



Mains Marathon
Compilation

21st to 26th August, 2023

Mains Marathon Compilation for the Month of August, (Fourth Week) 2023

- 1. Analyze the impact of pilot fatigue on aviation safety in India. What measures have been taken by the regulatory authorities, and what further steps are needed to ensure the well-being of pilots and passengers?**
- 2. Compare and contrast genome-edited (GE) crops with genetically modified (GM) crops. Discuss the implications of Genome-Edited (GE) crops for agricultural innovation in India.**
- 3. Analyze the factors contributing to the growing epidemic of drug addiction in Kashmir. What preventive measures can be taken to address the issue?**
- 4. Analyze the success of the PLI scheme in boosting mobile phone exports. What are the challenges and limitations of the scheme in achieving self-sufficiency in manufacturing?**
- 5. Discuss the significance of the Election Commission's independence in the context of India's democratic setup. How does the proposed bill impact this independence?**
- 6. Discuss the potential benefits and challenges for India in engaging with the Northern Sea Route (NSR).**
- 7. How has the transition from a planned economy to a market-mediated economic system impacted India's fiscal federalism?**
- 8. How can clean tech solutions be integrated into existing government programs to enhance their impact on rural livelihoods? What challenges do clean tech manufacturers face in bringing their products to rural customers, and how can these be addressed?**

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1. **Analyze the impact of pilot fatigue on aviation safety in India. What measures have been taken by the regulatory authorities, and what further steps are needed to ensure the well-being of pilots and passengers?**

Introduction: Briefly describe the issue.

Body: Analyse the impact of pilot fatigue on aviation safety & measures to deal with it.

Conclusion: Way Forward.

Recently there have been instances where pilots have refused to operate flights citing fatigue which has often led to inconvenience and delays for passengers. In India, the civil aviation safety regulator **Directorate General of Civil Aviation (DGCA)** keeps a close watch on flight duty time limitation (FDTL) norms compliance by airlines as well as flight crews. Globally, FDTL regulations are considered important to ensure that crew fatigue does not compromise flight safety. It is worth noting that flight crew fatigue and exhaustion are seen as major factors contributing to human errors in aircraft operations, which can lead to catastrophic accidents.

What is the impact of pilot fatigue on aviation safety in India?

- **Impaired Reaction Time:** Fatigue slows down cognitive and physical responses, affecting a pilot's ability to react quickly to unexpected situations.
- **Reduced Situational Awareness:** Fatigue can lead to reduced attention, memory lapses, and decreased awareness of the aircraft's position and surroundings.
- **Poor Decision-Making:** Fatigue can impair a pilot's judgment and decision-making abilities, potentially leading to incorrect choices in critical moments.
- **Errors in Communication:** Communication breakdowns among pilots and air traffic controllers can occur due to fatigue-related cognitive deficits.

What steps can be taken to ensure the well-being of pilots and passengers?

- **Strict implementation of ICAO guidelines:** DGCA must ensure strict enforcement of ICAO guidelines related to rest periods between flight duty periods, guidelines for scheduling night operations, and norms for operating ultra-long-haul flights.
- **International Experience:** The Ministry of Civil Aviation (MoCA) must frame these regulations based on ICAO standards and international best practices of the US aviation regulator Federal Aviation Administration (FAA) and the European Union Aviation Safety Agency (EASA).
- **Airlines' responsibility:** Every airline is required to formulate its own FDTL scheme, which must be compliant with the regulations issued by the DGCA. Airlines could provide at least two days off every week and proper rest periods between flights for the pilots.
- **New practices:** Airlines should try new practices like preparing flight crew rosters in advance, training flight crew on fatigue management, maintaining fatigue reports of the crew & responsive action on these reports.
- **Addressing Pilot shortage:** India has emerged as the world's third-largest aviation market & will require additional pilots every year over the next few years to keep up with the expected pace of fleet expansion.

