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Growth of Indian Aviation: Management and Sustenance Strategy

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I. INTRODUCTION

A. History of Indian Aviation

The first Indian commercial flight was flown on February 18 in the year 1911from Allahabad to Naini by a French Pilot. The first Indian licensed commercial carrier was established in the year 1932 by "Jehangir RatanjiDadabhoy also known as the Father of Indian Aviation". Tata Airlines later changed to Air India in 1946, was located out of Mumbai and it carried both passengers and mail across all over India (IATA, 2011). The airline company 49% stake was later acquired by the government and was fully nationalized through "the Air Corporations Act, 1953"(IATA, 2011). With the commencement of the Air Corporations Act, the government gained control over Tata Airlines and the entire aviation sector was nationalized. Major milestones in the Aviation are shown in Table 1.

Table 1: Major Milestones in Indian Aviation

Year	Milestone
<1953	9 Airlines including Air India & Indian Airlines
1953	Introduction of the Air Corporation Act & Nationalization of all Private Air Carriers
1986	"Permitted to operate as Air Taxi Operators"
1994	"Private Players permitted to operate scheduled Air Carriers"
1997	First Greenfield PPP Airport developed in Cochin, India
2001	Aviation Turbine Fuel prices decontrolled
2003	India's "First low-cost Carrier Air Deccan" starts operations
2007	Jet Airways acquires Air Sahara, Kingfisher acquires Air Deccan
2012	The government allows direct Aviation Turbine Fuel imports. FDI allowed for foreign airlines to hold up to 49% stakes in scheduled and non-scheduled air transport services while NRIs are allowed to hold 100% stake in airlines.
2013	Singapore based Tiger air enters into an interline agreement with Spicejet.
2014	Ai Asia (a joint venture between Tata Sons, Malaysia's Air Asia Berhard and Arun Bhatia's Telestra Trade Place) and Vistara (a joint venture between Tata Sons & Singapore airlines) enter market
2014	Etihad Airways purchases 24% stake in Jet airways
2015	Indigo launches one of the largest IPO in Indian history.
2016	Jet Airways merge with Jetlite to complete its exit from LCC segment.

Source: Association of Private Airport Operation, 2018

The aviation sector is a dynamic sector that constantly adapts to changing market forces. As the world economy is becoming more connected with each other, the aviation sector has transformed into one of the fastest transportation sectors worldwide. It has "played a significant role in the rise in the tourism sector and economic growth especially in developing nations" (Usami et al., 2017, p.1). At the global stage, air travel has grown at a rapid pace. With the rise in living standards, low cost travels, emerging markets and growth in travel and tourism resulted in the demand for air travel. Airline business strategies and product offerings are evolving constantly, providing more value to travelers such as lower fares and increasing airline network connectivity.According to KPMG, India (Global Aviation Summit- 2019, Mumbai) "Aviation sector is one of the key drivers behind the globalization and development of the modern world". It has evolved and is expected to grow, mainly in regions such as India, China, and South-east Asia. The Asian market will fast grow to become one of the largest travel markets in the world (Boeing, 2017).

II. LITERATURE REVIEW

Researchers in the past have examined the relationship between the economic indicators and the aviation sector. For example, Raheja & Zhong (2018, p.1) investigated the connection between the Gross Domestic Product (GDP) of Singapore and its role in air passenger traffic. The study analyzed data from 1980 to 2015 and employed JohansenJuselius co-integration methodology, Engel-Granger procedure and Granger

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causality test to examine the relationship between GDP and air passenger traffic. The study highlighted the significance of airport development and the necessity to develop local airport infrastructure. On the other hand, Ohlan (2017, p.1)examinedthe relationshipbetween economic growth and the role of tourism in India for over a period of 1960-2014. The result indicates that economic growth, financial development, and tourism are co-integrated, that is, inbound tourism encourages economic growth both in the long-run and the short-run. In another study, aviation passengers' satisfaction and loyalty were examined as an outcome of airline service quality. The study collected participants' responses through personal interview using structured questionnaires based on which the study concluded that the aviation service quality of pre-flight, post-flight and in-flightservices had a "significant impact on passenger satisfaction and on passenger loyalty" (Namukasa, 2011, p.10).

