

# Analyzing India's National Civil Aviation Policy and Global Trends in Contemporary Civil Aviation Policies

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## **ABSTRACT**

The expansion of the Indian economy is expected to extend to remote regions, and while market-driven processes are ideal for regional air connectivity, there is recognition of the valuable role of public policy in this endeavor. The UDAN Scheme follows a market-oriented approach where operators assess demand, propose routes, and navigate variables like traffic rights, slot allocation, regulatory restrictions, and infrastructure limitations. Global airline industry deregulation has introduced healthy competition, enhancing efficiency and service quality, leading to increased passenger traffic. Studies have highlighted the constructive impact of improved air connectivity on the economic development of regions. Efficient airports are vital economic catalysts, but research suggests that some regional airports operate inefficiently, missing opportunities for profitability.

Government subsidies and policies for enhancing regional and remote air connectivity are common practices worldwide, with schemes like EAS in the United State and PSO in Europe bridging the accessibility gap. Research is crucial to understand policy effects on air connectivity and identify factors that improve outcomes. Route dispersal guidelines, such as those in India, can create financial redistribution between route categories, affecting airlines' profitability and serving state capitals over remote regions. Policymakers must find effective ways to enhance air transport to underserved areas where market dynamics might not naturally establish viable transportation links.

In summary, this study emphasizes the importance of government-supported policies like UDAN and the role of market-oriented approaches in promoting regional air connectivity. It underlines the need for research to assess policy impacts and identifies the challenges and opportunities in enhancing air connectivity to remote and underserved regions.

**Keywords:** UDAN Scheme, National Civil Aviation Policy, Regional Connectivity Scheme, Domestic, air travel subsidy

## **Introduction**

### **1.1 Overview**

As the Indian economy continues to expand, it is anticipated that the growth driven by increased consumption in major metropolitan areas will gradually extend to more remote regions (Ministry of Civil Aviation, 2017). While the most optimal scenario for fostering sector growth and establishing regional air connectivity involves market-driven processes, including airlines assessing demand on different routes, building networks by deploying suitable capacities and technologies, and synchronizing

infrastructure development with demand, there is a recognition that promoting regional air connectivity is a valuable goal from a public policy standpoint (Ministry of Civil Aviation, 2017).

The implementation of this UDAN Scheme is to follow a market-oriented approach. Under this approach, operators will evaluate the demand for specific routes, submit proposals to operate and provide connectivity for those routes. Availability of traffic rights (via bilateral air service agreements or open skies treaties), the slot allocation regime, regulatory restrictions on airport use by airlines (e.g. traffic distribution rules or local rules in the slot allocation) and infrastructure restrictions (e.g. runway length or gate positions) are variables that determine/influence market access levels (Burghouwt, 2017). (Amit Kumar Das, 2020) refers to research scholars to inform that global deregulation of airline industries has introduced healthy competition in the free-market landscape. This shift towards competition has not only enhanced efficiency but also raised the bar for service quality. Furthermore, it has facilitated the success of entrepreneurial endeavors, ultimately fueling the expansion of commercial aviation. As a result, the volume of passenger traffic has witnessed significant growth, primarily attributed to factors such as the introduction of new flight routes, reduced airfares, increased flight frequencies, and a broader array of travel options. This positive transformation in air travel has been substantiated by numerous studies, which have highlighted the constructive impact of improved air connectivity on the economic development of regions.

## 1.2 Background

In India the government has a bigger role to play in terms of setting the policy thereby providing a cushioning support to the airline industry. The Regional Connectivity Fund (RCF) will be financed through a departure fee imposed on most domestic flights, with specific exceptions. This levy will not apply to flights that are operating on flight connecting unserved or underserved airports as defined by the government. The Ministry of Civil Aviation (MoCA) will determine the fee rates. The RCF aims to use the funds generated from this fee to support growth and development in the aviation sector. Operators serving domestic routes subject to this fee will be eligible for benefits under a designated service scheme (K.Chandrashekar Iyer, 2019).

(Amit Kumar Das, 2020) refers to their work that there exist areas in every nation that airlines tend to neglect because of the commercial infeasibility of their operations. In such cases, ensuring air connectivity to these underserved regions may involve government subsidies or cross-subsidization in accordance with established policy regulations. Government support for enhancing regional and remote air connectivity is a common practice in various countries. For example, the United States employs the Essential Air Services (EAS), Europe utilizes Public Service Obligations (PSO), and Australia has the Remote Air Subsidy Scheme (RASS), all of which have been operational for an extended period. These schemes aim to bridge the accessibility gap and facilitate air travel in areas that might otherwise be commercially unattractive to airlines.

(Xavier Fagedaa, 2018) proposes that route dispersal guidelines program involves a financial redistribution mechanism between different route categories, where airlines experience losses when operating in Category II airports but are allowed to charge higher fares on Category I routes. Civil aviation Policy also mandates that airlines with larger aircraft must operate on Category II routes, which creates obstacles for specialized regional carriers that could offer more efficient flights with smaller aircraft. Moreover, airlines tend to prioritize more profitable routes by following a selective approach, serving mainly state capitals in Categories II and III airports.