Conclusion:

DGCA & Ministry of Civil Aviation must step up efforts & engage with airline companies to address crew fatigue and exhaustion which are seen as major factors contributing to human errors that lead to catastrophic accidents.

2. Compare and contrast genome-edited (GE) crops with genetically modified (GM) crops. Discuss the implications of Genome-Edited (GE) crops for agricultural innovation in India.

Introduction: Give definition of GM & GE crops.

Body: Difference between GE crops with GM crops. What is the implication of GE crops for agricultural innovation in India?

Conclusion: Way forward.

In GM crops, foreign genes are inserted into a plant's DNA to introduce specified features, such as pest resistance or herbicide tolerance. In GE crops, the plant's DNA is precisely altered, without the introduction of foreign DNA, by deleting, adding, or changing a few selected genes.

Difference between contrasting genome-edited (GE) crops with genetically modified (GM) crops:

- **Method used:** The foreign genes are frequently introduced into the plant's genome via bacterial or viral vectors in traditional GM techniques. Genome editing methods like CRISPR-Cas9 are frequently utilized because they enable precise, targeted alterations.
- **Regulation:** GM crops have faced public and regulatory scrutiny due to concerns about potential unintended effects and the use of antibiotic resistance markers. Regulatory approaches to GE crops vary by country, and some countries may regulate them differently than traditional GM crops.
- **Commercial Use:** In India, GM crops are currently subject to strict "environmental release" laws, including for field testing and seed production in addition to commercial farming. Such release is subject to approval from the MoEFCC unique Genetic Engineering Appraisal Committee (GEAC). On the other hand, GE plants that are "free of exogenously introduced DNA" have been exempted by MoEFCC from the need for GEAC approval for open field trials leading to commercial release.

What is the implication of GE crops for agricultural innovation in India?

- **Reduce impact on the environment:** Reduced pesticide and water use from GE crops with features like insect resistance or drought tolerance could be good for the environment and farmers' livelihoods.
- **Improved crop varieties:** Using GE technology, scientists can create crop types with specific modifications, such as increased nutritional value, disease resistance, and abiotic stress tolerance. This might boost India's food security and agricultural output.
- **Fast breeding process:** GE technology permits quicker production of crop varieties with desired features than conventional breeding techniques. This might hasten the introduction of enhanced varieties to address new problems.
- **Customized Crops:** GE technology can be tailored to suit local agro-climatic conditions, potentially leading to the development of region-specific crop varieties optimized for Indian conditions.

Conclusion:

Genome-Edited (GE) is very important for a country like India which is a huge importer of edible oils. The massive import bill forces India to boost domestic oilseeds production through focused breeding to improve crop yields, pest and disease resistance, and product quality. The recent example of GM hybrid mustard and the new GE low-seed high-leaf glucosinolate lines can be seen as major plant breeding advancements that can go some way towards bringing down the dependence on imported vegetable oils.

3. Analyze the factors contributing to the growing epidemic of drug addiction in Kashmir. What preventive measures can be taken to address the issue?

Introduction: Describe the context of question.

Body: Highlight the factors contributing to the growing epidemic of drug addiction & measures that can be taken to address the issue.

Conclusion: Way forward.

Various newspaper reports have revealed a devastating epidemic of drug addiction, mostly affecting young men, across Kashmir impacting several families & their children, stretching the state's public health system and posing a new challenge to the security forces. According to data from India's Ministry of Social Justice and Empowerment, approximately 8 percent of the population, roughly 10 lakh residents, are drug addicts. This alarming situation calls for urgent attention and comprehensive solutions to combat the widespread abuse of drugs such as heroin, cannabis, opioids, and sedatives.

What factors have contributed to the growing epidemic of drug addiction in Kashmir?

