

## Article

# Airports in Communes before and during the COVID-19 Pandemic

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**Abstract:** Airports, linking air transport with other modes of transport, are indicated as one of the elements influencing regional and local development. Their presence strengthens the communication accessibility of a particular place in space attracting investors and dynamizing its development. Recently, the functioning of airports has been significantly affected by the COVID-19 pandemic drastically reducing passenger traffic at airports, which also translated into the situation of related companies and people who live near airports (commune). Assessing the impact of an airport on the socio-economic situation in a commune is difficult because, on the one hand, they create jobs and attract investors and, on the other hand, they generate noise and pollution. In this situation, a preliminary study was carried out in five communes throughout Poland. The aim of the research was to determine how residents and representatives of communes perceive airports located in their communes, in the context of the impact of these airports on the socio-economic situation in communes, also in the situation when the airports face problems resulting from the COVID-19 pandemic. The aim was achieved using analysis of strategic documents of communes, analysis of data on the functioning of communes and airports in the period 2016–2021, and a diagnostic survey using interview and survey techniques. The survey research involved 600 respondents from 5 communes located in different regions of Poland and 5 representatives of their authorities. To analyze the collected material and present the results, Statistica v.13.3 and R/RStudio software were used.

**Keywords:** airport; commune; impact; local development; pandemic



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## 1. Introduction

Air transport, which plays an important role in moving people and commodities [1] (pp. 14; 15–20), [2] (pp. 2–13), [3] (pp. 4–7; 10–15) and facilitating business [4] (pp. 1–6) [5] (pp. 1–11) in various places around the world, ensures over 65.5 million jobs [6]. The link between air transport and other modes of transport is airports, which occupy a defined area with fixed facilities within their boundaries [7] (p. 225), [8] (p. 534). As an element of air transport, they play one of the key roles in the development of the territory in which they are located.

As a result of the development of the aviation sector, the role of airports has changed, leading to greater diversity and complexity in the functions they perform. Nowadays, to a greater or lesser extent, they influence the development and competitiveness of the region and contribute to the success of local economies and the maintenance of the activity of local service providers [8]. The presence of an airport in a given locality broadens the scope of activity of its inhabitants and, for companies, it means the possibility of entering into new interactions and undertaking new activities.

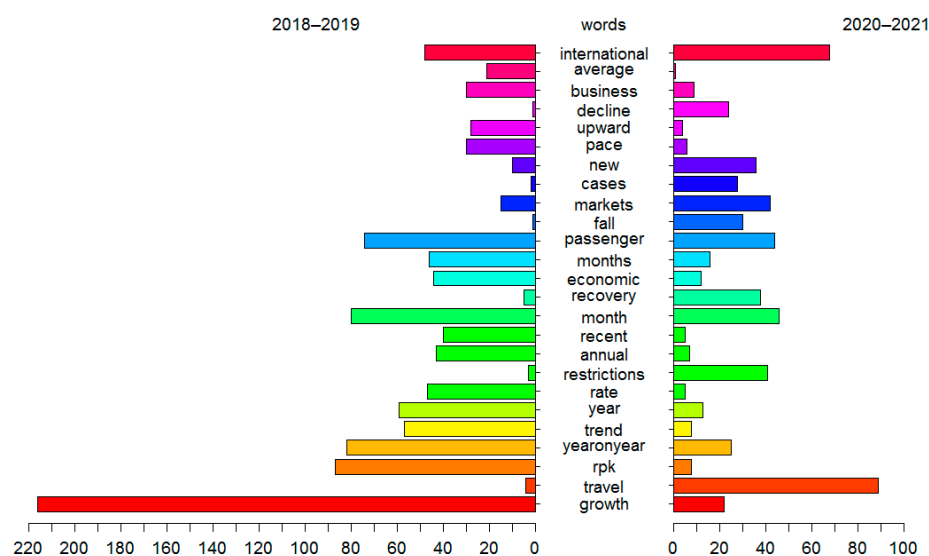
Airports are an important factor leading to the modernization of the economy and a driver of economic growth, which, by involving residents and businesses, leads to an increase in the investment attractiveness of the region and the communes in which they are located [9–11]. Being an important factor attracting investors, they contribute to a higher recognition of a particular region or commune. Designed and organized in accordance with the expectations of passengers and the airlines transporting them, they are a showcase for the region and the commune. There are also a number of companies providing specific

services at airports, both for travelers and the local community [12] (pp. 32–43), [13]. Another face of airports is their negative impact on the surroundings, contributing to an increase in noise and environmental pollution [14] (pp. 12–14), [15] (pp. 4–10), [16,17].

Airports, while allowing carriers to provide air transport services, charge their fees [18]. Revenues of airports result from air traffic, including fees related to passengers and aircraft. Other fees result from sales concessions, parking, and others [19]. By 2019, airports driven by increasing passenger traffic have generated revenue. According to Airports Council International (ACI), for example, in 2015, in the European Union, the total revenue from airports and aviation-related activities amounted to EUR 338 billion [20].

From 2020 onwards, the aviation industry, as well as airports, has been affected in an unprecedented way by the COVID-19 pandemic [21] (pp. 5–13), [22] (pp. 26–33), [23] (pp. 6–14), [24] (pp. 9–13). According to the International Civil Aviation Organization (ICAO), only 1.8 billion passengers will use this mode of transport in 2020, compared to 4.5 billion in 2019. The number of scheduled commercial flight operations performed fell by 42 percent, with around 22.5 million in 2020, compared to over 38 million in 2019 [25] (p. 5).