An assessment was carried out by Hooper (1997, p.3) on the liberalization of the Indian aviation sector. He concluded that with the Air Corporation (Transfer of Undertakings and Repeal) act 1994, "the entry of new airlines resulted in a boom in air travel". Saraswati (2001)examined the civil aviation industry in India. He assessed that the civil airlines have transformed into an indispensable communication network necessity. The study also analyzed the history of Indian civil industry and the operating environment based on which the civil airline sector in the country is operating. Ishutkina&Hansman (2008)performed an investigation to understand the relationship between economic factors and the air transportation sector. The study also identifies the role of government in driving the relationship. The study identifies that there is a link between air travel of a country and its increase in GDP.

III. RESEARCH METHODOLOGY

Passenger, Freight and GDP data from world bank (worldbank.org) comprising of five decades i.e. from 1977-2017 wasstudied. It helped to analyze the growth of World and Indian GDP and compare the same with the growth of aviation. Simple statistical tools like average and percentage have been used for analysis. Existing literature on the subject was analyzed to identify the gap and formulate the recommendations. The scope is limited to Indian aviation only.

A. Decoding and Analysing the Growth of Indian Aviation

The civil aviation industry consists of several segments including "helicopter/seaplane services", "ground handling services", "maintenance and repair organizations", "flying training institutes", and "technical training institutions" (Director General of Civil Aviation, 2018). The airports in India are governed under the framework of "Airport Authority of India (AAI), Act". However, before the introduction of "AAI, Act" the construction and management of airstrips were maintained by the DGCA. The "Airport Authority of India" manages 125 airports (AAI report, 2017).The aviation has experienced unprecedented growth due to government reforms, modernization of airports, private air carriers, improvements in standards of service and adoption of low-cost carriers (Khurana, 2009). "The government has also played a large role in supporting growth in aviation by encouraging the private sector to become more involved in the construction of airports through Public Private Partnership models, and by providing state-level support in terms of permitting land allotment, financing, tax holidays and other incentives" (IBEF, 2018).

"The International Air Transport Association (IATA) has reported that the total annual passengers in India will increase to 367 million by 2034, and overtake the United Kingdom to become the 3rd largest market by 2031" (IBEF, 2018). This means not only aviation services will increase in coming years but it also suggests rise in demand for "Maintenance, Repairs, and Overhaul (MRO) services"(Vieira&Loures,2016,p.1).

As per vision 2040 for the Civil Aviation Industry in India presented by KPMG, India (Global Aviation Summit -16 January 2019) the passenger traffic within & to/ from India is expected to rise six fold to 1124 million passengers in FY 2040. This includes CAGR of 9% of domestic passengers to 821 million and CAGR of 7% of international passengers to 303 million passengers for the period 2018- 2040.

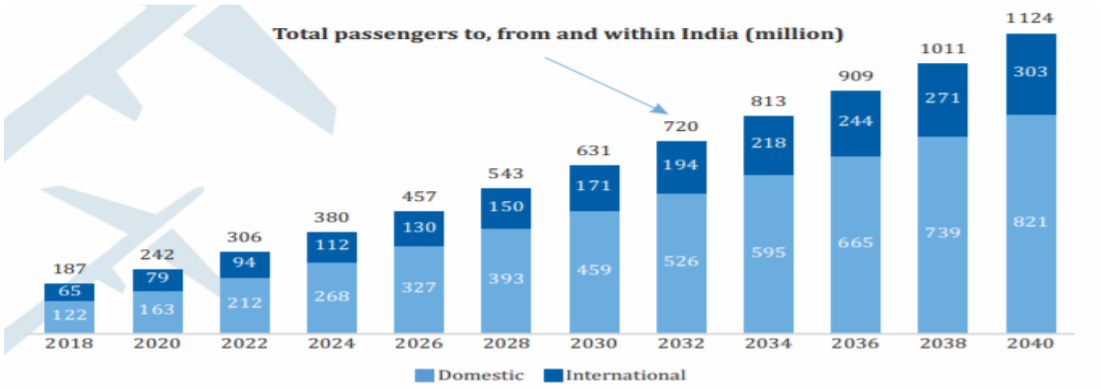


Fig. 1. Source. KPMG, India (Global Aviation Summit- 2019, Mumbai)

Aviation helps in connecting small communities to major cities which further enables stable and sustaining economic activities. Thus, airports and airlines acts as a catalyst to support growth of employment and global GDP. A comparison analysis has been conducted between GDP of World and Aviation Industry comprising of passengers carried and freight movement. The data of five decades (1977-2017) from world bank was used for the study. The analysis included comparing the growth every decade and presenting it in percentage form. The Carrier Departures, Passenger Traffic, Airport Freight along with the GDP of India was plotted on the same graph to see the comparison. On the face of it, it can be said that the growth in the aviation industry and world GDP have increased simultaneously.

