

1. Examine the factors that are causing stress in the civil aviation sector.

Introduction

The Civil Aviation Sector in India is a fast-growing industry and has recorded considerable growth in the last 30 years. India has the **third-largest aviation market** in terms of domestic passenger traffic. Further, It is projected that India would overtake the UK to become the third-largest air passenger (both Domestic and International) market by 2025.

Current Situation

- The civil aviation sector contributed USD 8.9 billion to India's GDP in 2014 and supported 1.31 million direct, indirect and induced aviation jobs.
- In 2016, the demand for domestic air travel was twice that in China.
- The World Economic Forum's **Global Competitiveness Report, 2018** ranks India as **53rd** out of 140 countries worldwide in air transport infrastructure

Factors causing stress in the civil aviation sector

- **Rising fuel prices and the depreciating rupee:** Oil for the airline industry is an important variable cost. As the price for oil has shot up, it had led to difficulties for airlines as they have not been able to absorb in the short term due to their business model.
- **Taxes on aviation turbine fuel (ATF):** Due to high taxes and lack of competition among providers, ATF is relatively expensive in India. Since it remains outside the GST network, there are also regional disparities in its price. The price of aviation fuel in India may be up to 60 per cent higher than prices in ASEAN and the Middle East countries because of high central and state taxes
- **Airlines' inability to balance volume and value:** The suffering for the sector is not a new one altogether. Over time, checks and balances should have been built in the system to absorb price shocks. The sector is confused as a whole on whether they want more volume or should they concentrate on a feasible plan that will help them keep their house in order.
- India's airlines have been trying so hard to capture market share that they've lost focus on making money. Indian aviation companies have been unable to value sustainability over volumes.
- **Inability to come up with a currency policy:** No airlines company has been able to devise a credible currency policy to protect them against sharp currency movements.
- **Capacity and infrastructure:** Inadequate hangar space and unavailability of land to expand airports at their current sites, particularly in major cities, are two of the major constraints that face the sector

- **Aviation safety:** Although the number of aviation safety violations in 2017 (337) has declined in comparison to 2016 (442), the absolute number remains high.
- **Skilled workers:** Shortage and gaps in the availability of industry-recognised skills – from airline pilots and crew to maintenance and ground handling personnel – could constrain the growth of different segments of the sector.

Way Forward

India needs to

- **Enhance aviation infrastructure:** Complete the planned airports under the UDAN initiative in a time-bound manner. A revival of 50 un-served and under-served airports/airstrips should be completed.
- **Address shortage of skilled manpower:** Promote collaboration between original equipment manufacturers (OEMs), industry and educational institutes to teach the latest concepts in the aviation industry including management principles, IT in aviation, etc
- Become a huge exporter of services as well, in terms of maintenance, repairs, and overhauls (MRO) services and other things
- **Ease the regulatory environment for airports:** Deregulate further and open up the aviation market to help increase passenger and freight traffic in India.
- Usher in amendments to Land Acquisition, Rehabilitation and Restructuring Act, 2013 and adopt “land-pooling” techniques to develop newer airports.
- Levy a lower Goods and Services Tax (GST) reasoning that “taxes add pressure on the airline’s bottom line”, thus aviation turbine fuel (ATF) needs to be brought under GST “at the earliest”.
- Airlines must try to reduce dependence on ATF by adopting biofuels and explore issuing masala bonds to raise funds for themselves.
- **Prioritize aviation safety:** Shift focus to pre-empting and preventing accidents/incidents. • There should be zero tolerance for safety violations.
- **Aviation Financing:** In the wake of falling rupee, airlines may not be able to continue with Sale and Leaseback (SLB) model due to reduced margins (on account of the expensive dollar). Thus, the model will fail to be sustainable in the long run. Therefore, establishing a domestic aircraft finance industry will require a long term vision and significant policy reforms, especially on the taxation front.
- The government may consider establishing a **Nabh Nirman Fund (NNF)** with a starting corpus of around \$2 billion to support low traffic airports in their initial phases.