Analyzing International Air Transport Association (IATA) reports [26] that looked at passenger traffic between 2018 and 2021, it was found that the problems specific to this mode of transport as a result of the COVID-19 pandemic were evident in the vocabulary used, in addition to the numbers cited (Figure 1). While until the end of 2019, the word “growth” or an indicator showing the revenues of air carriers, which are calculated per 1 passenger-kilometer, could often be found in the reports, in subsequent studies, words related to the pandemic, such as restrictions, decline, recovery, strengthening passenger interest in travel, and the introduction of security procedures to counter the spread of the COVID-19 pandemic were more frequent. Examples of safety procedures are presented in the article [27] (pp. 58–60) and report [28].



**Figure 1.** Occurrence of selected words in IATA reports from 2018 to 2021. Source: own preparation based on [29] (pp. 80–83).

As a result of reduced air traffic, airports have experienced significant revenue declines. A report published by the ACI shows that in 2020, as a result of the COVID-19 pandemic, airports saw passenger-related revenue drop by around 65% and revenue from landing fees by 42% [30]. Considering that air traffic drives the profits that airports make, its drastic decline has, to a greater or lesser extent, affected the situation of people and companies associated with airports. Suspension of connections, terminal closures, and other actions have affected both the people employed at airports and the companies working with them. It should be recognized that in addition to the flying staff, cabin crew, flight attendants, and

aircraft operators, characterized by high competence, people occupying auxiliary positions and residents of neighboring towns [6,31–33] have lost their jobs.

According to the information provided in the IATA reports, the reduction in epidemiological risks led to a revival of air connectivity. By September 2021, direct connectivity at European airports had recovered to 64% of pre-pandemic 2019 levels. At hub airports, connectivity has returned to 33% of pre-2019 levels. The changes presented, on the one hand, are a positive signal, giving hope for a return to normality; on the other hand, there is a need to raise awareness that airports have a long way to go to restore pre-pandemic connectivity levels.

Airports, through generating jobs, attracting investors, creating conditions for the dissemination of new technologies, and facilitating movement, positively affect the quality of life of people living in their vicinity [34–36]. At the same time, it should be emphasized that the accessibility of airports to inhabitants varies. There are places (e.g., Dutch regions) where the daily intensity of flights exceeds 2500 flight operations and, in other places (regions of eastern Poland, Bulgaria, Estonia, Latvia), there are no airports within a 90-min drive [37] (p. 107). On the other hand, ports generating noise and contributing to air pollution create negative social and environmental effects.

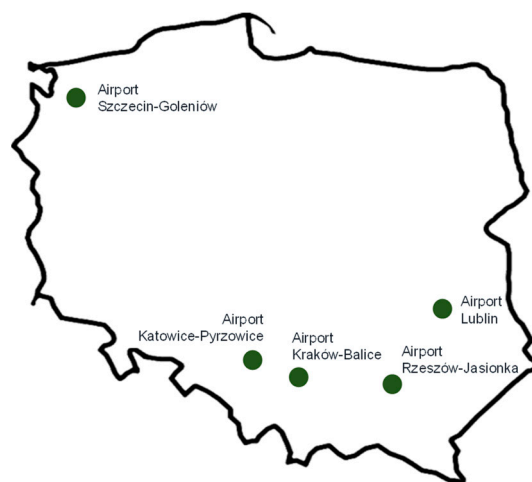
The importance of infrastructure as a factor in regional and local development is changing over time. The old paradigm of regional policy was to support regions with infrastructure projects, the labor market, subsidies for international companies, and external investment in order to attract them to the region. The implementation of proven, standardized development patterns was to be a factor in the development of individual places in space, even though it did not take into account their specific characteristics [38] (pp. 2–4). The new paradigm of regional policy became one of the basic assumptions of highlighting the specific features that distinguish individual spaces. According to its assumptions, the identification of endogenous potential and its development on the basis of favorable institutional solutions, high-quality business environments, high competence of employees, access to goods, services, and information, the development of innovation and entrepreneurship, and infrastructure investments were the source of success in the development of regions [38] (pp. 4–6). Infrastructure and its high quality are a prerequisite for the development of a region. Supporting the process of rooting companies, building local production networks, and strengthening the competitive advantages of companies located in a specific space [39] (pp. 130–132), [40] (pp. 37–41), [41] improve the competitive position of regions [42] (pp. 637–638), resulting in attracting companies to the region [43]. In light of the presence of the mechanism of cumulative causality, the creation of infrastructure is particularly important in regions lagging behind in development [44] (pp. 46–47).

This complexity makes it difficult to assess the impact of the airport on the socio-economic situation in the commune. The inspiration to undertake research at the commune level was the fact that airports are presented as an element affecting the functioning, competitiveness, and attractiveness of the region, while their impact on entities in their immediate environment is less frequently exposed.

## 2. Materials and Methods

The research started with identifying communes in Poland where airports are located. Then, five communes were selected from among them, distributed throughout the country. These were three rural communes (Trzebowniko, Ożarówice, Zabierzów), an urban-rural commune (Goleniów), and an urban commune (Świdnik). Airports are located in these communes (Rzeszów-Jasionka, Katowice-Pyrzowice, Jan Paweł II Kraków-Balice, NSZZ “Solidarność” Szczecin-Goleniów, and Lublin—Figure 2). Two of them, Katowice-Pyrzowice and Kraków Airport, have a higher number of air operations per year than the other airports. Municipalities and airports (Figure 2), years 2016–2020, are presented on the basis of data obtained from the Local Data Bank of the Central Statistical Office and the websites of the Civil Aviation Office (ULC) [45], the Polish Air Navigation Services Agency

(PANSa) [46], and the International Airports Council (ACI) [47]. Despite these efforts, no data have been obtained to allow an in-depth analysis of airport operations.