IV. RESULTS AND DISCUSSION

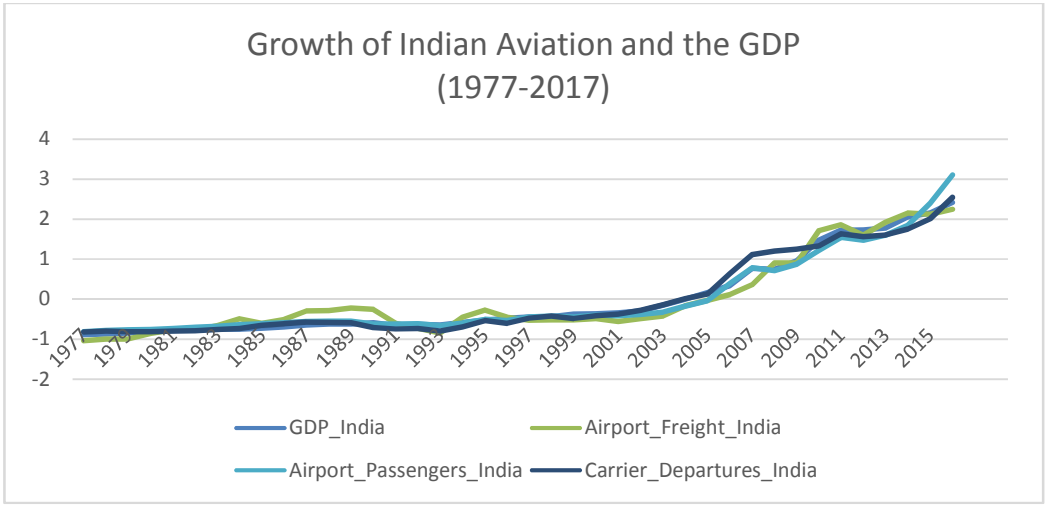


Table 2: Comparison of India's GDP and the Aviation Industry from the year 1977-2017

Year	GDP (current US$) in Trillion	% Growth	Passengers	% Growth	Freight (million ton-km)	% Growth
1977	0.12		5147500		276	
1987	0.28	129.68	12668600	146.11	645	133.69
1997	0.41	49.03	16039800	26.61	528	-18.13
2007	1.2	192.72	51897450	223.55	968	83.33
2017	2.6	116.25	139822450	169.42	2407	148.65
Source: World Bank report, 2017						

India's growing GDP and eagerness to implement new reforms have resulted in major investments, entry of new carriers and launch of new destinations by existing airlines. In the year 1977, India's GDP was 0.12 trillion US$ and "India's passenger and freight movement was 51,47,500 and 276 million ton-km respectively. In the last decade (2008-2017) India's GDP grew at 116% when the world grew at 39%. In

the same decade, Indian Passengers grew at 169% when the total passengers in the world grew at 80%. A comparison analysis has been conducted between the GDP of India and Aviation Industry of India comprising of passengers carried and freight movement. The data comprises of five decades i.e., from 1977-2017 which clearly indicates that the increase in GDP through the subsequent years has also seen a corresponding increase in air travel and air freight. Therefore, there is a correlation between a country's GDP and the increase in passengers and freight movement.

Table 3: Comparison of World's GDP and the Aviation Industry from the year 1977-2017

Year	GDP (current US$) in Trillion	% Growth	Passengers	% Growth	Freight (million ton-km)	% Growth
1977	7.26		513269292		21323	
1987	17.1	135.67	904838104	76.28	45393	112.88
1997	31.43	83.78	1455104192	60.81	102876	126.63
2007	57.83	84	2209136496	51.81	158206	53.78
2017	80.68	39.51	3978849402	80.10	213590	35.00
Source: World Bank report, 2017						

A. Relationship between India's GDP Growth and Growth in Airline Passengers

Table 4: Correlation between India's Growth in GDP and increase in Passenger movement

Pearson Correlation Analysis		Growth of India's GDP	Growth in Aviation Passenger of India
Growth of India's GDP	Pearson Correlation	1	.984**
	Sig. (2-tailed)		.000
	N	41	41
Growth in Aviation Passenger of India	Pearson Correlation	.984**	1
	Sig. (2-tailed)	.000	
	N	41	41
**. Correlation is significant at the 0.01 level (2-tailed).			

