

CURRENT AFFAIRS PROGRAM

PRE-CUM-MAINS 2024

JUNE 2023 - BOOKLET-4

INFRASTRUCTURE

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LevelUp IAS

1. SYLLABUS:

- **INFRASTRUCTURE:** ENERGY, PORTS, ROADS, AIRPORTS, RAILWAYS ETC.
- **INVESTMENT MODELS**

2. PYQS

1. Why is **Public Private Partnership (PPP)** required in infrastructure projects? Examine the role of PPP model in the redevelopment of Railway Stations in India [Mains 2022, 10 marks, 150 words]
2. Investment in **Infrastructure** is essential for more rapid and inclusive economic growth. Discuss in the light of India's experience [Mains 2021, 15 marks, 250 words]
3. "Access to affordable reliable, sustainable and **modern energy** is the sine qua non to achieve Sustainable Development Goals (SDGs). Comment on the progress made in India in this regard [Mains 2018, 10 marks, 150 words]
4. Examine the development of **airports** in India through joint ventures under **Public-Private Partnership (PPP)** model. What are the challenges faced by the authorities in this regard [Mains 2017, 10 marks, 150 words]
5. What are '**Smart Cities**'? Examine the relevance for urban development in India. Will it increase rural-urban differences? Give arguments for 'Smart Villages' in the light of PURA and RURBAN mission [Mains 2016, 12.5 marks, 250 words]
6. **National Urban Transport Policy** emphasizes on 'moving people' instead of 'moving vehicles'. Discuss critically the successes of the various strategies of the Government in this regard. [2014, 12.5 marks, 200 words]
7. Explain how **PPP arrangements**, in long gestation infrastructure projects, can transfer sustainable liabilities to the future. What arrangements need to be put in place to ensure that successive generations' capacities are not compromised? [2014, 12.5 marks, 250 words]
8. Adoption of **PPP model** for infrastructure development of the country has not been free of criticism. Critically discuss pros and cons of the model [2013, 12.5 marks, 200 words]
9. Write a note on India's **Green Energy Corridor** to alleviate the problem of conventional energy [2013, 10 marks, 150 words]
10. Are the '**Dedicated Freight Corridor**' railway project and the '**Golden Quadrilateral**' road project mutually complementary or competitive? Assess [10 marks, 150 words]

3. SIGNIFICANCE OF INFRASTRUCTURE SECTOR

Question 1: Investment in Infrastructure is crucial for inclusive and long-term development of the country. Discuss the key recent initiatives by GoI to promote sustainable Infrastructure Development in India [10 marks, 150 words]

Question 2: Investment in **Infrastructure** is essential for more rapid and inclusive economic growth. Discuss in the light of India's experience [Mains 2021, 15 marks, 250 words]

- Introduction:

- Infrastructure is the backbone of any economy. The extent and quality of infrastructure determines the ability of the country to utilize its comparative advantage and enables cost competitiveness.

- **Investment in infrastructure is crucial for inclusive and long-term development** because:
 - Infrastructure services like electricity, telecommunications, roads, rail, ports, and airports - are critical to the development of **a strong, modern, productive and efficient economy**.
 - It reduces logistic cost and promotes export competitiveness.
 - Multimodal transport system provides **integrated and seamless connectivity** for movement of people and goods.
 - It contributes to **national integration and regional development**.
 - Infrastructure also contributes to **poverty reduction and promoting both rural and agriculture development**.
 - For e.g., good roads/Railways/Storage facilities etc. ensure better income for farmers through timely market access.
 - Digital infrastructure further has huge impact on all the sectors including health (e.g., telemedicine), education (e.g. MOOCs) etc.
- Keeping this in mind, GoI has launched several initiatives in recent years to promote sustainable infrastructure development.
 - **Increasing Investment:**
 - **High Capital allocation for infrastructure:** In last few years, government's capital expenditure has regularly increased and the budgetary allocation for the FY24 for the same has reached Rs 10 lakh crores.
 - **National Infrastructure Pipeline (NIP)** aims to mobilize more than 100 lakh crore rupees between 2020-25 for various infrastructure projects.
 - **National Monetization Pipeline** will also contribute to mobilization of resources for infra projects through monetization of various brown field government projects.
 - **National Bank for Financing, Infrastructure and Development (NaBFID)** has been set up as developmental financial institution to set in motion a **virtuous investment cycle**.
 - **Project Development Cells (PDCs)** have been set up in all concerned ministries and departments of GOI to provide an institutional mechanism to fast track investments.
 - To **enhance efficiency and cost competitiveness** - PM Gati Shakti and National Logistics Policy has been launched.
 - **PM GatiShakti** is aimed at breaking departmental silos and bring more holistic and integrated planning and execution of projects.

- **National Logistics Policy (NLP)** aims to reduce the logistics cost in India and bring it on par with developed nations.
 - **Sector Specific Initiatives:** Other than these the traditional focus on infrastructure efforts like roadways, railways, airways, ports etc have continued with various initiatives like Bharatmala Pariyojna, Sagarmala Pariyojna, UDAN initiatives, etc.
- **Conclusion**
- These initiatives can collectively bring out untapped potential of underutilized modes of infrastructure. This buffet of reform on all aspects related to infrastructure investment and project execution not just ensure economic growth and economic efficiency but also generates confidence among various stakeholders in the economy towards government functioning. IMF has observed in case of India, increased government spending on infrastructure also leads to crowding in of private infrastructure.

4. PUBLIC PRIVATE PARTNERSHIP (PPP)

- **Practice Questions:**
 1. Why is **Public Private Partnership (PPP)** required in infrastructure projects? Examine the role of PPP model in the redevelopment of Railway Stations in India [Mains 2022, 10 marks, 150 words]
 2. Explain how **PPP arrangements**, in long gestation infrastructure projects, can transfer sustainable liabilities to the future. What arrangements need to be put in place to ensure that successive generations' capacities are not compromised? [2014, 12.5 marks, 250 words]
 3. Adoption of **PPP model** for infrastructure development of the country has not been free of criticism. Critically discuss pros and cons of the model [2013, 12.5 marks, 200 words]
- **Introduction:**
 - In 1997, the report of the **Rakesh Mohan Committee (RMC)** concluded that India's problem was that of **poor infrastructure holding back development**.
 - It also highlighted the importance of **bringing in the private sector** into most areas of infrastructure in the country.
 - This private investment in infrastructure has mainly come in the form of **PPPs** in India.
- **Public Private Partnership (PPP)** is a collaborative arrangement between government and private sector to jointly plan, mobilize resources, develop, and/or operate infrastructure projects.
 - According to the Canadian Council for Public Private Partnership PPP is defined as "**Co-operative venture between the public and private sectors, built on the expertise of each partner that best meets clearly defined public needs through appropriate allocation of **resources, risks and rewards****".
- **Significance of Public Private Partnerships:**