Conclusion

The industry stakeholders should engage and collaborate with policymakers to implement efficient and rational decisions that would boost India's civil aviation industry. With the right policies and relentless focus on quality, cost and passenger interest, India would be well placed to achieve its vision of becoming the third-largest aviation market by 2025.

2. What is the Sagarmala project? What are its economic and strategic implications for India?

Introduction

In order to achieve port led development and develop coastal regions of country, government took up a unique initiative called Sagarmala project. It aims to exploit the Blue economy to achieve high growth and development of country.

Body

Components

- Port Modernization & New Port Development – extending the capacity of existing ports and developing new ports
- Port Connectivity Enhancement – improving port-hinterland connectivity, optimizing cost and time of cargo movement through multi-modal logistics solutions including domestic waterways
- Port-linked Industrialization – Developing industrial clusters close to ports and developing Coastal Economic Zones
- Coastal Community Development – Promoting sustainable development of coastal communities through skill development & livelihood generation activities, fisheries development, coastal tourism, etc.

Need for Sagarmala:

- India has a 7,517 km (4,670.84 miles) long coastline, 14,500 km (9,010 miles) of potentially navigable waterways, and strategic locations along major international maritime trade routes.
- Yet, the country has been unable to capitalize on its geography due to infrastructural and operational deficiencies.
- Data shows that despite its long coastline, India's coasts only contribute to 15 percent of national trade activity.
- For instance, the turnaround time (TAT) at major Indian ports in 2014-15 was about four days; the global benchmark is an average of 1-2 days.

Economic implications:

- Port development and modernization: New port infrastructure like better handling capacity, modernization etc will help improve the turnaround time of ships (From 2015-16 to 2017-18, it got reduced by 25%).
- Infrastructure- Development new infrastructure like new ports, road connectivity to ports, coastal economic zones (CEZs), multi-modal logistics parks etc.
- Reduced logistics cost- At present, logistics cost in the country is in the range of 14-16 per cent against 8-10 per cent in other countries. Sagarmala can help reduce these costs.
- Inter-connectivity: It leads to inter-connection between roadways, railways, water ways and airways, thus reducing the overall cost of transportation as well as improving connectivity.
- Employment: Provides employment opportunity to coastal area people and increase their standard of living. It is estimated to create an estimated 10 million new jobs (four million in direct employment).
- Development: Will help in development of regions around ports by increase in investment, new sectors presence like manufacturing, services etc.
- Efficiency: Will reduce the cost of transportation and make India a new transit hub. Developing rivers as inland waterways can also help save domestic logistics costs too.
- Export competitiveness- Sagarmala could help the country and industrial to gain competitive advantage compared to its neighbors. It is expected to boost India's merchandise exports to \$110 billion by 2025
- Power sector- The project aims to shift the movement of coal to the coastal route, which would cut down electricity costs by up to 35 percent, especially for coastal power plants in Andhra Pradesh and Karnataka, which receive coal by rail networks.
- Blue economy: Developed coastal infrastructure, livelihood development of coastal communities, exploitation of ocean resources will help improve India's Blue economy.
- FDI: It will also help in attracting foreign container companies to set up their facilities.

Strategic implications:

- Coastal security: It also enhances coastal security along with economic development.
- Check Chinese intrusion- The project is an effective way to counter China's Belt and Road Initiative (BRI) in the Indian Ocean region (IOR).
- ASEAN- With increasing ties with ASEAN countries, the importance of ports and port infrastructure further increases and Sagarmala can help address it.
- Efficiency: Will reduce in cost of transportation and make India a new transit hub.

Conclusion

Sagarmala project not only helps in port led development and trade but it will also enhance employment opportunity, increase foreign exchange earnings for country. The Britain ruled the world due to its Maritime power, India aiming for superpower status can utilize this opportunity to project its might among world countries.

3. The Indian Railways is facing stiff competition from the domestic airlines and highways. What measures can be taken to make railways more competitive?

