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## A Critical Review on Regional Connectivity Scheme of India

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### Abstract

The civil aviation industry of India has arisen as one of the world's fastest growing industries. In June 2016, the Ministry of Civil Aviation in India unveiled the National Civil Aviation Policy (NCAP). One of the objectives of NCAP was on the Regional Connectivity Scheme (RCS), also known as UDAN (Ude Desh Ka Aam Nagrik) which translates as 'let the common citizen of the country fly', and aims to make flying affordable for the masses, promote tourism, increase employment opportunities and promote balanced regional economic growth. Even though the national and international aviation market is thriving, the regional market in India is underdeveloped. From the RCS draft unveiled in December 2016, it is clear that a lot of work is done on coming up with a scheme which encourages airlines to start flights to remote destinations, to airports which are right now lying unused and to those airports where there are few flights but not adequate in number. The present paper attempts to elucidate the business model, the impact of RCS on the aviation sector, various opportunities and challenges of the scheme. Performance analysis of Indian airports, before and after the scheme is done using Data Envelopment Analysis. There is limited research within the area of air transport in remote regions in India, and hence a variety of sources from news articles, government documents, discussion papers, presentations, and reports are used. While the RCS is a novel idea to promote regional connectivity, its success will depend entirely on traffic demand and cooperation from various stakeholders including governments, local bodies and airport operators. The paper reveals that RCS is a step in the right direction unless the implementation is carefully monitored.

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### 1. Introduction

From an over-regulated sector, the aviation industry has now changed to a more open, liberal and investment-friendly sector in India. The traffic is growing in all the three segments- passenger, freight and aircraft movement. India is expected to become the world's largest domestic civil aviation market in the next 10 to 15 years, as per Mr Jayant Sinha, Union Minister of State for Civil Aviation, Government of India (IBEF, 2018). According to the

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International Air Transport Association (IATA), India will displace the UK for third place in 2025. “Airport capacity sufficient to process 1,150 million passengers per annum is required by 2031-32” (NTDPC India Transport Report). The domestic, as well as international traffic, has been increasing at a fast rate. But the stunning standpoint is that 95 per cent of the country’s population has not still flown in an aeroplane. Air travel can be the quickest of transport links that can be stretched to many remote regions with challenging geography and topography. The policymakers are extremely interested in suitable mechanisms to effectively promote air transport to remote areas when the impact of air connectivity on economic growth and development is well established in the literature. Reports by the Government of India (2014, 2016) and DTTIPL Report for MoCA (2013) defines Regional Air Connectivity as the provision of air transport services to under-served and un-served markets (towns/cities) with potential, providing connectivity both within a Region as well as between Regions. Regional Connectivity Scheme, presented by the Ministry of Civil Aviation (MoCA), refers to the operation of an air transport service between two airports, of which at least one has been declared by the central government as unserved or under-served. Under-served airports are airports having not more than seven flights a week and unserved airports are airports having no flights during the last two flight schedules.

Oum et al. (2008) argue that “an efficient airport provides important economic catalysts that enable the local and regional economy to thrive and improve the quality of life in the region”. Graham and Guyer (2000) remark that the term “regional airport” is not one that is amenable to a ready definition. At one level, all airports, even the largest inter-continental hubs, serve local markets and are dependent on the regions within which they are located. Adler et al. (2013) studied the efficiency of 85 European regional airports via data envelopment analysis and second-stage regressions, and concluded that regional airports have inefficient daily operations, have failed to explore business opportunities, and have missed the chance to break even with small traffic volumes. Small and regional airports frequently suffer from limited traffic given minimum fixed infrastructure requirements and insufficient revenues to cover their costs. The question is whether such airports could be structured, managed and possibly financially supported to survive efficiently. Fernandes and Pacheco (2018) examine the performance of airports under Brazil’s state enterprise for airport infrastructure, Infraero, in 2009 and 2015, three years before and after concessions began to come into effect. They used DEA modelling to analyse performance and found that overall performance index fell from 71.48% to 62.73%, as it failed to encounter pathways to improvement in the scenario of concessions of airports to private administration. Kazda et al. (2017) represent regional airports as not only important points of access to remote locations and parts of the country with limited or lengthy ground access but also have a significant economic impact on the surrounding region. The RCS aims at making these airports profitable by attracting airlines to improve traffic. Instead of making it obligatory for airlines to start operations at underserved and unserved airports by providing some rebate, the pioneering approach adopted in RCS is to invite airlines to bid for routes suitable for airline profitability choosing the number of subsidized seats and number of flights per week, while the government will support them by providing Viability Gap Funding (VGF).