**Figure 2.** Location of airports. Source: own preparation.

In order to obtain a more complete picture showing the role of airports in the communes, strategic documents of individual communes were also analyzed, including municipal development strategies, municipal status reports, strategies for solving social problems, and revitalization programs [48–52]. These documents were analyzed in terms of the identification of factors influencing the development of communes and barriers hampering this development. Attention was paid to the importance that local authorities ascribe to the airport located on the territory of their commune, as well as to the development trends of the commune in connection with air traffic development trends. The situation in the aviation industry was presented based on information presented in studies [22–25].

Research involving residents of communes (questionnaires) and representatives of local authorities (interviews) was conducted in February and March 2021, using structured questionnaires. The research based on the tools prepared by the authors of the article was carried out by the research company “Instytut Badawczy IPC sp. z o.o”. Their aim was to determine how the impact of the airport on its immediate surroundings is perceived by residents (their sex, age, education, distance from the place of residence, and airport included) and representatives of local authorities. The survey covered 600 residents of the communes: Goleniów, Ożarówce, Świdnik, Trzebownik, and Zabierzów (120 respondents each). The people taking part in the survey were drawn from among the residents of the communes. The respondents were selected according to their gender and age. The questions contained in the survey questionnaire were divided into thematic blocks. They dealt with the problems of a general assessment of the presence of the airport in the commune, the impact of the airport on the situation in the commune in the economic, social, and environmental dimensions, and possible changes in the way the airport operates, in connection with the occurrence of the COVID-19 pandemic and the consequences of these changes on the socio-economic situation in the commune. The subjects of the discussion with representatives of local authorities were the impact of the airport on the situation in the commune, in economic, social, and environmental terms, as well as possible changes in this area, in connection with the COVID-19 pandemic, as a result of the reduction in air traffic. The interviews were recorded, which, as a consequence of transcription, made it possible to prepare text files (.txt) from each interview.

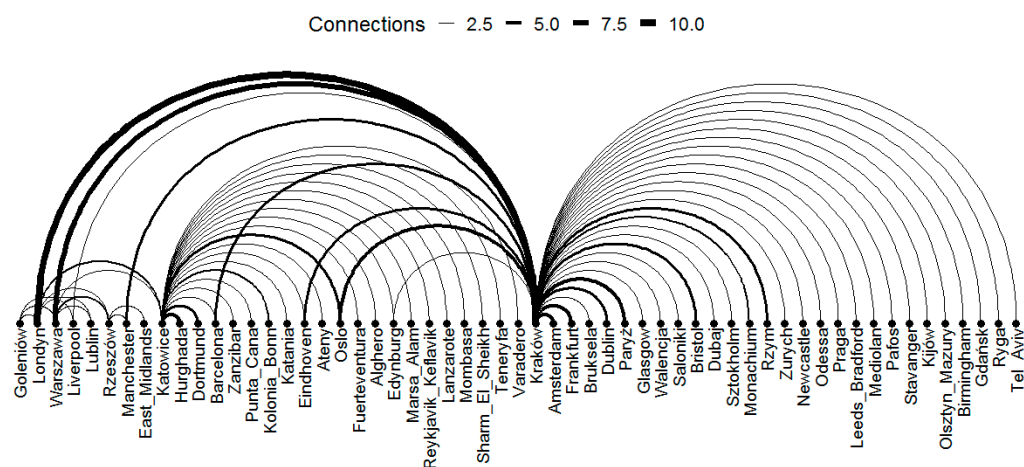
Analyses of the collected statistical material were carried out using the following software: Excel, Statistica v.13.3, and R/RStudio. Statistical hypotheses were verified using the test  $\chi^2$ . A standard level of significance of  $\alpha = 0.05$  was adopted. Taking into account the nature of the drawn communes and the size of the airport located in their area, the answers of the respondents, in addition to the variables included in the metric, were

analyzed through the prism of these variables. The description of the statistical analyses, the results of which are included in the article, is presented in the works of [29,53–56]. Their use allowed us to combine quantitative and qualitative approaches in the context of identifying the impact of airports on the situation in individual communes. For the preparation of Figures 5, 7 and 8 in the R program, library (Likert) and solutions presented in [57] were used.

### 3. Research Results—Correlations between Communes and Airports

#### 3.1. Airports

The airports presented in this article, to a greater or lesser extent, affect the development and competitiveness of the region and contribute to the success of local economies and the maintenance of local services at the current level. From both the airlines' and the airports' perspectives, it is important that their services are part of a larger network. Airports encourage airlines to use them as one of the hubs in their route network. The close proximity of an airport to a large city/town in the region, with good access to road and rail communications, means its favorable location. The attractiveness of an airport is also determined by where planes depart to, how often this is done, and which airlines operate each route. From the passengers' perspectives, this is an important issue, especially when reaching the destination involves the need to use other modes of transport. Figure 3 shows the daily intensity of flight operations at Szczecin-Goleniów, Lublin, Rzeszów-Jasionka, Katowice-Pyrzowice, and Kraków-Balice airports. Data for the analyses were obtained on 7 February 2022 from the airports' websites. Some destinations can only be reached from Katowice-Pyrzowice and Kraków-Balice airports.