This challenge is primarily due to the inherent cost structure of air transport, which involves significant

fixed operating costs, making it feasible only at relatively high levels of passenger traffic. Achieving cost efficiencies through economies of scale is particularly challenging for routes to and from remote areas. (Xavier Fageda, 2019) is helping to classify the various types of public policies that can be implemented by the government to support the airline industry with financial support as follows.

#### **1.4 Research Hypotheses**

In an era where global connectivity and economic vitality are increasingly interdependent, a comprehensive analysis of the National Civil Aviation Policy becomes paramount to ascertain its significance and explore how it can be leveraged to enhance regional development, accessibility, and economic prosperity.

**To critically evaluate the effectiveness and impact of policies designed to enhance air connectivity promotion.**

To conduct a thorough examination of the current global policies utilized for establishing air connectivity in remote areas. There are route-based policies, passenger-based policies, airline-based policies and airport-based policies. Currently, the policy followed in India is a route-based policy with traffic distribution rules. This involves airlines being awarded routes to un-served and underserved routes on a bidding basis. The study will help us to understand that the route-based policy is the best suited for the domestic aviation sector.

**To study the impact of the RCS (Regional Connectivity Scheme) scheme on the Indian aviation industry while also examining the current challenges and identifying opportunities to enhance regional connectivity.**

A study will be conducted to understand the impact of the Regional Connectivity Scheme on the Indian aviation domestic sector. The study will also include the analysis of parameters such as comparison of critical airline variable such as passenger movement data, passenger load factor. This comparative study will also help to understand the performance of RCS and non- RCS flights.

## **2 Literature Review**

(Xavier Fageda, 2018) argues that the imposition of Public Service Obligations (PSOs) on specific air routes stands as a prevalent and effective policy instrument for connecting and serving isolated communities globally. This approach has found application in countries with fully deregulated aviation markets, playing a pivotal role in addressing connectivity challenges.

(K.Chandrashekar Iyer, 2019) aims to provide a comprehensive understanding of the business model associated with RCS (Regional Connectivity Scheme) in the aviation sector, its impact, and the opportunities and challenges it presents. In order to assess the scheme's effects on Indian airports, the author has done a performance analysis using Data Envelopment Analysis. The author also there is a dearth of research in air transport in remote regions of India.

According to (Yadav, 2018) initially there were only very few scheduled airline operators and also some non-scheduled airline operators. Such smaller airlines were able to enter the Indian aviation industry through the support of regional connectivity scheme. The author argues that in the subsequent regional connectivity schemes that were launched, helicopter operations were also introduced due to the introduction of better Viability Gap Funding (VGF).

The author (Yadav, 2018) also mentions that one of the reasons for the government to introduce the subsidized transport is lack of critical infrastructure, which includes airports in remote areas lacking operational readiness, a shortage of landing areas at private airports in major cities, lack of pilots,

unfavorable regulations, and lack of reforms within DGCA (Directorate General of Civil Aviation) and AAI (Airports Authority of India).

(Tale, 2023) Says that the domestic segment of India's air transport industry has undergone rapid expansion in recent years. The author argues that this growth can be attributed to a variety of factors, including the increasing number of middle-class households, the presence of competitive low-cost carriers, ongoing infrastructure enhancements at major airports, and a favorable policy environment, all of which stimulate economic growth.

According to the author (Tale, 2023), Indian civil aviation industry is currently experiencing an extraordinary period of growth. While the sector is expanding, domestic airlines are faced with a range of structural challenges that are impeding their smooth operations. India is rapidly emerging as a global player in various sectors, and the aviation industry is a pivotal component that cannot be overlooked. This sector plays a substantial role in job creation and significantly contributes to the economy. Given the circumstances, it is imperative to implement additional structural reforms in the aviation sector to ensure its continued advancement.

(Mamgain, (2019)) highlight the importance of understanding how passenger flow has evolved over more than a decade at the airports managed by the Airport Authority of India (AAI). The authors have conducted the study to understand to understand the impact of findings with the "UDAN" (Ude Desh Ka Aam Nagrik) regional connectivity scheme initiated by the Government of India. The research explores the relation of the National Civil Aviation Policy (NCAP) in terms of claims of increased passenger flow.

The study reveals a substantial increase in international, domestic, and total passenger flow over the last decade. The findings have significant implications for various stakeholders in the aviation industry and the broader economy due to the multiplier effect on output and employment in aviation.

(K Chandrashekar Iyer, 2019) provides an argument that various forms of subsidies, such as resident discounts, route subsidies, airline traffic distribution regulations, and state-owned airline assistance, are extended to certain airports where it is unprofitable to operate on unprofitable routes. However, this financial assistance places a financial burden on passengers traveling on non-subsidized routes so to create an effective support scheme for regional airports, it is crucial to determine the required subsidy amount and duration.

(Sharma, 2023) analyses role of air connectivity in stimulating regional economic growth and advancing the long-term objectives of national economies. It helps us to understand how air connectivity serves as a gateway for a country's integration into the global economy. To this end, governments are urged to study the impact of their policies on air connectivity and identify factors that can enhance it.

