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THE ROLE OF PUBLIC POLICIES IN TERRITORIAL AIR CONNECTIVITY. THE CASE OF COLOMBIA

Oscar Diaz Olariaga[1]

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[1] PhD in Aeronautical Engineering (UPM)
and PhD in Economics and Administration (UNED).
Professor at the University of Santo Tomás.
Bogotá – Colômbia.
E-mail: diaz_olariaga@yahoo.es

ABSTRACT

This article analyzes the role of public policies in territorial connectivity, primarily domestic, using Colombia as a case study. The growth and evolution of Colombian air transport have been supported and driven by a set of public and investment policies designed exclusively for the aviation sector and implemented almost continuously since the liberalization of the air transport industry in the country in the early 1990s, policies that are still evolving. Among the main findings of this study, it can be noted that, firstly, the liberalization of the air transport sector in Colombia and the ongoing development of public policies for the sector, as well as public and private investment policies in airport infrastructure, contributed to the progressive evolution of air connectivity between territories. And secondly, aviation public policies have not only contributed significantly to connectivity and territorial cohesion but have also boosted the socioeconomic development of the regions.

Keywords: public policy, regional development, territorial management, Colombia.

1. INTRODUCTION

Air transport plays an important role in today's globalized society. There is a growing understanding among governments around the world that air connectivity is an asset that enhances the global competitiveness of cities, regions, and countries. In this sense, increased connectivity lowers travel costs for consumers and businesses and facilitates global contacts and trade. There is growing evidence that increased air connectivity stimulates productivity, foreign direct investment, tourism, etc., in different regions of a country (Burghouwt, 2017). In this context, many governments formulate public policies in their (local) air transport industries to improve regional connectivity outcomes, to achieve a connectivity portfolio that better meets the needs of society (van de Vijver *et al*., 2014).

At the national level, governments are interested in domestic air connectivity, i.e., how well their national air transport system connects the population between different inland territories, since, on the one hand, it offers significant economic benefits to users (all stakeholders) and, on the other, it boosts regional economies by facilitating tourism, domestic foreign direct investment, and business development (OECD/ITF, 2018a). In addition to the economic benefits of local air connectivity, it also plays a very important social role for communities in remote and isolated areas. These communities often do not have direct access to essential services such as healthcare, education, and social services and therefore depend on connections to larger cities. In these cases, governments often formulate public policies to ensure air accessibility to these communities through so-called "essential air services" (Fageda *et al*., 2019). Governments' considerations for facilitating minimum levels of connectivity may go beyond the social logic of providing communities with what is perceived as essential connectivity to meet certain social needs. The reason for supporting domestic connectivity may be more strategic: providing adequate air connectivity to remote regions can make them more attractive to current and potential inhabitants, thereby maintaining the populations of those regions (or, in other words, preventing massive and gradual depopulation) (Tveter, 2017).

In this context, Colombia, the case study country for this research, liberalized its air transport industry in the early 1990s and experienced all the related events that occurred worldwide, namely: opening the market to private air operators, privatizing the flag carrier, progressively deregulating fares, privatizing airports, signing bilateral air agreements with other countries, developing public investment

programs in regional, remote, peripheral, and isolated airports, etc. All of this was done through a series of public policies designed exclusively for the aviation sector, which are still in place (Díaz Olariaga, 2021).

This article analyzes and evaluates, from a public policy perspective, how air transport contributes to regional/territorial connectivity, using the Colombian air transport system as a case study. This research fills a huge gap in the scientific literature on the relationship between public policy and air connectivity in regions, not only in the case study country, Colombia, but also at the Latin American subcontinent level. It is hoped that the results of this research will provide input to Colombian authorities and policy makers for the development of public policies to improve/enhance the connectivity of territories and their communities, thereby contributing to effective regional development. Furthermore, this study could serve as a reference for authorities in other countries in the region for the development of air connectivity policies (that contribute to regional development), since almost all South American countries have isolated, remote, and peripheral regions/territories, where in many cases communities are completely neglected by central administrations.

2. METHODOLOGY

The descriptive methodology used in this research is based on systematically observing, recording, and analyzing the characteristics, behaviors, or properties of a current population or phenomenon without manipulating variables. Its objective is to define what the object of study is or how it behaves, using qualitative or quantitative methods, case studies, or observation. The phases designed and developed in this research, which is based on a case study, were: (a) identification of the problem; (b) data collection; (c) categorization of the information collected; and (d) interpretation of the variables. The methodology is rigorously and strictly structured to ensure its replication (e.g., in other regions or countries).

Therefore, the objective of this research paper is to analyze the role and influence of public policies on air connectivity in Colombia. As this article is descriptive in nature, the methodology focuses on describing, analyzing, and evaluating the different arguments related to the study. First, the corresponding conceptual framework is presented to understand the main pillars on which all the analyses presented are based (at a theoretical level). Subsequently, the case study is developed, describing the characteristics of

Colombia in terms of: (a) air transport investment policies, (b) air service policies for remote, isolated, and peripheral regions, land connectivity, and finally (c) the impact of public aviation policies. The data were collected from official public sources (and freely accessible). The graphic description was carried out by generating thematic maps (using the ArcGIS for Desktop program). This was done to aid in understanding the subsequent analysis of air transport in the context of Colombia's geography.