Fageda et al. (2018) provide a mapping of existing policies applied worldwide to provide air connectivity to remote areas. In practice, Public Service Obligations (PSOs) in Europe and Essential Air Services (EASs) in the U.S. represent the most documented policies. PSOs are short-term contracts set by the government with airlines that may specify the service levels, including flight frequency, the type of plane, scheduling, and fares to be offered in the route. In return for meeting these requirements, an airline may receive a subsidy, and it is usually protected from the entry of other airlines. The U.S. uses EAS with the aim is to maintain a minimal level of scheduled air service to the small communities that otherwise would not be profitable. Spain, Ecuador, Portugal and Scotland uses the policy of discounts to residents in remote regions. Colombia, Ecuador and Malaysia guarantee air services in unprofitable routes through a state-owned airline. Europe also uses incentive schemes by regional authorities or airport operator to attract airline operations. Canada has state-ownership of airports located in remote regions. India used Route Dispersal Guidelines (RDGs) to support air services in remote regions which forces airlines to distribute traffic across three categories of airports. Under this program, set up in 1994, routes are classified in three categories: Category I, II and III. Category I includes routes from Bombay, Calcutta, and Delhi to other large cities. Category II includes airports in the North-East region, Jammu and Kashmir, Andaman and Nicobar Islands, and Lakshadweep. Category III includes airports and routes other than those in I and II.

## 2. Regional Connectivity Scheme

### 2.1. Features of the Scheme

The features of the scheme are as follows:

- Airfare cap at Rs.2500 for a one hour journey of approximately 500 km.
- RCS is applicable on route length between 200 to 800 km with no lower limit set for hilly, remote, island and security sensitive regions. But this guideline has been revised to stage length less than 150 km to provide enhanced connectivity.
- A Regional Connectivity Fund (RCF) is created to fund the scheme through a levy on certain flights. States are expected to contribute 20 per cent to the fund.
- Allocations are spread equitably across 5 regions - North, West, South, East and North East with a cap of 25 per cent for balanced regional growth.
- A minimum of 3 and a maximum 7 regional connectivity scheme flights per week per route with minimum 9 and maximum 40 seats per flight
- The RCS will be in operation for ten years with individual route contracts to be for three years.
- Interested operators can submit initial route proposals. The gap in costs and revenues, if any, will be compensated through Viability Gap Funding (VGF).
- Market-based reverse bidding mechanism to determine least VGF to select the airline operator with the right to match to the initial proposer. The government said VGF would be reduced if passenger load factor remains high and will be discontinued after three years when the route becomes self-sustainable (The Economic Times, 2016).

### 2.2. Business Model

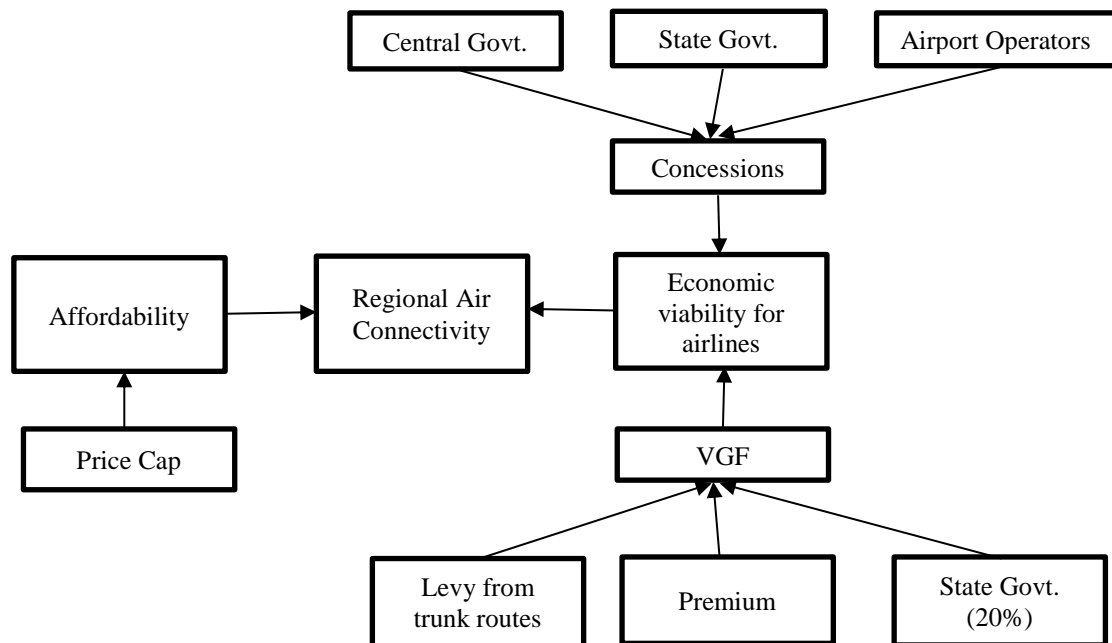


Fig. 1. Business Model of Regional Connectivity Scheme

The business model of RCS is shown in Fig. 1. To achieve regional air connectivity, affordability and economic viability for airlines are indispensable. More people need to use the aviation route for achieving regional air connectivity. Thus, the main aim would be to make it affordable for the population. Therefore, the price cap of Rs.2500

per hour journey is created by the Government, so that for a short journey people would be willing to use flights. If airlines need to connect these regional airports, it has to be commercially viable for them. If a particular route does not have enough traffic, then that route would not be commercially viable for airlines. So, concessions and viability gap funding would become necessary for airlines.