(Amit Kumar Das, 2020) propose in their research work that India's vast population and diverse landscape pose significant hurdles in creating a sustainable model for regional connectivity. The authors argue that RCS has two primary objectives: first, to expand air travel access across India, and second, to enhance connectivity to remote regions. The success of this scheme hinges on fostering free-market competition and active participation from the private sector.

In addition to this (Amit Kumar Das, 2020) also argue that critical study on these civil aviation policies can be valuable for enhancing future iterations of the program, particularly for countries working on their own remote area connectivity initiatives. The implementation of the Regional Connectivity Scheme (RCS) represents a significant milestone in expanding civil aviation in India.

(Singh, 2016) has a different take on the growth of civil aviation industry in the recent past. He states th-

at the deregulation of the aviation industry has had a significant impact, particularly in opening up opportunities for small business jets to operate across India. This, in turn, has given rise to non-scheduled air transport services. Over the past two decades, the increasing affluence of the business class has led to a consistent demand for air charter services, resulting in a notable shift from commercial airlines to private jets for business travel. Opting for charter or private aircraft not only offers luxury and privacy but also delivers time and effort savings.

(Sharma, 2023) has referred to in their article that primary aim of civil aviation is to enhance the accessibility and affordability of air travel, promoting inclusive economic growth, job generation, and the expansion of air transport infrastructure across all regions and states of India. In their study the criteria for evaluation were chosen such that there is a potential Regional Connectivity Scheme (RCS) airport hinged on specific criteria, including a minimum distance of 150 km from the nearest operational airport, demographic and industrial profiles, passenger demand, and market potential. The study also took into account the quality of runways and terminals at these airports. The paper was published with a need to focus on the need to plan for future land acquisition, financial investments, and ensure access to alternative transportation modes like highways and trains.

### 3. Data Sources

Although adequate research papers have been published, there are relatively less papers on the regional connectivity scheme being implemented in India much less on the different types of policies across the globe. So, the study mainly focuses on the data available on a wide spectrum of scholarly contributions, including research papers, conference papers, journals, government reports, and pertinent documents. This approach is adopted to ensure the research is founded on comprehensive and reliable information, despite the unavailability of direct primary data sources.

#### 3.1 Research Design

First and foremost, the study will explore the different types of civil aviation policies implemented worldwide. These encompass initiatives like the Public Service Obligations (PSO) and the Essential Air Service program (EAS). The PSO ensures that essential air services are provided to remote and less-developed regions, a concept that aligns with the core objectives of the UDAN scheme. Meanwhile, the EAS program in the United States focuses on subsidizing air services to underserved communities, offering valuable insights into successful aviation policy implementation that can be relevant to India.

Additionally, the research will undertake a comparative analysis between the UDAN scheme and international civil aviation policies. This comparative approach will provide insights into how the current economic, social, and local environment in India is conducive for the continued success of UDAN.

By scrutinizing successful models from around the world, the study will strive to identify best practices and potential enhancements that can further boost the UDAN scheme's impact on regional connectivity, economic development, and societal well-being. In essence, this research aims to shed light on the imperative need for studying and fine-tuning civil aviation policies, with a specific focus on how UDAN can serve as a model for promoting accessibility and inclusivity in the Indian aviation sector.

### 4. Route-based policies: a policy standard implemented worldwide

Such policy implemented has so far played an important role in the development of domestic airline industry across the globe. To connect isolated communities globally, the imposition of Public Service



Obligations (PSOs) on specific air routes is a widely employed method. This strategy is particularly prevalent in countries with fully deregulated aviation markets, such as the United States, European Union member states, and Australia (Xavier Fagedaa, 2018).

There are a variety of elements to analyze regarding the specific implementation of these policies. We may characterize route-based policies according to 1) the scale of the program; 2) the institutional framework; 3) the eligibility criteria for regions; 4) the selection criteria of carriers; 5) the service levels and fares; and 6) the scope of competition (Xavier Fagedaa, 2018).

For example, in countries like European Union, their legislation aims to secure essential air services for economically challenged regions and low-demand routes where air travel is vital, explicitly excluding surface transportation as a viable alternative (Xavier Fagedaa, 2018). The specific determination of what constitutes a disadvantaged region or a route with limited demand is delegated to the discretion of the national governments overseeing the program (Xavier Fagedaa, 2018).

#### **4.1 Overview of the National Civil Aviation Policy**

India's civil aviation industry has surged to become one of the world's most rapidly expanding sectors. In June 2016, the Ministry of Civil Aviation introduced the National Civil Aviation Policy (NCAP) (K.Chandrashekar Iyer, 2019). A key focus of the NCAP is the Regional Connectivity Scheme (RCS), also referred to as UDAN (Ude Desh Ka Aam Nagrik), which translates to 'empower the common citizen to take flight (K.Chandrashekar Iyer, 2019).' The primary goal of this scheme is to render air travel affordable for the general public, stimulate tourism, foster job creation, and stimulate balanced economic growth across different regions (K.Chandrashekar Iyer, 2019).