- **Poverty & Unemployment:** Numerous young people are vulnerable and disillusioned as a result of the high unemployment rate and the lack of available economic prospects which lead some individuals to experiment with drugs out of boredom or frustration.
- **Easy accessibility of drugs:** Kashmir is geographically located near the Golden Crescent and hence there is easy availability of heroin (Golden Crescent refers to illicit opium production areas in Iran, Afghanistan, and Pakistan).
- **Conflict & Trauma:** Numerous people have experienced trauma, stress, and anxiety as a result of the region's prolonged conflict and political unrest. To cope with these emotional and psychological difficulties, some people turn to drugs.
- **Lack of awareness:** People may underestimate the effects of drug usage as a result of inadequate education and awareness initiatives. The lack of recreational facilities in the valley has contributed to the growing menace of drug use.
- **Religious stigma:** Due to the religious taboo connected with alcohol consumption in the Valley and the fact that the population is predominately Muslim, adolescents are turning to heroin as a coping and recreational tool.

What preventive measures can be taken to address the issue?

- **Community Engagement:** Communities may shift young people's attention away from drug use by getting involved in programs that provide them with healthy alternatives, such as sports, the arts, and vocational training.
- **Institutional support:** The state government in cooperation with civil society has worked to increase the number of DDC (drug de-addiction centres) to reduce the stigma around addiction and seek treatment.
- **Limit supply chain:** Law enforcement should strengthen efforts to limit the supply chain of drugs by curbing drug trafficking from neighbouring countries & states like Punjab & Haryana.
- **Rehabilitation and Treatment Centres:** Establishing well-equipped rehabilitation centres and treatment facilities, along with trained medical professionals, can provide individuals struggling with addiction the help they need.
- **Skill development:** The likelihood of young people turning to drugs can be decreased with the help of programs that emphasize skill development, job training, and entrepreneurship.

Conclusion

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The drug crisis poses a governance test for the J&K administration to end the narco-terror network across the state. Political and economic empowerment of people and civil society is necessary for thwarting the designs of the drug cartels.

4. Analyze the success of the PLI scheme in boosting mobile phone exports. What are the challenges and limitations of the scheme in achieving self-sufficiency in manufacturing?

Introduction: Define PLI scheme.

Body: Highlight its progress and challenges and limitations of the scheme.

Conclusion: Way Forward.

Production Linked Incentive (PLI) is a program that the Government of India introduced in 2020 to promote domestic manufacturing in several industries by offering cash incentives to producers that fulfill particular production targets. The plan seeks to improve production and exports, attract foreign investment, foster job growth, and lessen reliance on imports.

Success of the PLI Scheme:

- **Export Promotion:** The scheme's focus on boosting exports of mobile phones has led to increased production capacity, which in turn can contribute to higher export numbers. For eg, mobile phone exports jumped from \$300 million in FY2018 to an astounding \$11 billion in FY23.
- **Reduced Import Bill:** By promoting domestic manufacturing and exports, the PLI scheme has the potential to reduce the trade deficit by increasing exports and decreasing imports of finished mobile phones. For eg, India imported mobile phones worth \$3.6 billion in FY2018, which dropped to \$1.6 billion in FY23.
- **Job creation:** Increased production has the potential to create jobs across the entire value chain, from manufacturing to supply chain and logistics, benefiting local employment rates. According to Government sources PLI scheme has created around 1,20,000 new direct jobs and nearly 2,50,000 new indirect jobs in 24 months.

Challenges and limitations of the scheme:

- **Infrastructure bottlenecks:** Infrastructure gaps, especially in terms of power, logistics, and connectivity, can pose significant challenges to companies looking to scale their operations under the PLI scheme.
- **Regulatory hurdles:** Despite efforts to simplify the regulatory environment, Indian businesses often grapple with red tape, bureaucratic hold-ups, and complex regulatory requirements that can slow down or complicate the implementation of the PLI scheme.
- **Access to capital:** Despite the financial incentives provided by the PLI scheme, businesses, especially small and medium-sized enterprises, often face difficulties in accessing affordable capital. This can limit their ability to invest in new technologies, expand capacity, or upgrade their infrastructure.
- **Geopolitical factors:** Fluctuations in global trade dynamics and geopolitical tensions can impact the outcomes of the PLI scheme. For instance, trade restrictions, tariffs, or changes in the global supply chain can affect the export potential of companies benefiting from the scheme.

