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# The Analysis of the Environmental Impacts of the Proposed Third Runway at London Heathrow Airport and Why It Will Make Aviation Management Easier

## Methodology

### *Research Design*

The study adopts a qualitative approach as it strives to meet the aims and objectives of the research. The application of qualitative research in this case was important in determining the best tools for collecting the intended data and analyzing it. Additionally, the nature of the research and the expected results make a qualitative research design highly relevant for the study.

### *Data Collection*

To facilitate the success of the study, data was collected from online academic journals, reliable news articles, and governmental databases. Moreover, the findings gathered were qualitative because they did not take any numerical form. The research used peer-reviewed journal articles because they are more valid and credible sources of academic research compared to non-academic sources. Reliable news articles and government databases were also considered in obtaining the intended findings because they are been known to deliver information that is relevant and trustworthy.

### *Sampling Criteria*

A random sampling selection method was used to collect the data from peer-reviewed articles that were based on the themes of airport expansion, climate change, greenhouse gas emission, airport delays, and airport management. These themes were considered because the research question revolved around them, and they were also helpful in collecting findings that would adequately aid in meeting the objectives and aims of the research. The research explored numerous research articles published between 2010 and 2021.

### *Data Analysis*

The research adopts the use of qualitative secondary analysis as it is a preferred way of analyzing the data that it collects from the chosen sources. Qualitative secondary analysis is the application of qualitative data collected by other researchers for the purpose of answering other different research questions. The data analysis criterion is the most applicable and appropriate in this study because the data collected relies on secondary sources. Additionally, it enables the research to effectively meet all the objectives and provide succinct findings that can be used to make appropriate decisions and recommendations regarding the expansion of the airport.

### *Strengths of the Study Design*

One of the strengths of the research design is the fact that it is time-efficient and easy to conduct. Since the research depends on secondary sources, there will be no need for analytical processes (Taylor *et al.*, 2018). The analysis of the research took a relatively short time due to the approach that was chosen. Additionally, the research was simple because the sources used were readily available in various online databases, including Science Direct, Google Scholar, and EBSCOhost.

It is also important to note that the research was not costly because the materials utilized to obtain the data were free. The use of secondary research findings to conduct studies is generally a cheaper alternative because most of the sources are freely available to the public domain (Sherif, 2018). The cost-effectiveness of the research was an advantage because many other researches require significant funding to completely undertake them (Bree and Gallagher, 2016; Van Damme *et al.*, 2017). It is important to note that the process of analyzing the collected data requires expertise, which is sometimes outsourced and adds to the financial burden of the research (Bree

and Gallagher, 2016). Meanwhile, the current study reduces the cost of the research because it does not outsource any specific expertise in completing the study.

Additionally, the other advantage of this research is increased credibility. Secondary research provides a wider perspective and validity for a study because researchers are going through many articles and journals on the subject matter (Schenk, 2016). Therefore, through the use of current evidence-based, empirical, and data-driven research findings, the arguments made in the secondary research are more credible and trustworthy as long as the selected articles are relevant to the subject matter (Johnston, 2017). For instance, when undertaking research on Heathrow Airport, finding more than one article supporting the same result gives the argument more credibility. The probability of bias in the secondary research is minimized or avoided as the study provides accurate findings and results. Thus, this study is relatively accurate and free from potential bias.

#### *Weaknesses of the Study Design*

Despite the fact that the chosen study design has made the research a success, there are some challenges it has faced. Opponents of this design believe that the use of secondary research methods has some limitations. For instance, it was necessary to ensure the validity and credibility of the sources utilized, which was time-consuming (Lenger, 2019). The scrutiny on the secondary sources utilized in the research increased the time of the research, although not by any significant length. The second challenge that the research encountered was the difficulty in identifying the correct sources with the themes of interest (Weil, 2017). However, despite these few weaknesses, the research was accurately conducted and successfully completed.

## Findings

### *Introduction*

The chapter briefly highlights some of the important results obtained after the secondary analysis of sources obtained. The results are in line with the research question, and they aim to provide information that aids in achieving the overall purpose of the study. Starting with the economic benefits and potential environmental costs, the section strives to succinctly answer the research question. It also gives clear points regarding some of the potential ways in which the airport can effectively address the challenges linked to the expansion project. Therefore, the section strives to present the results obtained from the sources that were analyzed.

### *Economic Benefits*

The government, through the ministry of transport, argued that the proposed third runway would increase the economy up to £61 billion over a period of 60 years (Department for Transport, 2021). Moreover, the project was expected to generate job opportunities for the locals through the construction and operation phases of the airport expansion project. The government planned that more than 77,000 jobs would be created for the locals before 2030 (Department for Transport, 2021). Employment is a key factor that almost all governments in the world are keen to create for their people. Therefore, the promise of employment opportunities is a strong point of argument that the proponents of the project have clung on over the years.

Additionally, the airport would help the government to achieve the goal of providing apprenticeship opportunities to 10,000 individuals by 2030. This would also reduce the rate of unemployment in the region and improve its economy. The expansion is also expected to reduce the price of tickets for various flights (Özsoy and Örkücü, 2021). The reduction of prices is eminent because of the potential increase in the number of flights. The expansion of the airport means that

the airport will have a better capacity to offer more services to the customers. This implies that the supply will match the demand for aviation services in the market, and this will definitely result in reduced prices. Lowered prices will have a significant economic impact since they will decrease the costs of various activities.