- **Mobilization of Resources**: PPP helps government in mobilization of enough resources for infrastructure development and thus address infra gaps. (For e.g., in the BOT (Toll/ Annuity) model of road construction, private player invests the entire initial money for the construction of the road project).
 - **Getting Private Sector expertise and Innovation**: E.g., in the EPC model, private sector engineers and construct the entire road.
 - **Risk Sharing**: Long gestation period of infra projects bring along its own risks due to uncertain revenue stream in long run. PPP projects allows government to share these risks with private players.
 - **Increased Efficiency and Reduced cost of the project**: Private sector comes along with efficiency and reduced scope for corruption - this leads to timely and economic completion of various infra projects.
 - **Increased Transparency and Accountability**: PPP projects are subject to public scrutiny and the private players are also accountable to their shareholders.
 - **Better Infrastructure**: All the above advantages eventually contribute to better quality and quantity of infrastructure for general public.
- But, the success of PPPs lies in the robustness of institutional structure, financial support, and use and availability of standardized documents, such as Model Requests for Qualifications (RFQ), Model Request for Proposal (RFP) and Model Concession Agreement (MCAs).
- Government of India has taken several measures:
 - Government of India has **streamlined the appraisal and approval mechanism** for Central Sector PPP projects to ensure speedy appraisal of projects, eliminate delays, and have uniformity in appraisal mechanisms.
 - » Procedure for approval of PPP projects was finalized in 2005 and in 2006, the Public Private Partnership Appraisal Committee (PPPAC) for the appraisal of was notified in 2006. It has cleared 79 projects with a total cost of Rs 2,27,268 crore from FY15 to FY23.
 - **Viability Gap Funding (VGF) Scheme, 2006**
 - » It provides financial assistance to financially unviable but socially/economically desirable PPP projects.
 - **Economic Sector Projects** may get upto 40% of Capex as VGF grant.
 - **Social Sector Projects** include higher provisions of VGF grant. It may get upto 80% of CAPEX and upto 50% of the Operating Expenditure (OPEX).
 - **India Infrastructure Project Development Fund (IIPDF) Scheme** notified in Nov 2022)
 - » The scheme aims to develop quality PPP projects by providing necessary funding support to project sponsoring authorities, both in the central and the state governments, for creating a shelf of bankable and viable PPP projects by on-boarding transaction advisors.
 - » It has an outlay of Rs 150 crores for a period of 3 years from FY23 to FY25.
 - » Under the scheme a maximum amount of Rs 5 crores for a single proposal, inclusive of any tax implications, can be funded which can include cost of consultants/transaction advisors of a PPP project.
- **Several types of PPP Models** are used in India in different sectors:

- » **EPC Model (Engineering, Procurement, and Construction):** In this model, the cost of project is completely borne by government. Private sector with its expertise is responsible for engineering, procuring raw material and constructing the project. Ownership remains with government.
- » **Built Operate and Transfer (BOT) model** involves private player entity designing, financing, constructing, operating, and maintaining an infra projects for a specific period. After the specified period, the ownership is transferred back to government. This model has been used in sectors like Roadways, Ports, Airports and Power Generation. It can be of two types - BOT (Toll) & BOT (Annuity).
- » **Hybrid Annuity Model (HAM):** It is a mix of EPC and BOT (Annuity) model.
- » **Build Own Operate (BOO):** The private sector entity builds and owns the asset, and then operates it for a specified period of time.
 - Government has agreed to "buy" the goods and services delivered by the project on mutually acceptable terms and circumstances.
- » **Build Own Operate Transfer (BOOT):**
 - It is a model of PPP in which a private company is granted a concession to finance, build, own, and operate a project for a specified period of time. At the end of the concession period, the project is transferred back to government.
 - E.g., of project under BOOT model, Delhi Mumbai Expressway, The Mumbai Metro, the Bangalore International airport etc.
 - It involves a private sector entity being responsible for the complete lifecycle of the project, including design, financing, construction, operation, and maintenance. However, here private sector entity retains ownership of the project even after the concession period.
- » **Build Own Lease Transfer (BOLT):** It is a PPP model in which a private company is granted a concession to finance, build, own and lease a project to the government for the specified period of time. At the end of the concession period, the project is transferred back to government. Some notable BLT projects in India are, the Delhi-Gurgaon Expressway and the Mumbai-Pune Expressway.
- » **Design Build Finance and Operate (DBFO):** It allows a private sector to design, build, finance, and operate a project for a specified period of time. This public sector client retains the ownership of the project, but the private sector contractor is responsible for all aspects of its delivery.
 - E.g. Delhi Metro: Project was awarded to a consortium of private companies, which designed, built, financed, and operated the metro for a period of 30 years. At the end of the concession period, the metro will be transferred back to government.
- » **Lease Developed Operate (LDO) Model:** Private company is granted a concession to finance, develop, and operate a project for a specified period of time. The government sector retains the ownership, but the private sector is responsible for all aspects of its delivery. At the end of the concession period, government may choose to operate the project itself, or it may contract with another private company to operate the project.

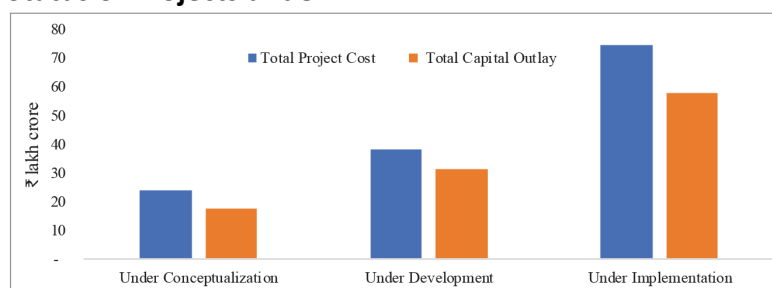
- » **Rehabilitate-Operate-Transfer (ROT) Model:** Under this model, government allows private promoters to rehabilitate and operate a facility during a concession period. After the concession period, the project is transferred back to government / local bodies.
- **Challenges of PPP Model:**
 - **Institutional Inadequacies:**
 - » An overly regulated institutional and legal framework with issues such as complexity, fragmentation, and lack of accountability results in inefficient implementation of PPP Projects.
 - **Lack of expertise in identifying projects, forming contract, choosing the right PPP models etc.**
 - » This leads to difficulty in assessing the investment needs and the duration required to improve service and operational efficiencies, which is crucial to the success of PPP.
 - » **It leads to projects being stuck due to disputes in existing contracts.**
 - **Lack of Transparency and Accountability:**
 - » There is inadequate information on PPPs in public domain. Private companies often don't share data in the name of business secrecy.
 - **Profit Motive as opposed to Public Service:**
 - Service efficiency in the delivery of PPP models is lacking due to profit motive.
 - **Crony capitalism** has also emerged as a major challenge in several sectors.
 - **Communication and Stakeholder engagement** is generally weak and lacking in the projects.
 - **Lack of balanced assessment and treatment of Risk Sharing** in the PPP projects.
 - Issues such as non-availability of capital and land acquisition challenges also hinder PPP projects.
 - **Long Gestation period and delays** in the implementation has led to a lot of loans becoming Non-Performing Assets (NPAs).
 - **Uncertainty:** The regulatory and legal framework of PPP models in India are still evolving. This can lead to uncertainty for investors.
- **Recommendations of Vijay Kelkar Committee:**
 - » Vijay Kelkar Committee on "Revisiting & Revitalizing the PPP model of infrastructure Development" was set up in the Union Budget of FY15-16. It recommended:
 - The Need of PPP contract to be **more focused on service delivery**.
 - The need to identify, balance and allocate risks amongst the different stakeholders.
 - Viability Gap Funding for unviable social and economic projects
 - Careful monitoring of performance as well as managing the risk.
- **Other suggestions:**
 - » **Strengthening Contracts:** PPP model contracts should allow flexibility in resetting the targets or renegotiating funding allocations
 - » **Strengthening Institutional Capacities:** Bringing experts from the area of contract formation, risk assessment etc. Setting up a PPP adjudication tribunal for better dispute redressal.
- **Conclusion:**
 - » The success of PPP model in India will depend on the ability of the government to address these factors and to create an environment that is conducive to private investment in infrastructure

5. NATIONAL INFRASTRUCTURE PIPELINE (NIP)

- **Example Questions:**
 - » What is National Infrastructure Pipeline? What is its significance for India's development [10 marks, 150 words]
- Ministry of Finance estimates that to achieve a GDP of \$5 trillion by 2024-25, India needs to spend about \$1.5 trillion (Rs 111 lakh crore) over these years in infrastructure. Keeping this in mind, government has launched National Infrastructure Pipeline (2020-25) with projected infrastructure investment of around Rs 111 lakh crores. It also envisages to improve project preparation and attract investment, both domestic and foreign in infrastructure.

