

Sustainability in Airports: Confins International Airport X Salvador International Airport

*Sustentabilidade em Aeroportos: Aeroporto Internacional de
Confins X Aeroporto Internacional de Salvador*
*Sostenibilidad en Aeropuertos:
Aeropuerto Internacional de Confins x Aeropuerto Internacional de
Salvador*

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Abstract: The exuberant growth of airports in Brazil is causing irreparable damage to the environment, and this brings insecurities regarding the future of the planet and the next generations. With this, this research has the general objective of presenting actions in airport management that influence the environment and showing architectural projects that many airports in Brazil are implementing in their structure, focusing on the International Airport of Salvador (BA) and the International Airport of Confins (MG), which presents a good nature between the environment and the airline industry. The focus is on the actions that airports adopt in their operating strategies, acting and measures with a sustainable vision, being able to use new technologies for a more economical and yet ecological management. The study presents forms of management at airports that have a positive end. After careful research, it was possible to identify a major concern in relation to sustainability that grows continuously every day and that is still a long path and of great cult.

Keywords: *Sustainability; Environment; Airport Management.*

Resumo O crescimento acentuado de aeroportos no Brasil está causando danos irreparáveis ao meio ambiente e traz como consequência inseguranças sobre o futuro do planeta e das próximas gerações. Com isso, esta pesquisa tem como objetivo geral apresentar ações na gestão aeroportuária que influenciam no meio ambiente e mostrar projetos sustentáveis que muitos aeroportos pelo Brasil estão implementando em sua estrutura, com foco no Aeroporto Internacional de Salvador (BA) e o Aeroporto Internacional de Confins (MG) que demonstra uma boa correlação entre meio ambiente e setor aéreo. A análise está nas ações que os aeroportos adotam em suas estratégias de operação, atuação e medidas com uma visão ecológica, podendo utilizar de novas tecnologias para uma gestão mais econômica e após uma pesquisa cautelosa foi possível identificar uma grande

preocupação em relação a sustentabilidade que a cada dia cresce continuamente e que ainda sim, é um caminho longo e de grande relevância.

Palavras-chave: Sustentabilidade; Meio Ambiente; Gestão Aeroportuária.

Resumen: El fuerte crecimiento de los aeropuertos en Brasil está causando daños irreparables al medio ambiente y trae como consecuencia inseguridades sobre el futuro del planeta y de las próximas generaciones. Así, esta investigación tiene como objetivo general presentar acciones en la gestión aeroportuaria que influyen en el medio ambiente y mostrar los proyectos sostenibles que muchos aeropuertos de todo Brasil están implementando en su estructura, centrándose en el Aeropuerto Internacional de Salvador (BA) y el Aeropuerto Internacional de Confins (MG) que demuestran una buena correlación entre el medio ambiente y el sector aéreo. El análisis está en las acciones que los aeropuertos adoptan en sus estrategias de operación, desempeño y medidas con una visión ecológica, pudiendo utilizar las nuevas tecnologías para una gestión más económica y luego de una cuidadosa investigación se pudo identificar una gran preocupación en relación a la sostenibilidad que crece día a día continuamente y que aún así, Es un camino largo y muy relevante.

Palabras clave: Sostenibilidad; Medio ambiente; Gestión Aeroportuaria

1. INTRODUCTION

Sustainability has been a topic addressed at airports over the years. Greenhouse gas, pollution, and melting glaciers have been a global concern, as they affect the health of a large part of the population. Instructors have been increasingly holding lectures on the comparative field to encourage sustainable methods, such as less aggressive disposal methods and reducing unnecessary water use. One of the biggest problems is still the emission of CO², whether by vehicles or factories, which is the most harmful to the air.

Airports are significant emitters of toxic gases, and aircraft, with their high fuel consumption, automatically release aggressive gases that can potentially harm the environment. Given the critical importance of sustainable development for the longevity of the planet and all living beings, we compare two airports, the Confins International Airport (MG) and the Salvador International Airport (BA), both of which have sustainable development as a core principle.

In 2019, ANAC (2023) introduced the Sustainable Airports program through the Sustainable Aerodromes pilot project, which aims to monitor the development of environmental management in airports and disseminate sustainable initiatives adopted by airport operators, promoting the reduction of the impacts of civil aviation on the environment.