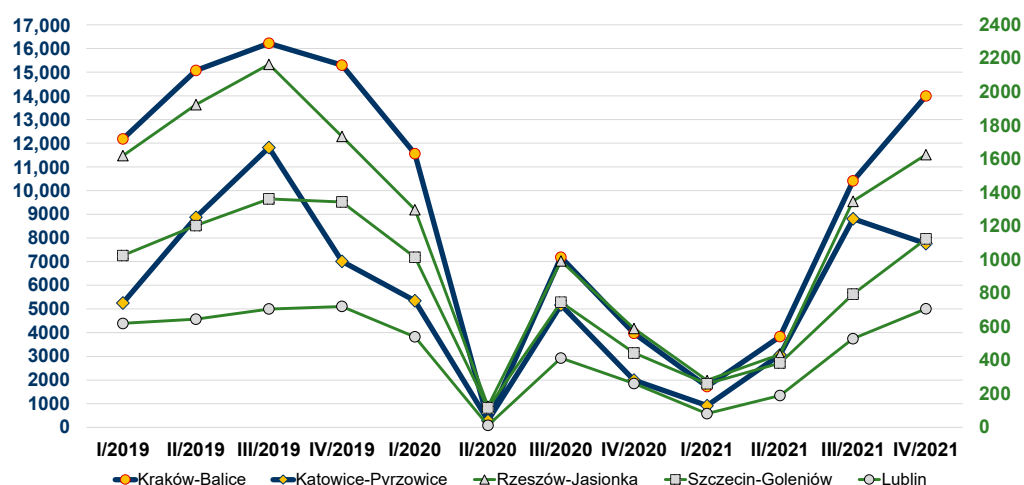
**Figure 3.** Daily volumes of departures and arrivals at the characterized airports. Source: own compilation based on [58] and data from the airports' websites.

Based on data obtained from the CAA, it was found that from 2016 to 2019, at all of the above-mentioned airports, there was a systematic increase in the number of flight operations carried out (Kraków-Balice by 48.9%, Katowice-Pyrzowice by 41.0%, Rzeszów-Jasionka by 19.8%, Szczecin-Goleniów by 16.0%, Lublin by 4.6%). In most ports, this translated into an increase in the number of passengers serviced (Kraków-Balice by 68.9%, Katowice-Pyrzowice by 51.3%, Rzeszów-Jasionka by 16.2%, Szczecin-Goleniów by 24.2%, Lublin decreased by 5.8%).

Similarly, at Polish airports, as a result of the COVID-19 pandemic, the number of flight operations (Figure 4) and the number of checked-in passengers fell dramatically in the first half of 2020. Due to the fact that at Kraków-Balice and Katowice-Pyrzowice airports, a significantly higher number of flight operations were carried out, for better readability and the possibility of comparing exchanges at other airports, in Figure 4, two



OY axes were used. Data for Kraków-Balice and Katowice-Pyrzowice airports are on the left OY axis, and the right OY axis is for the rest.



**Figure 4.** The impact of the COVID-19 pandemic on the number of flight operations at the airports in question. Source: own elaboration based on data from ULC and PAŻP.

The data presented in Figure 3 shows that if in the first months of 2021, compared to 2019, the number of flight operations performed was significantly lower, then starting from June 2021, the differences began to decrease significantly. The presented data shows that regardless of the size of the airport, the course of phenomena (decrease and then increase in the number of air operations) was similar.

Seasonal fluctuations in demand, which are characteristic of the aviation industry, were also evident at the airports presented when there was an underutilization and, at other times, an over-utilization of the capacities held by the airports [59] (p. 88), clearly visible before the pandemic, was also noticeable during its occurrence.

### 3.2. Communes

The Zabierzów commune, due to its distinctive natural features, proximity to Krakow (13 km away), and transport accessibility, is an attractive place to live. Access to a large labor market, educational, cultural, health care, and other institutions, as well as the location of the airport in the commune, which is considered one of the factors stimulating its economic activity, support this assessment. In the period 2016–2020, the number of national economy entities included in the REGON (Business Statistical Numbers) register increased by 22% in the commune. During this period, the share of registered unemployed in the number of people of working age decreased by 0.4 p.p., with the indicator in 2019 being the lowest in the analyzed period, amounting to 2%, while its deterioration, as can be assumed, was a consequence of the COVID-19 pandemic and the resulting restrictions on doing business in some industries [60]. Moreover, between 2016 and 2020, the number of employees decreased by about 14%. However, comparing 2020 with 2019, the number of employed decreased by 6.6%. The balance of migration for permanent residence, internal and foreign, was positive, amounting to 359 people. It should be emphasized that the communication accessibility of the commune, allowing more efficient movement of people and goods, on the one hand, is its advantage, and on the other hand, increasing traffic intensity and air pollution are noticed [52] (pp. 17, 20, 65, 69).

In the commune of Trzebowno, between 2016 and 2020, the number of inhabitants increased by 6.87% to 22,633. The commune is located about 7 km from Rzeszów. This territory is the home of Podkarpacki Park Naukowo-Technologiczny Aeropolis (Podkarpackie Science and Technology Park Aeropolis), which is part of SSE Euro-Park Mielec and is adjacent to Rzeszów-Jasionka airport. The activities of the science and technology park and the airport are seen as factors dynamizing the development of the commune. Due

to the development of the aviation industry, among other things, the economic profile of the commune is transformed in the industrial direction, which promotes the creation of new jobs [51] (pp. 11, 71, 77). From 2016 to 2020, the number of national economy entities included in the REGON register increased by almost 25% in the commune [61]. During this period, the share of registered unemployed in the population of working-age people decreased by 0.3 p.p. (the lowest value of the indicator was recorded in 2019: 4.3%). In the analyzed years, a positive balance of migration for permanent residents (internal and foreign) was registered, the highest value was recorded in 2020: 316 people. At the same time, despite the persistence of a positive natural growth rate in the commune since 2016, in 2020, it was 53% lower compared to 2019. The number of employed people in the commune over the period of 2016–2020 increased by 159% [60].