Conclusion:

PLI program could expand India's domestic manufacturing capacity and encourage the export of mobile phones. The complexity of the supply chain, infrastructure, level of competition, and dynamics of the global economy present obstacles to achieving total self-sufficiency in manufacturing. For the scheme to be successful and for the Indian mobile phone sector to

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thrive over the long term, a well-balanced strategy that takes these issues into account and concentrates on creating a strong and competitive manufacturing ecosystem is essential.

5. Discuss the significance of the Election Commission's independence in the context of India's democratic setup. How does the proposed bill impact this independence?

Introduction: Give brief description of ECI.

Body: Significance of EC & how does the proposed bill impact this independence.

Conclusion: Way forward.

The Election Commission of India (ECI) is an autonomous and permanent constitutional body established under Article 324 responsible for organizing free and fair elections in the Union and States of India. The Constitution grants the ECI the power of direction, superintendence, and control of elections to Parliament, state legislatures, the office of president of India, and the office of vice-president of India. Recently, the Central Government introduced a Bill that proposed that the selection panel for appointing the Election Commission, comprising the Chief Election Commissioner (CEC) and other Election Commissioners (ECs), will consist of the Prime Minister as the chairperson, the Leader of the Opposition as a member, and a Union Cabinet Minister nominated by the Prime Minister as another member instead of Chief Justice of India.

Significance of the Election Commission's independence in India's democratic setup:

- **Free & fair elections:** The ECI is responsible for conducting elections at various levels of government, including national and state elections. Its primary role is to ensure that elections are conducted in a free, fair, and transparent manner, upholding the principles of democracy.
- **Voter registration:** The ECI is in charge of overseeing the voter registration procedure and working to inform the populace of the value of voting. This encourages diversity and guarantees that eligible citizens can take part in the political process.
- **Prevention of Electoral Malpractices:** The Election Commission of India (ECI) takes action to stop election malpractices like vote manipulation, booth capturing, and corruption. To maintain the integrity of the elections, it sends out observers and prosecutes anyone who violates the law.

How does the proposed bill impact this independence?

- **Full Executive control:** The presence of the CJI was required to usher in the impartiality and insulate the appointment process from the Executive's interference. The present bill gives the executive total control over the appointment process.
- **Issue in order of precedence:** The bill specifies that the salary of the CEC would be equivalent to that of the Cabinet Secretary which is the same as that of the SC judge but rank in the warrant of precedence is being reduced.
- **Protection of EC:** One extremely important provision of the Bill is that it seeks to protect the two Election Commissioners from removal, bringing them on par with the CEC. They can be removed through a process of impeachment like a SC judge.
- **Qualification of EC:** The fact that the CEC and other ECs will be chosen from "persons who are holding or have held a post equivalent to that of secretary and shall be persons of integrity, who have knowledge of and experience in the management and conduct of elections" is another positive aspect of the Bill.

Conclusion:

In the current national and international climate, maintaining the institutional autonomy of the EC is crucial. Trust in electoral institutions has been declining everywhere. The Indian Election Commission has long served as a shining example of democracy around the world.

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To maintain this reputation, we must make sure all the necessary protections are in place to dispel any doubts about its reliability and standing.

6. Discuss the potential benefits and challenges for India in engaging with the Northern Sea Route (NSR).

Introduction: Briefly explain NSR route.

Body: Discuss its benefits and challenges with regards to India.

Conclusion: Way forward.