2. THEORETICAL BASIS

Airports have set the trend for becoming more sustainable, a result of the collective attitudes of people and entities, and a crucial factor for the planet's survival. In other words, the key to achieving positive results in sustainability is to create more strategies in organizations and ignite the interest of society. For Boff (2012), sustainability is the set of processes and actions that aim to maintain the vitality and integrity of the Earth, preserving its ecosystems with all the physical, chemical and ecological elements that enable the existence and reproduction of life, meeting the needs of future generations. In other words, sustainability is a conscious solution for the population to achieve results for the environment gradually.

Airports significantly influence the country's economy, serving as embarkation and disembarkation points for cargo and passengers, with a structure that generates a substantial environmental impact. Norberto Cunha (2011) states, "an efficient and well-located airport is a determining factor in the competitiveness of a region, with a decisive role in land use planning."

Therefore, the impacts of air activities on the environment that occur in an unaligned manner generate an environmental change that can compromise factors such as: the environment, the region, the population, and even wildlife. Therefore, an Environmental Impact Study (EIA) was created to assess environmental impacts precisely. This assessment is a preventive environmental management instrument that acts in the decision-making process. It evaluates the negative results in the environment where the activity was proposed before it is even implemented (SANTIAGO, 2016).

Analyzing environmental issues, the Airports Council International (ACI), together with ICAO, is working on Green Airports, looking for airports that are planned ecologically, with emphasis on infrastructure, better land use, and management. The ACI provides some requirements to be considered a Green Airport, such as main sustainable mobility initiatives and management that analyzes the environmental impacts on airports (TECHNOLOGY, 2020 apud SILVA, 2020).

The so-called "Green Airports" are based on the concept of sustainability, which is thinking about the next generations; that is, a "Green Airport" focuses on being increasingly ecological, based on technologies and knowledge to reduce environmental and ecological impacts (SILVA, 2020).

3. METHOD

The methodology used during the study is descriptive, as it will analyze and describe the correlation between the environment and the airline industry. Descriptive research collects and analyzes information about a situation or element of data obtained. It is similar to exploratory research but focuses more on analyzing the description of events. (RAMOS, 2009)

Descriptive research can be confused with exploratory study. However, it differs from the latter in that it gives greater importance to describing the process in which the variables are related. In this case, the parameters of cause(s) and effect(s) are known, and the focus is on describing the phenomenon through more structured techniques, such as interviews, planned observations, and experiments, among others. Explanatory research aims to explain a theory about a fact/phenomenon/process; it deals with the reason for the fact/phenomenon/process (RAMOS, 2009, p.183).

The research methods used are bibliographic. Bibliographic research is illustrated using previously published materials as a content source; examples include articles, magazines, and books. The research was carried out using these sources to highlight the argument about concern for sustainability, show the results over the years, and receive recognition. Pádua (2007, p. 55) reaffirms that Bibliographic research is based on knowledge of library science, documentation, and bibliography: its purpose is to put the researcher in contact with what has already been produced and recorded regarding his/her research topic.