Introduction:

Indian Railways has the fourth-largest rail network in the world after the United States, China and Russia. India's railway network is recognised as one of the largest railway systems in the world under single management.

Body:

In the last few decades, Indian railways have seen a fall in passenger and freight traffic due to shifting preference to other transport modes such as roads and air. The Economic Survey noted how railway passenger business declined by an average of 0.26% every year in the five years ending 2017-18, while the number of domestic air passengers rose 10% annually.

Reasons for stiff competition from domestic airlines and highways:

- **Convenience:** Roads have become more convenient for people for short distance.
- **Fares:** Upper-class fares face competition from low-cost airlines and AC bus fares.
- **UDAN:** the regional air connectivity scheme has expanded airport capacity more than five times to handle a billion airline trips per year. This has attracted upper-class rail travellers.
- **Better Service:** Airline services are faster, safer and more reliable with high customer-centric services.
- **Better last mile connectivity:** provided by road transports.
- **Railways' freight rates:** are already higher than other modes of transport for several commodities.
- **Large Road network:** India's road traffic is being expanded to 2,00,000 km with a capacity to carry 80% of the country's goods traffic. Trucks will clock much higher mobility, further facilitated by the GST regime.

Issues with Indian Railways:

- **Efficiency:** Low efficiency of the Railways in terms of the human resources it employs, and their capacity.
- **Safety:** has been one of the biggest concerns in the Indian Railways system.
- **Delay:** Due to technical, maintenance and climatic reasons.
- **Centralized decision making:** Railway zones have very limited powers with regard to raising their own revenue. Therefore, they are unable to contribute more effectively towards improving Railways' revenue.
- **Inadequate carrying capacity:** Passenger trains utilise two-thirds of capacity and generate only one-third of revenues.
- **High freight tariff:** leading to getting out-priced in market.
- **Low Service quality:** as compare to Airlines and private bus services.
- **Limited Freight Basket:** The freight basket is limited to certain bulk commodities, and heavy dependence on coal transport poses a risk to the business.
- **A vicious cycle for Railways:** Poor finances of Railways had led to low investment in infrastructure. Low investment means Railways' infrastructure and services take a hit (resulting in low speed, delays, and safety issues). Poor infrastructure and services result in loss of remunerative business for Railways which leads to further deterioration of finances.
- **Capacity Constraints:** The rail network currently faces huge capacity constraints, and the high-density network (a network that connects metros) has already reached saturation.

Measures to be taken:

- Use of LHB coaches for better safety and comfort.
- 100% electrification of tracks to save fuel.
- Start new trains on busy routes to tap the demand.
- Rationalize railway traffic as per efficiency and economic feasibility.
- Improve pre-board facilities such as hassle-free booking, clean station platforms, coaches and toilets, standardised packaged food, trains running on time, and so on. Beautify Railway station and provide world-class passenger amenities such as waiting lounge and high-speed internet.
- Provide for high-capacity, speedy, intercity passenger trains. Start more semi-high-speed train such as Humsafar, Tejas, Antodhaya and Uday.
- More dedicated freight corridors required.
- IR needs to perform as a corporate entity to carry the nation's freight and passengers adequately, efficiently and economically.
- Boost Non-Fare Revenues sources such as Rail Neer and Catering services. Can promote Train Branding which will include both external and internal advertising on trains.

- Integrate its rail network with other modes of transport and develop a multi-modal transportation network.

Conclusion:

Passenger and Freight transportation is the backbone of any economy. As we are moving for Bullet Train and Hyperloop, we should also make Indian railways more efficient and productive as it is far too important and strategic for the nation for better economic growth.

4. Examine the economic prospects of pipelines in India. What measures have been taken to expand pipeline networks in India? Examine.**Introduction:**

Transportation by pipelines is a rising development being preferred nowadays in India for cost-effective projects in various fields. Pipelines are most convenient, efficient and economical mode of transporting liquids like petroleum, petroleum products, natural gas, water, milk, etc. Even solids can also be transported through pipelines after converting them into slurry.