Another commune located in the south of the country is the commune of Ożarówce. It recorded a slight (1.3%) increase in the number of inhabitants between 2016 and 2020. During this period, the number of national economy entities in the REGON register increased by 10.6%. The share of registered unemployed in the number of people of working age decreased by 1.2 p.p. to 3.4% (in 2019, the value of the indicator was the lowest, it was 2.6%) [60]. The number of employed over the years increased from 3056 people to 3511, by almost 15%. The natural growth rate has recorded a negative value in the commune since 2017; in 2020, it was (−5). In contrast, the balance of migration for permanent residence is positive. The economic activity zone and the airport located in the commune are considered factors influencing local development and conditioning its attractiveness to new residents [48] (pp. 87–88).

In the commune of Goleniów, located in the north-western part of Poland, the number of inhabitants increased by 0.8% from 2016 to 2020. The total migration balance was positive. The natural growth rate was negative in 2019–2020, recording a value of (−71) in 2020. The situation in the labor market in the commune was relatively good, as, in 2020, the number of employed people was 9.38% higher than in 2016 (the highest value was recorded in 2019: 14,208), and the share of registered unemployed people in the number of people of working age was 0.1 p.p. lower (the lowest value assumed in 2018: 2.3%). In the presented period, the number of entities registered in the REGON register increased in the commune by 9.3% [60]. Integrated road, rail, and air connections will determine the communication accessibility of the commune, improving the movement of inhabitants [49] (pp. 18, 22).

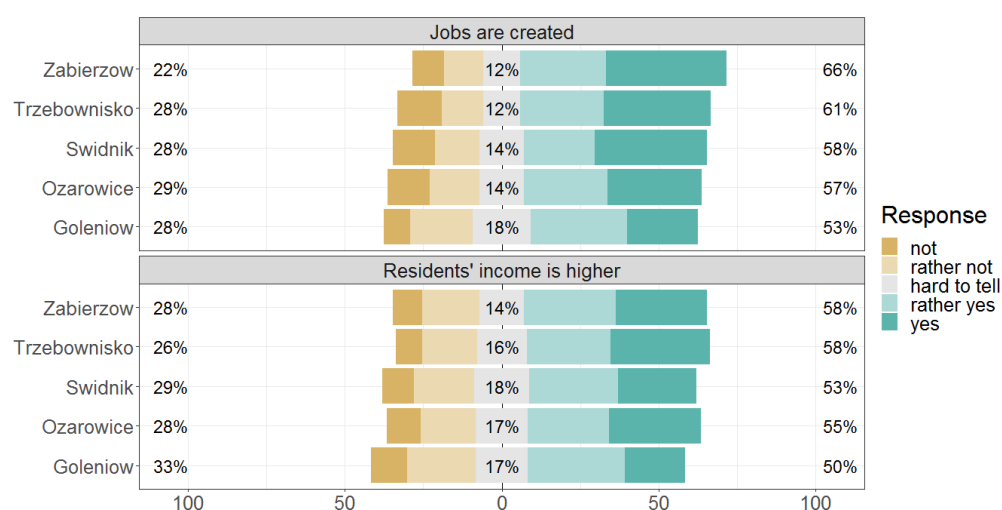
In the last of the characterized communes, the commune of Świdnik, a decrease of 2.8% in the number of inhabitants was recorded between 2016 and 2020. Its favorable location (10 km away from Lublin) and access to the railway line connecting Lublin with Warsaw, Kyiv, and Lviv are its assets. In the analyzed period, in the commune, a negative balance of internal and foreign migration was recorded; in 2020, it was (−253). In addition, between 2018 and 2020, a negative natural growth rate was also registered; in 2020, it was (−118). The number of employed people over the period under review increased by about 1.4% and amounted to 8803; the highest value was recorded in 2019 with 9290 people. The share of registered unemployed in the working-age population improved by 1.4 p.p. to 5.7% (the lowest value was registered in 2019: 4.9%). However, the number of national economy entities registered in the REGON register increased by 5.3% [60]. Along with others, the airport is recognized as a strength in the development of the commune [50] (p. 14).

### *3.3. Opinions of Residents and Government Representatives on the Impact of the Airport on the Socio-Economic Situation in Their Commune*

In the opinion of the majority of the residents surveyed (56.2% women, 55.6% men), the airport increases the quality of life in their commune. This opinion was expressed by half of the respondents in Goleniów commune, 55.8% of respondents in Trzebownik commune, 57.5% in Ożarówce commune, 57.0% in Świdnik commune, and 59.0% in Zabierzów commune. A different opinion was expressed by 21.7% of respondents from the Goleniów commune, 16.7% from the Trzebownik commune, 19.2% from the Ożarówce commune, 16.5% from the Świdnik commune, and 19.7% from the Zabierzów commune,

who felt that the presence of the port lowers the quality of life in the commune. The others did not take a clear position in this respect. The majority of respondents (44.8%) were satisfied with the presence of an airport in their commune (37.5% of respondents from the Goleniów commune, 48.3% of respondents from the Ożarówice commune, 48.7% of respondents from the Świdnik commune, 47.5% from the Trzebowńsko commune, 41.8% from the Zabierzów commune). It was found that as the distance between the respondents' place of residence and the airport increased, the percentage of respondents pointing to the positive impact of the airport on quality of life increased (statistically significant correlation,  $p = 0.006$ ). The positive impact on the community was more often perceived by those with lower education (statistically significant correlation,  $p = 0.002$ ).