3. CONCEPTUAL FRAMEWORK

3.1 THE ROLE OF AIR TRANSPORT IN TERRITORIAL CONNECTIVITY

In general terms, connectivity can be understood as a quality that arises and develops from the existence of links between interrelated objects and functions. Thus, the physical representation of the abstract concept of connectivity is that of a structure made up of a network of corridors (land, air, sea, and river) that serve to move goods and people between different points within a territory.

The characteristics of this network will depend, first and foremost, on the physical or structural aspects of the territory where it is located, that is, on the difficulties or advantages that this territory offers for the deployment of said network. Likewise, the characteristics of the flows, in terms of mobility, volumes, and type of resources mobilized, are also determining factors in the configuration of the network (Figueroa and Rozas, 2005). Finally, connectivity serves multiple purposes in the different areas of a country's economic and social activity, the most typical being: (1) connectivity to facilitate economic and productive activity; (2) connectivity for social development and integration; (3) geopolitical connectivity (exercise of sovereignty); and (4) strategic connectivity (connection of a country's regions and territories with other countries) (Rozas and Figueroa, 2006).

In the field of air connectivity, many governments formulate public air transport policies to, among other things, improve connectivity between their territories. The arguments for the government sector to do so are diverse; the most important are (1) economic (productive development, job and wealth creation, etc.) and (2) sociopolitical (integration and territorial cohesion) (Burghouwt, 2017; Burghouwt and Redondi, 2013). Regarding the former, air transport is considered an enabling factor for broader economic development in a region (van de Vijver *et al.*, 2016).

An analysis of existing literature on the subject confirms that passenger air transport and employment (in different industrial sectors) in urban regions are positively linked (Goetz, 1992; Liu *et al.*, 2006; Button and Taylor, 2000; Neal, 2012; Green, 2007; Brueckner, 2003; Ivy *et al.*, 1995). The reason for these assertions is the observation that better air transport services imply better accessibility, which encourages companies to locate in a region and stimulates the expansion of existing businesses (Cooper and Smith, 2005; Zak and Getzner, 2016). It appears that this improved accessibility and connectivity contributes to positive economic outcomes for the economy by improving overall productivity through greater access to other markets and improved dynamics of worker movement between regions (Perovic, 2013; Mukkala and Tervo, 2013; Neal, 2012; Button *et al.*, 1999).

Finally, some research asserts that employment in the service sector stems from the assumption that the service industry is more sensitive to passenger air transport than other sectors of the economy (Percoco, 2010; Bel and Fageda, 2008; Denstadli, 2004; Faulconbridge *et al.*, 2009; van de Vijver *et al.*, 2014).

3.2 THE ROLE OF AIRPORT POLICY IN TERRITORIAL COHESION AND DEVELOPMENT

There is an ongoing debate about the definition of a regional airport. Some attempts to define a regional airport link the notion of regional (or non-central) with the fact that an airport's catchment area is located outside a capital city. In the European Union, at least to date, there is no formal definition of a regional airport for the purpose of public policy development. In the United States, the Federal Aviation Administration subdivides airports with commercial traffic into primary and non-primary airports, based on the number of annual passengers boardings (FAA, 2022). A European study (ACI Europe, 2017) considers that an airport's catchment area or annual traffic are not valid indicators of whether an airport is regional or not; therefore, it states that an airport should be considered regional if: (1) it mainly serves short- and medium-haul routes, and (2) it mainly serves point-to-point destinations.

Regional airports are essential transport hubs and facilitate the smooth functioning of a country's internal market by connecting people, products, and services. They also enable economic activity and growth, expand the horizons of traditional trade routes, and provide a significant boost to the cities and regions they serve, thereby increasing accessibility and improving social cohesion and

development (Baker and Donnet, 2012).

In many inland regions of countries, there are few efficient, or even viable, alternatives to air transport due to a combination of factors including distance, low population density, geographical constraints, adverse weather conditions, etc. Often, airports in these regions are the only means of facilitating access to essential services for these communities. They also support economic and social integration, enabling businesses to connect and citizens to travel for work. Regional airports and the air services they provide are therefore extremely important in terms of local development and containing severe depopulation (preventing mass and staggered migration to large cities) (Redondi *et al*., 2013).

As a result, regional airports are now defining the economies of their communities, i.e., they are drivers of socioeconomic development in their territories. Regional airports are becoming catalysts for economic regeneration and growth (OECD/ITF, 2018b).

3.3 ESSENTIAL AIR SERVICE POLICIES

Given the link between connectivity and economic growth, public managers are interested in appropriate mechanisms to effectively promote air transport, not only in large economic centers but also in remote areas, which under normal market conditions would be excluded. Globally, it is easy to find countries with regions and territories to which routes are not economically profitable for local airlines, mainly due to the low, or almost zero, volume of regular passengers transported (in other words, very low demand), so that it facilitates the development of adequate air transport connections. However, due to the social, economic, and even geopolitical importance of remote/ultra-peripheral/isolated communities, many countries formulate public policies aimed at providing and guaranteeing air connectivity to these regions. These policies lead to what are known as essential air services or public service obligations (IDB, 2018).