- **Progress So Far:**

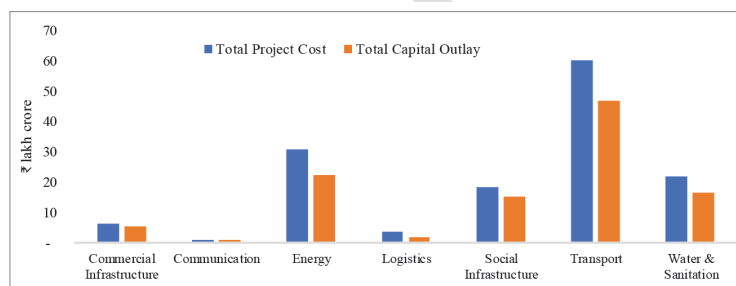
- » The NIP currently has 8,964 projects with a total investment of more than Rs 108 lakh crore under different stages of implementation.
- » **Status of Projects under NIP**



Source: Department of Economic Affairs.

Note: Data as of 13 January 2023

- » **Transportation Sector Dominates the NIP**



Source: Department of Economic Affairs.

Note: Data as of 13 January 2023

- » **Jointly funded by Central Government, State Government and Private Sector**

- **Some steps to improve the implementation of NIP:**

- » **Invest India Grid (IIG):**

- NIP is hosted on the Invest India Grid (IIG) platform and provides and provides opportunities states/UT and ministries to collate all major infrastructure projects at a single location. It is thus a centralized portal to track and review project progress across all economic and social infrastructure sub-sectors. It also provides the project sponsoring authorities to showcase investment opportunities to national and international investors.

» **Project Monitoring Group (PMG)**

- It is an institutional mechanism put in place by the government for resolution of issues related to large-scale projects. It is also involved in fast tracking of approvals/clearances for projects with an anticipated investment of Rs 500 crore and above. Now it has been proposed to integrate NIP and PMG portals. PMG portal will pick up data, as per requirements (project cost of Rs 500 crore or more), from the NIP database. This will save substantial time and effort by Ministries and States/UTs and ease monitoring of large scale projects.

- **Significance:**

- **Economic Development:** Well planned NIP projects will enable more infra projects, grow businesses, and create more jobs. It will also promote ease of doing business and enhance export competitiveness of Indian products.
- **Inclusive Growth:** Improved infrastructure will improve ease of living, and will provide equitable access to infrastructure for all making growth more inclusive.
- **Government:** Enhanced economic activities will lead to creation of additional fiscal space by improve revenue base of government. It also ensures quality of expenditure focused on productive areas.
- **Advantages for Developers:** NIP provides a better view of project supply, provides time to be better prepared for project building, reduces aggressive bids/failures in project delivery and ensure enhanced access to source of finance as a result of increased investor confidence.
- **Banks/Financial Institutions/Investors:** Confidence in the identified projects are likely to be higher and they are less likely to suffer stress given active project monitoring, thereby less likely of NPAs.

- **Way Forward:**

- **Improving Project Preparation Process** to avoid delays and reduce cost. The **preparation framework** shall consist of a transparent policy and legislative framework, an empowered public institution for infrastructure planning, multi-stage reviews, audits and approvals for quality assurance etc.
- **Enhancing execution capacity of private sector participants** - There is a need of deep pool of experienced developers with required competence and execution capacity. Here collaboration and joint ventures with strong global infrastructure developers can be crucial.
- **Robust Enabling Environment** through appropriate policy framework and a well developed public institutional capacity.
- **Institutionalization and Efficiency of Dispute Resolution**
 - **Steps already taken:** The Commercial Courts Act 2015, The Specific Relief (Amendment) Act 2018 and the New Delhi Arbitration Centre Act 2019
 - **What more can be done?** Ministry level committees to resolve complex contractual disputes as mediation mechanism that can settle disputes out of courts.
- **Strengthening infrastructure quality** - Creating a National Framework for Infrastructure Quality for each sector based on global and national standards.
- **Financial Sector Reforms**
 - **Revitalizing the bond and credit market**
 - **Strengthening the Municipal Bond Market in India**

- **Revitalizing Asset Monetization**
- **Enabling User Charges to finance infrastructure**
- **Long term financing Landscape**

- **Conclusion:**

- Overall, the National Infrastructure Pipeline (NIP) is a transformative initiative that aims to propel India's economic growth, improve living standards and position country as a global powerhouse.

6. NATIONAL MONETIZATION PIPELINE

- **Practice Questions:**

- » Discuss the objective and significance of the National Monetization Pipeline in the context of India's economic development [10 marks, 150 words]

- **Background**

- » **Asset Monetization** is one of the key recommendations of National Infrastructure Pipeline (2020-25). Consequently, National Monetization Pipeline was announced in 2021. It focuses on the principle of 'asset creation through monetization' and thus taps private sector investment for new infrastructure creation.

- **Details:**

- » Asset monetization entails a **limited period license/lease of a brownfield underutilized asset** owned by government or a public agency, **to a private sector entity** for an **upfront or periodic consideration**.
 - **The private sector entity** is expected to **operate and maintain** the asset based on the terms of the contract/concession, generating returns through higher operating efficiencies and enhanced user experience.
 - **Public authority**, which receives the fund, will **invest it in new infrastructure or deploy it for other public purposes**.
- » A **robust asset pipeline** has been prepared to **provide a comprehensive view to investors and developers** of the investment avenues in infrastructure.
 - It includes selection of de-risked and brownfield assets with stable revenue generation profile (or long rights) which will make for an attractive investment option.
- » Total **indicative value of NMP** for core assets of the Central Government has been **estimated at Rs 6.0 lakh** crore over 4-year period (FY22 - 25) (5.4% of the total infrastructure investment envisaged under NIP)
- » **National Land Monetization Corporation (NLMC)**: Cabinet approved the setting up of the NLMC to monetize surplus land and building assets of CPSEs and other agencies linked to government (March 2022)

- **Progress so far: ESI 2022-23:**

- » Against the monetization target of 0.9 lakh crore in FY22, Rs 0.97 lakh crore have been achieved during the period under roads, power, coal and mines.
- » NMP's 2nd year target, i.e. FY23 target is ₹ 1.6 lakh crore (27% of the overall NMP target).