From the above table, it can be seen that thePearson Correlation Analysis conducted between Growth in GDP of India and Airline Passenger movement indicates a positive relationship between Growth in GDP of India and an increase in Airline Passenger Movement (r=.984). The finding also indicates that there is a statistically significant relation between India's Growth in GDP and increase in Airline Passenger Movement i.e. increases or decreases in one variable do significantly relate to increases or decreases in the other variable(***r* = .984, *n* = 41, *p* = .000).**

Table 5: Correlation between India's Growth in GDP and increase in Freight movement

Pearson Correlation Analysis		Growth of India's GDP	Growth in Freight Movement of India
Growth of India's GDP	Pearson Correlation	1	.983**
	Sig. (2-tailed)		.000
	N	41	41
Growth in Freight Movement of India	Pearson Correlation	.983**	1
	Sig. (2-tailed)	.000	
	N	41	41
**. Correlation is significant at the 0.01 level (2-tailed).			

From the above table, it can be seen that Pearson Correlation Analysis conducted between Growth in GDP of India and Airline Freight movement indicates a positive relationship between Growth in GDP of India and an increase in Airline FreightMovement (r=.983). The finding also indicates that there is a statistically significant relation between India's Growth in GDP and increase in Airline FreightMovement i.e. increases or decreases in one variable do significantly relate to increases or decreases in the other variable(***r* = .983, *n* = 41, *p* = .000).**

The data tends to suggest that there is a correlation between a country's GDP growth and the increase in airline passengers and freight movement. On analyzing the correlation analysis of passenger growth and freight movement to the growth of GDP it is seen that, country's GDP is directly

proportional to the growth of aviation. Indian aviation has constantly contributed in larger proportions to the GDP of the country as well as the world.

- **Reasons for Aviation Growth in India:** Rise in household incomes (Growth in GDP and Producer Price Index or the PPI), economic growth, tourist movement, the evolution of Low-Cost Carriers, FDI inflows in domestic airlines and increase in freight movement are some factors which have contributed towards this growth. The growth is further accentuated with the enhanced safety of modern aviation compared to older times, modern airports with cutting-edge IT technologies and supporting government aviation policies. India's National Civil Aviation Policy (NCAP) 2016, aims to provide an ecosystem for harmonized growth. National Policy on FDI on airports and airlines and the proposed regional connectivity would further increase freight and passenger movement in India.

V.MANAGING AND SUSTAINING THE GROWTH OF INDIAN AVIATION: SOME SUGGESTIONSINFRASTRUCTURE PLANNING

Table 5: Rise in Passenger Travel Movement

Ranking by International seats Per Capita of 20 Largest markets				**Ranking by Domestic seats Per Capita of 20 Largest markets**			
UAE	21.30	Malaysia	1.80	Norway	5.24	France	0.49
Singapore	13.31	Canada	1.62	Australia	3.50	Thailand	0.43
Hong Kong	11.01	South Korea	1.34	USA	2.59	Germany	0.43
Switzerland	7.02	Thailand	1.09	Canada	1.57	UK	0.42
Netherlands	4.35	Turkey	1.0	Japan	1.18	Indonesia	0.41
UK	3.74	USA	0.71	Malaysia	1.04	Russian Federation	0.38
Spain & Canary Islands	3.40	Japan	0.67	Spain & Canary Islands	0.81	Mexico	0.36
Germany	2.76	Russian Federation	0.46	Brazil	0.65	China	0.34
France	2.15	China	.09	Turkey	0.64	Philippines	0.30
Italy	1.95	India	.04	Italy	0.59	India	0.07
Source: CAPA, India. Airport Modernization Conference, Bangalore, Aug 2018.							

As per the **Ranking by International and domestic seats Per Capita of 20 largest markets,** the leaders are UAE and Norway respectively. India stands at number 20 and a GAGR of 12.4% is expected in the aviation sector. This portends the potential growth of aviation in India. The much talked about growth cannot be supported by only airplanes and more passengers but the allied factors of aviation like airspace and infrastructure are also to be factored. Most of the times, discussion on Infrastructure is restricted to the airport infrastructure in terms of the bigger airport and a greater number of runways but in terms of aviation, the infrastructure also means, accessibility from the catchment area to the airport. In most of the times, the focus is only on the airport infrastructure but not the accessibility to the airport. For example, to ease access to the New Hyderabad International, Narasimha Rao Road was planned. However, when the airport started operating the access bridge to the airport was not complete causing inconvenience to the passengers as well to the residents of the catchment area. As per preparatory survey (2017) by Japan International Cooperation Agency for Mumbai Metropolitan Region Development Authority towards Trans harbourLink, afreeway grade road bridge spanning 21.8 km is under-construction which would connect the city of Mumbai to the NEW Greenfield "Navi Mumbai International Airport (NMIA)". Any delay in the completion of the project will affect the projected and desired growth. On similar lines, when the Bangalore International Airport started operating in 2008, the access road to the airport was not ready. It took another four years for the access road constructed by NHAI to be ready (National Highway Authority of India, 2012). When the road was operational, it disregarded the existence of another airport in the catchment area. The operations of Jakkur airport (Bangalore) which has existed from1948 was not catered to in planning the elevated highway to the BIAL as per SO 84 E. The only flying school in "Karnataka" is based in Jakkur airport. Owing to this non-inclusive infrastructural planning, more than 40% of infrastructure (Runway) at Jakkur is unusable. Thus, the existence of one aviation infrastructure threatened the existence of another aviation infrastructure in its catchment area. Hence to support the