The airline operators will be supported through: (i) concessions by the central government, state governments and airport operators and (ii) financial support (Viability Gap Funding – VGF) to meet the gap, if any, between the cost of operations and expected revenues on such routes.

- Concessions offered by the Central Government
  - a) Excise Duty on Aviation Turbine Fuel (ATF) shall be levied at the rate of 2% for three years.
  - b) Selected Airline Operators will get the freedom to enter into code-sharing arrangements with domestic as well as international airlines.
  - c) Concession on Service Tax on tickets -10% of taxable value (abatement of 90%) of tickets for one year.
- Concessions offered by the State Governments
  - a) Reduction of VAT to 1% or less on Aviation Turbine Fuel (ATF) for ten years.
  - b) Coordination with oil marketing companies for the provision of fueling infrastructure.
  - c) Provision of minimum land free of cost and multi-modal hinterland connectivity (road, rail, metro, waterways, etc.) as required.
  - d) Provision of fire services and security free of cost.
  - e) Provision of electricity, water and other utility services at substantially concessional rates.
  - f) Provision of a definite share (20%) towards VGF for corresponding RCS routes.
- Concessions offered by the airport operators
  - a) Airport operators shall not levy landing charges and parking charges on RCS flights.
  - b) Selected Airline Operators shall be allowed to carry out ground handling for their RCS flights at all airports.
  - c) AAI shall not levy Terminal Navigation Landing Charges (TNLC) on RCS flights.
  - d) Route Navigation and Facilitation Charges (RNFC) will be levied by AAI on a discounted basis at 42.50% of normal rates on RCS flights.

### *2.3. Impact of RCS on Indian Aviation Sector*

The launch of Regional Connectivity Scheme was on 21st October 2016, and the 1st round of bidding also started on the same day. The Prime Minister inaugurated the first flight under RCS by Air India on the Shimla-New Delhi route on 27th April 2017. The 1st round did not involve routes to Jammu & Kashmir. Seeing meagre response from fixed-wing operators in the first phase of the scheme for airports in challenging terrains, the government eased the guidelines of the scheme to attract more airlines and helicopters to fly into these regions. The exclusivity clause was diluted that mandated that only one airline flies on one route in the first three years. Now, the selected airline operator of a route may issue a no-objection certificate to other airlines that want to operate on the same RCS route. The Ministry also has diluted norms that restricted two airports close to one another from participating in the bidding.

The window for air operators to bid for routes under the second phase of RCS was in full swing on August 24, 2017. This phase aims to provide air connectivity to the hinterland to provide a stimulus to the economic growth of regional centres. The government has declared flights connecting 56 airports and 31 helipads in the initial two phases. Around 40 per cent of the 325 air routes awarded under the 2nd phase of the RCS was for North-eastern and hill states, underlining the Centre's emphasis on enhancing air connectivity to the remote terrains. These include airports such as Kargil in Jammu & Kashmir, Pakyong in Sikkim, and Tezu in Arunachal Pradesh, where civilian air connectivity will be delivered for the first time. Further, this phase has also seen routes being served by helicopters apart from fixed-wing aircraft. Nearly 70% or 31 out of 56 new destinations to be connected via air transport will be served by helipads.

The routes have been awarded to 15 airlines and helicopter operators after the bidding process for the 2nd round of UDAN. These include the major domestic players such as SpiceJet, IndiGo, Jet Airways and Air India subsidiary Alliance Air and helicopter operators such as Heligo Charters, Heritage Aviation, Pawan Hans, and Skyone Airways. The second round of bidding involved 502 routes connecting 126 airports, including helipads. These include 49 unserved and 15 under-served airports, as well as 24 helipads. Both these phases have added around 80 airports in the country. Twenty of the total 141 proposals received were with bids for zero VGF required by airlines. This implies that the scheme is getting the intended result and it will not require any subsidy in future and is moving towards self-sustainability (Airports Authority of India). The third phase of UDAN was announced on 25 January 2019. The features of UDAN 3 are inclusion of tourism routes, North-East Region routes and seaplane operations.

The impact of RCS on the Indian aviation sector is shown below.