Body:**Economic prospects of pipelines in India:**

- **Extensive coverage and inclusion:** India has just completed its biggest city gas distribution (CGD) auction. This is expected to extend coverage to more than half of its 1.3 billion people across a third of the nation's area. This project aims to see 10 million homes linked to gas grids by 2020 and bring relief to smog filled cities.
- **Boost to the steel industry:** Steel pipe makers are set to become beneficiaries of India's \$10 billion push to expand its natural gas network with approx 12,500 kilometres of pipes within the next three to four years.
- **Domestic Business opportunity:** Low penetration of pipes, and government measures such as setting up the National Gas Grid and revamping the water and sanitation infrastructure using pipelines underground, provide a domestic business opportunity of more than 300 billion rupees (\$4 billion).
- **Reduced import costs:** While seeking to double the share of natural gas in the country's energy mix to 15 percent by 2030 and slashing emissions by a third, a gas-based economy helped by pipelines would help India be less reliant on crude oil imports by substituting the use of oil products in industrial and residential applications. A 10% replacement of liquid fuel into gas will reduce India's import bill by nearly \$3billion every year.

- **Foreign investment and domestic economy strengthening:** Several pipeline projects are providing opportunities of foreign investment and support, there by attracting global investments and domestic industry giants. For example: The Torrent Group is preparing to invest Rs 3,000 crores (US\$ 417 million) for installation of gas pipeline network in Uttar Pradesh. This gas pipeline network will be utilised for domestic, commercial and industrial consumers.
- **Transportation of solid materials and future prospects:** Nowadays solid minerals are being transported through pipelines too, cutting down on operating and transportation costs considerably. Ex: Iron ore in form of slurry from Kudremukh to Mangalore port, Rock phosphate from Malton mines to Debari smelter plant in Udaipur etc. Dairy industries in many countries like New Zealand are efficiently using pipelines to transport milk. Suitable infrastructure can be used similarly in India.
- **Economical construction and maintenance:** Low energy consumption and low maintenance costs. Additionally they can be built in difficult terrains, under water etc.
- **Reduction in accidental charges and economic efficiency in the long run:** Pipelines are safe, accident-free and environmental friendly.
- **Reduces regional disparity and helps economic growth:** The far inland location of refineries like Barauni, Mathura, Karnal and gas based fertiliser plants at Jagdishpur and other places could be thought of only because of pipelines.
- **Lesser delivery costs:** Pipeline delivery comparatively immunizes against inflation of transportation costs. Also, natural gas is less costly when compared with other conventional fuels.
- **Reduction in subsidy expenditure:** Most importantly, the gas grid project would bring down government subsidy to LPG. Also, siphoning of cylinders to black market would come to an end, thereby reducing corruption and misuse of the same.

Measures taken to expand pipeline networks in India:

- Pradhan Mantri Urja Ganga project: The gas pipeline project aims to provide piped cooking gas to residents of Varanasi and later to millions of people in states like Bihar, Jharkhand, West Bengal and Odisha. According to GAIL, with the Urja Ganga project, 20 lakh households will get PNG connections.
- Different pipeline projects across the country:
 - Barauni to Guwahati Pipeline- The pipeline will pass through the Bihar, West Bengal, Sikkim & Assam;
 - North East Region(NER) Gas Grid-It will pass through Assam, Sikkim, Mizoram, Manipur, Arunachal Pradesh, Tripura, Nagaland and Meghalaya in a phased manner;

- Kochi-Koottanad-Bangalore-Mangalore Pipeline (Phase-II): It will pass through Kerala and Tamil Nadu;
- Ennore-Thiruvallur-Bengaluru-Puducherry-Nagapatinam-Madurai-Tuticorin Pipeline (ETBPNMTPL): It will pass through the State of Tamil Nadu, Andhra Pradesh & Karnataka.
- India has 16,000 km of gas trunk pipelines in operation, and 13,000 km more approved and in various stages of construction. The PNGRB has awarded licenses to build city gas distribution networks across the country, targeting districts that cover about 70 percent of India's population.
- The central government is promoting a gas based economy which needs a massive network of pipelines for transportation of natural gas to various corners of the country.
- City Gas Distribution (CGD) Network: CGD refers to transportation or distribution of natural gas to consumers in domestic, commercial or industrial and transport sectors through a network of pipelines. Recently, the Indian Prime Minister laid Foundation Stones of City Gas Distribution (CGD) Projects in 65 Geographical Areas (GAs) in 129 Districts.
- Public Utility Status granted to CGD Projects by Ministry of Labour and Employment.