- **Significance: Positives**

- » **Infrastructure Upgradation and Development:** The NMP aims to enhance infrastructure development in the country by leveraging the potential of existing assets.
- » **Unlocking of Capital and Revenue Generation:** The funds generated can be used for financing new infrastructure projects without increasing the fiscal deficit.
- » **Efficient Asset Management:** Promotes the use of complete assets which are languishing or it is not fully monetized or is under utilized.
- » **Job Creation and Skill Development:** It will attract investment, promote entrepreneurship, and stimulate economic growth.
- » Clear framework for monetization and given potential investors a ready list of assets to generate investment interest.
- » Along with disinvestment, monetization of idle land is part of the Centre's strategy to reduce its business presence to a bare minimum and generate resources for future asset creation.

- **Key challenges:**

- » Valuation of Assets is a complex process. There may be challenges in accurately assessing the future revenue, depreciation factors etc.
- » Lack of government's expertise in designing long term contracts:
 - Contractual disputes can pose hurdle in implementation process.
- » **Monetizing assets with low revenue potential may be a challenge**
- » **Asset Management and Quality Maintenance** - Poor monitoring may lead to poor quality of asset management.
- » **Sector Specific Challenges:**
 - **Level of capacity utilization in gas and petroleum pipeline networks** -> lack of capacity utilization has been due to lower gas supplies
 - **Regulated tariffs in power sector assets**
 - **Low interest of investors in national highways** of less than 4 lane.

- **Other limitations:**

- » **Threat of monopolization:** Because of limited number of private players, bidding for assets may not be totally fair.
- » **Public welfare** may get ignored (which should be the basic focus of public sector assets)
- » **Why are the assets being poorly managed** at the first place. If its poor management, Asset Monetization makes sense. But if the issues are structural, even asset monetization will not solve the problem.

- **Way Forward:**

- » **Set up a centralized institution with the skills and responsibility to oversee contract design, bidding and implementation**, separate from, but with appropriate assistance of, the concerned line ministries.
- » **Robust dispute resolution mechanism**

- » Government should start with sectors that offer greatest cash flow predictability and the least regulatory uncertainty before expanding the experiment.
- » Ensure that resources raised from the NMP are used to fund new asset creation.

- **Conclusion:**

- » While the ideal of monetization seems great, execution of the plan remains key to its success.

7. LOGISTICS SECTOR

1) LOGISTICS SECTOR

- **Introduction**

- Logistics including transportation, inventory management, warehousing, material handling & packaging, and integration of information, is related to management of flow of goods between the point of origin and the point of consumption.
- India's logistic sector currently is worth \$160 billion dollars and government expects it to go to \$360 billion by 2032. But it remains unorganized to a large extent.

- **LOGISTIC PERFORMANCE OF INDIA:**

- **As per the Logistics Performance Index, 2023 released by World Bank, India is ranked 38/139 countries in terms of the logistics performance.**
- **Logistics Cost in India have been in the range of 14-18% of the GDP against the global benchmark of 8%.**

- **Key Problems in India's Logistic Sector:**

- **The Regulatory Environment remains complex and fragmented** due to multiple regulations governed by various stakeholders.
 - For instance, there are 20 government agencies, 37 export promotion councils, 500 necessary certifications ; 200 shipping agencies; 36 logistic services etc.
- **Heavy dependency on Road Transport** and lack of seamless movement of goods across modes.
- **Low level of technology adoption among various stakeholders:** Lack of integrated IT infrastructure/ modern technology.
- **Underdeveloped material handling infrastructure**
- **High Indirect Costs** due to unpredictable supply chains and poor first and last mile connectivity add to the logistic cost.

- **What should be done to improve logistics performance in India:**

- **Ensuring Efficiency of Clearance Process** (i.e., speed, simplicity, and predictability of formalities) by border agencies, including customs.
- **Improving the quality of trade and transport related infrastructure** - (e.g., ports, railroads, roads, IT etc.)
- **Easing of arranging competitively priced shipments**
- **Enhancing the competence and quality of logistics services** (e.g., transport operators, custom brokers)
- **Providing for Tracking and Tracing of Consignments**

- Ensuring **timeliness of shipments** in reaching destinations within the scheduled or expected delivery time.
 - The above aspects would be possible if government focus on new technology, skilling and automation.
 - These aspects have been captured by the LPI, 2023 of the World Bank.
- **Key steps taken in this direction include:**
- i. **Infrastructure initiatives** like Bharatmala, Sagarmala, Parvatmala, National Rail Plan, UDAN etc.
 - ii. **Process reforms** include - Introduction of GST, e-Sanchit, Single Window Interface for Trade (SWIFT), Indian Customs Electronic Data Interchange Gateway (ICEGATE), Turant Customs and others.
 - iii. **National Logistic Policy, 2022** was launched to integrate all the above efforts by different government agencies and lay on overarching inter-disciplinary, cross sectoral, and multi-jurisdictional framework for the logistics sector.
 - **It provides a comprehensive agenda to develop the entire logistic ecosystem with two major visions:**
 1. **Reduce Logistic Cost in India by 5% of GDP** over the next five years
 2. **Improve India's ranking in the Logistic Performance Index**
 - **It also aims to enhance logistics sector competitiveness through a unified policy environment and an integrated institutional mechanism.**
 - iv. **Other initiatives improving the logistics sector include:**
 - **PM Gatishakti** was launched in 2021 as a National Master Plan for Multi-modal connectivity to bring together 16 ministries, including railways and roadways, for integrated planning and coordinated implementation of infrastructure connectivity project. The scheme envisages efficiency in services like processes, digital systems and regulatory framework.
 - **Plans of 35 Multimodal Logistic Parks:** The **Road Ministry** plans to develop 35 multimodal logistic parks in India that would cater to 50% of the freight movement, enable a 10% reduction in transportation cost and a 12% reduction of CO₂ emissions.
 - **Other Projects** like Bharatmala, Sagarmala etc. are also focused on improving India's logistic sector.
 - **Diesel Deregulation** have made logistic cost more predictable.
 - **Creation of a Logistic Division** in the Department of Commerce
 - **Infrastructure Status to Logistics sector**
 - **Logistic Efficiency Enhancement Program and Vehicle Fleet Enhancement Program**
 1. By Ministry of Road Transport and Highway
 2. To improve India's logistics efficiency
 - vi. **Freight Smart Cities** by Commerce Ministry's Logistic Division.
 - Under this, the Logistics Division under Ministry of Commerce and Industry has decided to work in a planned manner to improve the city freight movement.