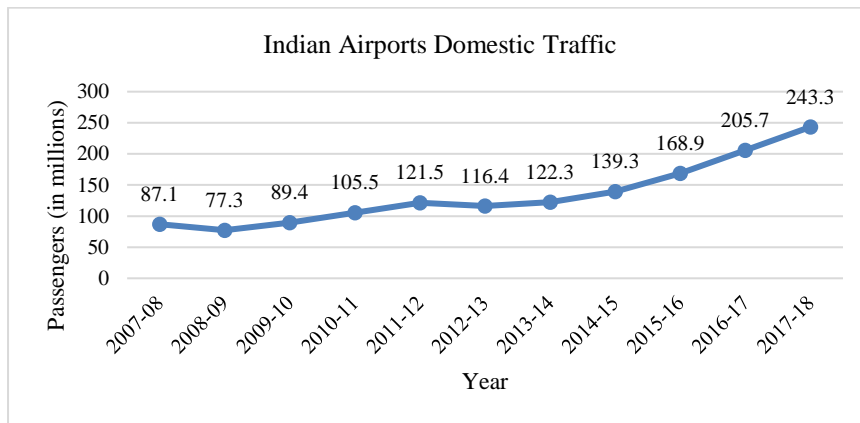


Fig. 2. Domestic Air Traffic Growth in India from 2007 to 2018 (Source: Association of Private Airport Operators, 2018)

Domestic passenger traffic has grown year over year (YoY) by 18.28 per cent to reach 243.3 million in FY-2018 as shown in Fig. 2. India saw the highest ever monthly domestic flyers in 2018. The passenger traffic is showing a rising trend since UDAN due to low-cost aviation.

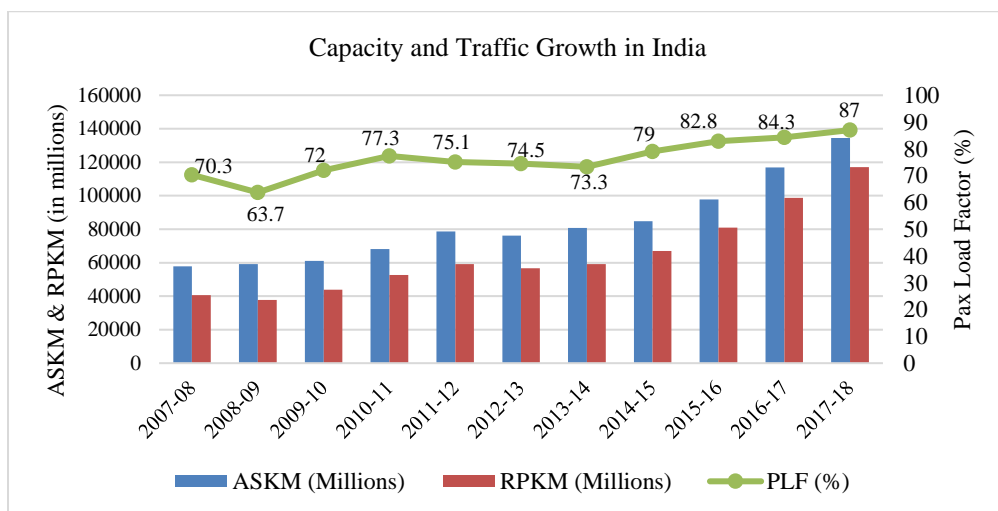


Fig. 3. Growth of Airline Capacity Deployment and Passenger Traffic in India (20017-2018)

The capacity in the domestic market, ASKM (Available Seat Kilometres) grew at a rate of 8.79% (CAGR) while the demand, RPKM (Revenue Passenger Kilometres) grew at a rate of 11.14% (CAGR) during 2007-08 to 2017-18. The PLF (Passenger Load Factor) in the domestic market, which fell to 73.3% in 2013-14, is steadily increasing after that as shown in Fig. 3. UDAN has contributed to register positive growth in both ASKM and RPKM in 2017-18 compared to the previous year.

### 3. Methodology

The performance of Indian airports is analyzed before and after UDAN. Data Envelopment Analysis (DEA) is a well-established tool that uses linear programming for performance measurement. DEA uses a non-parametric approach that can accommodate multiple outputs and inputs at a time with varying units-one of the major advantages of its use. It is widely used for assessing airport performance. Various researchers suggest different thumb rules in arriving at the appropriate number of DMU (Decision Making Units). According to Cooper et al. (2007), a good rule of thumb is:

$$N \geq \max \{m, Xs\}, 3 * \{m+s\}; \quad (1)$$

where m is the number of inputs, s is the number of outputs and n is the number of DMUs. This condition has specifically been taken care of in this study to enhance the discriminating power of DEA. The authors have chosen the input-oriented approach using a variable return to scale (VRS) model.

This study uses two inputs and three outputs listed below:

Outputs:

The total number of passengers embarked and disembarked at the airport in a year

The total amount of freight handled by the airport in a year (in tonnes)

The total number of aircraft movements, take-off and landing at the airport in a year

Inputs:

Total airport area, landside and airside (in acres)

Terminal capacity of the airport, the peak hour design capacity

The data has been collected for 22 sample Indian airports from Airport Authority of India website for 2014-15 (Pre UDAN) and 2017-18 (Post UDAN). Table 1 shows the descriptive statistics of the variables for the years in consideration.