Challenges:

- High initial costs and inability to increase capacity once the pipeline is laid.
- Delays due to policy failure, non-cooperation of State Governments, or apprehensions of common citizens to adapt to pipeline supply.
- Difficulty in repair and leakage detection.

Conclusion:

Pipelines have relieved the increasing pressure on the existing surface transport system and can go a long way as the future of transportation of essential materials, especially as India is intending to move towards a gas-based economy by increasing the share of natural gas in India's energy basket from the current 6-7% to 15% by 2022. A robust and efficient policy for the same will not only ensure this, but also help in the overall economic growth of the country.

5. What is the BOT investment model? Is it suited for India's infrastructure sector? Critically comment.**Introduction**

BOT Investment model is a Public Private Partnership model where the private partner is responsible to design, build, operate (during the contracted period) and transfer back the facility to the public sector. Role of the private sector partner is to

bring the finance for the project and take the responsibility to construct and maintain it. In return, the public sector will allow it to collect revenue from the users.

Body

Advantages of BOT Investment model:

- **Discreet asset:** It is used to develop a discrete asset rather than a whole network and is generally entirely new or Greenfield in nature (although refurbishment may be involved).
- **Advantages of BOT for governments:** Include reduced development and infrastructure budget and transfer of risk to the concession company.
- **Advantages for the concession company:** Include better management of many construction risks, and possible countering of any adverse effects by benefits during operation.
- **Efficiency:** BOT provides a mechanism and incentives for enterprises to improve efficiency through performance-based contracts and output-oriented targets.
- **Competitive bidding:** The projects are conducted in a fully competitive bidding situation and are thus completed at the lowest possible cost.

Disadvantages of BOT Investment model:

- **Higher than debt cost:** There is a profit element in the equity portion of the financing, which is higher than the debt cost. This is the price paid for passing of the risk to the private sector
- **Long duration:** It may take a long time and considerable up front expenses to prepare and close a BOT financing deal as it involves multiple entities and requires a relatively complicated legal and institutional framework. There the BOT may not be suitable for small projects
- **Institutional framework:** It may take time to develop the necessary institutional capacity to ensure that the full benefits of BOT are realized, such as development and enforcement of transparent and fair bidding and evaluation procedures and the resolution of potential disputes during implementation.

Model that suits India's infrastructure sector:

The Hybrid Annuity Model (HAM):

- HAM is a mix of BOT Annuity and EPC (engineering, procurement and construction model) models. As per the design, the government will contribute to 40% of the project cost in the first five years through annual

payments (annuity). The remaining payment will be made on the basis of the assets created and the performance of the developer.

- Example: NHAI in India. The private player has no role in the road’s ownership, toll collection or maintenance (it is taken care of by the government)
- Hybrid annuity means the first 40% payment is made as fixed amount in five equal instalments whereas the remaining 60% is paid as variable annuity amount after the completion of the project depending upon the value of assets created.
- Advantage of HAM is that it gives enough liquidity to the developer and the financial risk is shared by the government.

Model	Financing	Revenue collection	Operation and maintenances
BOT model	Private entity	Private entity	Private entity
EPC model	Government	Government	Government
HAM	By private and Govt	Government	Private entity

Conclusion

HAM is a good trade-off, spreading the risk between developers and the Government. Moody’s also notes that the improving credit profiles of infrastructure developers are increasing their capacity to participate in PPP projects. However, their access to funding remains a key concern, with banks constrained by sector-specific exposure limits and existing stressed assets in their infrastructure portfolios.