Globally, many countries develop public policies to provide air connectivity to remote regions, and these policies are tailored to the characteristics and situation of each country. In general, these public policies can be classified into four distinct groups (Fageda *et al*., 2018):

1. Route-based policies: contracts are generally established between the government and airlines, which may specify service levels, frequencies, aircraft type, scheduling, and fares offered per route.

2. Passenger-based policies: this policy focuses on discounts (fixed or variable) for residents of these remote regions.

3. Airline-based policies: in some countries, essential air services are provided by a public airline operator. These public airlines guarantee air services on unprofitable routes.

4. Airport policies: these consist of an incentive scheme for airlines operating these unprofitable routes (e.g., discounts on airport fees, certain bonuses, etc.) and, on the other hand, subsidies for the airports concerned (from which routes and frequencies to remote regions are offered).

Ultimately, these policies contribute to the well-being of citizens and communities living in remote regions. Although the precise benefits remain difficult to quantify, it is possible to highlight different types of impacts of air connectivity in remote regions: (a) impacts on communities due to the incidence on passengers and goods, and stimulation of long-term growth in the area; (b) impacts on airlines (construction of new profitable routes, or those benefiting from subsidies), and (c) impacts on the government in terms of service delivery. These different types of impacts can influence which types of programs and public policies will be most appropriate under different circumstances (Fageda *et al*., 2019).

4. CASE STUDY DEVELOPMENT

4.1 AIR TRANSPORT INVESTMENT POLICIES

In Colombia, air transport investment policies are divided into two main groups. First, private investment, which is channeled through an airport concession program, in other words, the privatization of airports, understood as the transfer of airport operation and administration to a private operator, which must invest in expanding, modernizing, and maintaining the air infrastructure. Second, public investment in airports with full public governance, generally small or very small, which are not viable (from the point of view of commercial profitability) for privatization (Díaz Olariaga, 2017).

With regard to the first group, private investment policies in air infrastructure, in Colombia, since the mid-1990s, and in several phases known as generations, the Colombian public sector has granted concessions for several of the country's airports with the aim of improving the administration, modernization, expansion, operation, commercial exploitation, and maintenance of air terminals (Pulido and Díaz Olariaga, 2019). The concessioned airports are in the most populated areas of the country, where there is greater productive and economic activity. Private investment in airports has evolved in line with the dynamics of the concessions, from zero in 1996, the year the first concessions began, to 20% as a percentage of air transport GDP in 2010 (Díaz Olariaga, 2016). In concrete figures, exclusively private investment in the four generations of airport concessions between 1996 and 2015 amounted to USD 1.61 billion (MinTransporte, 2021).

On the other hand, public investment policies in medium, small, and very small airports managed by the state, many of them located in isolated, peripheral, or remote regions, have continued unabated for three decades. The objective of this investment is to expand (where appropriate), modernize (technologically), and maintain airports under 100% public governance. Between 1993 and 2018, exclusively public investment in airport infrastructure amounted to approximately USD 1.72 billion (Díaz Olariaga, 2020), and in the short period from 2019 to 2022 alone, public investment amounted to USD 736 million (MinTransporte, 2023).

4.2 POLICIES ON AIR SERVICES TO REMOTE, ISOLATED, AND PERIPHERAL REGIONS

Colombia has a complex geography that hinders territorial connectivity (regardless of the mode of transport), namely: (1) the country is crossed from southwest to northeast by three mountain ranges of the Andes; (2) the country has an insular region in the Caribbean Sea (the archipelago of San Andrés, Providencia, and Santa Catalina) 775 km from the Colombian Atlantic coast; and (3) 42.3% of the continental territory is Amazon rainforest (in the southeastern part of the country). In addition to this geographical situation, Colombia has a major deficiency (in coverage and capacity) in its land-road and rail communication systems (the latter being practically non-existent) (Díaz Olariaga and Carvajal, 2016). In short, all of this means that air transport in Colombia is vital and plays a highly relevant role in territorial connectivity.

In Colombia, the public policy adopted for air access to remote and isolated regions corresponds to the so-called airline-based policy. Therefore, essential air services in Colombia are currently provided by the public operator Satena, whose objective is to provide passenger, mail, and cargo air services, prioritizing transportation to the least developed regions of the country and connecting, by air, those regions where, for geographical, public order, and poverty reasons, no other airline operator arrives, thus ensuring connectivity and territorial integration (Aerocivil, 2016). It is worth mentioning that the public operator Satena also operates commercially profitable (domestic) routes, in direct competition with private operators present in the Colombian market, although these destinations are generally small cities.

4.3 LAND CONNECTIVITY

The notable division of Colombia along the Andes Mountain range has, in some ways, created geographical isolation that is reflected in the political, economic, ethnic, and cultural characteristics of each region. At the same time, it has created difficulties in the interregional transport of people and goods (Villarreal and Ortiz, 2016). This has had an impact on the country's economic and social development. Added to this situation is a worrying lag in Colombia's road infrastructure, and the rail transport system (with very limited coverage and capacity) is only used for freight transport (passenger rail transport is non-existent). In comparative terms, the development of Colombia's road and rail infrastructure lags far behind not only developed countries but also other countries in the region (Latin America). A study conducted a decade ago estimated that a country with Colombia's geographical characteristics (1.14 million km^2 in area, and with a significant mountainous topography that crosses the country from southwest to northeast), should have 30% more kilometers of (paved) roads than it had at the time and almost 300% more kilometers of railways than it had at the time (Díaz Olariaga and Carvajal, 2016).