Table 1. Descriptive Statistics of variables.

Descriptive Statistics	Year	Airport area (acre)	Terminal capacity	Passengers	Freight (Tonnes)	Aircraft Movements
Mean	2014-15	580.11	862.50	1168332.86	5345.00	10842.18
Standard Deviation		305.14	504.48	771013.52	7397.28	6545.13
Minimum		23.00	300.00	319260.00	134.00	3050.00
Maximum		1250.00	2600.00	3174018.00	29897.00	26871.00
Count		22.00	22.00	22.00	22.00	22.00
Mean	2017-18	643.74	865.68	2108524.55	6923.45	17189.00
Standard Deviation		366.75	501.64	1369005.56	7783.99	11152.11
Minimum		23.00	300.00	336851.00	289.00	2706.00
Maximum		1568.00	2600.00	4757178.00	28715.00	42289.00
Count		22.00	22.00	22.00	22.00	22.00

#### 4. Results and Discussion

The analysis is done for two years, 2014-15 and 2017-18. The relative efficiency scores are compared as to know if any improvement has occurred in the post-UDAN phase. The results show that the overall performance of the sample airports has slightly improved from 70.73% to 71.20%.

Table 2. DEA scores for sample airports.

IATA Code	City	2014-15 score (%)	2017-18 score (%)
RAJ	Rajkot	60.00	60.00
BHO	Bhopal	46.48	44.11
IXU	Aurangabad	44.13	43.29
IMF	Imphal	55.36	53.83
IXR	Ranchi	54.28	58.09
IXM	Madurai	34.29	36.46
IXA	Agartala	93.69	81.17
VNS	Varanasi	46.58	53.74
TRZ	Trichy	100.00	93.77
PAT	Patna	86.72	100.00
IXE	Mangalore	48.18	45.35
CJB	Coimbatore	100.00	89.17
BBI	Bhubaneswar	49.40	47.79
JAI	Jaipur	100.00	100.00
GAU	Guwahati	100.00	100.00
CCJ	Kozhikode	100.00	100.00
TRV	Trivandrum	100.00	100.00
IXL	Leh	100.00	100.00
DIB	Dibrugarh	60.21	60.00
IXJ	Jammu	100.00	100.00
VTZ	Visakhapatnam	44.76	61.59
ATQ	Amritsar	32.08	37.93

The relative scores represent the position of one airport with respect to others. An airport with a score of 100% is the most efficient one compared to other airports considered. The percentage of airports which are efficient (efficiency score=100) lies in the range of 30%-40% for both the years. Airports like Jaipur, Guwahati, Kozhikode, Trivandrum, Leh and Jammu are showing a score of 100%, one year before and after UDAN. As noted from the DEA scores from Table 2, the performance of 7 airports remains constant, 6 airports show improved performance and the remaining have deteriorated. Airports such as Madurai and Amritsar are showing very lower scores compared to their peers.

The number of airports with scheduled operations in each state in the Pre UDAN (2014-15) and Post UDAN (2017-18) phase is compared and illustrated in Fig. 4. The number of airports has considerably improved in some states. New airports have come up lately in states of Himachal Pradesh, Haryana, Sikkim, Arunachal Pradesh and Meghalaya. The number of states with more than seven airports has increased from 1 to 4 in 2017-18.