According to the respondents, the airport plays an important role in the local labor market. In each of the surveyed communes, opinions prevailed that its presence fosters the creation of jobs for the surrounding population, which in turn makes the income of residents higher (Figure 5).



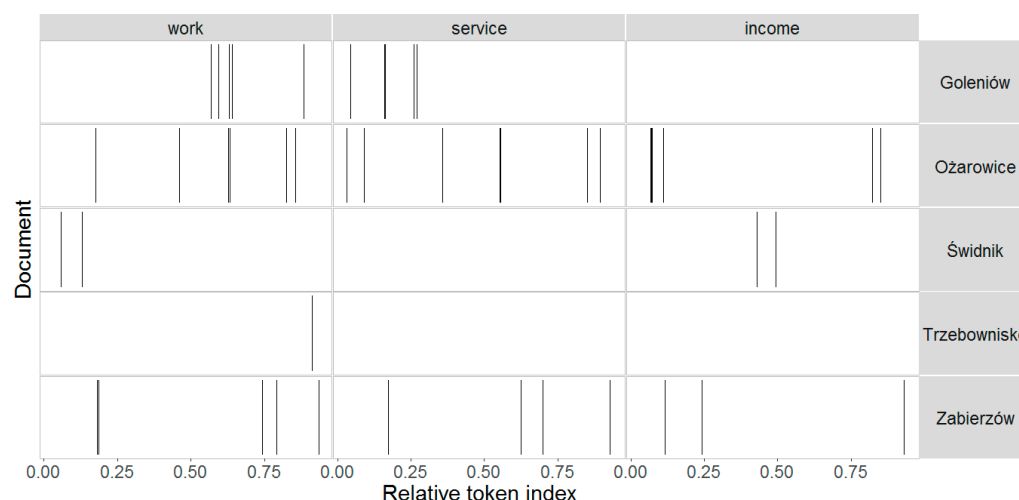
**Figure 5.** Respondents' opinions on the impact of the airport on the local labor market and residents' income. Source: Own study.

In the communes where the study was conducted, respondents most often assessed the airport as offering well-paid jobs (Goleniów 40.8%, Ożarówice 56.7%, Świdnik 52.1%, Trzebowńsko 54.2%, Zabierzów 54.9%). These responses were given by both men and women from every age group, regardless of their education or place of residence. The positive impact of the airport on the local labor market and the financial situation of local residents was perceived by both women (58.4%) and men (59.7%) participating in the study, people of all ages with different educational backgrounds. The beneficial impact of airports on the local labor market was also pointed out by the representatives of the authorities, which was manifested by their use of relevant words such as work, services, and income, with varying frequency in different parts of the interview (Figure 6).

Sentiment analysis [29,54] was used to analyze the overtones of statements made by local government representatives. In the commune of Goleniów, the good mood was a consequence of the port's influence on the improvement of communication accessibility of the commune, including investors operating in the Goleniów Industrial Park. In the commune of Ożarówice, the positives were the development impulse for companies and the attraction of new businesses to the commune, while the commune of Świdnik attracted investors to the economic activity zone and investments in technical infrastructure, improving driving comfort and accessibility of the commune. In the commune of Trzebowńsko, the airport is seen as a major employer in the local labor market and has a positive effect on the state of roads. In the Zabierzów commune, the impact of the airport on the emergence of new businesses in the area was emphasized. In the statements made by representatives



of the local authorities of Trzebowńsko and Zabierzów, words with a negative connotation were more frequent than in other communes.



**Figure 6.** Occurrence of selected words in statements of representatives of communes' authorities. Source: own elaboration based on [62].

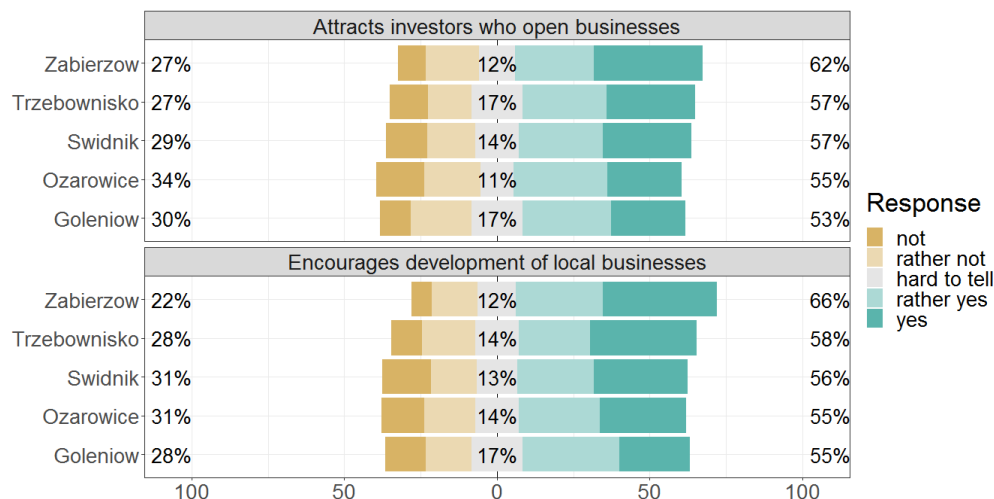
Among the words that were uttered by local government representatives, words expressing emotions accounted for 20–25%. They were related to expectation, trust, and joy in the context of new opportunities and development plans related to the presence of the airport (Goleniów), increased economic activity in the commune (Ożarówice), investments contributing to the quality of life of residents (Świdnik), new businesses being set up in the commune, greater accessibility to markets (Zabierzów), and the role of the airport as an employer (Trzebowńsko).