It is for the above reasons that the air transport sector in the country has grown significantly and has been linked to economic growth in certain regions of the country. In fact, air transport has become one of the most important services in the Colombian economy, as the country's topography makes it difficult to operate other types of transport, thus facilitating integration and connectivity, mainly in some of the most remote (or isolated) areas of Colombia (Díaz Olariaga and Carvajal, 2016).

4.4 IMPACT OF PUBLIC AVIATION POLICIES

4.4.1 REGIONAL DISTRIBUTION OF THE AIRPORT NETWORK

The Colombian airport network has not changed in the last three decades, meaning that no new airports have been built. However, as mentioned above, related investment policies contributed to the expansion and technological modernization of almost all airports in the network, a process that is still ongoing.

Colombia's population, economic, and productive development is concentrated in the central, western, and northern regions of the country. As a result, the airport network, and especially its main airports, is also concentrated in these regions. In short, the geography of the airport system and its development coincide and is consistent with the country's socioeconomic geography (see Figure 1). However, there are airports in remote, peripheral, and isolated regions where medium-sized and small communities live, which is why the presence of airports there, mostly small and small, is justified.

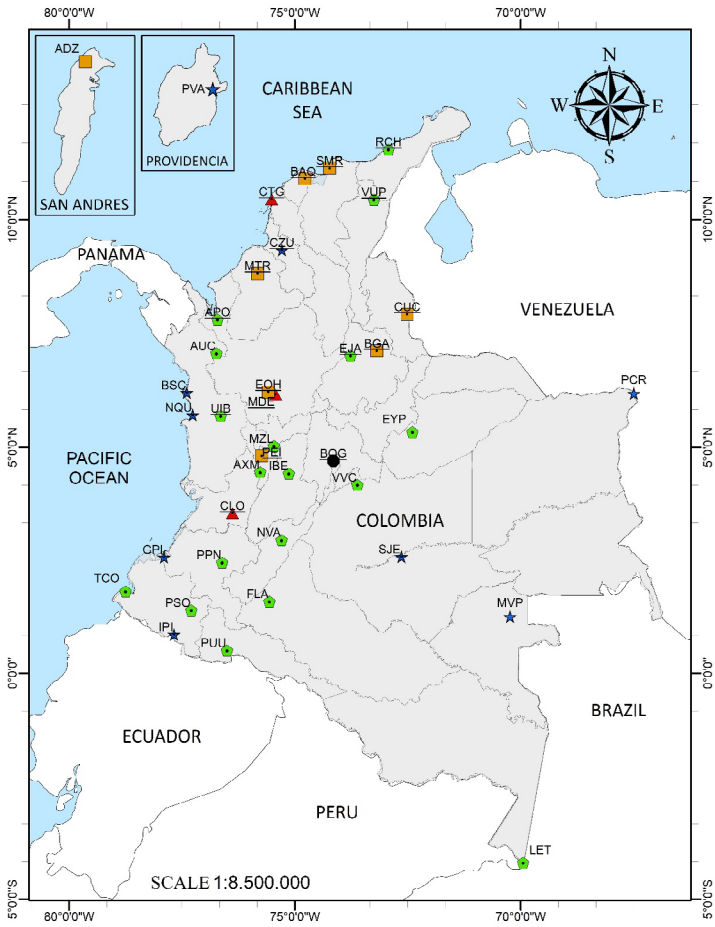

Figure 1. Colombian airports with annual domestic passenger traffic data for 2024. Description: black circle: the country's main airport (29 million); red triangle: 4-8 million; orange square: 1-3 million; green pentagon: 0.1-0.5 million; blue star: 0.03-0.1 million. Airports with 100% private governance are identified with underlined IATA codes. Source: Aerocivil (2025).

4.4.2 AIR TRAFFIC DEVELOPMENT AND THE IMPACT OF THE COVID-19 PANDEMIC

In Colombia, domestic passenger air traffic (all airports) has experienced significant and uninterrupted growth since the liberalization of air transport in the country (1991) (Díaz Olariaga, 2017, 2021). Between 1991 and 2019, domestic passenger air traffic tripled (Aerocivil, 2025), reaching 30 million passengers in 2019. Domestic air cargo transport grew by 150% between 1991 and 2019 (Aerocivil, 2025), reaching 170,000 tons of air cargo transported in 2019.

On the other hand, domestic RPK (Revenue Passenger Kilometers), an indicator that considers the distance traveled by passengers, tripled between 2007 and 2019 (Aerocivil, 2025). However, as the national airport network has not changed, with no new airports built in three decades, the growth in domestic RPK is due to airlines adding new domestic destinations and increasing the number of seats and frequencies (Tascón and Díaz Olariaga, 2020). On the other hand, the domestic TKT (Tonne-Kilometer Transported) indicator, which multiplies the cargo transported by the distance it travels, has doubled in the period 2007-2019 (Aerocivil, 2025), and again, as the airport network has not grown, the increase in the indicator (and in demand) is due to the increase in supply (of cargo capacity), routes, and frequencies by operators to existing destinations in the national airport network.