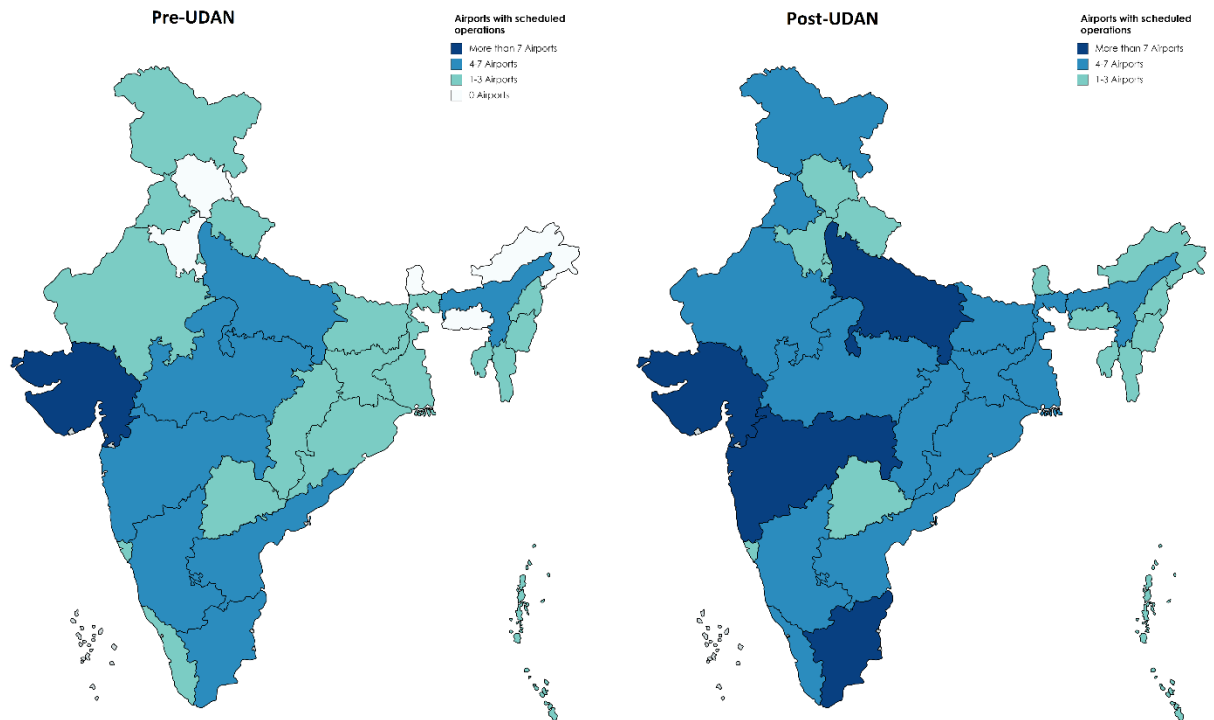


Fig. 4. Airports with scheduled operations- Pre UDAN and Post UDAN (Recreated by authors from Airport Authority of India website)

## 5. Opportunities and Challenges of RCS

Previous policies of the Ministry of Civil Aviation, recent news articles, and presentations at professional bodies have contributed to this section.

### 5.1. Opportunities

- a) Channelling funds for the development of the civil aviation sector: RCS is one of the critical elements of NCAP 2016, which envisions domestic ticketing of 30 crores by 2022 and 50 crores by 2027. RCS, as well as NCAP 2016, would eventually promote the growth of the whole civil aviation sector. The Regional Connectivity Fund (RCF) is to be funded by a levy or a fee per departure on all domestic flights other than the ones on Category II/Category IIA routes under RDG, RCS Routes and flights using small aircraft below 80 passenger seats irrespective of routes as provided under NCAP 2016 at rates to be informed by the MoCA. The RCF would thus channel funds generated from the sector to stimulate further growth and development of the sector and the operators providing services on domestic routes where such fee per departure is levied would be eligible to gain benefits under the Scheme for providing services under this Scheme.
- b) Promotion of balanced regional growth in the country: RCF allocation to regions will be made in a manner that promotes balanced growth or regional connectivity in different parts of the country. The country will be divided into five regions based on Flight Information Regions as currently defined by the DGCA accordingly,



to have an equitable distribution of RCF and enhanced air connectivity across the country. From the date of notification of the Scheme, proposals in a particular region can be permitted such that up to 25% of the estimated annual inflows in the RCF can be devoted to such proposals. Allocations will be spread equitably across five regions- North, West, South, East and North East with a cap of 25 per cent for balanced regional growth. Wherever a particular RCS Route connects airports/helipads in two different regions, the VGF for such RCS Routes will be divided equally between the two regions for the above determination.

- c) Increase in the number of passengers: The airfares have now dropped to a level that it is more or less than the third class A/C rail tickets. In terms of both cost and time savings, air travel offers considerable advantages. It is a high chance that air passengers will outnumber rail AC-class passengers in the coming years. With the advent of RCS, the prices are going to be even cheaper. There would be an outpouring of passengers in airports and can ease the pressure from railways.
- d) Boost to the tourism industry in India: RCS will open India's vast tourism potential by making it accessible to the common man. Foreign tourists are increasing in number every year to India. Direct air connections to tourist destinations can massively promote the tourism industry. This will lead to more employment opportunities and thus faster economic growth.
- e) Demand-driven mechanism: The airlines would start operating in a competitive environment and development of regional air connectivity routes is proposed to be left to market forces. The airlines would assess demand and nature of supply required on particular routes and lead the process under RCS.
- f) Code-sharing: Airlines in RCS routes can code-share the bigger airlines. It is an aviation business arrangement where two or more airlines share the same flight. The airline that is operating the flight is called the operating carrier, and the airline that is marketing the flight is called marketing carrier. Both carriers may sell tickets for the flight. Airlines can broaden the offer in terms of a number of destinations and flight timings to the customers. They do not have to invest in new aircraft for their fleet.
- g) Investment opportunities: The RCS offers attractive business opportunities to international aviation companies and investors. As per media reports, airlines have ordered as many as 100 aircraft for deployment under the RCS. The RCS has also generated huge demand for helicopters and small aircraft for operations in hilly regions and other parts of the country. These developments could create tremendous opportunities for airline and leasing companies all over the world. One hundred and sixty airports in the country are being revived and operationalized in an attempt to boost regional and remote air connectivity. In an attempt to aid the modernization of existing airports, the Indian government has permitted 100 per cent foreign direct investment in greenfield and brownfield airport projects. It has also increased foreign investment allowances in scheduled air transport service, domestic scheduled passenger airlines and regional air transport services. The RCS, alongside the relaxed foreign direct investment policy, has opened multiple avenues for foreign investment (Vaidyanathan and Singh, 2018). Development of smaller cities takes place as faster air connectivity will attract infrastructure development and investment.
- h) Providing impetus to helicopter services: To encourage helicopter operations under the Scheme, VGF Caps for helicopters were increased to 10% of the estimated annual inflows in the RCF set aside for operations through helicopters. All seats up to 13 passenger seats for helicopters shall be considered as RCS seats and accordingly, VGF shall be provided. Thus, helicopter services would become significant in the country.