The perception of the airport as a factor contributing to a higher quality of life in the commune is also supported by its role as a factor dynamizing local economic activity and as a magnet attracting investors. In each of the communes where the research was conducted, more than half of the surveyed inhabitants (57.1% women, 59.0% men) perceived the importance of the airport for the development of local entrepreneurship (Figure 7). This referred mainly to companies providing the following services: hotel, parking, catering, cleaning, security, and at the same time, to those looking for cooperators among enterprises located in economic zones. This group included people of all ages with different educational backgrounds.

Moreover, representatives of local authorities perceived the port as a factor increasing interest in the commune in the eyes of investors and, in this context, they undertook actions aimed at creating conditions conducive to the development of entrepreneurship and promotion of the commune's assets in order to attract new businesses to the commune, using, among other things, the asset of the airport. In their statements, in addition to the beneficial impact of the airport on the quality of life of local residents (economic revival, jobs, income, transport accessibility), there were also references to the negative effects of its presence. The most frequently mentioned were the deterioration of living conditions of local residents as a result of increased noise levels (particularly in the period before the COVID-19 pandemic, as a consequence of increased traffic at the airport), increased vehicle traffic (Zabierzów), restrictions on land use around the airport (Ożarówice), and increased prices of land plots in the commune (Trzebowńsko, Goleniów).

Noise nuisance was reported by 42.5% of respondents in the Goleniów commune, 58.3% in the Ożarówice commune, 38.0% in the Świdnik commune, 35.0% in the Trzebowńsko commune, and 48.4% in the Zabierzów commune. They were indicated by respondents of all ages, regardless of their education. The study confirmed that noise is more bothersome for those living closer to the airport (statistically significant relationship,

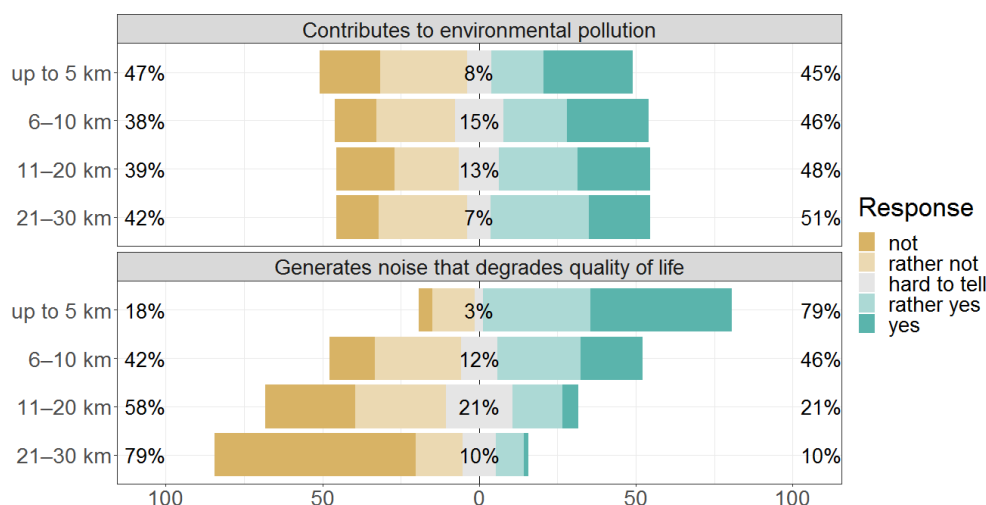
$p = 0.0000$ ), as seen in Figure 8. Noise at night was mentioned by 17.5% of respondents in urban-rural communes, 4.2% in urban communes, and 13.1% in rural communes. Noise problems were more often indicated by respondents living near larger ports (statistically significant correlation,  $p = 0.007$ ).



**Figure 7.** Respondents' opinions on the role of the airport as a factor stimulating economic development. Source: Own study.

Survey participants also perceived a negative impact of the airport on the environment. The deterioration of air quality was indicated by 33.3% of respondents from Goleniów commune, 34.2% from Ożarówice commune, 21.5% from Świdnik commune, 31.7% from Trzebowńsko commune, and 30.3% from Zabierzów commune. Respondents also pointed out that the airport contributes to the increase in car traffic (Goleniów 22.5%, Ożarówice 22.5%, Świdnik 8.3%, Trzebowńsko 14.2%, Zabierzów 26.2%).

Transport accessibility fosters an increase in economic activity in the commune and consequently also increases demand for municipal land, which is indirectly influenced by the presence of the airport. In the opinion of nearly a third of respondents (28.7%), the location of the airport has a very high and high impact on increasing demand for land in the commune. Among the respondents perceiving a beneficial impact of the airport on the quality of life in their commune, more than a third (37%) indicated that it affects to a very large and large extent the increase in prices of plots of land in its vicinity.



**Figure 8.** Respondents' opinions on the negative impact of the airport on the quality of life in the community. Source: Own study.

In the opinion of respondents, the COVID-19 pandemic and the consequent air traffic restrictions that were put in place resulted in changes in the direction of airports and temporary restrictions on employment (reduced staffing levels, work stoppages, and holiday withdrawal). Airports were experiencing financial difficulties and therefore turned to shareholders for support. To meet the needs of ports, communes offered support in the form of remissions, reductions, and exemptions from property tax (e.g., based on the provisions of the anti-COVID shield) (Goleniów, Ożarówice). The significant reduction in the number of passengers carried at the ports was accompanied by an increase in air cargo operations, which, in turn, encouraged the implementation of investments in the cargo terminal and the warehouse for handling special goods (Świdnik). On the other hand, the positive side of the reduction in the number of air operations was the decrease in noise nuisance for residents (Zabierzów).