In relation to the impact of the COVID-19 pandemic on the case study country, this circumstance led to a significant drop in air passenger demand in 2020, the worst year of the pandemic (85% for domestic passengers and 75% for international passengers, both compared to 2019). However, total air cargo demand (domestic plus international) fell by only 16% compared to 2019, an area where the impact of the pandemic was much less severe (Aerocivil, 2025). By the end of 2022, however, passenger demand, both domestic and international, had fully recovered to 2019 levels. At the end of 2024, domestic passenger traffic nationwide was 38 million passengers (Aerocivil, 2025).

On the other hand, with regard to the impact of the pandemic on (domestic) passenger and air cargo demand at airports located in regions that can be considered remote, isolated, and peripheral in the case study country, it should be noted that, in terms of domestic passenger demand, the drop in traffic was significant in 2020, as mentioned above, but there was a rapid recovery in the transition period (2021) and a complete recovery in demand by the end of 2022 (to 2019 levels) (see Figure 2) (Aerocivil, 2025). Domestic air cargo demand at this type of airport was virtually unaffected by the pandemic (see Figure 3).

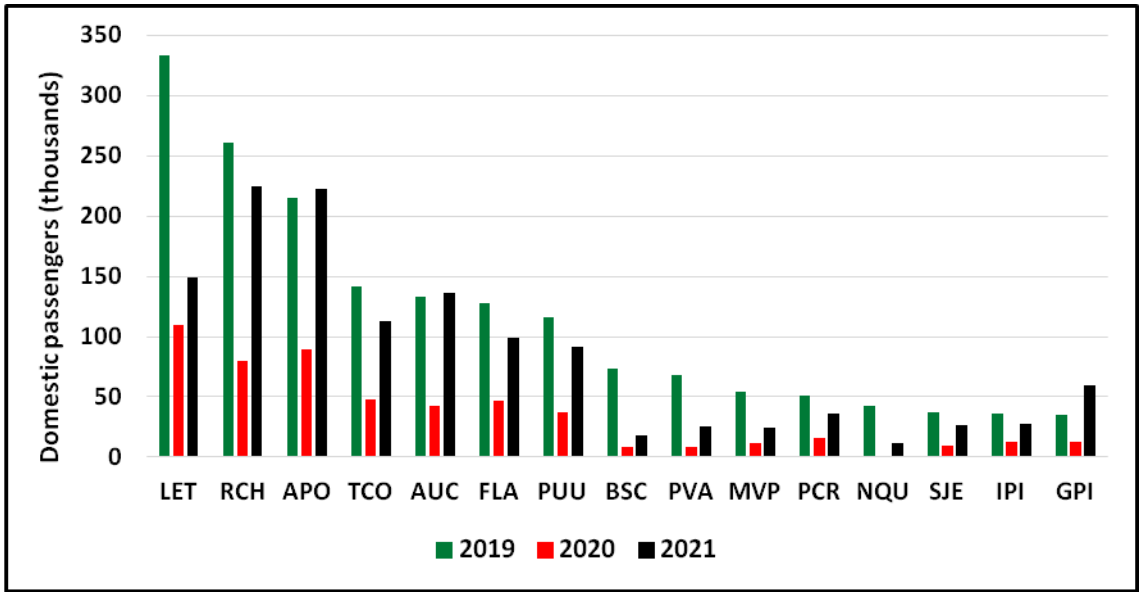

Figure 2. Development of domestic passenger traffic at remote, isolated, and peripheral airports (all of which are small and have low traffic volumes) in Colombia during the pre-pandemic (2019), pandemic (2020), and post-pandemic (2021) periods. Airports are identified by their IATA code. Source: Aerocivil (2025).