2) NATIONAL LOGISTICS POLICY, 2022

- **Why in news?**
 - PM Modi has launched National Logistic Policy 2022. (Sep 2022)

- **Practice Question:**
 - "The National Logistic Policy 2022 has the potential to impact all three sectors of the economy - primary, secondary and tertiary" Discuss [10 marks, 150 words]
- The **vision of NLP** is " to develop a technologically enabled, integrated, cost-efficient, resilient, sustainable and trusted logistics ecosystem in the country for **accelerated and inclusive growth**"
 - **The Targets** for achieving the vision of NLP are to
 - reduce the **cost of logistics** in India to be comparable to global benchmarks by 2030;
 - improve the **Logistics Performance Index ranking** - endeavour is to be among the top 25 countries by 2030, and
 - create a **data driven decision support mechanism** for an efficient logistics ecosystem.
 - The policy thus seeks to pave the way for **India to become a logistic hub** by leveraging technology, processes and skilled manpower.
- The Policy has **four key features (four key pillars)**: Integration of Digital System (IDS); Unified Logistics Interface Platform (ULIP); Ease of Logistics (ELOG); and System Improvement Group (SIG);
 - **Under IDS**, 30 different systems of seven departments are integrated - including data from the road transport, railways, customs, aviation and commerce departments.
 - **ULIP** would bring all digital services related to the transportation sector into a single platform.
 - **Ease of Logistics (E-Logs)** is a new digital platform which has been started for industry associations to resolve issues by reaching out to the government.
 - **Systematic Improvement Group (SIG)** has been created along with the **Network Planning Group (NPG)** to improve coordination across government ministries and between the state and central governments.
- The policy will be implemented through **CLAP (Comprehensive Logistics Action Plan)**, which proposes the following interventions:
 - **Integrating digital logistics systems** to develop a system of unified logistic interface
 - **Sectoral Plan For Efficient Logistics**
 - **Facilitating the development of logistics Park**
 - **EXIM logistics**
 - **Logistics manpower skill development and capacity building**
 - **Service Improvement Program**
 - **Standardizations of physical assets and benchmarking service quality standards**
 - **Engagement with different Indian states**
- The government has also launched a **Unified Logistics Interface Platform (ULIP)** under NLP.
 - The ULIP platform will enable various stakeholders like industry players to get **secure access to information** related to logistics (e.g. cargo movement) and resource available with various ministries
 - It will also democratize information. It will contribute to abolition of monopoly and un-levelled advantage.

- It integrates 7 ministries on one platform. It will also integrate 17 digital platforms from seven ministries on ULIP.
 - It will also help provide cargo movement clearance.
 - It also has dedicated portal that makes the process of data requests simpler, faster, and transparent.
 - ULIP will have **direct and benefits to all logistic stakeholders** like verification of drivers and vehicles details in a single click, tracking and tracing consignment, route optimization planning, a timely update on the destination of the consignment etc.
- **Significance:**
 - NLP has the **potential to bring a revolutionary approach to the nation's logistics environment,** boosting the effectiveness of supply chains.
 - It would increase warehousing capacity and facilitate quicker movement of goods closer to consumer.
 - It will also lead to strengthening of other sectors like manufacturing tourism etc.
 - It is going to improve overall productivity of workforce by reducing their time spent in travel.
 - Improved logistic sector can also be an important factor attracting foreign investments.
 - It will **benefit the farmers greatly** as it would allow farmers to market their goods more swiftly, reduce waste, and avoid unnecessary delays, all of which would cut overall price.
 - It will contribute to **improved competitiveness of Indian export** goods.
 - Reduce complexity by reducing multiplicity of authorities through ULIP.
 - ULIP will also enhance visibility for customers and enable logistic companies to adopt digitization on a much larger scale.
- **Way Forward:**
 - **Railway freight trains'** speed have remained stagnant for many decades at around 25km/hour. This has to be improved on priority to make Logistic sector more effective.
 - **Inland waterways** have huge potential in the country and have remained under utilized for long.
 - **NLP** has to function in conjunction with Gati Shakti, Sagarmala, Bharat Mala etc. to achieve the goal.
 - **Take feedback from all the stakeholders and evolve the policy and its implementation** with changes in technologies and feedbacks.
- **Conclusion:**
 - The National Logistics Policy thus aims to bring ease of doing business in the logistics sector by simplifying the logistics processes, improving its efficiency bringing in transparency and visibility, and reducing logistics cost and time.

8. AIRWAYS

1) INTRODUCTION

- India is the **third largest domestic market** for civil aviation in the world and has been growing at a very healthy growth rate of over 14% per annum between FY14 and FY20.
- Covid-19 lockdown led to some hiccups in FY21 and FY22, but as per Economic Survey of India, the aviation industry has crossed the passenger and cargo traffic pre COVID times in FY23.

2) CIVIL AVIATION SECTOR IN INDIA HAS GREAT POTENTIAL

- Growing middle class population
- Growing tourism
- Improved socio-economic conditions -> Higher disposable income.
- Favorable demographics -> More young people who are happy to fly
- Improved penetration of aviation infrastructure due to initiatives like UDAN

3) NATIONAL CIVIL AVIATION POLICY, 2016

- **Introduction**
 - It is the First time since independence that an integrated civil aviation policy has been brought out by the Ministry.
 - **Aims/Objectives**
 1. Make regional air connectivity a reality.
 2. Take flying to masses by making it affordable and convenient
 3. Establish an integrated ecosystem which will lead to significant growth of the civil aviation sector to promote tourism, employment and balanced regional growth.
 4. Enhance ease of doing business through deregulation, simplified procedures and e-governance.
- **Salient Features**
 - **Regional Connectivity Scheme (UDAN Scheme)**
 - **Route Dispersal Guidelines** - to make more services available for Tier-2, Tier-3 cities.
 - **5/20 Requirements replaced with new schemes for starting international flights -> Provides level playing field**
 - All airlines can commence international operations provided that they deploy 20 aircraft or 20% of total capacity (in terms of average number of seats on all departure put together), whichever is higher in domestic operations.
 - **Bilateral Traffic Rights** - Enter into 'OPEN Sky' agreements with SAARC and other neighboring countries ASAP.
 - **Airport PPP/AAI**

- Encourage development of airport by AAI, state government, the private sector or in PPP mode
 - Future tariffs at all airports will be calculated on a '**hybrid till**' basis, unless specified otherwise in concession agreements.
 - 30% of non-aeronautical revenue will be used to cross subsidize aeronautical charges
 - Increase non-aeronautical revenue by better utilization of commercial opportunities of city side land
 - AAI to be compensated in case a new green field airport is approved in future within a 150 km radius of an existing unsaturated operational AAI airport (not applicable to civil enclaves)
- **Aviation Education and Skill building**
- Estimated direct additional requirement of the Civil Aviation Sector by 2025 is about 3.3 Lakh.
 - All training in non-licensed category will conform to National Skill Qualification Framework standards.
 - MoCA will provide full support to Aviation Sector Skill Council and other similar organizations/agencies for imparting skills for the growing aviation sector
 - There are nearly 8000 pilots holding CPL but who have not found any regular employment. MoCA will develop a scheme with budgetary support for Type-rating of Pilots.