With the expanding Indian economy, the growth driven by consumption in densely populated metropolitan areas is anticipated to extend to rural and less densely populated regions (Yadav, 2018). This shift is primarily driven by the increasing cost of factors of production, such as land and labor, in highly populated metro cities. In this context, air connectivity is poised to play a crucial role in stimulating economic development in regional centers, including towns and cities (Yadav, 2018).

The National Civil Aviation Policy (NCAP) of 2016 also emphasizes the importance of maintaining a competitive market environment within the civil aviation sector. It aims to foster growth and enhance regional air connectivity through open market mechanisms (Ministry of Civil Aviation, 2017). This involves airlines independently assessing demand on different routes, expanding their networks by deploying suitable capacities and technologies, and aligning infrastructure development with the evolving demand (Ministry of Civil Aviation, 2017). By nurturing a competitive landscape and allowing airlines to respond to market dynamics, the NCAP seeks to drive sustainable growth in the civil aviation sector while promoting regional connectivity (Ministry of Civil Aviation, 2017).

#### **4.2 Features of the Scheme**

Under this scheme, The Ministry of Civil Aviation has the authority to appoint an Implementing Agency for this Scheme, and this designated entity will assume the responsibility of executing the tasks and activities required for the Scheme's implementation. As stipulated in NCAP 2016, the Implementation Agency will receive suitable administrative fees for carrying out the Scheme's implementation (Ministry of Civil Aviation, 2017).

In addition to the above there are various other financial assistance provided to airlines operating on certain un-served or underserved airports. The features as part of the National Civil Aviation Policy are explained as follows:

Excise Duty at the rate of 2% shall be levied on Aviation Turbine Fuel (ATF) drawn by Selected Airline

Operators at RCS Airports for RCS Flights for a period of three years from the date of notification of this Scheme (Ministry of Civil Aviation, 2017).

Selected Airline Operators will have the freedom to enter into code sharing arrangements with domestic as well as international airlines pursuant to applicable regulations and prevailing air service agreements (Ministry of Civil Aviation, 2017).

Provision of security and fire services free of cost at RCS Airports through appropriately trained personnel and appropriate equipment as per applicable standards and guidelines by relevant agencies (Ministry of Civil Aviation, 2017).

It is also the duty of the coordinating authorities for coordinating with oil marketing companies for provision of fueling infrastructure on best effort basis (Ministry of Civil Aviation, 2017).

The scheme also offers a specified amount of land, if necessary, without charge and devoid of any encumbrances for the advancement of RCS Airports, while also supplying the necessary multi-modal hinterland connectivity (including road, rail, metro, waterways, etc.) as needed (Ministry of Civil Aviation, 2017).

Providing security and fire services at RCS Airports, free of charge, by well-trained personnel and with suitable equipment conforming to the relevant standards and guidelines established by the respective agencies (Ministry of Civil Aviation, 2017).

This regulation ensures that airport operators, irrespective of their ownership, are not allowed to impose certain charges, such as Landing and Parking Charges, on RCS Flights as part of the Regional Connectivity Scheme. This provision is aimed at promoting regional air connectivity and reducing financial burdens on these flights (Ministry of Civil Aviation, 2017).

#### **4.3 Public Service Obligations in the European Union**

For numerous decades following the 1944 Chicago Convention, air transportation operated under stringent regulations governing commercial aviation globally. However, a significant turning point occurred with the enactment of the Airline Deregulation Act of 1978 in the United States, which initiated the process of opening up air transportation to more competitive dynamics (Elen Paraskevi Paraschi, 2023). Europe later embraced a similar trend in 1987, introducing three liberalization packages, culminating in the creation of a unified aviation market within the European Union (EU) in 1997 (Elen Paraskevi Paraschi, 2023).

Individual member states, operating through their central government departments, hold the legal authority to implement Public Service Obligations (PSOs). These obligations can be assigned and funded by either regional or national authorities, granting selected carriers a temporary monopoly on designated routes. Tender requirements typically include predefined service quality and fare constraints for the duration of the contract (George Williams, 2004).

But there are many challenges and opportunities in the Indian aviation sector as compared to the European and American countries. As per (Xavier Fagedaa, 2018) member states have the power to impose Public Service Obligations (PSOs) on routes within their jurisdiction or connecting their airports with those in other member states. PSOs come into play when commercial interests alone cannot guarantee essential air services, with the primary aim being the preservation of air connectivity to remote areas to foster economic development.

#### **4.4 Essential Air service Program in the USA**

In the United States there are different set of conditions in play that affect the domestic airline industry. (Xavier Fagedaa, 2018) in his paper mentions that the United States operates the Essential Air Service

(EAS) program, providing subsidies to airlines serving numerous eligible communities. Enacted in 1978, this initiative offers federal support to airlines when serving these communities would result in financial losses. Notably, the scope and resources allocated to the EAS program are comparable in scale to the entire EU aviation program.