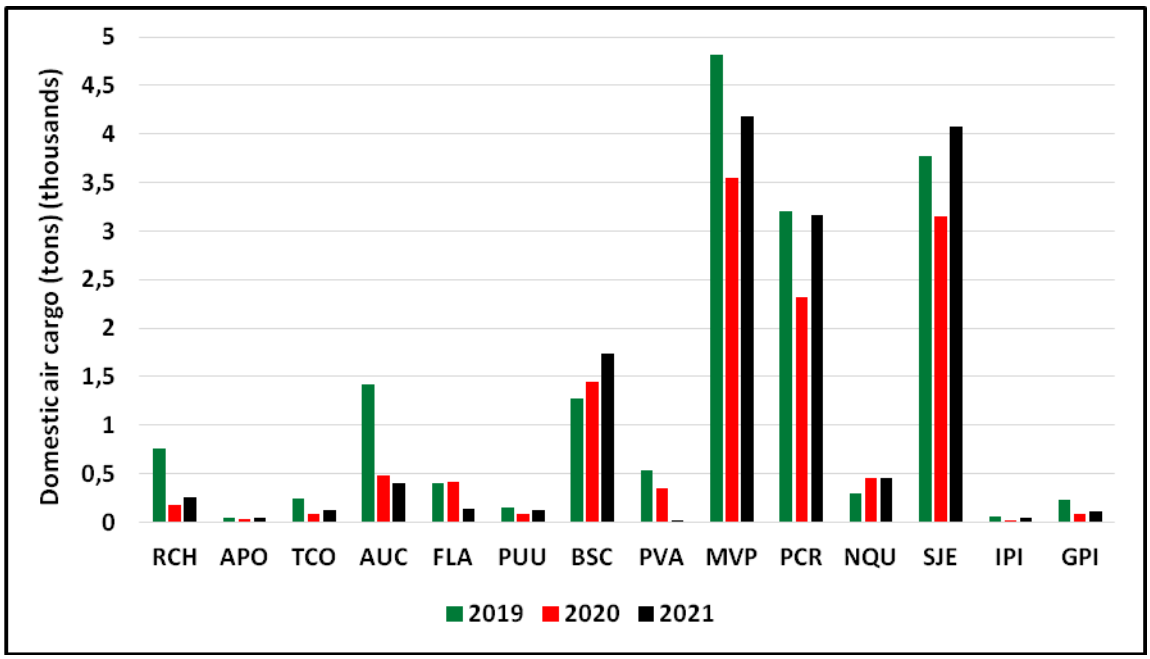

Figure 3. Development of domestic air cargo traffic at remote, isolated, and peripheral airports (all of which are small and have low traffic volumes) in Colombia during the pre-pandemic (2019), pandemic (2020), and post-pandemic (2021) periods. Airports are identified by their IATA code. Source: Aerocivil (2025).

4.4.3 NETWORK CONCENTRATION, CONNECTIVITY, AND ROUTE DEVELOPMENT

Recent research on the development of Colombia's domestic air transport network (over the last 25 years), which used a model derived from network theory, concluded that the Colombian airport network has a weak degree of interconnection, as well as a high degree of heterogeneity (Zea *et al*., 2019). According to the authors, one of the most important factors contributing to this heterogeneity is the enormous influence of the main airport in the country's capital (Bogotá-El Dorado), which handles 40% of domestic traffic and 74% of international traffic for the entire network (Aerocivil, 2025).

On another note, to determine the level of (domestic) traffic concentration in the Colombian airport network, the Gini Index (GI) was calculated. For 1992 (the start of air transport liberalization in Colombia), GI = 0.7474, and for 2019 (the last year before the start of the COVID-19 pandemic), GI = 0.8004. Analysis of this indicator allows us to confirm two things: first, the level of concentration is typical (very similar) to that of other regions and countries around the world in recent years (Berster *et al*., 2015; Huber, 2009), and second, as experienced in other regions of the world during their post-liberalization periods in the aviation industry (with a migration from a point-to-point structure to a hub-and-spoke type (Zhu *et al*., 2019; Pacheco *et al*., 2015; Papatheodorou and Arvanitis, 2009), in Colombia, post-liberalization was accompanied by an increase in traffic concentration (Díaz Olariaga and Zea, 2018).

It is now interesting to see how the increase in concentration in the domestic network has influenced traffic flow in the country's different regional destinations, many of which are remote, peripheral, and isolated. We then calculate the travel rate indicator, which identifies the relationship between domestic passengers handled by the airport and the population of the city-region where the airport is located; this indicator can also be considered as one of accessibility to air transport services (according to ICAO, 2017). Table 1 shows the performance of this indicator for the period 1992-2019 and for all airports/regions under analysis. At least two conclusions can be drawn from the behavior of the indicator: first, except in three cases, the indicator grew at the airports analyzed, in some cases significantly; and second, the indicator grew in almost all destinations considered remote, peripheral, and isolated (clearly identified in Table 1 with a different font).

Table 1 | Development of the travel rate indicator in regional destinations. Destinations considered remote, peripheral, and isolated are shown in italics and bold type. Source: own elaboration.

City (Airport IATA code)	Travel rate (1992)	Travel rate (2019)	City (Airport IATA code)	Travel rate (1992)	Travel rate (2019)
RIONEGRO (MDE)	15.6	52.0	RIOHACHA (RCH)	0.5	1.3
CARTAGENA (CTG)	0.9	4.6	MANIZALES (MZL)	0.4	0.5
CALI (CLO)	0.8	2.1	CAREPA (APO)	2.0	4.2
BARRANQUILLA (BAQ)	0.5	2.0	IBAGUÉ (IBE)	0.2	0.3
SAN ANDRÉS (ADZ)	11.3	41.1	BARRANCABERMEJA (EJA)	0.3	0.7
SANTA MARTA (SMR)	0.7	4.3	TUMACO (TCO)	0.4	0.6
BUCARAMANGA (BGA)	0.8	3.0	POPAYÁN (PPN)	0.1	0.4
PEREIRA (PEI)	0.9	3.6	ARAUCA (AUC)	2.4	1.4
MEDELLÍN (EOH)	0.3	0.4	FLORENCIA (FLA)	0.5	0.7
CÚCUTA (CUC)	0.9	1.4	PUERTO ASÍS (PUU)	0.6	1.7
MONTERÍA (MTR)	0.3	2.0	COROZAL (CZU)	0.3	1.3
VILLAVICENCIO (VVC)	0.4	0.9	BAHÍA SOLANO (BSC)	2.9	7.1
VALLEDUPAR (VUP)	0.2	0.9	PROVIDENCIA (PVA)	14.3	10.9
ARMENIA (AXM)	0.3	1.4	MITÚ (MVP)	0.5	1.6
QUIBDÓ (UIB)	0.6	2.7	PUERTO CARREÑO (PCR)	0.8	2.5
PASTO (PSO)	0.4	0.8	NUQUÍ (NQU)	1.3	2.5
LETICIA (LET)	1.2	6.7	SAN JOSÉ DEL G. (SJE)	0.5	0.7
NEIVA (NVA)	0.4	0.8	IPIALES (IPI)	0.3	0.3
EL YOPAL (EYP)	3.3	1.7	GUAPI (GPI)	0.6	1.3