4) REGIONAL CONNECTIVITY SCHEME (UDAN)

- **Introduction**
 - Discussion
- **Some challenges of India's Domestic Aviation Sector:**
 - **Traffic concentrated between large airports:** This leads to choking of large airports
 - **Existence of a lot of ghost airports:** Inefficient resource utilization
 - **Poor connectivity to tier-2 and tier-3 cities** -> this also hampers other services and tourism; negatively impacts national integration.
 - **States have ignored aviation sector** as Civil aviation is mentioned in the Union List.
- **UDAN Scheme** (A part of National Civil Aviation Policy 2016)
 - Launched in 2017 with an aim to provide air connectivity to tier II and Tier-III cities and ensuring affordable fares.
 - Under the scheme, government has approved a budget of Rs 4500 crore for **revival of existing unserved/underserved airports/airstrips** of the state governments, AAI, PSUs, and civil enclaves.
 - Government has also accorded 'in-principle' approval for the setting up of 21 greenfield airports across the country.
- **Key Provisions of the scheme**
 1. **Subsidization of regional flights - to promote regional connectivity.**

- **Regional Connectivity Fund (RCF)** has been created to meet the VGF requirement.
- 2. **Cap on Airfare** at Rs 2,500/hour journey for 50% of the seats.
- 3. **Other steps** which are being taken
 - **Revival of airstrips/airports as No-Frills Airports** at an indicative cost of Rs 50 crore to Rs 100 crore
 - No airport charges
 - Reduce service tax on tickets (on 10% taxable value) for 1 year initially
 - Reduced excise duty of 2% on ATF picked at RCS airports
 - **Steps which states would need to take**
 - RCS only in those states which reduce VAT on ATF to 1% or less, provide other support services and 20% of VGF
 - State government will provide police and fire services free of cost. Power, water and other utilities at concessional rate.
- 4. **Equitable Geographical Allocations:** For balanced regional growth, allocations will be spread equitably across 5 regions - North, South, West, East and North East with a cap of 25%.
- 5. Regional connectivity scheme will be in operation for 10 years with individual route contract for a 3 year span.
- 6. Market based **reverse competitive bidding mechanism** to determine least VGF to select the airline operator with the right to match the initial proposer.
- **Key Achievements/Significance of UDAN Scheme:**
 - **Increased number of operational airports** to 140+ from 74 in 2014
 - **Increased connectivity** to tier-2 and tier-3 cities
 - **400+ new routes** have been initiated providing air connectivity to 29 states/ Uts across the country
 - **46+ helicopter routes** have been operationalized under previous rounds of schemes benefitting a number of hilly and NE region.
 - **More than one crore passengers** have availed the benefits of the scheme
 - **Better connectivity** will contribute to inclusive growth, through more employment opportunities, and more tourism in the connected region.
- **UDAN 5.1 - Specifically designed for helicopters (May 2023)**
 - For the first time under RCS-UDAN, the round has been designed specifically for helicopter route
 - **Key features:**
 - **Increase in scope of operation** - Even if one of the locations (destination or origin) is priority area, these routes will be allowed.
 - **Airfare caps** have been reduced by as much as 25% to make flying in helicopters more affordable for passengers.
 - **VGF caps** for operators have been increased substantially for both single and twin-engine helicopters to enhance financial viability for operating the award routes.
- **UDAN 5.0**
 - Why in news?
 - Following four successful rounds of bidding Ministry of Civil Aviation launched the 5th round of the Regional Connectivity Scheme (RCS) - UDAN to further enhance the

connectivity to remote and regional areas of the country and achieve last mile connectivity.

▪ **Key features:**

- Focuses on Category-2 (20-80 seats) and Category-3 (>80 seats)
- Stage length cap of 600 km is waived off and there is **no restriction on the distance between the origin and destination of the flight.**
- **VGF** to be provided will be capped at 600 km stage length for both priority and non-priority areas which was earlier capped at 500 km.
- Same route will not be awarded to single airlines more than ones.

- **Some Challenges**

- a. **Not all the underserved and unserved (ghost) airports** which were envisaged to become operational have been revived and **not all the routes** for which airlines (new and established ones) had placed bids have been started.
- b. **New players** (like Air Deccan and Air Odisha) have little experience, lack funds and have struggled with economics and logistics of providing connectivity from remote locations. **Quality of service** has also remained a concern with highest number of cancellations being seen for these new players.
- c. **Concerns about sustainability after VGF funding ends** in 3 years is also keeping the aviation player worried especially now when oil prices are seeing a positive trend.
- d. **States have been reluctant to contribute.**
 - For e.g. VAT on ATF has not been decreased by many.
- e. **Land Acquisition for greenfield airports** have emerged as a major issue.

- **Some criticisms of the scheme**

- Subsidy for air travel will only benefit middle class and upper middle class -> it could be used at other places
- Before COVID-19 crisis, India had the fastest growing aviation market and thus state subsidies could be avoided.

- **Way forward**

- Government should think about **extending the VGF beyond three years** to bring in more player at the route.
- Regulations for Scheduled helicopter service should be finalized ASAP so that smaller airports can be viably connected.
- There is a need of **higher investment on airport infrastructure** to increase the quality of service and to complement the efforts by new players in the aviation industry.
- **A Cooperative Federalism Framework** can provide the required impetus to the Civil Aviation Sector.
 - How can states contribute:
 - Reduce VAT on ATF
 - Develop airports on its own or through PPP.

- **Conclusion**

- Travel dynamics through India is evolving and air service development is becoming a major force in this development. The newly connected cities have massive opportunities to boost regional and inter-continental connectivity.
- And with the significant benefits that a new air service brings to community, UDAN will only help to facilitate the further evolution of a modern, well-connected country.

5) PPP IN AIRPORT DEVELOPMENT

- **PPP Definition:**

Public-Private Partnership (PPP) models have been utilized in the development of airports in India to leverage private sector expertise, investment, and efficiency while ensuring public control and oversight.

- **Various PPP models used in airport development in India are:**

i. **Build Operate Transfer (BOT):**

- E.g., Delhi International Airport Limited (DIAL): DIAL was formed as a JV between AAI and GMR Group. The consortium obtained concession rights to design, finance, construct, operate and maintain the Indira Gandhi International Airport in Delhi. After the concession period of 30 years, airport will be transferred back to AAI.

ii. **Design-Build-Finance-Operate-Transfer (DBFOT):** This model is similar to the BOT model, but the private entity is also responsible for the design and construction of the airport facility. The private entity finances, builds, operates, and maintains the airport for a specific period, and then transfers it back to the public authority.

- The **Bangalore International Airport Limited (BIAL)** Project follows the DBFOT model.
 - A consortium comprising Siemens Project Ventures GmbH, Larsen & Toubro Limited, and Unique Zurich Airport developed and operated the airport. The consortium financed the project, designed, and constructed the airport, and operated it for a concession period of 30 years. At the end of the period, the airport will be transferred back to the government.

iii. **Operate Maintain Transfer (OMT):**

- E.g., Chhatrapati Shivaji International Airport (CSIA), Mumbai
- It is owned by AAI, and Mumbai International Airport Limited (MIAL), a joint venture between GVK-led consortium and AAI, operates and manages the airport. MIAL receives the management fee based on performance targets.

iv. **Joint Venture:**

- E.g., **Cochin International Airport Limited (CIAL):**
 - Cochin International Airport Limited (CIAL) was formed by a joint venture between the government of Kerala and a consortium of NRIs. The consortium provided the necessary capital, and the airport was developed and operated jointly by the government and the consortium.

- **Critical analysis of development of airports in India using JV:**

i. **Positives:**

- **PPP models has helped in improving infrastructure and services at some of India's busiest airport, without increasing government's fiscal burden.**
 - For e.g. airports in Delhi and Mumbai have undergone major expansion and renovations under PPP model.
- **Government is able to focus on regional connectivity more.**

ii. **Challenges/Limitations:**

- It has been difficult to attract private investors to airports as airports are often seen as risky investments, as they are subjected to fluctuation in air traffic.
- **Higher airport charges for passengers**
- **Other general challenges with PPP** (done in previous topics - Contract issues etc.)