aviation growth the relevance of infrastructure cannot be restricted only to airports. Infrastructure inside and outside the airport is also important. Efforts should be made for inclusive infrastructure planning and timely completion of infrastructure allied to aviation.

A. Manpower

Table 6: Forecast: Manpower Requirements for Indian Aviation

Category	**FY 2017**	**2027**	**% increase in 2027**
airports and airspace staffing requirements	129,006	266,488	107
commercial airline pilots	6772	16,802	148
Cabin crew	11,000	26,325	139
maintenance engineers	14,220	34,972	146
airport operations and management	37,150	62,304	68
ground handling	31,252	61,194	96
cargo/warehousing	20,021	32,613	63
ATC/CNS manpower	5,406	14,000	159
Source: CAPA, India, 2017			

According to "Report by Working Group on Civil Aviation, Ministry of civil aviation (Twelfth Five-Year Plan 2012-17)", Air India will add 40 aircraft, Go Air will add 22 aircraft, SpiceJet 68 aircraft, IndiGo 69, and Jet Airways & Jet Lite combined will add 109 aircraft by 2017. As per CAPA reports, there are over 7000 pilots for a combined fleet of 600 airplanes in Indian Aviation. There is a shortage of about 250- 275 pilots. As per the orders placed by Indian aviation players, 1,100 aircraft will join the aviation scape in India in next 7-8 years and that would require an additional 10,000 pilots. These figures do not reflect the requirements of private jets, regional players and charter aircraft. Hence there is relatively less number of "Pilots" especially pilots in command/ Captain/ commander. The shortage is more pronounced for twin-aisle aircraft which at present is operated only by Air India and Jet Airways. The shortage of pilots is met by hiring expats pilots whose salary is at least 25% more than Indian pilots incurring additional expenditure to the operators. As per the statement of Mr. Jayant Sinha (MoSCA, 2017), 249 foreign (expat) pilots are currently employed in the industry. For non-scheduled operators around 120 expat pilots work. He further advised that the Indian operators should train Indian pilots rather than depend on foreign pilots so that the dependence on expat pilots can reduce in the future. The deadline for 'foreign aircrew temporary authorization' (FATA) has been temporarily extended again to the end of 31stDec 2020 (DGCA, 2017). As the past trend shows, this deadline is unlikely going to be the final one as there are just not enough pilot-in-command to fly the ordered airplanes of the future. CAPA projects tenfold increase in passenger traffic in India in 2025 as compared to the 2015 figures. This means an increase of 207 % in passenger traffic in ten years. The rate of growth of aviation in terms and cargo and passengers is comparatively more than the projected growth of manpower requirements. This also shows that, as the aviation grows, the growth of opportunities is not linear as many more sectors get associated with aviation. New opportunities for additional employment are generated in Non-aviation sectors at an airport like hotels, entertainment, food &beverages, etc. Similarly, the increase in the requirement of ATC/ CNS personnel is attributed to increased aviation safety needs and allied equipment and the use of new technology. In the next 10 years"close to 2.6 million direct, indirect and induced jobs would be generated by India's aviation industry"(CAPA, 2017). According to CAPA, "the current staffing, as in FY 2017 is 1,97,309 which is expected to reach 4,32,021 by FY 27 and all of this would be direct jobs" (CAPA, 2017).The estimates are encouraging for Indian economy but the moot question comes to fore- 'Where and how do you train this manpower?