Regarding route development, the Colombian Civil Aviation Authority, through its Air Navigation Plan, structures homogeneous areas within Colombian airspace. These areas, four in total, are large air corridors that bring together all air traffic flow. All domestic air traffic routes are grouped within them. Domestically, the routes that handle the highest number of flights (and passenger traffic) are called main national routes (each route connects two airports, and traffic on that route is measured by adding the traffic in both directions). These main routes form a true network across Colombia, and the development and growth of this network has been reinforced by the dynamics of domestic air transport over the last three decades. Figure 4 shows a graph of the main domestic routes, which together account for 98% of the entire network's traffic (Aerocivil, 2025). The highest growth in interregional air traffic (1992-2019) occurred between: (1) the country's capital and the central Andean region (BOG-EOH) (approximately 2000%); (2) the country's capital and the Caribbean coast (BOG-SMR, BOG-CTG, BOG-MTR, BOG-VUP) (between 600% and 800%); (3) the central Andean region and the Caribbean coast (CTG-PEI, MDE-SMR, CTG-MDE) (between 800% and 1000%); and (4) the country's capital and the Amazon region (BOG-LET) (approximately 500%) (Aerocivil, 2025). The destinations connected by the main national routes (shown in Figure 4), through the airports that serve these cities and regions, represent almost all of Colombia's territory. Therefore, the growth in domestic air traffic has benefited and boosted, and continues to do so, the country's territorial connectivity in almost all its inhabited geography.

On another note, four decades ago, only one airport, the country's main airport (BOG), located in its capital, was practically the only hub in the entire network. Today, several regional airports serve as hubs or distribution centers (at the domestic level) (see Figure 4). This circumstance has contributed, and continues to contribute, to the strengthening of territorial air connectivity.

