathapuzha River

- The Bharathapuzha River, which flows into the Arabian Sea, is Kerala's second longest West Flowing River.
- It is bounded on the east by the Cauvery basin and on the west by the Arabian Sea.
- Bharathapuzha is a river in Kerala, India. It is also known as the Nila, Ponnani, or Kuttippuram River.
- The main course of the Bharathapuzha begins as a series of minor rivulets in the Western Ghats near the Anamalai hill ranges in Tamil Nadu.
- The three major tributaries are the Gayathripuzha, Kalpathipuzha, and Pulanthode.

Periyar River

- The source of the Periyar lies high in the Western Ghats. The Periyar River begins on the southeastern edge of the Idukki district.
- The river's headwaters are in the isolated woods of the Periyar Tiger Reserve.
- According to various reports, the river's source is Chokkampatti Mala, a hill on the southern fringe of the Periyar Tiger Reserve.
- The Periyar River originates in the Sivagiri Hills of the Western Ghats and flows through the Periyar National Park.
- It ultimately drains into Vembanad Lake, which finally empties into the Arabian Sea.
- The Periyar River is the longest and has the highest discharge capacity in the Indian state of Kerala.
- Muthirapuzha River, Mullayar River, Cheruthoni River, Perinjankutti River, and Edamala River are its primary tributaries.
- Muthayar, Perunthuraiar, Chinnar, Cheruthony, and Kattappanayar are minor tributaries.

Small Rivers Flowing towards the East

- A huge number of rivers, as well as their tributaries, flow to the east.
- There are several tiny rivers that connect to the Bay of Bengal, and while they are little, they are significant in their own way.

Subarnarekha River

- It begins at an elevation of 600 metres in Nagri hamlet in Jharkhand's Ranchi area.
- It is bounded on the north-west by the Chota Nagpur Plateau, on the south-west by the Brahmani basin, on the south by the Burhabalang basin, and on the south-east by the Bay of Bengal.
- Hundru Falls, which falls from a height of 98 metres, is produced along the Subarnarekha River.
- The numerous rock formations developed as a consequence of erosion by the constantly running water have contributed to the area's allure.
- The Subarnarekha's major tributaries are the Kharkai, Roro, Kanchi, Harmu Nadi, Damra, Karru, Chinguru, Karakari, Gurma, Garra, Singaduba, Kodia, Dulunga, and Khaijori.

Baitarani River

- The Baitarani is a large east-flowing river in peninsular India that finally flows into the Bay of Bengal.
- The Baitarani flows through the Gonasika hills and through a stone shaped like a cow's nose.
- The Baitarani is known as Guptaganga or Gupta Baitarani in the Indian state of Odisha.
- Baitarani's commencement is a short stretch of the boundary between the states of Odisha and Jharkhand.
- Baitarani's tributaries are the Budhi, Kanjori, Ambajhara, Mushal, Kusei, and Salandi.

Brahmani River

- The Brahmani river originates in Nagri village in Jharkhand's Ranchi area at a height of around 600 metres and travels for 799 kilometres.
- The Brahmani River flows south through the valleys created by the Garhjat Hills to reach the well-known Gangpur Basin. In this location, the Brahmani River is joined by a number of fast-flowing tributaries.
- The deltaic zone of Brahmani begins 315.00 kilometres downstream from Jenapur, when the Kalamitra island divides the river into two streams.
- Brahmani tributaries include Koel, Kuradhi, Mankara, Samakoi, Ramiala, Karo, Sankh, Rukura, Gohira, Tikira, Singdajhor, Nigra, Barjor, and Nandira.

Pennar River

- The Pennar River, also known as the Uttara Pinakini in India, is a river.
- The Pennar River is a vital waterway in Peninsular India.

- Pennar River begins in Karnataka's Nandi highlands' Chenna Kesava hills and flows for around 597 kilometres before draining into the Bay of Bengal.
- The Pennar and its tributaries watershed span a section of the southern Deccan plateau, including the bulk of Andhra Pradesh's Rayalaseema region and a piece of Karnataka.
- The Kolar Plateau divides the Pennar watershed from the Kaveri, Ponnaiyar, and Palar river basins to the south.
- The river's major tributaries are the Jayamangal, Kunder, Sagileru, Chitravati, Papagni, and Cheyyeru.

Palar River

- It starts in Karnataka's Chikkaballapur district and goes through Karnataka, Andhra Pradesh, and Tamil Nadu until entering the Bay of Bengal at Vayalur, south of Chennai.
- The flow of the Palar is unpredictable, with large variations from year to year.
- The Palar Basin is one of the most significant of the 12 basins that connect the Pennar and Cauvery basins.
- The river Palar is fed by two major tributaries: the Ponni on the left bank and the Cheyyar on the right.