## 5.2. Challenges

- a) High airfares on non-RCS routes: For the economic viability of airlines, the VGF would be collected as levy from passengers flying in trunk routes. So, the first major concern would be that the fliers on major domestic routes will have to shell out more. No mechanism exists to ensure that passengers are not overcharged (it is

likely that airlines will collect more than the levy). The airline operators of airlines on major routes will face a problem if the airfares are high on such routes. The operators feel that they would need some other alternative for funding the scheme.

- b) **Failure of Regional Airlines in the past:** In the case of regional airlines, the past also does not give much hope as they have failed in the last decade. For example, Air Mantra based in Delhi, Paramount Airways based in Chennai ceased due to legal issues. Profits on underserved and unserved routes are tough. Major players did not participate in the first phase of RCS. They had higher aircraft flight capacity and not smaller aircraft. There was a fear of whether the liability of operating such routes could end up eventually falling on Air India. But in the second phase of RCS, major players have come up.
- c) **Lack of parking areas and landing slots:** This is a huge problem if regional aircraft are coming up. Due to the congested air traffic and inadequate infrastructure in India, airports are finding it difficult to allocate slots for regional operations. On 20th April 2018, Air Deccan has stopped its flights on the Pune-Nashik route owing to non-availability of slots at Pune airport. Air Deccan, which has bagged 34 routes in the first round of UDAN, had launched services on Pune-Nashik route in December 2017. The services will be resumed only after getting new slots at Pune airport. The issue has also been taken up with the civil aviation ministry. AAI also confirmed that an adequate number of slots were not available at the Pune airport. So, slot constraints are a major issue in some airports. Mumbai indicates they are completely out of slots.
- d) **Complexities in calculating VGF:** If an airline using a regional route is not able to get back their investment (e.g. volatile jet fuel prices), more VGF is needed which would cause additional subsidy burden. The costs of operation are different for different aircraft which makes VGF calculation difficult. The VGF Caps determined for specific routes will be indexed to inflation, ATF prices and the exchange rate of INR with reference to United States Dollar. Controversies are going on over the inclusion of certain costs and revenues while calculating VGF. Reducing operational costs can bring the airlines to fly RCS routes. Thus, Centre-State cooperation is essential, in the form of viability gap funding, subsidized aviation fuel and a fare cap, pivotal to enabling the scheme's success.
- e) **Pressure on air safety:** If more regional air routes arise, there would be more pressure on safety. With mounting worries over air safety and the alarming rise in 'near-miss' incidents in India, there can be no space for compromise on this vital component of the aviation industry.
- f) **Pressure on operational strength:** Operational viability is as important as financial viability. Operational viability includes talent, technology and contracts. With the significant growth in the domestic market, the demand for pilots, engineers and management personnel is very high. More human resources would be required for the upcoming airports. Shri. Jayant Sinha, Union Minister of State for Civil Aviation has signed MoU with the Ministry of Skill Development and Entrepreneurship for fully complying with skilled certification and increase the supply of people coming into the aviation sector.
- g) **The uncertainty of the benefits of subsidized fares to the common man:** Passengers are eligible for subsidized fares on a first-come-first-served basis. Will the common man benefit out of this scheme would be a question to think over. The airfare cap on the RCS seats is for 50% of the aircraft capacity to a maximum of 40 seats. The cap is INR 2500/hour, but no process of determining RCS seats has been confirmed. And the last minute bookings will almost be non-RCS when they are a fair share of "urgent" travel, most importantly medical travel which will likely bring up complaints.
- h) **Cumbersome certification process:** Air Operator's Certificate (AOC) is the approval granted by a government statutory authority to an aircraft operator to use their aircraft for commercial purposes. Of the 5 awardees in the first phase of the scheme, only 3 have AOCs. While the government indicates that they will fast-track AOC in a period of as little as four months, the AOC approval process is detailed and cumbersome. As such

this target seems to be highly optimistic. Additionally, carriers like Air Deccan will have to acquire aircraft which itself can be a lengthy process.