In the U.S., airlines seeking subsidies for routes that are not commercially sustainable must submit detailed proposals outlining various operational aspects, including flight frequency, hub size, aircraft type, schedules, and pricing (Xavier Fagedaa, 2018). This process differs from the approach in the EU. Communities seeking eligibility for the Essential Air Service (EAS) program must meet specific requirements, including distance from hub airports, subsidy limits, and enplanement thresholds. These criteria ensure that the EAS program serves communities that genuinely need air service support (Office, 2019).

#### **4.5 Study of contemporary civil aviation policies**

When the civil aviation policy was implemented, there were some core capabilities that were focused upon to improve the domestic aviation industry. Firstly, by the implementation of the Regional Connectivity Scheme (RCS) addressed the issue of underutilized and non-commercial airports, particularly in remote areas where alternative transportation options were limited (rofessor Milind Sohoni, 2021). Secondly, the Regional Connectivity Scheme RCS was established to protect air travelers from excessive costs by supporting airline operators through concessions and financial aid (rofessor Milind Sohoni, 2021). The concessions aimed to reduce operational expenses on regional routes, and VGF was provided to cover any financial gaps between operating costs and anticipated revenues on these routes (rofessor Milind Sohoni, 2021). Thirdly, the Regional Connectivity Scheme RCS was primarily concerned with the continued sustainability of operations beyond the initial government support. While Ministry of Civil Aviation (MoCA) and state governments will play a key role, the ultimate goal was for the RCS to thrive through market forces, demand, and competitive dynamics, leading to self-sustaining and profitable operations (rofessor Milind Sohoni, 2021).

#### **4.6 Performance of PSO in EU**

It is also mentioned in the paper published by (Xavier Fagedaa, 2018) that by studying the efficiency of 18 European airlines operating PSO routes between 2008 and 2009 that airlines tend to perform more efficiently during the early stages of a PSO contract, with performance declining as the contract nears its end. This decline is linked to the absence of robust competition, which, in turn, is influenced by factors such as the limited number of bidders and the short time frame between tender selection and the start of operations.

Also, in countries like Norway, residents in remote areas often prefer driving to larger airports, even when PSO services are available nearby. This behavior, known as "airport leakage," poses a challenge to PSO effectiveness (Xavier Fagedaa, 2018). It occurs because maximum fares in PSO contracts cover direct flights but not indirect ones, and airfares from smaller airports are typically more expensive. As a result, travelers choose longer ground travel to access larger airports with lower airfares (Xavier Fagedaa, 2018).

As there are many countries within the European Union, PSO (Public Service Obligations) system has faced criticism for different policy among countries and regions. Additionally, the discretionary criteria applied to determine eligible routes, fares, service levels, and subsidy amounts have been a source of concern (Xavier Fagedaa, 2018).

Entry into the tendering process has been hindered by the lack of transparency, with only a one-month



window for bid submissions. There is also the issue of Public Service Obligations (PSOs) potentially favoring highly frequented routes, such as tourist destinations (Xavier Fagedaa, 2018).

#### **4.7 Performance of EAS in USA**

Densely frequented routes do not receive subsidies, with the emphasis placed on improving network connectivity in thinly connected areas, rather than merely remote ones. It's worth noting that some of the protected routes are short enough to facilitate the use of surface transportation modes (Xavier Fagedaa, 2018).

Also, the authors are also mentioning in their work that the efficiency gains in the Essential Air Service (EAS), emphasizing the role of competition among airlines (Xavier Fagedaa, 2018). However, it points out that the EAS program may not adequately account for shifts in the aviation market, improvements in surface transportation, and changes in population distribution that have occurred since deregulation in 1978.

There are some unique features that are pertinent to this EAS scheme which includes the following. Reliable access to air service through the Essential Air Service (EAS) greatly contributed to economic development, fostering a business-friendly environment and making the community an attractive choice for hosting tourism events (Office, 2019). Moreover, it facilitated the creation of various job opportunities, spanning TSA personnel, airport and airline staff, as well as employees in concessions like fixed-based operators and airport restaurants (Office, 2019).

#### **4.8 Performance of National Civil Aviation Policy (NCAP) in India**

Previously, there was the concept of traffic distribution rules which was prevalent in India which involved cross subsidization between dense and thin routes across the country (Xavier Fagedaa, 2018). In India, the Route Dispersal Guidelines (RDGs) are implemented to support air services in remote regions. These guidelines mandate airlines to distribute passenger traffic across three airport categories (Xavier Fagedaa, 2018). Category I includes major city connections, Category II encompasses remote and special regions, and Category III includes other airports and routes (Xavier Fagedaa, 2018).

In the report (rofessor Milind Sohoni, 2021) we can understand that the outcome mentions that passenger and flight traffic trends between UDAN airports offers insights into the program's year-on-year performance. It also helps evaluate the progress of underserved regions and airports (rofessor Milind Sohoni, 2021). Notably, the number of UDAN flights and passengers both saw significant increases, with the total flights growing from 390 to 5,240, and passenger numbers rising from 19,400 to 277,914 between September 2017 and September 2019 (rofessor Milind Sohoni, 2021).