At present, there are few institutes of national repute (IIM-B, UPES) where aviation management professionals are trained. As a national policy under the Ministry of HRD, the government should start courses in Aviation Management in Institutes of repute rather than depending on market forces. An organized system of education like the engineering or medical sciences would ensure the standardized format of training and availability of quality manpower. Collaborations with industry would ensure meeting the market demand and the required dynamic changes in syllabi.According to the latest data, there are 32 flying schools/ clubs under the government subsidy scheme. There are 12 private flying schools too. The number of schools looks good but they cannot cater to the requirement of more pilots-in-command. These clubs generally fly small trainer airplanes such as Cessna/ Piper, Puspak or Swati class

which are outdated and not much in use. They are generally single-engine piston aircraft which caters to basics of flying. The clubs are plagued with lack of quality flying instructors, availability of spares and lack of adequate maintenance engineers. These clubs as a matter of nature, produce only co-pilots for the Indian aviation industry. These pilots once employed learn to fly modern day big jets and accumulate flying experience towards becoming pilots-in-command. In most of the cases, the airline or the operator spends money in training these pilots for the commander's job. The money spent is mortgaged against a bond of continuation. The pilots are further trained in these modern jet simulators in Singapore, Abu Dhabi, Dubai, USA or Canada. Very few simulators are available in India. It takes an average, 8 to10 years for a person who starts flying in a club to attaining the qualification of a modern-day jet aircraft. The process is very lengthy. As a consequent, many Indians train in flying clubs abroad. Cost pilot training in India is at least 20 % to 30 % more when compared to the USA, Canada, New Zealand, and Australia. The duration of training is also prolonged when compared to other stated parts of the world. Hence it can be said that there is a requirement to set quality basic pilot academies in India with better aircraft. All the clubs are inspected and audited by DGCA. Instead of many clubs across India, collaborative and consolidated effort amongst clubs can ensure centralized and standardized training could be imparted to future pilots.

Further to this, setting up of simulator training centers is required in India in collaboration with the aircraft manufacturer. The Government can give special tax rebate/ discount to companies who set up such centers. The operating cost for airlines would reduce if the commanders are trained in India. This would also save the country from Indian money being spent abroad.

B. Airports Economic Regulatory Authority (AERA)

Consultations with non-government agencies towards any policymaking have been notional with no obligationsso far. As a rule of law and not a convention, a representative from IATA, ACI, private airports, airline, non-scheduled operators and representative of private ground handling agencies should be members of any policy-making the body of Aviation ministry. Since aviation is highly regulated, it is but natural that the policies have to guide the organized growth of aviation and allied sectors.

In 1994, "Airports Authority of India Act, 1994 (AAI Act)" was amended. Airport-related activities through Public-Private Partnership (PPP) model was allowed. AERA Act or Airports Economic Regulatory Authority Act of 2008 resulted in an independent body being established for economic guidelines of major airports. "Powers and functions of the Airports Economic RegulatoryAuthority (AERA) were notified" and established vide GoInotification no. GSR 317 (E) dated 12.05.09. Some suggested points to sustain the aviation are enumerated below.

"For those airports not under the mandate of AERA, it is both the operator as well as the regulator. An independent regulator is required. It has regulatory overlap in many areas with DGCA e.g. slot allocation, the height of buildings in proximity to airports, etc. Overlap with AAI needs to be addressed"

Limited mandate: "AERA's mandate is limited to major airports. It monitors service standards but has no powers of enforcement. The section pertaining to the establishment of the Appellate Authority is not notified".

"Slot allocation and route dispersal are economic issues and should come under AERA".

The Return of Returns (ROR) is capped by AERA but it does not consider the cost of construction of the airport. ROR, as mandated by AERA, is the same for an AAI airport (constructed at a higher cost) or a private/ PPP airport (constructed efficiently at lower cost)

In PPP model airport, "the accounts and thereby the comments on functioning is done by Comptroller and Auditor General of India (CAG)". This is done even if the state (Central or State Govt.) has a miniscule share. This unwanted interference in the functioning of the airports build under the PPP models affects the efficiency and is anti-thesis to private equity and management style in the field of aviation.

C. Air Navigation Services (ANS)/ Air Traffic Control (ATC)

"The Ministry of Civil Aviation manages the civilian airspace and provides air traffic services through AAI for flights operating at civil aerodromes (i.e.125 out of 130 airports, although 50 of these are idle). The Air navigation services (ANS) for all the airports in India whether it is private or AAI is provided only by AAI, a government organization. Being the lone player in the field as an Air Navigation Service provider (ANSP), AAI is stressed in terms of its resources to cope with the unprecedented growth of aviation in India. Lack of adequate technical team in the field and lack of training center in adequate numbers will affect Indian aviation in the long run.