For commune residents, the proximity of an airport, on the one hand, means a certain discomfort due to increased noise levels, but on the other hand, it favors taking up employment at a place remote from home. This opinion was expressed by 24.6% of respondents from Goleniów commune, 20.3% from Ożarówice commune, 18.1% from Świdnik commune, 19.6% from Trzebowńsko commune, and 17.4% from Zabierzów commune. There was no statistically significant correlation between the opinions of respondents in this regard and the variables of gender, age, education, and distance from the airport. Respondents were also asked to assess the percentage of community residents who used the services of carriers operating from airports located in their commune before and during the pandemic. The median differences in these ratings for respondents from each commune were: Goleniów 10%, Ożarówice 20%, Świdnik 15%, Trzebowńsko 15%, and Zabierzów 10%.

#### 4. Discussion

This paper focuses on the impact of the airport on the socio-economic situation of the commune in which it is located. The analysis of data found on the websites of CAA, PANSA, CSO, and the airports and the communes' websites and the analysis of the communes' documentation served to characterize the entities (airports and communes) that cooperate with each other. The analysis of the statistical material obtained during the questionnaire survey and the use of text mining to identify the most frequently used words and the analysis of the mood and emotions that accompanied the interviewees allowed a picture to be obtained (from the perspective of residents and local government representatives) of the impact of airports on the socio-economic situation in their immediate environment (commune). The approach used, quantitative and qualitative, allowed us to gain a broader perspective on this impact.

During the study period (2016–2020), until the COVID-19 pandemic, an increase in the number of air operations carried out was evident at the airports located in the communes. This indicated an increase in the transport accessibility of the communes and entailed measures to increase investment attractiveness for businesses and improve the quality of life for residents. In communes, projects related to the expansion and adaptation of space for entrepreneurs were implemented, e.g., in the Goleniów Industrial Park (Goleniów commune), in the Regional Industrial Park (Świdnik commune), in the Subcarpathian Science and Technology Park (Trzebowńsko commune), and the reconstruction of the railway line (Ożarówice commune), which exposed the importance of airports and industrial parks in specific locations, as well as the connections between them [31]. The decrease from the end of 2019, followed by a slow increase (from mid-2020) in the number of these operations, continued along a similar pattern at all airports. These ports operate mainly domestic and within Europe, allowing them to slowly, like other ports with similar scope [6,19], rebuild the number of connections to pre-pandemic levels. One impediment may be the staffing problems faced by other airports [63,64]. Analyzing the job offers (May 2022) posted on the airports' websites, it was found that employees were sought mainly for auxiliary activities that do not require specialized training, such as in the case of flight attendants or air traf-

fic controllers. This is a signal regarding job opportunities for the local population, also discussed in the literature [6,31–34].

Communal transport accessibility resulting from the improvement of the quality of transport infrastructure in the opinion of the respondents favored the development of entrepreneurship (e.g., an industrial park in Goleniów; an economic activity zone in Ożarówice) and the improved situation in the labor market, which confirms the relationships presented in the literary references [44].

## 5. Conclusions

The communes in which the research was carried out are located within a few to several dozen kilometers from the largest urban centers in the region. An additional advantage of communes is a good road network, which allows fast access to closer and further urban centers. The communes are diversified with regard to their character, location, resource structure, and interaction with entities located within their territory. The importance of the airport (as well as the location in relation to large cities) for local development is confirmed in the strategic documents of individual communes, in which the authorities emphasize that airports are the commune's strong point and the prospect of increased air traffic in the coming years represents a development opportunity for it. As a result, local authorities are making efforts to create favorable conditions for business development, including integrating the network of transport links, in order to properly discount the presence of the airport in the commune.

Among the benefits derived from the presence of an airport in a commune, as perceived by residents and representatives of the communes' authorities, the following should be pointed out: an increase in communication accessibility in the region and the commune, thanks to which it is possible to attract investors, the development of cooperative ties between businesses, an improvement in the situation on the local labor market, and an increase in the quality of life in the commune, which is an incentive for residents from neighboring communes to settle in the area. No statistically significant relationship was found between opinions in this regard and the variable character of the communes or the variable size (number of air operations) of the airport.

During the interviews, characterized by a good atmosphere and emotions of expectation, trust resulted from the presence of airports and representatives of commune authorities perceived the presence of a port in the municipality to be an asset, pointing to its importance for improving the commune transport accessibility and its image, and thus enhancing investment attractiveness and as a result attracting investment capital (Ożarówice, Świdnik, Goleniów). New investments in economic zones contribute to improving the situation in the labor market; there are more and more jobs in the communes (Trzebowno, Goleniów, Ożarówice). Local economic entities servicing the airport are also developing, cooperating with companies in the zones and benefiting from the improved income situation of residents.

Problems for communes connected with the location of airports include increased noise levels, restrictions in land development in zones around the airport, and partly, also, rising prices of land plots in the commune. Nevertheless, in light of the respondents' answers, it can be assumed that the benefits associated with the presence of an airport in the commune outweigh the nuisances. In the period from 2016 to 2020, the values of socio-economic indicators in each commune indicate the continuation of the development trend despite the decreases recorded in 2020 due to the occurrence of the pandemic. The negative consequences of its impact on the airport and, consequently, the socio-economic situation in communes (in terms of job losses, problems of local companies cooperating with the airport, reduced receipts to communes budgets from taxes paid, and difficulties for people taking up employment far from their place of residence) were perceived by inhabitants and representatives of local authorities.

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