By referring to the fare ratio analysis proposed by the report (rofessor Milind Sohoni, 2021) we can observe the difference between non-UDAN and UDAN seat fares, providing insights into passenger demand. Such helps us to understand whether a higher ratio suggests that passengers are willing to pay more for non-UDAN seats due to stronger demand (rofessor Milind Sohoni, 2021). The scheme is designed in such a way that the funding is based on the concept of VGF (Viability Gap Funding) whereby it is a self-funded mechanism is followed. This also includes the fee collected from passengers of departing passengers from airport. This is one the ways of funding the policy as there is less interference from the government and this also shows that the market forces such as demand and supply play important role in deciding the prices.

In 2018, the regions with limited connectivity made up 6% of the total passenger traffic. However, these areas have displayed a consistent and noteworthy annual growth, in accordance with the Regional Connectivity Scheme (RCS) goal of enhancing accessibility in these underserved regions (rofessor

Milind Sohoni, 2021). More precisely, there was a 6% rise in the eastern region, a 5% increase in the northeastern region, and a 4% increase in the central region (rofessor Milind Sohoni, 2021). This indicates a growing latent demand that is being met by RCS flights, highlighting the positive impact of the program.

The next aspect that we will observe is the load factor involved in aviation industry. The passenger load factor (PLF) represents the proportion of passengers on a flight in relation to the aircraft's maximum capacity (rofessor Milind Sohoni, 2021). When looking at specific routes, a higher PLF indicates a stronger demand for that route and suggests its sustainability (rofessor Milind Sohoni, 2021). PLF is a valuable metric for assessing and comparing the performance of underserved and un-served regions with respect to other regions on a regional scale (rofessor Milind Sohoni, 2021).

From (rofessor Milind Sohoni, 2021) it can be observed that across all three regions, there is a notable rise in the passenger load factor (PLF). Specifically, in the northeastern region, we observed an increase from 0.4 in 2018 to 0.56 in 2019 (rofessor Milind Sohoni, 2021). Similarly, the eastern and central regions also displayed significant increases in PLF. These findings indicate that flights connecting these regions are now operating at a greater capacity, signifying improved performance and demand in these areas (rofessor Milind Sohoni, 2021).

Airlines must allocate a minimum of 10% of their capacity from Category I routes to Category II routes. Within Category II, a minimum of 10% of the capacity dedicated to this category should be deployed on services exclusively within Category II (Xavier Fagedaa, 2018). Airlines are obligated to deploy at least 50% of the capacity from Category I routes on routes in Category III

There were other notable studies conducted especially in this area to be better understand the growth of the UDAN scheme. One such study was done by (Mamgain, (2019)) to uncover insights by linking passenger flow data with the recent policy measures introduced by the Ministry of Civil Aviation, Government of India. These studies were conducted to measures significant implications for the successful attainment of the objectives outlined in the Regional Connectivity Scheme RCS (Mamgain, (2019)).

The study examined the basis of NCAP, 2016 and provided additional support for the Regional Connectivity Scheme: UDAN by considering the claims made by the Joint Secretary of the Ministry of Civil Aviation, Government of India in 2019 regarding the growth in passenger flow over the past decade (Mamgain, (2019)). The research discovered a substantial increase in both international and domestic passenger traffic during this period, making it an opportune moment to leverage this growth for enhancing regional connectivity through the development of new routes and airport infrastructure (Mamgain, (2019)).

Also, there is significant proof collected to prove that operation of airport operations has also been viable under the Regional Connectivity Scheme (RCS). (K Chandrashekhar Iyer, 2019) shows in their research that 27 regional airports owned and operated by the Airport Authority of India for a three-year period from 2014-15 to 2016-17, the operating breakeven point for AAI-owned regional airports changed from 0.8 million passengers in 2014-15 to 0.6 million passengers in 2016-17 (K Chandrashekhar Iyer, 2019). This trend of decreasing breakeven passenger traffic over the three-year period suggests an improvement in the cost efficiency of Indian airports over the years (K Chandrashekhar Iyer, 2019).

We can also understand from the author's analysis that the results offer valuable insights that can assist in the strategic selection of airports for advancing regional connectivity and in determining suitable

locations for new airport development (K Chandrashekhara Iyer, 2019). Furthermore, the breakeven passenger traffic data can serve as a basis for designing incentive programs aimed at attracting airlines to these airports (K Chandrashekhara Iyer, 2019). It's worth noting that the analysis does not encompass capital expenses, as the sample airports commenced operations in different years, resulting in varying depreciation costs (K Chandrashekhara Iyer, 2019).

## 5. Interpretation of Result

The study has so far extensively covered the prevalent civil aviation policies implemented across the globe. Now an understanding has to be developed based on the available data presented in the previous section.

In the case of PSO (George Williams, 2004) states that there are obstacles to entering the Public Service Obligation (PSO) system are evident, and one prominent challenge faced by PSO governing bodies is ensuring the competitiveness of the bidding processes. Potential new entrants encounter a substantial hurdle in the form of sunk costs associated with operating PSO services, especially considering that the contracted air carrier is granted a route monopoly for only a brief three-year period (George Williams, 2004). The author also argues that this situation helps to explain why well-established local airlines in Norway and in Scotland continue to maintain their dominance in the national PSO markets, particularly in remote areas with low traffic density (George Williams, 2004).