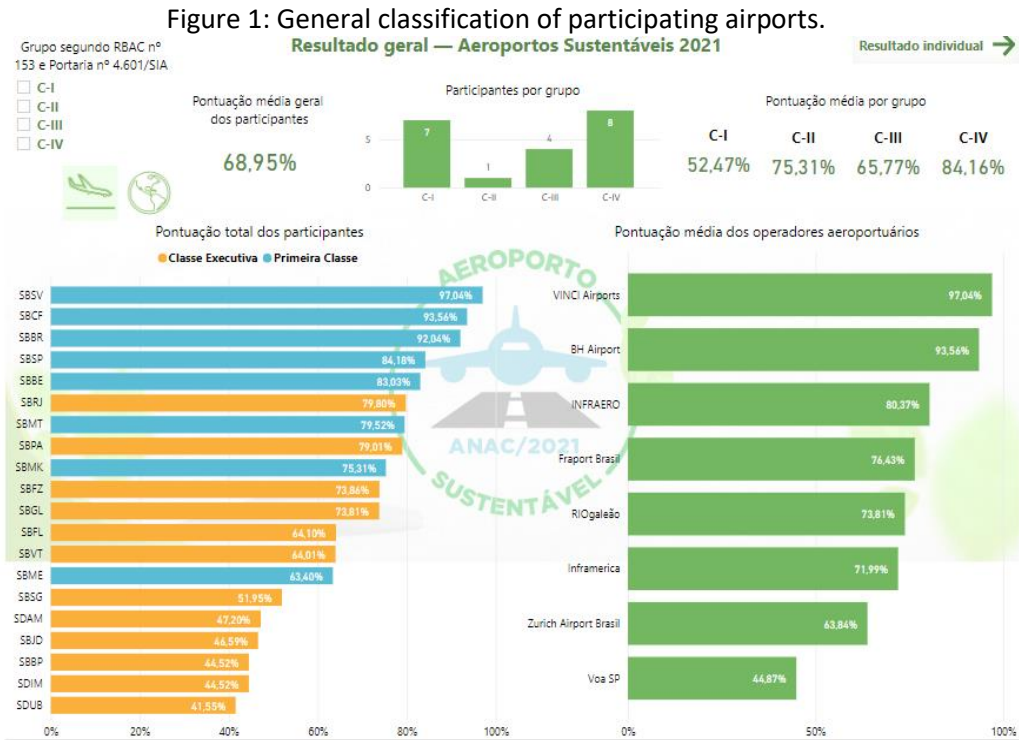
4. RESULTS AND DISCUSSION

4.1 Case Study – Comparative Analysis of Two Airports

Emphasizing the importance of airports in becoming increasingly ecological, ANAC created in 2019 a program called "Sustainable Airports" that analyzes, through criteria, good practices, and proactive recognition linked to environmental management in national airports' air operations.

The edition analyzed was 2021, and the participating airports answered 32 evaluation criteria. Based on the sum of the weights that the airports met, there

were 20 competitors in this edition. The airports were classified into two levels according to their sustainable activities: first and business class. The results are presented in Figure 1.



Source: ANAC (2021)

The results showed that Salvador International Airport (BA) is ranked first among the most sustainable airports in Brazil. In contrast, Confins Airport (BH) is ranked second, and Congonhas Airport is ranked third.

The analysis will be conducted between the top two airports ranked in this report that propose more sustainable actions with future concerns in mind.

4.2 Salvador International Airport (BA)

Salvador Bahia Airport is located 28km from the center of Salvador, measuring approximately 7 million meters distributed between vegetation and dunes. It has a complete infrastructure and a terminal with a current capacity to handle 11 million passengers/year and to operate 26 aircraft on its apron, operating domestic and international flights to South America and Europe. It is currently part of the VINCI AIRPORTS operator. It leads the list of the most punctual airports in the world in the medium-sized category, achieving a punctuality rate of 95.09% for takeoffs and 93.50% for landings. (VINCI AIRPORTS, 2021)

The entire concept of environmental management and sustainability focuses on reducing pollutant and greenhouse gas emissions. In 2021, level 2 of the ACA (Airport Carbon Accreditation) certification was achieved, granted by the Airport Council International (ACI) organization. In 2021, the reduction was equivalent to 29% compared to the same period in 2018. A 50% reduction is expected by 2030. (VINCI AIRPORTS, 2021). In 2018, environmental management began at

the airport, where solar power plants were installed, as shown in Figure 2, with 11,000 photovoltaic panels with an investment of R\$16 million. In 2020, the milestone of 30% of the energy generated by the sun and distributed throughout the airport was reached, an investment of R\$16 million that has increasingly made Salvador Bahia Airport stand out for its concern for the environment and sustainability (VINCI AIRPORTS, 2020).

Figure 2: Solar plant.



Source: Salvador Bahia Airport (2023)

4.3 Confins International Airport (MG)

Confins Airport is an international airport in the municipality of Confins, Minas Gerais. The state's main airport is located 39 km from Belo Horizonte. It is the seventh busiest airport in Brazil.

Belo Horizonte International Airport, BH Airport, mainly serves the capital, the Metropolitan Region of Belo Horizonte, and the state of Minas Gerais. It has 26 boarding bridges, one of which is exclusive for international flights, 26 boarding bridges, three of which are for international operations, 17 inspection channels for passengers (X-ray), nine baggage claim conveyors, and three sets of moving walkways.

Currently, the airport can meet an annual demand of 22 million passengers/year, 132 thousand m² of area, with 52 thousand m² in the new area being able to receive large aircraft, such as the Boeing 747 and the Antonov An-124 (BH AIRPORT, 2021). Its facilities are concentrated on advanced technology systems, a cargo terminal, a fully automated air terminal, a 3600 x 45-meter runway equipped with precision landing equipment (ILS CAT I), and all other aids to aeronautical operations. (BH AIRPORT, 2021) BH Airport works to strengthen itself as the most sustainable in the country. In 2022, the Minas Gerais international terminal received the Green Airport Recognition for the second consecutive year during the Annual Assembly Conference & Exhibition ACI-LAC 2022, held in Buenos Aires, Argentina. The renovation of the Chilled Water Plant, as shown in Figure 3, was highlighted during the event and also received an honorable mention as a sustainable project in the areas of Energy Efficiency, Water Reuse, and Maintenance Cost.