"Over the last decade, scheduled aircraft movements (number of flights) have more than doubled from 718,000 to more than 1.6 million in 2015, supplemented by a further 281,000 general aviation movements. In addition to arriving and departing movements, the Indian airspace handles approximately 400,000 annual over-flight movements. CAPA projects that "Indian passenger traffic will almost triple in size within 10 years (i.e. from 7.1 crores in FY15 to 21.8 crores in FY25)".

It is suggested that the ANS be privatized in some sectors. Induction of private players would cater to the shortage of trained manpower. The security concerns on the employment of private players could always be addressed by proper screening and security clearances. Sustainable and long-term model of engaging private player or using the PPP formula would support the growth. The private ANS providers would focus more on efficient training, R&D, infrastructure and effective procedures. The benefits accrued by private ANSP operators would be:

"Benchmarked operations and management practices as the best in the world would compete".

The ANS infrastructure would be upgraded to the latest available technology.

Latest Air Traffic Flow management system would synergize the airspace/airports capacity and anticipated Growth in Traffic.

Reduction in emission and fuel saving due to direct routing of aircraft.

Enhanced operational efficiency.

Reduced stress levels of controllers.

Cost-effectiveness of aircraft operations.

Enhanced Efficiency and Safety in general.

D. NCAP 2016

Compared to the domestic sector, the international sector is more profitable as the number of players is less and the destinations many. Since international travels are subject to many rules like time bound visa, the travel dates once fixed are generally not changed. Hence the date of travel is largely immune to the cost of tickets. With the globalization of business, there has been sizeable growth in international traffic over the past decade. The growth in the international sector continues. In 2004 the aviation rules mandated that an airline could fly international only if it had a fleet of 20 airplanes and had operated in the domestic sector for five years. It was called the 5/20 rule. In 2016, the 5/20 rule was changed.

As per National civil aviation policy 2016, "an airline could start international operations if it could deploy 20 aircraft or 20 % of an average number of seats on all departures (whichever is higher), in domestic sectors". To promote domestic tourism as well as regional connectivity, NCAP 2016 introduced regional connectivity scheme (RCS). As per the plan, Central and state governments concessions would support the airlines who provide subsidized rates in chosen RCS sectors through. 43 initial proposals by various Air operators for RCS have been received by AAI.

The 20 % seats required to qualify for the international route cannot support the RCS of NCAP 2016. To support domestic sector and RCS, it is felt that, 20 % of seats in domestic operations is too less. It is recommended that "at least 20 aircraft or 40 % of an average number of seats on all departures (whichever is higher) should be used for calculating the eligibility for international operations". Moreover, a minimum of 3% out of 40% should be on RCS routes. The figure can be revised incrementally after analyzing the number of passengers in RCS routes and actual impact. "Such a change in policy would give impetus to the domestic sector and would improve connectivity to tier II and tier III cities/towns". The recommended change in policy would generate more employment and bring in associated economic growthand development in remote and far-flung areas.

E. Airspace

Routes	Fuel tobe saved (Kg)	Amount tobe saved (Rs)	Revenue per flight (Rs)	Savings	
				Time (mins)	As % of revenue
Ahmedabad- Hyderabac	470	35,800	810,000	15	4.0-5.0
Mumbai- Amritsar	430	32,700	891,000	13	3.5-4.0
Chennai-Ahmedabad	285	21,600	567,000	9	3.5-4.0
Kabul-Delhi	230	17,500	1,449,000	8	2.0-3.0

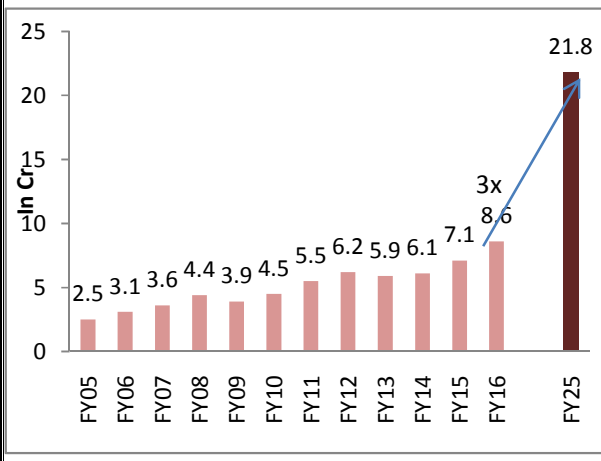
Figure 6: Saving per flight under FUA [**Source:IATA, 2017**]

The airspace of the country is divided between defense and the civil. Only civil airspace is used for all civil aviation traffic. This gives rise to many restricted and prohibited airspace. At present, for defense use, 35 % of Indian airspace is earmarked and it restricts its use by civil aircraft. Airspace is one of the biggest constraints for aviation growth.