The author (George Williams, 2004) also mentions in his work that another significant barrier to entry emerges due to the tight timeframe of only one month allowed between the notification of a tender and the bid submission. Within this limited period, air carriers not only need to prepare their proposals but also secure appropriate aircraft for operating the designated route (George Williams, 2004). For instance, during the Norwegian PSO tender in 2000, one carrier encountered the challenge of identifying only eight available DHC-8 aircraft, all of which required costly engine conversions (George Williams, 2004). Moreover, only two of these aircraft could be assured for delivery at the commencement of the PSO contract. This constraint adds to the complexity of entering the market (George Williams, 2004).

We have already discussed previously that there has been the economic benefit of choosing certain destinations as part of this scheme, (George Williams, 2004) also explains in their work that in countries like France, the majority of Public Service Obligations (PSOs) are mandated for routes connecting small regional airports such as Brest, Roanne, and Rodez to Paris, as well as between major mainland cities like Marseille, Nice, and Paris, and airports on Corsica, including Ajaccio, Bastia, Calvi, and Figari (George Williams, 2004). The extensive implementation of PSOs in France can be attributed to a firm dedication at both the national and regional levels to foster economic development by ensuring the regions are well-connected to the capital city, Paris (George Williams, 2004). This commitment has led to the establishment of numerous PSOs in the country.

While there are certain challenges at the entry level, equally important issues also arise once the operation of airlines begin in a designated route and airport. In the research work of (George Williams, 2004) it is observed that fare limitations are enforced on all Public Service Obligation (PSO) routes in Ireland.

The authors explain that each PSO route has specified return fare caps, ranging from €111 to €124. The carrier operating the route must allocate a portion of seats at these fare levels. For instance, on the Dublin-Kerry route, out of the mandatory seats available throughout the day, sixty must be offered at €111, sixty at €124, and the remaining thirty can be priced at the airline's discretion (George Williams,

2004). Notably, there are presently no special discounts offered for specific passenger categories on these routes (George Williams, 2004).

The level of regulatory intricacy within the Public Service Obligation (PSO) tender process and the extent to which fares are controlled play a significant role in determining the amount of subsidy needed to cover the operating deficit of the contracted air carrier (George Williams, 2004).

There are again various factors that go about deciding the pricing mechanism in such situations. (George Williams, 2004) have given proposed that Several factors impact the necessary subsidy for operating a specific Public Service Obligation (PSO) service. The choice of aircraft, its size, and type significantly influence operational costs. An older, non-pressurized aircraft like the Shorts 360 typically incurs lower operational expenses compared to a regional jet (George Williams, 2004).

This indicates that operators may not have strong incentives to enhance their efficiency until the contract's end because there is a lack of competitive pressure (Xavier Fagedaa, 2018). This is partly attributed to the limited number of bidders, often just one, and the short time between the notification of an airline's selection in the tender and the commencement of operations, which hinders competitive dynamics in the market (Xavier Fagedaa, 2018).

There was another issue observed which is mentioned in (Xavier Fagedaa, 2018) that residents in remote areas of Norway tend to choose to travel by car to larger airports when those airports are nearby, which negatively affects the viability of Public Service Obligation (PSO) services. This phenomenon, known as "airport leakage," occurs because the maximum fares regulated within PSO contracts apply to direct flights but not indirect flights (Xavier Fagedaa, 2018). As a result, airfares for routes departing from smaller airports are significantly higher.

Unlike the Public Service Obligation (PSO) program, in this scenario, a second carrier can enter the market without needing a subsidy. In such cases, the DoT notifies the incumbent carrier that the subsidy will be withdrawn, and the incumbent can then choose to continue operating services without a subsidy or discontinue the services altogether (George Williams, 2004). This approach, encourages carriers to minimize subsidy levels (George Williams, 2004).

The resilience of the Essential Air Service (EAS) system in the United States has faced significant challenges since the events of September 11, 2001, leading to reduced air service, especially in smaller communities (George Williams, 2004). This situation is exacerbated by the fact that the EAS eligibility criteria are viewed as overly strict and are open to varying interpretations, which has added to the system's vulnerability (George Williams, 2004).

In the author's work (Xavier Fagedaa, 2018) it is discussed that when an airline is unable to offer air service to eligible communities without operating at a financial loss, the federal government steps in to provide the airline with a subsidy to serve these communities. Remarkably, the scope of the EAS program, with its protected routes and allocated resources, is comparable in scale to the entire European Union (EU) program (Xavier Fagedaa, 2018).

(Xavier Fagedaa, 2018) has shown in his research that the Essential Air Service (EAS) system exhibits two notable weaknesses. First, there is significant variability in the number of subsidies per passenger, mainly due to the fact that payments are made on a per-flight basis rather than on a per-passenger basis (Xavier Fagedaa, 2018). Second, the routes that receive subsidies often suffer from underutilization, resulting in lower load factors on EAS routes when compared to non-subsidized routes (Xavier Fagedaa, 2018).