- **Overall**, the development of airports using PPP model has been a mixed bag in India.

6) EMERGING DUOPOLY IN AVIATION SECTOR

- Duopoly is a market structure in which there are only two sellers of some goods and services. In India's Civil Aviation sector, this duopoly may be emerging for new future due to problems faced by Jet Airways, SpiceJet, GoFirst etc on the one hand and rising of **IndiGo and Tata Group Airlines - Air India, Vistara, and AIX Connect (Air Asia India)** on the other. Between them, IndiGo and Tata group now control a staggering 87.7% of India's domestic civil aviation market.

Market Share of various companies in May 2023:

- **Further**, both these airlines have lined up massive fleet expansion and modernization plans, with the latest announcement of IndiGo ordered 500 Airbus jets - the biggest ever aircraft order in the history of commercial aviation.

Airlines	Domestic Market Share (%) in April	Domestic Market Share (%) in May
IndiGo	57.5	61.4
Air India (Tata)	8.6	9.4
Vistara (Tata)	8.7	9
AIX Connect (Tata)	7.6	7.9
SpiceJet	5.8	5.4
Akasa Air	4	4.8
Go First	6.4	0.4*

**Go First operated flights on just two days in May. (Source: DGCA)*

- **This duopoly may lead to reduced competition which may result into:**

- **Higher Prices**
- **Lower Quality of Services**
- **Less Innovation** - When there are limited players in the market, there is slower adoption of technologies.
- **Reduction in customer choices.**
- **Increased potential of collusion**
- **Difficult for others to enter the market** - Duopoly collusions and high cost of entry in aviation sector may further lead to problems.

- **Way Forward: Meeting the risks of duopoly in the aviation sector:**

- **Government Regulation** to ensure fair competition and consumer rights protection.
- **Incentivizing new entrants** through financial assistance, reduced entry barriers etc.
- **Ensuring transparency and fair play** in the sector could encourage healthy competition. This could involve measures like a clear and equitable allocation of airport slots, unbiased access to infrastructure, and fair distribution of air traffic lights.
- **Consumer Education** can also play a role in mitigating the risks of a duopoly by being aware of the potential problems and by demanding high quality service from airlines.

7) DEVELOPING HUB AIRPORT IN INDIA

- **Why in news?**
 - Experts believe that it is time to transform India's metro gateway airports into a hub airport (June 2022)
- **Background:**
 - India is the third largest domestic aviation market in the world, after USA and China. With increasing population, improved socio-economic conditions, and government initiatives like UDAN, the sector is expected to have high rate of growth in India.
- **What is a Hub Airport?**
 - A hub airport, also known as a hub, is an airport that serves as a central transfer point for connecting flights. It connect several airports through non-stop flights.
 - A typical hub airport operates on the concept of waves, a wave of incoming flights arrives and connects with another wave of outgoing flights that departs an hour or two later.
- **Advantages:**
 - **Economies of Scale** for the airport and airlines alike.
 - Concentrating air traffic at a hub airport enables airlines to achieve economies of scale. By funnelling a large volume of passengers through a central location, airlines can optimize their operations, reduce costs, and maximize efficiency in areas such as aircraft maintenance, ground handling, and fuel consumption.
 - **Better Connectivity:** A hub airport provides extensive flight connections, allowing passengers to travel between different origins and destinations efficiently. Airlines get to serve city pairs that are otherwise economically unviable for non-stop flights.
 - **Greater Choice and flexibility for passengers-** Frequent fliers get greater choice and flexibility with flights, destinations, and service frequencies, as well as lower ancillary costs, such as avoiding the time and cost of overnight stay.
 - **Positive knock-on effect on the wider airport ecosystem**
 - Improved passenger throughput will also benefit aero and non aero service providers at the airport, including cargo and ground handling, fuelling, retail and duty free, vehicle parking etc.
 - **Improved infrastructure** - Hub airports are often focal point of airline alliances and partnerships. These collaborations allow airlines to coordinate schedules, share facilities, and thus improve efficiency.
 - **Propels the economic and social development of the city** and its inhabitants .
- **Consideration of Hub Airports in India**

- There are three basic requirements for becoming a major airport hub:
 - Sufficient local consumer demand
 - Good geographical location
 - Necessary infrastructure to support high-volume of traffic
- In India's case, the first two requirements are rightly addressed the focus is rightly on addressing the third requirements.
- **Favourable Factors for Airport Hub in India:**
 - India has the **largest diaspora** (around 18 million people across all six continents and regions).
 - India is also located on busy international air corridor which connects Europe, Africa, West Asia, etc with East Asia. Thus it is ideal for a transit hub and alternative/diversion/fuel stop/ technical stop.
 - Since, India is a very large economy, it can support development of more than one hub.
- **Impediments:**
 - **Capacity constraints** at all major airports - especially during peak season or peak hours.
 - **Congestion and air traffic management** will be worsened at the hub airport.
 - **Large Geography** - may present challenges in establishing a single or limited number of hub airports.
 - **Land Acquisition** is a huge challenge in all the cities of India
- **Conclusion:**
 - Addressing these impediments requires a comprehensive approach involving government support, private sector participation, infrastructure development, airspace management improvements, and strategic planning to ensure the viability and success of hub airports in India.

8) PROMOTING HELICOPTER SERVICES IN INDIA (JUST NOTE SOME FACTS)

- **Why in news?**
 - Minister of Civil Aviation, Shri Jyotiraditya M Scindhia inaugurates 4th Heli-India Summit 2022 (Oct 2022)
- **Details**
 - **4th Heli-India Summit 2022** with the theme 'Helicopters for Last Mile Connectivity' at Sher-e-Kashmir International Conference Centre, Srinagar.
- **Multifarious Roles of Helicopters:**
 - Providing Urban Connectivity
 - Emergency Medical care
 - Disaster Management during floods
 - Rescue operations
 - **Infrastructure development:** For e.g. J&K has set an example of the best use of Heli services when it erected transmission lines and towers using heli-cranes (sky cranes) on the Peer Panjal mountain ranges.

- **Other initiatives launched in recent times to promote Helicopter sector:**
 - **UDAN 5.1**
 - **HeliSewa Portal** - it is an online portal being used by all operators for obtaining landing permissions to helipads, and it also is creating a database of helipads in the country.
 - **HeliDisha**: It is a document that has been prepared as guidance material to state government administration to effectively and safely support civil helicopter operations.
 - **Helicopter Accelerator Cell**: It is fully active in resolving helicopter issues and the advisory group of industry representatives is helping identify problem areas.
- **Fractional Ownership Model:**
 - Released in Oct 2022
 - It will lower the barrier on the cost of acquisition of helicopters and aeroplanes through pooled capital by multiple owners.
 - This will allow companies and individuals to minimize their capital outflow by sharing the purchase cost, reducing their exposure to risks and making it financially easier to run a NSOP business (Non-scheduled Operator's Permit Business)
 - Fractional Ownership Model has the potential to energize the NSOP segment by demonstrating ownership of aircraft and it can be a driver to boost the number of aircraft existing in the NSOP industry.