The Northern Sea Route (NSR), which spans four seas of the Arctic Ocean, is the quickest shipping route for moving goods between Europe and nations in the Asia-Pacific area. The route, which spans 5,600 km, starts at the Kara Strait, which separates the Barents and Kara seas and ends in Provideniya Bay, which is in the Bering Strait. Recently, Murmansk, or (NSR), has witnessed a significant rise in Indian cargo highlighting India's greater interest in the NSR.

What are the intended benefits for India in engaging with NSR?

- **Alternate route:** The NSR is essentially a passage linking Europe with East Asia benefitting countries like China, Japan, and South Korea. This route is more promising and is being regarded as an alternative to the present shipping route connecting Europe with Asia via the Suez Canal and the piracy-infested Gulf of Aden.
- **Scientific studies and research:** Since the Svalbard Treaty was signed in February 1920, India has been involved in the Arctic, and the country is currently conducting several scientific research and studies there. This includes research in the fields of glaciology, marine biology, hydrology, and atmospheric science. Eg, Himadri, a research station, Svalbard.
- **Untapped resources:** The region also constitutes the largest unexplored prospective area for hydrocarbons remaining on the Earth. According to estimates, the Arctic Sea contains between 10 and 20 percent of the world's oil and close to 30 percent of its natural gas. There could be sizable quantities of coal, zinc, and silver as well.

What are some of the challenges?

- **Environmental concerns:** One of the most dramatic effects of global warming is seen in the Arctic region where the Arctic Sea has been melting rapidly. The NSR passes through environmentally sensitive areas, and increased shipping activity in the Arctic could have ecological implications.
- **Geopolitical Dynamics:** The NSR passes through Russia's territorial waters, and India's engagement with the route could involve diplomatic negotiations with Russia and other Arctic states.
- **Security:** Piracy, maritime mishaps, and search and rescue operations could pose security concerns as the Arctic assumes greater geopolitical and economic relevance.
- **International regulations:** India would need to navigate international regulations governing Arctic shipping, including those related to safety, environmental protection, and indigenous rights.

Conclusion:

India's geographical position and ambitious projects like the Chennai-Vladivostok Maritime Corridor present promising economic and strategic benefits for India. India's approach to the Arctic region is defined by the Arctic Policy of 2022 which is guided by UN Sustainable Development Goals.

7. How has the transition from a planned economy to a market-mediated economic system impacted India's fiscal federalism?

Introduction: Give a brief context of the shift from a planned economy to a market economy.

Body: How has this transition impacted fiscal federalism?

Conclusion: Way forward.

Since the early 1990s, India has carried out significant economic changes that have resulted in a more market-oriented approach while keeping some aspects of a mixed economy. These reforms, often referred to as the "economic liberalization" or "economic reforms," aimed to open up India's economy to global markets, reduce government intervention, and encourage private sector participation. This paradigm shift was indeed followed by the transformation of a two-tier federation into a multi-tier fiscal system following the 73rd and 74th Constitutional Amendments, the abolition of the Planning Commission and its replacement with NITI Aayog, the passing of the Fiscal Responsibility and Budget Management (FRBM) Act & finally the Goods and Services (GST) Act giving major changes to India's fiscal federalism.

How has this transition impacted fiscal federalism?

- **State autonomy:** State governments now have more freedom to create and carry out economic policies as a result of economic liberalization. This is also visible in the implementation of important programs like MGNREGA, RTE, & Food Security Act. There is also a demand to shift education from Concurrent to the State list.
- **Devolution of fiscal powers:** While states have gained more autonomy vis-à-vis Central Government, there is a lack of autonomy for local government institutions vis-à-vis state governments. There is a serious need to give more powers to third-tier institutions based on the 3F (Functions, Funds, Functionaries).
- **Tax reforms:** The introduction of the Goods and Services Tax (GST) in 2017 was a major step in fiscal federalism. It replaced a complex web of indirect taxes levied by both the central and state governments, streamlining the tax system and enhancing revenue collection efficiency.
- **Disparity among states:** Some states were better positioned to take advantage of the new economic opportunities, while others experienced difficulty in adjusting to the changing economic landscape. Economic reforms contributed to growth but also raised worries about growing economic inequities across states. This can be seen in the analysis of the Human Development Index (HDI) & per capita income data of states.