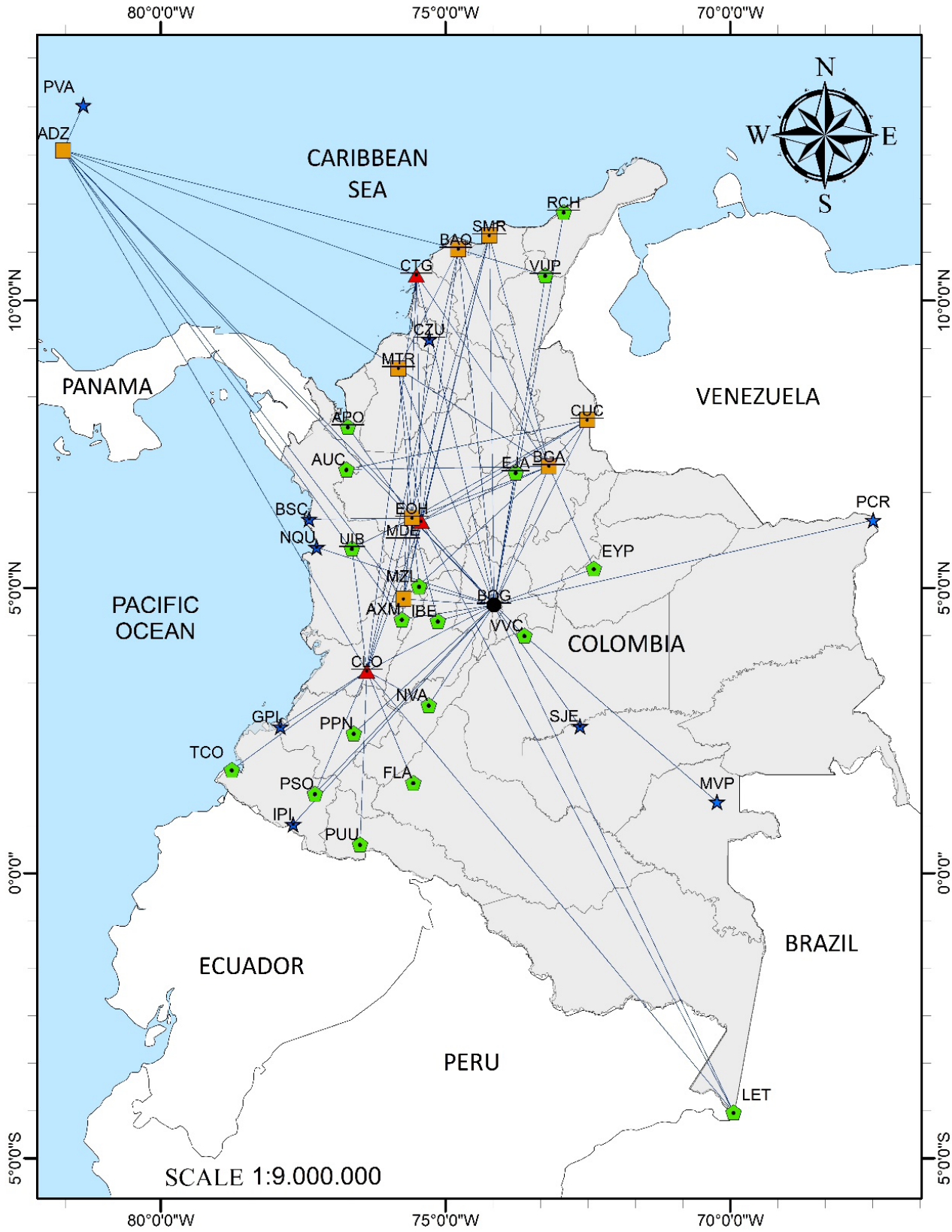

Figure 4. Main national routes in Colombia. Source: Aerocivil (2025).

Finally, another study, which analyzed domestic passenger traffic behavior in Colombia using a gravitational model, concluded that due to factors such as the country's complex geography, airport locations, economic factors (purchasing power), and lack of mobility alternatives (other modes of transport), air transport is a determining factor in domestic connectivity, which is becoming very competitive (compared to road or land transport) for distances greater than 200 km (Díaz Olariaga *et al*., 2018).

4.4.4 TOURISM POLICY AS A DRIVER OF REGIONAL AIR CONNECTIVITY

In Colombia, the last two sectoral tourism plans (which are national tourism policies), 2018-2022 and 2022-2026 (MinCIT, 2018, 2022), request and recommend that the national government design and implement public aviation policies that are oriented and aligned with strategic tourism guidelines and that address the following relevant aspects. The main strategies suggested by the tourism policy are mentioned below.

Airfare prices: Colombia has some of the highest airport taxes and fees in the world. In fact, around 14 taxes have been identified that are levied on the air transport industry. In Colombia, airport costs represent around 8.3% of airline operators' costs, which is much higher than in other Latin American countries, demonstrating that there is room for improvement for airlines in terms of reducing these factors.

Investment in airport infrastructure: the current Sectoral Tourism Plan establishes that in order not to slow down the current development of air travel, and even to boost it further, airport infrastructure must be able to absorb the new demand without limitations. And this requirement must extend beyond the country's main airports; it must attempt to cover most of the national airport network.

Regional airports: joint actions must be taken with the aviation authority and stakeholders in the aviation sector to ensure that regional airport infrastructure is properly maintained and continuously modernized, enabling airports in destinations with high tourism potential to develop their capacity to meet service demand.

Reduction of aviation bureaucracy: promote the facilitation of the operation of charter flight companies and local/regional airlines with tourist destinations in the country, negotiating with the aviation authority and competent entities to simplify the procedures for setting up companies and eliminating barriers to market access regarding seat limits, operating routes, and time limits.

Tariff policy: airfare liberalization schemes should be promoted to encourage the development of new routes and destinations.

Connectivity policies: connectivity strategies for tourist destinations should be developed with the relevant national and regional authorities, promoting the operation of airlines with non-scheduled flights using small-capacity aircraft. Connectivity between capital cities and/or intermediate cities should be increased by encouraging the opening of new routes except for certain taxes in order to promote domestic tourism.

5. CONCLUSIONS

As shown by the indicators presented and analyzed here, the liberalization of the air transport sector in Colombia, which began in the early 1990s, and the ongoing development of public policies for the sector, as well as public and private investment policies in airport infrastructure, contributed to the progressive evolution (in capacity and coverage) of air connectivity across the country. Public aviation policies have not only contributed (and continue to contribute) significantly to territorial connectivity and cohesion but also contribute to the socioeconomic development of the regions and support and stimulate growth in other strategic sectors of the country, such as tourism and international trade, via air transport from the regions.

On the other hand, it is worth highlighting the function and relevance of regional airports in Colombia, many of which are small or very small and several of which are in remote, peripheral, and isolated regions. These airports play a fundamental role in the development of the domestic air transport network, especially in terms of territorial connectivity by air and the development of the regions where these airports are located. This circumstance has been favored by mandatory public service (or essential air service) policies, which aim to connect and integrate regions that are very difficult, or even impossible, to reach by other means of transport, given the country's unique geography.

This research fills a huge gap in the scientific literature on the relationship between public policy and regional air connectivity, not only in the case study country, Colombia, but also at the Latin American subcontinent level. It is hoped that the results of this research will provide input to Colombian authorities and policymakers for the development of public policies to improve the connectivity of territories and their communities, thereby contributing to effective regional development. On the other hand, this study could serve as a reference for authorities in other countries in the region for the development of air connectivity policies (that contribute to regional development), since almost all South American countries have isolated, remote, and peripheral regions/territories, where in many cases communities are completely neglected by central administrations. In short, in the Latin American subcontinent, the role and importance of air transport in territorial connectivity and cohesion and in the socioeconomic development of the regions presents a major challenge, which calls for the continuation of this line of research.

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