Also, the report published by (Xavier Fagedaa, 2018) states that the policy aims to promote competition



among air carriers vying to serve eligible communities. However, an argument is stated that the Essential Air Service (EAS) system fails to adapt to the evolving conditions in the aviation industry, the advancements in ground transportation, and shifts in population distribution within the country since deregulation in 1978 (Xavier Fagedaa, 2018).

The second category, as observed in countries like Norway and Sweden, focuses on providing lifeline services, establishing direct point-to-point links that connect remote regions with nearby urban centers (Xavier Fagedaa, 2018). Additionally, in certain regions like France, Portugal, or Scotland, a combination of network access and lifeline services is implemented, as PSOs serve to connect remote territories, including islands, to each other and to mainland transportation hubs (Xavier Fagedaa, 2018). As far as India is concerned, airlines operating in remote regions receive various benefits, including tax exemptions on airport charges, fuel, and local taxes. They are also allowed to handle their own ground operations, and there is a risk-sharing mechanism in place (Xavier Fagedaa, 2018). This means that a set number of seats for a particular operator are reserved by the government at predetermined airfares (Xavier Fagedaa, 2018). To mitigate the risk of uncertain demand on specific routes, selected airline operators (SAOs) are granted an "exclusivity period," except for tourism routes. The availability of Viability Gap Funding (VGF) through the Regional Connectivity Fund (RCF) is expected to ensure the sustainability of the program (Mamgain, (2019)). The completion of three rounds of bidding, UDAN 1.0, 2.0, and 3.0, within a span of three years demonstrates the positive response from airline operators to the scheme (Mamgain, (2019)).

This progress is instrumental in extending airport and air travel accessibility to a broader segment of the population at competitive prices (Mamgain, (2019)). Therefore, it is a sound argument that the recent surge in passenger traffic, coupled with the vision outlined in NCAP 2016 to promote balanced regional development through improved regional connectivity, represents a judicious step in the right direction (Mamgain, (2019)).

(K.Chandrashekar Iyer, 2019) In their paper have made many interesting observations with respect to the development of the regional connectivity scheme (RCS). They state that allocating resources for the advancement of the civil aviation sector is a crucial objective of the National Civil Aviation Policy (K.Chandrashekar Iyer, 2019). The resources channeled into the RCF from the aviation sector are then reinvested to stimulate further progress and expansion within the sector. Operators serving domestic routes subject to the departure fee are eligible to benefit from the services provided under this scheme, contributing to the sector's development and growth (K.Chandrashekar Iyer, 2019).

The author's (K.Chandrashekar Iyer, 2019) also argue that the Regional Connectivity Scheme (RCS) in India is poised to unlock the country's immense tourism potential, making it accessible to a wider audience. India has been witnessing a growing influx of foreign tourists annually, and establishing direct air links to popular tourist destinations holds the promise of significantly boosting the tourism industry (K.Chandrashekar Iyer, 2019). This, in turn, is expected to create more job opportunities, contributing to accelerated economic growth.

According to (Amit Kumar Das, 2020) certain airline operators have recognized the commercial potential of participating in the program, evident in their bidding strategies. However, a few operators partake in the program as a regulatory requirement. While the government has pledged support to ensure the commercial viability of these initiatives, concerns have emerged regarding the sustainability of the program (Amit Kumar Das, 2020). Rising costs and operational challenges are among the factors contributing to this uncertainty.



Additionally, it's important to note that the program primarily concentrates on improving air services for underserved and un-served airports, which doesn't always align with the specific requirements of remote regions, especially in the northeastern part of the country (Amit Kumar Das, 2020). This highlights a need for further examination of the program's effectiveness in addressing the unique challenges of these areas.

## 6 Conclusion and Scope for Future Work

There are limitations in obtaining recent data on the Regional Connectivity Scheme (RCS) in India, as there are few published journals available to gauge its scope. In this study, we examined current policies aimed at enhancing regional air connectivity. We also faced challenges in accessing operational data from EU and US regulatory bodies. Despite these constraints, our paper provides insight into the significance of establishing a government-assisted policy to foster the growth of regional air connectivity in India.

Existing literature highlights the need for economic incentives to support airline operators on non-profitable routes due to the airline industry's high operating costs and thin profit margins. Viability gap funding (VGF) addresses this issue, with central and state governments and a portion of passenger fares from profitable routes contributing to the scheme, while this approach may burden regular passengers, it aims to normalize operational costs over time based on market demand.

Traditional wisdom suggests it takes up to a decade to see results from this scheme in India. Nearly seven years since its initiation, it has already had a positive impact on the Indian economy. Challenges remain in sustaining airlines on unprofitable routes, but addressing critical airport infrastructure can boost tourism and local employment.

Airlines are finding increased investment opportunities in India, supported by the government's efforts to develop a strong Maintenance Repair and Overhaul (MRO) sector. We welcome foreign investment and global MRO players due to the growing demand for improved aircraft maintenance driven by regional connectivity expansion. Detailed research is required to assess the RCS's flight operations and the effectiveness of viability gap funding (VGF) investments. Moreover, a deeper understanding of the pandemic's impact on the global airline industry is essential.

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