The airport also received the renewal of its carbon emissions reduction accreditation, at level 2, by the Airport Council International (ACI) program. It was the third time the terminal received certification for meeting all the requirements for reducing greenhouse gas emissions, which went from 2,480 tons in the first year of participation in the program in 2017 to 584.6 tons in 2021. (BH AIRPORT, 2021).

Figure 3: Chilled Water Center.



Source: Concessionária UltraEnergia (2023)

4.4 Comparative Table

The airports participating in the program created by ANAC called “Sustainable Airports” include a study of sustainable improvements that they implement in their structure. Based on this, there is excellent relevance between the airports of Confins and Salvador. This comparative table can be seen in Table 1.

This table sets out some critical criteria that ANAC asked the airports participating in the program. The percentages presented are related to reducing environmental problems already known and debated worldwide. The two highlighted are very similar in their responses about airport noise, which corresponds to all noise that can be emitted besides aeronautical noise. Confins International Airport obtained a lower score (12.1%) compared to Salvador Bahia Airport (14.7%); many similarities can be noted in energy consumption (13.8%), GHG (4.18%), water resources (11.7%), pollutant emissions (4.37%) and air quality (9.07%). There are still discrepancies in solid resources, with 12.63% in Confins and 11.7%, where there was a more significant reduction in BH, and aircraft noise (aircraft), with 20.7% in Confins and 22.1% in Salvador, with emphasis on Salvador Bahia Airport, which reduced the most and had a higher percentage, which occasionally resulted in Salvador Bahia Airport being number one and Confins Airport number two.

It is important to emphasize that, based on these results, Confins International Airport and Salvador Bahia Airport are referenced in sustainable issues. Few issues differentiate them, but both are on the right track with their methods and environmental management.

Table 1: Comparison of environmental requirements

	Aeroporto Internacional de Confins	Aeroporto Internacional de Salvador
Ruído	12,1%	14,7%
Consumo de energia	13,8%	13,8%
Gás efeito estufa	4,18%	4,18%
Recursos Hídricos	11,7%	11,7%
Resíduos Sólidos	12,63%	14,75%
Emissões de poluentes	4,37%	4,37%
Ruído Aeronáutico	20,7%	22,1%
Qualidade do ar	9,07%	9,07%

Source: Anac (2021)

5. CONCLUSION

Environmental sustainability is a concern and is evident all over the world today, with an eye on future generations and the planet, thus becoming a concern for the aviation sector, which is increasingly implementing measures that aim for this improvement, such as, for example, the ANAC report called "Sustainable Airports," which seeks to name airports with sound environmental management practices and that recognize sustainability initiatives in air operations.

In Brazil, some airports apply these sustainable airport measures, emphasizing the ones we studied, such as the Confins Airport in Belo Horizonte and Salvador International Airport. These airports implement various measures of sustainable actions, such as reducing energy use, adding programs to reduce greenhouse gas emissions, and selectively collecting solid waste, among other items.

Analyzing both that seek to innovate by investing in technological means, the airport of Salvador—BA creates measures and conducts that are positively estimated for the environment. For example, it implements actions that reduce the power of paper use and the energy consumption of the airport itself, using rainwater throughout its structure to reduce expenses and maintenance, focusing on not affecting the environment.

The airport of Salvador is considered a "Green Airport" and was named the best sustainable airport in Brazil, with ecological and sustainable measures such as reducing energy consumption by adding solar panels and generating clean energy that reduces energy use during the day, in addition to permanently preserving the area around the airport by modifying its reservoirs and reducing water consumption, both rainwater and tap water, where it created a rigorous treatment reused in its infrastructure. Salvador Airport is estimated to handle 11 million passengers annually, while Belo Horizonte Airport can handle 22 million. In other words, the larger an airport is, the greater its structure and cost will be in implementing new sustainable economic actions. Therefore, Salvador International Airport has a slight advantage in the research made available by ANAC, which presents a difference of 2.6% in noise, 2.12% in solid waste, and 1.40% in aircraft noise. However, both have similar objectives, especially related to saving water and how to reuse energy consumption. Therefore, these airports seek to implement the best measures equally, based on the best sustainable.

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