As a result of additional infrastructure, Heathrow would experience the increased airport management and operational efficiency. The airport would reduce the passengers' waiting time and delays at the airport should the project be implemented (Francis, Humphreys and Ison, 2017). The number of airplane routes would be escalated due to the expansion process (Francis, Humphreys and Ison, 2017). Therefore, the expansion is appropriately targeted to achieve future growth as the demand is projected to increase in the future.

Further research identified that airport delays cause significant losses and interference in major airports (Wang and Wang, 2019). Therefore, there is a need for airports to increase the number of flights and enhance flight networks (Wang and Wang, 2019). Additionally, research by Bendinelli, Bettini, and Oliveira (2016) reveals that airport management would improve due to reduced airport delays and congestion. Mohri *et al.* (2018) suggests the use of hub-and-spoke model as a potential solution to the problem of delays upon the construction of the third runway. However, the study also discovered that airport expansion improves the hub-and-spoke model as it provides more capacity for the airplanes to conduct more flights, which enhances flight networks (Wu, Zhang and Wei, 2018). The benefits are instrumental in making arguments regarding the adoption and implementation of the project.

## *Environmental Costs of the Expansion Project*

### *Climate Change*

The study revealed that climate change is the major reason against the construction of a third runway at Heathrow Airport. Arguments concerning climate change were paramount in the legal battle between the campaigners who were against the expansion project and the government through its transport ministry (Josimović, Krunić and Nenković-Riznić, 2016). In February 2020, the court of appeal was faced with challenges as it pronounced that the construction of a third runway at Heathrow Airport was illegal since it did not follow the set climate commitments (Heyvaert, 2020). Moreover, the research found that the aviation sector, contrary to other transport sectors, such as road and rail transport, experienced an increase of 13.3% in greenhouse gas emissions between 1990 and 2014 (Singh, Sharma and Srivastava, 2018). The increase is significant because it raises crucial environmental concerns especially with respect to climate change.

### *Pollution through Greenhouse Gas Emissions*

The research showed that greenhouse gas emissions were the center of attention for the fight against Heathrow Airport expansion by way of a third runway. Increased public awareness of the effects of anthropogenic carbon dioxide in the atmosphere led the anti-Heathrow campaigners to go to court to stop the project from commencing (Carrington, 2021). The legal battles based on air pollution have delayed the implementation of the project.

### *Noise Pollution*

Research reveals that the completion of the third runway may result in nearly 47 flights flying in and out of London every hour. According to the study by Weston (2021), this could expose almost 1.6 million people to an almost constant noise. Further research showed that aircraft

noise in the UK already poses health problems to the people living in the country. For instance, the noise from aircraft has been attributed to the deteriorating cardiovascular health of the individuals exposed to it (Basner *et al.*, 2017). Studies by the World Health Organization established that noise exposure was a significant cause of sleep disturbance among the people living in the UK (Basner *et al.*, 2017). Sleep disturbance is a problem because it affects the well-being of the people.

Additionally, studies showed that continuous noise exposure might affect people's psychological health (Basner *et al.*, 2017). However, research suggests that the impact of the aircraft noise on psychological health is not as consistent or strong as the other influencing factors. Studies done to assess the effects of aircraft noise on children show no effect on their cortisol levels or psychological health. However, aircraft noise is a potential threat to children with depression as it raises their cortisol levels (Basner *et al.*, 2017). Therefore, noise pollution from the aircrafts results in health problems that cannot be ignored.

### *Potential Ways of Addressing the Environmental Concerns to Support the Project*

#### *Internal Waste Recycling*

The expansion of the airport will increase the amount of solid and liquid wastes disposed from the airport. The waste would be produced from different sections of the airport including, but not limited to, airport offices, hotels, and cargo and passengers waiting bays (Sebastian and Louis, 2021). Managing the liquid and solid wastes is an important consideration that the company's management should plan for adequately. The research discovered that the best approach for airport waste management would be recycling, the process of which would necessitate the airport to adopt reusable and recyclable materials in its service industries (Onyelowe *et al.*, 2019). The research identified a sustainable waste management approach to be a system that is equipped with 3Rs:



reuse, recycle and reduce. The use of the 3R method was found to be effective in airports that aim to achieve sustainable development goals (Zamroni *et al.*, 2020). Moreover, the research discovered that, contrary to landfills, the 3R method was more effective as there are wastes such as plastics that are non-biodegradable (van Heek, Arning and Ziefle, 2017). Thus, recycling is a sure way of managing the organization's waste.

### *Green Technologies*

The research identified green technology as a solution to airport expansion. Due to the challenges associated with the expansion process, the adoption and implementation of eco-friendly technologies would help reduce the airport's environmental and climate change impact (Ferrulli, 2016). Research identified the use of renewable energy and natural energy as the best methods of reducing the airport's carbon footprint (Barrett *et al.*, 2016). The utilization of these approaches can help in addressing the problem of air pollution.

### *ICAO Sustainability Plan*

According to the International Civil Aviation Organization's (ICAO) annual report of 2016, airports can significantly reduce the emission of greenhouse gases by adopting sustainable aviation fuels (SAFs). Since their first adoption in 2008, many airports have considered and embraced their use, hence ensuring joining hands towards environmental sustainability (ICAO, 2016). The efforts of embracing the adoption of SAFs in Europe are steered by the European Commission, which set a target of 3% to 4% penetration into the European Union by the year 2020 and a further increase up to 40% by 2050 (ICAO, 2016). ICAO also suggests the adoption of the e-fan project, which is a significant milestone aiming to aid in the decarbonization process (ICAO, 2016). Combining these factors can help London Heathrow Airport to address most of the environmental concerns related to the third runway project.

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