9. DRONE SECTOR

9) UAVS AND ASSOCIATED ISSUES

- **Why in news?**
 - » Ministry of Civil Aviation issues guidelines for PLI Scheme to support indigenous drone industry (Nov 2022)
- **Example Questions**
 - » "Drones are frontier technology which has the potential to leapfrog India's economic growth" Elaborate [10 marks, 150 words]
 - » Discuss the key challenges limiting the growth of drone technology and its usage in India [10 marks, 150 words]
- **Introduction**
 - » Remotely Piloted Aircrafts, popularly referred as drones, are unmanned aircrafts piloted from a remote platform. Drones, with its associated remote pilot station(s), command and control links and other components form a **Remotely Piloted Aircraft System (RPAS)**. It has many wide-ranging applications. But, due to various security concerns, the Gol had, in Oct 2014, banned the use of UAVs by private players and individuals.
 - » After years of deliberations, the new regulations by DGCA which came into force on 1st Dec, 2018 have lifted this ban. It is expected to encourage more investment and R&D in the sector in India.
- **Key Areas of Application**

Agriculture	<ul style="list-style-type: none"> •Compilation of Plant Count •Crop Supervision, maintenance, fertilizer/pesticide supply etc. •Agri-Insurance: Collecting Crop Yield Data, Surveillance etc.
Media and Entertainment	<ul style="list-style-type: none"> •Aerial documentary, photography, videography etc.
Mining	<ul style="list-style-type: none"> •Thermal imaging, terrain mapping, infrastructure and equipment manufacture
Infrastructure Development	<ul style="list-style-type: none"> •Industrial inspections, 3-D video mapping, Land Audit, Town Planning, Site Management, etc.
Energy and Utilities	<ul style="list-style-type: none"> •Remediation and site monitoring, survey grad maps for siting transmission lines
e-Commerce	<ul style="list-style-type: none"> •Transportation of deliveries
Defence and Policing	<ul style="list-style-type: none"> •Replacing manned aircraft in future •coast guard and navy may use it for surveillance and anti-piracy operations •General Monitoring of the law and order situation
Health Sector	<ul style="list-style-type: none"> •Supplying medicines to remote areas

- **Challenges and limitations hindering the growth of drone sector in India.**

- » **Evolving Regulatory framework:** The regulatory framework for drone sector in India is still evolving, and this can make it difficult for businesses to operate.
- » **Poor Demand:** There is a lack of awareness among people and businesses about potential uses and applications of drone sector. This has kept the potential demand on the lower side.
- » **Safety Concerns:** With increased uses of drones, there may be increased risk of drone accidents/ drone falling. This may create problems specially in a densely populated area.
- » **Privacy Concerns:** Drones may be used for spying on people without their permission leading to privacy violations.
- » **Cybersecurity issues:** Drones are vulnerable to cyber-attacks and these attacks may disrupt drone operations.
- » **Job Losses:** In future, when drones are used for work like delivery by online sellers, food delivery companies etc, it may lead to a job loss situation for a lot of people.
- » **Military use of drones can also be very devastating:**
 - Easier, violation of sovereignty
 - For e.g., in recent years, sightings of drones along the Indo-Pak borders have increased.
 - Drones have been used by Pakistan based outfits to smuggle arms, ammunitions and drugs in India.
 - Risk of overusing of military options
 - Making it more difficult to identify violations of constraints against targeting non-combatants.

- **Key steps taken in recent times to promote drone sector in India:**

- » Liberalized Drone Rules, 2021
 - » India's Airspace Map for Drone Operations Released by Ministry of Civil Aviation
 - » PLI scheme for Drones, 2021
 - » Guidelines for PLI incentive scheme to support Indigenous drone industry (Nov 2022)
 - » Drone Shakti Scheme - Financial incentives to startups that are developing drone based solutions.
 - » Initiatives to promote the use of drones in different sectors like Agriculture, infrastructure logistics etc.
- **Way Forward:**
- » **Encourage drone use in various sectors** like logistics, infrastructure, agriculture etc.
 - » **Create a favorable regulatory environment:** The 2021 rules need further simplification to promote ease of doing business in the drone sector
 - » **Support Drone Industry**
 - **Launch** a drone startup accelerator program.
 - **More R&D Support:** Government should incentivize/support R&D in drone sector to ensure innovation and development in the drone sector.
 - Organized drone-expos and conferences.
 - » **Encourage PPP models in Drone sector** - This will help pool resources and expertise and accelerate the development of the sector.
 - » **Education and Skill development:** Create dedicated courses for drone sector at both graduation and post graduation level to promote drone sector. Jobs in the areas of drone repairs will be a big deal.
 - » **Promote Industry-Academia collaboration** to support research.
 - » **Focus on Cyber Security**, which is expected to increase in vulnerability
 - » **Plan for sustainable disposal of e-waste** generated by the use of drones.

10) LIBERALIZED DRONE RULES, 2021

- **Key Significance of the new Rules:**
- » **Reduces Operational Complexities and Promotes Ease of Doing Business**
 - The new rules are premised on **trust, self-regulation** and **non-intrusive monitoring** rather than enforced regulation.
 - Rules have been **simplified** by **doing away with several unnecessary approvals** (e.g. Unique Authorization Number, certificate of manufacturing and airworthiness etc.)
 - **Reduction in number of forms (from 25 to 5) and number of fee (from 72 to 4).**
 - **Quantum of fee** reduced to nominal levels and delinked with size of drones.
 - For e.g. the fee for a remote pilot license has been reduced to INR 100 for all categories of drones; and is valid for 10 years.
 - **To promote minimum human interference**, the rules provide for creation of a **Digital Sky Platform**
 - It will serve as a business friendly single-window online system that allows for various approvals to be generated automatically for manufacturers, importers etc.
 - **Interactive airspace map** with green, yellow and red zones shall be displayed on the digital sky platform within 30 days of publication of these rules.

- **Max penalty** for violation of the norms have been reduced to Rs 1 Lakh.
 - » **Foreign investment and imports in the sector** simplified-> **No restriction on foreign ownership** in Indian drone companies.
 - » **Coverage of drones under drone rules 2021**, increased from 300 kg to 500 kg. This will cover drone taxis as well.
 - » DGCA shall prescribe drone training requirements, oversee drone schools and provide pilot licenses online.
 - » **Safety Measures Ensured**
 - The central government will also be notifying the safety measures to be installed on a drone.
 - Some measures will include 'No permission - no takeoff (NPNT)', real-time tracking beacon, geo-fencing etc.
 - A six-month lead time will be provided to industries for compliance.
 - » **Infrastructure Improvement:**
 - **Drone corridors** will be developed for cargo deliveries.
 - » **Institutional Mechanism to promote the sector**
 - **Drone Promotion Council** will be set up by government with participation from academia, startups and other stakeholders to facilitate a growth oriented regulatory regime.
 - » Overall, these rules are expected to leverage India's capability in innovation, technology and engineering to develop India's Drone Sector.
- **Concerns and Way Forward**
- » The rules are vague on privacy infringement and may need to be tweaked to ensure that privacy concerns are not violated.
 - » The DGCA would also face technical challenges in integrating unmanned aircraft systems into India's National Unmanned aircraft system.
 - » With changes in technology, the drone regulation will need to change and hence this will necessarily remain a work in progress.
- **Conclusion**
- » The new rules definitely spell good news for the Drone Industry in India. But at the same time government should remain flexible to bring changes as and when new challenges appear in the system.

10. NEXT BOOKLET

- Roadways
- Railways
- Waterways
- Ports
- Energy