"In terms of airspace in India, out of a total airspace area of 10.5 lakh square nautical miles over land, 3.7 lakh square nautical miles (more than 35% of the Indian airspace) has been earmarked for defense use, which does create challenges for commercial operations. In case of Delhi, approximately 70% of the total airspace is reserved for military use. In such a scenario, many navigational routes are not aligned along the shortest flight passage between airports and require commercial flights to take circuitous paths that account for additional fuel and time. Some of the busier routes where airlines want direct routing using flexible use of airspace (FUA) are Delhi-Mumbai, Delhi-Kolkata, Delhi–Chennai, Delhi-Hyderabad, Kolkata-Chennai, Chennai-Mumbai, Ahmedabad-Bangalore, Hyderabad-Pune, Ahmedabad-Hyderabad, Ahmedabad-Dubai, and Ahmedabad-Muscat. In case of international flights like Ahmedabad-Dubai, carriers also have to incur $500 per flight for using Pakistani airspace due to restricted airspace in Gujarat around Bhavnagar".

Table 7: Seat Per Capita

The trend in Growth of Passenger traffic



Capacity Status Vs. Traffic Status of 12 top Airports in India

Airport	Pax (In cr)	Share (%)	Capacity	Current Express Capacity
Delhi	4.8	21.6	6.0	1.16
Mumbai	4.2	18.6	4.0	-0.17
Bangalore	1.9	8.5	2.0	0.1
Chennai	1.5	6.8	2.3	0.78
Kolkata	1.2	5.6	2.4	1.16
Hyderabad	1.2	5.5	1.2	-0.04
Cochin	0.8	3.5	1.3	0.53
Ahmedabad	0.6	2.9	1.4	0.75
Pune	0.5	2.4	0.4	-0.15
Goa	0.5	2.4	0.5	-0.05
Trivandrum	0.3	1.6	1.4	1.05
Lucknow	0.3	1.4	0.3	-0.02

Source: CAPA, India, 2017

The responsibility of Air Defense (AD) of Indian airspace rests with the defense, primarily the IAF. Hence Flexi Use of Airspace (FUA) concept is mooted to mitigate this constraint. In the FUA concept, the airspace is shared equally between civil and military based on its availability for optimization. FUA concept is applied to a few areas in the country and it can be implemented to part of airspace too. With FUA in use, many civil aircraft would be flying over otherwise restricted military airspace. This requires dynamic monitoring of traffic by defense AD radars. Civil radar repeaters could be placed in IAF bases and AD centers. To cater to this additional task, the civil radar controllers can also be trained in the basics of Air Defense and as a consequent, they can also contribute to overall AD coverage and management of FUA.

VI. CONCLUSION

India has witnessed unprecedented growth in the aviation sector. This sector has globally contributed to the country's economy. According to the study made by ICAO, "the output multiplier and employment multiplier are 3.25 and 6.10 respectively in aviation sector" (ICAO, 2017). Certain factors attributable to this growth are explained in the present study but there are many factors which cannot be explained

linearly. In many sectors associated with aviation additional employment has been generated. In India, it is seen that the projected manpower requirement of the aviation sector and consequently the employment opportunity is more than that projected by ICAO (CAPA, 2017). As per NCAP 2016, the Government of India's aim to provide an ecosystem for harmonized growth has to be planned well. Making policy is good but the policy is as good as its execution.

The growth story of India cannot be decided by "market forces" only since aviation is highly regulated by international rules and by obligation, national rules, the growth has to be supported by correct government policies. The policies cannot be confined to only the conceptual framework but the policies should be more practical and tangible for the aviation industry to follow (Nagpal &Saranga, 2017). A researched policy would help in the strategic growth of this industry; this would contribute towards the GDP of the country. A policy can be executed if all the markers and tangibles are planned well in advance. If India wants to sustain this unprecedented growth in Aviation and reap its benefits, an inclusive approach has to be adopted towards the progress of Airports, GeneralAviation, Aerospace Manufacturing, Cargo, MRO, Airlines, Skill Development, and infrastructure development. Since any policy is as good as its execution, all the aviation growth markers and tangibles should be planned well in advance. The growth of aviation in Indian skies cannot be restricted to just the number of aeroplanes and bigger airport but it has to be more inclusive with efficient management and planning.

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