Conclusion:

The responsibility of balancing fiscal federalism rests on the mandate of the 16 Finance Commission which should start by constituting a uniform financial reporting system comprising all levels of government. There is a greater need to review the off-budget borrowing practices of both the Union and the States to maintain fiscal discipline. Finally, 16 FC should ensure that equity and HDI should be considered in the horizontal distribution of tax devolution.

8. How can clean tech solutions be integrated into existing government programs to enhance their impact on rural livelihoods? What challenges do clean tech manufacturers face in bringing their products to rural customers, and how can these be addressed?

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Introduction: What are clean tech solutions?

Body: How can they be integrated into government programs and what are challenges associated with it?

Conclusion: Way forward.

Integrating clean tech solutions into existing government programs can greatly enhance their impact on rural livelihoods by promoting sustainable development, improving access to basic services, and fostering environmental conservation.

How can clean tech be integrated into government programs?

- **Access to clean energy:** In rural locations with limited access to power, cleantech solutions like solar lamps, solar home systems, and mini-grids can deliver dependable, clean energy.
- **Agriculture management:** Using effective irrigation systems, solar-powered water pumps, and soil monitoring technology, cleantech solutions can increase agricultural productivity. These technologies can be incorporated into government agricultural programs to increase crop yields and water consumption effectiveness. For example, solar dryers converting throwaway tomatoes into sun-dried ones in Andhra Pradesh, and biomass-powered cold storages helping farmers in Maharashtra sell lemons.
- **Convergence of tech with livelihood programs:** There is a need to support government programs by enabling their implementation using clean tech. For eg, Pradhan Mantri MUDRA Yojana can be used to enable the adoption of clean tech. Pradhan Mantri Formalisation of Micro food processing Enterprises (PM-FME) can be used to unlock support for solutions like solar dryers, energy-efficient multipurpose food processors, or solar grain mills. Pradhan Mantri Matsya Sampada Yojana can be leveraged towards adopting solar refrigerators and dryers for fishing communities.
- **Financing of clean-tech solutions:** This requires support from the banking industry and government support. There is a need to involve self-help groups, farmer-producer organizations, and individual micro-entrepreneurs in rural areas.
- **Multi-stakeholder partnerships:** There is a need to enable multi-actor partnerships between technology innovators, manufacturers, distributors, service providers, financiers, and market-linkage players to enable an overall ecosystem for enabling cleantech solutions.

What are the challenges faced by manufacturers?

- **Lack of awareness:** Rural customers might not be aware of the benefits and availability of cleantech solutions and be hesitant to adopt such solutions.
- **Affordability:** Due to their scarce financial resources, many rural communities find it difficult to afford the upfront expenditures of cleantech solutions.
- **Last mile connectivity:** It might be difficult for manufacturers to reach remote clients since rural areas frequently lack adequate infrastructure and distribution networks.
- **Maintenance and Services:** Rural customers might lack technical knowledge for product maintenance and repairs. The lack of strong service centres might discourage people from adopting such solutions.
- **Cultural norms and behaviour:** Some cleantech solutions might require changes in traditional practices or behaviors. Manufacturers need to take into account cultural preferences and adapt their products accordingly.

Conclusion:

Various studies have shown that cleantech solutions can be a big boost to the rural economy. India's rural economy, which is made up of 120 million farmers and 34 million microbusinesses, frequently struggles due to inconsistent access to electricity and a reliance on costly imported diesel. These cleantech innovations that are run on renewable energy can reduce India's reliance on imported fuel, prevent the loss of perishable food, improve rural

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livelihood chances, and present a \$50 billion investment opportunity for bankers and investors.