- i) **Mostly VFR:** Majority of RCS airports are VFR (Visual Flight Routes) makes them inaccessible during weather conditions such as fog or limited visibility. Defence airfields pose additional challenges as they have very specific requirements and foreign pilots may not be allowed to operate to such airfields.
- j) **Cooperation of the States:** The state governments are required to provide tax subsidies for regional operations, as well as security and fire services free of charge, besides providing electricity, water and other utility services at concessional rates. Each state has to agree to this, and it may not be as simple as the Centre has envisioned it to be. Additionally several of the airports need rehabilitation, and this is at best a multi-year process (given the nature of airport development in India). Humphreys and Francis (2002) examine the U.K. aviation market and conclude that regional airport performance depends significantly on the decisions of airlines regarding which airports to operate from and their responses to capacity constraints, regulation and planning laws. Thus, it is important to balance the interests of all stakeholders when formulating airport planning and regulatory policies.
- k) **Market Risk:** Sustainability of operations is one of the key guiding principles for RCS. The Ministry of Civil Aviation recognizes that traffic demand on RCS Routes will be indeterminate, and with most of such routes being untested/non-operational, the market risk for Selected Airline Operators could be substantial. Such market risk would tend to be heightened on account of possible competition from other airline operators – especially in the early stages of route development. Such competition in the early stages of development of such routes, especially given the demand uncertainty, could eventually impact the achievement of the scheme objectives.
- l) **The duration of national subsidies:** Even though RCS can help in boosting traffic growth, the scheme should not be dependent on VGF or national subsidies in perpetuity. Cross-subsidies hinder cost reduction and cost efficiency (IATA). They distort competition. Zou et al. (2015) investigate the effect on airport productive efficiency of two major funding sources used by US airports, namely the Airport Improvement Program (AIP) grants and the Passenger Facility Charges (PFC). It was found that PFC use has a positive impact on airport productive efficiency, whereas the impact of AIP grants is negative. Chang et al. (2016) developed dynamic network DEA models to investigate PFC-for-AIP funds substitution. U.S. airports can substitute PFC for 8–35% of the current AIP funds-amounts to \$14–58 million annually. But it is not possible for non-hub airports to substitute PFC for AIP funds, probably because these airports have smaller passenger bases and collect less PFC than other airports, thus relying heavily on AIP funds for airport financing. The amount of substitution negatively correlates with airport efficiency as the potential increase in PFC may discourage air passenger travel demand. Minato and Morimoto (2011) have concluded that ticket subsidies combined with measures to enhance non-aeronautical revenue are efficient and effective in assuring the viability of regional airports.
- m) **Cancellation of tickets:** Ministry of Civil Aviation identifies that cancellation of tickets is a regular business phenomenon in the aviation industry and certain passengers may cancel their RCS Seats before the flight departure which may not provide sufficient time to a Selected Airline Operator to resell such RCS Seats. However, the obligation of proving such cancellation in terms of relevant details (passenger identification, etc.) shall be on the Selected Airline Operator.

## 6. Concluding remarks

In airport management today, the commercial viability of regional airports and regional routes is a critical issue. The concessions provided by the Central Government and the State Government and the viability gap funding can ameliorate this issue. If all the stakeholders are cooperative, these airports would be economically viable. Around the world, 13 countries that provide a subsidy for regional aviation, including the United States, Australia and Germany. More the people on the network, the better. Increased connectivity will lead to the development of remote areas, enhance trade and commerce, and expand tourism. There would be a positive impact on the national market. If the air tickets are subsidized, it will benefit the airport ecosystem as a whole. The number of passengers will increase if the ticket rates are affordable to a common citizen. This will boost airline revenues. There would be more spending at the airport, and the size of the local economy will be expanding. Hence, there would be regional economic growth, and the living standards of the people would be increased. The RCS is benefitting not just airline operators but also original equipment manufacturers. The RCS will not only let the ‘common man’ fly at affordable prices but will also boost the regional economy and lead to job creation.

The present paper has explained the possible implications of the scheme to date. It will take five to ten years to see the benefits of Regional Connectivity Scheme. Hence, it is too early to analyze the performance of airports after RCS has introduced. But DEA analysis in this paper can provide an opportunity for airports to review their performance. Airports whose performance has declined can utilize this analysis to make changes and decisions as required. Accepting the fact that market dynamics will change over time, MoCA may review the Scheme provisions as and when necessary for efficiency in the accomplishment of the objectives. With the availability of data, we could also examine the impact of the scheme on prices, economy, environment and society on a local, regional, national or global scale. The model is new which evolves over time. All the stakeholders should be cooperative throughout the journey to make this project a success.

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